On Migration, Migration Costs, and Wage Differentials, with Special Reference to the United States

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There have in recent years been a number of studies which found interregional wage differentials unable to induce interregional labor migration. For example, Gallaway et al. found that interregional wage differentials exercised no apparent influence over interregional migration in West Germany. J. G. Williamson has derived similar results for a number of countries, including the United States. In yet another study, international labor migration from West Germany and the United Kingdom to the Republic of South Africa was found insensitive to variations in international wage rate differentials over time. Finally, this same conclusion was reached in an analysis of international migration from the United Kingdom to the United States.

The above findings would appear to cast doubt upon the ability of interregional and international labor markets to achieve factor price equalization through interregional and international migration. In view of this, this paper seeks to demonstrate the general proposition that there can be a substantial range of interregional (or international) factor price differentials that will not lead to interregional (international) factor flows. First, we discuss costs of migration. Next, we investigate the theoretical implications of migration costs for interregional (international) migration. Finally, we empirically investigate the relationship among migration, migration costs, and wage differentials.

Costs of Interregional Migration

At the outset, it should be noted that there ordinarily are costs involved in transferring from one region to another. We here classify the costs of inter-

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regional migration under two categories: (1) moving costs and (2) non-moving costs. Each of these classifications warrants some discussion.

Several forms of moving costs must be acknowledged. First, of course, there are the direct costs of moving. Second, the act of moving may necessitate the sale of property (especially tangible) and may thus result in certain pecuniary losses (or gains). Alternatively, costs resulting from leasing arrangements and commitments may be encountered. Next, there may be foregone earnings while in transit and/or while in the process of packing and unpacking. Beyond this, of course, there are the psychic costs of leaving familiar surroundings, as well as the psychic costs associated with the experience of moving. There may also be significant psychic costs resulting from the search for a new residence. Finally, there may be costs involved in going out and seeking employment in another region, costs that in themselves may be sufficient to inhibit labor mobility before a job offer is ever made.

There are likely to be costs to migration aside from moving costs per se. To the extent that interregional migration is accompanied by interindustry transfers of labor, there are other costs to be reckoned with. Consider, for example, two common labor market institutions: seniority and pensions. Clearly, seniority provisions, where they pertain, afford an element of job security. This job security presumably has a value. Any interindustry transfer which causes the loss of seniority benefits obviously imposes a real cost on the worker involved. In this same vein, consider the possible effect of pension plans. Should the benefits of a pension plan be nonvested and should a pension plan’s benefits be an increasing function of industry employment, another cost to migration must be recognized. Finally, interregional migration which involves interindustry transfers may impose upon the labor unit costs associated with such factors as occupational licensing and/or union membership.

In addition, to the extent that interregional migration is accompanied by occupational changes, there are retaining costs which may have to be reckoned with. These retraining costs may assume a number of forms. First, there are the direct costs of retraining, which may assume the form of tuition expenses and/or materials expenses. Second, to the extent that income is foregone during retraining per se, occupational changes involve an obvious cost to the labor units affected. Additionally, to the extent that retraining is both (a) on-the-job in nature and (b) undertaken at a below-normal wage rate, retraining involves other forms of income loss.


Moreover, there are many other potential costs which may be involved with job-search or job procurement. Such costs as search costs and/or employment agency fees must be considered. In some cases, it should be noted that the very act of job search may impose costs on the searcher in terms of diminished job security (increased probability of involuntary discharge). In addition, the opportunity costs to job search must be taken into account.\(^7\)

In light of this brief discussion, it seems reasonable to assume that there exist cost barriers to the interregional flow of labor. For simplicity (and relevance), we assume that all such costs can be translated into pecuniary terms and consequently into an absolute interregional wage rate differential which must be overcome for any interregional labor flows to take place. We refer to this differential as the “mobility cost constraint”.

**Analysis of Interregional Labor Migration**

Consider a two-region economy. We denote the regions as region A and region B. The firms in each region are assumed to employ a single homogeneous labor input. We define the “intraregional labor supply” as the number of labor units forthcoming from within a region at various alternative regional wage rates, given the wage rate as unchanged in the other region. It is assumed that the intraregional labor supply is an increasing function of the region’s wage rate. The “interregional labor supply” to a region is a result of the flow of labor units between regions in response to absolute differentials in regional wage rates. The “total labor supply” to a region is the lateral sum of the intraregional and interregional labor supplies at alternative wage rates in a region. Exogenously introduced labor demand shifts are assumed to have a source outside regions A and B and to be directable at either region alone.\(^8\)

We assume that regions A and B have identical initial labor demand curves and identical initial intraregional labor supply curves. Thus, both regions have the same initial equilibrium wage rates and employment levels. Region A’s labor market is shown in Figure 1 (a), and region B’s labor market is shown in Figure 1 (b), with an initial equilibrium at points \(a\) and \(g\). Given this situation,


we must now identify the mobility cost constraint developed above. Using points $a$ and $g$ for reference points, we assume that the mobility cost constraint is given in Figure 1 by the distance (amount) $st$. No labor movement from region B to region A will occur until the wage rate differential between the regions exceeds the amount $st$. Similarly, no labor flow from A to B will take place until the wage rate in A falls by more than the amount $su (su = st)$, ceteris paribus.

Postulate a rise in the demand for labor in region A from $D_1D_1$ to $D_2D_2$, holding region B's labor demand curve unchanged. Equilibrium in region A drifts from point $a$ to point $b$. Since the interregional wage rate differential does not overcome the mobility cost constraint, A's intraregional labor supply continues to be the curve $S_1S_1$. Thus, points $a$ and $b$ both lie on A's total labor supply curve. Had region A's labor demand curve shifted from $D_1D_1$ to $D_3D_3$, equilibrium in region A would have drifted from point $a$ to point $c$. Since the interregional wage rate differential would fail to overcome the mobility cost constraint, A's intraregional labor supply curve would remain at $S_1S_1$. Point $c$ thus is another point on A's total labor supply curve. It follows that had region A’s labor demand curve shifted from $D_1D_1$ to any intersection point along $S_1S_1$ between points $a$ and $c$, such an intersection would also lie on A’s total labor supply curve. It follows, therefore, that all points on $S_1S_1$ between $a$ and $c$ (inclusive) lie on A’s total supply of labor curve.

Now let region A’s demand curve for labor rise from $D_1D_1$ to $D_4D_4$, holding B's labor demand curve unchanged. Initially, the wage rate in A will rise toward point $d$, and, since the interregional wage rate differential exceeds the amount of the mobility cost constraint, labor units will flow from region B to region A. This has the effect of shifting A’s intraregional labor supply curve to the right (and B’s to the left). Labor units will continue to flow from B to A until an interregional wage rate differential equal in amount to $st$ is established at some points such as $e$ in region A and $h$ in region B. Point $e$ is another point on region A’s total labor supply curve.

With equilibrium at point $e$, once again the mobility cost constraint must be identified. Consider a decline in A’s labor demand (B’s being held constant), after the establishment of equilibrium at point $e$. The wage rate in A will have to decline below the wage rate in B by an amount greater in magnitude than the value $st (st = su)$ before labor units will flow from A to B. In Figure 1, this marginal point below which interregional labor movement from A to B will now take place is given by point $f$. In short, region A’s labor demand curve must decline below $D_5D_5$ before labor units will flow from A to B. Obviously, in Figure 1, all points along $S_2S_2$ between $e$ and $f$ and including $e$ and $f$ are on A’s total labor supply curve. Below $D_5D_5$, region A’s total labor supply curve will differ from its intraregional labor supply curve.
Theoretical Implications

Several important theoretical implications can be drawn from this analysis generally. To begin with, there is likely to be a substantial range of interregional wage rate differentials that will not be associated with interregional labor flows. In addition, persistent interregional wage rate differentials are entirely compatible with conventional wage rate analysis. Finally, once interregional labor flows have occurred, the range of variation which does not induce interregional labor flows will shift. For example, in Figure 1, the range shifted from bc to ef. This suggests that the sensitivity of interregional labor flows to interregional wage rate differentials may depend upon the presence or absence of systematic shifts in one direction of one region's labor demand curve. Consider Figure 1. If region A's labor demand curve continues to shift to the right beyond $D_4D_4$, labor movement from B to A will take place pari passu. But should the labor demand shifting reverse direction, reverse labor flows from A to B may not occur and the apparent sensitivity of interregional labor flows to variations in interregional wage rate differentials may thus disappear. This suggests that where there is not a systematic growth in labor demand in one region vis-à-vis another, labor movement between the two regions may display an apparent insensitivity to wage rate differentials.

Empirical Findings – The Case of SMSA's in the United States

It remains for us to analyze empirically the above propositions. To carry out this investigation, data have been assembled from the United States 1960 decennial census describing the 1955–1960 migration patterns among Standard Metropolitan Statistical Areas (SMSA's). Since the basic theoretical argument of this paper stresses the existence (or non-existence) of systematic differences in growth in the demand for labor among areas (regions), the 15 fastest growing and the 15 slowest growing SMSA's were selected for study. The growth of SMSA's was measured in terms of percentage increases in employment between 1955 and 1960. The following mobility model is postulated:

$$M_{ji} = M_{ji} (W_i, U_i, D_{ij}, P_j, A_j, B_j),$$

where $M_{ji}$ denotes the number of individuals resident in area $j$ in 1955 living in area $i$ in 1960, $W_i$ is a measure of wage levels in area $i$ (1959 median income levels are used for this purpose), $U_i$ is the 1955 unemployment rate in area $i$, $D_{ij}$ is the distance in statute miles between areas $i$ and $j$, $P_j$ is the 1955 population of area $j$, $A_j$ is a measure of the age of the population in area $j$ (1955 median age levels were used for this purpose), and $B_j$ is the ratio of nonwhites to whites.
in the population of area $j$ (1955 data were used in these calculations). All data other than those for distance are from the 1960 decennial census. *A priori*, we would expect the following signs on the partial derivatives in (1):

\[
\delta M_{ji}/\delta W_i, \delta M_{ji}/\delta P_j > 0
\]
\[
\delta M_{ji}/\delta U_i, \delta M_{ji}/\delta D_{ij}, \delta M_{ji}/\delta A_j, \delta M_{ji}/\delta B_j < 0.
\]  (2)

A positive relationship between migration from $j$ to $i$ and wages in $i$ follows from orthodox economic theory, while $P_j$ is a simple population scalar. On the other hand, higher values for $U_i$ and $D_{ij}$ have the effect of imposing greater costs on migrants, in the form of greater uncertainty about employment possibilities and the larger costs implicit in moving greater geographic distances, respectively. The sign of $\delta M_{ji}/\delta A_j$ presumably results from the fact that the greater one's age, the shorter the time horizon available for discounting the net returns to migration. Finally, to appreciate the postulated sign of $\delta M_{ji}/\delta B_j$, first note that for the United States, generally, nonwhite median (and mean) income levels are lower than those of whites. This means that, whatever the costs of migration between area $j$ and any other area, these costs will on average impose a relatively greater monetary burden on the nonwhite than on the white. Thus, an increase in the value of ratio $B_j$ implies, *ceteris paribus*, that migration costs, on the average, impose a relatively greater economic burden on the total population in area $j$.

Conceptually, what is proposed is the estimation of log-linear regression equations of the following form:

\[
\log M_{ji} = \log a + b \log W_i + c \log U_i + d \log D_{ij} + e \log P_j + f \log A_j + g \log B_j + v,
\]  (3)

(where $v$ is an error term with zero mean and variance greater than zero) for two sets of migration data. The first involves movement only between relatively slow growing SMSA’s, and the second deals solely with migration from slow growing to fast growing SMSA’s. On the basis of the theoretical discussion above, one would expect the same set of values for the independent variables in the regressions to produce less movement between slow growing areas than between slow growing and fast growing areas. This might be reflected in the regressions either by a greater value for the coefficient associated with the wage variable in the slow to fast growing regression than in the slow to slow regression or by values for the other regression coefficients that suggest a greater sensitivity of migrants between slow growing areas than from slow to fast growing areas to the factors that impose costs on them.

The basic data for each set of SMSA’s were pooled to provide 210 observations of movement between slow growing SMSA’s and 225 observations of movement
from slow to fast growing SMSA's. The regression results are summarized in Table 1.

Clearly, there is no difference between the coefficients in the two regressions associated with the wage variable. However, marked differences appear in the other coefficients, and they are all consistent with the predictions of the theory stated above. When contemplating movement from one slow growing area to another, *vis-à-vis* movement to a fast growing area, individuals view the costs as being more substantial (observe the larger absolute values for the unemployment and distance coefficients). In addition, the lower value for the coefficient of the $P_j$ variable and the higher values for the coefficient of the $A_j$ and $B_j$ variables in the slow-to-slow regression reinforce this general tendency. Overall, this suggests that residents of slow growing areas view the costs (and benefits) of movement to another slow growing area in an entirely different light than they view movement costs (and benefits) to a fast growing area. This is quite consistent with the theoretical arguments developed above.

**Summary**

This paper has discussed generally the barriers (costs) that may exist to interregional (international) migration. It has also investigated the theoretical implications of such barriers on the interregional flow of labor, with the analysis focusing on the presence of a "mobility cost constraint". It also has empirically investigated the theoretical propositions of the model. In particular, this paper has effectively explored the possibility that, as a result of the presence of a mobility cost constraint, the pattern of movement of people between geographic areas is sensitive to the presence of systematic positive shifts in the demand for labor in one area relative to another. The theoretical section of this paper argues on theoretical grounds that this is the case, and, in general, our empirical analysis supports this view. Presumably, movement from slow growing to fast growing areas is less inhibited by the presence of the various forms of movement costs than is movement between slow growing areas. Consequently, less of a wage differential is required to produce a given amount of movement between slow and fast growing areas than is needed in the case of movement between slow growing areas. This creates the appearance of a relative insensitivity of labor migration between slow growing areas to wage rate differentials; however, this clearly is not the correct interpretation to place on the data.

Clearly, this analysis leads to the conclusion that interregional factor price equalization through the mechanism of factor migration over time seems most unlikely, although it is still feasible. This conclusion can also be derived from a framework in which migration is treated as an investment and where an
individual residing in area \( i \) chooses to migrate to area \( j \) only if the discounted present value of the net benefits associated with migration are positive. Mathematically, this is expressed by

\[ M_{ij} > 0 \text{ only if } \]

\[
\frac{B_1 - C_1}{(1 + R)} + \ldots + \frac{B_x - C_x}{(1 + R)^x} > 0,
\]

where \( B_e, e = 1, \ldots, x, \) represents the value of the benefits associated with migration from \( i \) to \( j \) for year \( e \), \( C_e, e = 1, \ldots, x, \) represents the value of the costs associated with migration from \( i \) to \( j \) for year \( e \), \( R \) is the appropriate rate of discount, and \( M_{ij} \) denotes migration from \( i \) to \( j \).
<table>
<thead>
<tr>
<th>SMSA Group</th>
<th>Wage Levels</th>
<th>Unemployment</th>
<th>Distance</th>
<th>Regression Coefficients*</th>
<th>Age</th>
<th>Ratio of Nonwhites to Whites in Area of Origin</th>
<th>R²</th>
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<td>(0.05515)</td>
<td>(0.23180)</td>
<td>(0.23430)</td>
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</table>

* Values in parentheses beneath coefficients are standard errors.
Summary

*On Migration, Migration Costs, and Wage Differentials, with Special Reference to the United States*

This paper analytically and empirically demonstrates that persistent interregional wage differentials may be entirely compatible with conventional economic theory. The methodology employed involves treatment of migration as an investment in which both the benefits and the costs of migration are weighed before the migration decision is made. The analysis considers the influence of a number of variables, including income, unemployment rates, distance, population, age, and the white-nonwhite population ratio.

Zusammenfassung

*Wanderbewegung, Wanderkosten und Lohnunterschiede (mit besonderem Bezug auf die USA)*


Résumé

*Migration, frais de migration et différences de salaires (avec référence spéciale aux Etats-Unis)*

L'article démontre, empiriquement et analytiquement, la proposition que de persistantes différences interrégionales de salaires sont compatibles avec l'analyse économique conventionnelle. L'étude empirique se base sur des dates disponibles de la migration aux Etats-Unis des années 1965–1970, les revenus par tête de la population et d'autres variables.