

THE DETERMINANTS OF MIGRATION
TO THE MIDWEST

by

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CHAPTER I

INTRODUCTION

The trend in the sixty year period from 1900-1960 shows that settlement in the United States has become increasingly more urbanized. In 1900, forty percent of the United States population resided in rural areas, and sixty years later in 1960, the urban population made up almost seventy percent of the total United States population. With this shift of population from predominately rural, agricultural areas to settlement in the industrial urban areas, it would be expected that the West North Central geographic division of the United States would suffer a relative loss in population because of its basic agricultural orientation.¹ Table I, which indicates the redistribution of population from rural to urban areas, shows the actual extent and direction of the population redistribution for the United States and the West North Central region from 1900-1960.

This rural to urban resettlement was accompanied by a relative loss in population by the West North Central States. Table II clearly shows the extent to which this area has lagged behind the national growth rate in population over the sixty year period. The lag in the region's population growth can be attributed to both the actual birth rate, which was slightly below the national average, and the loss in population resulting from net out-migration from the states. It is important to note, however, that after

¹The West North Central region is one of nine Census regions in the United States, and includes the states of Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas.

TABLE I. -- Urban and Rural Population by States for the Nation and the Central States (in Thousands)

	1900			1910			1920		
	Urban	Rural	%Urban	Urban	Rural	%Urban	Urban	Rural	%Urban
U.S.	30,380	45,614	40	42,166	49,806	45.8	54,158	51,553	51.2
W.N.C.	2,947	7,401	28.5	3,874	7,764	33.3	4,726	7,818	37.7
Iowa	572	1,659	25.6	680	1,545	30.6	875	1,528	36.4
Missouri	1,128	1,979	36.3	1,399	1,895	42.5	1,587	1,817	46.6
Nebraska	253	814	23.7	311	811	26.1	405	891	31.3
Kansas	331	1,140	22.5	494	1,197	19.2	618	1,151	34.9
	1930			1940			1950 (Old Definition)		
U.S.	68,955	53,820	56.2	74,424	57,246	56.5	90,128	61,198	59
W.N.C.	5,556	7,741	41.8	5,993	7,533	44.3	7,018	7,043	49.9
Iowa	979	1,492	39.6	1,084	1,454	42.7	1,229	1,392	46.9
Missouri	1,859	1,770	51.2	1,961	1,824	51.8	2,290	1,665	57.9
Nebraska	486	892	35.3	514	802	39.1	607	719	45.8
Kansas	730	1,151	38.8	754	1,047	41.9	903	1,002	47.4
	1950 (New Definition)			1960 (Old Definition)			1960 (Old Definition)		
U.S.	96,847	54,479	64	113,056	66,267	63.0	125,269	54,054	69.9
W.N.C.	7,305	6,756	52.0	8,617	6,777	56.0	9,046	6,348	58.8
Iowa	1,251	1,370	47.7	1,440	1,318	52.2	1,463	1,295	53
Missouri	2,433	1,522	61.5	2,647	1,673	61.3	2,877	1,443	66.6
Nebraska	622	704	46.9	734	678	52.0	766	645	54.3
Kansas	993	912	52.1	1,229	950	56.4	1,329	850	61.0

Source: U.S. Bureau of the Census, Statistical Abstract of the United States: 1925, 1954, 1962. Washington, D. C. 1925, 1954, 1962.

1950 this trend seemed to have lessened in its magnitude. Table IV presents an index of relative differential growth for the United States and four of the West North Central States. This table clarifies the issue and illustrates that although this area was still growing less rapidly than the nation as a whole from 1950-1960, the disparity was much smaller than it was in the decade 1940-1950. Minnesota, Nebraska, and Kansas were three states especially noteworthy in this recovery. This new growth was apparently due to the westward diffusion of industries and to the growth rate of urban areas in the West North Central States.² The growth rate could not be attributed to the birth rate because the birth rate in this area from 1950-1960 was slightly below that of the national average. There are, however, other factors such as the death rate, age composition and out-migration that may also influence the growth rate.

This paper will concentrate on only the four southern states in this West North Central region, namely, Iowa, Missouri, Nebraska, and Kansas. These states will be collectively known as the Central States. A short economic description of each of these states follows.

Iowa³

The state of Iowa covers 56,290 square miles, and in 1960 had a population of 2,757,537. In 1960 there were twenty cities with a population of at

²In his attempt to describe and interpret the population changes of the 1950-1960 decade in the United States, Donald Bogue claims that the disparity of growth of the West North Central Region has been reduced from the 1940-1950 decade and attributes this to the westward diffusion of industry and the growth of urban centers. Donald J. Bogue, The Population of the United States, III.: The Free Press of Glencoe, 1959, p. 57.

³Leland L. Sage, Erma Plaehn, and Hermon Nelson, "Iowa," Encyclopedia Americana, Vol. 15 (1966), p. 294-302d.

TABLE II. -- Percent Distribution of Population and Land Area in the West North Central States

Land Area (1950)--17.2 percent of total	
<u>Year</u>	<u>Percent of the Population</u>
1958	8.8
1950	9.3
1940	10.3
1930	10.8
1920	11.9
1910	12.7
1900	13.6

Source: 1950 Census of Population, Volume I, U.S. Summary, Table 8, and Current Population Survey, Series P, 25 No. 189, November 13, 1958.

TABLE III. -- Rates of Increase in The Population for the U.S. and the West North Central Region

<u>Period</u>	<u>U.S. Total</u>	<u>West North Central</u>
1950-1957	13.0	8.9
1940-1950	14.5	4.0
1930-1940	7.2	1.7
1920-1930	16.1	6.0
1910-1920	14.9	7.8
1900-1910	21.0	12.5

Source: 1950 Census of Population, Volume I, U.S. Summary, Table 7, and Current Population Survey, Series P, 25 No. 189, November 13, 1958.

TABLE IV. -- Index of Relative Differential Growth in the Nation and the Central States

Area rate minus national rate divided by the national rate x 100						
	<u>1950-57</u>	<u>1940-50</u>	<u>1930-40</u>	<u>1920-30</u>	<u>1910-20</u>	<u>1900-10</u>
National	13	14	7	16	15	21
Iowa	-48	-77	-62	-83	-46	-101
Missouri	-42	-69	-40	-59	-77	-71
Nebraska	-27	-95	-162	-61	-42	-44
Kansas	-7	-60	-160	-61	-69	-29

Source: Donald J. Bogue, The Population of the United States, Illinois: The Free Press of Glencoe, 1959. p. 65.

TABLE V. -- The Birth Rate Per Thousand in the United States and the Central States

<u>Year</u>	<u>Iowa</u>	<u>Missouri</u>	<u>Nebraska</u>	<u>Kansas</u>	<u>Central</u>	<u>U.S.</u>
1940	18.6	18.0	17.3	16.8	17.7	19.4
1950	24.1	22.2	24.1	23.2	23.4	24.1
1955	23.6	22.7	24.7	25.8	24.2	25.0
1960	23.5	23.5	24.0	22.6	23.4	23.6

Source: U.S. Bureau of the Census, Statistical Abstract of the United States: 1960. Washington, D.C. 1961.

least 15,000, with the largest city, Des Moines, containing a population of 208,982.

The dominant and basic driving force of Iowa's economy is agriculture. Only in recent years has the value of manufactured products exceeded that of agricultural products brought to the market, and manufacturing remains closely allied with agriculture in the state. Most of Iowa's manufacturing is farm centered--processing products that come from the farms or making equipment used on them. The principal processed foods are meat, dairy, and grain-mill products. Processing meat furnishes employment for more than half of the persons engaged in manufacturing food and kindred products. Tractors, combines, corn pickers, and hay balers are a few of the machines manufactured for use on the farms. The state has benefited from the expansion of manufacturing in the nation, and from the trend toward decentralization. Many out-of-state industries now operate one or more factories in Iowa. The total annual output in manufactured products in the state exceeded \$4 billion in 1955 and \$5.25 billion in 1960. Adjusted value added by manufacture in 1960 was estimated at \$1.8 billion of which nearly forty percent was in food and kindred products and thirty percent was accounted for by the manufacture of machinery, much of it for farm use.

Iowa has always lagged behind the United States average in the excess of wholesale over retail sales. This is due in part to the high percentage of agricultural activity, and in part to the large wholesale markets that border Iowa--Chicago, Minneapolis-St. Paul, Omaha, Kansas City and St. Louis.

Agriculture's share of the total labor force steadily declined after 1950. Farm units were getting larger in size and fewer in number and mechanization was making possible greater production with proportionately less manpower.

Of the employed nonagricultural labor force, twenty-five percent were engaged in wholesale or retail trade, twenty-five percent in manufacturing, and seventeen percent in government services.

Missouri⁴

The 1960 population of Missouri was 4,319,814 with a total area of 66,674 square miles. In this same year, there were twenty-four cities with a population of over 15,000. Included in these twenty-four cities with a population of over 15,000 were three metropolitan areas with over one hundred thousand each--St. Louis-2,060,103; Kansas City-1,039,493; Springfield-126,276.

Historically, agriculture has been Missouri's chief industry, but in recent years manufacturing has surpassed it both in value of production and the number of persons employed. Nevertheless, the state still ranks in the upper ten in the total value of farm products.

In 1955, the per capita income of Missourians was \$1,800, just a little below the national average. Missourians derived this income from a wide variety of occupations. By July 1956, Missouri's labor force engaged in manufacturing accounted for 29.9 percent of the total labor force. Wholesale and retail trade employed 24.7 percent; service industries engaged 12.1 percent; government 11.0 percent; transportation, communication and other public utilities 9.9; construction 5.8; finance, insurance, and real estate 5.0; and mining and quarrying 0.7 percent.

Missouri ranks in the top twelve states in manufacturing, and has 319 of the 446 types of manufacturing listed by the Federal Bureau of the Census.

⁴W. Francis English, "Missouri," Encyclopedia Americana, Vol. 19 (1966), p. 253-261.

The state has expanded steadily in manufacturing. In 1947 there were 5,725 establishments employing 327,479 people. By 1954 the number had increased to 6,198 employing 368,479. About eighty percent of all manufacturing plants were located in the metropolitan areas of Kansas City and St. Louis.

Wholesale trade in the state totaled \$3,700,524,000 in 1954, with most of the trade centering in St. Louis and Kansas City. In St. Louis, the leading wholesale businesses were those handling groceries, drugs, chemicals and allied products, farm products, electrical appliances, and machinery equipment. In recent decades, the women's apparel trade has had a vigorous growth in St. Louis.

The Kansas City metropolitan area, dominated more by the grain and livestock area to the west, is also a distribution center for farm machinery, automobiles, and parts, and construction materials consumed by the Southwest part of the Great Plains area.

Nebraska⁵

Nebraska covers 77,227 square miles and had a 1950 population of 1,411,330. There are only six cities in Nebraska with a population greater than 15,000, included in these are Omaha with 464,000 and Lincoln with 155,272.

Nebraska possesses relatively few mineral resources and has depended largely upon agriculture as its primary economic activity. Agriculture has been hampered by light and uncertain rainfall, but irrigation, conservation, and advanced farming techniques combined with a highly productive soil have produced a generally healthy economy. Since World War II, there has been a slight trend toward industrialization.

⁵James C. Olson, "Nebraska," Encyclopedia Americana, Vol. 20 (1966), p. 41-48.

Personal incomes in Nebraska have fluctuated over the years, largely in response to agricultural conditions. Per capita income was \$1,588 in 1956 as contrasted with \$590 in 1929, and \$225 in 1934. Since 1929, there have been marked changes in the sources of personal income. In 1929 farm income accounted for thirty-two percent of the total, trade for fifteen percent, and manufacturing for seven percent; in 1955 they accounted for 12, 20 and 11 percent, respectively.

About twenty-five percent of 1950 labor force was employed in agriculture while manufacturing employed 18.8 percent, trade took 28 percent, government took 18.8 percent, and transportation and the utilities employed about 12.9 percent.

The leading manufacturers of the state are those which relate to the processing of agricultural products; of these, meat packing, concentrated quite largely in Omaha, is the most important. The processing of breakfast cereals is another prominent manufacturing enterprise. In heavy industry, the manufacture and repair of railway equipment, concentrated in Omaha and Lincoln, predominates. Other leading manufactures include printing and publishing, beverages, chemicals, electrical machinery, fabricated metal products, stone, clay and glass products, tractors and other farm machinery.

Omaha is the state's leading center of trade. It is also an important interstate trading center. Second only to Omaha is Lincoln, an important retail and wholesale trading center for a wide area.

Kansas⁶

In 1960 the population of Kansas was 2,178,611, and there were fifteen cities with a population greater than 15,000. Among these were Wichita with 254,698, Kansas City with 121,901, and Topeka with 119,484. Kansas occupies an area of 82,276 square miles.

Agriculture has for a long time held the dominant position in the state's economy. Moreover, until after World War II the processing of food and kindred products was the leading manufacturing enterprise. By the 1950's, however, it has been displaced by the manufacture of transportation equipment. While total value added by manufacture rose from \$461,110,000 in 1947 to \$1,313,739,000 in 1955, cash farm income declined from \$1,275,500,000 in the same period. Between 1940 and 1956 per capita income increased from \$426 to \$1,668 as compared with \$1,940 for the United States as a whole.

In terms of value added by manufacture, the production of transportation equipment, principally aircraft, is by far the most important industrial activity in Kansas. In second place is the processing of food and kindred products, of which meat, and flour are the most valuable. Other major industries in order of value are chemical products, nonelectrical machinery, stone, clay, glass products, printing and publishing, petroleum and coal products, fabricated metal products, and pulp and paper products.

The principal direction of Kansas' trade is southwest and northeast. Greater Kansas City is the most important marketing and trade center with Wichita and Salina serving as interior centers. To a limited extent Denver and Omaha serve the state, especially the northwestern counties.

⁶James C. Malin, "Kansas," Encyclopedia Americana, Vol. 16 (1966), p. 294-499.

Of the nonagricultural labor force, the greatest number was employed in wholesale and retail trade, which accounted for 24.3 percent of the total in 1956. Manufacturing was second with 22.5 percent, and other categories, with their percentages, were as follows: government, (17.2), transportation, communications, and other public utilities, (11.4), service and miscellaneous, (10.5), contract construction, (7.1), finance, insurance, and real estate, (3.6), and mining, (3.4).

With this short economic analysis of each of the Central States completed, it is clearly evident that these four states have been traditionally agriculturally oriented. The principal occupations have been either in agriculture or industries dependent on agriculture. Therefore, it is logical that the rural to urban migration would greatly affect these Central States. Table VI proves out this logic as it shows that there has been a distinct trend toward the reduction in the number of farms in the Central State area. Starting in 1910, the Central States have continually shown a decrease in the number of farms. The only exception to this trend was the period during the depression years. During these years, the number of farms showed a slight increase primarily because of the lack of employment opportunities in the cities. Many of those who might have migrated off the farm stayed for they were not able to get jobs in the urban areas, and many of the farm oriented, unemployed in the urban areas, moved back to the farms where the cost of living was lower. The reduction in the number of farms in the Central States brought with it a relative loss in population, and this led to a decreasing rate of growth in the nonagricultural endeavors in these states. The actual acreage in productive uses however, remained fairly constant. Although the number of farms decreased, the intensity of land increased with the breaking up of pasture land

TABLE VI. -- Total Number of Farms in the Central States and Their Percentage Change: 1900-1959

State	No. Farms	%	State	No. Farms	%
<u>Iowa</u>			<u>Missouri</u>		
1959	174,707	-9.4	1959	168,672	-16.3
1954	192,933	-5.0	1954	201,614	-12.4
1950	203,159	-2.8	1950	230,045	-5.3
1945	208,934	-2.1	1945	242,935	-5.1
1940	213,318	-3.9	1940	256,100	-8.0
1935	221,986	3.3	1935	278,454	8.8
1930	214,928	.7	1930	255,940	-1.7
1925	213,490	less.5	1925	260,473	-1.0
1920	213,439	-1.7	1920	263,004	-5.1
1910	217,044	-5.1	1910	277,244	-2.7
1900	228,622	13.2	1900	234,866	19.7
<u>Nebraska</u>			<u>Kansas</u>		
1959	90,475	-10.3	1959	104,347	-13.2
1954	100,846	-5.9	1954	120,167	-8.5
1950	107,183	-4.1	1950	131,394	-6.9
1945	111,756	-7.7	1945	141,192	-9.2
1940	121,062	-9.4	1940	156,327	-10.5
1935	199,616	3.2	1935	174,589	5.1
1930	129,458	1.3	1930	166,042	.1
1925	127,734	2.7	1925	165,879	.4
1920	124,417	-4.1	1920	165,286	-7.1
1910	129,678	6.7	1910	177,841	2.7
1900	121,525	7.0	1900	173,098	3.9

Source: U.S. Department of Commerce, Bureau of the Census, U.S. Census of Agriculture: 1959 (Washington: U.S. Government Printing Office), Vol. II General Report, Statistics by Subjects. Table 21.

during the wet years and other years of high demand particularly the war years. This land was put to use for the production of grain crops which require either more man-hours of labor, more machinery, or both. Therefore, the industries closely associated with the agricultural output continued to grow at the same pace as the intensity of agricultural output. However, it must be remembered that as the country developed, the incomes of the population was spent on agricultural goods. Therefore with the loss in relative income, and the reduction in the number of farms, a loss in rural population in areas where the predominate occupation was farming could be predicted. From Table I it is quite obvious that even in the basically agricultural Central States, the trend was toward the urban areas. However, it was not until 1960 that all four Central States showed more than half of their respective populations in urban areas.

It was obvious then that unless these four states presented some attractive incentives to new industry, they would continue to lose in relative population growth. If those people leaving the farms also left the state, this could result in an adverse effect on consumer demand for products produced in the state. The loss in consumer demand or at best its stagnation would have had an extremely adverse affect on local industries. With the application of the multiplier principle, the problem would have become even more grave. The cumulative effect of migration is also aggravated by its usual selectivity. Therefore, the loss of the most productive, enterprising, educated, and skilled through migration would have diminished the chances for the area to attain a normal level of income. Finally, the rigidity of the costs of local public services would have to be taken into account for now the burden of the dependent individuals remaining would be relatively greater for those productive individuals remaining in the state.

This generalization was not exactly the case in the Central States from 1900 until 1950, but without a reverse in the trend, this potential problem could have become reality. Although the Central States continued to lose in relative population after 1950, there was lessening of the disparity between the population growth of the Central States and of the United States average. In addition the birth rate of the Central States was below that of the United States average. By checking the Census of Population it is evident that there was a significant number of migrating into the Central States from the other continental states between 1950 and 1960. Therefore, since there was a significant number of people migrating into the Central States, there must have been some attraction in these states even though they were not growing as rapidly as the national average.

It will be the objective of this paper to examine the factors that affect the individual decisions to move into the Central States. These factors will be studied with respect to those that most affect migration--the magnitude of each factor and its influence on the aggregate geographic migration into the Central States. In addition to the effects of gross migration into the Central States, a comparison will be made of the effects on the four individual states within the region. Consideration will be given to the causes of the similarities and differences in the migration patterns into each individual state. The spatial unit employed as a measurement in this study will be the state.

The method used in this analysis will be both descriptive and empirical. Several factors were chosen which might reasonably explain the gross migration of people into the Central States during the period 1955-1960. Each of these factors is described and an explanation is given as to why they were chosen.

The empirical information related to these factors was obtained from the United States Census of Population: 1960. This data was then prepared for a multiple regression analysis. A step-wise multiple regression analysis program was used for the study. In the use of a step-wise multiple regression analysis, the independent variables used in the equation are added to the regression in order of the significance of their contribution of the R^2 . A simple correlation was also run on all the variables. The results of these tests were considered and a statistical interpretation was made in order to determine the validity of the variables used.

In previous empirical studies concerned with interstate or interregional migration in the United States, a variety of factors have been found to be significant in explaining geographical movement. Some of the more interesting and useful factors have been distance, income, labor market information, intervening opportunities, unemployment rates, education, level of urbanization, industrial similarity, racial discrimination, and federal spending. However, the most consistently used variable has been distance. From this list of useful factors were selected the factors used in this study.

CHAPTER II

THE MODEL: ITS FORMULATION

The Dependent Variable

The dependent variable is the number of persons, five years of age and over, residing in state j (the destination state) on April 1, 1960, who resided state i (the origin state) on April 1, 1955, divided by the total number of persons, age 5 and over, who resided in state i on April 1, 1955, but in some other state on April 1, 1960. Separate analyses were run, one using j as observations of the Central States and four others using j as the pooled observations of each of the component Central States. The data for the study was taken from the United States Census of Population: 1960 because this was the most recent general census and provided the most accurate and complete set of statistical data.

The dependent variable, therefore, is a measure of the percent of the total number of people leaving each state i and coming to the Central States j both as a region and as individual states and will be characterized as a flow. This is, however, a measure of population migration and not necessarily one of civilian labor force migration. It can be seen that there are some inherent disadvantages to this measure. One of the minor faults of this measure is that it includes many persons who are not members of the labor force, such as wives and children. Their inclusion in the dependent variable is probably not especially serious since their movements are closely related to those of the individual in the labor force upon whom they are dependent. A more serious shortcoming is the inclusion of military personnel and college

students. A high percentage of these are not members of the civilian labor force, and do not necessarily follow the migrating patterns of the civilian labor force. Generally students and military personnel are not influenced by the same factors that influence members of the civilian labor force. Another shortcoming of this measure is the inclusion of a large number of retired persons. With the increase in the number of people covered by social security, with better pension plans, and with earlier dates of retirement, many elderly people are migrating to areas where they can more fully enjoy the benefits of their labor. The Central States do not, however, have an attraction for this segment of the population.

The Independent Variables

As mentioned previously, growth of interstate and interregional migration has been related to several explanatory factors. Those factors chosen as independent variables in this analysis include distance, income, education, urbanization, rate of unemployment, and defense spending. Each of these factors represents a separate characteristic of the origin state. The reasons for choosing each of these factors as variables in the analysis, both as to their advantages and disadvantages will be explained in some detail.

Education

The level of education of an individual is likely to exert a significant influence on his decision to migrate. With more education, the individual is available for greater employment opportunities and generally is better informed of these opportunities. In addition, education reduces the importance of tradition and family ties and increases his awareness of other localities, thereby

weakening the forces which hold an individual to his present home. Since an educated person is likely to have a job before he moves, there is less risk and uncertainty involved in migration.⁷ Further, education encourages an individual's migration by increasing his awareness of the cultural and social advantages of other regions. Educated persons, therefore, generally have more marketable skills, and are more adaptable to new surroundings.

There is, however, some uncertainty as to the relationship between migration and the level of destination education. Poorly educated people might be reluctant to migrate to areas of high educational attainment. Even though these areas might offer a higher level of income, the uneducated may not be able to compete effectively for the available jobs, or at least be of the opinion that they could not get these jobs. However, these same people might be of ambitious character and therefore be attracted to regions of high educational achievement hoping to improve their education and in turn their employment prospects. Areas displaying high educational levels also are likely to attract people who are educated, not only because the demand for them is much greater, but also because of the social and cultural advantages associated with these areas. It should, however, be noted that the value of the marginal product of some educated people will be higher in areas of lower educational attainment. This might motivate the educated to migrate to these regions rather than to regions of high educational achievements. Not only will

⁷A survey conducted by the Bureau of Labor Statistics concerning the characteristics of persons who migrated between March, 1962, and March, 1963, indicates that the higher the level of education associated with a given occupation, the more likely a migrant is to have a job awaiting him, while the lower the level of education associated with a given occupation, the more likely a migrant is to be looking for work. Samuel Saben, "Geographic Mobility and Employment Status, Mar. 1962-Mar. 1963, "Monthly Labor Review. August 1964, p. 877.

the marginal productivity of these individuals be higher, but their standard of living and position in the community may be higher absolutely or relatively than if they moved to an area of high educational attainment. Thus, while the relationship between destination education and migration is indefinite, with all probability, the relationship will be positive. This can be assured if for the most part it is the educated who migrate. Recently, however, there has been some doubt raised as to the consideration that the educated migrate to a greater proportional extent than do the uneducated.

Today, the proportion of children (5-14) attending public school in the United States is about eighty-five percent.⁸ In addition, new guidance programs are providing educators with materials to inform students as to the outlook for different occupations. Young men and women enter today's labor market better trained with better ideas of both their own abilities and the prospects in different occupations. Young people entering the labor force are less likely to wander from unskilled to unskilled job before they become settled, and are more likely to begin close to their occupational limit without as many preliminary jobs. Therefore, mobility has decreased among the very group that traditionally has shown the highest mobility. Although the more educated may not migrate as much as before, when considering the distance used in this study, the conviction is that for the most part it is those with the greatest education who will be the most inclined to move to the areas of greatest demand.

In this study, the education variable employed is the median number of years of school completed by persons twenty-five years of age and over in 1960.

⁸Stanley Lebergott, "Long Term Factors in Labor Mobility and Unemployment," Monthly Labor Review, Vol. 32, No. 8 (Aug., 1959), p. 876.

There is one important criticism of this variable that should be noted, and that is the lack of homogeneity in educational measurement between states or between population subgroups. With the same number of years of education, a white person is likely to be better educated than a non-white person; an urban dweller than a rural resident; a Northerner than a Southerner.⁹ Since there has been no other satisfactory method devised to reduce all education to a common unit, the inconsistency remains inherent in the formal measurement of education.

Urbanization

The level of urbanization is another important variable which is quite often used in explaining migration. If people are being attracted to cities, then areas with a high proportion of urban to total population would prove desirable for migrants. Urbanization of the origin state should probably be positive since a large percentage of the migrants are interurban. Urban areas by their mere definition are highly populous areas. These areas also contain the bulk of the nation's manufacturing and nonagricultural industries which employ large numbers of skilled and educated workers. It could then be implied that these educated and skilled workers are the ones most apt to migrate. In addition, the unemployment rates are more noticeable in the urban areas, and it would be expected that many of these unemployed might leave the urban area of their residence for an area of more abundant employment

⁹At each age, the educational attainment of the population of the South is below that of the other regions. These regional differences are due in part to differences in rural-urban composition, in part to differences in quality and quantity of educational facilities provided, and in part that so many of the better educated persons migrate from regions of lower opportunity to regions of higher opportunity. Bogue, Op. cit., p. 346.

opportunities. In addition to unemployment, areas of greater concentrations of population in an urban area have a greater number of persons having a reason to migrate. On the other hand, the greater the population and urban concentration of the destination state, the greater the expected number of job opportunities available. Large urban areas also have more facilities to spread information and more of this information is obtained by the urban dwellers than by those residents of rural areas.

The urbanization variable used in this study is UP_i/P_i (the percent of the population living in urban areas in state i in 1960). This variable was calculated by dividing the urban population of i in 1960 (UP_i) and P_i , the total population, age 5 and over of state i in 1960.

The end of the period (1960) population and urbanization estimates have been employed in this study. It could, however, be argued that the migratory flows themselves have seriously affected the urbanization and the population estimates. If the 1955 estimates of population and urbanization had been used, they would have been subject to the criticism that they were not indicative of the period at any time after 1955. It could be said that the later migrants were not influenced by the migration which accrued after that date. Neither choice can be made without some hesitation. However, the 1960 estimates appear to be more reliable because they are based on the census.

Unemployment

The unemployment variable, another important factor considered in this study, is the percent of the civilian labor force unemployed during approximately the first week of April, 1960. Unemployment means those individuals not at work but looking for work. It is felt that this rate of unemployment in both the origin and the destination state is likely to exert a positive

influence on the rate of migration from state i to state j . If the rate of unemployment is high, there will be a greater number of people looking for jobs and at the same time jobs will be more difficult to find. In addition, the unemployed person will be more willing to migrate because he will give up less by migrating than will the employed worker--his opportunity costs will be less. Thus we would expect that a high rate of unemployment in state i would stimulate a greater rate of migration from i to j .

In addition, it is expected that the greater the rate of unemployment in state j , the less will be the migration from state i to j . There will be little incentive for a potential migrant to seek a job where the chances of employment or re-employment are poor. In addition, if a migrant does go to a state of high unemployment, he will probably spend much more time searching for a job and thereby his opportunity costs of migrating will be proportionately greater. Time required to find a new job is presumably affected by the level of unemployment. Therefore, there seems to be some credibility to the rationale that the availability of jobs and the unemployment rate are important factors in determining the amount and the direction of interstate migration.

Distance

Many previous empirical studies have generally considered distance to be one of the most important factors used in explaining the spatial allocation of migrants.¹⁰ Therefore, there is little difficulty in justifying distance as an important variable in the determination of migration. There are two primary reasons why gross migration between states is inversely correlated with distance. These shall be referred to as the money component and the psychic component. The money component is made up of the transportation costs incurred in moving. There is very little reliable data available as to the expenses incurred in moving. Some rough estimates claim that annually one billion dollars is spent to pack and haul. However, this does not include the increase in expenditures for migrants and their belongings for food, lodging, transportation, etc. Although these data could be collected only from the migrants themselves, these costs could be estimated reasonably well for given distances. Therefore, we could figure that money costs are closely

¹⁰Michael J. Greenwood, "The Determinants of Labor Migration in the U.S.A., 1955-1960," (Unpublished Ph.D. dissertation, Northwestern University, 1967).

Richard L. Morrill, "The Distribution of Migration Distances," The Regional Science Association Papers and Proceedings, Vol. 11 (1963), p. 75-85.

Phillip Nelson, "Income and Migration in the U.S.," Journal of Regional Science, Vol. 1, No. 2, 1959, p. 43-55.

Larry A. Sjaastad, "Income and Migration in the United States," (Unpublished Ph.D. dissertation, University of Chicago, 1961).

Larry A. Sjaastad, "The Relationship Between Migration and Income in the United States," Vol. 5 (1960), 37-64.

George S. Tolley, "Population Adjustment and Economic Activity: Three Studies," The Regional Science Association Papers and Proceedings, Vol. 11, 1963, p. 85-99.

related to the distance moved and therefore distance was chosen in lieu of transportation costs. There are also opportunity costs other than the costs of transportation. The greater the distance to be traveled, the greater will be the earnings foregone while traveling, searching for, and learning a new job. Part of these foregone earnings will be a function of the distance of migration.

The second component of the distance variable is the psychic costs or the non-money costs of migration. Since people are attracted to familiar surroundings, cultural patterns, family ties and associations; and friends, it is clearly seen that there is definitely a reluctance to move. In addition these attractions are apt to increase with an increase in distance from one's home. The distance variable gains more importance when we consider employment information and distance to be closely related, for an additional cost of uncertainty is added. Extreme difficulty is encountered when attempts to quantify these costs are made. However, if these costs could be quantified, they would have to be treated separately from the costs previously considered. The transportation costs represented real resource costs whereas the psychic costs do not. Rather they are of the nature of an intangible cost.

Although the psychic costs involve no resource cost, they do affect resource allocation. Very likely more migration would take place if psychic costs were zero for everyone and everyone had perfect knowledge. Since it is presumed that these psychic costs are greater for greater distances, the distance variable can be used in lieu of measurement of psychic costs which in itself is almost impossible to measure. Therefore distance will be used as a measurement of both economic and non-economic variables. This study should show the greater the distance from i to j , the lower the rate of migration.

There are, however, some inadequacies in the use of the distance variable in explaining migration. The choice of the major city or geographic center of the state for use as a base from which to measure distances may be an arbitrary one and the distances used may not adequately represent many of the movements that take place. There are also particular shortcomings since the states under consideration are large, irregularly shaped, and diversified with respect to population density. In this study the mileage between the major population centers of each state is that given by the 1955 edition of the Rand McNally Road Atlas. For states with two or more population centers, a suitable alternative or average distance between the two was chosen. The appendix lists the cities which were chosen as bases for the distance measurements.

Income

Probably the variable that is most commonly regarded as affecting migration to a considerable degree is income. The income estimates in this study are the United States Bureau of the Census estimates and refer to median 1959 dollars of income for males in state i in 1960 and adjusted to constant dollars by the 1953 Hurwitz-Stallings State Consumer Price Index for each state. Although the effect of income on migration is one of the most obvious variables, it is difficult to find a reasonable expression of income that adequately explains its effect on migration. Some choices of measurement considered in addition to the median income of males were as follows: average per capita money income of persons living in i in 1955-1960. The concentration levels of income for each state i in 1959 were also considered.

To make the use of median 1959 income of males equitable among states of different costs of living, the use of a deflator was needed. The choice of the 1953 Hurwitz-Stallings State Consumer Price Index was made because at the time the data was recorded, this was the most recent available information on a state-by-state basis. However, it seems only reasonable to say that a greater flow of information would be needed to inform the potential migrants of these differences in real income. Therefore, many migrants without the knowledge of the real income levels may not be affected, but in general the importance of the deflator would be expected to show up in the final analysis. In addition, potential migrants do not generally choose to migrate on a comparison of state median incomes. More significantly, they are likely to consider the income that they would earn at various locations given their training and previous occupation. However, wage structures are generally similar and a higher median income would probably indicate that most of the occupations in that state had higher returns than comparable ones in another state. Therefore, we would suspect that migration would tend to be away from states with low median incomes and toward states with high median incomes.

Defense Spending

The level of defense spending in both the destination and the origin state is likely to exert a significant influence on decisions to migrate. Areas of high levels of military spending contain either large numbers of armed forces personnel or industries with a large number of defense contracts. In addition, the pattern of defense expenditures has been shifting since World War II and the Korean War. The most dramatic change has been an extreme shift of military prime contracts, but the regional distribution of military and civilian employee payrolls has shifted as well. Changes during the 1950's

had important repercussions for regional growth simply because they were large enough to amount to significant shifts in demand, and because defense activity is an important source of income for certain areas.

In adjusting to new requirements of warfare--particularly to changes in the nature of weapons and in geographical requirements for installation sites--the armed services drastically changed the geographical impact of defense purchases. Even with a rising defense budget in the later 1950's, these changes caused an absolute decline in defense demand in some areas and a relative decline in others. It is believed that such areas that have had these large defense expenditures or continue to have them provide many skilled workers who could readily adjust to similar industries in the area of their desired relocation. The movement of military personnel could also have an impact on migration when the gross migration figures are used. It was felt then that defense spending would prove to be a significant factor to explain some of the migration into the Central States. The variable used for this study was the total defense spending for 1959. It was felt that a per capita expenditure would be more significant because it would more accurately show the impact on the economy of the origin state. However, since the defense spending data for 1960 was not available, it was necessary to use the data for 1959. The 1960 population figures were used. Although these two time periods do not exactly coincide, the one year difference in either the defense spending or the population is not great enough to cause significant bias in the results.

CHAPTER III

THE MODEL: ITS ESTIMATION

In the 1960 population census for the United States, each person was asked his place of residence during the previous five years. The answers given were then taken and recorded in order to determine the number of people moving to another state. For the purpose of this study, the number of persons moving from state i (the origin state) to state j (the destination state) will be expressed as M_{ij} . The summation of all the migrants leaving the origin states will be expressed as $\sum M_{i.}$.

Migratory movements have at times been greatly affected by shortrun conditions. For example, during 1949 more Negroes migrated from New York to North Carolina than migrated in the opposite direction. This finding, counter to the known long-run trend was probably due chiefly to the recession of 1949 which made jobs scarce in New York and temporarily drove many Negroes back to the farm. It is hoped, however, that the time period used in this study does not contain any severe shocks that might affect the short term movements of migrants. It is the purpose of this study to concentrate on the factors that are of a longer term duration. From these longer term factors, an attempt will be made to establish a more general case, to determine the magnitude and direction of the factor conditions present in the origin states of the migrants coming into the Central States.

Two sets of relationships were estimated in this analysis:

$$(1) \text{Mij}/\text{Mi} = f(\text{Dij}, \text{MYi}/\text{CPIi}, \text{Ei}, \text{UPi}/\text{Pi}, \text{Ui}, \text{random errors})$$

$$(2) \text{Mij}/\text{Mi} = g(\text{Dij}, \text{MYi}/\text{CPIi}, \text{Ei}, \text{UPi}/\text{Pi}, \text{Ui}, \text{OYi}/\text{Pi}, \text{random errors})$$

where

Mij/Mi = the percentage of the migrants age 5 and over, who were residents of state i in 1955 and residents of state j in 1960;

Dij = 1955 highway mileage between the principal city of state i and that of state j ;

MYi/CPIi = median 1959 income of males living in state i in 1960 deflated by the 1953 Hurwitz-Stallings Consumer Price Index for i ;

Ei = median number of years of school completed by residents state i , 25 years of age and over, 1960;

UPi/Pi = percentage of population living in urban areas in state i , 1960;

Ui = percentage of civilian labor force unemployed in state i during approximately the first week of April, 1960;

OYi/Pi = per capita total defense spending in state i , 1959.

The first relationship contained five separate regressions which utilized the same variables, i.e., one regression for the Central States, and one for each individual state in the Central State region. The second set of estimated relationships utilized the same area but contained the addition of the defense spending variable (OYi/Pi).

TABLE VII. -- Set I--Gross In-Migration, 1955-1960: Logarithmic Regression Coefficients (β), Standard Errors (σ), and t-ratios (t) and the Order of the Addition of the Variables to the Regression

Independent Variables	All	Iowa	Missouri	Nebraska	Kansas
Dij	β : -.309 (1)	.318 (1)	-.299 (1)	-.297 (1)	-.295 (1)
	σ : .020	.035	.039	.036	.030
	t : -15.651	-8.967	-7.750	-8.283	-9.888
MYi	-.833 (4)	.595 (4)	-.943 (4)	-.906 (3)	-.787 (5)
CPIi	.155	.288	.271	.283	.219
	-5.390	-2.066	-3.478	-3.203	-3.598
E i	1.068 (2)	.908 (2)	1.279 (2)	1.187 (2)	.742 (4)
	.140	.260	.266	.251	.193
	7.623	3.499	4.806	4.722	3.836
Upi	1.050 (5)	.892 (3)	1.087 (5)	.975 (4)	1.369 (2)
Pi	.200	.374	.348	.374	.280
	5.250	2.387	3.120	2.608	4.891
Ui	.266 (3)	.160 (5)	.311 (3)	.213 (5)	.198 (3)
	.057	.180	.103	.107	.078
	3.976	1.476	3.033	1.995	2.557
R ²	.627	.709	.667	.699	.773
Df	182	41	41	41	41

Dependent Variable: $\frac{M_{ij}}{\sum M_i}$

TABLE VIII. -- Set II--Gross In-Migration, 1955-1960: Logarithmic Regression Coefficients (β), Standard Errors (σ), and t-ratios (t) and the Order of the Addition of the Variables to the Regression

Independent Variables		All	Iowa	Missouri	Nebraska	Kansas
Dij	β :	-.318 (1)	-.327 (1)	-.300 (1)	-.312 (1)	-.315 (1)
	σ :	.020	.036	.039	.036	.029
	t :	-15.984	-9.018	-7.655	-8.783	-10.985
<u>MYi</u> <u>CPTi</u>		-.724 (5)	-.523 (5)	-.925 (4)	-.773	-.622 (5)
		.158	.294	.284	.282	.212
		-4.702	-1.778	-3.260	-2.742	-2.931
Ei		1.082 (2)	.924 (2)	1.281 (2)	1.193 (2)	.768 (3)
		.139	.259	.269	.243	.180
		7.803	3.566	4.756	4.904	4.267
<u>Upi</u> <u>Pi</u>		.564 (6)	.461 (6)	.992 (5)	.264 (6)	.561 (6)
		.289	.535	.518	.513	.394
		1.947	.861	1.916	.515	1.424
Ui		.251 (4)	.189 (4)	.314 (3)	.258 (5)	.233 (4)
		.057	.111	.105	.106	.073
		4.378	1.705	3.006	2.440	3.187
<u>CYi</u> <u>Pi</u>		.174 (3)	.160 (3)	.033 (6)	.264 (3)	.282 (2)
		.076	.142	.133	.135	.103
		2.298	1.122	.248	1.955	2.733
R ²		.638	.717	.667	.726	.802
DF		181	40	40	40	40

Dependent Variable: $\frac{M_{ij}}{\sum M_i}$

Parameters were estimated by using least squares, and log-linear functions were chosen for this analysis because in previous migration studies they have generally yielded better fits than linear relationships.¹¹ The use of the log-linear function is also important since the coefficients estimated in log-linear relationships can be interpreted as elasticities.¹²

Tables VII and VIII contain the estimates obtained from the two separate sets of regression analyses upon which this study is based. Included in these tables are the dependent and independent variables used. For each independent variable, there is given the logarithmic regression coefficients (β), the standard error (σ), the t-value (t), the order in which the variable was added to the regression, and the dependency on the contribution to the R^2 . From the calculation of the regression analysis, the multiple correlation coefficient (R^2) is recorded. A detailed discussion of the relative size of the parameter estimates of the variables will be undertaken. When

¹¹Nelson chose the logarithmic form to explain migration between state pairs, partly because this improved the fit over a linear one, and partly because he believed the statistical tests to be more appropriate in logs. His observations on migration were highly skewed to the right in arithmetic form, while they more closely approximated a normal distribution when in logs. This he interpreted as evidence that tests of significance would be more appropriate with the data in logs. Phillip Nelson, "A Study in the Geographic Mobility of Labor," (Unpublished Ph.D. dissertation: Columbia University, 1957), p. 21-22.

In his study on migration, Greenwood considered both linear and log-linear relationships. Since the log-linear functions produced a much better fit, they were reported in his paper. Greenwood, op. cit. p. 27.

¹²The log-linear relationships interpreted as elasticities in this study used log to the base 10 which is called the common logarithm. In most studies, the relationships using the natural logarithm or the logarithm to the base e are interpreted as elasticities. The difference is that when using common logs, the following rule is used $dy/dx = 1/x \log_e e$, whereas when natural logarithms are used, the derivative becomes $dy/dx = 1/x \ln e = 1/x$.

measuring the significance of the elasticities in this study, the five-percentage level will be considered unless otherwise stated. A stepwise regression was used and consideration was given to the distinction between the variables and to the extent in which they added to the multiple correlation coefficient. Tables VII and VIII indicate an order in which the variables used in the study were added to the regression analysis for in the calculations used in a step-wise regression analysis, the variables are added according to the importance of their contribution to the R^2 .

Distance

As indicated in Table VII, in the Central State regression, the distance elasticity of migration of $-.309$ has the expected sign and is highly significant. The importance of distance is reinforced when studying the "partial correlation coefficients." Here again the distance variable is undoubtedly the most important independent variable used for determining migration with an elasticity of migration of $-.247$. The distance elasticities of migration in the multiple regressions for Iowa $-.318$, Missouri $-.299$, Nebraska $-.279$, and Kansas $-.295$ are all significant and of the right sign. In all cases, then, the distance variable is the most significant factor contributing to the R^2 . It is quite evident that distance is the most important variable used in this study, which suggests that transportation costs and the non-economic factors for which distance is a proxy both act as restraints to migration to the Central States (i.e., people come from nearby states). However, this is not surprising for this observation agrees favorably with those obtained in previous studies. Sjaastad, Lowry, and Robinson, for example, all found that distance is important in explaining the spatial allocation of migrants. While Sjaastad estimated a distance elasticity of

migration of roughly -1.5 in his analysis of interstate migration,¹³ Lowry in his study of interurban migration in the United States obtained an elasticity of approximately -.83.¹⁴ In his study of migration to Oxford, England, Robinson estimated a distance elasticity of about -1.25.¹⁵

It has been noted in Chapter II that there are two primary components of the distance variable, and since this variable is extremely important to the study, some further observations are justified at this time. The monetary costs involved in moving greater distances can be crudely measured and would surely influence a decision to migrate. The non-monetary costs are important, probably far more so than the monetary costs. Although there is no doubt that the monetary costs are important, there is at least a crude form of measurement that can be used. On the other hand, it is almost impossible to put a tangible value of the non-monetary cost of migration. One important aspect is that of less familiar environment and its effects on migration. It is felt that people tend to remain in a familiar environment and dissimilarity between two places will discourage migration between them. This effect of distance, however, is not believed to vary smoothly with mileage.¹⁶ There are many kinds of environmental influences that may affect the distance of migration. Generally speaking, it is convenient to classify these into three types of environmental influences upon migration.

¹³Sjaastad, Op. cit., p. 18.

¹⁴Ira S. Lowry, Migration and Metropolitan Growth: Two Analytical Models San Francisco: Chandler Publishing Company, 1966, p. 20.

¹⁵Herbert W. Robinson, "The Response of Labor to Economic Incentives," Oxford Studies in the Price Mechanism, Oxford: Clarendon Press, 1951, p. 219.

¹⁶Tolly, Op. cit., p. 86.

The first type of migration is within the same general vicinity, within a radius of up to one hundred miles. This does not necessarily require a change in way of life such as making new friends or establishing new social relationships. Often such moves are made even though there is no change in way of life or job. A second type of migration may be typified by intra-regional migration. Old ties are broken, but the new ties that will be made are very similar to the old. Once this type of move is decided upon, the migrant may be largely indifferent to any similar environments into which he might go regardless of their distance. Finally the migrant may go out of the region or to an environment which is extremely different from the one he leaves. Again the distance may be relatively unimportant once this type of move is decided upon.

Another non-monetary cost to consider is the opportunity cost--the earnings foregone while traveling, searching for, and learning a new job. Part of these foregone earnings will be a function of the distance of migration. In addition, the time required to move and to find a new job in unfamiliar surroundings will also be affected by the distance.

Lack of information also becomes a detriment to migration of long distances. With the likelihood that there will be fewer friends and relatives at more distant locations, the fear of the unknown will become important. Locations at greater distances are probably also less familiar to the migrant with respect to income, job opportunities and living conditions. Therefore, distance can serve as a detriment to migration if the interstate migrants are merely unaware of the better opportunities that may be available at a distant location. In a study done by Nelson, he computed that the scarcer the information the greater the distance elasticity of migration.¹⁷

¹⁷Nelson, Op. cit., p. 86.

If these non-monetary factors are important as is claimed, then it seems that the monetary costs involved in moving represent only a part of the total cost of migrating. It would prove to be quite beneficial if a method was devised to measure the monetary and non-monetary costs separately. However, there are two obstacles that would have to be overcome before this could be accomplished. The first is that there is no accurate method of measuring the non-monetary costs, and the data that is available for measuring the monetary costs is entirely insufficient. The second obstacle is that there is often a gray area between the monetary and non-monetary costs and it is sometimes difficult to distinguish between the two. Even if we could measure the direct monetary costs of migration, there might be a monetary cost which is a direct result of a non-monetary cost. For example, transportation costs from the origin to the destination home may be roughly proportional to distance but, there is a greater complexity involved than merely the monetary cost of a one way trip. The difficulty arises when individuals may not wish so much to minimize their initial one-way cost as their desire to minimize the time and money costs of the repeated vacation and other visits back home that will be made after there has been a change of residence. It seems quite evident then that it will be necessary to continue using distance as a measure of the cost of migration until someone is able to solve the problems involved in using some other form of measurement.

Since people are not as apt to migrate to distant places, then this study gives credibility to the belief that gross migration, when the i th and j th states are contiguous, tends to be much greater than when the states are non-contiguous.¹⁸ This can be explained on the grounds that people in contiguous

¹⁸Tolley, op. cit., p. 86.

states are not as hindered by the monetary and non-monetary costs of migration. Therefore, a case is made for analyzing gross migration between contiguous states. Although there is much intrastate migration with the Central States themselves, the magnitude of this study does not allow for a specific discussion of this point. The results of this study and the statistics on migration show that the states within the study area do experience a large amount of migration among each other. However, since this area as a whole is growing the migration from areas outside the Central States show an ample rate of migration into this area to make this study revelant.

There is one researcher in particular who takes somewhat of a different approach to the use of distance in migration analysis, and this is Stouffer. Stouffer has developed a theory of migration which combines distance and opportunities--the theory of intervening opportunities.¹⁹ His basic thesis is that there is not necessarily a relationship between migration and distance as such. Rather the number of persons moving any given distance is directly proportional to the number of opportunities existing at that distance and inversely proportional to the number of intervening opportunities. This has the effect of making migration generally inversely proportional to distance. Although Stouffer does not attempt to define opportunities for most purposes where migration of working ages is concerned, some variable representing employment opportunities would be most appropriate. Exceptions would be older people going into retirement.

¹⁹S. A. Stouffer, "Intervening Opportunities and Competing Migrants," Journal of Regional Science, Vol. 2, No. 1, pp. 12-26.

Education

With respect to its contribution to the R^2 for the Central States area, education is the second most important determinant of migration. As expected the educational level (elasticity of 1.068) of the origin state is highly significant and positively correlated. The partial correlation coefficient with education as the independent variable is also significant with an elasticity of .248. This gives further credence to the importance of education in determining migration. It appears that education alone is significant in its contribution to migration contrary to a study by Blanco in which she found that regional differences in education do not appear to have a significant direct influence on the rate of interstate migration of population.²⁰

The results of the first set of regressions seem to show that the people who are leaving the origin states are leaving areas of high educational levels, supporting the contention that an increase in education increases the mobility of an individual. In addition, education is expected to have a two-fold effect on individuals of the origin state. Other things constant, increasing education reduces real-relative to measured income. Increasing education should be accompanied by better access to information about opportunities elsewhere, plus a greater range of opportunities. Ceteris paribus, increasing education should foster out-migration and hence the elasticity coefficient is expected to be positive. Not only is the elasticity coefficient positive and significant for the Central States, but the individual states follow as expected--Iowa (elasticity of .901), Missouri (elasticity of 1.279), Nebraska (elasticity of 1.187), and Kansas (elasticity of .742). The elasticity of

²⁰C. Blanco, "The Determinants of Interstate Population Movements," Journal of Regional Science, Vol. 5, No. 1, 1963, p. 78.

education for the Iowa regression is smaller than that of Missouri or Nebraska, but it is still highly significant and education is still the second ranking variable in the regression analysis for Iowa. It should be noted, however, that the elasticity of education associated with the Kansas regression, although still significant, ranks only fourth in its contribution to the R^2 . It appears that urbanization and the rate of unemployment in the origin state are of more importance in determining migration into Kansas than is education.

Unemployment

In the first set of regressions, it is observed that unemployment is the third most important contributor to the R^2 of the Central States. The unemployment rate of the origin state is highly significant and has the expected positive sign (elasticity of .226). These findings regarding the unemployment variable agree quite closely with those of Sjaastad's study. He too found that to increase the unemployment rate of state i increased the rate of migration from state i . On the other hand, he found that destination unemployment rates played little role in explaining migration to state j .²¹

The results of the partial correlation coefficients strongly suggest that if you increase the rate of unemployment, the migration flows are decreased. The elasticity of the partial (-.275) is highly significant and of a negative sign. This is understandable when considering that the unemployed may not be able to afford the costs of moving and find it more advantageous to stay at their present homes and try to obtain work in the same area or else draw on some form of relief.

²¹Sjaastad, "Income and Migration in the United States," Op. cit., p. 57-68.

Although the partials and the simple correlations are negative, this does not invalidate the results obtained in the regression. With the addition of the other variables to the unemployment variable in the multiple regression analysis, the sign of the unemployment variable is changed and it becomes positive and significant. Therefore, it is assumed that although the partial has a negative sign, the addition of the influence of the other variables reverses the sign and makes the unemployment coefficient positively correlated in the multiple regression analysis.

The results of the elasticities of the states within the Central States are not consistent with those obtained for the region as a whole. Missouri and Kansas are both significant and follow the area pattern of drawing migrants from areas of relatively high unemployment. Nebraska and Iowa, however, do not follow the area pattern. In these two state regressions, unemployment acts as only the fifth contributing variable in the makeup of the R^2 . Although in Nebraska the unemployment variable is significant and the right sign, the R^2 appears to be affected more by the urbanization and the level of income of the origin state. The unemployment variable deviates from the expected results to the greatest degree in the Iowa regression. With an elasticity of .160, it is the only variable in the first set of regressions that is not significant at the five percent level. It appears then that Iowa is least affected by migration from origin states of high unemployment rates. This can possibly be substantiated by the fact that in the period 1950-1957 the destination state Iowa had an increase in estimated unemployment of 1.3 percent whereas Missouri had a decrease of 1.3 percent, Nebraska had a decrease of .6 percent

and Kansas had a decrease of 3.1 percent.²² If Iowa's unemployment rates increased during this period relative to that of the rest of the Central States, it seems reasonable to say that people would be less willing to move from one area of relatively high unemployment to this area of relatively high unemployment when the neighboring states appear to offer greater opportunities and a decreasing unemployment rate. This can be substantiated by some suggestions with respect to opportunities in either the origin or destination states.

With respect to "opportunities" it has long been recognized that there is a significant relationship between migration and economic opportunities.²³ Labor tends to migrate from areas having few opportunities to areas having them in greater abundance. Poor opportunities and high unemployment rates tend to exert an expulsive force on the labor of a region or occupation while better opportunities elsewhere represent something of a magnetic attraction. Based on the statistical analysis of data from a sampling of states, Blanco found that the availability of jobs is the principal factor which determines the amount and direction of interstate migration in the United States.²⁴ He found that in states where the number of new industrial jobs added annually was less than the natural addition to the population of working age, unemployment rose, and outward migration increased to other areas where job opportunities matched the labor supply more closely.

²²Computed from the Statistical Abstracts by Blanco, Op. cit., p. 80.

²³Roger L. Burford, "An Index of Distance as Related to Internal Migration," Southern Economic Journal, Vol. 29, p. 77-81, Oct., 1962.

²⁴Blanco, Op. cit., p. 79.

Variations in economic opportunity may take many forms. Basically, however, they all stem from either an excess or deficiency of labor force in an area or occupation relative to available complementary resources or the state of demand for labor's output. In other words, the labor force may be excessive or deficient with respect to either the demand for its output, the availability of land and capital resources or both. The degree of this excess or deficiency determines the state of economic opportunity facing workers in any given location or occupation relative to others.

Income

Although significant and of the expected negative sign (elasticity of $-.833$), the income variable is not as important as might generally be expected. However, there seems little doubt that people are not as prone to migrate from areas of high income. The strong negative correlation shows that the higher the level of income of the origin state, the less likely the prospects of migration from that state. On the other hand, this variable does not contribute as much to the R^2 as might be expected. When the partials were run, income was the only variable for the Central States that was not significant at the five percent level. It appears that Sjaastad arrived at a similar conclusion in his Ph.D. dissertation. From his study, he concluded that income is an important determinant of migration, but that it is not the only determinant of importance.²⁵ An important point brought up, however, is that the migrant population is far from the image of the total population. If the migrant population were broken into younger and older migrants, it

²⁵Sjaastad, "Income and Migration in the United States," Op. cit., p. 1-13.

would probably be found that young migrants do respond much more sensitively to income differentials among origin and destination states. In all probability, the distance costs, especially the non-monetary costs, would not weigh as heavily upon this group. It also appears quite plausible then, that at least part of the observed income gaps among states are more apparent than real for changes in skill and quality are factors that are not critically measured.

As for the states within the region, Iowa and Missouri follow the general characteristics of the area as a whole. In the Nebraska regression, there is a minor change in income that seems to add a little more to that regression than it does in other states; Kansas on the other hand, is affected in the opposite manner. The income variable is the last variable added to the Kansas regression. This does not mean that it is not important, for it remains as a highly significant variable and of the right sign.

Urbanization

The final variable added to the regression analysis is urbanization with an elasticity of 1.05 which is still highly significant and of the right sign. In addition to the significance of urbanization in the multiple regression, it is also significant when measured as a partial with an elasticity of .382. Migration is quite obviously from areas of high population concentration. That a great number of migrants tend to migrate from large urban areas is not surprising since urban areas offer greater opportunities for information and contain a large diversified population which might contribute to the promotion of migration.

Although urbanization is significant for the Central States, the individual states, although all are highly significant, are not consistent in following the regional pattern. Missouri is the only state that follows the pattern of the region, and it has an elasticity of 1.087. On the other hand, urbanization for the Kansas regression has an elasticity of 1.369 which is the second most important variable in its contribution for that state. The urbanization variable for the Nebraska (elasticity of .975) and Iowa (elasticity of .892) regressions contributed fourth and third respectively to their regressions.

It appears that urbanization of the origin state is the least important variable contribution to migration into Missouri, and this appears to have an impact on the whole region for Missouri is the only state following the regional pattern. Missouri itself is the most urbanized of the Central States and has been over fifty percent urban since 1930. In addition, it has an established broad base of industrialization. Seemingly these conditions have prevailed over a long enough period of time to make Missouri attractive to both rural and urban migrants. Therefore, since it cannot be denied that urbanization of the origin state is an important determinant of migration into Missouri, it appears to be relatively less important for Missouri than the other Central States. The other variables appear to be of more importance in the Missouri regression than urbanization.

On the other hand, in his study on migration in the United States, Greenwood found that urbanization of the destination state is highly significant.²⁶ That migration tends to be in the direction of urban areas is not

²⁶Greenwood, op. cit., p. 35.

surprising since they offer generally higher incomes as well as greater opportunities for education and the cultural pursuits than do non-urban areas. By checking Table I it can readily be seen that Nebraska and Kansas were reaching a high level of urbanization at a more rapid pace from 1950-1960 than was Iowa. Using the new definition, Nebraska has grown from 46.9 percent in 1950 to 54.3 percent in 1960, whereas Iowa has grown from 47.7 percent to 53.0 percent and; Kansas has grown from 52.1 percent in 1950 to 61.0 percent in 1960.²⁷ The urbanization variable, although important to the regression for Iowa, has the lowest elasticity of the whole region. Iowa is not growing as rapidly in urbanization and the urbanization of state *i* is not as significant in explaining migration into Iowa as it is in explaining migration into the three other states.

Defense Spending

The patterns of defense spending have been shifting since World War II and the Korean Conflict. These changes, especially during the 1950's have had important repercussions for regional growth because they were large enough to amount to significant shifts in demand. In order to determine the effect of this shift in defense spending in the Central States, a defense spending variable was added to the original regression. The impact of the addition of this variable on the elasticities of the other variables and the R^2 was measured in the second set of regressions.

The results from the first set of regressions strongly suggested that distance is the important factor in determining migration to the Central States

²⁷The appendix contains a discussion of the old and new methods used by the Bureau of Census in determining what would be considered an urban area.

and the addition of the defense spending variable did nothing to disprove this. Distance remained the most significant contribution to the R^2 and there was no important change in the elasticities for the region or the individual states.

Also, there is a little effect on the education elasticity of the region when total per capita defense spending is added to the equation. Education continues to rank second in its contribution to the R^2 for the Central States. The elasticities show very little change for the individual states and education remains second in importance for the Iowa, Missouri, and Nebraska regressions. However, Kansas does appear to be significantly affected by the addition of the defense spending variable. When defense spending was added to the Kansas regression, education rose from the fourth to the third most important contributing variable. Of even more importance was the fact that with the addition of defense spending to the regression this defense variable became the second most important contributor to the R^2 in the Kansas regression. Since this is the case, it appears that the origin states of migration into Kansas have high levels of per capita defense spending. The probable contributing factors to this migration tendency are the many military installations in Kansas, especially Fort Riley, and the large scale production of aircraft in the state. If many of these migrants are trained in skills that are useful in producing defense goods, and on military installations, Kansas may have an attraction for these migrants and may be able to utilize those skills or qualifications obtained from employment in defense related endeavors in Kansas.

In the second set of regressions, defense spending was highly significant with the right sign (elasticity of .174) and the third most important

contributing factor to the R^2 for the Central States. Although the defense spending variable proved significant for the Central States as a whole, it is not uniform in its effects on individual states. As already mentioned, defense spending is extremely important in the regression for Kansas. It is possibly so important that Kansas alone contributed to its high ranking for the Central State region as a whole. This gives even more credence to the fact that defense spending in the state of origin is a very significant factor affecting migration into Kansas. The Nebraska regression is also significantly affected by those migrants coming from states of high defense spending. The addition of defense spending to the Iowa regression contributed as the third most important variable in adding to the significance of the regression.²⁸ Although Iowa itself is not heavily endowed with receipts of defense expenditures, it has developed a number of light industries that would employ workers with those skills acquired in defense related industries.

The Missouri regression is the one that most differs from the region as a whole with the defense variable only the sixth in order of significance in that regression. Besides being the most ineffective variable for explaining Missouri's migration, it is the lowest elasticity of the whole area and is not statistically significant at the five percent level. There are two possible reasons that can be given to explain this differential that Missouri experienced. The first is that Missouri has a greater industrial base than the rest of the Central State area; the level of defense spending in either

²⁸When the defense variable was added to the regression it had a coefficient elasticity of .60 and was significant. However, when the other three variables were added to complete the regression the defense variable became insignificant at the five percent level with an elasticity of .160.

the origin or the destination state could have a smaller overall impact on migration into Missouri. With the greatest diversification of industrial composition of the whole Central State area, Missouri's more varied opportunities would cause one item such as defense spending to have a proportionately minor impact on total migration. The second important point is that there is a high simple correlation between defense spending and urbanization in the Missouri equation (.731). If it is assumed that urban people tend to migrate to other urban areas, and given the fact that Missouri is more urbanized than the other Central States, the impact of the urban variable would negate some of the effect of the defense spending variable.

In the second set of regressions the unemployment variable is only slightly affected and all the elasticities remain significant with a positive sign. The defense spending variable does little to change the magnitude of the unemployment variable. Likewise, the defense spending variable makes little change in the income variable as all the elasticities remain significant and of the expected negative sign.

When the addition of defense spending is made to the Central State regression the elasticity coefficient of urbanization remains significant (.564), but not nearly of the magnitude of the previous regression. In addition, the individual states become extremely affected, i.e., all except Missouri which retains an elasticity of .992 and actually increases in importance in its contribution to the R^2 . Kansas, Nebraska, and Iowa all drop to the bottom of the list in their contribution to the R^2 and no longer become significant. This inconsistency with our desired results will require some additional explanation to justify the use of urbanization and the defense spending variable.

Multicollinearity

When adding the defense spending variable to the regression, it was noted that the most important results were focused on the defense spending variable and the urbanization variable. Because of the adverse affects with the additional variables, it might be a benefit to look into a possible problem area. Frisch²⁹ made extensive studies of correlation and regression and found that when there was a close relationship among the explaining variables, the standard errors of the estimated parameters were very large. This may be understood in the extreme case: if there were perfect correlation between any two explaining variables could be used as well as the other, and there would be no reason to use both. We seldom find perfect correlation, but quite often we have high correlation among the independent or explaining variables. In problems in economics, we may even say that correlation between these two explaining variables is the general rule. This may help to explain some of the difficulty encountered in this study. In order to check the significance of each of the variables and to check on the possibility of multicollinearity, six additional regression analyses were run using the dependent variable ($M_{ij}/\sum M_i$) and one independent variable. A check for significance was made on the partial correlation coefficients. Only the distance variable proved significant in all cases. The unemployment variable came closest with only one state, Missouri, not being significant at the five percent level. Therefore this problem of multicollinearity, in all probability, has entered into this analysis. However for the Central State

²⁹Ragnar Frisch, "Propagation Problems and Impulse Problems in Dynamic Economics," Economic Essays in Honour of Gustav Cassel, (Londan, Allen, 1933), pp. 171-205.

region as a total this is not too important for most of the regressions remained significant; it is the analysis of the individual states where the problem becomes most evident. This could probably be expected for the number of observations were reduced when the regressions on the individual states were run. Generally, though most of the interrelationships do not seem to detract from the desired results.

There are, however, two variables which seem to be affected to a greater degree by multicollinearity. They are the defense spending variable and the urbanization variable. With the addition of the defense spending variable, three of the four state urbanization variables showed up insignificant--Iowa, Nebraska, and Kansas, and two of the defense spending variables showed up insignificant--Iowa, and Missouri. In addition, the standard errors showed up higher in all four cases of the urbanization variable. The simple correlation between urbanization and defense spending was .733 which was high but not extremely so. In order to further test the validity of the defense spending variable, the analysis was run omitting the urbanization variable and replacing it with the defense variable. The results of this third set of regressions are shown in Table IX. The defense variable retained its exact ranking in the regression with the exception of Missouri which gained a step and also became significant. It appears that defense spending and urbanization both are important variables contributing to migration for they are both significant in the area regression. This leads to the conclusion that defense spending does serve a useful purpose in explaining migration and deserves to be retained for purposes of comparison as a valid variable in addition to its tremendous impact on the migration into Kansas.

TABLE IX. -- Set III--Gross In Migration, 1955-1960: Logarithmic Regression Coefficients (β), Standard Errors (σ), and t-ratios (t) and the Order of the Addition of the Variables to the Regression

Independent Variables	All	Iowa	Missouri	Nebraska	Kansas
Dij	β : -.318 (1) σ : .020 t: -16.141	-.328 (1) .036 -9.089	-.307 (1) .040 -7.630	-.312 (1) .035 -8.857	-.322 (1) .029 -11.299
MYi/CPIi	-.534 (5) .128 -4.163	-.379 (5) .241 -1.571	-.613 (4) .240 -2.556	-.690 (4) .229 -3.018	-.455 (5) .174 -2.557
Ei	1.028 (2) .137 7.502	.901 (2) .241 3.506	1.247 (2) .240 4.497	1.178 (2) .229 4.922	.749 (3) .174 4.121
CYi/Pi	.289 (3) .051 5.627	.247 (3) .099 2.508	.219 (5) .093 2.353	.314 (3) .095 3.321	.392 (2) .069 5.686
Ui	.249 (4) .057 4.369	.190 (4) .111 1.712	.319 (3) .108 2.960	.256 (5) .105 2.446	.236 (4) .074 3.194
R ²	.634	.712	.638	.724	.799
DF	.82	41	41	41	41

Dependent Variable: $M_{ij}/\sum M_i$

TABLE X. -- Partial Correlation Coefficients of Gross In Migration 1955-1960: Logarithmic Regression Coefficients (β), Standard Errors (σ), and t-ratios (t)

Independent Variable	All	Iowa	Missouri	Nebraska	Kansas
Dij	β : -.267 σ : .020 t: -12.478	-.267 .035 -7.626	-.203 .036 -5.574	-.249 .038 -6.538	-.255 .033 -7.625
R ²	.456	.564	.408	.487	.564
DF	186	45	45	45	45
Dependent Variable: $M_{ij}/\sum M_i$					
Myi	-.037 .131 -.279	.152 .265 .575	-.228 .234 -.978	.096 .259 .370	-.161 .229 -.704
R ²	.0004	.072	.020	.030	.011
DF	186	45	45	45	45
Dependent Variable: $M_{ij}/\sum M_i$					
Ei	.248 .140 1.773	.319 .281 1.338	-.001 .255 -.002	.538 .267 2.014	.100 .248 .404
R ²	.017	.028	.000	.083	.004
DF	186	45	45	45	45
Dependent Variable: $M_{ij}/\sum M_i$					

TABLE X. -- (Continued)

Independent Variable	All	Iowa	Missouri	Nebraska	Kansas
UPI/Pi	β : .382 σ : .230 t: 1.660	.427 .466 .915	.393 .415 .947	.206 .457 .452	.535 .399 1.340
R ²	.015	.018	.020	.004	.038
DF	186	45	45	45	45
Dependent Variable: M_{ij}/\bar{z}_{Mi}					
Ui	-.275 .074 -3.709	-.363 .150 -2.429	-.199 .132 -1.502	-.297 .150 -1.984	-.234 .129 -1.816
R ²	.069	.116	.048	.081	.068
DF	186	45	45	45	45
Dependent Variable: M_{ij}/\bar{z}_{Mi}					
CYi/Pi	.125 .076 1.648	.086 .155 .557	.156 .136 1.147	.074 .150 .491	.204 .131 1.558
R ²	.014	.007	.028	.005	.051
DF	186	45	45	45	45
Dependent Variable: M_{ij}/\bar{z}_{Mi}					

One possible explanation of the high correlation between these two variables is the fact that many areas that receive large government contracts are the long established, industrial, urban areas. The migrants from these areas who are coming to the Central States would want to engage in occupations with which they are familiar. This is generally accepted, for on the average, a man's efficiency, and hence his wage, is greater in his present industry of skill than in an alternative occupation. Hence his income can be maximized by moving to areas where he can work at his old job. Among such industries and occupations are the production of electrical machinery and related machinery manufacturing, chemicals and allied products, motor vehicles and equipment and other transportation equipment, especially aircraft. All these industries have been showing a growth in the Central States region.

Another aspect of defense spending that is of a more recent nature is the new spending in areas of large available tracts of land for use as installation sites. Since movements of military personnel are also included in the census statistics, the gross migration could be affected by movements of large concentrations of defense personnel and their dependents. There is also a large employment of civilians on military installations. Generally, these areas are not predominately urban areas and so there appears to be many cases in which urbanization and defense spending are not completely related.

The Squared Multiple Relations Coefficient

The R^2 for the first set of regressions is .627 and although not extremely high, it compares favorably with those obtained in the previously mentioned studies using a similar method. When the defense spending variable was added

to the regression, the R^2 was only slightly increased to .638. However, since all of the elasticities were significant for the Central States area, the use of all the variables seems justified. In the test regression, when the urbanization variable was removed and the defense variable substituted, a R^2 of .634 was obtained suggesting that maybe for the Central States, defense spending of the origin state is slightly more important than urbanization in the origin state.

CHAPTER IV

SUMMARY AND CONCLUSIONS

Recent trends in population migration seem to show that in the 1950-1960 period, the disparity between the growth rate of the Central States and the rest of the United States decreased. This cannot be attributed to the increase in the birth rate because the Central State area has remained slightly behind the national growth rate. The belief then is that the Central States were providing a relatively greater attraction for migrants than they had previously, due primarily to the long term growth in industry and urban areas which needed large areas of cheap land, and diversification to keep up with the shift and increase of the population of the United States.

In order to determine the areas from which these migrants came, several factors were chosen which might reasonably be expected to explain the interstate migratory movements which occurred over the period 1955-1960, and the magnitude in which each of these factors exerted their influence on aggregate geographic migration into the Central States. It was found that people are greatly deterred by distance and are inclined to migrate from the nearby states. In addition, the evidence indicates that, ceteris paribus, migrants tend to come from states of low income, from states of high rates of unemployment. It was also found that migrants come from states with a high percentage of the population living in urban areas, but also important was the tendency for people to come from areas of high per capita defense spending. This proved to be an especially important variable in explaining the migration of people into Kansas.

The primary objective of this study has been to present an examination of the migratory movements into the Central State region and into each of the component Central States over the period 1955-1960 and make a comparison of the factors influencing these movements. The policy implications that come from this model are not completely clear. A reasonable point to start for any policy which is intended to encourage migration is to determine the factors which influence people's decisions to migrate. It is then possible to study the factors to determine which can be effectively manipulated to achieve the desired results.

It appears that from this study distance has been the most important factor in influencing the decisions of individuals to migrate to the Central States. Policy-makers in the Central States must seek measures that will tend to offset the adverse affects of distance. It is important for policy makers to take charge of the initiating process and see that a broad base for development is established. If the Central States are to continue to reduce their disparity in relative growth, they must provide a broad base of attraction so that a slack in any one sector of the economy will not disproportionately disrupt the growth of this area.

Appendix A

Simple Correlation Coefficients for the Central States

	$M_{ij}/\Sigma M_i$	D_{ij}	MY_i/CPI_i	E_i	UPI/P_i	U_i
D_{ij}	-.675					
MY_i/CPI_i	-.031	.242				
E_i	.126	.233	.747			
UPI/P_i	.107	.175	.669	.433		
U_i	-.261	.438	.013	-.129	-.095	
CY_i/P_i	.108	.140	.311	.179	.733	-.163

Simple Correlation Coefficients for Missouri

	$M_{ij}/\sum M_i$	D_{ij}	My_i/Cp_{ii}	E_i	Up_i/pi	U_i
D_{ij}	-.639					
My_i/Cp_{ii}	-.144	.394				
E_i	.000	.443	.746			
Up_i/pi	.140	.158	.670	.436		
U_i	-.219	.424	.011	-.166	-.076	
Cy_i/pi	.168	.037	-.314	.187	.731	-.140

Simple Correlation Coefficients for Kansas

	$M_{ij}/\sum M_i$	D_{ij}	My_i/Cp_{ii}	E_i	Up_i/pi	U_i
D_{ij}	-.751					
My_i/Cp_{ii}	-.104	.306				
E_i	.060	.223	.743			
Up_i/pi	.196	.157	.668	.427		
U_i	-.261	.432	.024	-.118	-.084	
Cy_i/pi	.226	.165	.308	.156	.738	-.126

Simple Correlation Coefficients for Nebraska

	$M_{ij}/\sum M_i$	D_{ij}	MY_i/CPI_i	E_i	UPI/P_i	U_i
D_{ij}	-.698					
MY_i/CPI_i	.055	.136				
E_i	.288	.085	.753			
UPI/P_i	.067	.187	.668	.437		
U_i	-.284	.458	.002	-.107	-.112	
CY_i/P_i	.073	.212	.310	.186	.732	-.189

Simple Correlation Coefficients for Iowa

	$M_{ij}/\sum M_i$	D_{ij}	MY_i/CPI_i	E_i	UPI/P_i	U_i
D_{ij}	-.751					
MY_i/CPI_i	.085	.140				
E_i	.167	.183	.745			
UPI/P_i	.135	.127	.669	.432		
U_i	-.340	.446	.013	-.121	-.108	
CY_i/P_i	.083	.153	.313	.187	.732	-.200

Appendix B

The New Definition of the Urban Population

According to the new definition that was adopted for use in the 1950 census, the urban population comprises all persons living in:

- a. Places of 2500 inhabitants or more incorporated as cities, boroughs, villages, or towns.
- b. The densely settled urban fringe around cities of 50,000 or more inhabitants. Although census officials recognized that smaller but similar fringes existed about cities of less than 50,000, limitations of time and budget prevented their delimitation.
- c. Unincorporated villages or other compact settlements of 2500 or more outside any urban fringe.

The remaining population is classified as rural.

The first part of the above definition is the principal component of the old definition. The establishment of a new concept of urban fringe, and the definition of all areas of this type as urban, irrespective of whether they are incorporated as cities, boroughs, villages, or towns, is the most important additional component of the new definition.

An urban fringe is regarded by the census as the thickly settled territory characterized by a closely spaced street pattern, that surrounds most medium-sized and large cities. The entire urban agglomeration, comprising the central city and its fringe, is termed as urbanized area.

The urban fringe is formally defined as follows: Proceeding outward in each direction from the boundaries of a city of 50,000 or more inhabitants, all territory is included in the urban fringe if it falls in one of the following four types and lies contiguous to an area already included in the fringe:

- "1. Incorporated places with 2,500 inhabitants or more in 1940 or at a subsequent special census conducted prior to 1950.
2. Incorporated places with fewer than 2500 inhabitants containing an area with a concentration of 100 dwelling units or more with a density in this concentration of 500 units or more per square mile. This density represents approximately 2,000 persons per square mile and normally is the minimum found associated with a closely spaced street pattern.
3. Unincorporated territory with at least 500 dwelling units per square mile.
4. Territory devoted to commercial, industrial, transportational, recreational, and other purposes functionally related to the central city.

Also included are outlying noncontiguous areas with the required dwelling unit density located within one and a half miles of the main contiguous urbanized part, measured along the shortest connecting highway, and other outlying areas within one-half mile of such noncontiguous areas which meet the minimum residential density rule."¹

¹Quoted from "Introduction," U.S. Bureau of the Census, U.S. Census of Population: 1950, Vol. II, Characteristics of the Population.

Appendix C

Gross In and Out Migration of the Population Age 5 and Over, by State,
1955-1960

State	Gross Migration		As Percent of 1960 Population	
	In	Out	In	Out
California	1,938,130	815,926	14.2	6.0
Florida	1,157,937	381,141	26.9	8.8
Texas	682,421	710,476	8.2	8.6
Illinois	615,036	740,719	7.0	8.5
New York	587,669	990,488	4.0	6.7
Ohio	572,337	634,108	6.8	7.5
New Jersey	500,253	388,519	9.4	7.3
Virginia	456,398	413,104	13.2	12.0
Pennsylvania	398,343	678,595	4.0	6.8
Maryland	346,137	259,654	12.9	9.7
Michigan	338,645	503,897	5.0	7.4
Missouri	326,402	392,242	8.6	10.4
Washington	325,230	296,185	13.0	11.3
Indiana	317,454	368,976	7.8	9.1
Arizona	312,597	150,287	28.2	13.5
Georgia	296,252	150,287	28.2	13.5
Colorado	281,000	221,851	18.5	14.6
Massachusetts	275,100	339,613	6.1	7.5
North Carolina	272,172	348,707	6.8	8.8
Tennessee	253,217	333,619	8.1	10.6
Kansas	222,659	302,548	11.7	15.9
Oklahoma	221,155	294,548	10.8	14.4
Alabama	210,596	262,270	7.4	9.2
Connecticut	205,366	169,539	9.3	7.6
Wisconsin	198,759	228,328	5.8	6.6
Minnesota	198,621	228,525	6.7	7.7
Louisiana	198,081	204,645	7.1	7.3
Oregon	197,878	202,474	12.6	12.9
Kentucky	186,765	294,336	7.0	11.0
New Mexico	182,658	139,958	22.7	17.4
South Carolina	167,847	212,717	8.1	10.3
Arkansas	152,853	218,895	10.0	13.8
Iowa	148,970	245,348	6.1	10.1
Mississippi	137,900	208,990	7.3	11.1
Nebraska	111,358	172,811	9.0	13.9
West Virginia	92,043	229,222	5.6	13.9
Utah	89,522	84,047	11.8	11.1
Nevada	78,894	57,762	31.9	23.4

Appendix C (Continued)

State	Gross Migration		As Percent of 1960 Population	
	In	Out	In	Out
Rhode Island	70,550	86,057	9.4	11.4
Montana	67,971	84,959	11.6	14.5
Maine	66,541	90,013	7.8	10.6
New Hampshire	65,448	57,246	12.3	10.2
Delaware	59,057	42,077	15.4	11.0
Wyoming	56,074	62,446	19.5	21.8
South Dakota	52,784	90,735	8.9	15.3
North Dakota	42,094	79,167	7.7	14.4
Vermont	33,268	41,873	9.7	12.2

Appendix D

The Following Cities were used to Measure Highway Mileage Between Their Respective States

-
- | | |
|------------------------------|-------------------------------|
| 1. Maine, Augusta | 25. West Virginia, Charleston |
| 2. New Hampshire, Bristol | 26. North Carolina, Raleigh |
| 3. Vermont, Montpelier | 27. South Carolina, Columbia |
| 4. Massachusetts, Worcester | 28. Georgia, Macon |
| 5. Rhode Island, Providence | 29. Florida, Orlando |
| 6. Connecticut, Hartford | 30. Kentucky, Lexington |
| 7. New York, New York | 31. Tennessee, Nashville |
| 8. New Jersey, Newark | 32. Alabama, Birmingham |
| 9. Pennsylvania, Reading | 33. Mississippi, Jackson |
| 10. Ohio, Columbus | 34. Arkansas, Little Rock |
| 11. Indiana, Indianapolis | 35. Louisiana, Baton Rouge |
| 12. Illinois, Chicago | 36. Oklahoma, Oklahoma City |
| 13. Michigan, Detroit | 37. Texas, Austin |
| 14. Wisconsin, Milwaukee | 38. Montana, Helena |
| 15. Minnesota, Minneapolis | 39. Idaho, Twin Falls |
| 16. Iowa, Des Moines | 40. Wyoming, Rawlins |
| 17. Missouri, Jefferson City | 41. Colorado, Denver |
| 18. North Dakota, Jamestown | 42. New Mexico, Albuquerque |
| 19. South Dakota, Huron | 43. Arizona, Phoenix |
| 20. Nebraska, Omaha | 44. Utah, Salt Lake City |
| 21. Kansas, Emporia | 45. Nevada, Tonopah |
| 22. Delaware, Wilmington | 46. Washington, Seattle |
| 23. Maryland, Baltimore | 47. Oregon, Portland |
| 24. Virginia, Richmond | 48. California, Santa Barbara |
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THE DETERMINANTS OF MIGRATION
TO THE MIDWEST

by

THOMAS FRANCIS ZORN
B.S.E., Kansas State Teachers College, 1966

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF ARTS

Department of Economics

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Manhattan, Kansas

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Recent trends in population migration seem to show that in the 1950-1960 period the disparity between the growth rate of the West North Central States and the rest of the United States decreased. This could not be attributed to an increase in the birth rate because the West North Central States remained slightly behind the national birth rate. There are, however, other factors such as the death rate, age composition and out-migration that may also influence the growth rate. The belief is that the West North Central States are providing a relatively greater attraction for migrants than they had previously. This was due primarily to the growth in industry and urban areas which needed large areas of cheap land, the need for diversification, and the natural shift of the population.

Four states within the West North Central Region were focused on in this study. They were Iowa, Missouri, Nebraska, and Kansas. Collectively these states were referred to as the Central States. In order to put the study in perspective, a short economic summary was presented for each of the four states in addition to a summary for the area as a whole.

It was the objective of this study to examine the factors that affected the individual decisions to move into the Central States. These factors were especially studied as to their influence on migration--the magnitude of each factor and its influence on the aggregate geographic migration into the Central States. In addition to the effects of gross migration into the Central States, a comparison was made of the effects on the four individual states within the region. Consideration was given to the causes of the similarities and differences in the migration patterns into each individual state.

The method used in this analysis was both descriptive and empirical. Several factors were chosen which might reasonably explain the gross migration of people into the Central States. Those factors chosen to act as the independent variables were distance, income, education, urbanization, rate of unemployment and defense spending. A detailed explanation was presented as to why these variables were chosen and their importance in explaining the gross migration into the Central States.

The empirical data pertaining to these factors was collected from the United States Census of Population: 1960. A step-wise multiple regression analysis was run on the data, and then a statistical interpretation of the results was made.

The results of this regression analysis were discussed in some detail. They were that distance was the most important variable used to explain migration into the Central States and each of the individual states. Second in importance was the level of education. Income was the fourth variable added in order of importance in the regression while urbanization proved to be the fifth variable with respect to its importance to the regression analysis.

For the sake of additional information and some additional clarification, defense spending was added to the regression and these results were evaluated. The defense spending variable was most significant in its contribution to gross migration into Kansas. However, with the addition of defense spending, the possibility of multicollinearity arose. Therefore, it was necessary to run some additional tests and the results showed that evidently there was some multicollinearity present throughout the entire study.

The implications for policy formulation drawn from this study were not clear. However, it was felt that there was one important factor that should be considered. If the Central States were to continue to grow, policy makers would have to initiate policies that would reduce the effects of distance upon the potential migrants.