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DETERMINANTS OF MIGRATION TO CENTRAL CITIES: A COMMENT

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1. INTRODUCTION

In a recent issue of this journal, Pack [3] attempts to analyze the importance of certain variables in attracting migrants to central cities. However, due to a series of errors, Pack's paper falls far short of answering the questions she poses. It would appear that the main problem of the paper is a lack of a firm theoretical base for its model. This shortcoming allows some rather strange explanatory variables to wander into the estimated equations and fosters a certain lack of care in the presentation of the statistical results of her estimations. In this Comment, we discuss first the problems arising from the variables chosen and then the confusion created by Pack's statistical presentation and discussion.

2. APPROPRIATENESS OF VARIABLES USED

Throughout the study, Pack focuses on a single equation model purporting to explain the variation of migration rates to some twenty central cities between 1955 and 1960. White and nonwhite migration rates are estimated separately. The explanatory variables are categorized in three groups: economic variables, fiscal variables, and housing variables.

First consider the income variables, Y and Y_N . They are, respectively, "median family income, 1960" and "median family income; nonwhite population, 1960." There are two major problems with the inclusion of these two variables. First, Pack assumes in orthodox fashion that a city's income level influences the decision by people to migrate to that city. However, it is difficult to imagine that a city's income level in 1960 would logically influence migration decisions made between 1955 and 1960. A more appropriate approach would have been to estimate each city's median income for each of the years between 1955 and 1960 and then compute an average. Alternatively, city median income levels in 1955 could have been used as the income proxy on the assumption that migration decisions are based on information which travels slowly. Clearly, the only situation in which the use of 1960 income data would be appropriate is that wherein the central city median income structure was essentially the same in 1960 as it was in 1955. No effort has been made by Pack to provide this justification for the use of 1960 data.

The second problem with the income data is that there is no justification provided for postulating white migration rates to be a function of the level of *total*

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(white and nonwhite combined) income while nonwhite migration rates are treated as a function only of nonwhite income. Clearly, the assumption here is that nonwhites only take into consideration income data relevant to them. Is it then assumed by Pack that whites are less rational than nonwhites? Clearly, a more appropriate measure of the level of income for white migration rates would be "median income; white population."

The next variable introduced is Y^* , the "percentage change in median family income, 1950-1960." There would appear to be some doubt as to whether Y^* is really an exogenous variable.¹ In particular, the quantity, quality, and income levels of migrants affect the rate of change of income. In order to check for an identification problem, Pack's model needs to be expanded at least to a two equation model of the form:

$$(1) \quad W = f(Y, Y^*, \dots)$$

$$(2) \quad Y^* = g(W, \dots)$$

where W is the white migration rate. Clearly, problems of identification can be answered only once structures for both Equations (1) and (2) have been specified. If Y^* is assumed to be an exogenous variable when in reality it is not, the resulting coefficient estimates will be biased and inefficient.

A second criticism of Y^* follows a point made earlier for income. Pack has specified Y^* as the percentage change in median family (white and nonwhite combined) income. If it is assumed that potential migrants are concerned about information on future opportunities for themselves, they should be logically concerned about the growth rate of opportunities for people similar to themselves. Thus, it would appear more logical to have used the growth rate of median incomes of whites as a determinant of white migration rates and of nonwhites as a determinant of nonwhite migration rates. It makes little sense to separate incomes by race, but not the growth rate of income.

The next variable considered by Pack, "unemployment rate for metropolitan area, 1960," UN , suffers from precisely the same kind of problem. There is no apparent reason offered why it should not be split into white and nonwhite unemployment rates rather than simply the total (white and nonwhite combined) unemployment rate. Furthermore, it escapes us why the unemployment rate in 1960 should influence migration decisions made previous to 1960. A better specification would be some average unemployment rate for the period 1955 to 1960. Not only would this be more relevant, but it would also better reflect overall business conditions for the city during the period rather than the particular problems of the 1960 recession.

Consider next the variable ME , the "median years of education 1950, population 25 years or older." The justification for this variable as a proxy for "growing employment opportunities" is "the expectation would be that the more highly educated the adult population of a city, the greater the probability that the area is

¹ Arguments running along somewhat similar lines are found in both Muth [2] and Sahota [4].

economically dynamic" (Pack [3, p. 251]). The causal relationship assumed here is at best weak (thus Pack chooses to insert the word "probability" in her justification). With a sample size of only twenty cities, stronger evidence of the validity of this assumption is certainly needed. Unfortunately, the correlation coefficient between the absolute change in employment between 1950 and 1960 and the percentage of employees who are in professional-technical and managerial occupations, which is mentioned in a footnote [3, p. 251], is unclear; no mention of what industries are included or of whether these industries are found in all of the twenty cities is ever made. In the end, it is very difficult to analyze the meaning of *ME*.

Among the fiscal variables in the analysis are "per capita taxes, central city," *T*; "educational expenditure per capita," *EX*; and "general expenditure per capita," *GX*. Two brief comments are in order here. First, it would have been useful if Pack had justified not using property taxes per capita to explain white migration rates and nonproperty taxes per capita to explain nonwhite migration rates. It seems very likely that the two groups are interested in different types of taxes. Second, it is nearly impossible to identify *GX* and *EX* precisely since it is never mentioned whether these variables pertain to the central city or to the metropolitan area.

The housing variables also pose problems. The variable "percentage of housing stock owner occupied," *HO*, is used as a measure of the housing opportunities. Why it is used in this manner escapes us altogether. The potential migrant is not per se interested in the proportion of the housing stock which is owner occupied; rather, he is interested in the *availability* of rental housing for his personal consumption. A superior variable would have been the vacancy rate, for this is clearly a far better indication of rental housing availability.

The second housing variable, "percentage of housing stock unsound," *HU*, reopens the issue of the soundness of a single equation approach. In particular, a reasonable hypothesis might be that *HU* is itself a function of the migration rate, among other variables. If a city has a high net migration rate, owners of rental property in low income areas might very well not spend much money on upkeep because of (a) the high likelihood of future damage to their property (because of the social instability introduced by the large amount of migration) and (b) the ease of finding new occupants if the old ones do not like the conditions of the housing stock.

3. STATISTICAL PROBLEMS

If one were to ignore the problems with the variables used in Pack's model, he still would have difficulty interpreting the statistical results presented. A large portion of the problem stems from the absence of a correlation coefficient matrix.

This might not cause many problems except that, in adding a new variable, "percentage of central city population nonwhite, 1950," *NP*, to the nonwhite migration equation, the coefficients of several of the variables undergo very marked changes (Pack [3, Table 2]). In some cases, the estimated coefficients change sign: *Y**, *UN*, *GX* and *ADC* (aid to dependent children, average monthly payment per recipient). In addition, for three cases (*YX*, *GX*, and *T*), previously insignificant variables became significant. In all cases except *ADC*, *UN*, and *ME*, the signifi-

cance level improved. Pack chooses to view this change favorably: "At the same time, there is a substantial increase in the significance of the income variables. The latter effect is to be expected: once social obstacles are removed, potential migrants can concentrate on economic variables."

While Pack's conclusion might have a priori appeal, it is not justified by the empirical results. The very extensive variation in the estimated coefficients strongly suggests the presence of major multicollinearity problems. Without the correlation matrix, it is impossible to comment on the exact nature of the problem; however, it would not be surprising to find the percentage of nonwhite population highly correlated to many of the variables, including the income level, change in income level, unemployment rate, unsound housing stock, and aid to dependent children payments. If indeed there is a great deal of multicollinearity introduced into the model by NP , then the coefficients estimated are biased and highly imprecise. It would appear in point of fact that the changes Pack observed are very likely not due to potential migrants' concentrating on economic variables once social obstacles are removed; rather, they are very likely due to statistical problems totally ignored by the author.

4. CONCLUSION

The problem of examining "the significance and relative importance of economic . . . variables, fiscal policy variables, and housing variables, in attracting migrants to an area" [3, p. 250] is certainly important, especially in view of the possible policy implications that may be inferred from such an investigation. However, only if the investigation is (a) founded logically upon meaningful behavioral assumptions and (b) carried out with appropriately structured and applied techniques, can it be of any true value. Unfortunately, Pack's analysis does not seem to conform adequately to either (a) or (b).

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