

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

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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; Schlottmann 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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vajal, Geithman, and Armstrong) which estimates that approximately one-fourth (24.3 percent) of all households are poor.³ 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.⁴ A county's immigration 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.⁵ 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

3 According to this study, poverty is defined in terms of household annual per capita income below 165 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 31 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 Hojanca 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.

(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 exist 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 services⁶ 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.

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.

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.¹¹ This indicator is superior to the others since it is not biased by the age composition of the population.¹²

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.

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.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-

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.

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} , $b_7 ij$ 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

$k=1, \dots, 68$ for urban counties,

$k=1, \dots, 66$ 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 indicate that the estimated equations are highly statistically significant (beyond the 99 percent level), with overall respectable explanatory power as revealed

by the adjusted R^2 values.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.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

15 Adjusted R^2 values for comparable studies include Alperovich with 0.52, Fields (1979) with 0.33 and 0.60, Herzog and Schlottmann with 0.68 and 0.70, Langley with 0.54, and Sommers with 0.45 and 0.57.

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.

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 0.63 and 0.38, respectively, while for nonmigrants they are 0.62 and 0.41, respectively.

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

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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