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THE DETERMINANTS OF INTERREGIONAL MIGRATION IN KENYA

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Introduction

Recent years have seen a proliferation of studies of the determinants of migration in less developed countries. Econometric studies have covered Columbia /19/, Brazil /18/ and Venezuela /15, 20/ in Latin America; Taiwan /21/ and India /5, 6/ in Asia and Egypt /4/, Ghana /2/, Kenya /9, 16/ and Tanzania /1/ in Africa. All have been cross-section studies between states or regions while the studies for Kenya, Tanzania, Taiwan and one for India dealt specifically with rural-urban migration.

Migrants are assumed to be rational decision makers and the individual allocates himself spatially so as to maximize the net present value of his future stream of returns. Although there may be psychic returns and costs the economic component is most easily measured as the present value of the expected difference in income between the destination and origin regions, net of the direct costs of moving.

The general method of analysis has been defined by the data available. Most often data from a country's census of population have been used which gives the distribution of population by region of birth and region of residence at the time of the census. The rate of cumulative migratory flow from region i to region j is then related to various economic characteristics of the origin and destination regions such as average wages and employment rates, the distance between the regions and to other aspects of the regions, such as the degree of urbanization and the proportion of persons in the regions who have attained a certain level of education. Sometimes there has been enough disaggregation of the data to define the rate of migration by sex, by age-group and less often by education. But even where this has been possible the explanatory variables relate more often than not to the whole population of the region and are not specific to persons of a given age, sex and education level.(1)

Invariably migrants have been found to be highly responsive to relative wage and employment opportunities but differences in findings and difficulties of interpretation have been evident when education and urbanization are used as

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(1) The most notable exception is the study for Tanzania /1/ which is based on a large-scale sample survey and which relates time-specific rates of migration for males in different age and education groups to the economic variables at the time of migration in the rural area of origin and the urban destination. The explanatory variables are specific to the educational attainment of workers.

explanatory variables. "If migration is found to be an increasing function of the education level of the origin region, it may indicate either that educated people are more mobile or that migrants do not value educational opportunities for themselves or their children. Interpretation of the results is further complicated by the fact that high regional education levels may indicate fewer opportunities for the uneducated and induce their outmigration" /15 p.377/ (2)

Regions which are more urbanized are thought to be more attractive to migrants because they offer greater amenities, so they could be expected to have greater in-migration and lower out-migration. However, previous studies have not been unanimous in their findings. (3)

In addition to the problem that different patterns of migration of the various sub-groups in the population are masked using aggregated census data other problems remain. Since the time period of migration extends back over many years those people who moved from i to j and away again will be missed. And accurate measurement of some of the independent variables is difficult, especially the income and employment levels in the origin region, which may be predominantly rural.

Econometric problems are also evident. Explaining cumulative migration up to a recent year t with variables measured only for year t represents a misspecification and may well lead to simultaneous equation bias. Perhaps wage levels at time t are the result of past migration while invariably, they act as proxies for past wage levels which induce migration. Furthermore, it has recently been shown that in a large number of these studies, the method of normalizing the migration flow for variations in the sizes of regional populations bias the estimated coefficients of the explanatory variables, if the latter are correlated with population size, by attributing to them some of the variance in migration flows that is truly attributable to differences in regional populations (4) /25/.

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(2) Studies for Egypt /4/ and Brazil /18/ found that migration decreased with higher levels of education at the origin and increased with higher levels of education at the destination. For Ghana /2/ it was found that migration decreased with higher levels of education at both the origin and destination while for India /5/ migration increased with higher levels of education at both the origin and destination.

(3) For Brazil /18/ urbanization induced out-migration and deterred in-migration, for Venezuela /15/ urbanization retarded out-migration and induced in-migration while in Ghana /2/ in-and out-migration appeared to be induced by urbanization.

(See footnote (4) on page 4.)

This is a study of the determinants of inter-district cumulative migration in Kenya based on the 1969 Census of Population /12/. Therefore, many of the criticisms of such studies of other countries could equally well be levelled at this one. The aggregation problem remains since it was impossible to obtain migration flows by education and age levels. Some of our explanatory variables are, perhaps, not good proxies for what we are trying to measure while the interpretation given to some of them remains ambiguous. Our data then, are no worse and no better than those employed in most of the studies that have come before. However, we address ourselves to estimating a migration function that incorporates the possible interaction between migration and wage levels and which employs a model of choice which has found wider application in applied economics and which overcomes the problem of the specification of the dependent variable.

The Model

The polytomous logistic or linear logit model has been used to determine the probability that a certain mode of urban transport will be used by commuters rather than some alternative mode /22,24/. T. Paul Schultz /20/ recently applied the model to a study of migration in Venezuela and it will be used in our study of inter-district migration in Kenya.

The probability (P) that an individual, faced with n possible alternative locations including his birthplace i, will reside in region j in any time period is assumed to depend on a vector Ƶij of weighted personal characteristics, such as age, sex and education, and on such regional characteristics as wage levels and employment opportunities, as well as the distance between the regions.

Thus,

(1) $$P_{ij} = \frac{\exp(Z_{ij})}{\sum_{j=1}^{n} \exp(Z_{ij})} \qquad \begin{matrix} i = 1 \ldots\ldots n \\ j = 1 \ldots\ldots n \end{matrix}$$

and for each region of origin the Pij's sum to 1.

i.e.

(2) $$\sum_{j=1}^{n} P_{ij} = 1 \qquad i = 1 \ldots\ldots n$$

The difficulty of working with this specification is that the probability Pij is constrained to the interval from zero to one while the right-hand side can take arbitrary real values. This can be overcome by replacing the left-hand side by

(3) $$\frac{P_{ij}}{(1-P_{ij})} = \frac{P_{ij}}{P_{ii}}$$

and if logarithms are taken we obtain the estimation equation

$$(4) \quad \ln\left(\frac{Pij}{Pii}\right) = Zij - Zii \qquad \begin{array}{l} i = 1 \ldots\ldots n \\ j = 1 \ldots\ldots n \\ i \neq j \end{array}$$

where the left-hand side is defined to be the logarithm of the probability of migrating from i to j divided by the probability of not migrating from i.

Because almost all our variables relating to the characteristics of the origin and destination regions of Kenya are not specific to the sex, age and education levels of the migrants we decided to concentrate on the total migrants and formulated the model for testing in the following manner.

The probability of migrating from region i to region j, Pij, is measured as $\frac{Mij}{Bi}$

where: Mij is the total number of outmigrants born in i but at any time living in j and enumerated at time t.

Bi is the total number of persons born in i and still alive at time t.

The probability of not migrating, Pii, is measured as $\frac{Mii}{Bi}$

where: Mii is the total number of persons residing in i, at time t, who were born in region i.

Therefore, our dependent variable in logs (5) is:

$$(5) \quad \ln\left(\frac{Pij}{Pii}\right) = \ln\left(\frac{Mij/Bi}{Mii/Bi}\right) = \ln\left(\frac{Mij}{Mii}\right)$$

The elements in our vectors of regional characteristics, Zij and Zii, are the average wage levels of the destination and origin regions Wj and Wi; measures of employment opportunities in these regions, Ej and Ei; the average

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(4) The usual method of normalizing is to divide the number of migrants from the origin region to the destination region either by the number born or now residing in the region of origin. Young's criticism is directed particularly at those studies which do not include the population size of origin and destination regions as explanatory variables. Those studies which include "population size may be rationalized on the ground that it is a proxy for unknown variables which influence migration. For this purpose it is one of the least suitable of all variables because it is inextricably associated with a large number of factors which do undoubtedly influence migration.... When it is used as a vague proxy variable.... it is merely a formalized expression of ignorance; it has explanatory power only in the jargon sense of increasing the multiple correlation coefficient" /25 p.98/.

(5) An advantage of using the logarithmic transformation is that the estimated coefficients of our explanatory variables are easily interpreted as elasticities.

road distance between the regions i and j, Dij[6]; a measure of the educational attainments of the districts' populations, Edj and Edi; and finally the degree of urbanization in the receiving and sending regions, Uj and Ui.

Our first formulation of the polytomous logistic model can be written in the following manner, recalling that all variables are in logarithms, but for simplicity, this notation is excluded.

Model A

$$(6)\quad \frac{Mij}{Mii} = a_0+a_1Wj+a_2Wi+a_3Ej+a_4Ei+a_5Dij+a_6Edj+a_7Edi+a_8Uj+a_9Ui$$

An alternative specification is incorporated in model B, with the inclusion of the Todaro /28/ hypothesis that migration is functionally related to "expected" income differences, whereby the average wage in the origin and destination regions are multiplied by the probability of obtaining a job in the respective regions, as measured by the employment rate.

Model B

$$(7)\quad \frac{Mij}{Mii} = bo+b_1(WjxEj)+b_2(WixEi)+b_3Dij+b_4Edj+b_5Edi+b_6Uj+b_7Ui$$

In an attempt to take account of the possible interaction between some of the variables, particularly between migration and the wage variables, a simultaneous equations model is hypothesized as Model C.

Model C

$$(8)\quad \frac{Mij}{Mii} = co+c_1\left(\frac{\hat{Wj}}{Wi}\right)+c_2\left(\frac{Ej}{Ei}\right)+c_3Dij+c_4Edj+c_5Edi+c_6Uj+c_7Ui$$

$$(9)\quad \frac{Wj}{Wi} = do+d_1\left(\frac{\hat{Mij}}{Mii}\right)+d_2\left(\frac{Ej}{Ei}\right)+d_3\left(\frac{Jj}{Ji}\right)+d_4\left(\frac{Edj}{Edi}\right)+d_5\left(\frac{Uj}{Ui}\right)$$

In equation (8) we impose the homogeneity restriction[7] on some of our explanatory variables, whereby we expect our dependent variable to be positively related to relative wages and to relative employment rates, while the education and urbanization variables enter separately. We are allowing the levels of the latter variables to influence migration independently of their relative levels

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(6) Apart from the costs of transportation, which are usually a small part of the expected gain in income from migration, the distance variable reflects the psychic costs involved as well as the availability of information about the destination region and the existence of alternative opportunities.

(7) This implies that migrants respond to relative differences in the variables and that the elasticities of migration with respect to the given variable in the destination region and in the origin region are equal and opposite in sign.

in the destination and origin regions.[8]

In equation (9) we hypothesize that the wage in the destination region relative to the wage in the origin region is a function of the relative employment rates, as one measure of labour market tightness; the relative educational attainments of the populations of the regions, perhaps reflecting relative productivity levels of the regions' work force; the relative occupational make-up of those employed in the regions $\frac{Jj}{Ji}$; the relative degree of urbanization in the regions; and, of course, the migration probability. All of the d coefficients are expected to be positive except d_1 which may be negative. Where the probability of migrating from i to j relative to the probability of not migrating from i is large, and if wages are determined competitively in the regional labour markets, then we could expect d_1 to be negative, reflecting the forces of factor price equalization at work.

The Data and Measurement of the Variables

Of the 41 districts of Kenya gross migration flows between 34 districts were selected for analysis, so that we have observations on 34x33 = 1122 inter-district movements of population.[9]

Mij, Mii : The 1969 Census of Population /12/ contains an unpublished enumeration of persons according to the district of birth and the current district of residence, and from this we were able to acalculate our dependent variable. However, this measure of migration is deficient since we cannot determine when people moved nor whether they have made multiple moves in the intervening years. In addition, the economic forces inducing migration could well have been changing over the years, perhaps in response to the migration itself.

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(8) Again, an alternative specification of equation (8) employs the relative "expected" wage levels in the districts, as an explanatory variable, instead of the relative wage levels and relative employment rates. Then we obtain Model D:

$$(10) \quad \frac{Mij}{Mii} = e_0 + e_1\left(\frac{\hat{W}j}{Wi} \cdot \frac{Ej}{Ei}\right) + e_2Dij + e_3Edj + e_4Edi + e_5Uj + e_6Ui$$

The second equation in this alternative model would again be equation (9).

(9) The districts of North-Eastern Province and the four districts in Eastern and Rift Valley Provinces formerly in the old Northern Province were excluded because of the lack of modern sector activity located there. These exclusions were necessary given that our wage levels and employment rates are derived from modern sector activities in the districts.

Wj,Wi : These measure the average unskilled wage in the districts in private modern sector activities in 1968. This is the first year that such information is available at the district level and is derived from unpublished material obtained from the annual Employment and Earnings Report /14/.

Ej,Ei : These variables estimate the proportion of the districts' labour force employed in the enumerated, modern sector. An average value of this ratio for the years 1964 - 1968 has been used in the analysis. The numerator of this ratio, modern sector employment, is extracted from various Employment and Earnings Reports /13, 14/ while the denominator, the districts' labour force was estimated in the following manner. ILO /10/ labour force projections provide an age specific estimate for males and females for 1960, 1965 and 1970 for Kenya. A constant rate of change between these years is assumed to obtain labour force participation rates for 1962 and 1969. These rates are then applied to the 1962 and 1969 Census totals /11, 12/ to generate labour force estimates by districts for the relevant years.(10)

Edj, Edi : These represent the proportion of the districts' population that had completed at least one year of formal education and is taken from unpublished Census of Population data /12/.

Uj,Ui : The proportion of each districts' population residing in towns of 5000 or more is obtained from the 1969 Census /12/.

Jj,Ji : The proportion of modern, private sector employment in such occupational categories as 'top level administrators', 'professional, executive and managerial' 'technicians, works managers and foremen and other supervisory personnel' and 'teachers' in each district in 1968 is contained in unpublished material from the Employment and Earnings Report /14/.

Dij : This is a measure of the road distance between the headquarters of district j and the headquarters of district i, calculated from a standard road map of Kenya.

Regression Results

The single-equation OLS regression results for Models A and B are reported in Table 1. The overall explanatory power of the models is quite high, given the size of the R^2s, which are significant at the 1% level using

(10) For greater detail on the estimation methodology used, see Rempel /17/.

the F - test. In equation A(i) Wj , Ej and Ei all have the predicted signs and are significant, except for Ej, which just fails the test. The sign of Wi was not anticipated but the coefficient is not significantly different from zero. If the majority of migrants tend to be rural in their district of origin but aspire to a modern sector wage, perhaps the modern sector wage in the district of origin overstates their existing alternative opportunities.

Both Uj and Ui are positive and highly significant. Urbanization in the destination district acts as a pull factor, confirming the attraction of town life to the potential migrant. The positive sign of Ui has a number of possible interpretations : perhaps those persons living in more urbanized districts have greater access to better information flows which leaves them with a higher propensity to migrate:[11] alternatively, casual evidence suggests that women may move to urban areas, especially Nairobi and Mombasa perhaps to join their men-folk and enjoy better medical facilities at child-birth, only for mother and child to return to their home areas later.

While the coefficient of Edi is positive and significant the coefficient of Edj is negative but not significant. However, the high correlation coefficient between Ej and Edj of .98 suggests that multicollinearity is destroying our attempt to determine the independent influence of these variables on our dependent variable. When Edj is dropped from equation A(ii) the coefficient of Ej is highly significant, as expected. While we have seen that the interpretation to be given to a positive Edi can be ambiguous, our results suggest that those districts with higher educational enrollment rates are more likely to have higher out-migration, although we cannot determine whether it is the more or less educated that move. In equation A(iii) both Ej and Ei are dropped and the coefficient of Edj becomes positive and significant.[12]

In equation B(i) the "expected" income model is confirmed since (Wj x Ej) is positive and highly significant, yet (Wi x Ei) is not significantly different from zero, perhaps for the reasons already suggested, that Wi overstates the alternative wage opportunities in the origin district.

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(11) Herrick /̄7/̄ found that city-to-city migration dominates migration patterns in Chile.

(12) Because of the very high correlation between Ej and Edj both are measuring forces of attraction for migrants, the individual components of which cannot be disentangled.

Table 1. Estimates of Polytomous Logistic Model of Lifetime Migration

	MODEL A : Equation (6)			MODEL B : Equation (7)
	A(i)	A(ii)	A(iii)	B(i)
Constant	-2.92 (3.00)	-3.04 (3.13)	-2.96 (3.04)	-2.35 (2.79)
Wj	0.28[b] (2.23)	0.30[a] (2.43)	0.31[a] (2.51)	
Wi	0.12 (0.98)	0.13 (1.00)	0.08 (0.64)	
Ej	1.97 (1.63)	0.32[a] (3.31)		
Ei	-0.13[b] (1.79)	-0.14[b] (1.88)		
(WjxEj)				0.31[a] (4.80)
(WixEi)				0.06 (1.08)
Dij	-1.65[a] (25.4)	-1.65[a] (25.3)	-1.63[a] (25.3)	-1.64[a] (25.6)
Edj	-1.65 (1.38)		0.31[a] (3.24)	
Edi	0.21[b] (2.16)	0.22[b] (2.22)	0.17 (1.77)	0.22[b] (2.28)
Uj	0.49[a] (12.7)	0.49[a] (12.6)	0.49[a] (12.5)	0.48[a] (12.71)
Ui	0.52[a] (9.8)	0.52[a] (9.8)	0.45[a] (11.7)	0.50[a] (9.68)
R^2	.542[a]	.540[a]	.539[a]	.539[a]
d.f.	1112	1113	1114	1115

NOTE: a = significantly different from zero at the 1% level

b = significantly different from zero at the 5% level

Two-tail tests we carried out on Edj, Edi, Uj and Ui in Tables 1, 2 and 3 since no a priori expectations regarding their signs were made. One-tail tests were carried out on the remaining variables. The significance of R^2 was determined from the F - test.

Table 2. Estimates of Polytomous Logistic Simultaneous Equations Model of Lifetime Migration.

Dependent Variable: $\frac{Mij}{Mii}$:

	MODEL C : Equation (8)	MODEL D : Equation (10)
	C(i)	D(i)
Constant	-0.98 (1.51)	-1.26 (1.96)
$\left(\frac{\hat{Wj}}{Wi}\right)$	-1.69[a] (3.34)	
$\left(\frac{Ej}{Ei}\right)$	0.34[a] (3.61)	
$\left(\frac{\hat{Wj}}{Wi} \times \frac{Ej}{Ei}\right)$		0.09[c] (1.45)
Dij	-1.67[a] (25.7)	-1.64[a] (25.3)
Edj	0.36[a] (2.93)	0.26[b] (2.17)
Edi	-0.02 (0.15)	0.24[b] (2.41)
Uj	0.73[a] (10.2)	0.51[a] (14.1)
Ui	0.44[a] (7.40)	0.52[a] (9.51)
R^2	.542[a]	.537[a]
d.f.	1114	1115

NOTE: c = significantly different from zero at the 10% level.

Table 3. Estimates of Polytomous Logistic Models C and D - OLS Estimates

Dependent Variable : $\frac{Mij}{Mii}$

	MODEL C	MODEL D
	C(ii)	D(ii)
Constant	-1.24 (1.92)	-1.25 (1.94)
$\left(\frac{Wj}{Wi}\right)$	0.09 (1.08)	
$\left(\frac{Ej}{Ei}\right)$	0.12[b] (1.68)	
$\left(\frac{Wj}{Wi} \times \frac{Ej}{Ei}\right)$		0.11[b] (2.14)
Dij	-1.65[a] (25.3)	-1.64[a] (25.3)
Edj	0.23 (1.93)	0.24[b] (2.12)
Edi	0.26[a] (2.62)	0.26[a] (2.62)
Uj	0.51[a] (13.7)	0.51[a] (14.1)
Ui	0.54[a] (10.2)	0.54[a] (10.9)
R^2	.537[a]	.537[a]
d.f.	1114	1115

Table 4. Estimates of Relative Wage Levels in Districts j and i, from Model C - 2SLS and OLS

Dependent Variable : $\frac{Wj}{Wi}$

	C(iii)2SLS	C(iv)OLS
Constant	0.01 (0.17)	0.01 (0.16)
$\left(\frac{\hat{Mij}}{Mii}\right)$	0.02^b (2.42)	
$\left(\frac{Mij}{Mii}\right)$		0.02 (1.76)
$\left(\frac{Ej}{Ei}\right)$	0.13^a (5.87)	0.13^a (5.73)
$\left(\frac{Edj}{Edi}\right)$	0.07^a (2.56)	0.07^a (2.50)
$\left(\frac{Uj}{Ui}\right)$	0.10^a (10.1)	0.10^a (9.97)
$\left(\frac{Jj}{Ji}\right)$	0.07^a (4.73)	0.07^a (4.66)
R^2	$.30^a$	$.30^a$
d.f.	1116	1116

NOTE. One-tail tests were carried out on all variables except $\frac{\hat{Mij}}{Mii}$ and $\frac{Mij}{Mii}$ where no a priori expectations regarding their signs were made.

Throughout the tests of Models A and B Dij appears as a large deterrent factor to migrants, its coefficient being negative and highly significant, and confirms the results of earlier studies from other countries.

Table 2 reports the results of estimating Model C, and its derivative Model D, by allowing for the interaction between relative average districts wages and relative migration rates. Equations C(i) and D(i) are estimated by the method of two-stage least-squares (2 SLS), whereby the explanatory variable $\left(\frac{Wj}{Wi}\right)$ is regressed on all the explanatory variables in the models and then replaced by the predicted values $\left(\widehat{\frac{Wj}{Wi}}\right)$ and $\left(\widehat{\frac{Wj}{Wi}}\right) x \left(\frac{Ej}{Ei}\right)$ to provide consistent estimates of the coefficients. In equation C(i), while the coefficient of relative employment rates is positive and significant the coefficient of $\left(\widehat{\frac{Wj}{Wi}}\right)$ is negative and significant. While the remaining coefficients in the equation are similar to those founds in Models A and B the coefficient of Edi turns negative and becomes insignificant. Once again the problem of multicollinearity is present since our instrumental variable $\left(\widehat{\frac{Wj}{Wi}}\right)$ is highly correlated with $\left(\frac{Ej}{Ei}\right)$ and Edi.(13) Perhaps this is hardly surprising since the correlation coefficient between $\left(\frac{Wj}{Wi}\right)$ and $\left(\frac{Ej}{Ei}\right)$ is .45 and then our instrumental variable $\left(\widehat{\frac{Wj}{Wi}}\right)$ is constructed as a linear combination of the exogenous variables in the first stage, one of which is $\left(\frac{Ej}{Ei}\right)$. Clearly, relative wages are higher in those districts where employment opportunities are greater, with the result that it is impossible to determine their separate influences on migration in the simultaneous equations model.

This collinearity problem is reduced in equation D(i) where the predicted "expected" relative wage is used as an explanatory variable and is found to be positively related to the migration probability and significantly different from zero at the 10% level.

Table 3 presents the results of estimating the migration function by the method of OLS and treating relative wages as exogenous to the model. In equation C(ii) $\left(\frac{Wj}{Wi}\right)$ now attains the predicted positive sign yet its coefficient is not significant, while in equation D(ii) the coefficient of the "expected" relative wage is marginally higher than in the simultaneous equations model in Table 2 and is now significant at the 5% level.

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(13) The simple correlation coefficients are .81 and .50 respectively.

Although a comparison between equations C(i) and C(ii) is difficult because of multicollinearity in the former equation a comparison of equations D(i) and D(ii) suggests that allowing for interaction between migration and relative wages proves fruitless. All the coefficients in these equations remain virtually unchanged so perhaps the simultaneous equations problem, so often assumed but never tested in other migration studies, need be of no great concern.(14)

In Table 4 and equation C(iii) we estimate the relative wages equation, the second equation in our simultaneous equations Model C, by the method of 2SLS. There we find relative unskilled average wages in 1968 in the destination district j to the origin district i are positively and significantly influenced by relative employment rates, educational attainments, levels of urbanization and the occupational compositions of those employed. In addition, the coefficient of our migration variable $\frac{\hat{M}ij}{Mii}$ is positive and significantly different from zero at the 5% level. When the equation was estimated by the method of OLS, as reported in equation C(iv), all of the coefficients of the explanatory variables remained unchanged while our migration variable just failed to be significant at the 5% level. In both equations, the overall explanatory power of the model is relatively low.

If average unskilled wages in the districts of Kenya are determined by the forces of the supply and demand for labour we would have predicted that the sign of our migration variable in equations C(iii) and C(iv) would have been negative.(15) This would imply that a relatively large flow of migrants from district i to district j would depress the average wage differential between the districts. Yet, this proved not to be the case, given the positive sign of the migration variable. This result tends to confirm the earlier findings of the authors, that wages in Kenya's modern sector are determined by forces other than the supply and demand for labour /8/.

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(14) Perhaps this conclusion requires to be tempered somewhat, when we recall the limitations of our data. A lifetime migration probability rate is being related to relative wage levels in the destination and origin districts in the year prior to the Census of Population. The earlier relative wage levels that induced past migration, and which is turn may have been contemporaneously influenced by migration, may have appeared very different from the wage relatives of 1968.

In addition, there are other possible simultaneous equation interactions that we have ignored. Clearly, relative employment rates and levels of urbanization of more recent years are a function of past migration. To take account of all of these factors would require a general equilibrium approach, which is beyond the scope of this paper.

(15) Indeed, this was the result Sahota /18/ obtained from his simultaneous equations model for Brazil, yet he offered no interpretation of his findings.

Conclusions

Given the shortcomings of our data for this type of study the polytomous logistic model of migration in Kenya has performed reasonably well. We have found the population to be attracted to districts with better economic opportunities as measured by wages and employment rates as well as "expected" wage levels, and to be deterred by the distance factor of the move. Our results suggest that urbanization and the level of educational attainments, in both the district of origin and the destination district, induce migration. However, we had difficulties in sorting out the independent role of education and employment opportunities in the destination district.

In our test of the simultaneous equations model our results suggest that single equation methods of estimation of the migration function perform just as well as when we take account of the possible interaction between wages and migration. Inter-district relative wage differences do not appear to have narrowed as a result of migration.

The direct policy prescriptions from our analysis must be restricted, given the very aggregated nature of our census data. Since we have shown the population to be responsive to wage and employment opportunities, and if the flow of people in search of employment into the larger towns is to be retarded, then a greater effort is needed to redirect economic opportunities to those districts where existing opportunities are few. If high wages do not respond to an increasing flow of migrants then an optimal wages policy is needed which is consistent with the equitable distribution of income goal of the government.

However, census data do not allow us to answer such pressing policy issues as whether programmes to alleviate urban poverty will stimulate ever more in-migration, or whether population redirection is better accomplished with wage and employment policies or the provision of housing and social services, or whether the major origin or destination regions should be the focus of attention.

What is required is an in-depth study of migration in Kenya that will generate data offering a much finer profile of those who migrate as well as a greater disaggregation of the factors inducing migration.[16]

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(16) Perhaps a survey of the order of that of Bienefeld and Sabot /3/ in Tanzania is called for in Kenya. It generated data on rural-urban migrants, by sex, age and education, which were then related by Barnum and Sabot /1/ to the wage and employment levels in the origin and destination regions at the time of moving, during three different time periods.

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