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MIGRATION FLOWS AND THEIR DETERMINANTS: A COMPARATIVE STUDY OF INTERNAL MIGRATION IN ITALY AND THE U.S.A.

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Abstract

This paper has two goals: first, to describe a theoretical model which derives relationships among migration decisions explicitly from utility maximization under uncertainty; and second, to examine why nations vary in their internal migration. To explain variation in internal migration, we hypothesize that the degree of monetization and industrialization of an economy is inversely related to the family cohesiveness; hence, a given percentage increase in relative income will have higher migratory effect in a relatively more monetized economy. The availability of higher initial information and better transportation systems in these economies strongly complement this effect. These typotheses are confirmed by estimates based on the U.S. and Italian data.

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Section One: Introduction

Henry Shryock in his monumental work, Population Mobility Within the United States stated that:

> "One frequently reads statements in popular publications or even in the literature of Social Science, that Americans are the most mobile people in the world and that they are more mobile now than ever before in their history. Actually statistics do not exist to prove or disprove these statements." (23, p. 116).

In the last few years, however, statistics that can be used to answer these questions have become available. Long (13) using the rate of residential mobility i.e., the probability of changing house or usual address during an interval of one year, concludes that the expected number of moves for an American during his expected life time are 13.64. Similarly, a resident of England and Wales could anticipate 8.35 moves over his expected life time and a resident of Japan could anticipate 4.90 moves over his life time. Since Professor Long was mainly concerned with the problem of measuring volume of geographical mobility that would permit comparison between countries, he does not provide any answer to a question, "Why nations vary in the amount of geographic mobility within their borders?" In this paper we will attempt to answer this question.

This paper has two main goals. First, to describe a theoretical model which derives relationships involving migration decisions explicitly from utility maximization under uncertainty, and second, to examine why nations vary in their internal migration.[1] Section two of this paper deals with the

[1] As an explanation of migratory behavior, hypotheses of economic incentives arising from disequilibra across the spatially separated labor markets, imply some theoretical concern, but are not derived explicitly from any body of organized theory. See Lowry (14), Sjaastad (24), Ravenstein (19) and Bowles (5).

first goal. Section three deals with the proper specification of this model in an estimable form and its estimate using the data on inter-regional migration for the U.S. and Italy. To explain variation in the internal migration (our second goal) we hypothesize that the degree of monetization and industrialization of an economy is inversely related to the family cohesiveness; hence, a given percentage increase in relative income will have higher migratory effect in relatively more monetized economy. The availability of higher initial information and better transportation system in these economies strongly complement this effect. These hypotheses are confirmed by the estimates based on the U.S. and Italian data and are discussed in section four. Concluding remarks are presented in section five.

Section Two: Migration Under Uncertainty[2]

Let us begin with a potential migrant who is located in region i and who plans to move to some other region, say, j. If he remains in region i, the present value of the expected real income V_i^*, over the planning period of P years is:

$$V_i^* = \int_o^P (y_{it}/C_{1it})e^{-\delta_i t}\, dt \quad , \tag{2.1}$$

where y_{it} is the expected value of his earnings in region i at time t, C_{1it} is the cost of living index for region i and δ_i is the discount rate associated with region i.[5]

If he were to move to region j, the present value of the expected real income V_j^*, over the planning period P is:

$$V_j^* = \int_o^P \left[(y_{jt}/C_{1jt}) - C_{2ijt} \right] e^{-\delta_j t}\, dt \quad , \tag{2.2}$$

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[2]For a thorough discussion of migration under uncertainty, see Arora (1) and Arora and Brown (2).

where, as before, y_{jt} is the expected value of his earnings in region j at time t, C_{1jt} is the cost of living index for region j, δ_j is the discount rate associated with region j and C_{2ijt} is the fixed cost of moving from region i to j plus the cost of relocation.[3] Clearly, C_{2ijt} is non zero but will only be realized if he actually moves to region j.[4] Relationships (2.1) and (2.2) assume that a) each migrant has full information concerning the employment situation in the initial and the terminal location and b) there is no uncertainty involved with respect to job availability and migrant is sure to be gainfully employed at the prevailing real wage rate in the initial and the terminal location. To take these uncertainty factors into account, we can write the corresponding equations for $\bar{V}_j^*$ under uncertainty as follows:

$$(2.3) \qquad \bar{V}_j^* = \int_o^P p(\lambda_t) \, [Y_{jt}/C_{1jt}) - C_{2ijt}] e^{-\delta_j t} \, dt \quad ,$$

where $p(\lambda_t)$ is the probability of having a job in region j at period t.[5] It is a function of an information variable, λ_t, which depends upon initial information obtained from friends and relatives and the information, which is a function of time, obtained after migrating to the terminal location.[6]

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[3]Our underlying behavior model is formulated with reference to permanent income theory rather than to the theory of wage differentials. See also Raimon (18).

[4]Following Larry Sjaastad, we assume that cost of relocation in region j includes direct monetary outlays incurred in the course of relocation for such items as food, shelter and transportation as non-monetary aspects to the cost of resettling such as psychic cost, which reflects the individual's reluctance to leave familiar surroundings, friends and relatives. See Sjaastad, Larry op. cit. pp. 84-85

[5]We assume that there is no uncertainty involved with income earned at home. This assumption can be easily relaxed. See Todaro (28).

[6]In Todaro's model information gained after locating in region j plays no part. In his model selection procedure is random, but in our model selection procedure is non-random and probability of being selected is a function of his stay. Todaro op. cit., p. 148, fn. 8.

$p(\lambda_t)$ has the following properties:

(2.4) $$p(\lambda_{t=o}) = p(\lambda_0) \geq 0 \quad .$$

(2.5) $$p(\lambda_{t=\infty}) = 1 \; .$$

(2.6) $$\frac{\partial \lambda_t}{\partial_t} > 0 \text{ and } \frac{\partial p(\lambda_t)}{\partial \lambda_t} > 0 \quad .$$

We can easily conceive of a situation under which the income differentials $(V_j^* - V_i^*)$ in the certainty case is positive, while the expected differentials $(\overline{V}_j^* - V_i^*)$, in the uncertainty case is negative.[7]

Let P_i be the time he plans to spend in region i and P_j the time he plans to spend in region j such that

(2.7) $$P_i + P_j = P \quad .$$

The present value of the expected real income in region i over the time period P_i is

(2.8) $$V_i = \int_o^{P_i} (Y_{it}/C_{1it})e^{-\delta_i t} \; dt.$$

Similarly, the present value of the expected real income in region j over the time period P_j is

(2.9) $$\overline{V}_j = \int_{P_i}^{P} p(\lambda_t)(Y_{jt}/C_{1jt} - C_{2ijt})e^{-\delta_j t} \; dt.$$

Clearly V_i^* and $\overline{V}_j^*$ are the maximum values of V_i and $\overline{V}_j$, respectively.

The problem for the potential migrant is to derive demand equations for P_i and P_j (if he moves). From another point of view, one could regard the

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[7]For the proof of this preposition see Arora, Swarnjit S. and Murray Brown, op. cit. pp. 9-11.

problem as the derivation of offer curves for time spent in i and j. We assume that the potential migrant maximizes his utility

$$(2.10) \qquad U = U(A_i V_i,\ A_j \overline{V}_j) \quad ,$$

subject to constraint $P_i + P_j = P$; A_i and A_j are the factors of augmentation. For example, these factors could reflect degree or urbanization, the quality of life at location i and j respectively.[8]

Because of the probability term involved in the integral in (2.9), the expression for P_i and P_j are very complicated. To illustrate our point, we will consider a simple example, in which we assume that the real income (net of relocation cost in region j) is expected to grow at constant rates β_i and β_j in the location i and j, respectively, and that the probability function has a special form $p(\lambda_t) = (1-e^{-\lambda t})$; λ_t as before, is the sum of information available from friends and relatives etc., say α_0, plus the information procurred by staying at the new location, say α_{1t}; i.e., $\lambda_t = \alpha_0 + \alpha_{1t}$. Let us further assume that $0< \alpha_0, \alpha_1 < 1$. At time $t = 0$, $p(\lambda_t) = 1-e^{-\alpha_0}$ and at time $T = \infty$, $p(\lambda_t) = 1$.

If $\overline{y}_{i0}$ be the real value of expected income in the initial period and β_i be the rate of growth of this income, we can write (2.8) as

$$(2.11) \qquad V_i = \int_o^{P_i} \overline{y}_{io}\ e^{\beta_{it}}\ e^{-\delta_{it}}\ dt.$$

Integrating (2.11) over the range 0 to P_i we have:

$$(2.12) \qquad V_i = \frac{\overline{y}_{i0}}{\beta_i - \delta_i}\,(e^{(\beta_i - \delta_i)P_i} - 1) \quad .$$

Applying exponential expansions we get:

$$(2.13) \qquad V_i = \overline{y}_{i0} P_i + \frac{\overline{y}_{i0} P_i^2 (\beta_i - \delta_i)}{2!} + \overline{y}_{i0}\,\frac{P_i^3 (\beta_i - \delta_i)^2}{3!} + \ldots$$

[8]See Somermeyer (25) and Burmeister and Dobell (7).

Now both β_i, the rate of growth of real income, and δ_i, the discount rate, lie between zero and one. If $\beta_i = \delta_i$, then:

$$(2.14) \qquad V_i = \overline{y}_{i0} P_i$$

But if $\beta_i = \delta_i$, the terms containing $(\beta_i - \delta_i)$ and its powers are of the second order of smalls. Hence, for all practical purposes, we shall assume that (2.14) holds.

Using the expressions for the probability function and for the rate of growth of real income, the present value of the expected income (net of the relocation cost) in the terminal location over the period P_j is:

$$(2.15) \qquad \overline{V}_j = \int_{P_i}^{P} (1 - e^{-(\alpha_0 + \alpha_1 t)})\, \overline{y}_{j0}\, e^{\beta_j t - \delta_j t}\, dt \quad ,$$

where $\overline{y}_{j0}$ is the real value of the expected income in the period zero. On simplifying we get:

$$(2.16) \qquad V_j = y_{j0} \int_{P_i}^{P} e^{(\beta_j - \delta_j)t}\, dt - \overline{y}_{j0}\, e^{-\alpha_0} \int_{P_i}^{P} e^{(\beta_j - \alpha_1 - \delta_j)t}\, dt \quad .$$

Integrating (2.16) over the range P_i to P we have:

$$(2.17) \qquad \overline{V}_j = \frac{\overline{y}_{j0}}{(\beta_j - \delta_j)} \left[e^{(\beta_j - \delta_j)\, P} - e^{(\beta_j - \delta_j)\, P_i} \right]$$

$$- \frac{\overline{y}_{j0}\; e^{-\alpha_o}}{(\beta_j - \alpha_1 - \delta_j)} \left[e^{(\beta_j - \alpha_1 - \delta_j)\, P} - e^{(\beta_j - \alpha_1 - \delta_j)\, P_i} \right].$$

Applying exponential expansions we get:

$$\overline{V}_j = y_{j0}\ P + \frac{\overline{y}_{j0}P^2(\beta_j - \delta_j)}{2!} + \ldots \tag{2.18}$$

$$- \overline{y}_{j0}P_i - \frac{\overline{y}_{j0}P_i^2(\beta_j - \delta_j)}{2!} - \ldots$$

$$- \overline{y}_{\ j0} \left[1-\alpha_0 + \frac{\alpha_0^{\ 2}}{2!} + \frac{\alpha_0^{\ 3}}{3!} - \ldots \right] x$$

$$\left[P + \frac{P^2\ (\beta_j - \alpha_1 - \delta_j)}{2!} + \ldots - P_i \frac{P^2\ (\beta_j - \alpha_1 - \delta_j)}{2} - \ldots \right] .$$

Following the same arguments as for V_i in (2.14), we can say that the terms containing $(\beta_j - \delta_j)$ and its powers, $(\beta_j - \delta_j - \alpha_1)$ and its powers, and the term $\alpha_0^{\ 2}$ and its higher powers are of the second order of smalls. An approximate expression for $\overline{V}_j$ is:

$$\overline{V}_j = \overline{y}_{j0}\ P_j - (1 - \alpha_0)\ \overline{y}_{j0}\ P_j \tag{2.19}$$

or

$$\overline{V}_j = \alpha_0\ \overline{y}_{j0}\ P_j \tag{2.20}$$

The first term on the right hand side of (2.19) represents real income under certainty (to a first order approximation) and the second term (again to the first order approximation) represents real income lost due to uncertainty.

In equations (2.14) and (2.20) $\bar{y}_{i0}$ and $\bar{y}_{j0}$ are independent of P_i and P_j respectively. If we first assume that the utility function is of a CES type we can write:

$$(2.21) \qquad U = \left[k\, A_i^{-\alpha}\, \bar{y}_{i0}^{-\alpha}\, P_i^{-\alpha} + (1-k) A_j^{-\alpha}\, \alpha_0^{-\alpha}\, \bar{y}_{j0}^{-\alpha}\, P_j^{-\alpha} \right]^{\frac{1}{\alpha}}$$

where k is the intensity parameter -- that is, the larger is k relative to (1-k), <u>ceteris paribus</u>, the more utility is yielded by A_iV_i relative to $A_j\bar{V}_j$. It is defined in the interval $0 < k < 1$ and $\sigma = \frac{1}{1+\alpha}$ is the elasticity of substitution of V_i for V_j. It is important to note that to allow either P_i or P_j to be zero and still allow for positive utility (i.e., $U(A_iV_i, 0) \neq 0$ and $U(0, A_j\bar{V}_j) \neq 0$) we must assume that $\sigma > 1$.[9] In short, if the potential migrant chooses to spend all of the planning period in one location, then the elasticity of substitution must exceed unity.

Maximizing (2.2.) subject to $P = P_i + P_j$, we get:

$$(2.22) \qquad P_j = \frac{(1-k)^{\sigma}\, A_j^{\sigma-1}\, \alpha_0^{\sigma-1}\, \bar{y}_{j0}^{\sigma-1}}{(1-k)^{\sigma}\, A_j^{\sigma-1}\, \alpha_0^{\sigma-1}\, \bar{y}_{j0}^{\sigma-1} + k^{\sigma} A_i^{\sigma-1}\, y_{i0}^{\sigma-1}}\, P \quad ,$$

and

$$(2.23) \qquad P_i = \frac{k^{\sigma} A_i^{\sigma-1}\, y_{i0}^{\sigma-1}}{(1-k)^{\sigma}\, A_j^{\sigma-1}\, \alpha_0^{\sigma-1}\, y_{j0}^{\sigma-1} + k^{\sigma} A_i^{\sigma-1}\, y_{i0}^{\sigma-1}}\, P \quad .$$

Assuming as before that $\sigma > 1$, we can show

$$(2.24) \qquad \frac{\partial P_j}{\partial \bar{y}_{j0}} > 0, \; \frac{\partial P_j}{\partial A_j} > 0, \; \frac{\partial P_j}{\partial \alpha_0} > 0, \; \frac{\partial P_j}{\partial P} > 0, \; \frac{\partial P_j}{\partial \bar{y}_{i0}} < 0, \; \frac{\partial P_j}{\partial A_i} > 0.$$

[9] See Brown and Heien (6).

Similarly

$$(2.25)\qquad \frac{\partial P_i}{\partial \bar{y}_{i0}} > 0,\ \frac{\partial P_i}{\partial A_i} > 0,\ \frac{\partial P_i}{\partial P} > 0,\ \frac{\partial P_i}{\partial \alpha_0} < 0,\ \frac{\partial P_i}{\partial \bar{y}_{j0}} < 0,\ \frac{\partial P_i}{\partial A_j} < 0.$$

The relations in (2.24) indicate that the amount of time an individual plans to stay in region j varies directly with:

(i) the initial value of the expected real income in region j,

(ii) the factors of augmentation in region j,

(iii) the total planning period

(iv) the initial information, α_0. This indicates that the initial information is important at the time of decision making to migrate. The information obtained after migrating, α_1, will help in getting a job, but it is of secondary importance in the decision to move. Note, α_1 does not appear in the final expression for $\bar{V}_j$ in (2.19). Also term for initial information, α_0 (to the first order approximation) is independent of the form of the probability function assumed.

His planned period of stay in region j varies inversely with:

(i) the real value of the present income in region i,

(ii) the factors of augmentation in region i.

Similar interpretations can be give to the relation (2.25).

It is a simple matter to generalize the model to many regions by specifying an S Branch utility function (cf. Brown-Heien, op. cit.). In that case, the estimating form is identical to the one we have specified. However, this assumes that the elasticity of substitution between any pair of regions is identical to that of any other pair. Clearly, this is not as general as one would like. Thus, we have experimented with more general utility functions (S_1 and S_2) -- namely, we have assumed that the original region is in one branch, while all other regions are in a second branch.

There is no difficulty in deriving demand equations from that specification, but they are very difficult to estimate. It is our feeling, however, that the generalization of the present model should proceed in a different direction, i.e., toward a dynamic specification, so that decisions to move at time t are not independent of economic conditions occurring at t-1, etc.

Section Three: Aggregation Procedure and Estimation Results

From Equation (2.22) and (2.23) the nth potential migrant's demand equation for his planned stay in region j under uncertainty is:

$$(3.1)\quad P_{nj} = \left[\frac{1-k}{k}\right]^{\sigma} \left[\frac{\bar{y}_{nj0}}{\bar{y}_{in0}}\right]^{\sigma-1} \left[\frac{A_{nj}}{A_{ni}}\right]^{\sigma-1} \alpha_{nj0}^{\sigma-1}\; D_{ij}^{\sigma-1}\; P_{ni}$$

$$(n = 1, 2, \ldots, N).$$ [10]

where, to repeat

P_{nj} is the time that the nth potential migrant in region i plans to spend in region j

$\bar{y}_{nj0}$ is the value of the real income expected by the nth migrant in region j in the initial period

A_{nj} are the factors of attractiveness for the nth migrant in region j

α_{nj0} is the amount of initial information possessed by nth migrant about region j

D_{ij} Distance between region i and region j

P_n is the total planning period of nth migrant such that $P_n = P_{ni} + P_{nj}$

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[10] In order to make $\bar{y}_{nj0}$ (which is net of relocation cost in equation (2.2) conceptually comparable to $\bar{y}_{ni0}$ we add the relocation cost to $\bar{y}_{nj0}$ and treat D_{ij}, the distance variable, as a proxy for the relocation costs.

P_{ni}, $\bar{y}_{ni0}$ and A_i are the corresponding variables for region i and the subscript n refers to the value of nth micro unit in region i and n = 1, 2, ..., N.

Clearly equation (3.1) is linear in logarithms. Due to the specific form of the utility function, the coefficients of $\bar{y}_{nj0}/\bar{y}_{ni0}$, A_{nj}/A_{ni} and α_{nj0} are identical, but in a more general model these coefficients may differ. To obtain a regional demand equation we aggregate (3.1) over all n, n = 1, 2, ..., N. The aggregation procedure for various variables and their proxies are described below.

Variables P_{nj} and P_{ni}

Let us assume that nth individual has a planning period of P_n years; of this period he plans to spend P_{ni} years in region i and P_{nj} years in region j such that $P_{ni} + P_{nj} = P_n$. The total planned stay in region j of all N individuals is $\sum_{n=1}^{N} P_{nj}$ and the number equivalent of people migrating to region j for the planning period $\bar{P}$ is $\sum_{n=1}^{N} P_{nj}/\bar{P}$. We take M_{ij}, the number of people actually migrating from region i to region j, as a proxy variable for it. Similarly, the equivalent number of people from region i planning to stay in region i is $\sum_{i=1}^{N} P_{ni}/\bar{P}$. We take M_i, the actual population after migration as a proxy for this variable.

Real Income Variables $\bar{y}_{nj0}$ and $\bar{y}_{ni0}$

In the individual case, each potential migrant evaluates the earning differentials he expects between regions. The level of his nominal earnings at each site is related to his education level and his skills. In the aggregate, however, the total reaction of the group is sum of all the individual reactions to their respective earning differentials between the regions. The average earning differentials at the regional level are used as a proxy for these variables.[11] The bias resulting from average rather than geometric means is assumed to be of a random nature.

Augmentation Variables A_{ni} and A_{nj}

These variables reflect the psychic returns associated with region i and region j. This clearly is a positive attraction of "city lights" and (possibly) climate but also the economic attractiveness of more developed regions offering better job opportunities. These psychical reasons to move and returns from move vary from person to person. In the aggregate, per capita local government expenditures on health, highways, welfare, police, etc. are taken as proxy for these factors.[12]

Initial Information Variable α_{nj0}

Migration from region i to region j is a function of the initial information that potential migrants may obtain from friends, relatives and other media. Due to the non-availability of data on these items, we use information about the labor market, i.e., percentage of labor force employed, as a proxy variable.

Distance Variable D_{ij}

Distance is used as a proxy for the money cost of moving and relocation. At the aggregate level, the relevant measure of it should ideally take into account the spatial distribution of the population in both the origin and the terminal location. Therefore, it is necessary to choose a point in a region

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[11] Note that even if the region j has a higher average income than region i, the variation around these average incomes may imply that for some people region i offers better income opportunities than region j. Thus it is possible to have bidirectional flows. See also Vanderkamp (34).

[12] Use of per capita local government expenditure as a proxy for the factors of augmentation may be questionable. It may reflect a poor level of living rather than high level. In absence of any better index, we will use this but we cannot put much faith in this proxy. This may be one of the reasons for the coefficient

which approximates the geographic centre of a region. In the case of the U.S., due to the physical compactness of the Standard Metropolitan Statistical Areas (SMSA's), the distance between main cities of the SMSA is taken as a proxy for it and in the case of Italy the distance between main cities of the region is taken as a proxy for it.

To summarize the discussion of this section, the aggregate model can be written as:

$$(3.2) \qquad \log M_{ij} = \beta_0 + \delta_1 \log \frac{\bar{y}_j}{\bar{y}_i} + \delta_2 \log \frac{A_j}{A_i} + \delta_3 \log \alpha_{0j}$$

$$+ \delta_4 \log D_{ij} + \delta_5 \log M_i \qquad (i, j = 1, 2, \ldots, N, \; i \neq j)$$

where,

M_{ij} is the number of people migrating from region i to region j

$\bar{y}_j$ is the average real earnings in region j

A_j is the per capita local government expenditure on health, welfare, police, etc., in region j

α_{0j} is the percentage of labor force employed in region j

D_{ij} is the distance between region i and region j

M_i is the population of region i

$\bar{y}_i$ and A_i are the corresponding variables for region i and β_0, δ_1, δ_2, ..., δ_5 are the coefficients to be estimated.

Estimation Results for U.S.

Using the data on interregional gross migration flows for the 19 SMSA's (19 x 18 observations), the ordinary least square estimate of (3.2) is:

$$\log M_{ij} = \underset{(0.70)}{2.83} \log \frac{y_j/c_j}{y_i/c_i} + \underset{(0.103)}{0.154} \log \frac{A_j}{A_i} + \underset{(0.17)}{0.80} \log \alpha_{0j}$$

(3.3)

$$- \underset{(0.062)}{0.505} \log D_{ij} + \underset{(0.081)}{0.94} \log M_i \qquad R^2 = 0.9810$$

Figures in the parentheses are the standard errors.[13]

Estimation Results for Italy

Using the data on interregional gross migration flows for the 19 regions (19 x 18 observations), the ordinary least square estimates of (3.2) is:

$$\log M_{ij} = \underset{(0.123)}{0.72} \log \frac{y_j/c_j}{y_i/c_i} + \underset{(0.163)}{0.084} \log \frac{A_j}{A_i} + \underset{(0.068)}{0.11} \log \alpha_{0j}$$

(3.4)

$$- \underset{(0.088)}{1.24} \log D_{ij} + \underset{(0.070)}{0.89} \log M_i \qquad R^2 = .9711$$

Figures in parentheses are standard errors.[14]

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[13] Data on cost of living limits our sample to 19 SMSA. Data on M_{ij} were called from the U.S. Census of Population, 1960, Final Report PC(2)-C, Mobility for Metropolitan Areas, pp. 16-31. Data on nominal earnings were taken from the U.S. Census of Population, 1960, United States Summary, Vol. 1, Part 1, pp. 796-797. Data on cost of living for 19 large cities, for the year 1959 were taken from the Department of Labor, Bureau of Labor and Statistics and published in the Monthly Labor Review, August 1960. Data on unemployment rate (100-E) for the year 1958 were taken from Manpower Report of the President, 1963, Table D-6, pp. 174-176. Data on distance D, highway milage were taken from Sun's World Almanac and Book of Facts. Data on the proxy for factors of augmentation, i.e., local government expenditure, were taken from the U.S. Bureau of the Census Report, Compendium of City Government Finances, An Annual Report.

[14] Data for the Italian Model were collected from Un Modello Econometrico Di Sviluppo Nazionale-Regionale Per L'Italia, Volume 2, La Quantificazione Dei Dati Di Base Del Modello Econometrico, published by Centro di studi e piani economici, Rome, Italy.

Section Four: Interpretation of the Results

All independent variables (except factors of augmentation) in the estimated model for the U.S. and Italy are significant at 0.01 level of confidence. Also, all of them are of the signs consistent with those expected from *a priori* reasoning. Migration from region i to region j is encouraged by relatively high earnings in j, higher initial information about region j and the size of the population in region i, and it is discouraged by greater distance between i and j.

The elasticity of migration from region i to region j with respect to relative real income in region j and i represents a potential migrant's reaction to interregional earnings differentials; as such it can be regarded as an indicator of development of a country. Developed countries are customarily associated with higher industrialization and monetization, and less family cohesiveness than the developing countries; therefore, there would be relatively larger movement in response to regional income differentials in developed countries as compared to the less developed countries. This hypothesis is confirmed by the estimate of income elasticity of migration for the U.S. (2.83) and for Italy (0.72).

In this model, the probability of getting a job is a function of the initial information and the information gained by staying in the terminal location. But as shown in section two above, only the initial information available at the time of decision making is of primary concern to the potential migrant, information obtained after moving will help in procuring a job, but it is of secondary importance in the decision to move. Comparison of statistics on the number of employment exchanges and advertisement expenditure on "Help Wanted" in the U.S. and Italy reveals that the flow of information is much higher in the U.S. as compared to Italy. Our estimation of the information elasticity of migration for the U.S. (0.80) and for Italy (0.11) confirms this hypothesis.

The partial elasticity of migration with respect to base population is 0.94 for the U.S. and 0.89 for Italy. These coefficients do not differ significantly from each other and, moreover, they are close to one. In the overpopulated countries one would expect this coefficient to exceed unity. Clearly, the United States and Italy are not overpopulated in this sense.

Finally, the partial elasticity of migration with respect to distance is -0.505 for the U.S. and -1.237 in Italy. Distance exerts a frictional force and tends to reduce migration. The sign of this coefficient is negative for both countries but the magnitude is quite different. It seems that the distance creates a relatively greater hindrance to migration in Italy than that to the migration in the U.S. This may be due to better highways and the transportation system in the U.S.

Section Five: Conclusion

To summarize our findings, we see that due to the combined effect of better transportation system, availability of higher initial information and perhaps weaker family ties, Americans, on the average, tend to be more mobile than the Italians. Also, due to relatively smaller resistance due to distance, Americans have a much wider horizon to choose from and they migrate to distant places. On the other hand, Italians seem to migrate over relatively short distances. Before we conclude, one word of caution is in order. Due to availability of very scanty data, these results are more of an indicative rather than a definitive nature. But the reasonableness of the estimates is encouraging for further development along these lines.

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