Propensity to Migrate Differentials by Poverty Status: An Empirical Test for Costa Rica

Manuel J. Carvajal* and Anita Upadhyaya

I. Introduction

The empirical evidence of numerous studies on human resource shifts among geographic areas indicates that migration is highly responsive to socioeconomic environmental conditions. The nature of this responsiveness has been encapsulated in a variety of theoretical interpretations that include push-pull factors (King; Lipton), investment in human capital (Carvajal and Geithman, 1974, 1976; Perkinson), the selectivity approach (Lee-Ying; Nakosteen and Zimmer; Schllottmann and Herzog, 1982), residential stress (Brummell), risk aversion (Smith), and life-cycle/work-career arguments (Graves and Linneman; Mincer; Sandefur and Scott). Like pieces of an intricate puzzle, each contribution to the literature represents a dimension of the painstaking process of identifying and measuring migration’s economic correlates. The purpose of this paper is to provide one such additional dimension, that of poor-nonpoor differential migration response to identical environmental stimuli.

Redistribution of people by region is a purposeful way in which a population responds to its perception of changing economic opportunities, seeking to maximize the present value of

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a net utility stream resulting from locational change; that is, people move in an attempt to improve their welfare by choosing a more attractive combination of locational attributes within the framework of information, financial, and time constraints. Since this process is conducive to a more efficient labor resource allocation by virtue of reducing labor surplus over time and space (Hawley, Fernandez and Singh; Salvatore), a substantial portion of poverty, especially unemployment related poverty, may be attributable to failure by the unemployed to change residence in search of opportunities elsewhere.\footnote{This failure need not be willful on the part of the individual. For example, the unemployed may not have access to information on distant job opportunities or may not afford the initial moving expense regardless of the expected stream of benefits accruing from a change of residence.} The policy implications are most profound — relocation assistance programs are justifiable only to the extent that the poor be not sufficiently responsive to socioeconomic conditions created by private markets, and that such insufficiency be a primary determinant of their poverty condition; conversely, community development initiatives almost invariably rest on the assumption that an expansion in the local level of economic activity is a more cost-effective antipoverty tool than helping people move to where the jobs are.

Central to antipoverty choices between relocation assistance programs and community development initiatives is a need to evaluate whether people follow jobs or jobs follow people (Steen-\textemdash nes). This in turn points to broader issues such as estimation of the direction and magnitude of migration response to spatial earnings and quality-of-life variations as well as likelihood of reducing interregional income disparities (Langley). Although several studies (Da\textemdash Vanzo; Schlottmann and Herzog, 1981) have addressed the specific topic of migration response of the unemployed, none has focused, to the best of our knowledge, on poor-nonpoor migration propensity differentials, except for occasional curiosity on the impact of welfare payments (Fields, 1979; Sommers).

In attempting to explore the nature of such differentials in Costa Rica, this study utilizes county-local data from the 1973 Population and Housing Censi (Direcccion General de Estadistica y Censos, 1973a, 1973b)\footnote{The last Costa Rican population and housing censi were taken in 1973. At that time the country was divided administratively into seven provinces and 79 counties.} and from a recent study on poverty (Car-
vajal, Geithman, and Armstrong) which estimates that approximately one-fourth (24.3 percent) of all households are poor. The poverty incidence is far more prevalent in the countryside (32.4 percent) than in the urban milieu (13.8 percent), with the poor exhibiting less labor force participation, greater unemployment, more illiteracy, and lower schooling indices than their nonpoor counterpart (Table 1). The nonpoor also seem to enjoy better dwelling structure, higher percentage ownership of their dwelling, and more widespread electricity and running-water services. There are no appreciable differences by poverty status in either in-migration rates or in household head's median age.

A migrant, as defined here, is a household head born in a count different from the one in which he/she was enumerated in the 1973 censi. A county's inmigration rate represents the ratio of nonnative to total household heads. Since Costa Rican international migration flows are nil, this in-migration rate is an accurate reflection of internal population shifts.

Unfortunately, available data do not permit calculation of out-migration rates, thus precluding an analysis of potential expulsion factors and forcing us to concentrate on reason why people move into certain areas without inquiring why they leave others. This deficiency, however, is mitigated by recent empirical findings whereby economic conditions at the place of destination influence decisions to move more heavily than do conditions at the place of origin (Boswell; Fields, 1979). Of course, the use of a rate, whether in- or out-migration, poses additional interpretation difficulties for it refers to the behavior of a group of people and is not necessarily applicable to any individual or household in the

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3 According to this study, poverty is defined in terms of household annual per capita income below 155 dollars at 1973 prices. The definition was suggested by the U.S. Agency for International Development and is compatible with similar USAID-sponsored studies which define the poverty line as 150 dollars at 1969 prices. See page 51 of the study.

4 Eight counties were created shortly before 1973. Household heads who had never moved from their county of birth were wrongly recorded in the censi as if they had moved, since birth and residence administrative units were no longer the same. Thus, these counties are omitted from the analysis. They are Upala, Los Chiles, and Guatuso in the province of Alajuela; La Cruz and Hojancha in the province of Guanacaste; Parrita in the province of Puntarenas; and Matina and Guacimo in the province of Limon.

5 The in-migration and out-migration rates are independent of each other. A region may record a high value on one and a low value on the other or it may exhibit either high or low values in both.
Table 1

**SUMMARY OF COSTA RICAN SOCIOECONOMIC INDICATORS IN 1973 BY URBAN-RURAL RESIDENCE AND POVERTY STATUS**

<table>
<thead>
<tr>
<th>Socioeconomic Indicators</th>
<th>Poor</th>
<th>Nonpoor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban Rural</td>
<td>Urban Rural</td>
</tr>
<tr>
<td>Labor force participation rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>66% 89%</td>
<td>84% 95%</td>
</tr>
<tr>
<td>Female</td>
<td>15% 8%</td>
<td>35% 14%</td>
</tr>
<tr>
<td>Unemployment rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>33% 16%</td>
<td>5% 4%</td>
</tr>
<tr>
<td>Female</td>
<td>9% 12%</td>
<td>2% 4%</td>
</tr>
<tr>
<td>Illiteracy rate (10 years of age plus)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>8% 17%</td>
<td>3% 13%</td>
</tr>
<tr>
<td>Female</td>
<td>10% 17%</td>
<td>4% 13%</td>
</tr>
<tr>
<td>Schooling index</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>55% 89%</td>
<td>65% 41%</td>
</tr>
<tr>
<td>Female</td>
<td>51% 39%</td>
<td>62% 42%</td>
</tr>
<tr>
<td>In-migration rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15% 17%</td>
<td>14% 19%</td>
</tr>
<tr>
<td>Household head's median age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migrants</td>
<td>41.4 42.0</td>
<td>38.2 39.0</td>
</tr>
<tr>
<td>Nonmigrants</td>
<td>46.8 44.0</td>
<td>44.9 43.6</td>
</tr>
<tr>
<td>Dwelling and services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor structural condition</td>
<td>25% 15%</td>
<td>8% 16%</td>
</tr>
<tr>
<td>Ownership</td>
<td>30% 58%</td>
<td>57% 68%</td>
</tr>
<tr>
<td>Electricity</td>
<td>87% 38%</td>
<td>96% 46%</td>
</tr>
<tr>
<td>Running water</td>
<td>96% 60%</td>
<td>98% 63%</td>
</tr>
</tbody>
</table>


Group (King). Individual migration is a discrete act measured by a dummy variable, whereas an in-migration rate, computed along a percentage scale, denotes collective action. The only way in which it would make sense to project individual outcomes based on the experience of a collectivity is by construing the aggregate model as a predictor of the probability of persons in different categories
(poor-nonpoor, urban-rural) to change residence in response to a controlled socioeconomic influence.

Since migration is a long-term process of utility maximization over space (Alperovich; Farber), with potential migrants assessing the costs and benefits of different earnings and quality-of-life opportunities in alternative locations, including their current residence, and willing to trade-off income for quality-of-life consumption (Graves; Porell), the basic research issue is whether or not poor/nonpoor, urban/rural residents possess homogeneous utility functions, perceive related benefits and costs in a similar manner, and/or have equal access to information and other constrained resources. If no significant differences exists in any of these three areas between poor and nonpoor in-migrant households adjusted by urban-rural residence, there should be no discernible disparities in their reaction to identical stimuli. Conversely, the presence of any such disparities could be symptomatic of underlying reasons why some households are poor and others are not.

Maximization of a household's long-term utility function over space involves demand for location-specific goods and services subject to the usual constraints. The price of these goods and services is reflected in interregional wage differentials for comparable labor. On the one hand, the literature is replete with evidence that migrants move predominantly from lower- to higher-income regions (Dahlberg and Holmlund; Fields, 1982; Greenwood, 1978; House and Rempel; Inoki and Suruga; Peek and Standing), merely corroborating that the most important and obvious expected direct economic benefit derived from geographic mobility is an increase in the migrant's level of income. Since migration is a form of human capital investment, it is only logical that investors' earnings streams surpass those of noninvestors. On the other hand, it also could be argued that redistribution of human resources is highly selective of dynamic, risk-taking individuals likely to climb the socioeconomic ladder regardless of their ultimate migration status; that is, people who do not migrate may possess fewer abilities, and consequently lower earnings potential, than their counterpart who venture away from

6 The demand for location-specific goods and services can be satisfied only by people residing in a place which supplies the quantity demanded of these goods and services. Please refer to Graves and Graves and Linneman for further discussion of this concept.
home. If this were the case, higher-income regions would be the effect, rather than the cause, of population shift.

Spatial wage differentials for comparable labor may persist in spite of population flows because workers take into account job opportunities as well as potential income gains in making their migration decisions. The expected returns from moving are partly shaped by the location-specific probability of finding and keeping a job, in such a way that higher unemployment at origin (destination) often has been found to encourage (discourage) migration (Dahlberg and Holmlund; Nakosteen and Zimmer; Wasow). Since unemployment reduces the opportunity cost of moving, it is not surprising to find that the unemployed have a greater propensity to migrate than do people with jobs (DaVanzo; Mincer; Navratil and Doyle). It will be recalled from Table 1 that in Costa Rica joblessness among the poor is substantially higher than among the nonpoor, which leads us to hypothesize that the in-migration rate of the destitute is more sensitive to changes in unemployment than the in-migration rate of households above the poverty line.

Various methodological problems arise when one attempts to discern the magnitude and direction of the migration-unemployment relationship. For example, King argues that the unemployment rate not only fails to capture the nature of job vacancies, but it is also distorted by the likelihood of affording a change of residence; Fields (1979) alleges that the unemployment rate is not an adequate index of an area's economic opportunities insofar as migrants are more concerned with the probability of finding a job, given their own skills, than with a existing unemployment rate for all workers in that area's labor market; and both Boswell and Garcia-Ferrer contend that out-migration is more responsive than in-migration to unemployment differentials. But perhaps the most serious criticism has been raised by DaVanzo, among others, when she notes that lack of work often is measured at the end of the migration period and, consequently,

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7 While two regions may exhibit the same unemployment rate, the one with greater number of job vacancies in relation to the population or, for that matter, the unemployed, offers a better prospect for finding work.

8 Fields (1978) suggests that measures of turnover in a labor market perform better empirically than the unemployment rate in explaining migration.
may have been affected by the ongoing population redistribution. This, in essence, is the same simultaneity paradox faced earlier with earnings, that is, whether geographic mobility is primarily a function or a determinant of unemployment.

If in-migration is solely a passive respondent to interregional unemployment disparities, the two variables would be expected to vary inversely with each other (as unemployment increases/declines, in-migration goes down/up); conversely, if it is in-migration that basically affects unemployment, a positive correlation would be expected (as in-migration increases/declines, unemployment goes up/down). Carvajal and Geithman (1974) report that in Costa Rica joblessness among migrants is significantly higher than among nonmigrants, interpreted as evidence of a frictional unemployment problem during the assimilation period following change of residence, at which time migrants are likely to be searching for better jobs and/or new occupations. This conclusion lends support to the view that unemployment is heavily affected by migration.\(^9\) In fact, it seems quite plausible that migration and employment growth are cumulative phenomena (Chalmers and Greenwood, 1980; McCarthy and Morrison) calling for a dynamic model which requires time-series data and estimation procedures. Thus, improper specification of the model (simultaneity bias) or inadequacy of the data may be largely responsible for the widespread lack of statistical significance of local unemployment rates in explaining migration (Falaris; Greenwood, 1975; Greenwood, Ladman, and Siegel; House and Rempel), as the positive and negative associations cancel each other out.

Closely related to unemployment in determining migration patterns is labor force participation, especially by women, who in Costa Rica (Carvajal and Geithman, 1974), as well as in other places (Carvajal and Geithman, 1976; Herold; House and Rempel), are characterized by their rural out-migrant and urban in-migrant status. Since income returns from migration tend to be smaller for women who exhibit discontinuous work attachment, the higher a region's female labor force participation rate is relative to elsewhere, the greater will be the presence of female

\(^9\) For a more ample discussion of the effect of migration on unemployment refer to Oberai 240-241.
migrants in that region and, other things equal, the greater will be the in-migration rate.

If projected utility is broadly defined to include not only expected earnings and likelihood of employment but also availability of public services (health and educational facilities, access to running water, etc.) and other quality-of-life components, one should get a more comprehensive view of propensity-to-migrate determinants. Education has been linked to redistribution of human resources in numerous recent studies (Bartel; Browne; Herzog and Schlottmann; Rogers and Williamson). Presumably it has a positive effect on the conditional probability of moving to the extent that it increases awareness of job opportunities in alternative places, makes people more adaptable to change, and reduces risk aversion.

Migrant's educational selectivity is usually reflected in the out-migration rate (Allman and May; Cebula, 1981; Greenwood, 1975) — the higher the educational level of a region's residents, the greater will be expected out-migration. Of special relevance here is the poor's migration response to schooling opportunities, since it has been argued that they often refuse to leave areas with high educational expenditures, thus utilizing these funds to increase employment opportunities.10 If the converse were also true, it would be reasonable to postulate that migration increases with schooling attainment at destination and that society's poor segments, given their unemployment and preference to remain at home, are less sensitive than their nonpoor counterpart to income gains from migration attributable to education (Schlottmann and Herzog, 1981).

The role of destination education on the decision to migrate is the object of analysis by several studies (Carvajal and Geithman, 1974; House and Rempel). Supposedly communities that educate their populations provide a public service or nonwage benefit which attracts potential migrants; other things being equal, then, education is expected to exert a positive effect on in-migration. The estimated impact could be negative, however, if an increase in destination education while holding money wages constant were indicative of a reduction in real wages relative to skill levels

10 For a summary of this literature see Cebula (1979).
or a sign of disadvantageous competition for migrants with little schooling who, in order to compete more efficiently, choose as their new residence areas whose labor force possesses lower levels of formal education (Falaris; Levy and Wadycki).

Formal instruction has been measured in different ways throughout the migration literature. For example, Falaris uses average number of grades completed by the population 15 years of age and older, Herold refers to last year of completed education, and Wasow utilizes the population proportion in primary school. In this study formal instruction is approximated with a schooling index consisting of each county's ratio of average number of grades actually completed to average number of grades which should have been completed, through high school, allowing for the age of every person in the county at least six years old. This indicator is superior to the others since it is not biassed by the age composition of the population.

Age itself is another personal characteristic shaping population flows. Expectations that migration is highly selective of younger age groups have been amply verified (Alperovich; Goldstein and Goldstein; Inoki and Suruga; Schlottmann and Herzog, 1982). The young benefit relatively more from geographic mobility because they possess a longer expected working life over which to enjoy utility/income gains attributable to change of residence. In other words, the discounted benefits of moving in the face of an exogenous change are likely to be smaller for someone with fewer periods remaining; consequently, older communities are anticipated to show lower out-migration probability than do younger

11 Both numerator and denominator of this ratio fluctuate between zero or no formal education and 11 years or completion of high school. The denominator is obtained by subtracting six (preschooling years) from the age of the person with a maximum value of 17 years of age, even if the subject is older, since it is normally at 17 that people are graduated from high school. Thus, a 15-year-old subject should have ideally completed nine (15 minus six) years of formal education, so the denominator in this case would be nine; if he/she has dropped out of school after completing only fourth grade, the schooling index would be 4/9 or 0.44, but if he/she has actually completed ninth grade, the index would be 9/9 or 1.0. Similarly, if an adult (17 years of age or older) has dropped out of school after fourth grade, the index would be 4/11 or 0.36; if he/she has finished ninth grade, it would be 9/11 or 0.82; and if he/she has been graduated from high school, then the index would be 11/11 or 1.0.

12 Other things equal, a younger population is more likely to show higher educational attainment.
communities (Hay; King). Furthermore, not only do migration-related benefits decrease, but associated costs also increase, with age — younger persons are more easily adaptable to new environments and roles, have fewer family ties, are less risk averse, and experience lower opportunity costs in terms of location-specific job attachment and psychic sacrifice than their seniors.

What is the hypothesized effect of age on in-migration? If a relatively prosperous region demands a younger population composition, and if it is this kind of region that offers the right prospects suitable to migrants' eagerness for escalating the socioeconomic ladder, one would expect a negative association between median age and in-migration rate. Such association might be especially prevalent when one considers rural-to-urban flows responding primarily to a push from the countryside, perhaps precipitated by archaic land tenure patterns, increasing population pressure on rural land, agricultural unemployment, and other Third World conditions which highlight urban-rural income distribution disparities (Adepoju; Peek and Standing; Wasow).

Disparities in the distribution of earnings also have been linked to both direction and magnitude of internal migration. Greenwood's (1978) research on Mexico reveals that areas with relatively high income concentration ratios are characterized by lower immigration rates; that is, migrants seem to eschew inequality. Conversely, Lipton argues that unequal distribution of income and wealth encourages urban production of consumer durable and luxury goods, which in turn strengthens higher income and employment aspirations by rural residents who are absorbed by the urban labor force; according to this view, urban in-migration is accelerated by overall income disparities.

Simultaneity and its implications appear here, too. Measures of income and wealth distribution taken after the population shift has occurred reflect the impact of rural-to-urban residential change flows. Due to migration's selective nature, rural areas are depleted of scarce human resources and entrepreneurial determination most valuable to agricultural development, while, at destination, migrants, even if employed, join the ranks of the less productive urban earners. Consequently, internal migration may be twice to blame for increasing inequality.

Still another variable systematically related to geographic
redistribution of people throughout the literature is distance (Farber; Greenwood, Ladman, and Siegel; Mincer), which often serves as a proxy for direct, psychic, and opportunity costs.\textsuperscript{13} The incidence of these costs obviously increases with distance of the move, so the variable is expected to deter migration. Usually distance is measured as the interval separating point of destination from point of origin. In this paper, however, it refers to the interval separating each location from the capital city. Presumably economic, political, and administrative power are concentrated in the Metropolitan Area of San Jose, where 27.5 percent of the country's population lives. Thus, the distance variable, for purposes of this study, is designed to appraise the degree of influence which the capital city bears on different locations. Insofar as proximity to San Jose is a proxy for provision of public services and other noncash benefits attractive to potential migrants, it is expected to vary inversely with the in-migration rate.

II. Empirical Model of Internal Migration

The main questions addressed in this paper are (1) the extent to which internal migration in Costa Rica can be explained in terms of people's perceptions of regional differentials that systematically affect costs and benefits stemming from change of residence and (2) whether or not significant differences in these perceptions and subsequent reactions exist between urban-rural and poor-nonpoor segments of society. This section presents and discusses least-squares estimates of an empirical model seeking to infer propensities to migrate of various groups according to selected socioeconomic characteristics of their environment.

Individuals in every county are grouped into urban and rural residents and, within each category, into poor and nonpoor households. Thus, with the exception of a few municipalities that do not possess either an urban or rural nucleus, a household in any county would belong to one and only one of four classifica-

\textsuperscript{13} Direct costs include transportation, acquisition of information, and other out-of-pocket expenses. Psychic costs refer to nonmonetary loss of utility such as cultural dissimilarities, separation from family and friends, etc. Opportunity cost has to do with migration-related forgone income.
tions — urban poor, rural poor, urban nonpoor, and rural nonpoor — for a total of 68 urban and 66 rural observation units, one observation per county. The empirical model of geographic mobility tested here, within the limitations of available Costa Rican data, interprets in-migration rates as a linear function of seven independent variables, all discussed in the preceding section; wages and salaries adjusted by population size, unemployment, female labor force participation, education, age, income distribution, and distance. That is,

\[
M_{ijk} = b_0 ij + b_1 ij Y_{ijk} + b_2 ij U_{ijk} + b_3 ij L_{ijk} + b_4 ij S_{ijk} + b_5 ij A_{ijk} + b_6 ij G_{ijk} + b_7 ij D_k + v_{ijk}
\]

where

- \( M_{ijk} \) is the household heads' migration rate recorded in the \( i \)th poverty group living in the \( j \)th location of the \( k \)th county;
- \( Y_{ijk} \) is the predominantly wage-and-salary annual per capita income (in thousands of colons) of the \( i \)th poverty group living in the \( j \)th location of the \( k \)th county;
- \( U_{ijk} \) is the unemployment rate observed in the \( i \)th poverty group living in the \( j \)th location of the \( k \)th county;
- \( L_{ijk} \) is the female labor force participation rate registered in the \( i \)th poverty group living in the \( j \)th location of the \( k \)th county;
- \( S_{ijk} \) is the schooling index (note 11) for both men and women combined, 17 years of age or older, in the \( i \)th poverty group living in the \( j \)th location of the \( k \)th county;
- \( A_{ijk} \) is the median age of household heads belonging to the \( i \)th poverty group living in the \( j \)th location of the \( k \)th county;
- \( G_{ijk} \) is the Gini income concentration ratio computed for the \( i \)th poverty group living in the \( j \)th location of the \( k \)th county;

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14 In 1975 there were in Costa Rica 79 counties. Only two (San Jose's Central County and Tibas) were entirely urban, while six (Upala, Los Chiles, Guatuso, Sarapiqui, Coto Brus, and Talamanca) were entirely rural. Several counties were omitted from the analysis because, due to their recent administrative creation, their in-migration rates are overestimated. See note 4.
\(D_k\) is the distance between the \(k\)th county government seat and the capital city of San Jose;

\(v_{ijk}\) is a normally, independently distributed stochastic disturbance;

\(b_{0ij}, \ldots, b_{7ij}\) are the least-squares coefficients of the \(i\)th poverty group living in the \(j\)th location to be estimated; and

where

\(i = 1\) and \(j = 1\) for urban poor households,
\(i = 1\) and \(j = 2\) for rural poor households,
\(i = 2\) and \(j = 1\) for urban nonpoor households,
\(i = 2\) and \(j = 2\) for rural nonpoor households; and

\(k = 1, \ldots, 68\) for urban counties,
\(k = 1, \ldots, 66\) for rural counties.

Various functional forms of the migration equation have been proposed in the literature, the most common being linear (Carvajal and Geithman, 1974; King), semilog (Perkinson), and doublelog (Herzog and Schlottmann; Inoki and Suruga) specifications. According to Fields (1979), the most convincing rationale for doublelog transformation"... is the recognition that the migration decision is inherently a choice between a finite number of mutually exclusive discrete alternatives. As such, it is amenable to analysis by the polytomous logistic model, developed in economics by McFadden and applied to the migration decision by Schultz."

Another advantage of the doublelog transformation is that its estimated coefficients can be directly interpreted as elasticities. Nevertheless, in spite of these arguments, a linear equation is used particularly for this study because it explains substantially more of the in-migration rate variance than the other two functional forms.

The least-squares estimates of the coefficients, their standard errors, and levels of significance, as well as F statistic and coefficient of multiple determination \(R^2\) values, are reported for all four equations in Table 2. The F tests indicte that the estimated equations are highly statistically significant (beyond the 99 percent level), with overall respectable explanatory power as revealed
### Table 2

**Least-Squares Estimates of the Coefficients, Their Standard Errors, and Levels of Significance by Urban-Rural Residence and Poverty Status**

<table>
<thead>
<tr>
<th>Urban-Rural Location and Poverty Status</th>
<th>Constant</th>
<th>Per Capita Income ($Y_{jk}$)</th>
<th>Unemployment Rate ($U_{jk}$)</th>
<th>Female Labor Force Participation Rate ($L_{jk}$)</th>
<th>Schooling Index ($S_{jk}$)</th>
<th>Age ($A_{jk}$)</th>
<th>Gini Concentration Ratio ($C_{jk}$)</th>
<th>Distance ($D_k$)</th>
<th>F</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban poor</td>
<td>37.073</td>
<td>6.422**</td>
<td>-0.077</td>
<td>-0.026</td>
<td>-0.305</td>
<td>-0.301***</td>
<td>-27.570''</td>
<td>-0.033**</td>
<td>10.5**</td>
<td>0.46</td>
</tr>
<tr>
<td></td>
<td>(1.917)</td>
<td>(0.108)</td>
<td>(0.233)</td>
<td>(0.204)</td>
<td>(0.095)</td>
<td>(14.998)</td>
<td>(0.009)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural poor</td>
<td>43.284</td>
<td>8.081**</td>
<td>0.246''</td>
<td>0.548*</td>
<td>-0.501</td>
<td>-0.649**</td>
<td>-24.036''</td>
<td>-0.002</td>
<td>21.1**</td>
<td>0.70</td>
</tr>
<tr>
<td></td>
<td>(2.216)</td>
<td>(0.144)</td>
<td>(0.251)</td>
<td>(0.206)</td>
<td>(0.244)</td>
<td>(12.476)</td>
<td>(0.009)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban nonpoor</td>
<td>35.276</td>
<td>8.797**</td>
<td>-0.344</td>
<td>0.308*</td>
<td>-0.822**</td>
<td>-0.017</td>
<td>-16.204*</td>
<td>-0.013''</td>
<td>11.4**</td>
<td>0.49</td>
</tr>
<tr>
<td></td>
<td>(1.415)</td>
<td>(0.442)</td>
<td>(0.129)</td>
<td>(0.266)</td>
<td>(0.153)</td>
<td>(7.242)</td>
<td>(0.008)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural nonpoor</td>
<td>25.982</td>
<td>8.145**</td>
<td>0.550'</td>
<td>0.701**</td>
<td>-0.704**</td>
<td>-0.037</td>
<td>-21.016''</td>
<td>-0.006</td>
<td>21.9**</td>
<td>0.71</td>
</tr>
<tr>
<td></td>
<td>(2.333)</td>
<td>(0.378)</td>
<td>(0.250)</td>
<td>(0.235)</td>
<td>(0.147)</td>
<td>(12.108)</td>
<td>(0.008)</td>
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** Statistically significant at the .99 level.
* Statistically significant at the .95 level.
' Statistically significant at the .90 level.
'' Statistically significant at the .80 level.
by the adjusted $R^2$ values.\textsuperscript{15} Both $F$ and $R^2$ ratios are considerably higher for rural than urban equations, which suggests that the model specified here is more successful in explaining population flows into the countryside than in accounting for urban in-migration. Although multicollinearity is suspected to be somewhat of a problem, the coefficients' relatively low standard error values disclose that the problem is not a major one.\textsuperscript{16}

The local per capita income variable performs as expected in all four equations with huge confidence levels: High local wages do stimulate in-migration. The income elasticities of in-migration (Table 3), computed at the means of the migration rate and income estimates, are substantial. They indicate, for example, that a ten-percent rise in per capita income of a county's urban population increases, on average, the inflow of poor and nonpoor segments by 15.5 and 22.6 percent, respectively. The urban elasticities exceed the rural, thus implying that higher wages and salaries are a more potent force in attracting migrants to cities than in luring them into the countryside. More importantly, income elasticities are greater for the nonpoor than for the poor segments, which lends support to the hypothesis that poverty can be partially explained by the poor's lower propensity to migrate vis-a-vis the nonpoor.

The hypothesized negative relationship between in-migration and joblessness is obtained for urban areas, although neither the poor nor the nonpoor coefficient is significant different from zero. The rural coefficients possess some (although rather low) levels of confidence, but appear with the "wrong" sign. These results are not surprising in light of numerous other studies that have failed to corroborate a statistically significant, negative relationship between both variables (DaVanzo; Greenwood, Ladman and Siegel; House and Rempel). Maybe the implications of high unemployment are more correctly perceived in the origins, as opposed to

\textsuperscript{15} Adjusted $R^2$ values for comparable studies include Alperovich with 0.52, Fields (1979) with 0.83 and 0.60, Herzog and Schlottmann with 0.68 and 0.70, Langley with 0.84, and Sommers with 0.45 and 0.57.

\textsuperscript{16} Multicollinearity is present in virtually all real-life least-squares estimated equations consisting of several independent variables. Thus, its interference is a matter of degree. Severe multicollinearity causes disparately large standard errors in relation to the size of their coefficients, so the researcher is uncertain of the population values and unable to reject hypotheses regarding the parameters under study. This is certainly not the case here.
potential destinations; or the unemployment rate is not as adequate as other proxies like, say, number of job vacancies, for purposes of determining the migration decision; or indeed a serious case of simultaneity bias is responsible for both the "wrong" sign and the absence of statistical significance.

Alternatively, perhaps these findings ought to be interpreted as a reflection of the direct association that often exists between high income areas and areas rapidly expanding in job opportunities, which frequently experience above-average frictional unemployment rates (Sommers). Moreover, the lack of significance of the unemployment coefficients might be attributable to downward rigidity of income, that is, conditions such that the supply of high-paying jobs in high-wage areas likely to attract migrants is restricted by institutional forces, and wages are not susceptible to drop by a job demand expansion resulting from population inflow. In any case, no poor-nonpoor differentials can be discerned with respect to the joblessness variable.
Three of the four female labor force participation coefficients are significant, urban poor being the only one with low z score. Two patterns are evident here. First, in each poverty category statistical significance is greater for rural than for urban estimates. Carvajal and Geithman (1974) have found that in Costa Rica rural-to-urban migration is markedly selective of women, whether it is to escape the countryside's more traditional environment that offers relatively few and low-paying jobs for females, in search of greater occupational variety and better wages in a city milieu, or to take advantage of superior urban public services, including maternal and child health care as well as other noncash benefits. Thus, women who contribute to urban concentration do not do so solely for the sake of a change in labor conditions. Since women who migrate into rural locations lack the nonlabor incentives, it is not at all surprising to learn that they show a preference for areas in which female labor force participation is more commonplace. The second pattern which becomes evident regarding this variable is that, within each location, the size of the coefficient is substantially greater for nonpoor than for poor households, again suggesting that poverty, this time specifically of women, has some of its roots in the poor's lower propensity to migrate vis-a-vis the nonpoor.

Two conflicting hypotheses are postulated with respect to the effect of the schooling index, which is a proxy for education, on the in-migration rate. On the one hand, a high local schooling index tends to foster in-migration by increasing location-specific nonwage benefits attractive to potential migrants; if this is the case, the least-squares estimates are expected to be positive. On the other hand, a negative sign should be anticipated if an increase in the local index, while holding money wages constant, translates into a drop in real wages relative to skill levels. Furthermore, a negative sign also might indicate that many migrants, especially those with little educational attainment, choose as their new residence areas where the labor force is characterized by low levels of formal education so that they can compete more efficiently.\(^{17}\) The empirical evidence — all four coefficients negative

\(^{17}\) The schooling index is very similar for both migrants and nonmigrants. The national urban and rural indices for migrants are 0.68 and 0.38, respectively, while for nonmigrants they are 0.62 and 0.41, respectively.
and statistically significant — lends credence to the two latter propositions. While z scores are only moderate for the coefficients of the poor, they are substantial for the nonpoor’s estimates, thus implying that the decision to move into regions with little educational attainment is more prevalent among nonpoor than poor immigrants.

The education elasticities of in-migration, also reported in Table 3, are quite high, in fact, substantially higher (in terms of absolute value) than the income elasticities, with the exception of the urban poor category. This means that, other things being equal, geographic redistribution of human resources is more sensitive to a change in education than to an identical percentage change in income. As with income, the nonpoor’s in-migration rates are more education elastic than are those of the poor.

The anticipated negative relationship between a region’s median age and its in-migration rate is verified by all four coefficients, although only the estimates for the poor possess statistical significance (at the 99 percent level). It seems that age is not as important in motivating people above the poverty line to migrate as it is in explaining change of residence among the destitute. The elasticity (absolute) value for the rural poor is more than twice the size of their urban counterpart’s.

Still another locational factor to which internal migration may be responsive is the degree of income concentration. The empirical evidence of this study shows that higher Gini concentration ratios, which are indicative of income maldistribution, tend to depress in-migration rates. The negative least-squares coefficients, all moderately significant, accord with Greenwood’s (1978) earlier findings — areas with major disparities in the distribution of earnings are perceived by migrants as undesirable destinations. Judging by the size of the elasticities, nonpoor urban in-migrants seem to be less affected in their decision to migrate by earnings maldistribution considerations than are urban poor in-migrants, while both poor and nonpoor rural in-migrants show virtually identical elasticity values.

A final factor considered here inducing interregional population shifts is distance between point of destination and the nation’s capital. Since such distance is interpreted as a proxy for availability of public services and other noncash benefits attractive to
migrants, its estimated coefficients are expected to possess a negative sign. The signs are indeed negative, but only the estimates for the urban equations are significantly different from zero. This seems to imply that the anticipated migration-related influence exerted by the capital city on various receiving locations throughout the country is meaningful only for metropolitan nuclei, which is quite plausible because provision of public services is predominantly an urban activity affecting predominantly urban residents. Although city in-migrants appear to be generally distance inelastic, the responsiveness to this variable by the urban nonpoor is less than half the magnitude of the responsiveness by the urban poor.

III. Summary and Conclusions

This study has examined the empirical relevance of a migration behavior model from an economic perspective. It has focused on residence adjusted poor-nonpoor differential migration response to identical environmental stimuli, a dimension of worker mobility virtually ignored thus far in the literature. The model is based on the premise that interregional redistribution of people is a long-term utility maximization process which may involve heterogeneous utility functions, unequal perception of migration-related costs and benefits, and various constraint types and levels for different groups of people. Such heterogeneities, if they exist, are likely to translate into dissimilar income/quality-of-life tradeoff decisions taken by the poor vs. the nonpoor.

The principal findings show that, in general, migrants are attracted by counties with higher earnings, more female labor force participation, lower levels of educational attainment, younger median age, more equitable income distribution, and greater availability of public services. Overall F statistic and $R^2$ ratios are fairly high by the standards of similar studies, with more explanatory power offered by rural than urban in-migration equations.

Probably the single most important finding is that in both urban and rural areas the in-migration rates of the poor are systematically less income and education elastic than those of the nonpoor. This conclusion suggests that strictly private market
forces may be insufficient to induce migration in certain segments of the population, and that such insufficiency may be at least partly responsible for these strata's poverty condition, which brings forth the need for public politics to subsidize migration of the poor. With population movements performing an important function in facilitating structural changes accompanying economic growth, policies could be designed to increase the flow of information about existing job and other opportunities in different regions and reduce uncertainties associated with the exploitation of these opportunities; after all, households' response to income and other interregional socioeconomic differentials cannot be any more rational than people's awareness of such differentials. Or perhaps public authorities might encourage and assist the needy in responding to better conditions elsewhere by lending venture capital for migration. (This kind of policy is currently being implemented in Brazil, as people from the impoverished Northeast are helped relocate in the country's interior.) In addition to extending direct public credit, or even grants, to compensate for private capital market imperfections, public subsidization of migration costs also can be incorporated more vigorously into the tax structure.

Of course, the direct policy prescriptions derived from this analysis must be restricted, given the aggregate nature of the data, the conceptual confines of the proxies, and the limitations of the statistical model. By no means have we attempted to define a complete model, even if it were possible to do so. Some of the variables chosen may be far from capturing the theoretical associations they supposedly represent. Furthermore, the nature of the data precludes estimation of simultaneous-equation coefficients, which often conform more closely to theoretical relationships than do single-equation estimates.

The structural model presented here is merely a simplified version of some general microeconomic framework identifying both determinants and consequences of internal migration as well as other variables. Its conclusions are based on a Costa Rican sample observed at one point in time and hence may be place- or period-specific. Since no comparable studies exist, further work is required to ascertain whether or not these results are pertinent to other places and periods as additional variables suggested in the literature are incorporated if available and relevant to particular
situations.

In short, the findings of this study have shed new light into the interactive mechanisms of poverty and migration. They suggest that population relocation policies can be a meaningful component of antipoverty/welfare campaigns. The incorporation of these policies into overall growth strategies, however, will be achieved only if their objectives are harmonized with current policies on industrialization, agriculture, and other priority areas.

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