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# MINNESOTA farm business NOTES



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## Variations in Family Income Levels among Minnesota Counties

P. Hasbargen, K. Bryant, and K. Egertson

In 1959 median family incomes by county in Minnesota ranged from \$2,480 in Aitkin County to \$6,414 in Dakota County. The figure shows which counties had relatively low income levels (less than \$3,100), relatively high income levels (over \$4,500), or income levels in between. But why the wide differences?

A study of income levels among counties can uncover some important associated variables. It can also aid in the understanding of (1) factors involved in economic growth, and (2) problems of economic growth faced by various state areas.

This study examined the effect of three factors upon the variation in 1959 median family income among counties. The three factors were (1) percent of the labor force employed in agriculture, forestry, and mining; (2) educational level of the population; and (3) employment growth in manufacturing, trade, and service industries from 1950 to 1960.

Variations in these three factors accounted for 70 percent of the observed variance in median family income among counties.

### Proportion Employed in Primary Industries

The primary industries of agriculture, forestry, and mining are usually the dominant ones in the early stages of economic growth. As growth proceeds the **proportion** of the labor force employed in these industries declines. In later growth stages the number employed in these industries may decline **absolutely** due to improved labor efficiency and limited increases in demands for their products. During the 1950's employment in the primary in-

dustries declined by 26 percent in Minnesota, while employment in other industries increased by 22 percent.

Declining labor needs of primary industries, relatively higher returns paid to resources employed in expanding industries such as manufacturing, and lags in the migration of labor from agriculture, forestry, and mining bring low incomes to those employed in these primary industries. Thus counties with a relatively high proportion of their labor forces so employed can be expected to have relatively low median family incomes.

Differences among counties in the percent of the labor force employed in agriculture, forestry, and mining accounted for one-third of the variance among Minnesota counties in median family incomes, holding the other two factors studied constant.

A 10-percent decrease in the proportion of the labor force employed in the primary industries from one county to another, holding other factors constant, was associated with an increase of \$357 in median family income.

Counties in the Agricultural Complex had an average of 36 percent of their labor forces employed in primary industries. This compared to an average of 22 percent for counties in the other two complexes.

### Growth in Manufacturing, Trade, and Service Industries

While employment in primary industries declines during economic growth, employment in manufacturing, trade, and service industries typically increases. Counties can be expected to exhibit growth in these industries if they have advantages such as:

- A large market potential for the product or service in and near the county.

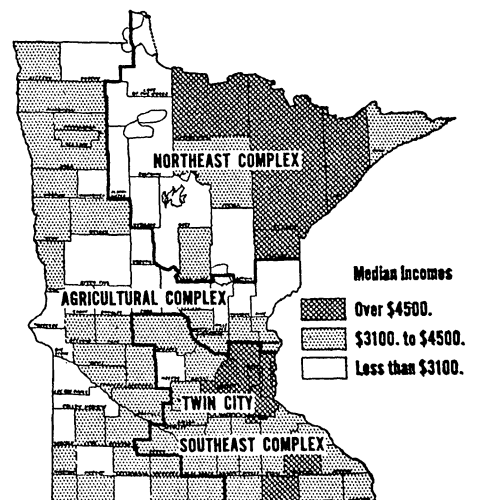
- A complex of related industries and services.

- A skilled labor force.

- Locational advantages because of transportation costs of inputs or products and services produced.

Larger towns in the Agricultural Complex, for instance, have expanded their trade areas, taking over functions once fulfilled by hamlets. However, some Northeastern Complex counties, even though the proportions of their labor forces employed in primary industries are relatively low, have not experienced much recent growth in the manufacturing, trade, and service industries.

In counties where the growth of employment opportunities in these industries has been relatively rapid, higher median family incomes can be expected than in counties where such growth has not occurred or been maintained. Differences among counties in the percentage change in employment in



Economic complexes in county median income of families and interested individuals by low, average, and high categories, 1959.

manufacturing, trade, and services from 1950 to 1960 accounted for 16 percent of the total observed variance among counties in median family income, holding the two other factors constant.

A county in which employment in these industries increased by 10 percent from 1950 to 1960 had a median family income \$94 higher than a county similar with respect to the two other factors studied but with no such growth.

Percentage growth in employment in manufacturing, trade, and service industries was considerably lower in the Northeast Complex than in the Southeast. It averaged only 11 percent in the Northeast Complex in contrast to 37 percent in the Southeast Complex and 21 percent in the Agricultural Complex.

### Human Resources

Differences among counties in the abilities, skills, and training of the people are important factors associated with differences in the income level. Unfortunately, these differences are difficult to measure. A partial measure can be obtained from data on formal education levels by county.

Highly educated people are generally highly skilled, have a lower incidence of unemployment, and are employed in higher wage occupations. People with little or no education are not highly skilled and tend to have low wage jobs or no job at all. So it can be expected that the higher the proportion of a county's adult population with at least a high school education and the lower its proportion with little or no education, the higher will be the family income level.

An index was constructed to measure the level of formal education of a county's adult population. It accounted for both the proportion with less than 5 years of formal education and the proportion with at least a high school education. (The index was calculated

by subtracting the percent with little education from the percent highly educated.)

Differences among counties in the formal education level accounted for 17 percent of the variance among counties in median family income, holding the other two factors studied constant. An increase of 10 percent in the formal education level from one county to another was associated with an increase of \$337 in median family income from one county to another, holding the two other factors studied constant.

Variation in the average level of formal education among the three complexes was not great. However, a large variation in the index of formal education existed among all counties in the state, with the more urbanized counties having higher education levels.

With a total range of over 40 percent in this factor, variation in educational

levels was associated with as much as \$1,350 difference in median incomes between specific counties.

### Summary

1. The impact of economic growth on the primary industries resulted in relatively low family income levels in those counties with high proportions of their labor forces employed in these industries. This was the most significant factor studied.

2. Counties that provide expanding opportunities in the faster growth sectors such as manufacturing, trade, and services tended to have higher family income levels than counties in which no such growth occurred.

3. The higher the education level of a county's adult population, the higher the income level.

## Growth Patterns of Minnesota Trade Centers\*

K. H. Thomas, J. L. App, and D. F. Fienup

Minnesota, like the rest of the United States, is undergoing rapid urbanization. The essence of the process is the shift of people from farm to nonfarm occupations, from farms and small trade centers to large urban areas, and from built-up city areas into neighboring suburbs and countryside.

The purposes of this article are to: (1) describe generally the impact of urbanization on population growth patterns of Minnesota trade centers, and (2) determine whether the growth patterns of small trade centers varied significantly by state areas.

### Trade Center Growth Patterns

The urbanization of Minnesota has taken place within a framework of local government units and urban settlements established soon after the first agricultural settlers arrived. Far reaching changes in transportation, agriculture, and manufacturing have occurred since this pioneer pattern was laid down. These changes accelerated during the past 3 decades, resulting in rapid urbanization and a concentration of growth at a relatively small number of larger trade centers.

The population of Minnesota's trade centers increased by almost a million persons during the 1930-60 period. Of this increase, 75 percent occurred in seven large urban areas classified as wholesale-retail centers. These centers accounted for 67 percent of the population in 1960, compared with 63 percent in 1930. Hamlets and convenience centers accounted for only 13 percent of the total in 1960, compared with 16 percent in 1930.

A comparison of growth rates of trade centers shows a tendency for a place's population growth to be directly related to its size—its previous growth (table 1).

Most shopping and wholesale-retail centers experienced moderate or fast growth during the past 30 years. Convenience centers experienced a less consistent growth pattern, particularly among minimum convenience centers. Of these centers 39 percent experienced only slow growth or decline. Similarly, 59 percent of the hamlets exhibited slow growth or decline.

However, there have been many exceptions to this past growth-future growth relationship. Some large centers grew slowly or declined as some of their functions became obsolete or as the economy upon which they were based declined.

At the same time, many hamlets and minimum convenience centers experienced moderate to fast growth. These

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\* This article is based on data developed in Urban Report No. 2, *The Urbanization of The Upper Midwest: 1930-60*. John R. Borchert, Upper Midwest Economic Study, February 1963.

**Table 1. Population characteristics of various classes of trade centers, Minnesota, 1930-60**

Trade center class*	Number of centers	Average size 1960	Proportion of trade centers in 1930-60 growth rate classes†		
			Fast	Moderate	Slow or decline
<b>Wholesale-Retail</b>					
Metropolitan .....	1	1,401,500	100	0	0
Primary†† .....	2	118,200	50	0	50
Secondary§ .....	4	43,400	100	0	0
<b>Shopping Center</b>					
Complete .....	38	9,805	61	26	13
Partial .....	57	2,813	58	28	14
<b>Convenience Centers</b>					
Full .....	52	1,573	50	46	4
Minimum .....	171	828	26	35	39
<b>Hamlets</b> .....	533	239	21	20	59

\* These centers are classified by volume of business and the number of services offered. See Urban Report No. 2, Upper Midwest Economic Study, for definition.

† Fast = population increase of 46 percent and over; moderate = 17 to 45 percent; slow or decline = less than 17 percent.

†† Includes urban areas of Duluth-Superior and Fargo-Moorhead.

§ Includes urban areas of Rochester, St. Cloud, Mankato, and Grand Forks—East Grand Forks.

centers are usually within commuting distance of major employment areas. Or, they are somewhat isolated from competing higher order centers and are thus moving upward in status. Therefore, extreme care must be exercised in predicting future growth of a given town or city merely on the basis of its present size.

### Growth Patterns of Small Centers

Today's geographical distribution of trade centers represents a phase in a long evolutionary process. The pattern is gradually adjusting to the distribution of agricultural resources and industrial development. As the process continues, many community leaders in Minnesota's small towns are concerned about the role their town will play in the future development of the state. Because of this concern, and the fact that these small towns represent 82 percent of Minnesota's trade centers, an analysis was made to determine whether minimum convenience centers and hamlets were exhibiting different growth rates in different state areas.

Minnesota was divided into three economic complexes (see figure on page 1) which have distinguishing characteristics of employment, growth, and income levels.<sup>1</sup> The **Twin City-Southeast Complex**, the predominant manufacturing and urban area, had the greatest growth in total income, per capita income, and population in the past decade.

Most fishery, forestry, and mining concerns are located in the **Northeast Complex** which has less than 10 percent of the state's agriculture and manufacturing. This Complex grew less than the state average in population and income.

The **Agricultural Complex** has a majority of the state's farms but little manufacturing. Its population actually declined and exhibited less income growth than the other two areas.

<sup>1</sup> J. L. App, D. C. Dahl, K. H. Thomas, and W. B. Sundquist, "The Growth and Development of Rural Minnesota," *Minnesota Farm Business Notes*, May 1962.

The difference in average size of **minimum convenience** centers mainly disappeared between 1930 and 1960. In 1930 these centers were much larger in the Northeast Complex but they failed to grow during the period. At the same time moderate growth occurred in the other two complexes (table 2).

Centers in the Twin City-Southeast Complex exhibited the strongest growth patterns, with 30 percent of the centers showing fast growth rates. Only one-fourth of the centers in the Agricultural and Northeast Complexes grew at this rate.

At the other extreme, 57 percent of the centers in the Northeast Complex showed slow growth or decline. Nearly one-third actually lost population. The continued decline of agriculture in this area over the past 30 years probably contributed to this trend.

The Agricultural Complex also tended toward slow growth. Farmers' preference for more complete shopping areas often leads them to bypass smaller trade centers. These differences in growth rates were even more distinct during the past decade.

**Hamlets** experienced similar growth patterns between 1930-60 with the greatest growth in the Twin City-Southeast Complex (table 3). Fifty-two percent showed moderate to fast growth rates, compared to 34 percent in the Agricultural Complex and 41 percent in the Northeast.

### Summary

The urbanization process in Minnesota has further concentrated the numbers of people living in larger population centers. Such communities generally have more drawing power for industries and as trade centers. At the other extreme, small towns appear to be in surplus, as evidenced by their higher proportion of actual declines in population or slow growth.

More favorable growth patterns of hamlets and minimum convenience centers in the Twin City-Southeast Complex may be partially explained by the greater economic growth of larger cities in this area. Little future growth of hamlets and minimum convenience centers can be expected in the Agricultural Complex. In the Northeast Complex, the decline in certain types of mining and in agriculture has weakened the position of many small trade centers. The extent to which the further development of recreation will brighten this future remains to be seen.

**Table 2. Population growth patterns of minimum convenience centers, Minnesota and three economic complexes, 1930-60**

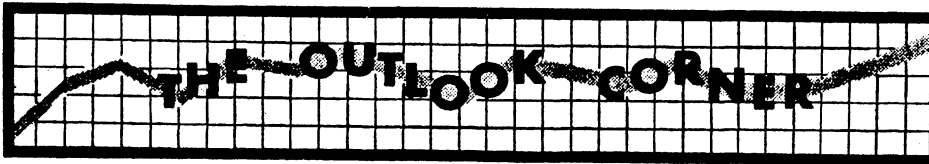
Item	State	Complex		
		NE	Ag.	TC-SE
Number .....	171	28	82	61
Year: population per center				
1930* .....	663	903	607	627
1960 .....	828	946	776	844
Growth rate				
1930-60*				
Fast .....	26	25	24	30
Moderate .....	35	18	38	39
Slow or decline .....	39	57	38	31

\* Significant at 0.05 level.

**Table 3. Population growth patterns of hamlets, Minnesota and three economic complexes, 1930-60**

Item	State	Complex		
		NE	Ag.	TC-SE
Number .....	533	90	277	166
Year: population per hamlet				
1930 .....	210	215	214	199
1960 .....	239	223	238	251
Growth rate				
1930-60*				
Fast .....	21	24	15	29
Moderate .....	20	17	19	23
Slow or decline .....	59	59	66	48

\* Significant at 0.005 level.



## Land Use Trends in Minnesota

Henry Hwang and Harold C. Pederson

In 1959, 30.8 million acres of farmland were reported for Minnesota. This is about 1½ million less than for 1954. This decrease in total acres was the largest reported for any U. S. Farm Census period since 1945.

Before 1945 the total acres of farmland increased steadily; since then the trend has been downward. The acceleration of the downward trend during the 1954-59 period was due largely to the soil bank program.

**Total cropland**, which includes cropland harvested and cropland not harvested and not pastured, has been maintained at about 22 million acres since 1930.

**Cropland harvested** fluctuated at around 18 million acres before 1950; since then there has been a downward trend (see table 1.) Government programs on wheat, feed grains, and some other crops will largely determine the amount of cropland harvested during the 1960's. Only 5.9 million acres of land were pastured in 1959; this is the lowest level in the past 40 years.

**Land pastured** has declined since 1935. This trend will probably continue, but will not be as drastic as in the 1954-59 period. The decrease then was attributed mainly to land put into the conservation reserves.

The total number of farms decreased at an increasing rate since 1935. The average farm size grew at an increasing rate during the same period. It is anticipated that these trends will continue.

Based on past trends in the acres of crops (see table 2), we can classify crops into three categories:

- Crops with increasing acreage: (1) corn for grain and silage, (2) soybeans harvested for beans, and (3) alfalfa for hay. This increasing upward trend in acreage will probably continue or at least remain near the 1959 levels of acreage.

- Crops with decreasing acreage: (1) winter wheat, (2) rye, (3) flaxseed, (4) hay crops other than alfalfa, (5) Irish potatoes, and (6) field seed crops. No marked departure from this same pattern is expected in the future.

- Crops with generally declining acreage but with large fluctuations: (1) spring wheat, (2) oats, (3) barley, (4) sorghums, and (5) other field crops ex-

cluding sugar beets and Irish potatoes. Their fluctuating nature indicates that their future trends are subject to several developments.

The increase in acres of some crops has occurred mainly because of decreases in acres of other crops since total cropland has not increased since 1940.

The above analysis is based mainly on historical time series data. Future courses of trend probably will be modified by governmental actions, technological advances, activities in the overall economy, rural education, relative price relations among farm products, etc., which will affect the crop system, crop acreage, and land uses.

**Table 1. Total acreage of farmland, average size, and number of farms in Minnesota, 1925-59**

	Years							
	1959	1954	1950	1945	1940	1935	1930	1925
Total acres of farmland (million acres)	30.8	32.3	33.0	33.1	32.6	32.8	30.9	30.1
Cropland, total	22.1	22.2	22.6	22.3	23.0	22.8	21.7	20.8
Cropland harvested	19.0	19.5	19.8	18.6	18.8	17.2	18.4	17.9
Land pastured	5.9	7.1	7.6	8.2	N.A.*	8.9	8.2	7.9
Average size of farm (acres)	212	195	184	175	165	161	167	160
Total number of farms (thousands)	145.6	165.2	179.1	189.0	197.4	203.3	185.3	188.2

\* N.A.—not available.

**Table 2. Land uses by major crops, 1925-59**

Crops	Years							
	1959	1954	1950	1945	1940	1935	1930	1925
	million acres							
Corn grain	5.92	4.57	4.83	4.50	3.46	1.79	2.86	2.66
Wheat	0.94	0.69	1.24	1.14	1.49	1.16	1.31	1.64
Corn silage	0.90	0.72	0.70	N.A.*	0.56	N.A.	0.46	0.41
Oats	3.57	4.93	4.67	4.27	3.70	3.09	3.70	4.55
Barley	0.95	1.07	1.05	0.62	1.94	1.35	2.00	0.92
Rye	0.06	0.10	0.17	0.10	0.49	0.31	0.41	0.61
Flaxseed	0.45	0.97	1.64	0.82	1.21	0.62	0.51	0.68
Soybeans	2.20	1.91	0.79	0.34	0.18	0.12	0.00	N.A.
Alfalfa hay	2.06	1.99	1.16	1.15	1.18	0.67	0.70	0.22
Other hay	1.37	1.86	2.56	3.48	3.10	3.93	3.86	4.17
Sugar beets	0.07	0.08	0.04	0.02	0.03	0.03	0.03	0.03
Irish potatoes	0.09	0.08	0.09	0.16	0.22	0.36	0.33	0.33

\* N.A.—not available.

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