INTERNAL MIGRATION PATTERNS IN THE MIDWEST, 1850-1960*

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One of the great sagas in American History is the massive movement of people from East to West that characterized the settlement of the vast open spaces that lay beyond the Appalachian Mountains. A good deal of mythology dealing with that movement has developed over time but beneath the overlay of distorted fact and sometimes pure fiction there is a story which has been of fascinating interest to both historian and economist. One of the major questions that rather obviously arises when one observes movement of the proportion that has occurred in the United States is what are the factors which are associated with migration of such substantial amounts between places? In this paper we will focus on that question with respect to an area of the United States we will broadly denote as the Midwest. Specifically, the term Midwest is defined to include the following states: Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas. These states comprise the "heartland" of the United States and have been the scene of many of the significant aspects of the process of American economic development. Consequently, the factors influencing the migration decisions of natives of this region are an important component of the mosaic of American economic history.

An Overview of Migration from the Midwest

The magnitude of the movement of native-born Midwesterners has been quite substantial. This can be seen from Table 1 which shows the proportion of this group living in states other than that in which they were born in various Census years. Generally speaking, this proportion is approximately one-fifth. It should further be noted that this migration has been quite diverse. Much of it has also involved movement out of the Midwest--both to the East and to the West. Some idea of the nature of the interstate movement of Midwesterners can be gathered from Table 2 which shows the state of residence in 1850 of individuals born in the Midwestern states. The data of this table reveal to

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TABLE 1: Per Cent of Native-Born Americans Residing in States Other Than State of Birth at Time of Decennial Census, Twelve Midwestern States, 1850-1960

State of Birth	Year				
	1850	1880	1900	1920	1960
Illinois	11.8	24.5	25.9	22.4	25.9
Indiana	14.5	24.7	25.5	20.5	25.5
Iowa	11.2	22.7	29.6	25.4	37.1
Kansas	n.a.	16.5	31.5	41.6	44.4
Michigan	8.1	12.8	16.6	24.1	17.4
Minnesota	n.a.	11.5	15.9	26.6	27.8
Missouri	12.0	19.1	23.2	25.9	36.5
Nebraska	n.a.	15.6	24.0	35.8	45.0
North Dakota	n.a.	n.a.	18.2	40.7	48.9
Ohio	19.5	28.5	25.9	19.6	19.8
South Dakota	n.a.	n.a.	21.3	45.2	47.2
Wisconsin	5.7	22.5	22.7	14.6	22.9

n.a. Not Available
SOURCE: U. S. Decennial Censuses, 1850-1960.

TABLE 2: State of Birth, Classified by State of Residence in 1850, Native-Born Midwesterners[a]

State of Residence	State of Birth						
	Illinois	Indiana	Iowa	Michigan	Missouri	Ohio	Wisconsin
Alabama	114	93	7	3	158	276	3
Arkansas	3,276	2,128	106	17	5,328	1,051	13
Connecticut	80	47	18	89	28	400	23
Delaware	5	19	0	12	8	54	1
Florida	8	14	0	7	7	53	3
Georgia	41	50	1	3	60	46	2
Illinois	343,618	30,953	1,511	2,158	7,228	64,219	1,095
Indiana	4,173	541,079	407	1,817	1,006	120,193	99
Iowa	7,247	19,925	50,380	521	3,807	30,713	692
Kentucky	1,649	5,898	59	59	1,467	9,985	11
Louisiana	401	414	28	68	909	1,473	7
Maine	38	5	1	19	11	68	10
Maryland	54	65	5	16	86	535	4
Massachusetts	165	60	12	122	58	593	32
Michigan	496	2,003	59	140,648	92	14,677	332
Mississippi	311	413	7	10	303	594	4
Missouri	10,917	12,752	1,366	295	277,604	12,737	123
New Hampshire	31	20	4	48	12	66	10
New Jersey	61	61	7	66	28	372	15
New York	605	415	70	1,921	173	3,743	360
North Carolina	23	67	3	2	33	48	4
Ohio	1,415	7,377	378	2,238	656	1,219,432	196
Pennsylvania	333	399	70	224	220	7,729	45
Rhode Island	15	11	9	22	13	98	6
South Carolina	6	11	0	2	3	23	0
Tennessee	872	769	30	7	920	742	8
Vermont	34	15	5	86	10	165	32
Virginia	126	288	37	33	223	5,206	11
Wisconsin	5,292	2,733	445	1,900	1,012	11,402	63,015

[a]State-of-birth data are presented only for the seven Midwest states for which sufficient data are available to conduct the analysis which is presented in this paper.

some extent the relative importance of movement within the Midwest as compared to movement to states outside the Midwest. For example, almost as many individuals born in Michigan were living in New York in 1850 as were living in Ohio. Actually, in the case of Michigan about 25 per cent of the movement out of the state was to non-Midwest states.

The Theoretical Framework

The casual empirical observations of the preceding discussion suggest that there is much to the movement patterns of Midwesterners that requires explanation. Any systematic treatment of this question requires a theoretical framework and the one we will employ in this paper is a modification of the contemporary methods of treating the phenomenon of labor mobility in a market economy. Two distinct approaches to the question of labor mobility patterns appear in the recent literature. One emphasizes differential economic advantages as an inducement to individual movement while the other places the greater stress on job opportunity considerations.[1] The differential economic advantage approach employs conventional economic theory to argue that people will be responsive to higher income levels and other factors which impose objective and subjective movement costs whenever they consider changes in their living location.[2] In the absence of any costs of movement we would hypothesize that

$$(1) \qquad M_{ij} = f(Y_j), \quad \frac{\partial M_{ij}}{\partial Y_j} > 0$$

where M_{ij} denotes the flow of people from the i^{th} to the j^{th} state and Y_j represents the income level in the j^{th} state. This is a very simple and straightforward relationship but somewhat over-simplified in that it ignores movement costs which most certainly do exist. One of the most obvious sources of such costs when geographic movement is considered is the distance which must be moved.[3] Obviously, we would expect that the greater the distance between i and j the smaller M_{ij} will be. Consequently, (1) may be modified to read

$$(2) \qquad M_{ij} = f(Y_j, D_{ij}), \quad \frac{\partial M_{ij}}{\partial Y_j} > 0, \text{ and } \frac{\partial M_{ij}}{\partial D_{ij}} < 0$$

where D_{ij} denotes the distance between the i^{th} and j^{th} state which the migrant must traverse.

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[1] A good description of this dichotimization of current views on labor mobility is contained in [8].

[2] For a much more complete description of the formal economic theory of labor mobility see [3, Ch. 11].

[3] The costs of movement associated with distance involve much more than just monetary costs of movement. Distance itself may act as a barrier to the flow of labor market information and thus impose costs of search for such information. This is argued in [4] and [5].

Expression (2) does not include all the possible variables which might be hypothesized to have an effect on M_{ij}. In particular, we have not included any variable which would reflect the influence of the availability of job opportunities. We use the symbol J_j to denote this variable and we hypothesize that the greater the value of J_j the greater the value of M_{ij}. Of course, the rationale of the job opportunity variable is that migrants will have a tendency to locate in those areas where jobs are most abundant. The precise fashion in which we choose to measure the availability of jobs will be discussed later.

At least two other variables should be included in the analysis. First, there are numerous references in the literature dealing with early patterns of migration in the United States to the importance of land as an attraction to settlers of new areas. Since we will deal with migration patterns of Midwesterners over the entire period since 1850 in this paper it is necessary to include some variable in our analysis to deal with this phenomenon. Its exact nature will also be described later.

Finally, we ought to consider in our analysis the impact of factors other than the obviously economic ones. For example, individuals might well be influenced by a desire for a physical climate similar to that in their state of birth, or a preference for a society and culture that is akin to that which one is leaving, or certain strong regional preferences. This list is not meant to be an exhaustive one. Indeed, we confess that it is quite unlikely that we could develop such a list. What we will attempt, though, is to in some fashion consider the effect of influences such as those we have enumerated in an effort to determine whether they are important in the decision making process that underlies geographic migration by Midwesterners.

The Sources of Data

Our introductory discussion has dealt with a number of factors which might be of importance in explaining the movement of individuals between geographic regions of the United States. Since our ultimate aim is to empirically test the propositions suggested by that discussion it is rather natural to ask whether the data which would be required for that purpose are available. First, of course, information describing the actual movement patterns of people will be required. This has been referred to previously (Tables 1 and 2) and they may be found in the various decennial Censuses since 1850. Fortuitously, they are available in precisely the same form in all the Censuses for native-born Americans.

The state-of-birth data are not a comprehensive measure of mobility of native Americans for at least two reasons.[4] First, intrastate movements

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[4]For a critique of the state-of-birth data see [7,pp. 57-64].

of Americans are not recorded. Accordingly, our data exclude an unknown amount of short distance migration. Second, the data only record one move for any individual. Intermediate moves are not included. For example, Thomas Lincoln (Abraham's father) was born in Virginia in 1778, moved to Kentucky in 1782, to Indiana in 1816, and finally to Illinois in 1830, where he lived until his death in 1851. Yet, the 1850 Census only records one movement, from Virginia to Illinois. While we do concede that the state-of-birth approach to mobility understates the fairly complex mobility patterns of part of the population, we nonetheless feel that the data capture the most significant point. In the case of Thomas Lincoln, for example, some factor or group of factors during his lifetime led him to move from Virginia to his final home in Illinois - and that information is recorded.

A final major objection to the state-of-birth data is that they do not measure mobility over a clearly defined span of time. The 1960 Census, for example, records not only moves made during the 1950's, but even some movement made before 1900. While the time horizon is admittedly somewhat vague, we believe that our intertemporal examination of the state-of-birth data over a protracted period of time will permit us to measure the changing relative importance of factors influencing migration, even though it is difficult to define the time dimension for any given set of data. Moreover, this time dimension feature of the data may well be more of an asset than a liability in that it gives us some measure of mobility in the early days of the United States. In the case of Lincoln père, for example, the 1850 Census records the cumulative results of three interstate movements that occurred between 1782 and 1830. These early mobility statistics provide one of the few bright lights shining in the black of what Paul David [1] calls the "statistical dark age." While the available data undeniably understate the true extent of mobility in the United States, we do not have any a priori reason for believing that this understatement introduces a systematic bias that seriously impairs the validity of our results. Indeed, we prefer to view these data as a remarkable compilation that provides us with the rare opportunity of analyzing the mobility of a key productive factor over virtually the entire history of the American Republic.

A sample of the migration data has already been presented in Table 2. In order to deal with as much of the history of mobility in the Midwest as possible in our analysis, we have chosen to use data from the 1850, 1880, 1900, 1920, and 1960 Censuses. Through 1920, these Censuses were chosen because of the availability of certain other sources of data which we felt were necessary and the 1960 Census was added for completeness of historical coverage. In all cases, the data refer to native-born Midwesterners.

Given the availability of lifetime mobility data of the form just described, we now require information relating to the factors which were suggested as possible explanations for such mobility. These are: income levels of states, distance between states, the availability of land in the various states, the availability of jobs in different states, and some device to measure the non-economic attractions between states. Per capita

income and service income per worker data are available for 1880, 1900, and 1920 from Easterlin, et al [7]. For those three Censuses we have chosen to use these data. However, there is nothing precisely comparable for 1840. The closest thing is Easterlin's 1850 estimates of per capita income by state [2]. Assuming that there were no great changes in the relative income levels in the various states between 1840 and 1850 these should prove suitable for use with the 1850 Census data. For 1960, standard state per capita income data from the Department of Commerce are used.[5]

Data describing the distance between states is rather easily obtained although the estimates are somewhat crude in that no attempt is made to adjust them for differential availability of transportation facilities. It was felt that this would involve making a large number of judgments which might cast doubt on the objective character of the analysis. Consequently, we simply measured the distance in miles between the major population concentrations of the various states and used this directly without any consideration of qualitative differences in the ease of moving from one state to another. While this may be unsatisfactory in some respects, we felt it to be the preferable course of action.

Job opportunity data are readily available from standard Census sources. We have chosen to use Easterlin's et al [7] compilation of these for 1880, 1900, and 1920 with the specific measure being total number of jobs in a state held by individuals 10 years of age and over. For 1850, we have used Census data describing the total number of workers in each of the states [11] and for 1960, total employment by state [12]. These would seem to be relatively unambiguous in their meaning and require only one further comment. While the case for including a variable measuring job opportunities is clear, the reader should be forewarned of the difficulties in interpreting the variable we have labeled J_j. The number of jobs in any state tends to be very highly correlated with population size.[6] There is real doubt, then, as to what extent the reported results for J_j in fact reflect sensitivity to job opportunities. While our variable measures employer demand for labor, the concept of job opportunity really refers to the relationship between the demand for and the supply of labor. Unfortunately, however, statistics which measure job opportunities more directly (such as unemploy-

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[5]Appearing originally in [14], we obtained these estimates from [13].

[6]In the extreme case, 1900, the zero order correlation coefficient between population size and the number of jobs was +.995. Given the attention that job opportunity is given in the mobility literature, we regarded it as preferable to use the occupational measure to a population measure. Obviously, statistical problems of multi-colinearity make it impossible to use both measures in the same equation. There is also the possibility that population effects are reflected in other variables included in the regression equations. However, an examination of the zero-order correlation coefficients suggests that there is little inter-relationship between population size of states and independent variables other than job opportunity.

ment rates) are simply not available for much of the period under consideration.[7] Moreover, to the extent our J_j variable does serve as a proxy for the size of a state, this is not completely undesirable as some account should be made of differences in population size among the states before drawing conclusions about the true relationships between the other independent variables (e.g., income and distance) and M_{ij}. Therefore, we proceed, with some caution, including the variable J_j our model.

Turning now to the matter of land availability, a number of possible measures exist. Since the land variable may also be measuring an aversion for neighbors,[8] we decided to employ a very straightforward measure-population density.[9] Simply put, we would expect land to be more readily available where population density is low and vice-versa. Admittedly, objections similar to those which can be voiced with respect to the distance data may be forthcoming here. In no way do we attempt to control for the quality of the land in question, just as we make no attempt to adjust for qualitative differences in transportation systems with the distance data. This makes our measure of land availability somewhat crude. However, the proof of the pudding in this case will be whether it contributes anything to explaining movement patterns among Midwesterners.

Finally, we are left with a pot-pourri of non-economic factors which might influence migration patterns. Some of these we listed earlier and it is these on which we will focus for they have one common element to them, namely, the notion that individuals would prefer to live in an area similar to their state of birth with respect to physical climate and social and cultural institutions. Such a possibility can be included in the analysis by defining regions which can be considered to be similar in these respects. Admittedly, this is a somewhat arbitrary process but what we have done is divide the country into three broad areas: Northern, Temperate,

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[7]The only exceptions would be 1900 and 1960 for which unemployment data are available in the decennial censuses. Interestingly, these do not perform well when used as a job opportunity variable in the basic model.

[8]Hansen discusses this phenomenon in [6, Ch. III].

[9]We have defined population density for a state as population divided by total land area. An alternative specification might be land area divided into rural population. However, these are for the most part highly correlated with one another.

and Southern.[10] On the basis of these divisions we are able to create a quantitative variable which measures the impact on mobility of affinity for one's own region. The details of how this is done will be described in the section dealing with the technical problems of statistical estimation.

Estimation Techniques

To this point we have described a conceptual framework for interpreting the phenomenon of mobility among Midwesterners and indicated that data sources are available for testing the hypotheses that are suggested by that framework. These hypotheses are expressed in the following relationship:

$$(3) \qquad M_{ij} = f(Y_j, D_{ij}, J_j, P_j, A_i), \quad \frac{\partial M_{ij}}{\partial Y_j} > 0, \quad \frac{\partial M_{ij}}{\partial D_{ij}} < 0,$$

$$\frac{\partial M_{ij}}{\partial J_j} > 0, \quad \frac{\partial M_{ij}}{\partial P_j} < 0, \quad \frac{\partial M_{ij}}{\partial A_i} > 0$$

where P_j denotes population density in the j^{th} state and A_i indicates that a state has an affinity to the i^{th} state.

Clearly, a relationship as complex as that shown in (3) is quite susceptible to empirical estimation through the use of least squares multiple regression techniques. In this case we will use the logarithmic form of such regressions. This is warranted by the data and has the advantage of yielding direct estimates of the elasticity of interstate migration with respect to each of the independent variables except for the regional affinity measure, A_i. As indicated earlier, it is based on a division of the United States into three broad regions. In those cases where the movement under consideration is between states within the same broad region this variable takes the value ten and when the movement is between states in different

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[10]The Northern states are Maine, New Hampshire, Vermont, New York, Michigan, Wisconsin, Minnesota, North Dakota, South Dakota, Montana, Idaho, and Washington. The Temperate are Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, New Jersey, Delaware, Maryland, West Virginia, Ohio, Indiana, Illinois, Michigan, Wisconsin, Iowa, Missouri, Nebraska, Kansas, Oklahoma, Wyoming, Colorado, Utah, Nevada, Oregon, and California. The Southern are Virginia, North Carolina, South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Texas, New Mexico, and Arizona. Note that some states appear in more than one category. This is due to some states being quite heterogeneous in their makeup. For example, upstate New York is quite different from downstate New York.

Professors Patrick Gormely and Michael Greenwood have pointed out to us that these groupings may well reflect a simple East-West orientation to movement which is the product of the development of transportation facilities along such an axis. We have experimented with certain measures of the availability of rail transportation but they do not produce satisfactory empirical results.

regions it takes the value one. This effectively quantifies regional similarity but the coefficient which is estimated in the multiple regression analysis to measure the relationship between this variable and migration is properly interpreted as the logarithm (to the base ten) of the multiple by which migration between states is increased when they are in the same broad region. Thus, a value of .30103 for this coefficient would indicate that movement between states is twice as great when they are in the same region. In the reporting of the statistical results this logarithm will be converted directly into a multiple for the convenience of readers.

In the pages to follow a number of estimates of the elasticity of migration with respect to various variables will be reported and discussed. We have estimated the appropriate regression equations for each of seven states in 1850, 10 states in 1880, and 12 states in 1900, 1920, and 1960. In addition, the data have been pooled to produce aggregate regressions for the entire Midwest for each of the Census years. Thus, there are 58 different estimates for each coefficient.

Empirical Estimates: Individual States

The results of fitting log linear least squares regression equations to the model discussed in the theoretical section of the paper are summarized in Tables 3 through 8 for the twelve states which comprise the Midwest. In general, the regression equations do an excellent job of explaining interstate migration patterns of native born Midwesterners. Turning first to the income variable (Table 3), we find that it is significant at the five per cent level or beyond in over 85 per cent of the regressions which are reported. The best results are found in 1900 and 1960 where the income variable is significant at this level in every regression. However, even in the other years at least seventy per cent of the individual state regressions have an income variable which is significant at the five per cent level. And, if we examine the performance of the income variable over time for each state, we find that in nine of twelve states income is statistically significant in every year for which regressions are estimated. The only exceptions are Ohio, Indiana, and Illinois and in Illinois all income coefficients are significant at the ten per cent level or beyond. Further, in no case does the coefficient of the income variable have a sign other than that posited in the theoretical discussion.

The performance of the job opportunity variable (Table 4) is even more spectacular - being significant at the five per cent level in every regression equation reported. Further, the elasticity of interstate migration with respect to this variable is extremely consistent over time. In 41 of the 53 regressions which are reported it falls between 1.00 and 1.50. The tendency of this coefficient to be close to unity suggests that our earlier speculations about the job opportunity variable substituting at least in part for a population standardization measure may be well founded. If population size in a state is a significant factor in influencing migration to it, it would not be surprising to find an elasticity of migration with respect to population size of about unity. However, we cannot be certain of this. Nevertheless, we do feel that some caution needs to be exercised

TABLE 3: Elasticity of Migration with Respect to Per Capita Income, Twelve Midwestern States, 1850-1960

State	Year 1850	1880	1900	1920	1960
Illinois	1.58**	0.65**	1.14*	0.80*	1.88*
Indiana	0.45	0.32	0.60*	0.32	1.32*
Iowa	2.25*	1.25*	1.78*	2.47*	2.47*
Kansas	n.a.	0.94*	1.25*	1.75*	1.95*
Michigan	3.24*	1.13*	1.56*	1.75*	2.04*
Minnesota	n.a.	1.57*	1.81*	2.12*	2.97*
Missouri	3.23*	0.82*	1.29*	1.13*	1.68*
Nebraska	n.a.	0.90*	1.35*	2.19*	2.88*
North Dakota	n.a.	n.a.	1.59*	2.04*	3.09*
Ohio	0.31	0.43	0.69*	0.62	1.38*
South Dakota	n.a.	n.a.	1.55*	2.21*	3.41*
Wisconsin	2.44*	1.48*	2.05*	2.23*	2.24*

n.a. Not Available
*Statistically significant at 5 percent level or beyond.
**Statistically significant at 10 percent level or beyond.

TABLE 4: Elasticity of Migration with Respect to Job Opportunity, Twelve Midwestern States, 1850-1960

State	Year 1850	1880	1900	1920	1960
Illinois	1.21*	1.35*	1.42*	1.53*	1.33*
Indiana	1.10*	1.57*	1.62*	1.57*	1.36*
Iowa	1.01*	1.14*	1.22*	1.31*	1.16*
Kansas	n.a.	1.14*	1.25*	1.37*	1.29*
Michigan	0.97*	1.48*	1.38*	1.34*	1.26*
Minnesota	n.a.	0.94*	1.10*	1.21*	1.22*
Missouri	1.02*	1.32*	1.36*	1.52*	1.39*
Nebraska	n.a.	0.96*	1.20*	1.22*	1.20*
North Dakota	n.a.	n.a.	1.08*	1.14*	1.23*
Ohio	1.74*	1.82*	1.68*	1.57*	1.27*
South Dakota	n.a.	n.a.	1.14*	1.12*	1.21*
Wisconsin	1.03*	1.11*	1.25*	1.31*	1.24*

n.a. Not Available
*Statistically significant at 5 percent level or beyond.
**Statistically significant at 10 percent level or beyond.

in interpreting the job opportunity coefficients reported in Table 4.

Distance performs exceedingly well in explaining interstate migration of Midwesterners (see Table 5). In 50 of the 53 cases reported it is significant at the five per cent level with only the results for Michigan in 1920 and 1960 and Ohio in 1850 not being significant. However, even these are of the right sign. One rather obvious relationship emerges from the results shown in Table 5, namely, the tendency for the distance coefficients to become smaller over time. This will be discussed in greater detail in the next section of the paper.

Our measure of the availability of land and/or the aversion of Midwesterners to neighbors also performs quite well (Table 6). Specifically, it is significant at the five per cent level in every case except one. This suggests that the attractiveness of land and open spaces has persisted throughout the history of the Midwest. Admittedly, there is evidence of some weakening in this attraction (particularly between 1920 and 1960) but even so it is clear that as late as 1960 the density of population of states was a factor in influencing the long term migration patterns of native born Midwesterners.

Finally, we have our measure of regional affinity, A_i, the significance of which is summarized in Table 7. Clearly, this variable does the poorest of the five independent variables we have included in our analysis. Only 33 of the 53 coefficients are significant at the five per cent level (about sixty per cent) while 42 (or eighty per cent) are significant at the ten per cent level. Also, with this variable three of the coefficients actually have a sign opposite of that hypothesized in the theoretical model.[11] Interestingly, though, the great bulk of the insignificant coefficients are concentrated in 1850 and 1960. In the other years (1880, 1900, and 1920) eighty per cent of the coefficients are significant at the five per cent level and ninety per cent are significant at the ten per cent level. Again, this will be discussed further in the next section of the paper.

One last word needs to be said about the performance at the individual state level of the basic migration model we have hypothesized. Table 8 indicates the proportion of the variation in M_{ij} explained by the model for each state and year. At the worst 63 per cent of the variation is explained and at the best 86 per cent with the median explained variance being about 75 per cent. Thus, the model seems to perform quite well in explaining gross flows of Midwesterners between their state of birth and other states.

Empirical Results: The Midwest as a Whole

The results described in the preceding section are quite impressive.

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[11] A negative sign for the regional affinity variable is indicated by a value for the regional affinity factor which is less than unity.

TABLE 5: Elasticity of Migration with Respect to Distance, Twelve Midwestern States, 1850-1960

State	Year 1850	1880	1900	1920	1960
Illinois	-2.00*	-1.05*	-1.01*	-0.86*	-0.49*
Indiana	-3.82*	-1.55*	-1.18*	-0.74*	-0.38*
Iowa	-4.11*	-1.73*	-1.75*	-1.55*	-0.72*
Kansas	n.a.	-1.32*	-1.38*	-1.18*	-0.52*
Michigan	-2.58*	-0.81*	-0.54*	-0.24	-0.14
Minnesota	n.a.	-2.04*	-1.52*	-1.26*	-0.64*
Missouri	-4.05*	-1.67*	-1.50*	-0.90*	-0.52*
Nebraska	n.a.	-1.39*	-1.43*	-1.33*	-0.59*
North Dakota	n.a.	n.a.	-1.85*	-1.89*	-1.35*
Ohio	-0.53	-0.93*	-0.71*	-0.57*	-0.42*
South Dakota	n.a.	n.a.	-1.98*	-1.89*	-1.11*
Wisconsin	-2.40*	-1.56*	-1.30*	-0.96*	-0.37*

n.a. Not Available.
*Statistically significant at 5 percent level or beyond.
**Statistically significant at 10 percent level or beyond.

TABLE 6: Elasticity of Migration with Respect to Population Density, Twelve Midwestern States, 1850-1960

State	Year 1850	1880	1900	1920	1960
Illinois	-1.19*	-1.07*	-1.06*	-1.18*	-0.59*
Indiana	-0.54*	-1.29*	-1.25*	-1.12*	-0.49*
Iowa	-0.28	-0.91*	-0.99*	-1.12*	-0.90*
Kansas	n.a.	-0.84*	-0.94*	-1.16*	-0.91*
Michigan	-1.20*	-0.96*	-0.81*	-0.76*	-0.34*
Minnesota	n.a.	-0.44*	-0.63	-0.85*	-0.74*
Missouri	-0.67*	-1.19*	-1.21*	-1.31*	-0.88*
Nebraska	n.a.	-0.84*	-0.90*	-1.07*	-1.02*
North Dakota	n.a.	n.a.	-0.33*	-0.55*	-0.72*
Ohio	-1.49*	-1.26*	-1.07*	-0.95*	-0.30*
South Dakota	n.a.	n.a.	-0.48*	-0.73*	-0.84*
Wisconsin	-0.67*	-0.67*	-0.87*	-0.97*	-0.58*

n.a. Not Available.
*Statistically significant at 5 percent level or beyond.
**Statistically significant at 10 percent level or beyond.

TABLE 7: Regional Affinity Factor, Twelve Midwestern States, 1850-1960

State	Year 1850	1880	1900	1920	1960
Illinois	1.83	4.78*	2.48*	2.33*	1.10
Indiana	0.38	4.63*	2.99*	2.71*	0.99
Iowa	1.93**	4.03*	1.80*	1.15	1.54
Kansas	n.a.	3.39*	2.91*	2.10**	1.66*
Michigan	5.62*	4.21*	1.71**	1.49	0.75
Minnesota	n.a.	2.11*	3.20*	3.60*	1.89*
Missouri	1.38	2.83*	2.29*	2.37*	1.60**
Nebraska	n.a.	5.87*	2.74*	1.72**	1.58**
North Dakota	n.a.	n.a.	3.29*	2.81*	2.07*
Ohio	9.35*	8.28*	4.54*	3.28*	1.02
South Dakota	n.a.	n.a.	2.47*	2.23*	1.43**
Wisconsin	3.19**	1.51	2.46*	2.91*	1.63*

n.a. Not Available.
*Statistically significant at 5 percent level or beyond.
**Statistically significant at 10 percent level or beyond.

TABLE 8: Proportion of Variance in Gross Migration Flows from Twelve Midwestern States Explained by Basic Migration Model, 1850-1960

State	Year 1850	1880	1900	1920	1960
Illinois	.7147	.6627	.6939	.7450	.8171
Indiana	.7944	.7286	.7364	.7626	.7827
Iowa	.8545	.7765	.8295	.7943	.7260
Kansas	n.a.	.7195	.7602	.7864	.7481
Michigan	.7453	.6962	.7295	.7263	.8160
Minnesota	n.a.	.6935	.7703	.7369	.7201
Missouri	.8623	.7087	.7169	.7390	.7376
Nebraska	n.a.	.7987	.8257	.8240	.8001
North Dakota	n.a.	n.a.	.8004	.7860	.7730
Ohio	.6319	.7005	.7313	.7677	.7580
South Dakota	n.a.	n.a.	.8103	.8384	.8118
Wisconsin	.6668	.6337	.7381	.7239	.7176

n.a. Not Available.

Eighty-eight per cent of the coefficients which have been estimated are significant at the five per cent level, 92 per cent are significant at the ten per cent level, and 99 per cent have the sign hypothesized in the basic model. This argues quite strongly that this model is sound, a conclusion which is reinforced when the individual state data are pooled and an aggregate regression is estimated for the entire Midwest for each Census year explored in the analysis.[12] These aggregate regressions permit us to better examine the shifting importance of the various coefficients over time. The results of the estimation process are shown in Table 9. Twenty-five regression coefficients are shown there and every one is significant at the one per cent level or beyond. Further, at the least these aggregate regressions explain 73 per cent of the variance in M_{ij} (in 1880) while at the most 79 per cent is explained (in 1900).

Probably the most interesting aspect of the results reported in Table 9 is the clear patterns that emerge when changes in the coefficients over time are considered. First, the income variable seems to become more significant with the passage of time, particularly from 1880 through 1960. Second, the job opportunity coefficients are remarkably stable over time. We suspect this is due to the previously mentioned possibility of the job opportunity variable capturing the impact of differences in population size in the states to which migration is flowing. Third, the distance coefficient falls markedly and steadily from 1850 through 1960. This was noted earlier and we are inclined to think that the decline in the elasticity of migration with respect to this variable (from -2.18 in 1850 to -0.76 in 1960) reflects general improvements in transportation facilities as well as possible improvements in the dissemination of labor market information across great distances.[13] Whatever the cause, though, it is clear that distance is no longer the inhibiting factor with respect to movement that it once was. Fourth, as noted earlier, there appears to be some weakening over time in the strength of the appeal of a low population density among Midwesterners although it is still strong in 1960. Finally, the behavior of the regional affinity factor indicates that it has become decidedly weaker through time. In 1880 the migration flow between two states judged to be similar in nature was about three times greater simply because of that factor. However, by 1960 it was only twenty-five per cent greater. In addition, the decline in this factor has been quite steady over time.

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[12] When the data are pooled in this fashion it is necessary to standardize the observations in order to eliminate the effect of differences in the size of total out-migration from the various states. This is accomplished by introducing a scale variable which for the ij^{th} observation is simply the total number of people born in state i no longer residing there.

[13] It has been noted earlier that distance as a variable in migration models may serve as a proxy for the availability of information. For discussions of the economics of labor market search see [9] and [10].

TABLE 9: Summary of Aggregate Regression Results, Midwest, 1850-1960

Year	Regression Coefficients						
	Constant	Income	Job Opportunity	Distance	Population Density	Regional Affinity Factor	R^2
1850 -	4.47	1.82#	1.25#	- 2.18#	- 1.14#	2.94#	.7411
1880 -	3.36	1.10#	1.33#	- 1.38#	- 0.94#	2.90#	.7336
1900 -	5.18	1.46#	1.36#	- 1.22#	- 0.93#	2.23#	.7867
1920 -	6.99	1.74#	1.38#	- 1.09#	- 1.06#	1.94#	.7793
1960 -	12.14	2.43#	1.25#	- 0.76#	- 0.74#	1.26#	.7535

#Statistically significant at 1 percent level or beyond.

Conclusions

We are now in a position to summarize our general findings. Possibly the most outstanding aspect of our results is the consistency with which our basic migration model has performed over more than a century of the economic life of the Midwest. But, beyond this an examination of the coefficients of the aggregate regression equations suggests that the general tendency has been for income levels to assume increasing importance in explaining migration patterns of Midwesterners. While the other economic factors (job opportunity and distance) either decline in importance or maintain about the same influence, income becomes more significant. Further, at the same time the quasi-economic and/or non-economic elements in the migration decision making process (population density and regional affinity) have also become weaker. Thus, if one broad substantive conclusion emerges from this paper, it is that Midwesterners have become increasingly sensitive to interstate income differentials when moving between states and less sensitive to other factors.

REFERENCES

1. David, Paul A. "New Light on a Statistical Dark Age: U. S. Real Product Growth Before 1840," American Economic Review, 57 (1967) 294-306.

2. Easterlin, Richard A. "Interregional Differences in Per Capita Income, Population, and Total Income, 1840-1950," Trends in the American Economy in the Nineteenth Century, Studies in Income and Wealth, Volume 24, Princeton. Princeton University Press, 1960, 73-140.

3. Gallaway, Lowell E. "Interindustry Labor Mobility in the United States, 1957-1960," Research Report No. 18, Social Security Administration, 1967.

4. Gallaway, Lowell E. "Geographic Labor Mobility in the United States, 1957-1960," Research Report No. 28, Social Security Administration, 1969.

5. Gallaway, Lowell E. "Industry Variations in Geographic Mobility Patterns," Journal of Human Resources, 2 (1967), 461-74.

6. Hansen, Marcus Lee. The Immigrant in American History. Cambridge: Harvard University Press, 1940.

7. Lee, E. S., A. R. Miller, C. P. Brainerd, and R. A. Easterlin. Population Redistribution and Economic Growth, United States, 1870-1950, Methodological Considerations and Reference Tables. Philadelphia: American Philosophical Society, 1957.

8. Raimon, Robert L. "Interstate Migration and Wage Theory," Review of Economics and Statistics, 49 (1962), 428-38.

9. Stigler, George J. "The Economics of Information," Journal of Political Economy, 69 (1961), 213-25.

10. Stigler, George J. "Information in the Labor Market," Journal of Political Economy, 70 (1962), 94-105.

11. U. S. Department of Commerce, Bureau of the Census, Census of Population, 1850.

12. U. S. Department of Commerce, Bureau of the Census, Census of Population, 1960.

13. U. S. Department of Commerce, Statistical Abstract of the United States, 1962.

14. U. S. Department of Commerce, Office of Business Economics, Survey of Current Business.