

NET MIGRATION IN MICHIGAN 1950-1960:
AN ANALYSIS OF POPULATION CHANGE IN
RELATION TO THE DEMOGRAPHIC,
SOCIOECONOMIC, AND OCCUPATIONAL
VARIABLES

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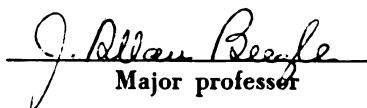
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ABSTRACT

NET MIGRATION IN MICHIGAN 1950-1960: AN ANALYSIS OF POPULATION CHANGE IN RELATION TO THE DEMOGRAPHIC, SOCIOECONOMIC, AND OCCUPATIONAL VARIABLES

by Savita Gupta

This dissertation considers net migration in relation to various sociodemographic variables such as age, sex, income, education, marital status and occupation. These variables are related to net migration in producing social change in the areas of out-migration, and the areas of in-migration. The first task of this thesis is to establish the validity of using net migration, the central variable, as a measure of population change in terms of redistribution of the population. It has been customary to view net migration under the blanket term "population growth." This thesis maintains that it is much more feasible to consider net migration as a phenomenon of population redistribution rather than population growth. The former not only involves change in population size, but gives much more importance to the various characteristics of the population mentioned above which undergo a change at the same time. The second task of this dissertation is to study the nature of the changes which characterize the social organization when net migration takes place, and to study also the influence of population characteristics on net migration as a process.

The results of the thesis indicate that net migration is as valid a measure for studying population change as other measures, such as total increase in population. The patterns of net migration are also closely related to recent past growth, and respond closely to the

socio-economic changes in Michigan in terms of location of the industries, transport and communications, and raw materials.

The study of net migration in relation to other variables indicates that some of these variables are positively correlated with net migration and the others are inversely or negatively correlated with net migration. Thus, the findings show that when net migration increases, the sex ratio, population density, educational level, median family income, and per cent employed in manufacture also increase; on the other hand, when net migration increases the dependency ratio, the per cent employed in agriculture, and the per cent sixty-five years and over in age, decline.

This kind of information regarding the extent and direction of change in the various variables can be very useful to the planners, administrators and social engineers, for they can evaluate the results of such changes in terms of the educational facilities, medical facilities, housing facilities, which might have to be provided for the migrants. On the other hand, they can also cope with the problems which arise in the areas of out-migration from which a large number of young able-bodied adults leave for the urban areas, giving rise to imbalance in the social structure. The study of net migration thus serves as an important link in the whole gamut of social change.

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CHAPTER I

INTRODUCTION

The Problem

When Thomas Hardy wrote Far From the Madding Crowds, he was writing about eighteenth century England. Today the crowds are not only "madding crowds," but also "constantly moving and milling crowds." Everyone seems to be on the move--from agriculture to industry, from smaller town to a bigger town, and from the metropolis to the suburbs. Occasionally someone stops to ask "Why do people move?" and more often than not the answer is "better opportunities": better than the yesterdays, better than the "Joneses" and the "Smiths"; the "opportunities" may be better for education, for employment, for status, or for better living altogether. Sometimes people move not necessarily to get something better but to get away from something worse, to forget the past and the present and to start life all over again.

In recent years the interests of social scientists have been focused on one type of movement; namely, net migration. Net migration is a two-directional movement of population, and it takes place in response to certain organizational and individual needs, which arise as a result of increase and expansion of urban centers, industries and production on the one hand and population pressure, lack of employment, and low levels of living on the other. The underdeveloped and agrarian societies of the world (such as the Asian, African, and the Latin American), are entering the phase of urban development which the United States entered almost a century ago, and with the rise of cities, it might be expected that these

countries would also experience a rapid increase in net migration in the direction of the urban centers of growth, with a corresponding control of their high fertility rates which most of them are trying to control even now. For instance, Japan has controlled its birth rates by legalizing abortions and by family planning. Most of the Afro-Asian countries with a high birth rate and high death rate, are now entering the high birth-low death rate phase, and given time are expected to enter the third phase of low birth and low death rates, similar to countries like Canada, United States and New Zealand, where the industrial revolution and urbanization process was marked by a corresponding change in demographic cycle of births and deaths. It is important therefore to assess beforehand the general nature of net migration and the extent of it in order to plan the future intelligently, the adjustment and assimilation of the migrating population, and the consequent changes involved in terms of population size and characteristics of the social structure and organization.

Net migration is closely tied to the phenomenon of change and plays a large part in creating a change in existing populations in terms of spatial distribution and size, and also in terms of the related demographic, socioeconomic and occupational characteristics of the population involved in such change. The primary focus of this thesis, therefore, is to study net-migration in relation to other demographic, socioeconomic, and occupational variables. The study has been made under the social and industrial conditions prevalent in the United States, and the test population is the state of Michigan. The general postulates and variables are applicable, under similar conditions of social and industrial development, to other countries as well, unless they are peculiar to the local conditions of Michigan, in which case they are specified as such.

The Concept of Net Migration

In order to understand the meaning of net migration, it is necessary first of all to define migration, for net migration essentially is a specification and classification of the parent term, migration. Migration signifies movement of population from one place to another. It has been defined operationally as "changing of residence from one community to another (over county lines)"¹ and it has been defined in relation to those "persons who were living in a different county in 1950 and 1949."²

Migration may be measured in terms of Gross Migration or as Net Migration. Gross Migration refers to the total number of people migrating to an area during a given period of time, irrespective of the number that might leave the place during the same period of time. Net Migration refers to the net aggregate of difference between the people migrating to an area, during a given period of time, and the people migrating from that area during the same time. Thus it involves two opposite processes occurring at the same time, "in-migration" and "out-migration," and whichever of these two predominates, shows up in the net migration figures. Thus, it is apparent that a gross measurement of migration would show different results than the net measurement. But net migration involves something more than mere measurement, depending upon what purpose one has in mind and how one looks at it. In the present thesis net migration has been considered as a two-directional movement of population and has been measured in net quantities. The point of difference in this case arises between the terms "net" and "gross" and not between migration and net migration.

¹D. J. Bogue, Population of the United States (Glencoe, Illinois: The Free Press, 1959), Chapter 15.

²The United States Census of Population (1950), No. PB-22.

The use of the term "net" before migration does not make it a different concept than migration but simply reminds one of the fact that migration is a two-directional movement of people and should be studied in net terms, not as a gross quantity or a one-way movement. Thus net migration is nothing more than a specific term for migration, and operates under the same conditions involving the same factors as migration. Therefore, net migration is defined as the net aggregate of difference between the number of people coming in and going out of an area during a given period of time. It involves two processes; namely, in-migration and out-migration.

Most migrations in the United States, whether rural to urban, East to West, North to South or urban to suburban, are composed of the two currents of in- and out-migration. Each influx to an urban center is followed by an outlet of the native urbanites to some other places.³ Ravenstein considered migration as a two-directional process involving in- and out-migration. According to Ravenstein "each main current of migration produces a compensating countercurrent."⁴ However, it is not necessary nor logical that these currents should balance each other. In fact the direction of the net migration or its flow is determined by the extent of imbalance between these two currents. Thus if in-migration occurs more than out-migration, then the net migration to a city is positive, meaning that the population is increasing through net migration. On the other hand, if out-migration is more than the in-migration, then the net migration from a city is negative, meaning that the population is decreasing through net migration.

³P. Sorokin and C. Zimmerman, Principles of Rural-Urban Sociology (New York: Henry Holt and Company, 1929), p. 595.

⁴E. G. Ravenstein, "The Laws of Migration," Journal of the Royal Statistical Society, Vol. 48 (June 1855), pp. 167-235.

To illustrate the fact that most migration in the United States has been two-directional, during the 1920's in the United States "net migration amounted to 6.3 million, the difference between an annual average of nearly 2 million migrants from farms, and 1.3 million migrants to farms. . . ." ⁵ Similarly if we consider East to West migrations in the United States ". . . a large part of the net gain through migration accrued to the Western states, most of it, to the Pacific Coast states, and it is the net gain or loss of population through migration, that produces most change both in distribution and in composition." ⁶ Looking at the South to North migration, "by 1950, the percentage of persons born in the North who were living in the South had increased to the highest level it had ever reached, though then it was only 4.3 percent of the total of northern-born persons. Ten percent of all southern-born persons were living in the North, also the highest figure reported since this series became available in 1870." ⁷ Regarding urban to suburban migrations evidence suggests that "Migration from the central cities to the suburban areas has in most instances been more than offset by migration to the central city from other areas, as well as by some movement from the suburban areas to the central cities. The data on migration within the country show clearly that any net migration is the result of two streams, with some migrants going in a direction precisely opposite to that taken by the majority." ⁸

The above evidence supports the view that net migration involves a two-way movement of population and should be considered as such.

⁵Conrad Taeuber and Irene Taeuber, The Changing Population of the United States (New York: John Wiley and Sons, 1958), p. 108.

⁶W. S. Thompson, Population Problems (New York: McGraw-Hill Book Company, Inc., 1953), p. 302.

⁷Ibid., p. 98.

⁸Ibid., p. 138.

The Theoretical Framework

The theoretical framework on which this study is based derives from the ecological works of McKenzie, Hawley, Bogue, and Cuzzort. The general ecological position views modern American society as urban centered, with interrelationships between the population numbers and resources. Net migration in this thesis, is viewed as the means of population distribution in the achievement of population balance or equilibrium in relation to the environmental resources, technology and social organization on the one hand and the population increase on the other. From the viewpoint of achieving balance between numbers and resources, net migration becomes an important phenomenon, for it helps to redistribute the population in appropriate spaces. The concept of balance, as applied to human population refers to the ratio of numbers to the opportunities of living.⁹ This notion of balance or equilibrium is not unique to the ecological theorists of today, but it has existed since the earliest periods of social history when the pre-Malthusian, Malthusian, as well as many economic theories, were concerned with "equilibrium," "optimum" or "balance." One such theory in the seventeenth century was the "law of diminishing returns" in agriculture,¹⁰ advanced by Adam Smith. According to this theory the capacity and quantity of land in agriculture was more or less fixed and after a time, when population increased due to natural increase, the returns from the land diminished, and only a limited number of people could be supported. The population pressure on the land, coupled with the lack of transportation and industries and relative isolation from places where resources (food and work) could be obtained, posed a serious threat to population balance.

⁹Amos H. Hawley, Human Ecology (New York: The Ronald Press Company, 1950), p. 149.

¹⁰J. J. Spengler and O. D. Duncan (Ed.) Population Theory and Population Policy (Glencoe, Illinois: The Free Press, 1956), p. 13.

This threat was emphasized by Malthus¹¹ because according to him, the food supply increased only in arithmetic proportions (1, 2, 3, 4, 5, etc.) whereas the population due to high fertility rates increased in geometric progression (2, 4, 8, 16, 32). Man had a tremendous capacity to reproduce and means of subsistence could never keep up with this increase in population. Misery and vices kept the numbers down, but as soon as misery was alleviated, birth rates increased. Hence the only way to lessen this problem was by preventive check and moral restraints (late marriages, celibacy, or sexual abstinence). Malthus did not take into account the tremendous technological advance which has brought about the exploitation of natural resources as well as an increase in productivity, and which has made the maintenance of a much larger increase of population possible today. Both the laws of diminishing returns, and the theory of geometric progression by Malthus were more applicable to closed, agrarian societies prior to the industrial revolution, or perhaps more applicable today to the agricultural economics, than they are to the highly industrialized countries. With the advent of the industrial revolution in the United States, the demographic transition had set in, and the high fertility, high mortality gave place to high fertility, low mortality and later to low fertility and low mortality due to advance of medicines, health facilities, and introduction of birth-control devices. However, even in the pre-Malthusian and Malthusian era, there were many who did not take such a dismal view of population increase. Thus Comte, Spencer, and Durkheim¹² maintained that as population increased, the social organization grew more complex and organic solidarity evolved

¹¹W. S. Thompson, op. cit.

¹²H. Becker and A. Boskoff (ed.) Modern Sociological Theories (New York: The Dryden Press, 1957), pp. 7-22; see also, F. Toennies, Community and Society (Translated by C. P. Loomis) East Lansing, Michigan State University (1957); and T. Parsons, The Structure of Social Action (Glencoe, Illinois: The Free Press, 1937).

out of social interaction and interdependence of parts of the social system, division of labor and specialization increased. Thus, population balance or equilibrium was maintained, because as the population increased so did productivity. The various mercantile economists during the nineteenth century, advanced the law of increasing returns, population and per capita income, and optimum population. Everett¹³ in the nineteenth century contended that an increase of population in a given territory resulted in the extension of manufacture and trade with a rise in wages. The notion of optimum population as defined by Cannon¹⁴ referred to "a population which was moving in the right direction with respect to the increase of output per capita."

These earlier theories then were all concerned with population balance or equilibrium, or the distribution of numbers in relation to means of subsistence, food, employment, wages, and spatial distribution. Applied to net migration, it would mean that as industrial growth took place, the division of labour and specialization increased and more population could be taken care of, with the rise in per capita income, production and employment. The ecological school in the early twentieth century concerned itself with the rise of industrialism and its consequences on the spatial distribution of population in response of increased demand for labor and production. Net migration increased and the majority of people flocked toward the cities. This movement of population took place in order to maintain an ecological balance between population numbers and resources. The ecological school¹⁵ maintains that just as

¹³J. J. Spengler, "Alexander Hill Everett, Early American Opponent of Malthus," New England Quarterly, Vol. IX (1936).

¹⁴J. J. Spengler and O. D. Duncan, Ed., op. cit., p. 25.

¹⁵Amos H. Hawley, op. cit., pp. 1-74.

plants and animals try to exist in the natural order, maintaining ecological relationships with the inorganic environment (air, water, space) by making dissimilar demands (if different species) and competitive struggle for existence (if same species) for space, in a similar manner human species exist in competitive and symbiotic relationship with each other responding to the conditions of environment, resources, and social organization. Thus if the size of the social organization increases, and the technological level and industrial growth increases, it necessitates redistribution and movement of population, especially from the areas where subsistence level is low, because the division of labor and specialization creates more employment, and increases the level of production with rise in wages. According to the theories of population balance, then, the greater the industrial growth, the greater the production, greater the income, and greater the net migration of population towards urban areas. The earlier ecologists such as McKenzie, Sanderson and Park concerned themselves with the interrelationship of spatial organization with respect to environment, and social relationships. In recent years Hawley¹⁶ has explored the ecological theory of spatial organization, and extended it to include the ecological notion of balance between social organization, technology, natural resources, and the complex interrelationships between all these. According to him the increase in the means of transport and communication, the discoveries of steam, gas, electricity, and utilization of central space by the important industries have all led to an increase and concentration of population in the urban centers. Most of this increase has been a result of net migration from the rural areas to the centers of power and production, or the metropolitan areas and cities, so much so, that there is evident today a process of decentralization of population evidenced in the migration to suburban areas.

¹⁶Ibid.

Demographers such as Taeuber, Thompson, Bogue, and Cuzzort agree to the fact that ever since the advent of the industrial revolution, basic changes in the spatial organization have been taking place. The early development of urban areas and cities in the nineteenth century largely involved a cityward movement of population. The economic and technical growth, entailed a reshuffling of manpower and resources from rural areas to the urban centers. Thus according to Taeuber, "The urban population grew much more rapidly than the rural, with the result that the proportion in the urban areas increased from 5 percent in 1790 to 15 percent in 1850, 40 percent in 1900, and nearly 60 percent in 1950 (by percent on the basis of large scale migrations,"¹⁷ and Thompson says that "It has long been known that during the period of modern industrial development, the prevailing net movement has been from agricultural to non agricultural industries--from the town and agricultural village to industrial village, or town, or city."¹⁸

Bogue observes that "From 1900 to 1950, the population of the United States nearly doubled in size. During this same period the population of areas which were defined as S.M.A.'s in 1950, increased far more rapidly; they grew 177.8 percent or at a rate 80 percent faster than the nation. At each census since 1900 a greater share of the total population has been found to be living either in or near the immediate vicinity of the metropolitan centers, than lived there a decade earlier."¹⁹

Today the metropolis represents the center of dominance and the greater is its development the greater its interdependence in the other areas in terms of population redistribution and net migration.

¹⁷C. Taeuber and I. Taeuber, op. cit., p. 106.

¹⁸W. S. Thompson, op. cit., p. 294.

¹⁹D. J. Bogue, Population Growth in Standard Metropolitan Areas 1900-1950, Housing and Home Finance Agency, Washington, D.C. (1953), p. 9.

Net migration thus is mainly a phenomenon of urban growth and industrial development, because according to the theory of demographic transition, fertility decreases as urban growth increases and fertility rates of agricultural areas are traditionally higher, with the result that population flows from rural to urban centers. According to Thompson and Sorokin,²⁰ population pressure due to higher birth rates in agricultural areas and increase of jobs in the cities leads to city-ward migration. Sorokin also takes into account the mechanization of farms along with high fertility rates in such areas which create population pressure.

Goodrich, et al.²¹ subscribe to the push-pull hypothesis, saying that migration takes place from areas of low economic opportunities towards areas of high economic opportunities. Beegle and others²² add the socio-psychological factors of satisfactions, aspirations, and social costs of moving as components in the decision to migrate. Stouffer's²³ hypothesis of intervening opportunities takes into account the distance of net migration, and the relative attractiveness of intermediate places, thus population size and available information regarding jobs, which determine the destination of migrants. Zipf advances the theory of increase relationship between population size and distance of migration. According to the recent theory of allometric growth²⁴ the "force of attraction" of the cities plays a large part in attracting migrants, and the bigger the city the higher its relative rate of growth. Among the

²⁰W. S. Thompson, op. cit., pp. 294-303, and P. Sorokin and C. Zimmerman, op. cit.

²¹Carter Goodrich, et al., Migration and Economic Opportunity (Philadelphia: University of Pennsylvania Press, 1936), p. 2.

²²J. A. Beegle and Harold F. Goldsmith, "Orientation to Community as a Factor in Voluntary Migrations," unpublished paper, East Lansing, 1959, Michigan State University.

²³S. A. Stouffer, "Intervening Opportunities: A Theory Relating Mobility and Distance," American Sociological Review, Vol. V (Dec., 1940).

²⁴C. J. Stewart, Jr., "Migration as a Function of Population and Distance," American Sociological Review, Vol. 25 (June, 1960), pp. 348-349.

above theories of migration can be identified demographic, economic, personal and familial factors which give rise to net migration, but behind these factors lies a broader reason, which has been discussed before, that of population balance or equilibrium. All population redistribution through net migration takes place with a view to maintain a balance between population size, resources and opportunities.

Net migration then is by no means a self-generating, self propelled phenomenon, but takes place in accordance with certain broader rules and regulations of an ecological order. From this discussion of various theories of population relating to population balance or equilibrium, have been derived later in this chapter, the main postulates underlying the basic hypotheses treated in this dissertation.

Operationalization of Concepts

This dissertation is concerned with the study of net migration within the State of Michigan during the 1950-1960 decade. The units for this study are all the counties (N = 83) and cities of 10,000 and over (N = 55) in 1950 in the State of Michigan. The variables studied in relation to net migration have been gathered from the United States Census of Population, General Characteristics, for 1950. Net migration was computed for the period April 1, 1950 to April 1, 1960. In some instances comparisons have been made with net migration data for the 1940-1950 decade.

The county is used as a unit of study because:

- (1) The county is a meaningful and readily identifiable unit in all states.
- (2) Many counties possess more than nominal status in the social system sense.
- (3) Population data concerning characteristics and components for intercensal estimates are more readily available.
- (4) Historical materials seldom relate to a community apart from some larger context.²⁵

²⁵Report of the Procedure Committee of NC-18: North Central Regional Project concerning field studies of migration, Michigan State University Social Research Service, 1957. (mimeographed)

The cities of 10,000 and over are used as units of study for the following reasons.

- (1) Comparable population data on characteristic of population (age, sex, etc.) are available for urban places of 10,000 or more as for the counties.
- (2) Since we are interested both in migration to metropolitan suburbs and migration from one urban place to another, the cities of 10,000 and over are readily identifiable units both as parts of the metropolitan area and as urban places outside the metropolitan area.

The period of time for which net migration is calculated is the ten years between 1950 to 1960, because, first of all, the computation of net migration depends upon the total population enumeration. Although the births and deaths are available annually, census data on characteristics of population are available only for every ten year period. Secondly, the patterns of net migration would be much more firmly established over a moderately long period of time. This is true since the unusual circumstances of high or low migration, which might falsely increase or decrease the importance of a peculiar trend in a one or two year period, have a better chance of being averaged over a longer time-period. Further, this study relates to other studies of net migration done in Michigan.²⁶

General Postulates

The general postulates, derived from the theoretical framework stated earlier, form the basis for the formulation of the hypotheses stated in

²⁶J. A. Beegle and J. F. Thaden, Population Change in Michigan 1940-50 with Special Reference to Rural-Urban Migration, Michigan State University, Agricultural Experiment Station, East Lansing, October, 1953, and, J. A. Beegle and J. F. Thaden, Population Changes, Michigan 1950-60, Michigan State University Agriculture Experiment Station, East Lansing, August, 1960.

subsequent chapters. Most of these postulates should be applicable to all social systems insofar as the ecological position from which they are derived and the "population equilibrium" concept applies to all human societies. However, in the statement of postulates here, they are limited to the conditions, urban and industrial, similar to those obtaining in the United States. In varying degrees, these postulates also apply to countries other than the United States which are passing through the same phase of industrial development and demographic transition that the United States experienced almost a century ago.

The general postulates are as follows:

(1) Net migration generally increases with increasing urbanization and industrial growth leading to population concentration in urban areas. Such growth according to the theories of Comte, Spencer and Durkheim gives rise to increased division of labor, and specialization of skills, leading to increasing complexity of the social system.

(2) Net migration flows from areas of agriculture toward areas of manufacture and industry according to the laws of diminishing and increasing returns given above.

(3) Net migration responds to the socio-economic opportunities and increasing opportunities for subsistence.

(4) Net migration flows from areas of low economic opportunities towards areas of higher economic opportunities, in keeping with the theory of push-pull according to Goodrich. It is also applicable since according to law of increasing returns advanced by Everett, industrial economy gives rise to increase in production and increase in per capita income.

(5) Net migration involves corresponding changes in the social organizations of the area of departure as well as of destination of migrants, due to the selective age and sex characteristics of the migrants. This assumption finds support in the ecological theory,

according to which, population distribution is bound to create changes in the other interrelated parts of technology, environment and social organization in order to maintain equilibrium and balance. This postulate is universally applicable, since all societies are faced with population balance (that is the ratio of numbers to opportunities for survival) and each has a social organization including occupational, familial and demographic variables which respond to varying ways to population movement.

From these postulates have been developed specific hypotheses and subhypotheses, which are stated at appropriate places in Chapters III and IV, respectively.

The Variables

The variables used in this dissertation were grouped into three categories, namely, demographic variables, socio-economic variables, and occupational variables.

The demographic variables represent selected attributes or characteristics of the population. Measures of age, density, a dependency ratio, and the sex ratio were used in relation to net migration. The socio-economic variables included measures of marital status, educational level, health, and income. The occupational variables included percentages employed in manufacturing, in agriculture, in government work, percentages in the labor force, and percentages non-white. A more precise statement of the measures used for Michigan counties and Michigan cities of 10,000 and over are listed later in this chapter.

Various studies support the fact that the demographic, socio-economic, and occupational variables given above, are closely related to net migration. Similar variables, for instance have been used by

Duncan and Reiss, Thompson, and Bogue. Duncan and Reiss,²⁷ for example, study them under three heads:

(1) Persistent currents of selective migration: These correspond to our demographic characteristics of age and sex distribution of population where selectivity of migrants shows most prominently. The observed age differences suggest a complex pattern of selection. There seems to be a disproportionate drift of persons in younger productive ages toward large places and a counterdrift of older males. Similarly males migrate to industrial and manufactural centers more than females. Interstate migrants have higher sex ratios than intrastate migrants.

(2) Family organization and functions: These correspond to our socio-economic variables, and include housing, marital status, and labor-force participation of women. Thus according to Duncan and Reiss, the larger the community--(a) the smaller is the proportion married, (b) the greater the family disruption, (c) the larger the labor force participation of women, and (d) the lower the fertility.

(3) Economic structure and functions: This corresponds to our occupational variables and the factors of labor force, white collar occupations, clerical workers, and technical jobs, have been studied. Thus the greater the size of the city the higher the percent in the labour force and the higher the migration. The higher the population increase, the higher the division of labor and higher the clerical workers.

Thompson²⁸ in reviewing the characteristics of migrants, asserts that the further the migrants move the higher is the sex ratio; males also

²⁷O. D. Duncan and A. J. Reiss, Social Characteristics of Urban and Rural Communities (New York: John Wiley and Sons, 1950), pp. 19-95.

²⁸W. S. Thompson, op. cit., pp. 303-306. See also, U. S. Bureau of Census; Population, Internal Migration, 1935 to 40, Color and Sex of Migrants, Government Printing Office, Washington, D. C., 1943; Age of Migrants, 1946; Social Characteristics of Migrants, 1946; Economic Characteristics of Migrants, 1946.

exceed females when migration is taking place in non-contiguous states. Migrants are heavily concentrated in terms of age, between ages fifteen to thirty-four with more females under twenty and more males over thirty-five. Old people show little tendency to migrate. People moving to cities are younger than those leaving the cities. Migrants are better educated than non-migrants; and people with college education or more have a higher rate of migration. White collar workers are more mobile than other category of workers.

Bogue²⁹ shows that net migration correlates quite highly with percent change in population. Net migration is higher to the non-metropolitan cities because these are still growing, whereas many of the central cities of the metropolitan areas have stopped growing and are sending population to the suburban areas. Net migration is also inversely related to percent engaged in agriculture and is inversely related to percent non-whites. The percent employed in labor force shows only a moderate relationship with net migration; income is positively related to net migration; and the level of living is inversely related to net migration.

The variables used represent a cross section of population characteristics as well as the social organization. We now turn to the specific indexes used for the 83 counties and 55 cities of 10,000 or more.

County and City Indices

The indices representing the above variables were chosen from the United States census of population 1950, and each of them was correlated with the central variable net migration (1950-1960) both as a number and as a percent of the 1950 population. The indices which were studied in relation to migration were data for the year 1950,

²⁹D. J. Bogue, The Components of Population Change in Standard Metropolitan Areas (Oxford, Ohio: Scripps Foundation, Miami University, 1957).

that is, at the beginning of the decade 1950-1960, because the data for the same indices for the year 1960 were not available at the time of the study.

County Indices: Out of the nineteen indices selected, four are measures of change in population size and are correlated with the central variables of net migration (in numbers and as percent of 1950 population). Fifteen are demographic, socio-economic and occupational measures and are correlated with net migration.

The four measures of change are:

- (1) Percent change in total population 1950-1960.
- (2) Percent change in total population 1940-1950.
- (3) Net migration as percent of 1940 population (or percent net migration 1940-1950).
- (4) Net migration in numbers 1940-1950.

The fifteen remaining indices, 1950, are:

- (1) Population density
- (2) Median age
- (3) Percent 65 years and over
- (4) Median family income
- (5) Level of living index
- (6) Median education of males and females 25 years and over
- (7) Buying income per capita
- (8) Percent of total employed in agriculture
- (9) Percent of total employed in manufacturing
- (10) Percent of total employed in wholesale trade
- (11) Percent working off-farm for 100 days or more
- (12) Dependency ratio
- (13) Percent of total employed in professions
- (14) Sex ratio
- (15) Number of doctors per 1000 population

City Indices: Out of the nineteen indices selected, two are measures of change in population size and are correlated with net migration (in numbers and as percent of 1950 population). Seventeen are demographic, socio-economic or occupational and are correlated with net migration.

The two measures of change are:

- (1) Percent change in total population 1940-1950
- (2) Percent change in total population 1950-1960

The seventeen remaining indices, 1950, are:

- (1) Percent under 5 years of age
- (2) Percent 65 years old and over
- (3) Median family income
- (4) Median education for males 25 years and over
- (5) Median education for females 25 years and over
- (6) Percent of total males single
- (7) Percent of total males widowed and divorced
- (8) Percent of total females single
- (9) Percent of total females widowed and divorced
- (10) Percent of total employed in agriculture
- (11) Percent of total employed in manufacturing
- (12) Percent of total employed in government
- (13) Percent of total population 14 years and over in the labor force
- (14) Percent of total males 14 years and over in the labor force
- (15) Percent of total females 14 years and over in the labor force
- (16) Percent non-white population
- (17) Sex ratio

Methods Used

The method used to compute net migration is the residual method.³⁰ Net migration was computed by using the components of population, viz., natural increase (births minus deaths) and net migration (in-minus out-migration).

The actual steps involved in computation of net migration are:

- Step I: - Take total population figures for 1950, for each county and city, as the base population for time t_1
- Step II: - Take total population figures for 1960, corrected for under-registration of births for each county, and city (of 10,000 and over) as the final year of study for time t_2
- Step III: - Subtract I from II and obtain change in total populations for each county and city, during the 1950-1960 decade
- Step IV: - Take total births (April 1, 1950 to April 1, 1960) and subtract from these total deaths (April 1, 1950 to April 1, 1960) for each county and city; this gives the natural increase for the period 1950-1960
- Step V: - Subtract Step IV from Step III and obtain net migration in numbers 1950-1960
- Step VI: - Compute percentage of net migration 1950-1960, as percent of the base population 1950, for each county and city.

The formula³¹ used here is:

³⁰For the use of this method see Dorothy Swaine Thomas, Research Memorandum on Migration Differentials, and Rupert B. Vance, Research Memorandum on Population Redistribution in the United States (New York: Social Science Research Council, 1938, Bulletins 43 and 42); P. Jehlik and R. Wakeley, Population Change and Net Migration in the North-Central States 1940-50, Agricultural Experiment Station, Iowa State College, Ames, Iowa, Research Bulletin 430, July, 1955, p. 488.

³¹Kingsley Davis uses the formula $P_2 = P_1 + (B - D) + (IM - OM)$ in his book Human Society (New York: The Macmillan Company, 1949), pp. 551-553; Jehlik and Wakeley, op. cit., use the formula $M = I - E = P_2 - P_1 - (B - D)$. My formula corresponds to that used by Jehlik and Wakeley, and is an explication of the same.

$$P_{t_2} - P_{t_1} = [(B_{(t_2 - t_1)})] - \{D_{(t_2 - t_1)}\} + [(I_{(t_2 - t_1)})] - \{E_{(t_2 - t_1)}\} = NM$$

$$\text{or } NM_{(t_2 - t_1)} = (I - E)_{t_2 - t_1} = P_{t_2} - P_{t_1} - (B - D)_{t_2 - t_1}$$

In the above formulae,

$NM_{(t_2 - t_1)}$ is the same numerically as $(I - E)_{t_2 - t_1}$ because

$$NM_{(t_2 - t_1)} = \text{net migration}$$

and $(I - E)_{t_2 - t_1}$ = computational formula for NM, where

I = in migration and E = out migration or emigration.

The difference between I and E gives change through net migration between times t_2 and t_1 .

$t_2 - t_1$ = 1960 population - 1950 population

$P_{t_2} - P_{t_1}$ = change in total population during 1950-1960 decade

$(B - D)_{t_2 - t_1}$ = change through natural increase (births minus deaths) during 1950-1960 decade.

If there is more in-migration than out-migration, during the decade, then NM would be positive (+); if there is more out-migration than in-migration during the decade, then NM would be negative (-).

In order to facilitate the analysis, data for six sets of units were utilized as follows:

1. The total counties $n = 83$
2. The in-migration counties $N = 29$
3. The out-migration counties $N = 54$
4. The total cities $N = 55$
5. The in-migration cities $N = 21$
6. The out-migration cities $N = 34$

The above six sets of data have been used in groups of three for counties (total, in-, and out-migration counties) and for cities (total (in- and out-migration cities). These county and city data have been used to test various hypotheses given above.

The statistical techniques used are Pearson's correlation (commonly known as product-moment correlation), partial correlation, and multiple correlation.

The formula for Pearson's correlation coefficient (r) is:

$$r = \frac{\sum xy}{\sqrt{(\sum x^2)(\sum y^2)}} = \text{for computations, } r = \frac{N\sum xy - (\sum x)(\sum y)}{\sqrt{[N\sum x^2 - (\sum x)^2][N\sum y^2 - (\sum y)^2]}}$$

The formula for partial correlation coefficient is:

$$r_{12.3} = \frac{r_{12} - (r_{13})(r_{23})}{\sqrt{(1 - r_{13}^2)(1 - r_{23}^2)}}$$

The formula for multiple correlation is:

$$R_{1.23} = \sqrt{\frac{r_{13}^2 + r_{12.3}^2 (1 - r_{13}^2)}{1}}$$

The basic assumptions for the use of these statistical measures are that the variables should have a linear relationship. If (r) turns out to be zero then the relationship may be of curvilinear nature. It is not necessary that the population distribution be normal as long as the distribution is symmetrical and is not badly skewed. The data should be numerical and quantifiable for the use of these formulae.

The Pearson's correlation coefficient (r) measures the relationship between two variables. It measures to what extent variations in one go with variations in the other.³² The correlation between two variables has been explained in the following ways:

High-positive - a county or city which is high on one variable is also high on the other variable, and one which is low on one variable is also low on the other variable.

³²J. P. Guilford, Fundamental Statistics in Psychology and Education (New York: McGraw-Hill Book Company, 1950), p. 347.

Low-positive - A county or city which has high values on one variable can be anywhere within the total range in terms of the other variable.

High-negative - A county or city which has high values on one variable has low values on the other, or the county or city having low values on one variable has high values on the other. This means that there is an inverse relationship between variables.

Low-negative - A county or city having high values on one variable, may have any value within the total range on the other value, or a county or city having low values on one variable can have any value (high or low) on the other variable. This means that the relationship is not definite due to the lowness of the scores.

Tests of significance: The null hypothesis of "no relationship" between two variables or $p = 0$ has been tested by the following formula:³³

$$F_{(1, N-2)} = \frac{r^2 (n - 2)}{1 - r^2}$$

The "F" has the distribution with 1 degree of freedom for the numerator and $N - 2$ for the denominator. Consequently, $\sqrt{f} = t$ and t has a distribution with $N - 2$ d.f. $t = \frac{r\sqrt{N - 2}}{\sqrt{1 - r^2}}$

Outline of the Thesis

This dissertation contains five chapters, in addition to Appendices and Bibliography.

Chapter I consists of introduction to the problem, the concept of net migration and its relation to natural increase, the theoretical framework, operationalization of concepts, indices, methods and statistical tests used.

³³Joseph Lev and M. Walker, Statistical Inference (New York: Henry Holt and Co., 1953), p. 251.

Chapter II reviews the literature in terms of a general history of human migration, with reference to United States in general and the state of Michigan in particular.

Chapter III deals with net migration in Michigan in the light of establishing its validity for use as a measure of change in population size. The indices given earlier in this chapter for counties and cities which represent measures of change have been examined in this chapter.

Chapter IV consists of an analysis and interpretation of the selected sociodemographic variables in relation to net migration. The fifteen indices for counties and the seventeen indices for cities mentioned earlier have been examined in this chapter. Various hypotheses are tested by applying simple, partial and multiple correlations.

Chapter V deals with some interpretations and conclusions regarding the above findings.

The Bibliography consists of references to the books used in this dissertation.

The Appendices contain the original correlation tables and the scatter diagrams.

CHAPTER II

REVIEW OF LITERATURE

Having established the nature, purpose and methodological orientation of the thesis in the introductory chapter, we now turn our attention to a review of selected literature. This chapter is concerned with a brief review of literature regarding the causes and consequences of migratory movements. It is divided into three subsections.

(1) The views of social philosophers regarding migration. - This portion of the review is concerned with the history of migration in terms of problems of adjustment, adaptation, and assimilation arising out of the intermixture of different racial and ethnic groups.

(2) American migrations. - This section deals with the modern migrations of which the American migrations form an excellent example. It is also a prelude to the third section, serving as a basis of comparison of migration in Michigan with that in the nation as a whole.

(3) Migration in Michigan. - This part deals with migration in Michigan. It is intended to show that the general trends of the nationwide migration are reflected in the migratory trends in Michigan, as well as in the North Central Region of which Michigan forms a part.

The Views of Selected Social Philosophers Regarding Migration

The great movements of people to and fro, since the dawn of history, gave rise to varied views and opinions regarding the nature and consequences of migrations. Near the beginning of the 18th century social philosophers began to wonder how and why one nation differed from

another and what happened when two different groups came together. Writers such as Hume, Montesquieu and Turgot fully realized the role played by migration, mental mobility and culture contact in the formation of new ideas, modifications in customs, learning of new language, and a general attitude of tolerance towards others. Among the present-day writers Sorokin, Toynbee, Huntington and White head have commented upon the role of migration and contacts in the shaping of civilizations. As early as 1741-42, David Hume wrote:

"Where several neighboring nations have a very close communication together either by policy, commerce or traveling, they acquire a similitude of manners, proportioned to the communication."¹

Montesquieu, the well-known exponent of secularism as opposed to ethnocentrism was "fully aware of the effects of isolation and the part played by migration in breaking down local mores and promoting social disorganization."²

The main difference between Hume and Montesquieu lay in the fact that while Hume was only interested in the co-mingling aspect of the social group and the good points about it, Montesquieu was also aware of the disruptive aspects of contact--the urban congestion, the anonymity, the conflict. Turgot in 1750, expressed the view that "human races would have remained forever in a state of mediocrity had it not been for the disruptive effects of migrations, wars, and conquests."³

More recently Sorokin has also pointed up the fact that in historical societies a notable portion of wars occurred when in the process of

¹David Hume, "Of National Characters" in Essays, Moral, Political and Literary, edited by T. H. Green and T. H. Grose, London (1881), Vol. I, p. 212.

²H. E. Barnes and H. Becker, Social Thought from Lore to Science (New York: Heath and Company, 1938), p. 409.

³F. J. Teggart, Theory and Processes of History (Berkley, Calif.: University of California Press, 1960), p. 184.

migration, expansion or colonization, one society met another. This is true of Greek, Roman and Egyptian history. The cause of such wars however was not the mere fact of contact, but incompatibility of values; as long as this incompatibility lasted, so long did the war.⁴

"Whether viewed as the partner of conquest or as a prerequisite for advancement of the human spirit, the contribution of migration to the unfolding of history and before that of prehistory is unquestioned. If it is true that geographical isolation and physical contact together are the great race-makers, then it is equally clear that migration is one of the great culture-makers; for the mingling of peoples through migration makes for the mixing of culture pattern."⁵

Huntington points up the role of climatic and geographic factors in the process of migration and the changes which such migrations brought about. He says: "Migrations involve changes in all three of the primary conditions which determine the level of civilization. On the physical side they bring people into contact with new climates, food, diseases, resources and occupations. Biologically they lead to bodily and mental changes, such as we have among the Japanese in Hawaii, and Europeans in New York. Culturally migration may bring people into contact with new habits or may stimulate them to drop old practices and adopt new ones."⁶

This interest in migratory movements and their consequences for the sending and the receiving populations has continued until the present time. This process of migration has given rise to many conflicting problems--the problems of assimilation, acceptance and adjustment of various groups and nationalities. For the country of emigration it

⁴P. Sorokin, Society, Culture and Personality (New York: Harper and Brothers, (1947), p. 509.

⁵Donald R. Taft and Richard Robbins, International Migrations (New York: The Ronald Press Company, 1955), p. 22.

⁶E. Huntington, Mainsprings of Civilization (New York: John Wiley and Sons, 1945), p. 77.

may mean getting rid of the surplus population, undesirable population, congested labor markets; on the other hand, it may mean a drain on the young adult population of that country, a reduction of its economic strength, a disturbance in its balance of production and labor. For the country of immigration, the evaluation of the effects of migrations depends upon the needs and situation of the economy in the in-migration country.

To cope with these problems, the countries involved in the migration process either make laws restricting the inflow or outflow of people, or make liberal laws to facilitate such exchange of people, depending upon the national and international opinions prevailing at a given time.

American Migration

The overseas migrations to America started from 15th century onwards, adding to the traditional continental movements of the American Indians. Little can be said about the latter movements with any certainty, but as to the former,⁷ migrations were limited in numbers during the 15th and 16th centuries. The hazards and perils of sea voyages in the earlier days, the lack of capital to migrate, and the unwillingness to leave one's country of origin unless forced by circumstances to do so, were responsible for this limited movement. The first slaves were brought in during the mid-fifteenth century, and later search for gold and silver, settlement of new frontiers, deportation of criminals from Britain and colonization contributed to the growth of migration in general up until the middle of the nineteenth century. From that time onward, migration was accelerated tremendously due to the rise of capitalism. On the one hand,

⁷For a discussion of migration movements to United States, see C. Taeuber and I. Taeuber, The Changing Population of the United States (New York: John Wiley and Sons, 1958); Donald J. Bogue, The Population of the United States (Glencoe, Illinois: The Free Press, 1959); The Annals of American Academy of Political and Social Science, Vol. 262 (March, 1949); Appraising Our Immigration Policy; and Taft and Robbins, op. cit.

industrialization created major demands for unskilled labor in factories, canals, road and railroad-building, and on the other hand, conditions developed in Europe which necessitated migration. Germany faced the 1848 revolution and political upheavals; Ireland was struck by the potato crop failure giving rise to the great famine; population growth and pressure led to poverty in Northern Europe. All these factors released large numbers of migrants from Germany, Ireland, Britain, and other Northern European countries. This stream of migrants came in large numbers, especially from 1830 to 1885. These immigrants were literate people from all walks of life, mostly young males in the productive age-groups with a largely rural background. They had less difficulties in assimilating because the Westward movement within the United States during the early settlement period provided them with agricultural opportunities.

In about 1880 the flow of European migration changed drastically. Now the immigrants came from Russia, Poland, Italy, the Baltic states and southern Europe, driven by political oppressions, poverty and population growth. These migrants were largely Catholics, Jews or Orthodox Greeks. They had relatively low education and low socio-economic status as compared to earlier migrants. This second stream of migrants reached a peak just prior to World War I. The migration figures for the country stood at 14 million in the decade 1906-1915.⁸

Most of these immigrants were absorbed as cheap labor in the growing cities, but the population within the United States also grew rapidly as a result of natural increase. This factor coupled with the mechanization of farms led to surplus labor within the country. Surplus labor together with immigration gave rise to a great need for population redistribution. The rural-urban migration was accelerated, with more and more people flocking towards the urban centers. It was in the main

⁸Milbank Memorial Fund, Postwar Problems of Migration (1946).

a two-directional movement of people: from East to West and from South to North. Long before the agricultural expansion towards the West came to a close, the cities of established states attracted more and more migrants. Thus all Westward migration was not agricultural, as is so often taken for granted, but it was migration in the vicinity of the already established cities and the newly developing urban centers. This was especially true after the period of initial settlement was over.

Similar to the East-West migration there was also migration between South and North, both of whites and Negroes due to the increased urbanization process and cityward migration. The urbanization of Negroes in America is evident from Table I. The movement of Negroes has predominately been to large Northern cities. The migration of Negroes from South to North gained momentum from 1910 onwards, and continued up to 1930. It slowed down in the decade 1930 to 1940 due to war and depression, but again reached a high level during the 1940s.

Since most migration within the United States has been in response to the process of industrial development and urbanization, whether it be called rural-urban, east-west, south-north or urban-suburban,⁹ an appropriate way of dealing with American migration is to study it in terms of development of cities, metropolitan areas and fringe areas, and to analyze the various social and demographic characteristics of the population, at each stage of development. The major patterns of redistribution are discussed here, as a prelude to migratory trends in the state of Michigan which also follow the "growing urban" pattern in keeping with the national trends described here.

⁹The favorite categories in terms of which earlier writers such as Bogue, Thompson, Taeuber, and Duncan and Reiss have studied migration are: (1) rural-urban; (2) east-west; (3) south-north, and (4) urban to suburban migration. A few add a fifth category (5) urban to urban migration.

Table I. Urban and Rural Population by Race and Nativity: 1900, 1930, 1950. (Numbers in thousands)

Year and Area	Native White (Thousands)	Negroes (Thousands)
<u>1900</u>		
Total	56,595	8,834
Urban	21,569	2,002
Rural	35,026	6,832
<u>1930</u>		
Total	96,303	11,891
Urban	52,483	5,194
Rural Non-Farm	19,794	2,017
Rural Farm	24,027	4,681
<u>1950</u>		
Total	124,781	15,042
Urban	78,268	9,393
Rural Non-Farm	27,351	2,491
Rural Farm	19,163	3,158

Adapted from Taeuber and Taeuber, The Changing Population of the United States, Table 38, p. 124.

Rural Population Depletion and Growth of Central Cities

This trend was most dominant during the 1900-1910 decade. During this period, the central cities had higher growth rates than any other parts of the metropolitan area. The surplus population from farms and the immigrants flocked to the cities of expansion in search of jobs. These early migrants were largely whites, the Negroes still being restricted largely to agricultural work in the South. Both east-west and south-north streams of migration culminated in an increased rural to urban migration of young adults in their productive ages. Such migration still continues giving rise to new urban centers, though not at the previous high rates.

Stabilization of Central City and Growth of the Urban Ring of the Metropolis

This trend of decentralization was especially characteristic of the years 1920 to 1930.

"In 1900-10, the central cities had higher growth rates than the metropolitan rings, but in 1940-50, the rings were growing at a much more rapid rate than central cities. This change appears to have taken place about 1920."¹⁰

Migrations were still occurring from agricultural regions to industrial areas; the cities were overflowing their boundaries and expanding outwards. The growth of the population was now mostly in the thickly settled urban fringe around the central city. The growth of urban rings involved new supermarkets, new services and new highways. There was an expansion of population, and business.

¹⁰Donald J. Bogue, Population Growth in Standard Metropolitan Areas, 1900-1950, Housing and Home Finance Agency, Washington, D. C., 1953, p. 18.

Decline of the Central City and Urban Rings, and Growth of the Rural Rings of the Metropolis

This trend has continued from 1930 onwards, and into the present decade. Bogue contends that growth of the rural ring of the metropolis is a result of migration into the rural ring from the central city and urban ring on one hand, and migration from rural parts outside the metropolitan area on the other. It is facilitated by increased transportation, congestion in cities, lack of living space in central cities, and desire to have more space to bring up children. The people who move to the less-congested rural rings are predominantly white, middle-aged, well-settled married people having large families.¹¹

After 1930, when the depression set in, there was a "back-to-the-land" movement and the rural to city migration was at an all-time low, but during the same 1930-40 decade the rural rings of the metropolitan areas showed a tremendous gain. The "back-to-the-land" movement was mostly to the rural part of the Standard Metropolitan Areas rather than to the farms. From 1930 onwards until the present decade, this same kind of growth of rural parts of the metropolis or the development of the fringe areas has continued at an increased rate.

City to City Interchange

This trend has been characteristic of the past two or three decades. With the expansion of the city into metropolis and the increased flow of goods and people, there is increased movement of people from one economic center to another. Thompson has this to say:

"The Ohio study dealing with intra-state migration in some details shows that, whereas the non-metropolitan urban population constituted

¹¹Cf. Bernard Lazerwitz, "Metropolitan Community Residential Belts, 1950 and 1956," American Sociological Review, Vol. 25 (April, 1960), pp. 245-252.

only 42.4 percent of the total non-metropolitan population, it furnished 50.6 percent of the migrants to metropolitan communities and 56.3 percent of those to the central cities, but that the non-metropolitan farm population which constituted 30.5 percent of the non-metropolitan population furnished only 20.1 percent of the migrants to metropolitan communities and only 16.0 percent of those to the central cities."¹²

In urban to urban migration, population sizes of the receiving and sending places, the distances involved and the intervening opportunities as well as communication play an important part. The increased industry and production, increased educational and employment opportunities, increased communication and transportation, increased horizontal and vertical mobility, have all paved the way for the rural to urban, urban to fringe and urban to urban migrations in the present era.

Migration in Michigan

The migration patterns in the state of Michigan are similar on the one hand to the trends in the nation as a whole, and on the other, to the trends in the North-Central region of which Michigan forms a part. As evident from the preceding pages, these trends are the movement of population from the agricultural areas to small urban areas, from small to large urban areas, from center of the metropolitan areas toward the rural rings or the fringe areas of the metropolis (suburban migration), and from one urban area to another.

In the following pages we shall first establish the relationship between regional trends and those of the nation; then we will show the

¹²Warren S. Thompson, Migration Within Ohio, 1935-40, a Study in Redistribution of Population, Scripps Foundation, Miami University, Oxford, Ohio (1951), p. 82.

relationship of migration in Michigan both to the North-Central regional and to the national trends.

Migration played a large role in the initial settlement of the North-Central regions, first the east to west migration until about 1900, and later the south to north migration contributing to urban growth and settlement. The population of the region nearly tripled in 77 years from 1880 to 1957; the urban and rural-nonfarm grew in all decades since 1920, while the rural farm population lost in every decade since the beginning.

The main migratory streams in the North-Central regions have been the following:

- (1) Movement of families from the farms (to urban centers)
- (2) Movement of youth from the farms (to urban centers)
- (3) Movement of hired farm workers and their families (to and from farms in search of seasonal employment)
- (4) Movement of persons and families from small towns and cities to large urban centers, and
- (5) Movement of urban employed persons to rural areas.¹³

This last type of migration has predominated in the region in recent years, and the former rapid growth of central cities has given way to an accelerated suburban growth, particularly in the areas surrounding large urban centers. These trends are in keeping with the national trends described in preceding pages.

Like the North-Central regions, Michigan has also had a history of continued population growth, ever since the territory was formed in 1805. The gain between 1900 and 1950 was 3,950,784. The largest

¹³D. G. Marshall, Population Characteristics, Resources and Prospects in the North-Central Region, Agricultural Experiment Station, University of Wisconsin, Madison, Research Bulletin 209, pp. 1-6.

numerical increase and rate of growth over the 50 years came in the decade 1920 to 1930, when an increase of 1,173,913 or 32.0 percent was recorded. The numerical increase of 1,115,660 between 1940 and 1950 represented a gain of 21.2 percent over the 1940 population of 5,256,106.¹⁴ As regard the 1950-60 decade, the priliminary total of 7,795,182 counted in 1960 represents a gain of nearly $1\frac{1}{2}$ million people and a percent increase of 22.3 percent over the 1950 totals.¹⁵

The urban population of Michigan had started gaining in 1840 when the rural population represented 95.7% and the urban 4.3%. Thereafter, in each succeeding decade the rural proportion became smaller and the urban proportion larger until in 1920, the urban proportion was 61 percent and the rural proportion was 39 percent.

Migration has had a significant role in this growing urbanity of the state. The post-depression and post-war effects have created increased demands for labor, raw materials, and employment. In keeping with the national and regional trends described earlier, the metropolitan and urban areas in Michigan are gaining population, especially the "fringe areas" or the "periphery" of the metropolitan areas.

W. A. Anderson in 1956 found that "the pattern of growth around cities reflects the general pattern of metropolitan growth which has taken place in the United States. People have been moving into territory surrounding the cities and into the open country at a rapid rate."¹⁶

¹⁴Cf. U. S. Population Census, Michigan--Number of Inhabitants, 1950, PA-22, p. V.

¹⁵J. A. Beegle and J. F. Thaden, Population Changes, Michigan 1950-60, Agricultural Experiment Station, Michigan State University, East Lansing, August 1960.

¹⁶W. A. Anderson, The Flight to the Fringe, Agricultural Experiment Station, Cornell University, Ithaca, New York, March, 1956, p. 1.

Walter Firey, in his study of the Flint fringe-area in Michigan, states that although the influx of new residents into Flint fringe area in Michigan came from all over the country, two areas were heavily represented; namely, northern Michigan and the lower Mississippi valley.¹⁷

Some people refer to the increasing population in the suburban or fringe area as decentralization or a flight from the city, while others see the process as merely one aspect of city expansion. There are still others¹⁸ who see the process as two-directional, in which on the one hand, the city people move out into the nearby rural areas, and on the other hand, people from farms and villages move toward the city to avail themselves of urban employment and educational opportunities.

Regarding the causes and characteristics of the "fringe movers," Tableman indicated that it is largely young families who move into the fringe from outside the country to find employment.¹⁹ On the other hand, families moving from within the city commonly represent middle-aged people desiring suburban type of living or young families with children who need more space, or older people who want quietude.

According to Firey²⁰ the fringe area was characterized by:

- (1) a high rate of population turnover; (2) a high rate of home-ownership;
- (3) a high proportion of young adults have many children; (4) a heavy dependence upon industrial work in the city; (5) inadequate social life and organizational facilities; and (6) part-time farming or gardening.

¹⁷W. A. Firey, Social Aspects of Land Use Planning in the Country-City-Fringe: The Case of Flint, Michigan. Agricultural Experiment Station, Michigan State University, East Lansing, Bulletin 339, June, 1946.

¹⁸M. W. Rodehaver, "Fringe-Settlement as a Two-Directional Movement," in Rural Sociology, Vol. 12 (March, 1947), pp. 49-57.

¹⁹Betty Tableman, Intra-Community Migration in the Flint Metropolitan District, Social Science Research project, Institute for Human Adjustment, University of Michigan, September, 1948.

²⁰W. A. Firey, op. cit.

The literature cited above regarding trends in Michigan points up the similarities between the population movement patterns of the United States, the North-Central states, and state of Michigan. All are characterized in recent times by suburban migrations, away from the congested areas or towards better economic centers, the former in the case of migrants from central cities towards more rural parts, and the latter in the case of migrants from rural farm areas or small cities, towards larger urban centers in the vicinity of metropolitan areas. Migratory movements thus reflect the population's need for income, adventure, and opportunities.

CHAPTER III

NET MIGRATION IN MICHIGAN IN RELATION TO OTHER MEASURES OF CHANGE IN POPULATION SIZE

The purpose of this chapter is twofold: firstly, to describe and compare the migratory movements in Michigan during the 1940-50, and 1950-60 decades; and secondly, to distinguish between population redistribution involving net migration and population growth involving total increase.

Relationship of Net Migration to Natural Increase

As indicated previously, the growth of any population results from a combination of natural increase and net migration. It is true furthermore that if population growth within sub-areas of the United States is measured, natural increase usually plays a much larger part in total increase or growth of population than does the total volume of migration. For example, during the 1950-60 decade "natural increase or the excess of births over deaths, accounted for a large share of Michigan's growth. Approximately nine-tenths of the growth came about through natural increase and the remainder through net immigration."¹

Net migration, viewed here as the primary mechanism of population redistribution, needs to be distinguished from population growth, a process involving birth and death rate levels as well as migration. For instance let us examine the following quotation:

¹J. A. Beegle and J. F. Thaden, Population Changes, Michigan 1950-60, Agricultural Experiment Station, Michigan State University, East Lansing (August 1960), p. 13.

"Population changes in Michigan counties during 1940-50 decade are more largely due to net migration than to varying levels of fertility or mortality. Heavy loss through migration characterized all upper peninsula counties as well as many in the northern part of the lower peninsula. The upper peninsula alone lost 54,000 persons through net migration in the 10-year period."²

At first glance the above quotations appears to be a direct anti-thesis of the previous one, but a close examination reveals that while the first quotation is concerned with a comparison of the interstate growth of Michigan, the second quotation is concerned with the intra-state redistribution (not total growth) of population within Michigan. Hence the use of the term changes instead of growth.

This comparison shows that population change can be viewed in two different ways; namely, as population growth, and as population redistribution. Therefore, it is the writer's view that population redistribution involving net migration is as valid a measure for the study of population change as is population growth involving total increase in population. Furthermore, the greater significance of net migration as compared to natural increase is that net migration is more responsive to socio-demographic attributes of populations.

Net Migration as a Measure of Population Change Compared with Total Increase as a Measure of Change

In this thesis, the main variable is net migration as an instance of population redistribution. This is not to say that population growth is unimportant, but here we are concerned with it only inasmuch as it affects our central variable of net migration. To assess this effect we

²J. A. Beegle and D. Halsted, Michigan's Changing Population, Agricultural Experiment Station, Michigan State University, East Lansing, Special Bulletin 415, (June, 1957).

shall correlate the two variables of net migration and the total increase in population. A second reason for doing this is as follows.

In the past, population growth, including the migration component has been given priority in the study of population change. The kind of questions most commonly asked were: "What have been the sources of increase of population? Has it been due to natural increase or due to migration?" The concern was often restricted to population increase or decrease as the only kind of change possible in the population. Instead of the above types, the question which needs to be asked is: "How does population change take place" and not, "How does population increase take place?"

However, since "total increase in population" (population growth) has been a well-established measure of population change whereas "net migration" (population redistribution) is less well-established, it must be shown first of all that net migration is at least as good a measure of population change as "total increase in population" and that either can be employed to study change in population.

This can be done by correlating net migration 1950-60 as a measure of population change, with total increase in population 1950-60. If the two are found to be highly correlated, then one is as valid as the other. Only when and if we are able to establish the validity for using net migration as a measure of population change can we endeavour to study it in relation to other socio-economic and demographic variables.

Variables Studied

Our central variables, that is the variables to be explained, are two: net migration as percent of 1950 population (or net migration, 1950-60) and net migration in numbers 1950-60 (or number of migrants 1950-60). These are correlated with the four measures of change in population, namely:

- (1) Net migration in numbers 1940-50
- (2) Net migration as percent of 1940 population (or net migration, 1940-50)
- (3) Percent increase in total population in 1940 to 1950 decade
- (4) Percent increase in total population in 1950 to 1960 decade

The first two measures were chosen because they represent recent past migratory trends, which might throw valuable light on present trends. The last two measures were chosen because they are direct measures of change in population and because net migration plays an important role in total population change. If our contention is correct and migration is an important measure of population change, then it would show a high correlation with percent increase in total population. Six sets of data serve as a test of the above postulates. Counties, (total, in-migration and out-migration); and cities of 10,000 and over, (total, in-migration and out-migration). Past studies of migration are also utilized as points of reference.

Hypotheses

Two major hypotheses, in accord with the objectives outlined in this chapter, have been examined. The first hypothesis deals with the comparison of migratory trends in Michigan during the 1940-50 and 1950 to 60 decades. The second hypothesis deals with the comparison of net migration 1950 to 60 as a measure of change in population with total increase in population, 1950-60, and 1940-50. The first hypothesis has been derived from the postulates number 1, 2, and 3 given in Chapter I, whereas the second hypothesis is derived from the discussion regarding the relationship of net migration, as an instance of population redistribution, to total increase in population or population growth.

The hypotheses may be stated as follows:

1. Net migration patterns in Michigan for the 1950-60 decade are positively correlated with migration patterns in the 1940-50 decade.³
The subhypotheses to be examined in this connection are:
 - 1a. When net migration in numbers 1950-60 rises, net migration in numbers 1940-50 also rises, or both variables are positively correlated.
 - 1b. When net migration in numbers 1950-60 rises, net migration as percent of 1940 population also rises, or both variables are positively correlated.
 - 1c. When net migration as percent of 1950 population rises, net migration in numbers 1940-50 also rises, or both variables are positively correlated.
 - 1d. When net migration as percent of 1950 population rises, net migration as percent of 1940 population also rises, or both variables are positively correlated.
2. Net migration 1950-60 is positively related to the percent increase in total population, both in 1950-60 as well as 1940-50 decade. The subhypotheses to be examined under this main hypothesis are:
 - 2a. When net migration as percent of 1950 population rises the percent increase in total population 1950-60 also rises, or the two variables are positively correlated.
 - 2b. When net migration in numbers 1950-60 rises, the percent increase in total population 1950-60 also rises, or both variables are positively correlated.
 - 2c. When net migration as percent of 1940 population rises, the percent increase in total population 1940-50 also rises, or both variables are positively correlated.

³Donald J. Bogue, Population Growth in Standard Metropolitan Areas, 1900-1950, Housing and Home Finance Agency, Washington, D.C., (1953).

- 2d. When net migration in numbers 1940-50 rises, the percent increase in total population 1940-50 also rises or both variables are positively correlated.

Interpretation of Data

The state of Michigan can be divided into two relatively distinct parts commonly referred to as northern Michigan and southern Michigan. The northern portion of the state consists of the upper peninsula and more than half of the lower peninsula. The upper peninsula accounts for less than five percent of the total population, while nearly half of the total population is concentrated in the Macomb, Wayne and Oakland counties of southeastern Michigan.

The whole of northern Michigan is characterized by out-migration, for the land is poor in quality, the growing season is short and the tillable land area is very small, and the climate is cold and rugged. The main cash crop is potatoes, and dairying is an important occupation. The level of living is low and work is seasonal. Fruits are grown on the northern strip along Lake Michigan, mainly cherries and apples, but farmers have to supplement their incomes by other types of general farming.⁴ The farm population has been on the decline, and so is the number of farms. "From 1950-54 alone, the number of commercial farms declined by 14 percent and the lands in farms by 4 percent. The size of the farm grew from 141 to 151 acres. The farm population fell by 15 percent from 141,500 to 120,400."⁵

⁴Cf. E. B. Hill, Types of Farming in Michigan, Agricultural Experiment Station Bulletin 206, Michigan State University, East Lansing, June, 1939.

⁵Michigan Department of Agriculture, Annual Crop Report for Michigan, Lansing, 1950.

Around 1880, the area was rich in iron ores, copper ores, and forests which provided good-quality wood for making furniture--an industry which flourished at the time in southern Michigan. But logging operations led to complete deforestation and the readily accessible iron and copper deposits gave out some forty years ago. Jobs disappeared and people moved away. The population declined from 650,000 in 1910 to 570,000 in 1930. The chances of employment were lowered further, because, due to lack of coal, electricity, gas and transport, the existing raw materials (petroleum, limestone, copper, iron, wood) could not be processed on the spot. Northern Michigan lacked equipment to establish industries, it was far from markets, water power or coal. The exhaustion of resources, coupled with lack of industries, has led to unemployment, low income, low education and ultimately migration in the past years.⁶ Although northern Michigan is an attractive tourist center, the tourist trade by itself is not sufficient to maintain a growing population. It is only very recently that some cement plants and paper industries have been started to improve the economy of northern Michigan.

The economy of southern Michigan is in direct contrast to the above picture. What the north lacks the south has and what the south lacks the north provides. The north has people, unemployment, and raw materials, the south needs people, raw materials, and employment, due to expanding industries and employment, nearness to large markets, and increasing opportunities. The people from northern Michigan are constantly migrating toward southern Michigan in response to the opportunities of better income and occupation--better as compared to the northern part only, because Michigan as compared to other states has recorded high unemployment recently; but within the state the

¹Cf. W. P. Strassmann, Economic Growth in Northern Michigan, Michigan State University, Institute of Community Development, East Lansing, General Bulletin No. 2, 1958; also

Cf. D. G. Marshall, Population Characteristics, Resources and Prospects in the North Central Region, Agricultural Experiment Station, University of Wisconsin, Madison, Research Bulletin 209, April, 1959.

southern Michigan offers more job opportunities than the north.

The southern portion of the state includes all the metropolitan areas of Michigan, the largest of which is the Detroit metropolitan area. If the same trends of growth continue, the Detroit metropolitan area may be expected to expand like a spider's web and merge with the Chicago area, making a vast urban agglomeration of man, market and machines. Besides the automobile industry of Detroit and Lansing areas in southern Michigan, which have flourished ever since 1900, the other industries of the area, comprise chemical and paper industries (Kalamazoo and Midland counties) durable manufacturing of machinery, wood and metal goods (Muskegon and Flint areas) export of governmental, educational and medical services (Lansing and Ann Arbor) and auto parts manufacturing in Detroit, Pontiac and Lansing.⁷ Although southern Michigan is mainly industrial, there is a considerable amount of agriculture due to good land and longer growing seasons.⁸

In view of the above picture it is not surprising that people have been migrating in large numbers from the north to the south according to the changing demands of the economy.⁹ The trends of migration have followed the socio-economic opportunities of an area, for we know that northern Michigan which is an area of heavy out-migration for the past two decades is also poor in industry and employment, whereas southern Michigan, which is an area of heavy in-migration, especially in its southeastern part, is an industrially expanding metropolitan area with better socio-economic opportunities in terms of income, occupation and

⁷Cf. W. P. Strassmann, The Urban Economics of Southern Michigan, M.S.U., Institute of Community Development, East Lansing, General Bulletin No. 3, 1958.

⁸Cf. E. B. Hill, op. cit.

⁹Cf. 1950 U. S. Census, Michigan Number of Inhabitants, P-A22; Encyclopaedia Britannica, under the heading "Michigan"; and J. A. Beegle and J. F. Thaden, Population Changes in Michigan 1950-60, Michigan Agricultural Experiment Station, East Lansing, August, 1960.

education. A further test between these variables and migration will follow in the next chapter.

We may now turn to an examination of the first hypothesis, namely that net migration patterns in 1950-60 are related to recent past migrations in the 1940-50 decade. The following table is given as evidence for sub-hypotheses 1a, 1b, 1c, and 1d of our hypothesis number 1.

Table 1 shows that sub-hypothesis 1a is borne out only in the case of In-migration counties. The out-migration counties, contrary to our assumptions show an inverse relationship. That is, when out-migration in numbers 1940 to '50 rises, the out-migration in numbers 1950 to '60 goes down. This may be an indication of the fact that out-migration is not as pronounced between 1950 to '60 as it was in the 1940 to '50 decade. Besides the almost balanced correlation of in- and out-migration counties (+.938 and -.974 respectively) arises due to a condition peculiar to the state of Michigan, where Wayne county which was the area of heaviest in-migration during 1940 to '50 decade, became an area of major out-migration during the 1950 to 1960 decade. The explanation for this phenomenon is probably that the population density reached the saturation point in Wayne county at the end of 1940 to '50 decade, so that in the present decade the same county started losing population to the surrounding areas. This shows that Michigan is passing through a phase of urban metropolitan growth, which many other parts of the nation passed through two to three decades earlier, that is, the phase of suburban growth.

Subhypothesis 1b shows inconclusive trends. The relationship between net migration in numbers 1950-60 and net migration as percent of 1940 population is statistically significant but low positive for the total and in-migration counties. It is inverse and nonsignificant for the out-migration counties, showing thereby that we cannot be sure whether or not the net migration in numbers 1950 to 60, and net migration as

Table 1.- Comparison of Net Migration in Numbers 1950-60 and Net Migration as Percent of 1950 Population, with Net Migration in Numbers 1940-50 and Net Migration as Percent of 1940 Population, Through Pearsonian Correlation r (County Data)

Dependent Variables	Independent Variables	Total Counties N = 83	In-migration Counties N = 29	Out-migration Counties N = 54
1a. Net migration in numbers 1950-60	Net migration in numbers 1940-50	+ .068	+ .938*	-.974*
1b. Net migration in numbers 1950-60	Net migration as percent of 1940 population	+ .337*	+ .583*	-.162
1c. Net migration as percent of 1950 population	Net migration in numbers 1940-50	+ .353*	+ .491*	+ .092
1d. Net migration as percent of 1950 population	Net migration as percent of 1940 population	+ .772*	+ .626*	+ .654*

* Statistically significant¹⁰ at .01 or .05 level of significance; see Scattergrams in the Appendix.

¹⁰The values of r at $n-2$ degrees of freedom, and .01 level of significance are, .281 for $N = 83$, .471 for $N = 29$, .348 for $N = 54$; at .05 level of significance, the values of r are, .216 for $N = 83$, .367 for $N = 29$, and .269 for $N = 54$. These same values are used to test the significance of correlations obtained throughout the chapter.

percent of 1940 population are positively related to each other. If they had been found to be related, it would have added support to the hypothesis that the present migratory trends are related to past trends.

Subhypothesis 1c shows a low positive relationship; when net migration in numbers 1940 to '50 rises, net migration as percent of 1950 population also rises, but the correlation is very low, and cannot be relied upon. This trend is further supported by Table 2 which also shows a low positive relationship between migration in numbers and migration as a percent. Thus migrations during the two decades (1940-50 and 1950-60) correlates better, if we deal either with numbers or with percentage of migrations, whereas if we try to relate migration in numbers in one decade with migration as percent in another decade, they do not correlate highly.

Subhypothesis 1d is supported by the data shown in Table 1. When net migration as percent of 1940 population rises, net migration as percent of 1950 population also rises and the two variables show high correlation. This correlation shows that the percentage of migration in the past decade (1940-50) is positively related with percentage of migration in the present decade, so that when one increases the other also increases, or conversely when one decreases, the other also decreases. Table 2 is given as further evidence for our second hypothesis that net migration patterns in 1950-60 and 1940-50 decade are positively related to each other.

There is no doubt about the fact that migratory trends in the two decades are related to each other, and that the past growth through net migration influences the present trends. The question is to what extent? The data above do not yield a high correlation, although they are statistically significant and positive in nature. Further, the partial correlations between net migration in the two decades, controlling for percent increase

Table 2. Comparison of Net Migration in Numbers 1940-50 and 1950-60, with Net Migration as Percent of 1940 Population and 1950 Population, Through Pearsonian Correlation r. (County Data)

Dependent Variables	Independent Variables	Total Counties (N = 85)	In-Migration Counties (N = 29)	Out-Migration Counties (N = 54)
Net migration in numbers 1950-60	Net migration as percent of 1950 population	+ .483*	+ .669*	+ .025
Net migration in numbers 1940-50	Net migration as percent of 1940 population	+ .477*	+ .622*	+ .321*

*Statistically significant at .01 level.

in total population, suggests that this relationship may seem high due to influence of the third factor. However, recent studies of migrations done in Michigan for the 1940-50 and the 1950-60 decades show that the pattern of migration is very similar in the two decades, though much more accelerated during the 1950-60 decade. In both decades the gains in the county-remainders¹¹ have been greater than in the central cities. Between 1940 and 1950, the urban population increased by 19 percent, the rural non-farm population increased by 67 percent and the rural-farm population by 19 percent.

"During 1950-60, the state of Michigan as a whole, cities of 10,000 and over, exhibited a much smaller gain (218,714) than did the county-remainders (1,141,702). In terms of migration, cities of 10,000 and over lost - 12.3% through migration while the county-remainders gained 21.8%. During the same decade, for metropolitan areas of the state, the cities of 10,000 and over lost - 12.8% while the county-reminders gained 55.3% through migration, and for non-metropolitan areas, cities of 10,000 and over lost - 8.9% while county-remainders gained 2.3% through migration."¹²

The above evidence also gives support to our first hypothesis that migration during the past and the present decade are related and follow the same trends viz., migration towards the hitherto less-congested areas surrounding the large urban centers.

We now consider our second hypothesis, namely, that net migration in 1950-60 is positively related to the percent increase in both in 1950-60 and 1940-50 decades. See Table 3.

¹¹The term county-remainder refers to all other parts of the county except the central city of 10,000 or more.

¹²J. A. Beegle and J. F. Thaden, Population Changes, Michigan 1950-60, op. cit., Table 6, p. 17.

Table 3.- Comparison Between Net Migration as Percent of 1940 Population and Percent Increase in Total Population, with Net Migration as Percent of 1950 Population and Percent Increase in Total Population. (County Data)

Dependent Variables	Independent Variables	Total Counties (N = 83)	In-migration Counties (N = 29)	Out-migration Counties (N = 54)
2a Net migration as percent of 1950 population	Percent increase in total population 1950-60	+ .934*	+ .914*	+ .800*
2b Net migration in numbers 1950-60	Percent increase in total population 1950-60	+ .539*	+ .865*	-.037
2c Net migration as percent of 1940 population	Percent increase in total population 1940-50	+ .964*	+ .926*	+ .963*
2d Net migration in numbers 1940-50	Percent increase in total population 1940-50	+ .515*	+ .700*	+ .347*

* Statistically significant at .01 level.

Table 3 shows that the second hypothesis holds true for this as well as the previous decade, and, that the trends are strikingly similar.

Subhypotheses 2a is supported and there is a high degree of positive correlation between percent increase in total population 1950-60, and net migration as percent of 1950 population; that is, when one rises the other also rises. The same is true for the 1940-50 decade; that is, when percent increase in the total population 1940-50 rises, net migration as percent of 1940 population also rises.

Subhypothesis 2b turns out to be inconclusive. The relationship between net migration in numbers 1950-60 and percent increase in total population 1950-60 is neither excessively high nor consistent, except in the case of in-migration counties. The same trends as above are visible for 1940-50 decade (subhypotheses 2c and 2d).

Not only is migration during one decade related to total growth in population during the same decade, but it is also highly correlated with the total population growth in the previous decade, and vice-versa. These conclusions are further substantiated by examining the city data, and the partial-correlation coefficients. The city data as well as county data exhibit a high positive correlation between percent increase in total population 1950-60 and net migration as percent of 1950 population. The relationship is very low for 1940-50 decade.

Tables 5 and 6 show partial and multiple correlations for county units; Table 7 shows similar correlations for city units.

The correlations shown in Tables 5, 6, and 7 indicate that although the three variables are interrelated, the relationship between net migrations as a percent of the 1940 and of the 1950 populations are lowered quite a bit when controlled for the third variable; that is, for the percent increase in total population. The same thing occurs when we control net migration in numbers 1950-60 as a third variable.

Table 4. - Comparison Between Net Migration in Numbers 1950-60 and Net Migration as Percent of 1950 Population, with Percent Increase in Total Populations 1940-50 and 1950-60.
(City Data)

Dependent Variables	Independent Variables	Total Cities (N = 55)	In-Migration Cities (N = 21)	Out-Migration Cities (N = 34)
Net migration in numbers 1950-60	Percent increase in total population 1940-50	+ .158	+ .171	+ .005
Net migration in numbers 1950-60	Percent increase in total population 1950-60	+ .266	+ .982*	+ .219
Net migration as percent of 1950 population	Percent increase in total population 1940-50	+ .543*	+ .293	+ .158
Net migration as percent of 1950 population	Percent increase in total population 1950-60	+ .967*	+ .982*	+ .291
The value of r for N-2 d.f., and levels of significance				
		.01 =	.549	.436
		.05 =	.433	.339

Table 5. - Comparison Between Net Migration as Percents of 1940 Population and 1950 Population, and Percent Increases in Total Populations 1940 to '50 and 1950 to '60. (County Data)

Variables	Partial Correlations (γ)	Multiple Correlations (R)
1. Net migration as percent of 1950 population	$\gamma_{12.3} = .131$	
2. Net migration as percent of 1940 population	$\gamma_{23.1} = .908$	$R_{1.23} = .782$
3. Percent increase in total population 1940-50	$\gamma_{13.2} = .201$	
1. Net migration as percent of 1950 population	$\gamma_{12.3} = .243$	
2. Net migration as percent of 1940 population	$\gamma_{23.1} = .202$	$R_{1.23} = .938$
3. Percent increase in total population 1950-60	$\gamma_{13.2} = .838$	

Table 6. - Correlation of Percent Net Migration 1950-60 With Any Other
Second Variable, Controlling the Third Variable. (County Data)

Variables	Partial Correlations (r)
1. Net migration as percent of 1950 population 2. Percent increase in total population 1950-60 3. Net migration in numbers 1950-60	$r_{12.3} = .931$
1. Net migration as percent of 1950 population 2. Percent increase in total population 1940-50 3. Net migration in numbers 1950-60	$r_{12.3} = .739$
1. Net migration as percent of 1950 population 2. Net migration as percent of 1940 population 3. Net migration in numbers 1950-60	$r_{12.3} = .739$
1. Net migration as percent of 1950 population 2. Net migration in numbers 1940-50 3. Net migration in numbers 1950-60	$r_{12.3} = .441$

Table 7. - Correlation of Percent Net Migration 1950-60 With Any Other
Second Variable, Controlling the Third Variable. (City Data)

Variables	Partial Correlations (r)
1. Net migration as percent of 1950 population 2. Percent increase in total population 1940-50 3. Net migration in numbers 1950-60	$r_{12.3} = +.526$
1. Net migration as percent of 1950 population 2. Percent increase in total population 1950-60 3. Net migration in numbers 1950-60	$r_{12.3} = +.965$

On the other hand the relationship of percent increase in total population in each decade (1940-50, and 1950-60) and of net migration as a percent of 1940 population and as a percent of 1950 population, is much more pronounced and positive when net migration in numbers is controlled for as a third variable. This adds weight in favor of our second hypothesis. Other significant variables which might have caused the above high positive relationship between net-migration and total population growth were also examined and controlled (e.g., population density, percent in manufacture) but they make no significant difference in the relationship.

Summary

An analysis of migration patterns in Michigan reveals that during the past two decades, net migration trends have responded to the increasing industrial and urban growth of southeastern Michigan, and an increasing number of people have been migrating from the northern to the southern sections of the state. The northern parts with their depleted forests, mines and rugged climate, offer little by way of subsistence to the ever growing population in those parts, and consequently, people turn towards the relatively industrial metropolitan areas such as Detroit, and Lansing, in search of education, employment, and increased standards of living. The trends of migration in 1950 to 60 decade have shown accelerated growth of the already growing southeastern metropolitan area within the state. In other words migration has followed the lines of the recent past growth in Michigan, as is evident from a comparison of migratory trends during 1940-50 and 1950 to 60 decades. The data further reveals that net migration is closely related to the total increase in population both during the past and present decades. Further the volume of migration rises with accompanying rise in total population, which for the most part is brought about by the increase of births over deaths.

Having established the high correlation between net migration and total population growth for Michigan counties and cities, we now turn to the investigation of net migration in relation to other attributes of Michigan counties and cities. Chapter IV is devoted to an explanation of the relationship between net migration and socio-economic, demographic, and occupational variables.

CHAPTER IV

NET MIGRATION IN RELATION TO THE DEMOGRAPHIC, THE SOCIOECONOMIC, AND THE OCCUPATIONAL VARIABLES

Introduction

The present chapter examines net migration in relation to the demographic, the socioeconomic, and the occupational variables. The nature of these variables and the rationale for their selection have already been described in detail in Chapter I. The main points of that discussion are summarized below.

1. The ecological theory which forms the background of this study contends that population distribution or net migration is necessary in order to maintain population balance in terms of environment, technology and social organization.

2. The movement of people from one place to another not only involves a change in terms of numbers, but gives rise to adjustments and changes in the entire social organization, through changes in the related sociodemographic variables of age, sex, income, education or occupation. Any study of net migration therefore would be incomplete without studying these variables in relation to net migration, as well as to each other when necessary.

3. As industrial development and urbanization increase the social organization tends to become heterogeneous and complex. A study of the changes in demographic, socioeconomic and the occupational variables reflects the probable changes in the social organization. Such a study of related variables in relation to net migration can serve as indicator of the direction of changes in social organizations, especially

in the countries that have recently started entering the phases of industrialization.

4. The fourth reason for study of these variables in relation to net migration is, that similar variables have been studied and found important in net migration, by prominent demographers, whose works in this connection have been summarized in Chapter I. However, the variables studied here apply only to the state of Michigan which serves as the test population for this study of net migration. For this reason, some of the results might be different from the general results obtained by other demographers, because a particular trend might be peculiar to Michigan, such trends would be indicated at appropriate points in the chapter.

The demographic variables comprise measures related to the age-character, the dependency ratio, the population density and the sex composition of the population. The main question is to discover how selected demographic variables are associated with different levels of net migration. Does an area with a young population tend to be characterized by a high or low rate of in-migration? Does an area with a high sex ratio have a high or low rate of in-migration? Does an area of high population density attract migrants or repel them? These are some of the questions the answers to which we seek in studying the demographic variables. Indices 1, 2, 3, 12 and 14 for the county units and indices 1, 2 and 17 for the city units represent the demographic variables.¹

The socio-economic variables include marital status, education, health and income. We are interested here in obtaining the relationship between levels of net migration and various socio-economic characteristics of the population. Do people tend to move from areas of low economic opportunities? Do people having a higher level of education move more

¹Cf. The indices for Counties and Cities in Chapter I, pp. 18-19.

than those who are less educated? Do married people move more than the widowed or divorced? Indices 4, 5, 6, 7, and 15 for the county units and indices 3, 4, 5, 6, 7, 8, and 9 for the city units represent the socio-economic variables used.

The third group of variables are referred to as occupational variables. It has often been said that migration has increased tremendously in recent years with the increase in industry and technology. New occupations and specializations have created various types of employment opportunities in the urban centers. Although occupation and employment determine to a large extent one's socio-economic status and can be considered under that category legitimately, they have become so important a factor in the urbanization process, that they are given separate attention here.

The questions of occupation and employment are closely tied up with income, educational status, and suitability for a particular occupation. It is a matter of common knowledge that some occupations require a person to move more often than others. By using the occupational variables we wish to find out what kind of work attracts migrants, how the percentage of the population employed in agriculture, and in manufacturing, is related to in- or out-migration?

Indices 8, 9, 10, 11, and 13 for the county units and indices 10, 11, 12, 13, 14, and 15 for the city units represent the employment and labor force variables.²

Each of the three groups of variables is related to net migration on one hand and to each other on the other. For example, the age structure is related to migration in the sense that migration occurs most from late teens to 35-40 years of age,³ and it selects the young, mature, and able-bodied persons more than the aged or the very young.

²Cf. Chapter I, pp. 18-19.

³W. S. Thompson, Population Problems (New York: McGraw Hill Book Company, 1953), p. 86.

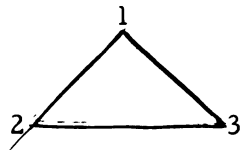
The particular age-structure in turn affects marital status, income and occupational structure. If there are large proportions of young adults there is likely to be a large proportion of married persons, higher incomes per family, and occupations which require strong able bodied men.⁴ Thus each of the variables is related to others and a change in one as a result of net migration causes adjustments in the others also. For each of the twenty-one variables considered in this thesis we can build up a similar range of arguments, showing the relation of each to the remaining twenty variables, but such elaborations are beyond the scope of this thesis. Our aim is confined mainly to the relationship of each variable to net migration. Only when this relationship can be further strengthened by examining certain other variables, have we ventured to consider the variable being studied in relation to other variables, besides net migration.

The main hypotheses examined in this chapter give us the expected relationship between net migration and the variables under the demographic socioeconomic and occupational groups respectively. These expected relationships have been derived from the postulates and theoretical background emphasizing the need for population balance, given in Chapter I of this thesis.

Each of the main hypotheses consists of relationship between one of the selection of variables and net migration. Under each main hypothesis there are various subhypotheses which give the expected relationship between the main variable, a closely related second variable and percent net migration 1950-60. For example, our main hypothesis can be "The higher the educational level of population, the higher the net migration." This has been tested by a simple product moment correlation coefficient.

⁴Ibid., pp. 86-104.

Our subhypothesis under this main hypothesis would be: "The higher the level of education, the higher the median income and the higher the net migration." The fact that we have not phrased this subhypothesis as "The higher the level of education, controlling median income, the higher the net migration" is because if we pose it this way, then we can only study the partial correlation between education and net migration controlling median income. But if we phrase it in the first manner, we are saying that no matter which one of the three variables is controlled, the partial correlation between the other two variables would be positive. This may be clarified in the following diagram:



1 = Percent education

2 = Median income

3 = Percent net migration

In this diagram we can control any one of the three variables and try to determine the relation between the other two.

The subhypothesis is stated in such a manner that we can study partial correlation between 1 and 2, controlling 3, ($r_{12.3}$), between 2 and 3, controlling 1, ($r_{23.1}$) or between 1 and 3 controlling 2 ($r_{13.2}$). This is made clear by reference to the tables of partial correlations in the Appendix. By using the partial correlations, a closely related third variable can be controlled, or its effect seen on the main variable and net migration.

Hypotheses

The main hypotheses to be examined in the present chapter are as follows: The Demographic Variables (D) and the Related Main Hypotheses Concerning Age, Dependency Ratio, Population Density, and Sex-ratio.

- (D, 1.) The higher the percent 65 years and over, the lower the net migration.
- (D, 2.) The lower the median age, the higher the net migration.
- (D, 3.) The higher the percent under 5 years of age, the higher the net migration.
- (D, 4.) The higher the dependency ratio, the lower the net migration.
- (D, 5.) The higher the population density, the higher the net migration.
- (D, 6.) The higher the sex-ratio, the higher the net migration.

The Socio-economic Variables (SE) and the Related Main Hypotheses Concerning Marital Status, Education and Income:

- (SE, 7.) The higher the percent of single males and females, the higher the net migration.
- (SE, 8.) The higher the percent of the widowed and the divorced, the lower the net migration.
- (SE, 9.) The higher the median education the higher the net migration.
- (SE, 10.) The higher the number of doctors per 1000, the higher the net migration.
- (SE, 11.) The higher the median family income, the higher the net migration.
- (SE, 12.) The higher the buying income per capita, the higher the net migration.
- (SE, 13.) The higher the farm-operated family level of living index, the lower the net migration.

The Occupational Variables (O) and the Related Main Hypotheses Concerning Employment, Labor Force, and Percent Nonwhites:

- (O, 14.) The lower the percent in agriculture the higher the net migration.
- (O, 15.) The higher the percent employed in manufacture, the higher the net migration.
- (O, 16.) The higher the percent employed in wholesale trade, the lower the net migration.
- (O, 17.) The higher the percent in professions the higher the net migration.
- (O, 18.) The higher the percent employed in government work, the lower the net migration.

- (O, 19.) The higher the percent working off-farm one hundred days or more, the higher the net migration.
- (O, 20.) The higher the percent in the total labor force, the higher the net migration.
- (O, 21.) The higher the percent males in the total labor force, the higher the net migration.
- (O, 22.) The higher the percent females in the total labor force, the lower the net migration.
- (O, 23.) The higher the percent nonwhites, the lower the net migration.

Testing Hypotheses Related to the Demographic Variables (D)

Age. - Below, we shall examine the main and the related sub-hypotheses, concerning age as a demographic variable. It has been well documented by previous studies summarized in Chapter I that migration is selective of the age of migrants, and that younger people migrate more, while the older people tend to stay behind. For instance, Bogue⁵ has found that persons in their late teens, their twenties and their early 30's are more mobile; persons 14 to 17 years of age or those 35 years old and over tend to be less mobile than average. Further according to postulate (2) in Chapter I, migration streams flow from agricultural towards industrial areas. Therefore, those who do not migrate, that is, especially the older people, should stay in agricultural areas, whereas those who do migrate, or especially the young adults should be found in industrial urban areas. Similarly it follows that since those who migrate more are young adults of marriageable ages, the migrants would have a higher proportion of children aged under 5 years, than would the non migrants who are advanced in age. On these grounds have been derived the main hypothesis and the subhypotheses concerning age structure and net migration.

⁵D. J. Bogue, The Population of the United States (Glencoe, Illinois: The Free Press, 1959), Chapter 15.

Hypothesis (D, 1.):

The higher the percent 65 years and over, the lower the net migration.

- (a) the higher the percent 65 years and over, the higher the percent in agriculture and the lower the net migration.
- (b) the higher the percent 65 years and over, the lower the percent employed in manufacture and the lower the net migration.

The data for cities and counties, Table 1, show an inverse relationship between percent 65 years and over and net migration. Our main hypothesis of inverse relationship is further substantiated when we control the factor of occupational differences through partial correlations. The partial correlations between percent net migration and percent 65 years and over still remain inverse, when the percent in agriculture and the percent employed in manufacture are controlled. This expected relationship between old age and net migration is supported by Bogue as well as Duncan and Reiss⁶ who found that migration is mainly a phenomenon of the young adult ages and as the age advances migration tends to decline.

On the other hand, partial correlations for the sub-hypotheses (a) and (b) indicate that the higher the percent 65 years and over, the higher the percent in agriculture, and the higher the percent 65 years and over, the lower the percent employed in manufacturing. The above facts point up two things. First, the older people tend to concentrate more in agricultural areas than in the manufacturing areas, and second, the older they are the less they migrate. The reasons may be physical disabilities and weakness, strong ties with the community of orientation, lack of incentive to migrate due to fewer economic necessities, and the disinclination to readjust to a totally new environment.

⁶Ibid., Chapter 15.

Table 1.- Pearsonian Correlation Between Net Migration and Percent 65 Years and Over

Product-Moment Correlation (r)	Total Counties N = 83	In-migration Counties N = 29	Out-migration Counties N = 54	Total Cities N = 55	In-migration Cities N = 21	Out-migration Cities N = 34
Net migration in numbers 1950-60 with percent 65 years old and over	-.133	+.489*	+.413*	-.016	-.263	+.195
Net migration as percent of 1950 population with percent 65 years old and over	-.242*	-.168	-.070	-.440*	-.358	+.158
The critical value of r at N-2 .01 = degrees of freedom and levels of significance .01 and .05	-.281	.471	.348	.345	.549	.436
	.216	.367	.269	.267	.433	.339

Note: The value of r has been determined throughout this chapter on the basis of these critical values for a given n, on .01 and .05 levels of significance. The asterisks (*) in the tables indicate that r is significant.

Hypothesis (D, 2.):

Among the young adults who are involved in migration, there is heavy concentration in the late teens or early twenties and as the median age advances, the volume of net migration declines. This view finds support in the study of internal migration by Bogue.⁷ It also follows then, that if the young migrants move towards industrial areas, there is a likelihood of their being employed in some kind of manufacturing employment, especially if they move towards cities, which specialize in a particular type of manufacturing such as automobiles in Michigan. Therefore, it is hypothesized that: The lower the median age, the higher the net migration.

- (a) the lower the median age, the higher the percent employed in manufacturing, and the higher the net migration.

Table 2. - Pearsonian Correlation Between Net Migration and Median Age

Product-Moment Correlation (r)	Total Counties N = 83	In-migration Counties N = 29	Out-migration Counties N = 54
Net migration in numbers 1950-60 with median age	-.172	+.233	-.066
Net migration as percent of 1950 population with median age	-.163	-.103	-.082

In Table 2 our main hypothesis is supported for total and out-migration counties, but the trends are ambiguous for the in-migration counties. The partial correlations⁸ show that the lower the median age,

⁷Ibid., Chapter 15.

⁸The partial correlations have been worked out for counties and cities both, where the indices are common, for counties only where the index is only applicable to counties, and for cities only where the index

the higher the net migration (-.180), the higher the percent employed in manufacture, the higher the net migration (.277), and the higher the median age, the lower the percent employed in manufacture (-.142). Thus we find that in the state of Michigan, net migration is largely a phenomenon involving young, able-bodied productive men, and as the median age advances, net migration tends to decline. Opposite to this tendency are the recent trends in suburban migration, according to which migration from the central cities to the suburbs involves people of higher median age, than the people involved in migration to the central cities from outside the standard metropolitan areas.⁹ In keeping with the present findings of this thesis, Bogue found for 1947-1955, that migration was much larger between 18-29 years of age, and that marriages took place mostly between 20 to 24 years of age, for the population on an average.¹⁰

Hypothesis (D, 3.):

Since the young migrants travel predominantly towards urban industrial areas (Postulage 1, in Chapter I), there should be a higher percentage of children under 5 years of age, because the young adults who migrate are mostly married (according to Bogue's findings given above), and are in the reproductive age groups. Conversely, in these industrial urban areas there should be a lack of old age groups.

Therefore, it is hypothesized that: The higher the percent under 5 years of age, the higher the net migration.

is only applicable to cities. In Chapter I, the indices 3, 4, 6, 8, 9, and 14 for the counties are the same as indices 2, 3, (4 + 5), 10, 11, and 17 for the cities; in other words they are common. The county indices 1, 2, 5, 7, 10, 11, 12, 13 and 15, and the city indices 1, 6, 7, 8, 9, 12, 13, 14, 15, and 16 are different from each other.

⁹B. Lazarswitz, "Metropolitan Residential Belts," American Sociological Review, (April, 1960).

¹⁰Bogue, op. cit.

- (a) the higher the percent under 5 years of age, the higher the net migration, and the lower the percent 65 years and over.
- (b) the higher the percent under 5 years of age, the higher the net migration, and the higher the percent employed in manufacturing.

Table 3.- Pearsonian Correlation Between Net Migration and Percent Under 5 Years of Age

Product-Moment Correlation (r)	Total Cities N = 55	In-migration Cities N = 21	Out-migration Cities N = 34
Net migration in numbers 1950-60 with percent under 5 years of age	+ .174	+ .283	+ .171
Net migration as percent of 1950 population with percent under 5 years of age	+ .408*	+ .356	- .032

Table 3 supports the hypothesis of positive relationship between percent under 5 years of age and net migration. It means that when the number of children under 5 years of age goes up, the net migration also rises. In other words, those who are married migrate more, and consequently, are liable to have young children with them. This finding is opposite to that of Thompson, who found that the proportion of children under 5 years of age decreases as the community size increases.¹¹ According to the finding in this thesis, since young married adults migrate to urban areas, the latter have a high proportion of children under 5 years of age and there is a positive relationship between net migration and percent under 5 years of age. This positive relationship is

¹¹Thompson, op. cit., p. 107.

supported by the study of internal migration by Taeuber¹² who found that those very areas which had low birth rates prior to World War II, have the highest rate of natural increase since 1946¹⁹⁴⁰ onwards and especially noticeable is the baby born after the war was over.

Partial correlations between net migration, percent over 65 years of age, and percent under 5 years show that the higher the percent under 5 years, the higher the net migration (.099), the higher the percent 65 and over, the lower the net migration (-.209), and the higher the percent under 5 years of age, the lower the percent 65 years and over in a population (-.438). Similarly partial correlations between net migration, percent under 5 years of age, and percent in manufacture reveal that the higher the percent under 5 years, the higher the percent employed in manufacture (.461), the higher the percent under 5 years, the higher the net migration (.409), and the higher the percent employed in manufacture, the lower the net migration (-.107).

The suggestion that migration takes place more in terms of married persons finds support in the above data, for the higher the percent under 5 years of age, the higher the net migration (and consequently more migration of families), and the higher the percent under 5 years, the lower is the percent of 65 years and over.

Dependency Ratio:

Below we shall examine the main and the related hypotheses concerning dependency ratio as a demographic variable. Dependency Ratio is the ratio of the economically unproductive population to the economically productive population. The dependency ratio tends to rise with a rise in the old age group or under 14 year age group. The agricultural areas, where there are more people over 65 years of age (as found in earlier pages), should have a higher dependency ratio, and the urban

¹²Conrad Taeuber and Irene Taeuber, The Changing Population of the United States (New York: John Wiley and Sons, 1958).

areas, where there are more young adults, should have a lower dependency ratio. This view finds support from Postulate 2, given in the first chapter of this thesis. It is therefore hypothesized that:

Hypothesis (D, 4.):

The higher the dependency ratio, the lower the net migration.

(a) the higher the dependency ratio, the higher the percent in agriculture and lower the net migration.

(b) the higher the dependency ratio, the lower the percent employed in manufacturing and lower the net migration.

Table 4.- Pearsonian Correlation Between Net Migration and Dependency Ratio

Product-Moment Correlation (r)	Total Counties N = 83	In-migration Counties N = 29	Out-migration Counties N = 54
Net migration in numbers 1950-60 with dependency ratio	+.087	-.241	+.554*
Net migration as percent of 1950 population with dependency ratio	-.286	+.001	-.198

Table 4 shows inconclusive results regarding our main hypothesis of inverse relationship between dependency ratio and migration, and the relationship may well be positive as suggested by the out-migration county data (+.554). However, further examination through partial correlations shows that the higher the dependency ratio, the lower is the net migration (-.130); the higher the net migration, the lower is the percent in agriculture (-.085); and the higher the dependency ratio the

higher is the percent in agriculture (.462). The partial correlations between dependency ratio, percent employed in manufacturing and net migration show that the higher the net migration the lower the dependency ratio (-.090); and the higher the percent employed in manufacturing, the lower the dependency ratio (-.594). The above means that the older people are concentrated more in the agricultural areas and less in manufacturing areas, obviously because employment in manufacture is physically more strenuous than agriculture. Besides, it is more expensive and cumbersome for young people living in cities to care for older relatives and dependents. The factor of selective migration of young adults towards areas of greater occupational opportunities, leaves the older age group behind giving rise to a greater dependency ratio (in the agricultural areas), that is, a greater proportion of economically unproductive population.

Population Density:

Below we shall examine the main and the related hypotheses concerning population density as a demographic variable. According to postulates 1 and 3 given in Chapter I, net migration flows towards industrial and urban areas, giving rise to a higher population density in these areas which already have population pressure. Because as the social organization becomes more complex, and as urbanization increases, the population density tends to increase. It is expected therefore, that:

Hypothesis (D, 5.):

The higher the population density the higher the net migration.

(a) the higher the population density, the lower the dependency ratio, and the higher the net migration.

(b) the higher the population density, the lower the percent in agriculture and the higher the net migration.

Table 5. - Pearsonian Correlation Between Net Migration and Population Density

Product-Moment Correlation (r)	Total Counties N = 83	In-migration Counties N = 29	Out-migration Counties N = 54
Net migration in numbers 1950-60 with population density	-.586*	+.680*	-.996*
Net migration as percent of 1950 population with population density	+.065	+.319	+.035

It seems that people do not migrate away from the areas of high population density (since the inverse relationship between population density and migration seems more strong) but generally go towards areas which have high population density because the areas of high urban and industrial growth are also areas of high population density. For instance, the in-migration counties show that the higher the population density the higher the net migration (+.680 and +.319).

The partial correlations between population density, net migration and dependency ratio, show that the higher the population density, the lower the dependency ratio and the higher the net migrations; this is expected because we already have seen that a low dependency ratio means less population density and less net migration; also the lower the population density, the higher the percent in agriculture and the lower the net migration. Thus the partial correlations support an inverse relationship between population density and net migration. This shows that industries can support a higher number of individuals (law of increasing returns) than agriculture (law of diminishing returns).

Sex-Ratio:

Below we shall examine the main and the related hypotheses concerning sex ratio as a demographic variable. Since, according to Thompson,¹³ more males are attracted towards particular types of industries (such as automobiles, or steel) than females, it is expected that:

Hypothesis (D, 6.):

The higher the sex-ratio, the higher the net migration.

(a) the higher the sex-ratio, the higher the median education,¹⁴ and the higher the net migration.

(b) the higher the sex-ratio, the higher the percent employed in government work, and the higher the migration.

Table 6 indicates that our main hypothesis bears out for the cities but not for the counties. Partial correlations indicate that net migration is highly correlated with sex ratio when median education as a factor is controlled (.820) in the cities, but this is not true for the county data, where the relationship is still inverse when education is controlled (-.146). This points up the fact that in Michigan at least, sex ratios are generally high, mainly because of the nature of employment in cities. Thompson¹⁵ found that the further the migrants move, the higher is the sex ratio, and that males migrate longer distances than the females. Partial correlations for sex-ratio, percent employed in government work and net migration show that the higher the percent employed in government work, the lower the net migration (-.168); the higher the sex-ratio the

¹³Thompson, op. cit., pp. 98-101.

¹⁴For subhypothesis (a), the variable of education for counties includes median education for males plus females; whereas for cities it includes median education for males only.

¹⁵Thompson, op. cit.

Table 6. - Pearsonian Correlation Between Net Migration and Sex Ratio

Product-Moment Correlation (r)	Total Counties N = 83	In-migration Counties N = 29	Out-migration Counties N = 54	Total Cities N = 55	In-migration Cities N = 21	Out-migration Cities N = 34
Net migration in numbers 1950- 60 with sex ratio	-.051	+.071	+.114	+.025	+.188	-.107
Net migration as percent of 1950 population with sex ratio	-.294*	+.193	-.304*	+.294*	+.224	-.065

higher the net migration (+.365); and the higher the sex ratio, the higher is the percent employed in government work (.507). In short the partial correlations support our initial hypothesis of positive relationship between net migration and sex ratio.

Testing of Hypotheses Related to the Socio-economic Variables (SE)

Marital Status:

Below we shall examine the main and the related hypotheses concerning marital status as a socio-economic variable. Duncan and Reiss¹⁶ have found that the larger the community, the smaller the proportion married, and since migrants move to urban areas or larger communities, it is expected that single males and females would migrate more than married people having families.

Hypothesis (SE, 7):

The higher the percent single males and females the higher the net migration.

From Table 7 we find an inverse relationship between net migration and single males and females instead of the positive relationship as hypothesized. The correlations obtained are of a low magnitude. This trend is supported by Bogue¹⁷ who found that the unmarried people were less mobile than the married people.

¹⁶O. D. Duncan and A. Reiss, Social Characteristics of Urban and Rural Communities (New York: John Wiley and Sons, Inc., 1956).

¹⁷Bogue, op. cit., Chapter 15.

Table 7. - Pearsonian Correlation Between Net Migration and Percent Single Males and Females

Product-Moment Correlation (r)	Total Cities N = 55	In-migration Cities N = 21	Out-migration Cities N = 24
Net migration in numbers 1950-60 with:			
Percent single males	-.019	-.219	+.042
Percent single females	-.002	-.254	+.065
Net migration as percent of 1950 population with:			
Percent single males	-.170	-.279	-.305
Percent single females	-.236	-.323	-.339*

Hypothesis (SE, 8.):

Since migration takes place in definite response to economic attractions and necessities, as is clear from Postulate 4, given in Chapter I, it is expected that people with families would have more economic necessity to improve their incomes to provide for the sustenance and schooling of their children, than would the widowed or the divorced, therefore the people with families would be more prone to migrate than the widowed or the divorced.

The higher the percent "widowed and divorced" the lower the net migration.

According to the data in Table 8 the inverse relationship as hypothesized is supported between net migration and percent "widowed and divorced." Coupled with the economic need to migrate are the factors of social ties, advanced age, and a reluctance to leave the communities where the widowed and the divorced have spent the major years of their life, which restrict the migrations of the widowed and the divorced.

Table 8. - Pearsonian Correlation Between Net Migration and Percent
"Widowed and Divorced" Males and Females

Product-Moment Correlation (r)	Total Cities N = 55	In-migration Cities N = 21	Out-migration Cities N = 34
Net migration in numbers 1950-60 with:			
Percent widowed and divorced males	-.146	-.009	+.045
Percent widowed and divorced females	-.133	-.408	+.070
Net migration as percent of 1950 population with:			
Percent widowed and divorced males	-.466*	-.072	-.064
Percent widowed and divorced females	-.601*	-.520*	-.005

The point made earlier regarding married people migrating more (Hypothesis D, 3) is supported here. If we take into account the trends of migration in the "single" and the "widowed and divorced" categories we can infer the trends in the third category of married persons. In our data we find that the "widowed and divorced" as well as the "single males and females" migrate less as net migration increases; therefore the one category of people who can migrate more than the other two are the married persons. This conclusion is also supported by the fact that the number of children under 5 years of age increases as net migration increases (Hypothesis D, 3).

Education:

Below we shall discuss some of the main and related hypotheses concerning education as a socio-economic variable. According to the

previous demographic studies,¹⁸ net migration is selective with regard to educational status of migrants. Bogue¹⁹ found that the highest rates of migration were for people with a college education and the lowest rates of migration were for people with grade school education. Since education is a means to better adjustment in society and net migration takes place in response to better adjustment of number of people to the existing resources, it is expected that the higher the education or means for better adjustment, the higher would be the net migration rates.

Hypothesis (SE, 9.):

The higher the median education, the higher the net migration.

- (a) the higher the median education, the higher the median income, and the higher the net migration.
- (b) the higher the median education the lower the percent employed in manufacture and the higher the net migration.
- (c) the higher the median education, the higher the percent in professions, and higher the net migration.

We find from Table 9 that there is a positive correlation between net migration and median education for total counties and total cities, and the higher the net migration, the higher is the median education for males and females. But interestingly enough we find that for cities of in-migration, this relationship becomes inverse; that is, in the cities, the higher the in-migration, the lower the median education of males and females. This means that those who migrate to the cities have lower median education. This trend is opposite to that found by Bogue, and is peculiar to Michigan, because here, many of those who migrate to the urban areas do so in response to the automobile industries, mostly

¹⁸Cf. Chapter I, pp. 15-17.

¹⁹Bogue, op. cit.

Table 9.- Pearsonian Correlation Between Net Migration and Median Level of Education

Product-Moment Correlation (r)	Total Counties N = 83	In-migration Counties N = 29	Out-migration Counties N = 54	Total Cities N = 55	In-migration Cities N = 21	Out-migration Cities N = 34
Net migration in numbers 1950-60 with:						
Median level of education, males plus females	+ .141	+ .213	- .263			
Median level of education, males				+ .117	- .265	+ .026
Median level of education, females				+ .105	- .264	+ .028
Net migration as percent of 1950 population with:						
Median level of education, males plus females	+ .400*	- .027	+ .315*			
Median level of education, males				+ .182	- .267	- .034
Median level of education, females				+ .162	- .256	+ .085

as labourers, and have low educational status. This suggests that the earlier findings (that people with higher educational status migrate more) are not universally true, but true only under certain conditions, for instance, it may not be true in towns with specialized industries, where migration is in response to the cheap labour demands.

Our main hypothesis of positive relationship between education and migration is weakened somewhat when we examine the partial correlations. Although net migration and median education are positively correlated (.135), when median income is controlled for, this correlation is weaker than the relationship between net migration and income when education is controlled (.349) or the relationship between median income and median education (.521) when net migration is controlled. This means that income is a much more predominant factor in migration than is education, and that education in turn depends upon income. There is support in this finding, for the statement that most migration is economically oriented, as is evident from postulate 4 in Chapter I. The multiple correlation between the three variables is .515, which is mainly due to high positive relationship between income and education. Our hunch that those who migrate to cities are less educated is further substantiated if we look at the partial correlations between median income, median education and net migrations for the cities. Here we find that the relationship of net migration and median education for males turns out to be $-.003$ when median income is controlled, which means that the higher the net migration, the lower the median education for males in the cities. The relationship between median education and median income is quite high for the cities (.580), because it is in the cities that education can be utilized in securing a suitable employment and higher income at the same time, but this is true only when we have controlled migration as one of the three factors among "education, income, and migration." Otherwise, as said earlier, the case of Michigan is

peculiar with regard to education, probably due to specialization in the automobiles in this area.

For our second sub-hypothesis we find that for the cities, the median education of males and the percent employed in manufacturing is negatively correlated ($-.397$); that is, the higher the percent employed in manufacturing the lower the median education of males. Putting the results of (a) and (b) together for cities, we can say that the higher the net migration, the lower the median education for males, and the higher the percent employed in manufacturing the lower the median education for males. But, as pointed out earlier, for total counties the positive relationship between median education and net migration still holds and is substantiated by partial correlations between net migration and median education ($.246$) when manufacture is held constant. (c) Partial correlations between median education, percent in professions, and net migration indicate that the higher the median education the higher the percent in professions ($.333$), and the higher the median education the higher the net migration ($.437$), but the higher the net migration the lower the percent in professions.

Health:

Below we discuss some of the main and related hypotheses concerning health as a socio-economic variable.

The following hypothesis is based on the fact that an increase in population density due to migration should be followed by a proportionate increase in health facilities, if, as has been hypothesized in Chapter I, population distribution is bound to create corresponding adjustments in other aspects of social organization. It is expected therefore, that:

Hypothesis (SE, 10):

The higher the number of doctors per 1000, the higher the net migration.

- (a) the higher the number of doctors, the higher the population density and higher the net migration.

Table 10. - Pearsonian Correlation Between Net Migration and Number of Doctors Per 1000

Product-moment correlation (r)	Total Counties N = 83	In-migration Counties N = 29	Out-migration Counties N = 54
Net migration in numbers 1950-60 with number of doctors per 1000 population	-.050	-.173	+.099
Net migration as percent of 1950 population with number of doctors per 1000 population	-.198	-.046	-.178

The data in Table 10 show that contrary to our main hypothesis, there seems to be an inverse relationship between the number of doctors per 1000 and net migration, but this conclusion is only a tentative since the results are ambiguous. However, the partial correlations support the suspected inverse relationship, between net migration and the number of doctors per 1000 (-.172) when the population density is controlled.

The number of doctors per 1000 and population density are also inversely correlated (-.098). This means that as the net migration and the population density rise, the number of doctors per 1000 tends to go down.

Income:

Below we shall examine some main and related hypotheses concerning median income as a socio-economic variable. Income is an important factor in migration as is shown by postulates 2, 3, and 4 in Chapter I.

According to Goodrich²⁰ most migration takes place from areas of low economic opportunities towards areas of high economic opportunities. On the other hand since movement and migration also requires money, especially when people have to migrate with their families and belongings, only those who can afford to move at all, are liable to migrate, coupled with the fact that they want to increase their economic and social status further. Therefore it is expected, that:

Hypothesis (SE, 11):

The higher the median family income, the higher the net migration.

- (a) the higher the median family income, the higher the percent employed in manufacturing, and the higher the net migration.
- (b) the higher the median family income, the lower the percent in agriculture, but higher the net migration.
- (c) the lower the median income, the higher the percent off-farm one hundred days or more, and higher the net migration.
- (d) the higher the median income, the higher the percent in the total labor force and higher the net migration.

The results summarized in Table 11 support our main hypothesis of positive relationship between net migration and median income, that is, as median family income rises so does net migration and vice versa. Bogue²¹ also contends that income is positively related to net migration. But this hypothesis holds true only for the total counties and cities, and for in-migration counties, for out-migration counties the results are inconclusive, while for in-migration cities, the data shows a negative direction (that is, the higher the median income the lower the net

²⁰Carter Goodrich, Migration and Economic Opportunity, University of Pennsylvania Press, (1936).

²¹Cf. Chapter I, pp. 17-19.

Table 11.- Pearsonian Correlation Between Net Migration and Median Family Income

Product-moment correlation (r)	Total Counties N = 83	In-migration Counties N = 29	Out-migration Counties N = 54	Total Cities N = 55	In-migration Cities N = 21	Out-migration Cities N = 34
Net migration in numbers 1950-60 with median family income	+ .121	+ .497*	- .463*	+ .024	- .095	- .207
Net migration as percent of 1950 population with median family income	+ .499*	+ .200	+ .173	+ .308*	- .019	+ .159

migration to the cities). However, the correlations are too small to be statistically significant. Our main hypothesis of positive relationship between income and net migration however, is strengthened by the partial correlations. The partials between income, per cent employed in manufacturing and net migration show that the higher the median family income, the higher is the per cent employed in manufacturing, and conversely, the higher the median family income, the lower is the per cent employed in agriculture (-.594); this is supported by Thompson²² who found that industrial occupations lead to higher incomes than agricultural occupations, and is also true according to the laws of diminishing and increasing returns given in Chapter I. Also, the higher the median family income the higher the net migration for the counties (.184). The partial correlations between median income, per cent working off-farm hundred days or more, and net migration, reveal that the higher the per cent working off-farm hundred days or more, the lower is the net migration (-.143) but the higher the median income the higher is the net migration (for county data only) (.481). Paradoxically, however, it is also found that the higher the median family income the lower the per cent off farm hundred days or more. This paradox can be resolved easily if we think about probable reasons behind this trend. People with higher incomes do not feel the need to leave their farms temporarily in search of jobs which is not the same as migration. In the case of migration, people need money for moving from one place to another, and moving the whole household and the family. Therefore, those who can afford to move migrate and those who cannot afford to migrate remain behind until they are able to do so. Partial correlations between income, total labor force, and net migration show that the higher the net migration, the higher the median family income (.318); the higher the net migration

²²Thompson, op. cit.

the lower the per cent in the total labor force (-.126); and the higher the per cent in total labor force, the higher the median family income (.145).

In each of the above sub-hypotheses, median family incomes and net migration are found to be positively correlated. Income also determines the standard of living and the buying capacity of different individuals.

Hypothesis (SE, 12):

Since net migration flows from areas of low economic opportunities to areas of high economic opportunities, it is expected that, the higher the buying income per capita, the higher the net migration.

- (a) the higher the buying income per capita, the higher the median family income, and the higher the net migration.

Table 12. - Pearsonian Correlation Between Net Migration and the Buying Income Per Capita

Product-moment correlation (r)	Total Counties N = 83	In-migration Counties N = 29	Out-migration Counties N = 54
Net migration in numbers 1950-60 with buying income per capita	+.068	+.460*	-.601*
Net migration as percent of 1950 population with buying income per capita	+.494*	+.133	+.249

The data in Table 12 shows that as buying income per capita rises, net migration also rises, but this is true only for total and in-migration counties. In the out-migration counties we find that as buying income does down net-migration tends to rise. This means that people migrate

from an area of the low buying incomes towards areas of higher buying incomes. The positive relationship between buying income and net migration also means that migration costs money, and those whose buying incomes are higher can really afford to move more often than those whose buying incomes are lower. The partial correlations further show that net migration is positively correlated both with median family income (.115) as well as with buying income per capita (.080). Further, that the median income and the buying income per capita are very highly correlated with each other (.934) because the latter is the function of the former. This further strengthens the role income plays in net migration which is not only true in the case of Michigan, but also in general, as is evident from postulates in Chapter I.

Hypothesis (SE, 13):

People migrate from agricultural areas to the industrial areas, for economic necessities; (among other factors such as personal ambitions and aspirations) the less this economic necessity is felt, the lower should be the rate of out-migration from agricultural areas. Therefore it is expected that: The higher the farm operator family level of living index, the lower the net migration.

Table 13. - Pearsonian Correlation Between Net Migration and the Farm - Operator Family Level of Living Index

Product-moment correlation (r)	Total Counties N = 83	In-migration Counties N = 29	Out-migration Counties N = 54
Net migration in numbers, 1950-60 with farm-operator family level of living index	+ .042	+ .002	- .005
Net migration as percent of 1950 population with farm operator family level of living index	+ .086	- .051	+ .039

The results of this hypothesis are statistically insignificant. The negative sign (-.005) in the out-migration counties might suggest that the lower the level of living index the higher the net migration out of an area. But for total counties net migration goes towards areas of high level of living index. The inverse trends in out-migration counties stand to reason, because where the level of living is low, people would migrate out of that area, and go to areas of higher level of living, according to postulate 4 in Chapter I.

Testing of Hypotheses Related to The Occupational Variables (O)

Employment:

The employment variables is a significant index of migration, for, according to postulate (1) in Chapter I, it should increase along with increase in urban and industrial growth and as the industries grow, so does migration. Below are examined the main and related sub-hypotheses concerning employment as an occupational variable.

Hypothesis (O, 14):

Since migration tends to flow in general from agricultural towards industrial areas, there would be more migration towards areas which are low in agricultur as a mode of employment, hence it is hypothesized that: The lower the per cent in agriculture, the higher the net migration.

The data in Table 14 indicates that our hypothesis of inverse relationship holds true for counties, but does not hold for the cities. For the cities the relationship is positive, that is, the higher the per cent in agriculture the higher the net migration. This might indicate the recent trend of suburban migration to the rural portions of the

Table 14. - Pearsonian Correlation Between Net Migration and the Per Cent Employed in Agriculture.

Product-moment Correlation (r)	Total		In-migration		Out-migration		Total		In-migration		Out-migration	
	Counties	N = 83	Counties	N = 29	Counties	N = 54	Counties	N = 55	Counties	N = 21	Counties	N = 34
Net migration in numbers 1950-60 with percent employed in agriculture	-.059		-.367*		+.260		+.163		+.370		+.190	
Net migration as percent of 1950 population with percent employed in agriculture	-.267*		-.125		+.042		+.455*		+.435*		+.045	

metropolitan areas, which have been emphasized by Taeuber²³ and Bogue.²⁴

Hypothesis (O, 15):

Since net migration rates are higher in the industrial areas, the extent of migration to a place is positively related to the percent employed in manufacture. Therefore: The higher the per cent employed in manufacturing, the higher the net migration.

Table 15 shows that for the counties our hypothesis of positive relationship between net migration and per cent employed in manufacturing is supported, but in the cities the trends seem to be ambiguous. Except for out-migration cities where the relationship is inverse, that is, the lower the per cent in manufacturing, the higher the net out-migration. This means that people move away from areas of low manufacturing potential. This probably reflects intensified suburban growth in Michigan during the past decade. This factor might explain why migration in the cities is highly correlated with agriculture, contrary to our previous hypothesis, because the in-migration cities coincide in this decade with the suburban areas which are agricultural at least in Michigan. This might also suggest that the earlier notion of "agriculture to industry" migration trend needs to be modified, in keeping with the existing situation, in a given area.

The partial correlations between net migration, per cent in agriculture, and per cent employed in manufacturing, confirm the fact that for counties the lower the per cent in agriculture, the higher the net migration; and the higher the per cent employed in manufacturing the higher the Net migration; also the higher the per cent employed in manufacturing, the lower the per cent in agriculture (-.507). For the cities

²³Taeuber and Taeuber, op. cit.

²⁴Bogue, op. cit.

Table 15.- Pearsonian Correlation Between Net Migration and Per Cent Employed in Manufacturing

Product-moment Correlation (r)	Total		In-migration		Out-migration		Total		In-migration		Out-migration	
	Counties	N = 83	Counties	N = 29	Counties	N = 54	Cities	N = 55	Cities	N = 21	Cities	N = 34
Net migration in numbers 1950-60 with percent employed in manufacturing	+ .113		+ .422*		- .308*		- .056		+ .213		- .100	
Net migration as percent of 1950 population with percent employed in manufacturing	+ .427*		+ .262		+ .172		+ .101		+ .233		- .095	

we find that the higher the per cent employed in manufacturing, the higher the net migration, but contrary to our assumptions, we find that the higher the per cent in agriculture, the higher the net migration in the cities. The per cent in agriculture and the percent in manufacturing are again inversely correlated for the cities, as they were in case of the counties. It is well-known that most of the urban growth at the present time is taking place in the rural areas surrounding the large metropolitan centers. This might be the reason for positive relationship between net migration and per cent in agriculture in the case of in-migration cities.

Hypothesis (O, 16):

It is expected that wholesale trade is more stable and involves older people more than other types of employment, and because older people are less migratory it is hypothesized, that: The higher the per cent employed in wholesale trade, the lower the net migration.

Table 16. - Pearsonian Correlation Between Net Migration and the Per Cent Employed in Wholesale Trade

Product-moment correlation (r)	Total Counties N = 83	In-migration Counties N = 29	Out-migration Counties N = 54
Net migration in numbers, 1950-60 with percent employed in wholesale trade	-.037	-.030	-.118
Net migration as percent of 1950 population with percent employed in wholesale trade.	+.091	-.082	+.114

The above data shown in Table 16 are statistically insignificant. Hence the hypothesis cannot be substantiated.

Hypothesis (O, 17):

Since those engaged in professions directly depend upon the number of population in a given area, persons engaged in the professions would tend to flow in the direction where most people migrate, and away from the areas where there are fewer people. Examples of professions are teaching, medicine, and law. Therefore it is hypothesized, that: The higher the percent in professions the higher the net migration.

Table 17. - Pearsonian Correlation Between Net Migration and the Per Cent Employed in Professions

Product-moment correlation (r)	Total Counties N = 83	In-migration Counties N = 29	Out-migration Counties N = 54
Net migration in numbers 1950-60 with percent employed in professions	-.026	-.131	+.029
Net migration as percent of 1950 population with percent employed in professions	-.252*	-.063	+.108

In Table 17 the directions of the correlations show that the lesser the per cent in professions, the greater the in-migration, and the higher the per cent in professions, the higher the out-migration. In other words, professionals tend to go where they are needed most and where their numbers are few as related to the needs. We have already examined one case of professionals, the doctors per 1000 (Hypothesis SE, 10) and there

it was indicated that as the net migration rises the number of doctors per 1000 decreases. But, our hypothesis, though suggesting an inverse relationship between per cent in professions and net migration still remains inconclusive, because the correlations are not statistically significant.

Hypothesis (O, 18):

The lower migration tendencies in occupations of a stable nature such as agriculture, or wholesale, suggest that there would also be less migration among those employed in government work, because spatially, the seats of administration are fixed, and government work also provides more economic security, lowering the economic need to migrate. Therefore, it is hypothesized that: The higher the per cent employed in government work, the lower the net migration.

Table 18. - Pearsonian Correlation Between Net Migration and Per Cent Employed in Government Work

Product-moment correlation (r)	Total Cities N = 55	In-migration Cities N = 21	Out-migration Cities N = 34
Net migration in numbers, 1950-60 with percent employed in govern- ment work	+ .059	- .171	+ .109
Net migration as percent of 1950 population with percent employed in government work	- .062	- .224	+ .039

Earlier, in hypothesis (D, 6), we tried to examine the relationship between sex-ratio and the per cent employed in the government in relation to net migration. We found there that the per cent employed in the government and net migration were inversely correlated. In the present case also, we find that for the cities of in-migration, as the net migration rises, the per cent employed in government work declines. These facts might suggest an inverse relationship between government work and net migration. The explanation might lie in the fact that government work provides steady income and security of employment, thereby lessening the need to migrate. It is clear that since net migration flows from the agricultural to industrial areas, the per cent employed in manufacture would predominate in the cities of in-migration, in comparison with the percent employed in government work, because in the latter type of work, there is not as fluctuating a demand for employment as is in labour for industries. It is found accordingly that as net migration rises, government work as a mode of occupation declines.

Hypothesis (O, 19):

The percent working off farm, constitute a reliable index of the extent of net migration since they reflect movement of farm labourers to other types of employments, during periods of low agricultural activity. Hence it is expected that: The higher the percent working off farm hundred days or more, the higher the net migration.

The data in Table 19 indicate that for total and in-migration counties, the higher the per cent working off farm hundred days or more, the higher the net migration. For the out-migration counties we find an inverse relationship (contrary to that hypothesized here) that is, as the net migration rises, the per cent working off farm hundred days or more declines. One reason for this may be that those who go from out-migrating areas leave permanently and do not usually return.

Table 19. - Pearsonian Correlation Between Per Cent Working Off-Farm One Hundred Days or More, and Net Migration

Product-moment Correlation (r)	Total Counties N = 83	In-migration Counties N = 29	Out-migration Counties N = 54
Net migration in numbers, 1950-60 with percent working 100 days or more off farm	+.007	+.466*	-.438*
Net migration as a percent of 1950 population with percent working 100 days or more off farm	+.206	+.206	-.168

Labor Force

Below we discuss the main and related hypotheses concerning the labor force in the cities, as an occupation variable. The proportion employed in the labor force is the most important index of the complexity of the social organization,²⁵ and net migration towards urban areas should lead to an increase in the employment chances. Accordingly it is hypothesized that:

Hypothesis (O, 20):

The higher the percent in the total labor force, the higher the net migration.

- (a) The higher the per cent in the total labor force, the higher the per cent in manufacturing and higher the net migration.

In Table 20 the direction of the correlations shows that the total and out-migration cities exhibit an inverse relationship between net

²⁵Cf. Chapter I, postulate (1), p. 14.

Table 20. - Pearsonian Correlation Between Net Migration and the Total Labor Force

Product-moment correlation (r)	Total Cities N = 55	In-migration Cities N = 21	Out-migration Cities N = 34
Net migration in numbers, 1950-60 with percent in total labor force	-.134	+.166	-.132
Net migration as percent of 1950 population with percent in total labor force	-.085	+.158	-.045

migration and total labor force. That is, the higher the net migration the lower the per cent in total labor force. Bogue²⁶ found only a moderate relationship between total labor force and migration. But the in-migration cities show a positive relationship, that is, the higher the net in-migration the higher the per cent in total labor force. The partial correlations further suggest a positive relationship between net migration and total labor force (.244).

The per cent in manufacturing is positively correlated with net migration (+.248); and the per cent in total labor force is highly correlated with the per cent employed in manufacture (.760) meaning thereby that the higher the per cent in total labor force the higher is the per cent employed in manufacture. Earlier, findings (Hypothesis SE-11) indicated that the higher the per cent in total labor force the higher the median family income.

Hypothesis, (O, 21):

It has been pointed out earlier in this chapter, that certain type of industries attract more males, and that males migrate longer distances

²⁶Cf. Chapter I, p. 17.

than the females. Therefore, it is expected that: The higher the per cent males in the total labor force, the higher the net migration.

Since young adults play a prominent part in heavy industrial enterprises such as the automobiles in Michigan,

- (a) the higher the per cent males in the total labor force, the higher the net migration, and higher the per cent employed in manufacturing.

Table 21. - Pearsonian Correlation Between Net Migration and Per Cent Males in the Total Labor Force

Product-moment correlation (r)	Total Cities N = 55	In-migration Cities N = 21	Out-migration Cities N = 34
Net migration in numbers, 1950-60 with per cent males in the labor force	-.063	+.209	-.121
Net migration as percent of 1950 population with per cent males in the labor force	+.087	+.248	-.064

In Table 21, like the previous table, the direction is as expected but the correlations are statistically non-significant. Thus, the positive correlations for the in-migration cities indicate that the higher the net migration the higher the per cent males in the total labor force. Similarly, the negative correlations for the out-migration cities indicate an inverse relationship between net migration and per cent males in the labor force. These findings appear logical since people move away from a city because of scarcity of opportunity, economic and social, which is reflected in the lower percentage of males in the total labor force of the out-migration city.

The partial correlations show a weak relationship between per cent males in the total labor force and net migration (.015) and between per cent employed in manufacture and net migration (.054) but they indicate a strong positive relationship between per cent employed in manufacture and per cent males in the total labor force. (.756).

Hypothesis (O, 22):

Since it is hypothesized above that males play a more prominent role in the labor force, conversely it is expected that: The higher the per cent females in the total labor force, the lower the net migration.

Table 22. - Pearsonian Correlation Between Net Migration and Per Cent Females in the Total Labor Force

Product-moment correlation (r)	Total Cities N = 55	In-migration Cities N = 21	Out-migration Cities N = 34
Net migration in numbers, 1950-60 with percent females in the labor force	-.144	-.337	-.045
Net migration as percent of 1950 population with percent females in the labor force	-.434*	-.494*	+.071

The data in Table 22 show as hypothesized that there is an inverse relationship between per cent females in the total labor force and net migration, and when one increases the other declines. This might be due to the fact that most women migrants migrate either in the capacity of housewives, or if they are single and are job seekers they are employed in fields other than manufacture.

These results are opposite to those found by Duncan and Reiss,²⁷ according to whom, the larger the size of the community, the larger is the labor force participation of women, and the lower their fertility. This does not hold true in Michigan, probably because of the specialized type of industries, and the agricultural nature of most counties, coupled with their small sizes, except the metropolitan areas of the state.

Hypothesis (O, 23):

It has long been known²⁸ that foreigners and non-whites are more numerous in northern urban centers of the United States than elsewhere.²⁹ The non-white migrants, especially from the south, represent the lower strata economically as well as socially. Hence it is expected that: The higher the per cent non-whites, the lower the net migration.

- (a) The higher the percent non-whites, the higher the per cent employed in manufacturing and the higher the net migration.
- (b) The higher the per cent non-whites, the higher the per cent in the total labor force and higher the net migration.

Table 23 shows that there is an inverse relationship between per cent non-whites and net migration. Non-whites have a lower economic standard which makes moving difficult, and they cannot take the risk of losing their present jobs. Bogue³⁰ finds that although the non-white population is more mobile locally (within the same county) the white population is two per cent higher with respect to migration, than the non-white population. The partial correlations also support a negative or inverse relationship between per cent non-whites and net migration.

²⁷Cf. Chapter I, pp. 16-19.

²⁸D. R. Taft and R. Robbins, International Migrations (New York: The Ronald Press, 1955).

²⁹Bogue, op. cit., Chapter 15.

³⁰Ibid.

Table 23. - Pearsonian Correlation Between Net Migration and Per Cent Non-whites

Product-moment correlation (r)	Total Cities N = 55	In-migration Cities N = 21	Out-migration Cities N = 34
Net migration in numbers, 1950-60 with per cent non-whites	-.071	+.020	-.058
Net migration as per cent of 1950 population with per cent non-whites	-.130	-.008	-.306

Summary

The preceding pages give us an insight into the directions and trends of net migration in relation to the various demographic, socio-economic and occupational variables. A detailed summary of the specific findings of this chapter, as well as Chapter III, is reserved for the final chapter. The remainder of this chapter attempts to summarize the findings of this chapter in terms of the implications of net migration for social organization.

The analysis of net migration clearly indicates that net migration is a crucial element in the complex web of social change and adjustment involving the whole social organization, both in areas of out-migration, as well as in areas of in-migration. According to the ecological theory outlined in Chapter I, the whole social organization undergoes change with a change in the number of migrants. Net migration is a necessary factor and occurs in order to bring about population balance in relation to the resources and technological developments. There is a very close relationship between the various aspects of the social organization such as income, educational level, and occupation. The socioeconomic

and occupational needs of the social system help to select the characteristics of the migrant population with regard to age, sex, and education. On the other hand when net migration takes place at an increased rate, the fact of migration must bring about changes in the various aspects of the social organization. Therefore it is important to gauge the nature and direction of these changes.

CHAPTER V

SUMMARY AND CRITIQUE

The purpose of this dissertation has been to study net migration mainly as a process involving changes in the population size and population characteristics. The study made use of data for the state of Michigan and covered a ten-year period, from 1950 to 1960. The data used were preliminary estimates for total populations in 1960 for each county and city, corrected for underregistration of births. Data for all the counties, and all the cities of 10,000 and over in the state of Michigan were used.

Essential in the background for this study was the assumption that net migration involves changes in the population, not only in terms of the number of individuals involved in the movement, but also in terms of the changes in the related demographic, socioeconomic and occupational variables of a given social system. This thesis then, dealt with two distinct though related problems. First, the problem of net migration as a measure of population change, as compared with other measures of change; and second, after the validity of using net migration as a measure of population change had been established, the problem of net migration in relation to other demographic, socioeconomic, and occupational variables.

The rationale behind the first problem was that population redistribution is not identical with the process of population growth, although both can be considered as different ways of looking at population change. Instead of regarding net migration under the blanket term of population

growth as has been commonly done, it is more appropriate to treat it under population redistribution, since net migration primarily involves population redistribution, whereas birth minus deaths (or natural increase) primarily concerns population growth in terms of increase or decrease. Furthermore, whereas population growth deals with population change only in terms of population increase or decrease, population redistribution through net migration deals with population change both in terms of increase or decrease through migration as well as in terms of changes in the characteristics of the population. Therefore net migration is a more suitable measure to study population change in terms of size and characteristics.

Regarding our first problem, namely the study of net migration as a measure of change in population, it was expected that if net migration showed a high positive correlation with other established measures of change such as total increase in population, then it could be used in lieu of these other measures, and was as valid a measure of population change as these other measures. And once this problem of using it as a central variable was settled, then it could be used in relation to the other variables.

The second problem regarding the study of net migration in relation to other variables was based on the rationale that the movement of population through net migration creates changes in the demographic, socioeconomic and occupational variables on one hand, and is influenced by these on the other. For example, the demographic variable of age is important in a study of net migration, for it tells us what aged persons are most involved in migration, young or old, productive or unproductive; on the other hand, decision as to who would migrate most is primarily based on the fact as to who is needed most in the areas of destination. The needs of the economy and the various related variables of a social system at a given time determine which age group would migrate most.

Summary of the Findings

During this study it was found that the patterns of net migration in Michigan in the 1950-60 decade were strikingly similar to those of the 1940-50 decade; also, the pattern of migration responded closely to the changes in the socioeconomic opportunities and the expansion in transport and technology in the state of Michigan. It was also found as expected that the percent net migration was highly correlated with the percent increase in total population in both the decades, respectively (1940-50, and 1950-60). Furthermore, net migration, 1950 to 1960, was highly correlated with the percent increase in total population 1940 to 1950. This meant that total increase in population influenced net migration to a great extent and vice versa. In fact the relationship was high enough for them to be used interchangeably in relation to a third measure. Hence it was concluded that net migration was as valid a measure to study change in population as the increase in total population.

In the process of studying the demographic, socioeconomic and occupational variables in relation to net migration, it was found that the demographic variables such as age, population density and sex-ratio correlated with net migration in the expected direction; the major socioeconomic variables such as income and education correlated with migration in the expected manner; and while the two major occupational variables; that is, agriculture and manufacture, were found to be correlated with migration in the expected mann, the other variables showed insignificant or ambiguous results.

For the demographic variables, it was expected that the percent 65 years of age and over would decline as net migration rose, that the dependency ratio would decline as net migration rose, that the

population density would rise as net migration rose, and that the sex ratio would rise as net migration rose. These correlations all were in the expected direction, except that the sex ratio was found to be inversely correlated with migration in the out-migration cities.

For the socioeconomic variables, it was found that the married people migrated more than either the single, or the widowed and the divorced people. This was supported by the finding that as net migration rose the percent under five years of age also rose, the implication being that migration involved young married couples, with young children. The data also suggested that those with higher educational levels migrated more in general than those with lower educational levels. However, this relationship was reversed for the cities of migration. In these cities, the higher the level of net migration, the lower was found to be the educational level. We might infer that those who migrated to cities in Michigan belonged to low educational and possibly low income groups. This is not improbable since much of the labor for automobile plants is drawn from rural counties, adjacent to the urban areas. A positive correlation was found between median family income and net migration. Median income was found to be low in agricultural areas and higher in manufacturing areas, using the county data. This indicated that people migrated from a low income area toward areas of higher incomes, since it was also found that the higher the percent engaged in agriculture the higher was the out-migration from an area, and the higher the percent employed in manufacturing, the lower was the out-migration, and the higher the in-migration to an area. However, for the in-migration cities there was a positive relationship between net migration and percent engaged in agriculture. This seeming unlikely trend might suggest and support the recent suburban migrations to the outskirts of the metropolitan area.

Except for proportions engaged in agriculture and manufacturing, the other categories of employment do not show a significant correlation with net migration, although the directions of the correlations were as expected. For instance, it was expected that persons employed in wholesale trade would tend to be older and this was supported by the directions of the correlations between percent employed in wholesale trade and the percent 65 years of age and over. Similarly, the direction of the relationship between percent employed in government work and net migration revealed that the higher the percent in government work, the higher was the net out-migration, while the higher the percent in the government work, the lower was the in-migration. This might suggest that government work does not predominate in cities of in-migration. However, the relationship was not statistically significant. It was also thought that the higher the percent engaged in the professions the higher would be the net migration. But instead, it was found, that the correlation was inverse rather than a positive one; the high in migration the lower the percent in professions, but the higher the out-migration the higher the percent in professions. The percent non-white population was also found to be correlated inversely with net migration, but was positively correlated with percent in manufacturing and percent in the total labor force. This meant that as percentage of non-whites rose, net migration decreased. Further it was found that the higher the percentage in the total labor force, the higher were the median incomes of the population.

After completing the analysis and interpretation of the data it was found that many variables remained ambiguous when related to net migration. Such variables, for instance were the number of doctors per thousand population, or the farm-operator family level of living index, or the percent working off the farm a hundred days or more.

These indices were either too insignificant or too specialized in terms of agricultural areas, to be applicable to general conditions in counties as well as cities. Thus some of the initial hypotheses were supported, others rejected, and still others required alteration in the light of the available information.

Limitations of the Study

1. Considering those results of this dissertation that remain ambiguous or insignificant, it seems that more refined and detailed variables relating to the occupational and employment structure of the population are required. For instance, employment was studied under four or five broad categories out of which only two are major; namely, agriculture and manufacturing, whereas government, professions, and wholesale trade, are minor in the sense that a much smaller portion of the population is engaged in these as compared to the two major areas. In this study equal weight was given to all five with the result that insignificant correlations were obtained. A better way, in the future, might be to abandon these, and concentrate only on the major categories of agriculture and manufacture, by classifying each of these two into smaller subsections for purposes of studying them in relation to net migration.

2. The hypotheses in this study could have been further classified in terms of out-migration hypotheses and in-migration hypotheses, in addition to the general ones that have been used in this dissertation. The general hypotheses sometimes do not apply equally well to in-migration and out-migration counties or cities. In such case the total correlations also tend to be low, because the opposite trends of in- and out-migration cancelled each other out in the total net migration. Although when such need arose the opposite directions were explained, it would have been possible to state the hypotheses only in terms of

in-migration and/or out-migration, and to refer to the total only as a check. If the in- and out-migrations were almost equal and opposite, the totals would be low or near zero, but if either in-migration or out-migration predominated, then this predominance would determine the direction of the general hypothesis.

3. Of necessity, the scope of this dissertation had to be limited. It would have been ideal, for instance, if each of the nineteen remaining variables could have been controlled every time a particular variable was correlated with net migration. This would have involved nineteen partial correlations in the rows, and the same number in the columns of the correlation matrix, and would have involved complex and time-consuming computations and interpretations. However, the few important and closely related variables to the main hypothesis were examined and controlled in terms of their effect on the main variables (net migration and the other variable). The multiple correlations were computed only for those three related variables, for which the partial correlations had been computed, though it would have merit if all the twenty remaining variables could be considered in relation to net migration, at the same time.

4. The data for this thesis would be considered much more infallible if the tests for nonlinearity could have been applied before using the linear correlations. Instead it was assumed that, since no sampling was involved and the data were in numerical form, the number being, in most cases evenly distributed, the population was normal and that the relationships were linear unless proven otherwise. A more rigorous way might have been to first draw scatter diagrams for the data and to see whether any curvilinear relations existed. Furthermore it would have been a great step forward if the insignificant results could have been as thoroughly examined as the significant results, and the reason for their insignificance detected and corrected in terms of modification

of indices, or tests. But again it became difficult to incorporate all the significant as well as insignificant explanations in a work of this size, and the best that could be done was to draw scatter diagrams³¹ of those correlations which came out to be insignificant to see if this was due to a curvilinear relationship. Such inspection showed that there was no curvilinear trend among those variables which had been shown to be insignificant through tests of significance for linearity.

³¹See Appendices - Scatter Diagrams.

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APPENDICES

I. TABLES

II. SCATTERGRAMS

APPENDIX I

Table 1 - Correlations Showing Net Migration in Relation to Other Measures of Change (County and City Data)

Counties and Cities	Percent migration 1950-60 with percent migration 1940-50	Migration in numbers 1950-60 with migration in numbers 1940-50	Percent migration 1950-60 with migration in numbers 1940-50	Percent migration 1940-50 with migration in numbers 1940-50	Percent migration 1950-60 with migration in numbers 1940-50	Percent migration 1940-50 with migration in numbers 1950-60	Percent increase 1940-50 with percent migration 1940-50
<u>Counties</u>							
Total	+ .772	-.068	+ .483	+ .477	+ .353	+ .337	+ .964
In-migration	+ .626	+ .938	+ .669	+ .622	+ .491	+ .583	+ .926
Out-migration	+ .654	-.975	+ .025	+ .321	+ .092	-.162	+ .963
<u>Cities</u>							
Total	--	--	+ .264	--	--	--	--
In-migration	--	--	+ .947	--	--	--	--
Out-migration	--	--	+ .137	--	--	--	--

Continued

TABLE I - Continued

Counties and Cities	Percent increase 1940-50	Percent increase 1950-60	Percent increase 1950-60 with percent migration 1940-50	Percent increase 1950-60 with percent migration 1950-60	Percent increase 1950-60 with migration in numbers 1950-60	Percent increase 1940-50 with migration in numbers 1940-50	Population density with migration in numbers 1940-50
	with percent migration 1950-60	with percent migration 1940-50	with percent migration 1950-60	with percent migration 1950-60	with migration in numbers 1950-60	with migration in numbers 1940-50	
<u>Counties</u>							
Total	+ .778	+ .767	+ .934	+ .539	+ .365	+ .515	+ .823
In-migration	+ .663	+ .603	+ .914	+ .865	+ .684	+ .700	+ .715
Out-migration	+ .619	+ .658	+ .800	- .037	- .189	+ .347	+ .987
<u>Cities</u>							
Total	+ .543	--	+ .967	+ .266	+ .158	--	--
In-migration	+ .293	--	+ .982	+ .932	+ .171	--	--
Out-migration	+ .158	--	+ .291	+ .219	+ .005	--	--

Continued

Table I - Continued

Counties and Cities	Population density with percent migration 1940-50	Population density with percent income 1950-60	Population density with percent increase 1940-50	Population density with migration in numbers 1950-60	Population density with percent migration in 1950-60
<u>Counties</u>					
Total	+ .167	+ .113	+ .196	- .586	+ .065
In-migration	+ .311	+ .539	+ .443	+ .680	+ .319
Out-migration	+ .221	+ .093	+ .251	- .996	+ .035
<u>Cities</u>					
Total	--	--	--	--	--
In-migration	--	--	--	--	--
Out-migration	--	--	--	--	--

Table II - Correlations Showing Net Migration and Percent Change in Total Population in Relation to the Demographic, Socioeconomic, and Occupational Variables (County Data)

Net migration and total population	Migration in numbers 1950-60	Population density	1940-50 migration in numbers	Median age	Percent 65 years and over	Median income	L.L. Index
Migration in numbers 1950-60							
Total	--	-.586	-.068	-.172	-.133	+.121	+.042
In-migration	--	+.680	+.938	+.233	+.489	+.497	+.002
Out-migration	--	-.996	-.975	-.066	+.413	-.463	-.005
Percent migration 1950-60							
Total	+.483	+.065	+.353	-.163	-.242	+.499	+.086
In-migration	+.669	+.319	+.491	-.103	-.168	+.200	-.051
Out-migration	+.025	+.035	+.092	-.082	-.070	+.173	+.039
Percent migration 1940-50							
Total	+.337	+.167	+.477	-.100	-.261	+.491	+.062
In-migration	+.583	+.311	+.622	+.101	-.187	+.125	-.078
Out-migration	-.162	+.221	+.321	-.108	-.147	+.301	+.023
Migration in numbers, 1940-50							
Total	-.068	+.823	--	-.108	-.490	+.536	+.043
In-migration	+.938	+.715	--	+.247	-.505	+.562	+.033
Out-migration	-.975	+.987	--	+.021	-.449	+.502	-.006
Percent increase 1940-50							
Total	+.365	+.196	+.515	-.252	-.429	+.587	+.066
In-migration	+.684	+.443	+.700	-.114	+.421	+.333	-.068
Out-migration	-.189	+.251	+.347	-.287	+.339	+.403	+.021
Percent increase, 1950-60							
Total	+.539	+.113	+.460	-.289	-.367	+.582	+.083
In-migration	+.865	+.539	+.731	-.304	-.377	+.430	-.040
Out-migration	-.037	+.093	+.153	-.236	-.186	+.249	+.015

Continued

Table II - Continued

Net migration and total population	Median School Years	Percent in agri-culture	Percent in manu-facturing	Percent in whole-sale	Percent in pro-fessions	Buying income per capita	Doctors per 1000	Sex ratio	Percent off farm 100 days or more
Migration in numbers 1950-60									
Total	+ .141	-.059	+ .113	-.037	-.026	+ .068	-.050	-.051	+ .007
In-migration	+ .213	-.367	+ .422	-.030	-.131	+ .460	-.173	+ .071	+ .466
Out-migration	+ .263	+ .260	-.308	-.118	+ .029	-.601	+ .099	+ .114	-.438
Percent migration 1950-60									
Total	+ .400	-.267	+ .427	+ .091	-.086	+ .494	-.198	-.294	+ .206
In-migration	-.027	-.125	+ .262	-.082	-.252	+ .133	-.046	+ .193	+ .206
Out-migration	+ .315	+ .042	+ .172	+ .114	-.063	+ .249	-.178	-.304	-.168
Percent migration 1940-50									
Total	+ .549	-.279	+ .387	+ .229	+ .108	+ .540	-.205	-.444	+ .230
In-migration	+ .260	-.264	+ .053	+ .237	-.007	+ .245	+ .022	+ .043	+ .171
Out-migration	+ .477	+ .003	+ .272	+ .155	+ .193	+ .351	-.211	-.509	+ .027
Migration in numbers, 1940-50									
Total	+ .408	-.338	+ .409	+ .076	+ .031	+ .611	-.139	-.175	+ .490
In-migration	+ .403	-.409	+ .391	-.018	+ .090	+ .573	-.182	+ .000	+ .465
Out-migration	+ .335	-.252	+ .350	+ .094	-.020	+ .644	-.074	-.158	+ .461
Percent increase 1940-50									
Total	+ .566	-.341	+ .452	+ .241	+ .122	+ .606	-.231	+.450	+ .285
In-migration	+ .303	-.451	+ .169	+ .222	+ .026	+ .381	+ .045	+ .117	+ .303
Out-migration	+ .478	+ .031	+ .345	+ .196	+ .198	+ .421	-.277	+.550	+ .059
Percent increase, 1950-60									
Total	+ .436	-.273	+ .470	+ .076	-.051	+ .560	-.242	-.355	+ .237
In-migration	+ .095	-.265	+ .407	-.105	-.175	+ .337	-.083	+ .168	+ .364
Out-migration	+ .266	+ .103	+ .174	+ .089	-.041	+ .268	-.261	+.441	-.200

Continued

Table II - Continued

Net migration and total population	Dependency Ratio	Percent migration 1940-50	Percent increase 1940-50	Percent increase 1950-60	Percent migration 1950-60
<u>Migration in numbers 1950-60</u>					
Total	+ .087	+ .337	+ .365	+ .539	+ .483
In-migration	- .241	+ .583	+ .684	+ .865	+ .669
Out-migration	+ .554	- .162	- .189	- .037	+ .025
<u>Percent migration 1950-60</u>					
Total	- .286	+ .772	+ .778	+ .934	--
In-migration	+ .001	+ .626	+ .663	+ .914	--
Out-migration	- .198	+ .654	+ .619	+ .800	--
<u>Percent migration 1940-50</u>					
Total	- .359	--	+ .964	+ .767	+ .772
In-migration	- .239	--	+ .926	+ .603	+ .626
Out-migration	- .186	--	+ .963	+ .658	+ .654
<u>Migration in numbers, 1940-50</u>					
Total	- .530	+ .477	+ .515	+ .460	+ .353
In-migration	- .414	+ .622	+ .700	+ .731	+ .491
Out-migration	- .555	+ .321	+ .347	+ .153	+ .092
<u>Percent increase 1940-50</u>					
Total	- .412	+ .964	--	+ .808	+ .778
In-migration	- .361	+ .926	--	+ .708	+ .663
Out-migration	- .213	+ .963	--	+ .676	+ .619
<u>Percent increase, 1950-60</u>					
Total	- .292	+ .767	+ .808	--	+ .934
In-migration	- .116	+ .603	+ .708	--	+ .914
Out-migration	- .083	+ .658	+ .676	--	+ .800

Table III - Correlations Showing Net Migration and Percent Change in Total Population in Relation to the Demographic, Socio-Economic, and Occupational Variables (City Data)

Net migration and percent change in total population	Migration in numbers 1950-60	Percent under 5 years	Percent over 65 years	Median family increase	Median males	School females	Marital Status	
							S	Males W & D
Migration in numbers, 1950-60								
Total	--	+ .174	-.016	+ .024	+ .117	+ .105	-.019	-.146
In-migration	--	+ .283	-.263	-.095	-.265	-.264	-.219	+ .009
Out-migration	--	+ .171	+ .195	-.207	+ .026	+ .028	+ .042	+ .045
Percent migration 1950-60								
Total	+ .264	+ .408	-.440	+ .308	+ .182	+ .162	-.170	-.466
In-migration	+ .947	+ .356	-.358	-.019	-.267	-.256	-.279	-.072
Out-migration	+ .137	-.032	+ .156	+ .159	-.034	+ .085	-.305	-.064
Percent increase in total population, 1940-50								
Total	+ .158	+ .418	-.669	+ .510	+ .523	+ .469	+ .086	-.683
In-migration	+ .171	+ .328	-.710	+ .327	+ .318	+ .315	+ .057	-.588
Out-migration	+ .005	+ .331	-.411	+ .374	+ .348	+ .346	-.057	-.372
Percent increase in total population, 1950-60								
Total	+ .266	+ .507	-.516	+ .292	+ .184	+ .156	-.178	-.500
In-migration	+ .932	+ .472	-.449	-.059	-.317	-.307	-.317	-.095
Out-migration	+ .219	+ .280	-.023	+ .201	+ .297	+ .297	-.114	-.258

Continued

Table III - Continued

Net migration and percent change in total population	S	Females W & D	Govern- ment workers	Percent in agriculture	Percent in manufacturing	Total labor force	Percent males in total labor force	Percent females in total labor force
<u>Migration in numbers, 1950-60</u>								
Total	-.002	-.133	+.059	+.163	-.056	-.134	-.063	-.144
In-migration	-.254	-.408	-.171	+.370	+.213	+.166	+.209	-.337
Out-migration	+.065	+.070	+.109	+.190	-.100	-.132	-.121	-.045
<u>Percent migration 1950-60</u>								
Total	-.236	-.601	-.062	+.455	+.101	-.085	+.087	-.434
In-migration	-.323	-.520	-.224	+.435	+.233	+.158	+.248	-.493
Out-migration	-.183	-.005	+.039	+.045	-.095	-.045	-.064	+.071
<u>Percent increase in total population, 1940-50</u>								
Total	+.062	-.733	+.259	+.141	-.007	-.254	-.104	-.441
In-migration	+.083	-.724	+.232	-.010	-.075	-.198	-.067	-.488
Out-migration	-.004	-.441	-.168	+.050	+.235	+.076	+.069	-.006
<u>Percent increase in total population, 1950-60</u>								
Total	-.247	-.653	-.066	+.480	+.148	-.082	+.109	-.485
In-migration	-.371	-.571	-.254	+.447	+.315	+.201	+.295	-.539
Out-migration	+.149	-.232	+.332	+.326	-.100	-.250	-.200	-.122

Continued

Table III - Continued

Net migration and percent change in total population	Percent non-whites	Sex ratio	Percent Increase in Total Population 1940-50	Percent Increase in Total Population 1950-60	Percent migration 1950-60
<u>Migration in numbers, 1950-60</u>					
Total	-0.71	+ .025	+ .158	+ .266	+ .264
In-migration	+ .020	+ .188	+ .171	+ .932	+ .947
Out-migration	- .058	- .107	+ .005	+ .219	+ .137
<u>Percent migration 1950-60</u>					
Total	- .130	+ .294	+ .543	+ .967	--
In-migration	- .008	+ .224	+ .293	+ .982	--
Out-migration	- .306	- .065	+ .158	+ .291	--
<u>Percent increase in total population, 1940-50</u>					
Total	- .006	+ .530	--	+ .562	+ .543
In-migration	+ .055	+ .614	--	+ .295	+ .293
Out-migration	+ .332	- .091	--	+ .521	+ .158
<u>Percent increase in total population, 1950-60</u>					
Total	- .067	+ .323	+ .562	--	+ .967
In-migration	+ .067	+ .252	+ .295	--	+ .982
Out-migration	- .224	- .030	+ .521	--	+ .291

Table IV - Partial and Multiple Correlations (County Data)

Variables	Partial Correlation Coefficient ($r_{1.23\dots n}$)	Multiple Correlation Coefficient ($R_{1.23}$)
(1) Percent migration 1950-60	$r_{12.3} = .115$	$R_{1.23} = .504$
(2) Median family income	$r_{23.1} = .934$	
(3) Buying income per capita	$r_{13.2} = .080$	
(1) Percent migration 1950-60	$r_{12.3} = .246$	$R_{1.23} = .460$
(2) Median education	$r_{23.1} = .377$	
(3) Percent in manufacture	$r_{13.2} = .294$	
(1) Percent migration 1950-60	$r_{12.3} = .349$	$R_{1.23} = .515$
(2) Median family income	$r_{23.1} = .521$	
(3) Median education	$r_{13.2} = .135$	
(1) Percent migration 1950-60	$r_{12.3} = .068$	$R_{1.23} = -.179$
(2) Population density	$r_{23.1} = -.098$	
(3) Number of doctors per 1000	$r_{13.2} = -.172$	
(1) Percent migration 1950-1960	$r_{12.3} = -.180$	$R_{1.23} = .371$
(2) Median age	$r_{23.1} = -.142$	
(3) Percent in manufacture	$r_{13.2} = .277$	
(1) Percent migration 1950-60	$r_{12.3} = -.178$	$R_{1.23} = -.303$
(2) Percent 65 years and over	$r_{23.1} = .256$	
(3) Percent in agriculture	$r_{13.2} = -.178$	
(1) Percent migration 1950-60	$r_{12.3} = .162$	$R_{1.23} = .130$
(2) Percent in manufacture	$r_{23.1} = -.507$	
(3) Percent in agriculture	$r_{13.2} = -.011$	
(1) Percent migration 1950-60	$r_{12.3} = .190$	$R_{1.23} = -.207$
(2) Percent in manufacture	$r_{23.1} = -.358$	
(3) Dependency ratio	$r_{13.2} = -.090$	
(1) Percent migration 1950-60	$r_{12.3} = -.195$	$R_{1.23} = -.120$
(2) Percent in agriculture	$r_{23.1} = -.210$	
(3) Population density	$r_{13.2} = +.007$	

Continued

Table IV - Continued

Variables	Partial Correlation Coefficient($r_{1,23\dots n}$)	Multiple Correlation Coefficient ($R_{1,23}$)
(1) Percent migration 1950-60	$r_{12.3} = .050$	$R_{1,23} = .443$
(2) Percent in manufacture	$r_{23.1} = -.594$	
(3) Median family income	$r_{13.2} = .184$	
(1) Percent migration 1950-60	$r_{12.3} = .038$	$R_{1,23} = .932$
(2) Percent in manufacture	$r_{23.1} = .065$	
(3) Percent increase in total population 1950-60	$r_{13.2} = .918$	
(1) Percent migration 1950-60	$r_{12.3} = -.115$	$R_{1,23} = .935$
(2) Population density	$r_{23.1} = .146$	
(3) Percent increase in total population 1950-60	$r_{13.2} = .935$	
(1) Percent migration 1950-60	$r_{12.3} = .026$	$R_{1,23} = .221$
(2) Population density	$r_{23.1} = .423$	
(3) Percent working off farm hundred days or more	$r_{13.2} = .197$	
(1) Percent migration 1950-60	$r_{12.3} = .154$	$R_{1,23} = -.236$
(2) Buying income per capita	$r_{23.1} = -.667$	
(3) Dependency ratio	$r_{13.2} = .063$	
(1) Percent migration 1950-60	$r_{12.3} = .131$	$R_{1,23} = .782$
(2) Percent migration 1940-50	$r_{23.1} = .908$	
(3) Percent increase in total population 1940-50	$r_{13.2} = .201$	
(1) Percent migration 1950-60	$r_{12.3} = .243$	$R_{1,23} = .938$
(2) Percent migration 1940-50	$r_{23.1} = .202$	
(3) Percent increase in total population 1950-60	$r_{13.2} = .838$	
(1) Percent migration 1950-60	$r_{12.3} = .437$	$R_{1,23} = .391$
(2) Median education	$r_{23.1} = .333$	
(3) Percent in professions	$r_{13.2} = -.104$	

Continued

Table IV - Continued

Variables	Partial Correlation Coefficient ($r_{1.23\dots n}$)	Multiple Correlation Coefficient ($R_{1.23}$)
(1) Percent migration 1950-60	$r_{12.3} = .051$	$R_{1.23} = -.220$
(2) Percent in wholesale	$r_{23.1} = .071$	
(3) Percent 65 years and over	$r_{13.2} = -.217$	
(1) Percent migration 1950-60	$r_{12.3} = .481$	$R_{1.23} = .530$
(2) Median family income	$r_{23.1} = +.596$	
(3) Percent off farm, hundred days or more	$r_{13.2} = -.143$	
(1) Percent migration 1950-60	$r_{12.3} = -.046$	$R_{1.23} = -.280$
(2) Population density	$r_{23.1} = -.363$	
(3) Dependency ratio	$r_{13.2} = -.173$	
(1) Percent migration 1950-60	$r_{12.3} = -.085$	$R_{1.23} = -.400$
(2) Percent in agriculture	$r_{23.1} = .462$	
(3) Dependency ratio	$r_{13.2} = -.130$	
(1) Percent migration 1950-60	$r_{12.3} = -.053$	$R_{1.23} = .367$
(2) Percent 65 years and over	$r_{23.1} = -.366$	
(3) Percent in manufacture	$r_{13.2} = .211$	
(1) Percent migration 1950-60	$r_{12.3} = .193$	$R_{1.23} = .300$
(2) Median education	$r_{23.1} = -.174$	
(3) Sex ratio	$r_{13.2} = -.146$	

Table V - Partial and Multiple Correlations (City Data)

Variables	Partial Correlation Coefficient ($r_{1.23...n}$)	Multiple Correlation Coefficient ($R_{1.23}$)
(1) Percent migration 1950-60	$r_{12.3} = .114$	
(2) Education of males 25 years and over	$r_{23.1} = .222$	$R_{1.23} = .341$
(3) Sex ratio	$r_{13.2} = .820$	
(1) Percent migration 1950-60	$r_{12.3} = .161$	
(2) Education of males 25 years and over	$r_{23.1} = -.397$	$R_{1.23} = .196$
(3) Percent in manufacture	$r_{13.2} = .128$	
(1) Percent migration 1950-60	$r_{12.3} = .253$	
(2) Median family income	$r_{23.1} = .580$	$R_{1.23} = .354$
(3) Education of males 25 years and over	$r_{13.2} = -.003$	
(1) Percent migration 1950-60	$r_{12.3} = -.168$	
(2) Percent in government	$r_{23.1} = .507$	$R_{1.23} = .287$
(3) Sex ratio	$r_{13.2} = .365$	
(1) Percent migration 1950-60	$r_{12.3} = -.209$	
(2) Percent 65 years and over	$r_{23.1} = -.272$	$R_{1.23} = -.427$
(3) Percent in manufacture	$r_{13.2} = -.063$	
(1) Percent migration 1950-60	$r_{12.3} = -.473$	
(2) Percent 65 years and over	$r_{23.1} = .164$	$R_{1.23} = .230$
(3) Percent in agriculture	$r_{13.2} = .303$	
(1) Percent migration 1950-60	$r_{12.3} = .248$	
(2) Percent in manufacture	$r_{23.1} = -.372$	$R_{1.23} = .463$
(3) Percent in agriculture	$r_{13.2} = .383$	
(1) Percent migration 1950-60	$r_{12.3} = .057$	
(2) Percent in manufacture	$r_{23.1} = .128$	$R_{1.23} = .323$
(3) Median family income	$r_{13.2} = .298$	
(1) Percent migration 1950-60	$r_{12.3} = .318$	
(2) Median family income	$r_{23.1} = .145$	$R_{1.23} = .299$
(3) Percent in total labor force	$r_{13.2} = -.126$	

Continued

Table V - Continued

Variables	Partial Correlation Coefficient ($r_{1.23\dots n}$)	Multiple Correlation Coefficient ($R_{1.23}$)
(1) Percent migration 1950-60	$r_{12.3} = .248$	$R_{1.23} = .056$
(2) Percent in manufacture	$r_{23.1} = .760$	
(3) Percent in total labor force	$r_{13.2} = .244$	
(1) Percent migration 1950-60	$r_{12.3} = .054$	$R_{1.23} = .137$
(2) Percent in manufacture	$r_{23.1} = .756$	
(3) Percent males in total labor force	$r_{13.2} = .015$	
(1) Percent migration 1950-60	$r_{12.3} = .105$	$R_{1.23} = .293$
(2) Percent single males	$r_{23.1} = .672$	
(3) Percent single females	$r_{13.2} = .192$	
(1) Percent migration 1950-60	$r_{12.3} = .007$	$R_{1.23} = -.802$
(2) Percent widowed and divorced males	$r_{23.1} = .279$	
(3) Percent widowed and divorced females	$r_{13.2} = -.343$	
(1) Percent migration 1950-60	$r_{12.3} = .409$	$R_{1.23} = .417$
(2) Percent under 5 years old	$r_{23.1} = .461$	
(3) Percent in manufacture	$r_{13.2} = -.107$	
(1) Percent migration 1950-60	$r_{12.3} = .099$	$R_{1.23} = .216$
(2) Percent under 5 years old	$r_{23.1} = -.438$	
(3) Percent over 65 years of age	$r_{13.2} = -.209$	
(1) Percent migration 1950-60	$r_{12.3} = .153$	$R_{1.23} = -.085$
(2) Percent in manufacture	$r_{23.1} = .326$	
(3) Percent non-whites	$r_{13.2} = -.175$	
(1) Percent migration 1950-60	$r_{12.3} = -.116$	$R_{1.23} = -.155$
(2) Percent non-whites	$r_{23.1} = .164$	
(3) Percent in total labor force	$r_{13.2} = -.061$	

Table VI - Matrix of Pearsonian Correlations (County Data)

Popu- lation density	1940-50 migration in figures	Median age	Percent 65 years and over	Median family income	L. L. Index	Median school	Percent in agri- culture	Percent in manu- facture	Percent in whole- sale	Percent in pro- fessions	Buying income per capita	Number of doctors per 1000	1950 sex ratio	Percent off farm 100 days or more	1950 depend- ency ratio	Percent migration in 1940	Total Population		Percent migration 1950-60	1950-60 migration in figures
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21
01																				
02 <u>+823</u>	....																			
03 -000	-108	....																		
04 -358	<u>-490</u>	<u>+593</u>	....																	
05 +412	+536	-308	<u>-602</u>	....																
06 +051	+043	+026	-016	+208	....															
07 +227	<u>+408</u>	-172	-309	<u>+617</u>	+325	....														
08 -282	-338	-121	<u>+415</u>	<u>-666</u>	-219	<u>-425</u>	....													
09 +325	<u>+409</u>	-200	<u>-444</u>	<u>+796</u>	+295	<u>+476</u>	<u>-589</u>	....												
10 +107	+076	+154	-109	+170	+091	+074	<u>-444</u>	+008	....											
11 -014	+031	-001	-103	+155	-006	+264	-228	-059	+178	....										
12 <u>+493</u>	<u>+611</u>	-205	<u>-550</u>	<u>+944</u>	+248	<u>+701</u>	<u>-633</u>	<u>+756</u>	+210	+100	....									
13 -123	-139	+249	+220	<u>-512</u>	-122	-259	+132	<u>-485</u>	-060	-094	<u>-423</u>	....								
14 -150	-175	+170	+137	<u>-410</u>	-170	<u>-378</u>	+143	-328	-317	-026	<u>-405</u>	+502	....							
15 <u>+426</u>	<u>+490</u>	+066	<u>-472</u>	<u>+609</u>	+046	+329	<u>-713</u>	<u>+513</u>	+126	+143	<u>+570</u>	-057	<u>+059</u>	....						
16 <u>-486</u>	<u>-530</u>	-072	<u>+507</u>	<u>-695</u>	-168	<u>-548</u>	<u>+722</u>	<u>-459</u>	-356	<u>-397</u>	<u>-745</u>	+196	+118	<u>-563</u>	....					
17 +167	<u>+477</u>	-100	-261	<u>+491</u>	+062	<u>+549</u>	-279	+387	+229	+108	<u>+540</u>	-205	<u>-444</u>	+230	<u>-359</u>	....				
18 +196	<u>+515</u>	-252	<u>-429</u>	<u>+587</u>	+066	<u>+566</u>	-341	<u>+452</u>	+241	+122	<u>+606</u>	-231	<u>-450</u>	+285	<u>-412</u>	<u>+964</u>	....			
19 +113	<u>+460</u>	-289	<u>-367</u>	<u>+582</u>	+083	<u>+436</u>	-273	+470	+076	-051	<u>+560</u>	-242	<u>-355</u>	+237	-292	<u>+767</u>	<u>+808</u>	....		
20 +065	<u>+353</u>	-163	-242	<u>+499</u>	+086	<u>+400</u>	-267	<u>+427</u>	+091	-086	<u>+494</u>	-198	-294	+206	-286	<u>+772</u>	<u>+778</u>	<u>+934</u>	....	
21 -586	-068	-172	-133	+121	+042	+141	-059	+113	-037	-026	+068	-050	-015	+007	+087	<u>+337</u>	<u>+365</u>	<u>+539</u>	<u>+483</u>	....
(1-21)	(2-21)	(3-21)	(4-21)	(5-21)	(6-21)	(7-21)	(8-21)	(9-21)	(10-21)	(11-21)	(12-21)	(13-21)	(14-21)	(15-21)	(16-21)	(17-21)	(18-21)	(19-21)	(20-21)	(21-21)

Percent in manu- facture	Perce in whol sale
09	10

.....

+008

-059 +178

+756 +210

-485 -060

-328 -317

+513 +126

-459 -356

+387 +229

+452 +241

+470 +076

+427 +091

+113 -037

(9-21) (10-21)

Table VII - Matrix of Pearsonian Correlations (City Data)

	Percent under 5 years	Percent over 65 years	Median family income	Median School		Marital Status			
				Males	Females	Males		Females	
						Single	W & D	Single	W & D
	01	02	03	04	05	06	07	08	09
01									
02 <u>-.584</u>									
03 <u>+0.053</u>									
04 <u>-.152</u>									
05 <u>-.156</u>									
06 <u>-.522</u>									
07 <u>-.344</u>									
08 <u>-.592</u>									
09 <u>-.584</u>									
10 <u>-.427</u>									
11 <u>+1.180</u>									
12 <u>+4.460</u>									
13 <u>+2.238</u>									
14 <u>+4.495</u>									
15 <u>-.552</u>									
16 <u>+0.090</u>									
17 <u>+1.113</u>									
18 <u>+4.418</u>									
19 <u>+5.507</u>									
20 <u>+4.408</u>									
21 <u>+1.174</u>									
(21-2)	(21-3)	(21-4)	(21-5)	(21-6)	(21-7)	(21-8)	(21-9)	(21-10)	

Government workers	Agri- cultural workers	Manu- facturing workers	Total labor force	Percent males in labor force	Percent females in labor force	Percent non-white	Sex ratio	Percent increase 1940-50	Percent increase 1950-60	Percent migration 1950-60	1950-60 migration in figures
10	11	12	13	14	15	16	17	18	19	20	21
....											
<u>+111</u>	<u>-.671</u>	<u>-.166</u>	<u>-.735</u>	<u>-.284</u>	<u>+749</u>	<u>+.883</u>	<u>+.008</u>	<u>+.079</u>	<u>+.003</u>	<u>+.530</u>	<u>+.562</u>
<u>-.880</u>	<u>-.184</u>	<u>+.758</u>	<u>+.360</u>	<u>+.102</u>	<u>+.079</u>	<u>+.003</u>	<u>+.530</u>	<u>+.562</u>	<u>+.967</u>	<u>+.264</u>	<u>+.264</u>
<u>+.137</u>	<u>-.264</u>	<u>-.008</u>	<u>+.360</u>	<u>+.102</u>	<u>+.079</u>	<u>+.003</u>	<u>+.530</u>	<u>+.562</u>	<u>+.967</u>	<u>+.264</u>	<u>+.264</u>
<u>-.074</u>	<u>-.112</u>	<u>+.341</u>	<u>+.190</u>	<u>+.102</u>	<u>+.079</u>	<u>+.003</u>	<u>+.530</u>	<u>+.562</u>	<u>+.967</u>	<u>+.264</u>	<u>+.264</u>
<u>+.468</u>	<u>+.185</u>	<u>-.016</u>	<u>-.355</u>	<u>-.361</u>	<u>-.270</u>	<u>+.003</u>	<u>+.530</u>	<u>+.562</u>	<u>+.967</u>	<u>+.264</u>	<u>+.264</u>
<u>+.259</u>	<u>+.141</u>	<u>-.007</u>	<u>-.254</u>	<u>-.104</u>	<u>-.441</u>	<u>-.006</u>	<u>+.530</u>	<u>+.562</u>	<u>+.967</u>	<u>+.264</u>	<u>+.264</u>
<u>-.066</u>	<u>+.480</u>	<u>+.148</u>	<u>-.082</u>	<u>+.109</u>	<u>-.485</u>	<u>-.067</u>	<u>+.323</u>	<u>+.562</u>	<u>+.967</u>	<u>+.264</u>	<u>+.264</u>
<u>-.062</u>	<u>+.455</u>	<u>+.101</u>	<u>-.085</u>	<u>+.087</u>	<u>-.434</u>	<u>-.130</u>	<u>+.294</u>	<u>+.543</u>	<u>+.967</u>	<u>+.264</u>	<u>+.264</u>
<u>+.059</u>	<u>+.163</u>	<u>-.056</u>	<u>-.134</u>	<u>-.063</u>	<u>-.144</u>	<u>-.071</u>	<u>+.025</u>	<u>+.158</u>	<u>+.266</u>	<u>+.264</u>	<u>+.264</u>
(21-11)	(21-12)	(21-13)	(21-14)	(21-15)	(21-16)	(21-17)	(21-18)	(21-19)	(21-20)	(21-21)	

Govern- ment workers	Agri- cultural workers
----------------------------	------------------------------

10

11

....

+111

....

-671

-166

-735

-284

-880

-184

+137

-264

-074

-112

+468

+185

+259

+141

-066

+480

-062

+455

+059

+163

(21-11)

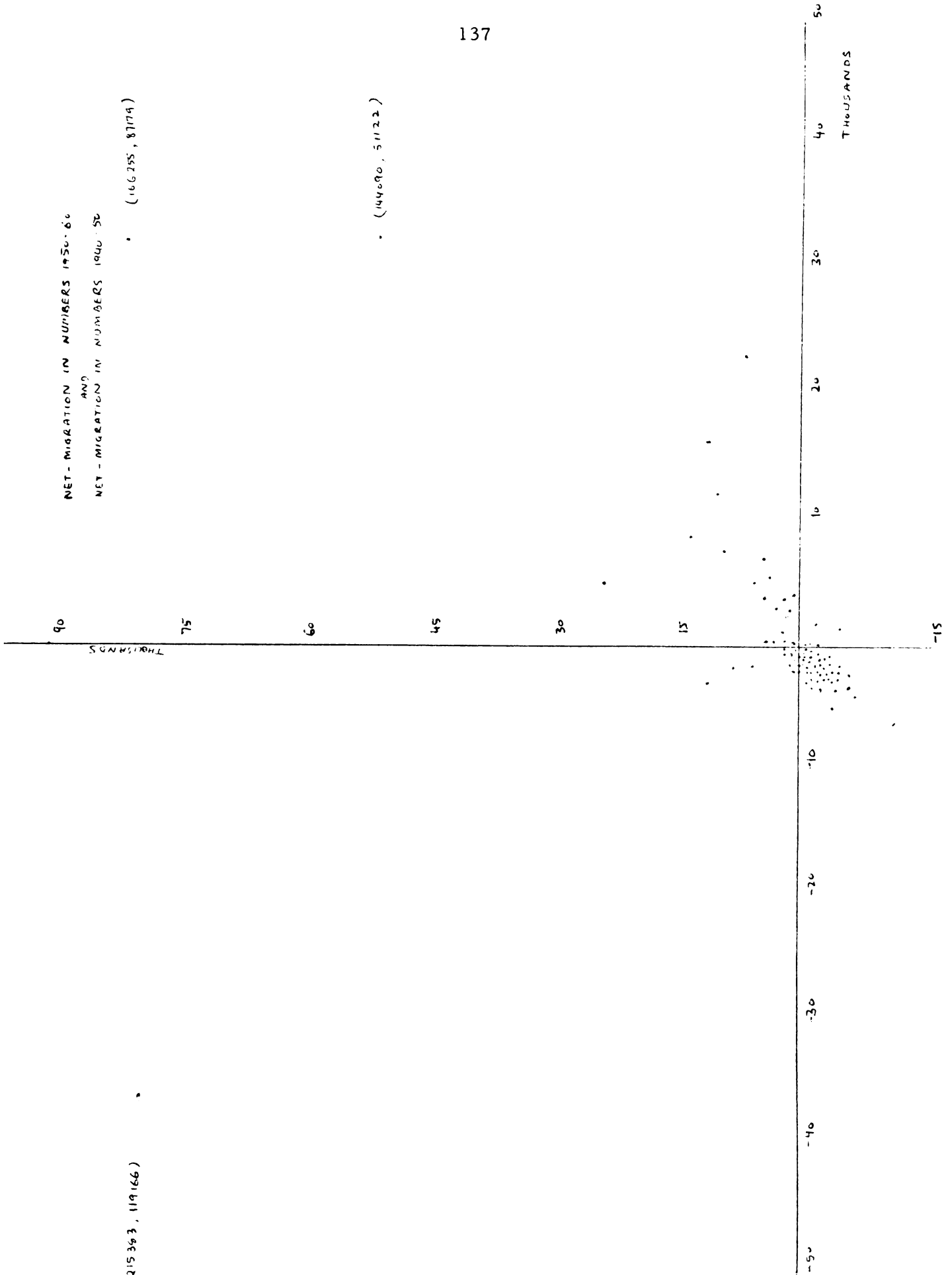
(21-12)

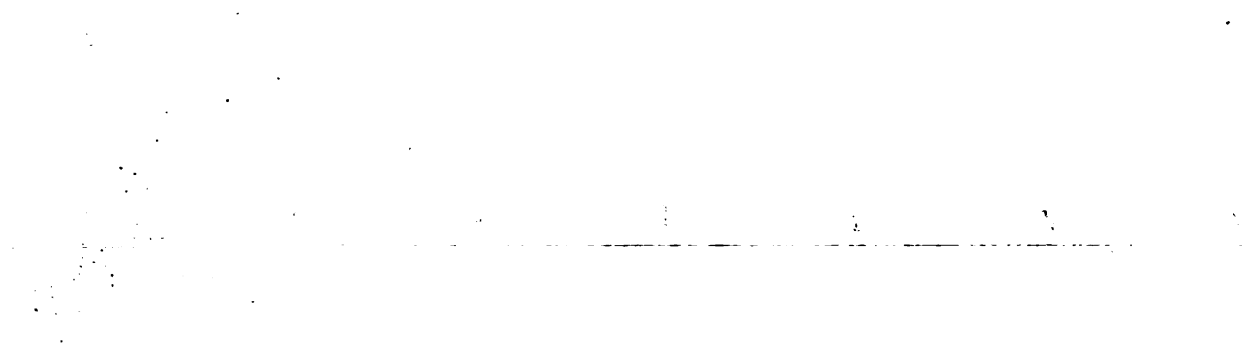
APPENDIX II

NET-MIGRATION IN NUMBERS 1950-60
AND
NET-MIGRATION IN NUMBERS 1960-50

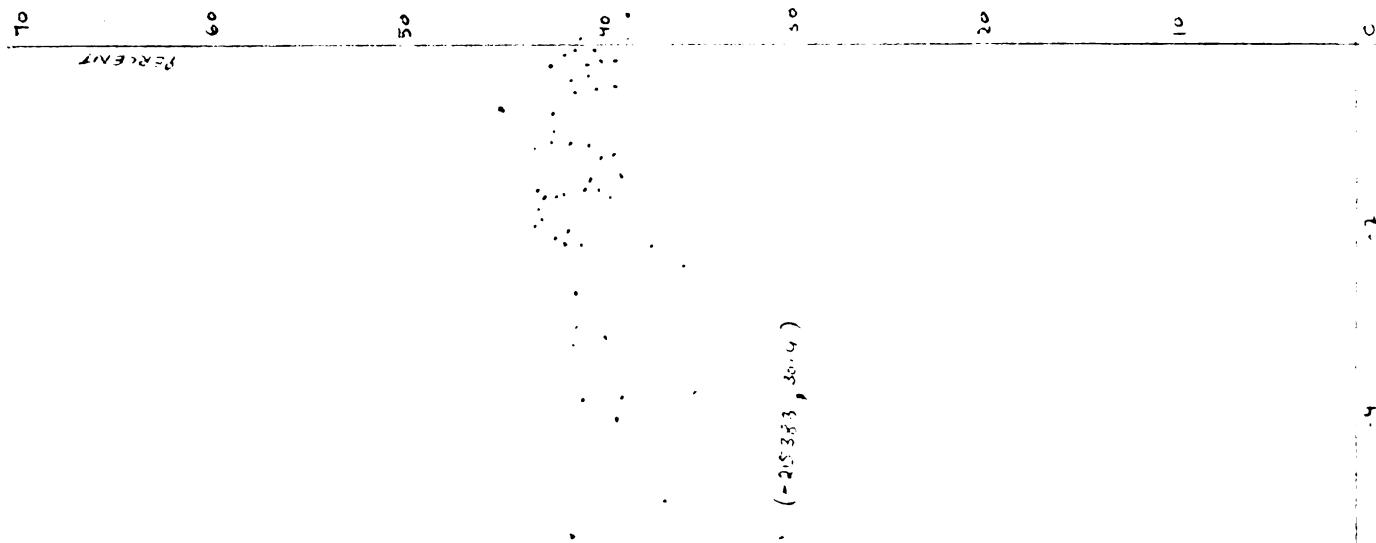
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(144090, 51122)





NET MIGRATION IN NUMBERS 1950-60
AND
DEPENDENCY RATIO

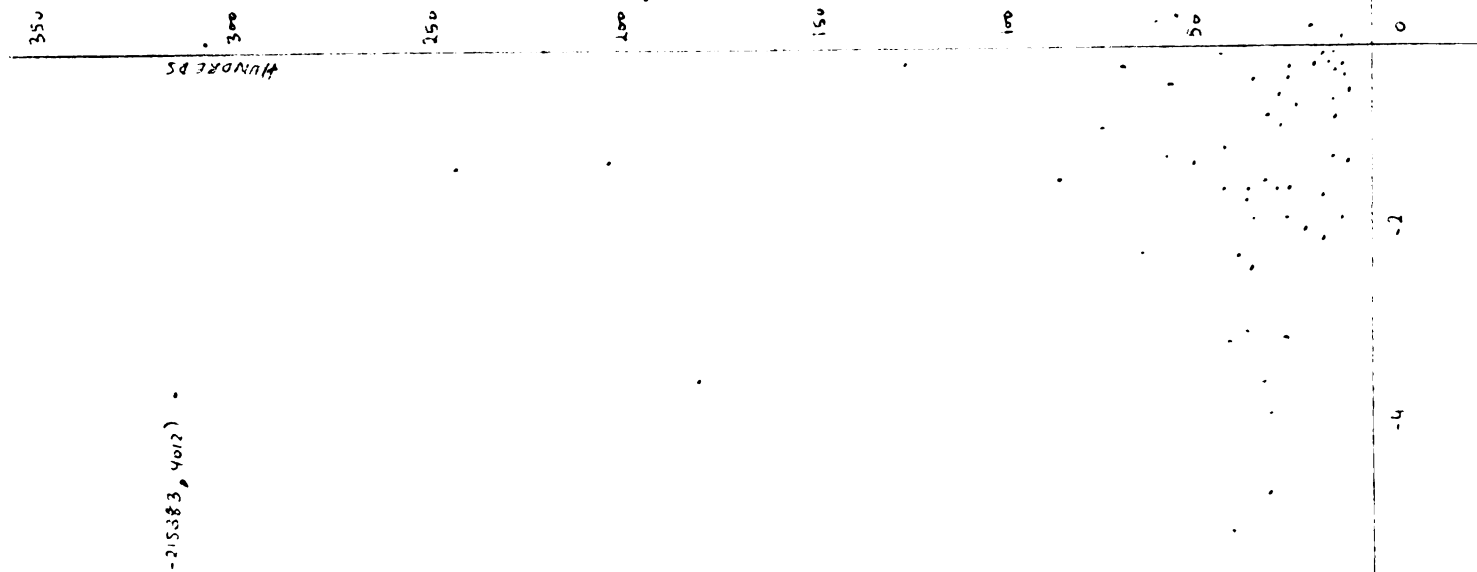


NET MIGRATION IN NUMBERS 1950-60

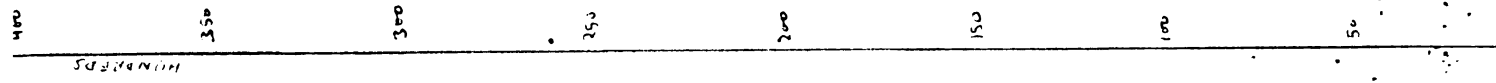
AND
POPULATION DENSITY

- (16655, 452)
- (23682, 421)
- (14400, 385)

-25383, 4012



T. J. H. H. H. H. H.



(383, 257)

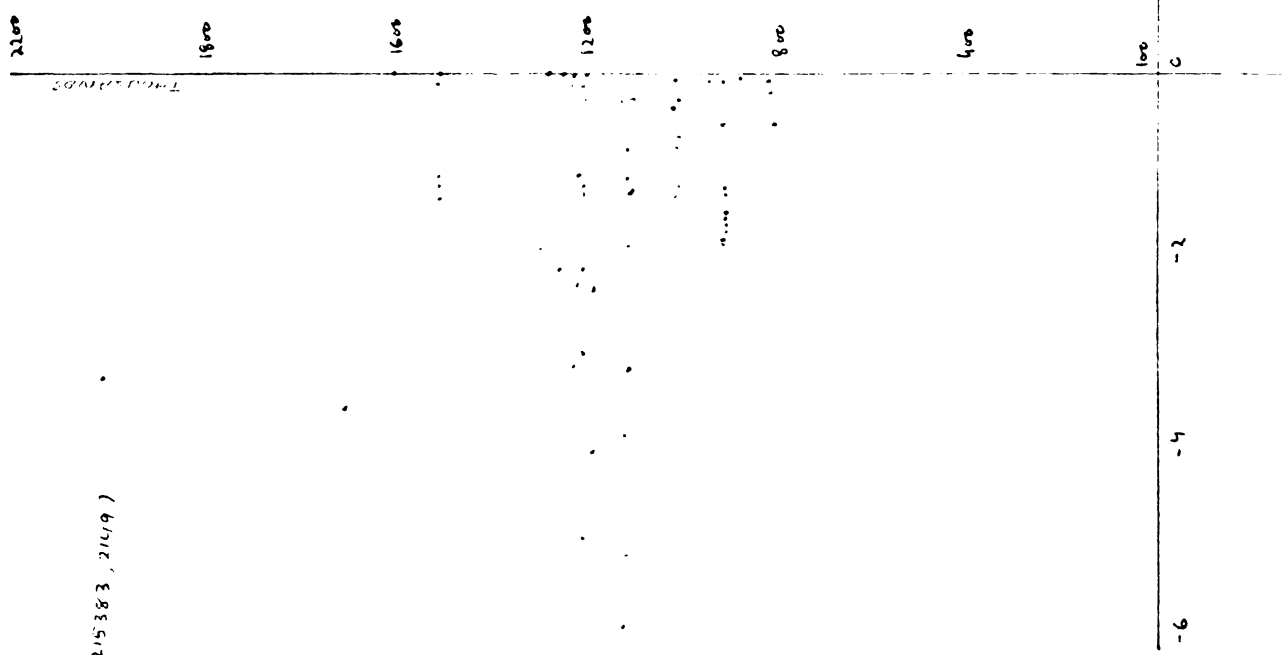
NET-MIGRATION IN NUMBERS 1950-60
NUMBER OF DOCTORS PER THOUSAND POPULATION

(23082, 337)

(16255, 355)

(14490, 75)

NET-MIGRATION IN NUMBERS 1950-60
AND
BUYING INCOME PER CAPITA



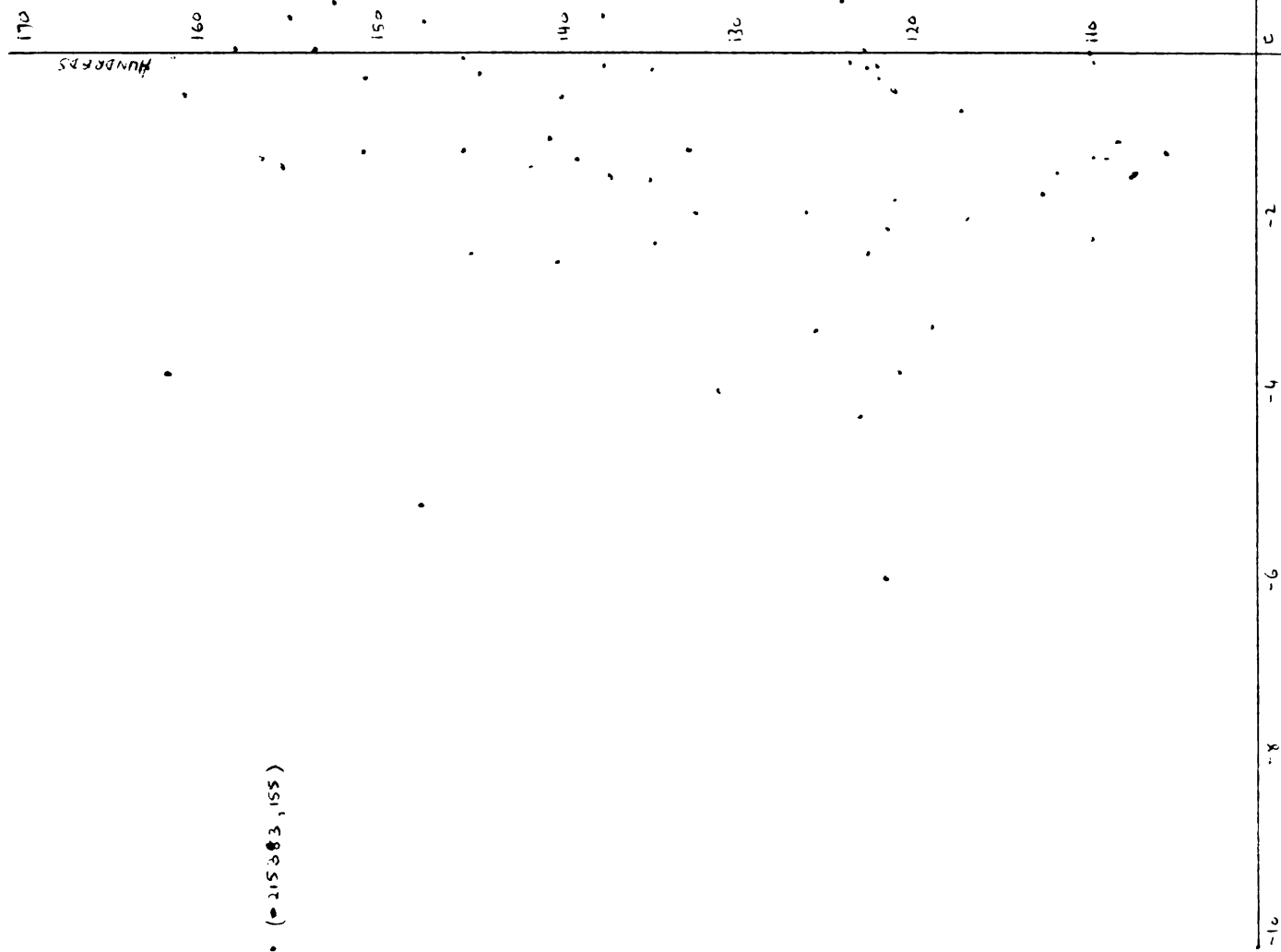
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• (23082, 1175)

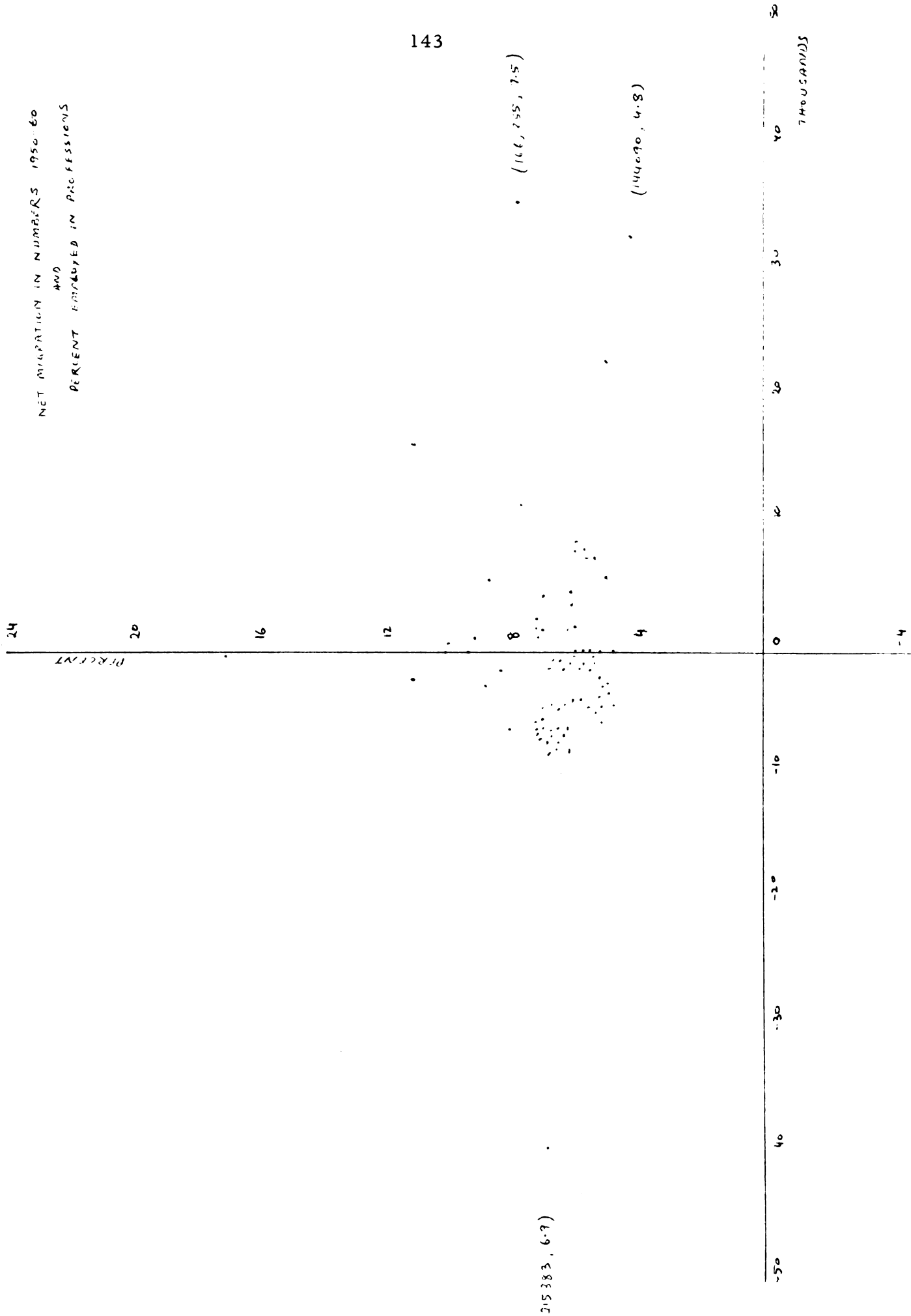
• (16235, 2000)
• (14400, 1723)

THIRTEENS

NET-MIGRATION IN NUMBERS 1950-60
AND
FARM-OPERATED FAMILY LEVEL OF LIVING
INDEX



NET MIGRATION IN NUMBERS 1950-60
AND
PERCENT EMPLOYED IN PROFESSIONS



NET-MIGRATION IN NUMBERS 1950-60
AND
PERCENT WORKING OFF-FARM 100 DAYS OR MORE.

70

PERCENT

60

50

40

30

20

10

0

-215383.54.9)

(23082, 52.8)

(160255, 44.2)

144
(144070, 37.4)

-4

-2

2

4

6

8

10

12

14

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