NON-MONEY INCOME AND OUT-MIGRATION IN LAGGING REGIONS

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The movement of people away from the "lagging" region to those whose economic growth rate is accelerating is a well-known and extensively studied phenomenon. Despite this, there are certain elements involved which have yet to receive proper recognition. One of these is the non-money element in the incomes of people in these regions. Its neglect is of consequence because it distorts the empirical estimates of the income-migration relation, a distortion, which if not recognized, can give rise to improper interpretations of the migration response of the population in a lagging region to income differentials.

The concern in this paper is with non-money income and out-migration in lagging regions. Initially, there is a statement of a simple migration model, the elements of which are confronted with data reflecting the experience of individual counties in the state of Kentucky during the periods 1940-50 and 1950-60. At this point we explore a direct interpretation of the empirical findings. Non-money income is introduced as a part of the interpretation of the model and the residual variances of the calculated regressions are used to make a number of empirical tests of this interpretation. Finally, certain policy implications of our overall findings are discussed.

A SIMPLE MIGRATION MODEL

The major elements which come into play in determining the extent to which people move out of lagging regions can be discussed in terms of relations between net migration and certain variables generally believed to be elements influencing the location decisions of people in these regions. Some of these variables are strictly economic in character. Recent studies of out-migration in the Southern Appalachian Region (1) (4) (5), for example, indicate the importance of economic factors and this Appalachian experience suggests both "push" and "pull" elements are involved. To talk of push and pull elements is, of course, simply one way of denoting relevant variables that enter into the evaluations families make when comparing the attractiveness of their economic circumstances where they presently live with the best alternative economic possibilities elsewhere. Push elements refer to economic changes within the region generating disincentives which can be, for example, revealed by focusing on a variable such as dN or the rate of employment change. Pull elements operate through the general level of economic well-being found in the region relative to other places. We can consider per capita income (Y) as a variable which measures the force of such elements operating in the region.

The Appalachian experience makes clear, however, that economic factors alone will not account for out-migration patterns in lagging regions. The

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process is selective. All people do not respond in the same way to economic variables.[1] That response is influenced by such personal characteristics as age and education level. Movement out of a region then, given the economic variables, should depend on such things as the age composition (A) and educational level (S) of the population. Thus, if we focus on per capita net movements (M), we can assert the following:

$$M = f(dN, Y, A, S) \tag{1}$$

Suppose we found differences in net migration rates over some time period in a group of regions--for example, counties within the state of Kentucky. According to (1), we should be able to explain these differences in terms of dN, Y, A and S. If we posit linear relationships between net migration and each of these specified variables,[2] the following regression provides a basis for making an empirical test of the statistical importances of these variables in "explaining" the dependent variable:

$$M = \alpha + BdN + \underset{\gamma}{Y} + \delta A \pm \varepsilon S + u \tag{2}$$

Using an assortment of Census and other data for the state of Kentucky's 120 counties, the parameters of this equation were estimated for the periods 1940-50 and 1950-60.[3] The results, shown in Table 1, indicate the correct signs with statistically significant associations excepting in the case of education in both periods and income in the 1950-60 period.[4] The failure of income to show up as statistically significant in the latter period could be the result of the special economic difficulties that arose in many of the state's coal counties during that time. These counties were relatively high income regions--in the state--that experienced an economic "disaster." There was clearly a structural change in the coal counties that was picked up by the employment measure which reflected the change in employment over that period. The income measure, on the other hand, was for a time period just prior to the beginning of the period studied. Such a measure could not be expected to capture the effects of structural change that took place over the period. Thus, the economic changes that occurred in the state's coal counties in the fifties distorted the income-migration relationship being investigated in the regression.

Overall, these regressions are taken as providing evidence that corraborates some of the things which have been claimed about out-migration in lagging regions. Out-migration will, according to these regressions, be greatest in regions where the push and pull of economic pressures are most severe and where the propensity to respond to such pressure is quite high--for example, in regions where the population is relatively young.

Suppose we stipulate that the economic and demographic variables specified in equation (2) were in some sense adequate. It is nevertheless likely that we have not specified all economic variables that influence the movement out of these regions. The economic variables included in the regressions, for example, do not include all economic factors which could have influenced individual decisions. Those variables were monetary economic variables. But individual welfare is not solely dependent on money variables. There are non-money factors that contribute to an individual's welfare in many cases. The presence of such non-money income factors, if not accounted for in the measures used for economic variables, could 'explain" some of that residual variation.

MIGRATION AND NON-MONEY INCOME

How might non-money income influence population flows among regions?

First, we need to define carefully the meaning of money and non-money income. By money income, we mean recorded money transactions involving end-use products and services. Non-money income is the complement set; that is, it includes all activities involving end-use products and services that are not recorded in our money income measures.

With these definitions, it is reasonable to suppose that money income is an imperfect measure of the person's real income in some places. People often do things in no way connected with recorded money transactions which provide them with goods they consume. Clearly the proper income concept is one which encompasses both money and non-money elements, that is, total per capita income in the ith region (TY_i) is properly defined as

$$TY_i = Y_i + NY_i \tag{3}$$

where Y_i is the money income element and NY_i is the non-money element. We can write the proportion of non-money income to money income as N so that

$$TY_i = Y_i + N(Y_i) \tag{4}$$

Let us now rewrite equation 2 as follows:

$$M = \alpha + \beta dN + \gamma[Y + \eta(Y)] + \delta A + \varepsilon S + u \tag{5}$$

and differentiate this equation partially with respect to changes in per capita money incomes.

$$\frac{\partial M}{\partial Y} = \gamma[1 + (Y\eta' + \eta)] \tag{6}$$

If we rewrite $(Y\eta' + \eta)$ as b then

$$\frac{\partial M}{\partial Y} = \gamma[1 + b] \tag{7}$$

Equation 7 indicates the impact of money income change in net-migration depends on γ and what happens to the relation between money and non-money income when money income changes--that is, on b. If we suppose that all income is money income, equation (7) reduces to

$$\frac{\partial M}{\partial Y} = \gamma\ [1] \tag{8}$$

which means that the impact of income change on net migration is given solely by γ. The use of measures of money income in calculating γ in this case would, of course, yield suitable results. But if, as certainly appears to be the case, there is a non-money elements in income, estimates of γ using money income may not give an accurate reading of the migration response of the population to income change. What becomes crucially important is what happens to the relationship between non-money and money incomes when money income is different.

Since the opportunites and skills present that lend themselves to the pursuits that yield non-money income appear to be more favorable in low-income lagging regions compared with high income regions--for reasons that will be discussed further below--one may suspect that non-money income is relatively more important in the low income regions. If so, b will be negative, that is, $(Y_o\eta' + \eta)$ $(Y_1\eta' + \eta)$ for all $Y_1 > Y_o$ which means that $\frac{\partial M}{\partial Y} = \gamma\ [1] > \frac{\delta M}{\delta Y} = \gamma\ [1 + b]$.

But if this is so, when money incomes are used in regional comparisons, the income-migration relationship will be distorted. The incomes of residents in low-income regions will be understated because of the exclusion of an income element which is relatively more important in the low income region. The use of money income measures then will overstate the extent of the pull of the higher incomes elsewhere. The income differentials will appear higher than they really are. Thus, when money income is used as a predictor variable, we should find actual migration to be less in the lagging region than the predicted amount based on estimates using data from regions with both high and low incomes, that is, the expected values of the residuals of the low income region would $\neq 0$.

MIGRATION AND NON-MONEY INCOME: SOME EMPIRICAL TESTS

If the regions in which non-money income is relatively important can be identified, there is a basis for checking the conclusions about non-money income against the residual variation of the regressions calculated earlier. These residuals, of course, are defined as

$$r = a - c$$

where a is actual net migration and c is net migration calculated from the regression.

Suppose we focus on regions in which there is out-migration, i.e., $M < 0$. If there are sizeable amounts of non-money activity in these regions, we would conclude on the basis of the argumentation above that the migration predicted by equation 2 would overstate the actual amount. Such an overstatement means, of course, that $a > c$, which indicates a positive residual for those regions.

Clearly we can investigate this implication by focusing on the expected values of the residuals in those places where we believe non-money incomes to be relatively more important, e.g., low-income regions. The eastern part of the state of Kentucky provides a laboratory of sorts for such an investigation, since it was the site of a mass exodus of people between 1940-60, many of whom left counties with the lowest incomes in the state (1) (5).

From the residuals for the 36 counties in the eastern part of the state,[5] we calculated the mean residuals ($\bar{r}$) and their standard errors for both sets of years. The results, summarized in Table 2, show the mean residual to be positive but not significantly different from zero. These results are not particularly surprising, however, since a number of counties included in this sample had per capita incomes above the median for all Kentucky counties. By excluding those which did and recalculating the $\bar{r}$'s we found the average residuals to be positive and statistically significant--see Table 2.

It is, of course, possible and in fact likely that the relation between non-money income and money income is not a simple one; in particular, it is likely that the amount of non-market income is not the same in all counties with a given income level. In fact, there are reasons for believing that non-money activities are more important in some than in others, and that these differences can be discerned in terms of certain characteristics and activities found in these counties. One differentiating characteristic is industry structure. More specifically, the distinction between an agriculture and industrial base has relevance to the question of the importance of such activities. Non-money type activity is more likely to be important in low-income regions in which agriculture is the primary form of economic activity. The spatial and economic forms of such regions are likely to generate conditions in which non-

market pursuits have a relatively high payoff in these regions. While hunting, fishing, and gardening are activities that can yield non-money income to any one no matter where he lives, the spatial organization of a "farm society" generates an accessibility which lowers the cost of pursuing these activities. In the more "industrialized" regions people can engage in non-money type activities which increase their consumption, e.g., hobbies of various kinds including hunting, fishing, and gardening. But most of what can be done in the city can be done in the country and the costs of doing some of these things, e.g., hunting, fishing, and gardening is lower in farm regions.

Money accumulations are another characteristic that provides a basis for differentiating counties. Money, of course, is an essential characteristic of a market economy by virtue of its extensive use in transactions. That use requires a money stock, which means that measures of cash balances can be conceived of as indexes of money or alternatively non-money type activity. This characterization of money balances seems particularly apt in regions in which farming is important, as it is in most eastern Kentucky counties. In such communities, of course, the demand for cash balances in a market situation is usually very heavy. If we find small cash balances in these communities, it may be that non-market activities are relatively more important.

One other characteristic we decided to investigate was the extent to which certain utilities were in use in the region. Utilities, perhaps telephones, may be correlated with money activities involving money transactions. Barter transactions, for example, are more likely to require direct meeting to consummate the transaction. Measures of the extent to which telephones are in use can therefore by construed as indexes of the importance of money or non-money activities and hence incomes.

We broke our sample of low-income eastern Kentucky counties into three dichotomies: (1) those counties whose economic base was primarily farming,[6] (2) those counties with low cash balance levels,[7] and (3) those counties that had little in the way of utilities such as the telephone.[8] For each group we calculated an $\bar{r}$ and its standard error. If non-money incomes were relatively more important in these three sets of regions, we would expect these mean residuals to be positive and statistically significant. Furthermore, we would expect the actual values to be greater than the mean value calculated for the sample of all low income regions.

The results shown in Table 3 indicate positive $\bar{r}$'s that are statistically significant for the farm and low money balance groups. In addition, the mean values for these two groups show up as greater than that for the sample of all low-income regions. For the utility group, the $\bar{r}$ was positive but did not differ significantly from zero. The extent of telephone penetration, however, was probably the weakest of the three characteristics used in differentiating the counties in the sample.

We do not suppose these to be independent tests. Nevertheless, we believe, overall, that the results lend support to our view about the way in which non-money income activities operate in lagging regions. When there is reason to believe, because of a particular characteristic of the region, that non-money income activities are important, the empirical results show migration to be less sensitive to income differentials then the simple migration model indicates. This is not so much a matter of the population in these regions being less sensitive to income differentials; rather we argue that it is a consequence of using inaccurate measures of these income differentials in the empirical analysis.

A more direct test of the hypothesis would require information about how people spend their time in a region. Such information should reveal directly the extent of non-money income in all regions. With this information we should be able to construct measures of total income (TY), which when incorporated in a migration model should reveal the true relation between migration and income. Our results indicate that we could expect to find migration out of lagging regions to be less sensitive to income than the current estimates of this relation suggest.

CONCLUSIONS AND POLICY IMPLICATIONS

Parts of this paper can be interpreted as providing additional evidence that people in lagging regions do respond to economic factors and do so in a way that is selective with respect to such personal characteristics as age. But we have clearly shown that simple migration models, even after taking into account such socio-demographic variables as age and education, do not give us a very precise indication of the responsiveness to economic factors. In particular, we cannot really say exactly how these people respond to the pull of income differentials even though we know these differentials are important. The income measures used in making such estimates are inadequate. They do not take into account non-money activities which are important in some places and are included as a part of the income comparisons families in the lagging region make. It is clear from both the argumentation and the empirical tests presented in this paper that a better measure of income -- one that took account of the non-money component -- would provide us with a better reading of that income-migration relation.

These findings have relevance to certain regional development policy issues currently under discussion. Much emphasis has been given recently in discussions of regional development policy to the concept of a growth center. Coming out of some interpretations of this concept is a set of regional development policies in which the emphasis is placed on human capital investment in lagging regions combined with whatever measures are needed to get people from lagging regions to places where there is autonomous growth potential, i.e., urban growth centers.

To emphasize investment in people and the movement of these people to growth centers has considerable appeal, particularly in view of what is generally judged to be the disappointing result stemming from capital goods investment programs that have been applied in the lagging regions. Yet, there remain questions about the ultimate costs of a growth center policy. It might be that these costs will turn out to be higher than anticipated because of the tastes and preferences of the people living in the lagging regions. It has often been argued that some of these people are unresponsive to income differentials because of "locational attachments" for the region in which they live. There may be some merit in the argument. But the results of this study suggest that when large money income differentials are found necessary to move people out of some places, this need not represent tastes and preferences, but rather the hard-headed recognition of the non-money income variable. Non-money income is a concept which warrants more attention then it has received in the analysis of regional development problems and policies. Not only can it contribute to our understanding of inter-regional population flows, but it should also aid us in our efforts to develop costs estimates of the alternative ways proposed to deal with our regional problems.

TABLE 1. MIGRATION REGRESSION FOR KENTUCKY COUNTIES
1940-50 and 1950-60

Period	γ	$\beta dN_{t} + n$	γY_{t}	δA_{t}	$\varepsilon S_{\varepsilon}$	R^2
1940-50	-0.715	+0.500151 T = 7.988	+0.000072 T = 5.696	+0.341278 T = 3.745	+0.016642 T = 0.158	0.738
1950-60	-0.279	+0.656735 T = 12.901	+0.000006 T = 0.178	+0.450150 T = 2.940	+0.052931 T = 0.299	0.805

TABLE 2. MEAN REGRESSION RESIDUALS FOR EASTERN KENTUCKY COUNTIES

	All Eastern Kentucky Counties	Eastern Kentucky Counties with Income Below Median
1940-50	+ 0.0085 (0.0060)	+ 0.0196 (0.0079)
1950-60	+ 0.0076 (0.0095)	+ 0.0285 (0.0109)

TABLE 3. MEAN REGRESSION RESIDUALS FOR SELECTED GROUPS OF EASTERN KENTUCKY COUNTIES

	Farm Counties	Low Cash Balance Counties	Counties with Few Utilities
1940-50	+ 0.0293 (0.0118)	-	-
1950-60	+ 0.0369 (0.0155)	+ 0.0458 (0.0140)	+ 0.0180 (0.0167)

FOOTNOTES

[1]This selectivity is clearly evident in the Brown and Hillery analysis of Southern Appalachia in "The Great Migration, 1940-60," in (5, pp. 54-78).

[2]There are no apriori reasons for expecting these relations to be linear--or non-linear for that matter. There are, of course, certain transformations of the data that can be made as a means of investigating empirically the nature of these relations. In the calculations made, four forms of the regressions were calculated (i.e., linear, semi-logarithmic, double-logarithmic and inverse semi-logarithmic). Since the linear regression fitted the data best, the linear relations were accepted as the best ones and they are the only ones reported.

[3]The migration data for the 1950-69 period come from (10, Table 2). For the years 1940-59, we used estimates published in (2, Table 13). Employment change figures were calculated from Census data covering total employment for the years 1940, 1950, and 1960 (13, Table 23), (12, Table 43), (10, Table 2). The age and education measures were secured from Census for the year 1940 and 1950 (13, Tables 21 and 22) (11, Table 2). Finally, the income measure used was per capita income for the years 1939 and 1949 and comes from the office of Development Services and Business Research at the University of Kentucky.

[4]The failure of education to show up in a statistically significant association with migration could be a consequence of the measure used. Median years of formal schooling is an extremely crude index of the education attainment of the population in Kentucky counties, especially in view of the apparent 'qualitative" differences in the school systems in these counties.

[5]We focused on those counties which were included in the delineation made by Bowman and Haynes (1, pp. 2-3).

[6]Eastern Kentucky counties with more than 50 percent of the gainfully employed persons classified as being employed persons classified as being employed in agriculture were considered as agricultural regions. There were 19 such counties in the 1940-50 period and 13 such counties in the 1950-60 period.

[7]It was only possible to use cash balances as a distinguishing characteristic during the 1950-60 period. Estimates of commercial bank demand deposits in 1956 were used as a measure of cash balances (11, Table 2). These figures, in turn, were divided by an estimate of the counties population (2, Table 7). Counties with demand deposits per person of less than $200 were designated as regions with a low cash balance level. There were 14 such counties.

[8]As the average cash balances, it was only possible to use information on telephones as a distinguishing characteristic during the 1950-60 period. Census data on the proportion of households having a telephone in 1950 was the measure used (11, Table 2). The dividing line was set as 25% and there were 12 counties in which less than 25 percent of the household population had telephones.

[9]These are not independent tests because there is likely to be a positive correlation between the regional characteristics investigated--low income, low cash balance, low utility user and a farm base.

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