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NORTHEAST MINNESOTA TRENDS AND OPTIONS

Wilbur R. Maki

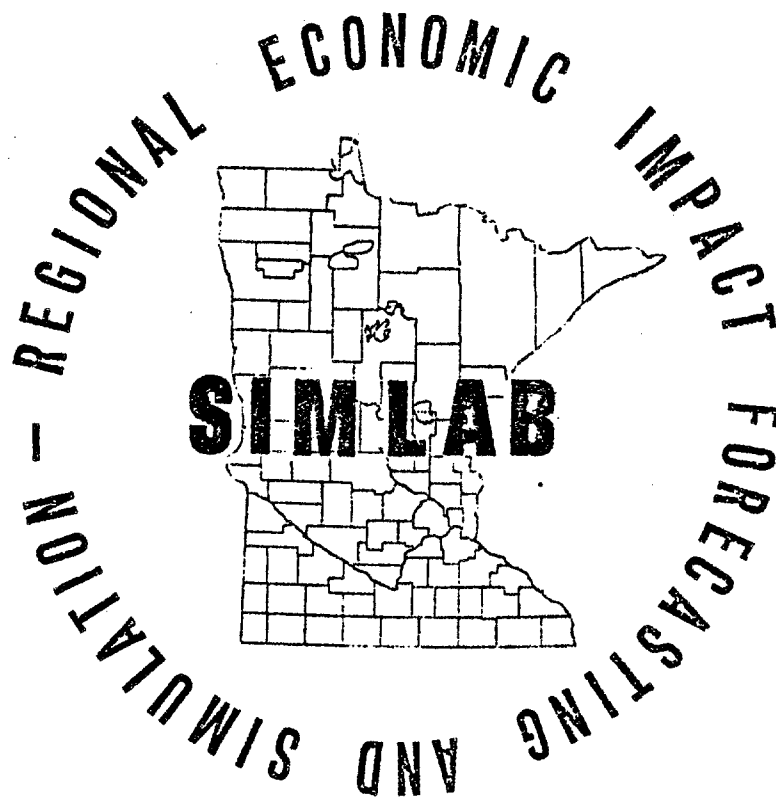


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Wilbur R. Maki



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Abstract

Existing statistical series on Northeast Minnesota economy are used in establishing a factual base for assessing regional economic trends and options. Population, labor force, and industry employment are presented in two contrasting options for Northeast Minnesota, namely, a baseline option and a differential option. In the baseline option, the Northeast Minnesota economy tracks the U.S. economy while in the differential option, current demographic and economic trends are extended to 1985 and 1990. The latter option portrays a rapidly declining regional economy as a consequence of reduced levels of exports in the region's basic industries, particularly taconite mining and manufacturing.

NORTHEAST MINNESOTA TRENDS AND OPTIONS

Wilbur R. Maki

My focus today is the economic future of Duluth and its region -- Northeast Minnesota. The four horesmen of regional economic growth -- people, jobs, income, and investment -- ride together. When people leave, jobs, income, and investment follow. When investment occurs in new businesses, however, and new jobs are created to increase the production of goods and services for export to regional and national markets, the regional economy expands and prospers. Even former residents return to seek the new jobs. Both patterns of economic change have characterized the Northeast Minnesota economy in recent years.

People, Jobs, Income, and Investment

People and their skills and capacities for working together productively in business and community enterprise is an important asset in regional growth and development. Over 343 thousand people live in the seven counties of Northeast Minnesota, of which 93 thousand reside in Duluth. They form a resident labor force of 147 thousand. In 1980, 132 thousand were employed. Because of severe reductions in taconite mining and other cyclically-sensitive industries in the region this total has declined sharply.

The 1980 U.S. Census of Population shows, for Northeast Minnesota, a population generally older than in Minnesota as a whole and also a population with fewer people in the remuneratively productive age classes, especially between 25 and 45 years of age.

Current population levels are the outcome of population migration and natural increase, that is, births minus deaths. Typically, young people move out while older people move into the region. The net movement depends, in large part, on jobs and income-earning opportunities in the region. Lack of new job openings locally, together with low retirement rates in existing jobs, high unemployment rates, and many new job openings elsewhere in the nation quickly trigger net out-migration, particularly in the age classes from 25 to 45 years.

A second important variable in regional growth and change is labor force participation. The rate of labor force participation is the proportion of the total population in each age and gender class which is in the labor force, that is, working or seeking work. In Northeast Minnesota, labor force participation rates are lower than in Minnesota as a whole largely because of the low participation rates of females in all age classes.

A third important variable is the occupational distribution of the regional work force. In 1980, a relatively large portion -- 34 percent -- of the Northeast Minnesota work force was included in (1) maintenance and construction and (2) craft and repair. In comparison, only 27 percent of the Minnesota work force was reported in these two occupations. Thus, the regional labor force is oriented to a materials-producing economy, which also accounts for the low proportion of female workers.

The three critical demographic variables in regional growth and change -- migration, labor force participation, and occupational distribution -- reveal much about the economic past of Northeast Minnesota. They are related to various household characteristics, including size, income, and residence. Because of proportionately more older single-person

households, the average household is only slightly larger in Northeast Minnesota than in Minnesota generally. A large proportion of households are in the low and, also, moderately high, income classes. The once large household is declining in average size.

Finally, a snapshot of Northeast Minnesota population and its distribution shows concentration in two urban modes -- Duluth and the agglomeration of 23 municipalities centered on the Mesabi Iron Range. A total of 198 thousand persons reside in urban areas, with slightly more than 102 thousand in the urbanized portions and another 95 thousand persons in urban fringe areas. A rural population of 146 thousand also is included.

Municipal and county population trends show a reversal in the 1970's, with a majority of places increasing in total population. Most recent trends and projections show still another reversal in the mid-1980's which is, in part, a response to high unemployment levels throughout the region.

Private and Public Entrepreneurship

Export expansion and import substitution are two strategies for private and public entrepreneurship. They focus directly on two dimensions of economic growth and change -- export markets and the economic base multiplier. Export markets are represented by all non-resident purchases of goods and services produced in Northeast Minnesota. Thus, shipments to manufacturing plants in the Minneapolis-St. Paul Metropolitan Area, as well as visitor purchases of recreation-related services, are included among non-resident purchases.

Exports are linked to local employment through the economic base multiplier, the statistical relationship between total employment and

export-producing employment. Its magnitude is inversely related to the level of industry, household, and government purchases from rest-of-nation industries, that is, imports. Thus, the smaller the purchases of imports, the larger the economic base multiplier.

Import substitution reduces the import dependency of local industries. Export expansion may generally increase total imports and thus import dependency. Neither strategy insures a region's economic prosperity and long-term viability. Rather, the region's industry composition and the input requirements and value added contribution of each industry are dominant considerations in the choice of development strategy.

Industry composition in Northeast Minnesota is represented by the level of individual industry employment, output, and value added. A recent historical period is selected for presenting the statistical indicators of industry composition, namely, 1977. Because of data availability, comparisons can be made between Northeast Minnesota and Minnesota industry composition for the same year. For these comparisons, industry output and employment are shown for 10 industry groups in Table 1.1

Also shown are the employment requirements of Northeast Minnesota industry activity. For example, a total of 108.4 thousand jobs were created in producing an aggregate industry output valued at more than \$5.5 billion in 1977. A total of 28.7 thousand jobs produced out-of-region shipments valued at more than \$2.2 billion while the in-shipments, which were valued at slightly more than \$2 billion, were produced by 35.6 thousand jobs outside the region.

Jobs created in the region in the production of goods and services for local and external markets is one measure of economic performance.

Table 1.1. Gross output, value added, regional requirements, export, and employment in specified industry, Northeast Minnesota, 1977.

| Industry No. | Title | Product Value | | | | | Employment | | | | | |
|-----------------|--------------------------|-----------------|--------------|----------------------------|-------------------------------|----------------------------|----------------|---------|--------------|--------------|-------------------|---------|
| | | Gross Output | Ex- ports | Im- ports ^{1/} | Requir ^{2/} ments | Im- ports ^{3/} | Value Added | Total | Ex- ports | Im- ports | Resi- dentiary | Net |
| | | (mil. \$) | (mil. \$) | (mil. \$) | (mil. \$) | (mil. \$) | (mil. \$) | (thou.) | (thou.) | (thou.) | (thou.) | (thou.) |
| 1. | Agriculture For. Fish | 53 | 10 | 191 | 244 | 18 | 18 | 4.3 | 0 | 6.3 | 4.3 | 10.6 |
| 2. | Mining | 910 | 894 | 149 | 165 | 199 | 367 | 10.5 | 10.5 | 0.4 | 4/ | 0.4 |
| 3. | Construction | 616 | 127 | 20 | 509 | 173 | 272 | 6.8 | 0.2 | 0.3 | 6.6 | 6.9 |
| 4. | Mfg., Nondurables | 1321 | 780 | 455 | 996 | 474 | 344 | 9.7 | 6.9 | 5.8 | 2.8 | 8.6 |
| 5. | Mfg., Durables | 481 | 125 | 671 | 1027 | 125 | 188 | 7.2 | 2.4 | 10.8 | 4.8 | 15.5 |
| 6. | Tran., Com., Util. | 481 | 121 | 122 | 482 | 77 | 263 | 9.0 | 2.7 | 2.5 | 6.3 | 8.8 |
| 7. | Wholesale Trade | 191 | 0 | 68 | 259 | 15 | 142 | 5.5 | 0 | 2.1 | 5.5 | 4.3 |
| 8. | Retail Trade | 432 | 82 | 0 | 350 | 49 | 292 | 19.8 | 1.8 | 0 | 18.1 | 18.1 |
| 9. | Fin., Ins., Real Est. | 651 | 14 | 296 | 933 | 61 | 464 | 4.6 | 1.4 | 5.7 | 3.2 | 8.9 |
| 10. | Services | 315 | 51 | 43 | 307 | 60 | 196 | 29.5 | 2.9 | 1.7 | 26.6 | 28.3 |
| 11. | Government ^{5/} | 61 | 0 | 1 | 62 | 9 | 32 | 1.7 | 0 | 0 | 1.7 | 1.7 |
| 12. | Sub-Total | 5512 | 2219 | 2016 | 5309 | 1223 | 2583 | 108.4 | 28.7 | 35.6 | 79.7 | 115.3 |

^{1/} Imports from specified (row) industry in rest-of-nation.

^{2/} Region requirements of specified (row) industry output, i.e., gross output-exports and imports.

^{3/} Import purchases of specified (column) industry in region.

^{4/} 50 or less.

^{5/} Government enterprise and scrap.

Jobs are created outside the region, too, because of the demand for products in the region. The total jobs created by the Northeast Minnesota market is the sum of the jobs created outside the region and within the region. In 1977, this total was 115.3 thousand, of which 35.6 thousand was attributed to jobs created by the imports of goods of services by Northeast Minnesota residents -- household, business, and government.

The net jobs created by private sector purchases of goods and services in Northeast Minnesota was 6.9 thousand greater than the jobs created directly by its production of goods and services. This difference represents the excess of jobs created outside the region by imports over jobs created within the region by exports. Thus, the Northeast Minnesota private economy achieves the consequences of a high value added and a high earnings per worker economy in fewer, but higher paying, jobs. The excess jobs created outside the region in 1977 was due to a combination of high regional purchasing power coupled with lack of strong competitive advantages in import substitution. Generally, earnings per worker among the 35.6 thousand import-producing jobs were significantly lower than in the 28.7 thousand export-producing jobs. All of these jobs, including the residentiary jobs, were in the private sector.

Government jobs in 1977 totaled 25.9 thousand, of which the civilian portion was residentiary and the military's was export-producing. The total jobs and their market orientation was as follows:

| <u>Sector</u> | <u>Total</u> | <u>Export</u> | <u>Import</u> | <u>Residentiary</u> | <u>Net</u> |
|---------------|--------------|---------------|---------------|---------------------|-------------|
| Private | 110.5 | 28.7 | 35.6 | 81.8 | 117.4 |
| Government | <u>25.9</u> | <u>3.0</u> | <u>0</u> | <u>22.9</u> | <u>22.9</u> |
| All Industry | 136.4 | 31.7 | 35.6 | 104.7 | 140.3 |

Thus, when all military jobs are viewed as export-producing (because of federal income payments originating outside the region), the export-import job deficit is reduced from 6.9 thousand to 3.9 thousand. If all federal civilian jobs were export-producing, then the export-import job deficit is reduced to 2.3 thousand. Finally, if all federal and state jobs, which includes University of Minnesota-Duluth employees, were viewed as export-producing, the export-import job deficit would be wiped out. Of course, with full employment in the mining industry, which operated with reduced employment in 1977 because of a prolonged strike, export-producing employment would have increased by more than 3 thousand. With higher levels of employment in iron mining, import-producing jobs would also increase outside the region, which would reduce the net increase to near its original level.

A second measure of regional economic performance is the purchasing power of its resident economic units represented by its final produce value. In 1977, the final purchases of its household, business, and governmental units were as follows:

| <u>Regional Product</u> | <u>Total Value</u> (mil. \$) |
|-----------------------------------|---------------------------------|
| Personal consumption expenditures | 1617 |
| Gross private capital formation | 528 |
| Change in business inventory | 24 |
| Federal government purchases | 122 |
| State and local gov. purch. | 496 |
| Exports to rest-of-nation | 2219 |
| Other exports | 245 |
| Less: Imports from rest-of-nation | <u>2016</u> |
| Gross product value | 3235 |

Of the \$3.2 billion gross regional product in 1977, one-half was accounted for by household purchases, while business investment and government purchases accounted for 17 percent and 19 percent, respectively. A positive net balance of trade accounted for the remaining 14 percent of the total.

Gross regional product, by definition, equals value added by remuneratively productive activity in the region. In 1977, \$2.6 billion, or 80 percent, of the total remuneratively productive activity was generated in the private sector. Thus, the value added by the private sector was slightly less than the total value of household and business purchases and net exports. Income payments received by the resident population from federal, state, and local governments thus slightly exceeded total government purchases in 1977. In short, a net transfer of less than \$40 million occurred from the public to the private sector in Northeast Minnesota.

The contribution of the Northeast Minnesota economy to Minnesota's balance of trade is illustrated in Table 1.2. The excess-supply industries,

Table 1.2. Industry gross output and requirements as a proportion of state, Northeast Minnesota, 1977.

| Industry | | Gross | Requirements | | State |
|-----------|-----------------------|-------|--------------|-------|-----------------------|
| No. | Title | Out- | Total | Ex- | Net |
| | | put | | cess | Balance ^{1/} |
| (percent) | | | | | |
| 1. | Agriculture For. Fish | 1.0 | 4.7 | - 3.7 | -0.3 |
| 2. | Mining | 93.0 | 17.1 | 75.9 | 1.1 |
| 3. | Construction | 12.7 | 10.1 | 2.6 | 0.2 |
| 4. | Mfg., Nondurables | 9.7 | 7.8 | 1.9 | 0.4 |
| 5. | Mfg., Durables | 4.4 | 8.1 | - 3.7 | -0.7 |
| 6. | Tran., Com., Util. | 9.3 | 9.4 | - 0.1 | <u>2/</u> |
| 7. | Wholesale Trade | 4.6 | 7.7 | - 3.1 | -0.2 |
| 8. | Retail Trade | 8.5 | 7.2 | 1.3 | 0.1 |
| 9. | Fin., Ins., Real Est. | 6.0 | 8.4 | - 2.4 | -0.4 |
| 10. | Services | 6.8 | 7.4 | - 0.6 | <u>2/</u> |
| 11. | Government | 7.8 | 9.6 | - 1.8 | <u>2/</u> |
| 12. | Sub-Total | 8.3 | 8.1 | 0.2 | 0.2 |

^{1/} Excess of requirements to gross output, as percent of state, weighted by relative importance of specified industry requirements.

^{2/} Absolute value of .05 percent or less.

and retail trade, accounted for a net balance of payments for the state as a whole of more than \$130 million, or 0.2 percent of total state requirements of industrial output. The importance of each industry to the region or state is thus represented by several criteria, including net exports to rest-of-nation markets. Exports provide the economic base of a region or state and, hence, they are critical determinants of regional or state economic growth. Imports, on the other hand, represent "leakages", that is, economic requirements that impose a burden on the economic base. Two measures of imports are presented, namely, the imports of specified industry outputs from rest-of-nation and the imports by specified industry in the state or region of all industry output from rest-of-nation. Industry requirements, finally, are represented by industry output, minus exports, plus imports.

To understand the dynamics of demographic and economic change and consequences for employment and earnings in the region, a four-pronged approach is outlined. First, factors affecting the total population and its distribution are isolated and evaluated. Second, alternative population and employment futures are developed from this initial assessment. Third, the regional economic implications of the alternative futures are carefully and critically examined. Fourth, regional implications of alternative public policies and programs are examined.

BACK TO BASICS

Basic trends in regional economic growth and development are represented by population change. While birth rates in Northeast Minnesota are declining and also approaching state and national age-specific birth rates, migration rates change from year-to-year depending on both general and local economic conditions. Thus, area-to-area differences in population growth are attributed almost wholly to migration, particularly the level of in-migration relative to out-migration.

Population Change

Natural increase is the net change in total population due only to births and deaths. Births exceed deaths in Northeast Minnesota. Persistent economic decline and increasing out-migration of the resident labor force and of females in the age classes from 25 to 44 years would result in fewer births than deaths simply because households in the child-bearing and child-rearing age classes would decline.

While age-specific birth rates are high in Northeast Minnesota relative to Minnesota and the U.S. as a whole, total births per 1,000 population are close to state and national averages because of the total population structure. Northeast Minnesota has a higher proportion of older female population. Indeed, its total population is skewed toward the 45 to 49 years and older age classes.

Age-specific death rates compare closely with state and national averages. Again the overall average rate is high because of the larger proportion of total population in the 65 years and older age classes.

Age-specific migration rates in Northeast Minnesota differ from

statewide averages because of wide swings in the rates of in-migration. Rates of out-migration of teenagers and young adults remain fairly constant, although their total numbers are declining as teenagers and young adults decline in the total population. The sharp drop in U.S. birth rates starting in the early 1960's is an equally important factor in the dynamics of population change in Northeast Minnesota. Thus, rates of out-migration show remarkable uniformity among states and substate regions.

Changes in the levels of in-migration in Northeast Minnesota correspond closely with changes in job outlook. Migration into Northeast Minnesota increased as total employment increased in the 1970's. Large year-to-year fluctuations occurred because of several major construction projects which resulted in large increases in taconite production capacity.

In comparison with the state as a whole, a smaller proportion of residents -- 17 percent as compared to 21 percent -- change their county of residence in Northeast Minnesota than in Minnesota. Slightly less county-to-county change of residence in the 1975-80 period occurred in St. Louis County, which is part of the Duluth-Superior Standard Metropolitan Statistical Area (SMSA). According to the U.S. Census of Population, 31.2 thousand, or 15 percent of the 174.7 thousand St. Louis County residents who were five years and over in 1980, had not resided in St. Louis County in 1975. Of the 111.8 thousand persons five years and over residing in the six Northeast Minnesota counties outside of St. Louis County, only 14 thousand, or 13 percent, had resided in an SMSA in 1975.

The Northeast Minnesota and the statewide percentages for 1975 and

1980 are almost identical. In the aggregate, at least, the migration patterns for the Northeast compare closely with statewide migration patterns.

Industry Trends

Population growth in the urban places and rural areas of Northeast Minnesota in the 1970's can be attributed to the revitalization of the taconite mining industry, and the growth of retail trade and service industry employment. High earnings per worker in the basic industries, particularly mining and manufacturing, and large federal and state transfer payments to individuals, businesses, and local governments were the sources of large basic industry multipliers. They provide monetary support for an expanding diverse services-producing sector of the regional economy.

Employment

Employment expansion in export-producing industries in the 1970's accounted for the region's strong overall economic performance, as indicated in Table 2.1. Sources of employment change are represented by national-growth, industry-mix, and regional-share effects. The national-growth and regional-share effects are based on U.S. industry growth rates while the regional-share effect is based on the difference between Northeast Minnesota and U.S. industry growth rates. Both the national-growth and industry-mix effects were positive in the 1975-79 and 1979-80 periods.

The below-average employment growth in Northeast Minnesota can be attributed to the dominantly negative regional-share effects for the

Table 2.1. Wage and salary and proprietorial employment and sources of employment change in specified industry, Northeast Minnesota, 1975-1980

| No. | Industry Title | 1975 | Change 1975-79 | | | | Change 1979-80 | | | | 1980 |
|-----|------------------------------|--------|-----------------|--------------|----------------|---------------|-----------------|--------------|----------------|--------|------|
| | | | National Growth | Industry Mix | Regional Share | 1979 (number) | National Growth | Industry Mix | Regional Share | | |
| 1. | Farm | 631 | 90 | - 117 | - 146 | 457 | 3 | 10 | 3 | 472 | |
| 2. | Agricultural Services | 277 | 39 | 89 | - 77 | 327 | 3 | 36 | - 43 | 332 | |
| 3. | Mining | 11839 | 1684 | 1670 | - 825 | 14369 | 83 | 1481 | -2869 | 13065 | |
| 4. | Construction | 6970 | 992 | 900 | -1671 | 7191 | 42 | - 376 | -1704 | 5153 | |
| 5. | Manufacturing Nondurable | 9377 | 1334 | - 510 | -2050 | 8151 | 47 | - 218 | - 388 | 7593 | |
| 6. | Manufacturing Durable | 6707 | 954 | 361 | 186 | 8212 | 48 | - 393 | - 373 | 7494 | |
| 7. | Transp. and Public Utilities | 9126 | 1299 | - 133 | -1399 | 8892 | 52 | - 9 | - 488 | 8448 | |
| 8. | Wholesale Trade | 4823 | 686 | 114 | - 500 | 5123 | 30 | 98 | - 349 | 4902 | |
| 9. | Retail Trade | 20125 | 2863 | 972 | - 207 | 23753 | 138 | - 218 | - 406 | 23267 | |
| 10. | Finance, Ins., Real Estate | 3158 | 449 | 162 | 150 | 3920 | 23 | 114 | - 41 | 4016 | |
| 11. | Services | 22009 | 3132 | 917 | -1256 | 24803 | 144 | 635 | -1089 | 24494 | |
| 12. | Federal, Civilian | 2505 | 356 | - 324 | - 83 | 2455 | 14 | 32 | - 2 | 2499 | |
| 13. | State and Local Government | 22622 | 3219 | -1299 | - 773 | 23770 | 138 | 5 | 173 | 24087 | |
| 14. | Federal Military | 3053 | 434 | - 572 | 166 | 3082 | 18 | - 17 | - 173 | 2910 | |
| 15. | Farm Proprietors | 3532 | 503 | - 633 | 67 | 3468 | 20 | - 33 | 10 | 3466 | |
| 16. | Nonfarm Proprietors | 8484 | 1207 | - 76 | 28 | 9643 | 60 | 527 | - 329 | 9897 | |
| 17. | Total | 135241 | 19241 | 1521 | -8390 | 147617 | 863 | 1674 | -8067 | 142096 | |

1975-79 period. More specifically, the overall negative regional-share effect was the result of negative regional-share effects for the region's basic industries in the mining, manufacturing, trade, and service sectors.

Yearly data show that the overall negative regional-share effect is due to the prevasively large negative regional-share effects in the 1976-77 period. Mining industry employment was low in 1977 because of a prolonged strike in this industry. Its negative effects were felt in the residentiary industries. Reduced levels of mining resulted in reduced levels of industry employment elsewhere in the regional economy. This pattern of employment decline was repeated in 1980.

Earnings

Total earnings of the employed work force in each industry group in Northeast Minnesota are summarized for 1975, 1979, and 1980 in Table 2.2. The total earnings estimates include both wage and salary payments and proprietorial income in constant 1977 dollars.

Change in total real earnings for the 1975-79 period correspond closely with the overall pattern of employment change in the same pattern, but with relatively larger negative regional-share effects. However, in the 1979-80 period, the national-growth effect was negative (because of the decline in aggregate real earnings in the U.S.). Only the overall industry-mix effect remained positive. The relative decline in overall real earnings in the Northeast was much larger than in the U.S.

Year-to-year changes in the regional-share effect for real earnings also correspond with year-to-year changes in employment, given the overall reduced levels of real earnings per worker. Nonetheless, industry-to-industry differences persist in real earnings change sources.

Table 2.2. Total personal income and sources of income change (in 1977 dollars) for specified type of income, Northeast Minnesota, 1975-80.

| No. | Industry Title | 1975 | Change 1975-79 | | | 1979 | Change 1979-80 | | | |
|-----|-----------------------------|---------|-----------------|--------------|----------------|----------|-----------------|--------------|----------------|---------|
| | | | National Growth | Industry Mix | Regional Share | | National Growth | Industry Mix | Regional Share | |
| | | | (thousand \$) | | | | | | | |
| 1. | Wages and Salary | 1510335 | 298895 | - 1963 | -83521 | 1723661 | 19477 | -32577 | - 99800 | 1610748 |
| 2. | Other Labor Income | 108266 | 21426 | 25248 | 6766 | 161709 | 1827 | 5999 | - 11869 | 157659 |
| 3. | Proprietorial Income | 86596 | 17137 | - 5429 | -10825 | 87483 | 989 | -10804 | 7025 | 84694 |
| 4. | Total Earnings | 1705197 | 337458 | 17856 | -87580 | 1972853 | 22293 | -37382 | -104644 | 1853101 |
| 5. | Contribution to Soc. Insur. | - 88147 | - 17442 | - 4108 | 6681 | - 103013 | - 1164 | 2390 | 5449 | - 96340 |
| 6. | Residence Adjustment | - 14352 | - 2840 | 2685 | - 113 | - 14620 | - 165 | 1455 | 2436 | - 10895 |
| 7. | Net Earnings | 1602698 | 317174 | 16433 | -81012 | 1855220 | 20964 | -33537 | - 96759 | 1745866 |
| 8. | Property Income | 227680 | 45058 | 17600 | - 2550 | 287798 | 3252 | 18505 | 1842 | 311378 |
| 9. | Transfer Payments | 318877 | 63106 | -35144 | 3051 | 349890 | 3954 | 20503 | 15535 | 389865 |
| 10. | Total Personal Income | 2149255 | 425338 | - 1111 | -80511 | 2492908 | 28170 | 5471 | - 79382 | 2447109 |

Income

Change sources for total personal income in Northeast Minnesota are presented in Table 2.3. In the 1975-79 period, both overall income-mix and regional-share effects were negative largely as a result of (1) a disproportionately small increase in U.S. transfer payments and (2) a disproportionately small increase in real earnings. Thus, growth in Northeast Minnesota personal income was at a below-average rate.

Growth in U.S. transfer payments in the 1979-80 period removed the negative income-mix effect. However, an even larger negative regional-share effect maintained a negative overall regional-share effect for the 1979-80 period. Impact of reduced employment and earnings levels in mining on the total economy is demonstrated in the annual data series.

Finally, the industry employment trends illustrate the dynamics of demographic change in the 1970's, particularly in the 1975-80 period. Expansion in goods-producing industry employment supported expansion in services-producing industry employment, as shown in Table 2.4. Conversely, decline in goods-producing employment, especially when coupled with decline in government employment, supports expansion in services-producing employment. Much of the economic base of Northeast Minnesota is included in its goods-producing and government sectors.

Table 2.3. Total personal income and sources of income change (in 1977 dollars) for specified type of income, Northeast Minnesota, 1975-80.

| No. | Industry Title | 1975 | Change 1975-79 | | | 1979 | Change 1979-80 | | | |
|---------------|-----------------------------|---------|-----------------|------------|----------------|----------|-----------------|------------|----------------|---------|
| | | | National Growth | Income Mix | Regional Share | | National Growth | Income Mix | Regional Share | |
| (thousand \$) | | | | | | | | | | |
| 1. | Wages and Salary | 1510335 | 298895 | - 1963 | -83521 | 1723661 | 19477 | -32577 | - 99800 | 1610748 |
| 2. | Other Labor Income | 108266 | 21426 | 25248 | 6766 | 161709 | 1827 | 5999 | - 11869 | 157659 |
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| 5. | Contribution to Soc. Insur. | - 88147 | - 17442 | - 4108 | 6681 | - 103013 | - 1164 | 2390 | 5449 | - 96340 |
| 6. | Residence Adjustment | - 14352 | - 2840 | 2685 | - 113 | - 14620 | - 165 | 1455 | 2436 | - 10895 |
| 7. | Net Earnings | 1602698 | 317174 | 16433 | -81012 | 1855220 | 20964 | -33537 | - 96759 | 1745866 |
| 8. | Property Income | 227680 | 45058 | 17600 | - 2550 | 287798 | 3252 | 18505 | 1842 | 311378 |
| 9. | Transfer Payments | 318877 | 63106 | -35144 | 3051 | 349890 | 3954 | 20503 | 15535 | 389865 |
| 10. | Total Personal Income | 2149255 | 425338 | - 1111 | -80511 | 2492908 | 28170 | 5471 | - 79382 | 2447109 |

Government

1344232192

POSING THE OPTIONS

To simplify the task of the future Northeast Minnesota population and employment, two projections of the future are presented, namely, a baseline projection and a differential projection. The baseline projection show a slightly increasing population while the differential projection anticipates reductions in the region's economic base. The baseline projection postulates population changes derived solely from natural increase, that is, births minus deaths. The original differential projection implies an increase in out-migration and/or a decrease in labor force participation rates. These adjustments, in turn, reduce high unemployment levels associated with the anticipated reduction in mining and related service employment and earnings.

Baseline Projection

The baseline population projection starts from current levels of population and labor force in Northeast Minnesota. Expected age-specific birth rates and age-specific and gender-specific death rates are used to derive the natural increase in total population, by age and gender, for the two five-year periods, 1980-85 and 1985-90, as shown in Table 3.1.

Age-specific and gender-specific labor force participation rates of the 1970-80 period are adjusted to their long-term trends in deriving the total labor force for 1985 and 1990, as shown in Table 3.2. Total baseline labor force minus total baseline unemployment (of roughly 12 percent) equals total baseline employment. Employment levels are postulated, by industry and occupation, which are consistent with the baseline labor force projections.

| Age Class and Gender | Estimated 1970 | Estimated 1980 | Projected | | Change from 1980 | | | | | |
|-------------------------|-------------------|-------------------|---------------|-------------------|------------------|-------------------|---------------|-------------------|---------------|-------------------|
| | | | 1985 | | 1990 | | 1980-1985 | | 1980-1990 | |
| | | | Base- line | Differ- ential | Base- line | Differ- ential | Base- line | Differ- ential | Base- line | Differ- ential |
| | | | (number) | | | | | | | |

Male:

| | | | | | | | | | | |
|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0-4 | 12875 | 13270 | 15270 | 11464 | 15632 | 9486 | 2000 | - 1806 | 2362 | - 3784 |
| 5-9 | 16991 | 12763 | 13165 | 13197 | 15159 | 13525 | 402 | 434 | 2396 | 762 |
| 10-15 | 22916 | 16916 | 15512 | 14879 | 15622 | 13546 | - 1404 | - 2019 | - 1294 | - 3370 |
| 16-19 | 13398 | 13715 | 10930 | 8662 | 10197 | 8334 | - 2785 | - 8254 | - 6719 | - 8582 |
| 20-24 | 9948 | 13388 | 16727 | 12207 | 13594 | 6751 | 1339 | - 3181 | - 1794 | - 8637 |
| 25-29 | 8497 | 14959 | 15265 | 14834 | 16594 | 9016 | 306 | - 125 | 1635 | - 5943 |
| 30-44 | 24550 | 30085 | 36617 | 28744 | 42082 | 33146 | 6532 | - 1341 | 11997 | 3061 |
| 45-64 | 36545 | 33207 | 31363 | 31771 | 31249 | 26928 | 1844 | - 1436 | - 1958 | - 6279 |
| 65 and over | 17395 | 19678 | 20420 | 19655 | 20813 | 20008 | 742 | - 23 | 1135 | 330 |
| Total Male | 163192 | 169981 | 175275 | 155411 | 180943 | 140740 | 5294 | -14570 | 10962 | -29241 |

Female:

| | | | | | | | | | | |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0-4 | 12280 | 12430 | 14458 | 10845 | 14796 | 8975 | 1028 | - 2585 | 1366 | - 4455 |
| 5-9 | 16141 | 12094 | 12359 | 12560 | 14377 | 12823 | 265 | 466 | 2283 | 729 |
| 10-15 | 21683 | 16031 | 14688 | 14331 | 14673 | 12924 | - 1343 | - 1700 | - 1358 | - 3107 |
| 16-19 | 12416 | 13180 | 10344 | 8082 | 9722 | 7903 | - 2836 | - 5098 | - 3458 | - 5277 |
| 20-24 | 10765 | 15213 | 16185 | 11422 | 12919 | 5946 | - 972 | - 3791 | - 2294 | - 9267 |
| 25-29 | 8681 | 14302 | 15163 | 13674 | 16132 | 7548 | - 861 | - 328 | 1830 | - 6754 |
| 30-44 | 25483 | 28995 | 35136 | 29726 | 40593 | 32955 | - 6141 | - 731 | 11598 | 3960 |
| 45-64 | 37382 | 34914 | 32903 | 31237 | 32927 | 26425 | - 2011 | - 3677 | - 1987 | - 8489 |
| 65 and over | 20855 | 26204 | 28475 | 24668 | 30047 | 24136 | - 6439 | -10246 | - 4867 | -10778 |
| Total Female | 165686 | 173363 | 179711 | 156545 | 186185 | 139635 | 6348 | -16818 | 12822 | -33728 |
| Total | 328878 | 343344 | 354986 | 311956 | 367128 | 280375 | 11642 | -31388 | 23784 | -62969 |

Table 3.2. Total civilian labor force of specified age class and gender, Northeast Minnesota, 1970-1990.

| Age Class and Gender | Estimated 1970 | Estimated 1980 | Projected | | | | Change from 1980 | | | |
|-------------------------|-------------------|-------------------|---------------|-------------------|---------------|-------------------|------------------|-------------------|---------------|-------------------|
| | | | 1985 | | 1990 | | 1980-1985 | | 1980-1990 | |
| | | | Base- line | Differ- ential | Base- line | Differ- ential | Base- line | Differ- ential | Base- line | Differ- ential |
| (number) | | | | | | | | | | |
| Male: | | | | | | | | | | |
| 16-19 | 6087 | 7216 | 5192 | 4026 | 4819 | 3755 | -2024 | -3190 | -2397 | -3461 |
| 20-24 | 7988 | 12612 | 14069 | 10267 | 11393 | 5658 | 1457 | -2345 | -1219 | -6954 |
| 25-29 | 8038 | 13541 | 14404 | 13998 | 15608 | 8480 | 883 | 457 | 2067 | -5061 |
| 30-34 | 7426 | 11929 | 14020 | 12098 | 14260 | 13084 | 2091 | 169 | 2331 | 1155 |
| 35-44 | 16251 | 14994 | 20755 | 15189 | 25653 | 18331 | 5761 | 195 | 10658 | 3337 |
| 45-54 | 16731 | 14271 | 13084 | 11452 | 14700 | 10664 | -1187 | -2819 | 429 | -3607 |
| 55-64 | 16252 | 12849 | 12260 | 13990 | 10930 | 11164 | -589 | 1141 | -1919 | -1685 |
| 65 and over | 2572 | 2501 | 2131 | 2052 | 2033 | 1955 | -370 | -449 | -468 | -546 |
| Total Male | 80027 | 89913 | 95915 | 83071 | 99396 | 73091 | 6002 | -6842 | 9483 | -16822 |
| Female: | | | | | | | | | | |
| 16-19 | 4952 | 6485 | 4263 | 3304 | 4040 | 3117 | -2222 | -3181 | -2445 | -3368 |
| 20-24 | 5260 | 9532 | 11745 | 8289 | 9529 | 4386 | 2213 | -1243 | 3 | -5146 |
| 25-29 | 2906 | 7925 | 8614 | 7768 | 9451 | 4422 | 689 | -157 | 1526 | -3503 |
| 30-34 | 3263 | 6221 | 8094 | 6784 | 8851 | 7429 | 1873 | 563 | 2630 | 1208 |
| 35-44 | 7706 | 9167 | 11345 | 9660 | 14175 | 11277 | 2178 | 493 | 5008 | 2110 |
| 45-54 | 9681 | 8376 | 7551 | 6310 | 8612 | 6028 | -825 | -2066 | 236 | -2348 |
| 55-64 | 6311 | 7734 | 6538 | 6847 | 5941 | 5451 | 1196 | -887 | -1793 | -2283 |
| 65 and over | 1711 | 1792 | 1850 | 1603 | 1874 | 1506 | 58 | -189 | 82 | -286 |
| Total Female | 41791 | 57233 | 60000 | 50572 | 62473 | 43616 | 2767 | -6661 | 5240 | -13617 |
| Total | 121818 | 147146 | 155915 | 133643 | 161869 | 116708 | 8769 | -13483 | 14723 | -30438 |

Regional Differences

An alternative population future is derived from the proposition that population follows jobs. The dynamics of regional demographic change start with the level of regional economic activity.

Although a pre-eminant societal goal for a region may be to balance the number of new entrants into the labor force with the number of voluntary retirees, in reality a region experiences recurring imbalances between the supply of, and the demand for, labor. What ultimately determines the size and character of a region's labor force and population is the demand for its industry output and the constraints imposed on its industry performance. In short, the number of persons residing in Northeast Minnesota depends on the number of employment opportunities and their economic linkages, direct and indirect, with all industries in the region and in the rest-of-nation.

The alternative future population scenario for Northeast Minnesota is represented by a series of regional differential projections of total population and labor force derived from the Northeast Minnesota Regional Economic Impacts Forecasting System (REIFS) and its computer model of the Northeast Minnesota economy.^{1/} The differential projection series show much lower levels of total population and labor force than in the baseline projection series. In short, the differential projection series imply much out-migration of the 1980 resident population in all age classes.

Different projected changes in population and labor force levels under the two demographic options also are compared in Tables 3.1 and 3.2.

^{1/}Richard Lichty and Peter Stenberg, Northeast Minnesota SIMLAB projection series, unpublished data, 1983. An intermediate, or most probable, projection series is now available for comparison with the baseline and the differential series presented in this report.

While both population and labor force are projected to increase in the baseline option, they generally decline in the differential option.

The generally lower differential projection series is represented by the predominantly negative values in Table 3.3. This table summarizes the differences in projected population and labor force in the two demographic options.

Economic effects of a changing regional population range from changes in consumption patterns and tastes to place and type of work. Both the baseline and the differential projections show an ageing population, in part, less dependent on a full-time job, but still seeking essential social services.

Labor Force Participation

Population redistribution and change leads to changes in labor force participation. In 1980, labor force participation rates were lower in Northeast Minnesota than Minnesota because of the low participation rate for the female population, as shown in Table 3.4. This rate had increased in the 1970's. They are projected to increase again in the 1980's.

Unemployment rates, that is, the percentage of the total labor force not employed, were higher in Northeast Minnesota than in the rest-of-state. These rates are projected to decline in the 1980's with economic recovery and net population out-migration.

Nearly three-fourths of all employed persons were private wage and salary workers for both Northeast Minnesota and Minnesota as a whole. The slightly lower percentage of wage and salary workers, and, also, self-employed persons in Northeast Minnesota occurs because of the

Table 3.3. Projected population and labor force difference in specified age class and gender between differential and baseline projections, Northeast Minnesota, 1985 and 1990.

| Age Class and Gender | Population | | Labor Force | |
|-------------------------|------------|--------|-------------|--------|
| | 1985 | 1990 | 1985 | 1990 |
| (number) | | | | |
| Male: | | | | |
| 0-9 | - 3767 | - 7780 | -- | -- |
| 10-15 | - 633 | - 2076 | -- | -- |
| 16-19 | - 2268 | - 1863 | - 1166 | - 1064 |
| 20-24 | - 4520 | - 6843 | - 3802 | - 5735 |
| 25-29 | - 431 | - 7578 | - 406 | - 7128 |
| 30-34 | - 2037 | - 1251 | - 1922 | - 1176 |
| 35-44 | - 5836 | - 7685 | - 5566 | - 7322 |
| 45-54 | - 1886 | - 4528 | - 1632 | - 4036 |
| 55-64 | + 2279 | + 307 | + 1730 | + 234 |
| 65 and over | - 765 | - 805 | - 79 | - 78 |
| Total Male | -19864 | -40203 | -12844 | -26305 |
| Female: | | | | |
| 0-9 | - 3412 | - 7375 | -- | -- |
| 10-15 | - 357 | - 1749 | -- | -- |
| 16-19 | - 2262 | - 1819 | - 959 | - 923 |
| 20-24 | - 4763 | - 6973 | - 3456 | - 5143 |
| 25-29 | - 1489 | - 8575 | - 846 | - 5029 |
| 30-34 | - 2308 | - 2427 | - 1310 | - 1422 |
| 35-44 | - 3102 | - 5211 | - 1685 | - 2898 |
| 45-54 | - 2499 | - 5143 | - 1241 | - 2584 |
| 55-64 | + 833 | - 1304 | + 309 | - 490 |
| 65 and over | - 3807 | - 5911 | - 240 | - 368 |
| Total Female | -23166 | -46550 | - 9428 | -18857 |
| Total | -43030 | -86690 | -22272 | -45162 |

Table 3.4. Total population and total labor force in specified gender, Northeast Minnesota, 1980 and 1990.

| Population Indicator and Gender | 1980 | Projected 1990 | |
|------------------------------------|--------|----------------|--------------|
| | | Baseline | Differential |
| (number) | | | |
| Male: | | | |
| Population, total | 169981 | 180943 | 140740 |
| Under 16 | 42949 | 46413 | 36557 |
| 16 or more | 127032 | 134536 | 104183 |
| Labor Force, total | 91211 | 100741 | 73091 |
| Employed, civilian | 78819 | 92418 | 61275 |
| Military | 1304 | 1345 | 988 |
| Unemployed | 11088 | 6948 | 11478 |
| Female: | | | |
| Population, total | 173363 | 180185 | 139635 |
| Under 16 | 40555 | 43846 | 34722 |
| 16 or more | 132808 | 142339 | 104913 |
| Labor Force, total | 57408 | 62649 | 46587 |
| Employed, civilian | 52725 | 59640 | 41518 |
| Military | 175 | 176 | 132 |
| Unemployed | 4508 | 2913 | 4937 |

relatively high level of government employment -- federal, state, and local. Local and federal government employment in Northeast Minnesota is nearly 50 percent higher than in Minnesota as a whole. This is equivalent to an additional 7,061 jobs in the government sector rather than in the private sector. Government employment is projected to decline in the 1980's, although its relative standing would remain high as a source of jobs and income for the resident population. Total employment on a person-count basis is, of course, lower than total employment on a job-count basis, as presented earlier in Table 3.4.

Data on the geographical distribution of population and labor force show large county-to-county differences in both labor force participation and unemployment rates. These differences, which stem, in part, from the population changes cited earlier, would be reduced with economic recovery and the projected shift in services-producing jobs to the population growth areas in the less urbanized counties.

Occupational Distribution

Changes in the industry distribution of employment in Northeast Minnesota were summarized earlier for the 1975-79 and 1979-80 period in Table 2.1. Two sources of employment change were presented, namely, proportional and differential. Proportional changes are the external changes associated with individual U.S. industry growth rates. The differential change represent differences between county and U.S. industry growth rates. The differential changes in employment from 1975 to 1979 are associated also with changes in the distribution of population.

The industry distribution of 1980 employment on a job-count and a person-count basis will differ because of multiple job-holding and

commuting. The total number of jobs is shown by place of work while the total number of employed persons is shown by place of residence. A person may be employed in more than one job. He also may commute from his county of residence to his county of work. The occupation distribution of employment, on the other hand, is shown according to place of residence in Table 3.5.

The county occupation profiles differ from the Minnesota occupational profiles because of differences in industry distribution. For example, an above-average number of transportation jobs were reported in St. Louis County in 1980. Compared with Minnesota as a whole, the St. Louis County figure was 460 higher than it would have been if transportation employment had been 4.6 percent, rather than 5.2 percent, of total employment. Implicit in the Northeast Minnesota employment projections to 1990 (which are on a job-count basis) is some decentralization of trade and service jobs. Specified service and manufacturing employment, especially if linked to other Minnesota industry, is likely to be concentrated in the Duluth urbanized area.

Table 3.5. Proportion of total civilian employed persons in specified industry, by county of residence, Northeast Minnesota, 1980.

| No. | Industry | Atkin | Carlton | Cook | Itasca | Koochi- ching | Lake | Total | St. Louis | | Total Region | Minnesota |
|-----------|-----------------------------|-------|---------|-------|--------|------------------|-------|-------|-----------|-------|-----------------|-----------|
| | Title | | | | | | | | Remainder | | | |
| (percent) | | | | | | | | | | | | |
| 1. | Agric., For., Fish., Min. | 11.0 | 3.8 | 10.3 | 14.1 | 3.0 | 21.0 | 13.3 | 1.1 | 23.0 | 12.3 | 6.7 |
| 2. | Construction | 10.2 | 6.7 | 8.8 | 6.1 | 5.5 | 12.8 | 5.7 | 4.5 | 6.7 | 6.3 | 5.3 |
| 3. | Manuf. Non-Durable Goods | 2.7 | 14.0 | 1.1 | 9.3 | 20.1 | 1.7 | 4.5 | 6.0 | 3.3 | 6.4 | 7.0 |
| 4. | Manuf. Durable Goods | 9.0 | 12.1 | 9.7 | 5.7 | 11.2 | 8.1 | 5.8 | 6.0 | 5.7 | 6.8 | 13.2 |
| 5. | Transportation | 2.8 | 4.1 | 2.8 | 2.9 | 3.7 | 6.6 | 5.2 | 6.4 | 4.2 | 4.7 | 4.6 |
| 6. | Communications & Utilities | 2.7 | 2.7 | 2.0 | 4.3 | 1.7 | 3.0 | 3.5 | 4.4 | 2.8 | 3.4 | 2.2 |
| 7. | Wholesale Trade | 1.5 | 2.6 | 1.2 | 2.2 | 1.0 | 0.7 | 3.5 | 4.1 | 3.1 | 3.0 | 4.9 |
| 8. | Retail Trade | 20.6 | 16.7 | 17.7 | 17.6 | 19.1 | 16.0 | 18.5 | 20.0 | 17.3 | 18.2 | 17.0 |
| 9. | Fin., Ins., and Real Estate | 3.9 | 3.4 | 1.5 | 3.1 | 2.3 | 2.3 | 3.9 | 4.3 | 3.5 | 3.6 | 5.7 |
| 10. | Business, Repair Services | 2.7 | 2.7 | 1.9 | 2.7 | 2.0 | 0.6 | 2.7 | 3.2 | 2.4 | 2.6 | 3.8 |
| 11. | Pers., Enter. & Rec. Svcs. | 5.3 | 3.3 | 16.6 | 4.3 | 5.1 | 5.2 | 4.0 | 4.5 | 3.7 | 4.3 | 3.7 |
| 12. | Health Services | 8.6 | 10.8 | 6.5 | 8.2 | 8.4 | 5.4 | 9.8 | 11.8 | 8.2 | 9.4 | 8.9 |
| 13. | Educational Services | 9.6 | 9.1 | 8.3 | 10.5 | 9.6 | 8.2 | 9.7 | 11.9 | 7.9 | 9.7 | 9.0 |
| 14. | Other Services | 3.3 | 2.8 | 3.4 | 3.6 | 2.2 | 2.3 | 4.4 | 5.9 | 3.2 | 3.9 | 4.2 |
| 15. | Public Administration | 6.0 | 5.1 | 8.3 | 5.3 | 5.1 | 5.9 | 5.4 | 5.9 | 5.1 | 5.4 | 3.7 |
| 16. | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Source: U.S. Bureau of the Census, 1980 Census of Population, Summary, Tape File 3, Table 65.

SHAPING THE FUTURE

Export expansion and import substitution are two different strategies for regional economic development. Export expansion in Northeast Minnesota is not necessarily confined to its existing export-producing industries -- taconite pellet production, timber-related manufacturing, tourism-and-recreation-related services, and educational and health care institutions. It may include, also, new basic industries which are closely related to the expanding urban-industrial complex centered on Minneapolis and St. Paul.

Unlike export expansion, import substitution is confined to existing imports and their regional markets. These markets include other producing industries and the final demand sectors -- household, business (private capital formation), and government. Opportunities for import substitution are limited by superior investment opportunities in export expansion, either in the region or elsewhere in the nation.

Regional export expansion and import substitution strategies are intended to increase regional employment and income. However, the actual short-run effects may coincide with intended effects, or they may trigger adverse short-run effects, but positive long-run effects, because of interindustry linkages. The larger the economy, the more complex the spillover effects among other industries in the region.

Building on What's Here

Export expansion strategies address the viability of the region's economic base, its export-producing industries. Employment expansion in export-producing industries in the 1970's accounted for the region's

strong overall economic performance, as indicated earlier in Tables 2.1 to 2.3. The series of three tables are based on the most recent statistical reports of the U.S. Department of Commerce to show recent trends in wage and salary and proprietorial employment and, also, earnings for a 16-industry group. A 214-industry breakdown was used, however, in deriving the industry performance indicators in Table 4.1.

Industry candidates for export expansion include the 50 export-producing industries in 1977 and, also, many of the deficit-supply industries. The outputs of these industries fall short of meeting regional requirements and, hence, imports from these industries in the rest-of-nation compete with the local industries in local markets.

Another name for import substitution is hometown loyalty: support your local merchant, your local dairy, or your local packer. Import substitution works when local merchants can beat the outside competition in product price and/or quality and, also, service. For many products, the outside competitor has advantages of size in production and procurement, and even distribution. Its tough to beat outside competition and, besides, the market economy is based on trade. Each area finds its own comparative advantage and the market niche in which its own products compete successfully with products of other areas.

Import substitution options in Northeast Minnesota are limited simply because of its size. The larger and more populous the area, the more diversified is the local economy, that is, the more options for import substitution. In recent years, the Northeast Minnesota economy has experienced a deficit supply in 156 of its 214 industries. No production is reported for 65 of the 156 deficit-supply industries. Thus, some gross output is reported for 91 industries but this output is less than total

Table 4.1. Gross Output, Exports, and Imports of Specified Industry, Northeast Minnesota and Minnesota, 1977

| Industry No. Title | Gross Output | | Exports | | Imports ^{1/} | | Requirements ^{2/} | | Imports ^{3/} | |
|------------------------------|--------------|--------|-----------|--------|-----------------------|--------|----------------------------|--------|-----------------------|-------|
| | Northeast | State | Northeast | State | Northeast | State | Northeast | State | Northeast | State |
| (million \$) | | | | | | | | | | |
| 1. Ag, For., Fish | 53 | 5,361 | 0 | 936 | 191 | 698 | 246 | 5,122 | 18 | 393 |
| 2. Mining | 910 | 978 | 894 | 896 | 149 | 887 | 166 | 970 | 199 | 88 |
| 3. Construction | 616 | 4,845 | 173 | 372 | 20 | 1,258 | 463 | 4,599 | 147 | 514 |
| 4. Mfg., Nondurables | 1,321 | 13,552 | 780 | 4,314 | 455 | 3,489 | 996 | 12,727 | 474 | 1,796 |
| 5. Mfg., Durables | 481 | 11,046 | 125 | 3,091 | 671 | 4,716 | 1,027 | 12,671 | 125 | 1,699 |
| 6. Tran., Com., Util. | 481 | 5,171 | 121 | 506 | 122 | 478 | 482 | 5,143 | 77 | 581 |
| 7. Wholesale Trade | 191 | 4,159 | 0 | 804 | 68 | 0 | 259 | 3,356 | 15 | 90 |
| 8. Retail Trade | 432 | 5,055 | 82 | 220 | 0 | 0 | 350 | 4,835 | 49 | 112 |
| 9. Fin., Ins., Real Est. | 651 | 10,865 | 14 | 54 | 296 | 272 | 933 | 11,083 | 61 | 218 |
| 10. Services | 315 | 4,649 | 51 | 560 | 43 | 46 | 307 | 4,136 | 50 | 329 |
| 11. Government ^{4/} | 61 | 777 | 0 | 631 | 13 | 60 | 74 | 774 | 9 | 56 |
| 12. Subtotal | 5,312 | 66,458 | 2,240 | 11,815 | 2,029 | 10,773 | 5,301 | 65,416 | 1,223 | 5,877 |

^{1/} Imports from specified (row) industry in rest-of-nation.

^{2/} Region requirements of specified (row) industry output.

^{3/} Import purchases by specified (column) industry in region.

^{4/} Government enterprise and scrap.

regional requirements and, hence, deficit supply is indicated for each industry.

Industry Performance

Industry performance indicators -- output, requirements, exports and imports -- in the seven-county Northeast Minnesota region, when compared with corresponding statewide industry indicators, show that Northeast Minnesota accounted for \$5.3 billion of the State's gross output of \$66.5 in 1977. They also show the region accounted for \$2.2 billion of the State's exports of \$11.8 billion and \$2.1 billion of the State's imports of \$10.8 billion. Industry gross output, less exports and plus imports, is equal to total industry requirements. Because exports exceed imports in both Northeast Minnesota and Minnesota, overall industry requirements were slightly less than overall gross output in 1977.

Imports, by industry destination, are much less than imports by industry of origin because final purchases are excluded. In Northeast Minnesota, the 1977 value of intermediate purchases was \$1.2 billion as compared with \$800 million of final purchases. Households, via their retail purchases, account for most final purchases of imports.

The relative importance of Northeast Minnesota in the State's economy is shown by the series of five economic indicators as follows:

| <u>Economic Indicator</u> | <u>Percent of State</u> |
|---------------------------|-------------------------|
| Gross output | 8.0 |
| Exports | 19.0 |
| Imports, by origin | 18.8 |
| Requirements | 8.1 |
| Imports, by destination | |
| Intermediate | 20.8 |
| Final | 16.5 |

Clearly, Northeast Minnesota accounts for a highly disproportionate share of Minnesota exports and imports. Also, Northeast Minnesota industry is more import-dependent than export-dependent, as shown by its slightly larger share of the State's industry imports than its industry share of the State's industry exports.

The percentage distribution of industry output, exports, imports, and requirements among Northeast Minnesota industries provides a measure of a region's export and import dependence. For example, the key role of taconite mining in the economic base of Northeast Minnesota is represented by its 39.9 percent share of industry exports. Timber-related industry (in pulp and paper production) and food products manufacturing account for much of the nondurable manufacturing industry's 34.8 percent share of the economic base. All government-supported activity is excluded from exports and other indicators of regional economic activity.

Dependence of both Northeast Minnesota and Minnesota on imports from manufacturing industries is demonstrated by their high share -- 55.5 percent and 76.2 percent, respectively -- of total imports. The region differs from the state, however, in the destination of these imports, with more being directed into final, rather than intermediate, use.

Projected levels of exports and imports show large differences between baseline and differential options. The baseline exports option, which is geared to projected U.S. growth rates in industry output, shows, in Table 4.2., growth in every industry. (Regional market share is assumed constant in these projections.) The differential option, however, shows, at best, exports returning to 1977 levels by 1990. In this differential projection series, exports of manufactured goods decline, while exports of taconite pellet shipments remain constant.^{2/}

Exports, that is, sales of goods and services produced in Northeast Minnesota to non-resident buyers, are a critical measure of both a region's economic viability as well as its economic vulnerability. Exports also affect imports. Implicit in a projected growth or decline in exports is corresponding growth or decline in imports. Import substitution strategies, when manifested in new successful businesses catering entirely to local markets, would lessen the close correlation between exports and imports.

Projected employment levels, which are summarized in Table 4.3, show wide differences between the two development options. While the baseline option envisions employment increases beyond 1980 levels, the differential option envisions reductions in employment to pre-1970 levels following a period of modest recovery from the 1981-82 recession.

Largest employment growth is expected in the trade and services industries in the baseline option. Nonfarm proprietorial employment would

^{2/}An alternative differential projection series shows a reduction in the value of taconite pellet exports from \$1235 million to \$786 million in 1985 and \$712 million in 1990. Corresponding employment levels would decline from 12.5 thousand to 9.5 thousand in 1985 and from 11.3 thousand to 7.9 thousand in 1990. On the other hand, the alternative series shows corresponding increases in manufacturing industry exports and employment.

Table 4.2. Total Value of Exports (in 1977 Dollars) In Specified
Industry, By Development Option, Northeast Minnesota, 1977-1980.

| <u>Industry</u> | | Estimated | <u>Projected</u> | | | |
|-----------------|-------------------------|-----------|------------------------------|------|------|------|
| | | | <u>Baseline Differential</u> | | | |
| No | Title | 1977 | 1985 | 1990 | 1985 | 1990 |
| (million \$) | | | | | | |
| 1. | Agr., For., Fish | 0 | 3 | 4 | 0 | 0 |
| 2. | Mining | 894 | 1236 | 1248 | 1235 | 1235 |
| 3. | Construction | 173 | 214 | 226 | 214 | 226 |
| 4. | Mfg., Nondurables | 780 | 935 | 1038 | 601 | 574 |
| 5. | Mfg., Durables | 125 | 179 | 212 | 144 | 154 |
| 6. | Tran.,Comm., Utilities | 121 | 160 | 185 | 148 | 170 |
| 7. | Wholesale Trade | 0 | 15 | 18 | 0 | 0 |
| 8. | Retail Trade | 82 | 91 | 114 | 106 | 155 |
| 9. | Fur., Ins., Real Estate | 14 | 2 | 3 | 0 | 0 |
| 10. | Services | 51 | 80 | 94 | 15 | 17 |
| 11. | Scrap, Used | 0 | 1 | 1 | 0 | 0 |
| 12. | Total | 2240 | 2488 | 2659 | 2270 | 2317 |

Table 4.3. Total employment (job count) in specified industry, by development option, Northeast Minnesota, 1975-1990.

| Industry No. Title | Estimated | | | | Projected | | | |
|-------------------------------|-----------|-------|-------|-------|------------------|-------|----------------------|-------|
| | 1975 | 1977 | 1979 | 1980 | Baseline 1985 | 1990 | Differential 1985 | 1990 |
| (thousands) | | | | | | | | |
| Wage and Salary: | | | | | | | | |
| 1. Agriculture | 0.6 | 0.5 | 0.5 | 0.5 | 0.4 | 0.4 | 0.3 | 0.2 |
| 2. Ag, Sew., For., Fish. | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.1 | 0.1 |
| 3. Mining | 11.8 | 10.5 | 14.4 | 13.1 | 13.1 | 13.6 | 9.6 | 7.9 |
| 4. Construction | 7.0 | 6.0 | 7.2 | 5.2 | 5.3 | 5.9 | 6.2 | 6.0 |
| 5. Mfg., Nondurables | 9.4 | 9.4 | 8.2 | 7.6 | 7.4 | 7.9 | 7.3 | 5.8 |
| 6. Mfg., Durables | 6.7 | 6.8 | 8.2 | 7.5 | 7.3 | 7.5 | 6.9 | 6.6 |
| 7. Trans., Comm., Util. | 9.1 | 8.5 | 8.9 | 8.4 | 8.0 | 8.1 | 6.7 | 5.8 |
| 8. Wholesale Trade | 4.8 | 4.8 | 5.1 | 4.9 | 5.2 | 5.5 | 3.5 | 3.0 |
| 9. Retail Trade ^{1/} | 20.1 | 22.0 | 23.8 | 23.4 | 25.6 | 28.0 | 21.4 | 20.2 |
| 10. Fin., Ins., Real Est. | 3.2 | 3.8 | 4.0 | 4.0 | 4.8 | 5.5 | 3.1 | 2.8 |
| 11. Services | 22.0 | 23.9 | 24.8 | 24.4 | 27.3 | 32.0 | 24.0 | 24.9 |
| 12. Federal, | 2.5 | 2.4 | 2.5 | 2.5 | 2.4 | 2.5 | 2.2 | 1.9 |
| 13. State and Local | 22.6 | 22.1 | 23.8 | 24.1 | 24.5 | 25.2 | 20.8 | 18.4 |
| 14. Fed., Military | 3.1 | 3.0 | 3.1 | 2.9 | 2.9 | 2.9 | 2.5 | 2.2 |
| Proprietorial: | | | | | | | | |
| 15. Farm | 3.5 | 3.5 | 3.5 | 3.5 | 3.4 | 3.3 | 2.1 | 1.9 |
| 16. Nonfarm | 8.5 | 9.0 | 9.6 | 9.9 | 10.5 | 11.5 | 9.1 | 8.6 |
| 17. Total | 135.2 | 136.4 | 147.6 | 142.1 | 150.0 | 161.2 | 120.9 | 111.0 |

^{1/} Including eating and drinking places.

increase, also. Only modest growth is projected in the manufacturing industries while mining employment would increase slightly (although not necessarily in taconite pellet production). Government employment would remain roughly at its 1980 levels while construction employment would rise slightly to its 1980 level by 1985.

Employment growth, if any, would be confined to the services industry group in the differential option. The sharp decline in export-producing employment in manufacturing results in reduced levels of growth in trade and services employment. Local government employment would decline because of lower levels of population and financing of local services.

Development Options

Historical trends and alternative projection series presented earlier are now summarized for the purpose of similarly addressing the content and impact of export expansion and import substitution strategies in Northeast Minnesota. These strategies are invariable and inevitably conditioned by the current status of regional and national economies as well as their perceived long-term prospects and potentials. Central to the question of regional sensitivity to changing national economic conditions is industry structure, particularly the mix and organization of export-producing businesses.

Northeast Minnesota industry structure has been represented by its industry output, exports, and imports, and related employment levels, including the distribution of employment according to size of establishment. Perceived long-term industry prospects for export expansion and import substitution are represented by a certain range of regional development

options as depicted by a baseline and a differential projection series. The baseline option is derived from the simple assumption that Northeast Minnesota population and industry will experience the same rates of growth as corresponding categories of population and industry in the nation as a whole.

The differential option is derived from a complex set of assumptions relating to the competitive position of the region's export-producing industries, particularly manufacturing. In the differential option, manufacturing, rather than taconite mining, exports and employment are expected to decline sharply in the 1980's. The overall employment effects of reduced manufacturing activity in this option are roughly equivalent to the overall employment effects of reduced mining activity in the alternative option noted earlier. The differential option thus represents a baseline for measuring the economic effects of selected export expansion and import substitution strategies in basic industries, except taconite mining, which already assumes a successful implementation of output-sustaining strategies for the U.S. iron and steel industry.

In the 75-industry breakdown of the Northeast Minnesota economy, industry differences of more than 300 in expected 1990 employment levels under the two development options are identified as follows:

| Excess-Supply Industry | | | Deficit-Supply Industry | | |
|------------------------|--------------------------|------------|-------------------------|-----------------------|------------|
| No. | Title | Difference | No. | Title | Difference |
| 63. | Retail Trade | 5,400 | 76. | Military | 700 |
| 66. | Hotels, Personal Service | 2,500 | 77. | Other State and Local | 6,400 |
| 68. | Eating & Drinking Places | 2,400 | | | |
| 71. | Health Services | 7,600 | | | |
| 72. | Educ., Nonprofit | 1,900 | | | |
| | Total | 27,800 | | | 15,600 |

Much of the expected difference in employment between the two options thus originates in the trade and service industries. These industries include the potential candidates for the successful development of export expansion and import substitution strategies.

Clearly demonstrated in the comparison of the selected Northeast Minnesota and Minnesota indicators of industry activity is the heavily commodity-producing, natural-resource dependent, and highly specialized character of the Northeast Minnesota economy. These characteristics sharply differentiate the Northeast Minnesota economy from the overall Minnesota economy, as illustrated in Table 4.4. For example, total civilian employment in Northeast Minnesota is expected to decline from 124 thousand in 1982 to 118 thousand in 1985 and 109 thousand in 1990. Meanwhile, the statewide civilian employment total would increase from its 1982-83 low of approximately 2.0 million to 2.2 million in 1985 and 2.3 million in 1990. If employment in each industry were to change at their corresponding U.S. rates, both Northeast Minnesota and Minnesota employment totals would increase to six percent and 14 percent above their 1980 levels by 1985 and 1990, respectively. Thus, the two development options provide contrasting patterns of employment and general economic growth in the region and the state.

Regional Revitalization

The potential for regional revitalization depends on the long-term viability of a region's economic base. Long-term industry viability depends, in term, upon its natural and human resources and its capacities for entrepreneurship in both the business and the government sectors of the Northeast Minnesota economy. These issues are addressed in public

Table 4.4. Total civilian employment (job count), by development option, Northeast Minnesota and Minnesota, 1975-1990.

| Year | Region | | State | |
|-------------|-----------|-------------------|-----------|--------------------|
| | Base-line | Differential | Base-line | Differential |
| (thousands) | | | | |
| 1975 | | 132 | | 1794 |
| 1976 | | 137 | | 1836 |
| 1977 | | 133 | | 1897 |
| 1978 | | 142 | | 1996 |
| 1979 | | 146 | | 2078 |
| 1980 | | 139 | | 2088 |
| 1981 | 141 | 135 ^{1/} | 2120 | 2056 ^{1/} |
| 1982 | 140 | 124 ^{1/} | 2097 | 2014 ^{1/} |
| 1983 | 140 | 122 | 2086 | 2013 |
| 1984 | 143 | 120 | 2146 | 2096 |
| 1985 | 147 | 118 | 2216 | 2180 |
| 1990 | 158 | 109 | 2371 | 2313 |

^{1/} Estimated from current labor market reports prepared by the Minnesota Department of Economic Security.

programs and policies affecting (1) job training and outlook, and (2) small business development.

Job Training and Outlook

Public programs and policies relating to job training and outlook have consequences for total population and labor force. They affect the levels of total personal income as well as long-term job prospects. In Northeast Minnesota, wages and salaries and other participation income account for a smaller proportion of total personal income than in Minnesota as a whole because social security, public assistance, and all other transfer payments account for a larger share of the total. Also, the number of workers per household in Northeast Minnesota is lower than in Minnesota. Thus, per capita income is low, not because earnings per worker are low, but because of low labor force participation.

Since household income relates to earnings per worker and the number of workers per household, the question of new job openings and access to these openings become important in a household's search for means of increasing existing income levels -- earnings per worker vary, of course, with occupation.

The association of industry distribution with occupation distribution is represented directly by the occupational, that is, the staffing, pattern of each industry. To project employment by occupation, industry employment levels are derived, first, for selected years. The projected industry employment levels are summarized in Table 4.5 for the 16-industry breakdown presented earlier and the baseline and the differential options.

U.S. industry growth rates are used in deriving the projected baseline employment change from 1980 to 1985 and 1985 to 1990. Thus, the

Table 4.5. Wage and Salary Employment in Specified Industry and Proprietorial Employment, By Source of Employment Change and Demographic Option, Northeastern Minnesota, 1980-85 and 1985-90.

| Industry No. | Title | BASELINE OPTION | | | | DIFFERENTIAL OPTION | | | | | | |
|----------------------------|---|-------------------|-------|----------------|--------|---------------------|-------------------|---------|-------------------|-------------------|---------|---------|
| | | Change 1980-85 | | Change 1980-85 | | Change 1985-90 | | | | | | |
| | | 1980 | 1985 | 1985-90 | 1990 | Propor- tional | Differ- ential | 1985 | Propor- tional | Differ- ential | 1990 | |
| (number) | | | | | | | | | | | | |
| Wage and Salary Employment | | | | | | | | | | | | |
| 1. | Farm | 472 | -25 | 447 | -47 | 400 | -25 | -153 | 294 | -31 | -38 | 225 |
| 2. | Agricultural Services, Forestry, Fisheries | 332 | -21 | 311 | 18 | 329 | -21 | -175 | 136 | 8 | -25 | 119 |
| 3. | Mining | 13,065 | 18 | 13,083 | 490 | 13,573 | 18 | -459 | 9,624 | 473 | -2,111 | 7,873 |
| 4. | Construction | 5,153 | 144 | 5,297 | 621 | 5,918 | 144 | 916 | 6,213 | 728 | -917 | 5,024 |
| 5. | Manufacturing, Non-Durables | 7,593 | -177 | 7,416 | 345 | 7,761 | -177 | -52 | 7,364 | 343 | -1,939 | 5,768 |
| 6. | Manufacturing, Durables | 7,494 | -180 | 7,314 | 149 | 7,463 | -180 | -440 | 6,874 | 79 | -461 | 6,553 |
| 7. | Transportation, Communi- cation, and Utilities | 8,448 | -452 | 7,996 | 72 | 8,068 | -452 | -1,322 | 6,674 | 60 | -930 | 5,804 |
| 8. | Wholesale Trade | 4,902 | 289 | 5,191 | 283 | 5,474 | 289 | -1,684 | 3,507 | 191 | -728 | 2,970 |
| 9. | Retail Trade | 23,267 | 1,543 | 24,810 | 1,830 | 26,640 | 1,543 | -3,407 | 21,403 | 1,579 | -2,803 | 20,179 |
| 10. | Financial, Insurance, and Real Estate | 4,016 | 756 | 4,772 | 727 | 5,499 | 756 | -1,667 | 3,105 | 473 | -756 | 2,822 |
| 11. | Services | 24,492 | 3,082 | 27,574 | 4,151 | 31,725 | 3,080 | -3,577 | 23,997 | 3,612 | -2,723 | 24,886 |
| 12. | Federal, Civilian | 2,499 | -56 | 2,443 | 83 | 2,526 | -56 | -287 | 2,156 | 73 | -340 | 1,889 |
| 13. | State and Local | 24,087 | 459 | 24,546 | 608 | 25,154 | 459 | -3,774 | 20,772 | 515 | -2,880 | 18,407 |
| 14. | Federal, Military | 2,910 | 26 | 2,936 | 0 | 2,936 | 26 | -438 | 2,498 | 0 | -292 | 2,206 |
| Proprietorial Employment: | | | | | | | | | | | | |
| 15. | Farm | 3,466 | -80 | 3,386 | -79 | 3,307 | -80 | -1,248 | 2,138 | -50 | -142 | 1,946 |
| 16. | Non-Farm | 9,897 | 638 | 10,535 | 958 | 11,493 | 638 | -1,431 | 9,104 | 828 | -1,377 | 8,555 |
| 17. | TOTAL | 142,093 | 7,432 | 149,528 | 10,139 | 159,667 | 10,139 | -31,359 | 120,876 | 8,829 | -18,706 | 110,999 |

individual industry employment change for the two periods is proportional to the projected change in the corresponding U.S. industry. The proportional change would amount to an overall change of 7,432 in the 1980-85 period and 10,139 in the 1985-90 period.

In the differential option, industry employment change is partitioned into a proportional effect and a differential effect. The proportional change for each industry is represented by its baseline percentage change for each period. The differential effect is equivalent to the differential change for each industry, that is, the difference in the five-year growth rate between the Northeast Minnesota industry and the corresponding U.S. industry. All industry employment levels under the differential option, except construction, are below the corresponding baseline employment levels. Thus, the differential effect is negative for these industries.

The differential effect for each industry provides a measure of the potential range of employment change in the two five-year periods. For the 1980-85 period, the range of employment change is largest for durable goods manufacturing, retail trade, private services, and state and local government. These four industries have the largest change in the 1985-90 period, also. A major portion of the projected employment decline under the differential option is attributed, therefore, to the negative differential effects in four industry groups.

Industry employment by occupation also is derived for the baseline and the differential options. The detailed occupational breakdown of industry employment is consolidated into nine occupational classes, as shown in Table 4.6. In the baseline option, the largest increases are projected in the service, professional, clerical and managerial occupations. In the (unrevised) differential option, on the other hand,

Table 4.6. Total employed persons in specified occupation by demographic option, Northeast Minnesota, 1980, 1985 and 1990.

| Occupation | 1980 | Projected | | | | Change from 1980 | | | |
|--------------------|--------|---------------|-------------------|---------------|-------------------|------------------|-------------------|---------------|-------------------|
| | | 1985 | | 1990 | | 1980-85 | | 1980-90 | |
| | | Base- line | Differ- ential | Base- line | Differ- ential | Base- line | Differ- ential | Base- line | Differ- ential |
| | | (number) | | | | | | | |
| Professional | 26003 | 27302 | 23410 | 29076 | 21482 | 1299 | - 2593 | 3073 | - 4521 |
| Managerial | 12206 | 12879 | 10147 | 13772 | 9098 | 673 | - 2059 | 1566 | - 3108 |
| Sales Worker | 7888 | 8586 | 6400 | 9121 | 5918 | 698 | - 1488 | 1233 | - 1970 |
| Clerical | 24000 | 24865 | 19719 | 26388 | 17693 | 865 | - 4281 | 2388 | - 6307 |
| Crafts | 16994 | 17528 | 15318 | 18418 | 13671 | 534 | - 1676 | 1676 | - 3323 |
| Operatives | 18290 | 19050 | 16337 | 20006 | 14414 | 760 | - 1953 | 1716 | - 3876 |
| Non-farm, non-mine | 4661 | 4810 | 4187 | 5134 | 3789 | 149 | - 474 | 473 | - 872 |
| Service | 18811 | 20216 | 16730 | 21980 | 15712 | 1405 | - 2081 | 3169 | - 3099 |
| Farm | 2692 | 2675 | 2359 | 2735 | 2122 | - 17 | - 333 | 43 | - 570 |
| Total | 131544 | 137911 | 114607 | 146630 | 103899 | 6367 | -16937 | 15086 | -27645 |

^{1/}Occupational distribution in differential option not adjusted to revised industry employment projections.

the largest decreases are projected in three of the four occupations (the exception being services, which is replaced by crafts as the occupation with the fourth largest employment decline.) For employment and educational counseling purposes, both occupational distributions must be recomputed using a more detailed industry breakdown of the regional economy and a more detailed occupational breakdown of each industry.

Changes in occupational distribution of the employed work force in the 1980's are incorporated into the projected Northeast Minnesota industry staffing patterns in 1990. The projected industry staffing changes are based on industry occupational profiles by the U.S. Bureau of Labor Statistics adjusted to the regional distributions of occupations. Differences between two demographic options for each industry are summarized in Table 4.7. These differences are indicative of the direction and magnitude of changes anticipated in the employed labor force in Northeast Minnesota. Thus, the projected professional employment in the differential option is 3,892 below the baseline option in 1985 and 7,594 below this option in 1990. The overall difference in the two options is 23,304 in 1985 and 42,731 in 1990.

Small Business Development

Small businesses generally are expected to account for 70 percent or more of the net increase in total employment in 1980. In Northeast Minnesota, however, the average size of business is larger than either in the U.S. or Minnesota as a whole. For small businesses to emerge as an equally important source of new employment in Northeast Minnesota, as in the state or nation, private entrepreneurship must achieve an unprecedented position of importance in the regional economy.

Table 4.7. Projected employment difference in specified occupation between differential and baseline options, Northeast Minnesota, 1985 and 1990.

| Occupation | 1985 | 1990 |
|--------------------|--------|--------|
| Professional | - 3892 | - 7594 |
| Managerial | - 2732 | - 4674 |
| Sales Worker | - 2186 | - 3203 |
| Clerical | - 5146 | - 8695 |
| Crafts | - 2210 | - 4747 |
| Operatives | - 2713 | - 5592 |
| Non-farm, non-mine | - 623 | - 1345 |
| Service | - 3486 | - 6268 |
| Farm | - 316 | - 613 |
| Total | -23304 | -42731 |

Small business development requires a combination of entrepreneurship, production and marketing skills, and venture capital sources, like those currently existing in the Minneapolis-St. Paul Metropolitan Area. While entrepreneurship may be less popular in the region than the state for historical reasons, the educational attainment of the region's population and labor force compares quite favorably with the state. The largest differences occur in the highest levels of educational attainment (because of the concentration of college graduates in the Minneapolis-St. Paul Metropolitan Area).

The educational attainment levels of the existing population and labor force is paralleled by the current high enrollment of persons in public and private schools. However, a lower proportion of the total population is enrolled in institutions of higher learning in Northeast Minnesota than in the state as a whole.

Small business development depends, also, on social investment, that is, public spending on education and health care. Public spending in Northeast Minnesota is above-average in both education and health care. If the below-average enrollment in higher education parallels below-average spending, much above-average support of public schools is implicit in the distribution of the total outlays.

Above-average spending on health care is related, in large part, to the role of health care as a basic industry. Federal and state outlays contribute largely to the above-average total public outlays for health care, particularly in Duluth.

SUMMARY AND CONCLUSIONS

Population, labor force, and industry employment levels in Northeast Minnesota are affected sharply by national economic forces, particularly the business cycle, but, also, the structural changes in the nation's basic industries. This dependence on national market accounts, in large part, for the region's boom-and-bust cycles of industry growth and decline. From 1975 to 1979, for example, the regional economy prospered with the expansion of taconite mining capacity. Employment in construction, as well as taconite mining, increased sharply during this period. Similarly, the large decline in employment and economic activity from 1979 to 1980 is attributed to national economic forces, specifically the 1980 U.S. economic recession.

Total population in Northeast Minnesota increased from 330 thousand in 1970 to 343 thousand in 1980. The largest growth in population occurred in selected urban places, for example, Hibbing and Hermantown in St. Louis County, Cloquet in Carlton County, and International Falls in Koochiching County, and also in selected rural areas in Cook and Itasca Counties. The localization of population growth was due to the localization of economic activity in the seven-county region. Hibbing became a major center of local economic activity related to taconite mining. Hermantown grew because of newly created jobs in the Duluth-Superior Metropolitan Area. Cloquet and International Falls expanded in resident population also as new jobs were created in trade and service, as well as the timber-related, industries.

The 1980 recession quickly turned the economic boom of the 1970's into an economic bust in 1980. In addition to the cyclical downturn,

clear indications of an imminent structural downturn in the U.S. market for Northeast Minnesota taconite pellets were already present by 1980. Since 1980 economic conditions have worsened with increasingly adverse consequences for the resident population and labor force.

Net population effects of cyclical and structural changes are incorporated into two sets of population and employment projections prepared for this report. The population, and related labor force, projections are summarized in Table 5.1 while the employment projections are summarized in Table 5.2. The two sets of projections establish the upper and lower limits of economic activity anticipated in Northeast Minnesota in the 1980's.

The baseline projection is derived from a no-migration, fixed market-share representation of the regional economy. It establishes an upper limit for regional population growth. The alternative scenario is derived from the Northeast Minnesota Regional Economic Impact Forecasting System (REIFS). It represents the lower limit of regional growth and change. The differences in population, labor force and employment, provide rough measures of the task ahead in devising and implementing regional economic strategies for coping with expected reductions in economic activity, particularly in taconite mining.

With no population out-migration as specified in the baseline option, the resident regional population would increase from 343 thousand in 1980 to 355 thousand in 1985 and 367 thousand in 1990. The largest increases would occur in the 25 to 44 year and the under 16 age groups. The 45 to 64 year age group would decline and then remain stable while the 16 to 24 year age group would decline over the entire period. Thus, the resident population becomes an increasingly older population in the baseline option.

TABLE 6.1. Summary Statistics of Population, Labor Force, and Employment (Person Count) by Demographic Option, Northeast Minnesota, 1980, 1985, and 1990.^{1/}

| Population Indicator and Gender | Estimated 1980 | Baseline | | Differential | |
|------------------------------------|-------------------|-------------|------|--------------|------|
| | | 1985 | 1990 | 1980 | 1985 |
| | | (thousands) | | | |
| Population, total | 343 | 355 | 367 | 312 | 280 |
| Under 16 | 84 | 85 | 90 | 77 | 71 |
| 16 to 24 | 57 | 54 | 46 | 40 | 29 |
| 25 to 44 | 88 | 102 | 115 | 87 | 83 |
| 45 to 64 | 68 | 64 | 64 | 63 | 53 |
| 65 and over | 46 | 49 | 51 | 44 | 44 |
| Labor force, total | 147 | 156 | 162 | 134 | 117 |
| 16 to 24 | 36 | 35 | 30 | 26 | 17 |
| 25 to 44 | 64 | 77 | 88 | 66 | 63 |
| 45 to 64 | 43 | 39 | 40 | 39 | 33 |
| 65 and over | 4 | 4 | 4 | 4 | 3 |
| Employed, total | 132 | 138 | 147 | 115 | 104 |
| Managerial, professional | 38 | 40 | 43 | 34 | 31 |
| Sales, clerical | 32 | 33 | 36 | 26 | 24 |
| Crafts, operatives | 35 | 37 | 38 | 32 | 28 |
| Services, laborers | 26 | 28 | 30 | 23 | 22 |
| Unemployed | 15 | 18 | 15 | 19 | 13 |

^{1/} Individual entries may not sum to totals because of rounding.

TABLE 6.2. Summary Statistics of Employment (Job Count) in Specified Industries, By Demographic Option, Northeast Minnesota, 1980, 1985, and 1990. ^{1/}

| Industry | Estimated 1980 (thousand) | Baseline | | Differential | |
|------------------------------|---------------------------------|----------|-------|--------------|-------|
| | | 1985 | 1990 | 1985 | 1990 |
| Goods-producing, total | 37.2 | 36.9 | 38.4 | 32.5 | 27.9 |
| Agriculture, mining | 17.0 | 16.9 | 17.3 | 12.1 | 9.5 |
| Construction, Manufacturing | 20.2 | 20.0 | 21.1 | 20.5 | 18.3 |
| Services-producing, total | 75.4 | 82.7 | 90.2 | 63.3 | 60.9 |
| Trade, private services | 52.7 | 57.6 | 63.8 | 48.9 | 48.0 |
| Other services ^{2/} | 22.7 | 25.0 | 26.4 | 14.4 | 12.3 |
| Government, total | 29.5 | 29.9 | 31.0 | 25.1 | 22.2 |
| Civilian | 26.6 | 27.0 | 28.1 | 22.9 | 20.3 |
| Military | 2.9 | 2.9 | 2.9 | 2.1 | 1.9 |
| All Industry | 142.1 | 149.5 | 159.7 | 120.8 | 111.0 |

^{1/} Individual entries may not seem to total because of rounding.

^{2/} Includes all nonfarm proprietorial employment as well as wage and salary employment in: finance, insurance, and real estate; transportation communications, and utilities; and agricultural services.

The differential population option shows a declining total population in all age groups, except the oldest. This option posits much out-migration of both males and females in the 25 to 44 age group. Consequently, the under 16 age group also is expected to drop sharply in the 1980's.

The resident regional labor force and its age distribution is affected by population changes. Labor force participation rates are identical for each age group and gender in the two population scenarios.

In the baseline scenario, the total labor force, 16 years and older, would increase from 147 thousand in 1980 to 156 thousand in 1985, and 162 thousand in 1990. The youngest age would decline most sharply while the 25 to 44 year age group would have the highest rate of increase. New entrants into the labor force would decline, especially in the 1985-1990 period, while retirements would increase, especially in the 1980-1985 period. Thus, involuntary retirements, or population out-migration, would be less with an increasingly older resident population.

In the differential population option, the largest reduction in total labor force is attributed to the 16 to 24 year age group with next largest reduction in the 45 to 64 year age group. The 25 to 44 year age group would remain essentially constant in total numbers.

The employed labor force would increase in the baseline option from 132 thousand in 1980 to 138 thousand in 1985 and 147 thousand in 1990. Unemployment would first increase from 15 thousand to 18 thousand and then drop back to 15 thousand during the 10 year period. Thus, unemployment would remain high -- over 10 percent -- in the entire 10-year period in the baseline option.

The employed labor force in the differential option would drop to

115 thousand in 1985 and 104 thousand in 1990. Unemployment would increase to 19 thousand by 1985 and then decline to 13 thousand by 1990, according to computer simulation results derived for the differential option. The unemployment rate in this option thus would remain above its 1980 level during the entire 10 year period.

The occupational distribution of the employed labor force would expand proportionately in the baseline option. In the differential option, however, every occupation would decline in total number. The managerial and professional group would decline most while the sales and clerical and the crafts and operatives group would decline less. The services and laborers group would decline least. Thus, the out-migration of population and labor force would gradually change its occupational distribution of the regional labor force from its current skill requirements to lesser skill requirements.

The changing occupational distribution of the resident labor force in the differential option is derived from its changing distribution of industry employment, as shown earlier in Table 5.2. Largest reductions in total employment would occur in mining, manufacturing, selected private services, and local government. When compared with the baseline option, however, the largest reductions would occur in other services and indeed, services-producing industries, generally.

Total employment (measured in jobs rather than employed persons) is projected to increase in the baseline option from 142 thousand in 1980 to 149.5 thousand in 1985 and 159.7 thousand in 1990. Implicit in the job-count employment projections is a job-to-employed-persons-ratio of roughly 1.08 to 1; that is, a total of 108 jobs for every 100 employed persons. Goods-producing (non-government) employment would increase in the baseline

option from 37.2 thousand in 1980 to 36.9 thousand in 1985 and 38.4 thousand in 1990. Services-producing (non-government) employment would increase from 75.4 thousand in 1980 to 82.7 thousand in 1985 and 90.2 thousand in 1990. Thus, the ratio of services-producing to goods-producing (non-government) employment would increase from 2.03 in 1980 to 2.24 in 1985 and 2.35 in 1990.

In the differential option the reduction in services-producing employment would be larger than the reduction in goods-producing employment. The ratio of service-producing to goods-producing employment in this option would drop to 1.95 in 1985 and then increase to 2.19 in 1990.

Civilian government employment, largely local government, is projected to increase in the baseline option from 26.6 thousand in 1980 to 29.9 thousand in 1985 and 31 thousand in 1990. In the differential option projections, civilian government employment drops to 25.1 thousand in 1985 and 22.2 thousand in 1990. The large drop in local government employment is consistent with the large projected drop in total population and local government revenues, particularly from the taconite production tax.

The 16-industry breakdown of the regional economy, and the 9-occupation breakdown of each industry must be expanded if the findings are to be useful in employment and educational counseling. Computer programming resources were lacking to complete this essential step. The limited findings nonetheless show the range of potential adjustments in Northeast Minnesota population, labor force, and employment as the regional economy is confronted by both cyclical structural changes in domestic markets, particularly for its taconite mining and selected manufacturing industries.

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