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PSYCHIC COSTS AND FACTOR PRICE EQUALIZATION

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INTRODUCTION

There has been some perplexity among economists over the failure of interregional wage differentials to approach zero over time in an economy characterized by labor mobility. Johnson [7], and Sjaastad [14], among others, have hypothesized declining wage differentials among regions and have puzzled over contrary empirical results. It has generally been assumed that labor will flow toward regions paying the highest wage rate. This equilibrating framework has dominated economic thought on this problem area and has directed research along narrow market-oriented lines.

The hypothesis of this paper is that nonmarket considerations, specifically psychic costs, are a major force in preventing a market-directed flow of human resources. Moreover, "nonoptimal" allocation of human resources results from differences in workers' perceptions of utility between various regions. We will first review the literature in this area and then present an empirical analysis of demographic characteristics suggesting the magnitude of the psychic factor.

RELATED WORK IN THIS AREA

Given real world constraints to labor mobility and widespread factor price inequalities, Samuelson [13] concluded "... it would be rash to consider the existing distribution of population to be optimal in any sense, or to regard free trade as a panacea for the present geographic inequalities." One factor influencing large interregional wage differences is the psychic costs workers incur in relocating. Sjaastad [14] argues that although psychic costs are not resource costs, they influence the labor allocation process.

Rohrlich [12] points out that our concern is with social opportunity cost of the psychic effect. Market-determined resource efficiency may, in fact, lead away from a higher state of welfare. The decision of individuals and families to either migrate or not is assumed to be an optimal decision for that family, since it is only the decision-maker who can adequately assess the intensity of psychic loss attributable to a decision in either direction. In their decision function, each migrant family will weigh heavily the flow of psychic costs and discount the net monetary benefits by an appropriate intrinsic psychic factor [17].

As early as 1960 Maddox [8] strongly urged economists to deal with the concept of psychic costs. He felt this was the only aspect of migration costs that was more than trivial. Migration research since 1960 has clearly supported all of Maddox's notions that direct cash outlay of migration is low, usually less than \$100 per family [3, 9, 11, 14]. Limited research has been conducted on the psychic costs aspects of migration [3, 9, 16] principally at the University of Kentucky under Kurt R. Anschel.

Modifying Sjaastad's definition of psychic costs [14], Deaton [3] and Morgan [9] measured psychic costs by the difference between current earning of migrants in the city and the annual earning necessary to induce a return to the area of origin (Eastern Kentucky). Their findings show that the psychic costs are substantial and vary by size of city. Migrants in Cincinnati would return to Eastern Kentucky for roughly two-thirds of their current city earnings. Conversely, Lexington, Kentucky migrants would have to be subsidized to return to Eastern Kentucky.

In an earlier study, Weidemann [16] found the determinants of psychic costs to be age, emotional

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adjustment and income. Deaton's study of urban migrants used regression analysis to explain the variation in psychic costs. Roughly 60 percent of the variation in psychic costs were explained by job satisfaction, interpersonal satisfaction, satisfaction with services and facilities, total family income, size of family and migrant family head's age and education [3, pp. 99-131].

These findings have important implications for rural development policy and population distribution. The intermediate size city in close proximity to the area of origin is seen as a far more preferable destination for migrants than the larger industrial complex. Even though average family income was higher in Cincinnati, educational levels and job status were higher in Lexington. Results for both cities indicate that psychic costs vary by demographic characteristics of the family — principally income, education, sex and family size.

These investigations support an increased emphasis on the importance of psychic costs in optimal human resource allocations. They also suggest the concept of psychic costs can be operationalized in the evaluation of rural development policy options.

A study by Hansen [5] is closely related to the importance of psychic costs in interregional wage adjustments. The opportunity wage costs of senior high school students in Eastern Kentucky relative to employment in regional growth centers were measured in 1969 and 1971. Students, who would soon join the region's heavy out-migration stream, were sensitive to wage differences between their home and other areas.

RURAL DEVELOPMENT AND INCOME EQUALIZATION

A central theme in the continuing search for consensus on rural development policy is the notion that rural people will migrate to urban areas if they perceive that the quality of life in rural areas is substantially lower than in urban areas. Although rural sociologists have strenuously objected, "quality of life" in rural areas has too often been measured in terms of income, which usually falls considerably below urban income. The large rural-urban income gap has been widely heralded as a major cause of out-migration from rural areas. The general rationalization of rural development programs has rested on the assumption that rural-to-urban migration is a net social cost, although some evidence to the contrary has been reported recently [10].

Hildreth and Schaller [6] argue that an adequate community development policy requires more intensive research on barriers to economic development in rural areas. Tweeten [15] suggests that economic opportunity in rural areas can be enhanced by broadening the resource base, such as with industrialization, or by more efficient use of the present community resource base.

One of the major inadequacies of the "place development" approaches to rural development is lack of any definitive measure of income necessary to make rural people indifferent between remaining there or migrating to urban areas. Knowledge of this particular level of income would be helpful in planning rural income maintenance programs. It aids in development of public goods policies for rural areas by revealing where people want to live [11].

The gap between this indifference level of income and the actual level of present income is a measure of degree of satisfaction with present place of residence. If the indifference level of income is greater than the actual, the gap suggests that rural people would have to earn at least that much more income in an alternative place of residence before migration would be seriously considered. Conversely, if the indifference level of income is less than the actual, there is strong pressure to out-migrate. This income difference may also be viewed as the psychic cost of either remaining or out-migrating.

PROCEDURES

In connection with the University of Tennessee Title V Rural Development Program, a random sample of 289 families was drawn from a three-county area on the Cumberland Plateau of Tennessee during the summer of 1974. This sample consists of approximately two percent of the families in that area. A series of questions were asked to the head of each household about the income necessary to induce him to migrate to four alternative cities:

1. Cookeville, a rapid-growth city of 15,000 population in Central Tennessee just south of the three-county area;
2. Knoxville, a metropolitan center of 180,000 population in East Tennessee;
3. Cincinnati-Indianapolis, as representatives of northern industrial cities that have historically attracted Southern migrants; and

4. Atlanta, a major metropolitan city in the South.

Of the entire sample, 236 respondents either refused or were unable to state a reservation income for other areas, or were retired and thus unlikely to consider moving. The remaining fifty-three non-retired respondents indicated a willingness to move to one of the four urban areas described above if a certain income could be assured.

Differences between these two sub-samples are striking in several instances (Table 1). Those families willing to move away have higher current earnings, are more educated, and are concentrated in the occupational category of Craftsmen and Operatives. In general, these differences between families willing and unwilling to move correspond to distinctions between migrants and return migrants, respectively, in an earlier study by Deaton

and Anschel [2], especially regarding income, education, and age. A psychic cost was constructed for each respondent, who specified minimum income necessary to induce him to move his family to a certain urban area, by subtracting that reservation income from the total family non-asset earned income. It is assumed that migration would not interrupt transfer payments or asset earnings to the family. If the psychiac cost is negative, it indicates the additional non-asset income the family would have to earn if it moved to that particular area. It also may be used as a proxy for psychic pain the family would suffer by migrating. Conversely, if the psychic cost value is positive, it reflects the amount of income the family is willing to forego in order to leave the area, or a proxy for amount of psychic pain the family suffers by remaining in the rural area.

Table 1. SELECTED CHARACTERISTICS OF HEADS OF HOUSEHOLDS, NORTH-CENTRAL TENNESSEE, 1974

Characteristic	Won't Move	Will Move	Will Move (Replicated)
	Mean (N=236)	Mean (N=53)	Mean (N=129)
Household Earned Income	\$4,605	\$8,725	\$8,806
Education (years completed)	8.2	10.1	10.4
Age	53	37	37
Percent Male	91	98	98
Percent Married	77	89	88
Family Size (no. in household)	2.9	3.6	3.5
Occupation: (percent)			
Managers and Professionals	11	19	16
Clerks and Sales Workers	3	4	5
Craftsmen and Operatives	21	56	50
Service Workers	10	9	2
Farmers and Farm Workers	6	2	2

The study by Hansen [5] measured students' wage opportunity costs of alternative locations, but no attempt was made to adjust costs for differences in their demographic characteristics. Neither was an attempt made to measure costs to one location after adjusting for students' preferences to all other locations.

In an effort to incorporate these considerations in the analysis of psychic costs, an attempt was made to estimate the mean psychic cost to each city after adjusting for variation due to respondents' demographic characteristics and their psychic costs to other locations. The 53 mover respon-

dents were replicated for each respective location where a psychic cost was calculated. The 129 observations resulting from the replications have essentially the same demographic characteristics as the 53 original observations (Table 1). Distribution of psychic costs by location in the replicated sample was as follows: Cookeville, 32 percent; Knoxville, 32 percent; Cincinnati-Indianapolis, 16 percent; and Atlanta, 19 percent. Demographic characteristics of households were not found to be significantly different at the 15 percent level, between alternative cities.

Each variable presented in Table 1 was con-

sidered in a regression model with the measure of psychic costs as the dependent variable. It was hypothesized that psychic cost would be inversely related to the household head's age, marital status, family earned income, and size of family. As these variables increase, family locational inertia should increase. Consequently, the family's reluctance to move away should increase. A direct relationship was hypothesized between psychic costs and the household head's education level; that is, the more educated families would tend to move away with less income inducement from other places. Dummy variables were used to detect significant differences in psychic costs between household heads' occupations (Table 1). Dummy variables were also used to measure differences between psychic costs to various cities. To allow for variation in psychic costs due to interdependence of responses for alternative locations, dummy variables were constructed to include all possible combinations of locations for a particular respondent.

All independent variables were entered stepwise into the regression model. The combination of variables that gave the lowest standard error of

estimate was chosen as the "best" model.

ANALYSIS AND RESULTS

Results of the regression analysis (Table 2) support our hypotheses regarding age (AGE), marital status (MARRY), and family size (FAMSIZE). However, a significant direct, though curvilinear, relationship between psychic costs and earned family income (ERNINC and ERNINCSQ) was found, suggesting that those families with lower incomes need less income inducement to leave the area. The negative regression coefficient for education (EDU) was also the opposite of that hypothesized. Results imply that, at the mean, an additional year of education for the head of the household requires \$395 in additional income in order to induce migration to another area. There is an indication that, at the means, the psychic cost of leaving the area is \$67 for an additional year of household head's age; \$391 for an additional family member; and an additional \$2,796 if the head is married. Thus, the inertia of age and family seem to be strong barriers to out-migration.

Table 2. REGRESSION MODEL FOR PSYCHIC COSTC OF LEAVING NORTH-CENTRAL TENNESSEE, 1974

Variable	Regression Coefficient	Standard Error	"t"
CONSTANT	-188.85		
ERNINC	1.67	.17	9.82*
ERNINCSQ	-0.00006	.00001	-6.00*
EDU	394.56	91.42	-4.31*
AGE	-67.46	24.65	-2.74*
FAMSIZE	-391.50	193.89	-2.02**
MARRY	-2795.80	950.61	-2.94*
FARMER	-4409.17	193.89	-2.32**
Locations			
COOK	1680.65	646.55	2.60**
CINN	-2029.83	833.55	-2.43**
ATLA	-1126.77	792.74	-1.42
Replication Interaction			
COOK-CINN-ATLA	-3126.56	1325.84	-2.36**
COOK-ATLA	-4447.08	2145.76	-2.07**
KNOX-COOK	-1411.59	738.06	-1.91**
KNOX-COOK-ATLA	1077.12	860.54	1.25

* Significant at the 1% level.

** Significant at the 5% level $R^2 = .68$ Std. Err. of Est. = \$2,919.

Each additional dollar of earned income reduces psychic cost of out-migration, up to an income of about \$14,000, and increases that cost for higher incomes. This relationship suggests that upper-income families in rural areas are reluctant to move away if they also enjoy high local social status.

Farmers and farm workers (FARMER) seem to be the occupational group most reluctant to move away, requiring a net difference of \$4,409 in additional income to move.

The regression model allows a comparison of relative desirability of the four hypothesized cities of destination. Using means of all independent variables except the location dummies, the adjusted mean psychic costs for each city are as follows: Cookeville, -\$750; Knoxville, -\$2,431; Atlanta, -\$3,558; and Cincinnati-Indianapolis, -\$4,461. Although rural families appear to be reluctant to move away, they are more willing to move to nearby urban centers. Cookeville is smaller than Hansen's notions of an intermediate-size growth center [4], but the attractiveness of smaller cities is apparent. Although Cincinnati-Indianapolis and Atlanta are roughly equidistant from the study area, Tennesseans seem to identify more with the South.

It should be recalled that approximately 81 percent (Table 1) of the respondents in the Title V survey sample indicated no desire to move to urban areas. When this information is compared with rankings of psychic costs to various cities, it is apparent that attachment to the home area plays a significant role in impeding labor mobility and income equalization for rural people.

This study more clearly delineates locational preferences of rural people in terms of psychic costs than the study by Hansen [5]. He analyzed only high school seniors, an important demographic group that is missing from this study. However, since the household head was the sampling unit, there was no opportunity to measure high school student locational preferences. It is generally the rural population between the ages of 15 and 20 that is more prone to out-migrate. These individuals have not yet acquired the encumbrances of a family.

Psychic cost estimates reported here are obviously associated with respondent errors, due to the subjectivity of perceiving incomes that would make a person indifferent between staying at home or moving away. Although it might be argued that rural people are unfamiliar with incomes in urban areas, studies of high out-migration areas such as the Title V area show that the people who stay

behind are knowledgeable of labor conditions in urban areas through their friends and relatives who have migrated [3, 9].

Closely associated with the subjectivity of respondents' perceptions of psychic costs is the problem of cost-of-living differences between the Title V area and the four cities. Since there is no Consumer Price Index for rural areas, there is no way to accurately adjust respondents' reservation incomes to rural constant dollars. Wertheimer has estimated that cost of living in metropolitan areas is about 10 percent higher than in rural areas [17]. If his estimate were used to adjust reservation incomes, psychic costs of leaving the area, net of any cost-of-living differential, would still be substantial.

CONCLUSIONS AND POLICY IMPLICATIONS

Rather conclusive differences in psychic costs among alternative cities of destination have been reported. Residents of some of the least developed counties in Tennessee would require from \$750 to about \$4,500 more annual family income than they are now earning in order to consider moving to a small nearby urban growth center or to three other metropolitan areas located less than a day's drive away. Age and family seem to be major migration impediments, as has been found in numerous other studies. Rural Tennesseans appear to be most reluctant to move to the North.

Our major conclusion is that interregional wage differences are overly simplistic indicators of differences in economic well-being. Results of this study suggest that "the people left behind" in rural areas are more content with their place of residence than the gaps between local income and higher income in urban areas would indicate in a market-directed resource allocation framework. Hansen's argument [4], that rural-to-urban migration should be directed toward intermediate-sized urban growth centers, recognizes that most migrants are young and less inclined to remain in rural areas than are older persons who already have families and hold most of the jobs. The fact that young migrants have earned large net benefits by moving to urban areas should not be automatically construed to mean that other rural people, who earn most of the income in the area, are also willing to migrate if their wage is less than the prevailing urban wage.

The magnitude of psychic costs estimated in this study also shows the desirability to industries of relocating from urban to rural areas. The willing-

ness of rural people to accept lower wages than workers in urban areas may reflect a stronger appreciation for the unique amenities of rural life that are not available in urban areas, even in so-called "optimum-sized" cities where public service costs per capita are lowest [1].

Population redistribution issues often include a consideration of subsidies to induce migration [1, 4, 5]. Results of this study suggest that rural people who did not migrate soon after completing secondary education would have to be subsidized at a

level far higher than cash costs of migration in order to lure them into urban areas.

Amenities of rural and urban areas are often viewed quite differently. According to Barkley [1] retirees and pensioners may be the only group that observes and acts on differences between urban and rural amenities. The approach used in this study to measure psychic costs may be helpful in more correctly assessing locational preferences of urbanites who, according to pollsters, prefer to live in rural areas or small towns rather than urban areas.

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