

Urban-Rural Income Transfers in Kenya: An Estimated-Remittances Function

G. E. Johnson and W. E. Whitelaw*
University of Michigan and University of Oregon

I. Introduction

In most LDCs a substantial wage differential exists between urban and rural employment—even after adjustment has been made for differences in living costs and labor quality. This causes a number of social and economic problems. First, labor-market equilibrium can be established only by the existence of a high urban unemployment rate, for many individuals will take their chances with unemployment in hopes of obtaining the high urban wage.¹ Second, the distribution of income in the society is artificially distorted. Those individuals who are fortunate enough to obtain permanent urban employment enjoy an enormous advantage over those who are forced to remain in rural areas and an even greater advantage over those who come to the cities but fail to find work.² This causes dissatisfaction with the existing social system, for there is a high probabilistic element in the determination of incomes. Third, job opportunities in the “modern” sector of the economy will be restricted by both large wage increases and a high wage level,³ and this will create downward pressure on wage levels in

* The authors were visiting research fellows at the Institute for Development Studies of the University of Nairobi at the time the research for this paper was undertaken. They are indebted to H. Goldstein, C. Kamau, S. Lewis, J. Moock, R. Porter, and J. Stiglitz for useful comments and to the Rockefeller Foundation for financial support.

¹ See J. R. Harris and M. P. Todaro, “Migration, Unemployment, and Development: A Two-Sector Analysis,” *American Economic Review* 60 (March 1970): 126–42.

² In Kenya the “typical” unskilled or semiskilled worker in the industrial sector earns about 240 shillings per month, whereas an agricultural worker earns about 80 shillings per month. This gross differential must be adjusted for cost-of-living differences between urban and rural employment, which may be as great as two to one for food and shelter. Any income which is transferred to rural areas, however, must be evaluated at the rural price level. There is also the problem of seasonality in agriculture, which blurs comparisons. For a thorough analysis of the determinants of the structure of urban wages in Kenya, see G. E. Johnson, “The Determination of Individual Hourly Earnings in Urban Kenya,” Institute for Development Studies Discussion Paper no. 115 (Nairobi, September 1971).

³ We would like to make it quite clear that we mean that the urban wage level in Kenya is “high” relative to the rural wage and for the country-wide capital-labor ratio; it is not high in any absolute sense or relative to wage levels in developed countries. The official value of the Kenya shilling is one-seventh of the U.S. dollar, so the 240 shillings monthly wage is worth about \$34.

the rural sector, thus exacerbating the fundamental distortion in the distribution of income.

At the same time, urban wage recipients often remit some of their income back to friends and relatives in rural areas, and this tends to mitigate the effects of a nonmarket wage structure on the distribution of income. To the extent that the utility of an individual who is employed in the urban sector depends on the consumption levels of other members of the "extended family" who live in rural areas as well as upon his own consumption level, we would expect that urban-rural remittances indeed would occur. The purpose of this paper is to investigate the quantitative magnitude and empirical determinants of these remittances for Kenya, using data on the average amount of money urban workers send to rural areas each month as well as the joint distribution of a number of their socioeconomic characteristics. Section II describes the data and reports the magnitudes involved; Section III provides empirical estimates of a remittances function; and Section IV discusses some implications of the findings.

II. The Data

In the spring of 1971 the Institute for Development Studies of the University of Nairobi conducted a survey of African households in Nairobi under the auspices of the Nairobi City Council. The sample was confined to low- and middle-income areas of the city, but this does not create much of a problem of bias, for most residents of high-income areas are Europeans and Asians.⁴ The survey schedule contained questions on basic socioeconomic variables as well as questions on income remittances. The latter included: (1) Do you ever send any money to other areas in Kenya? (2) If so, how much money per month do you usually send? (3) What is the purpose of sending the money?—(a) school fees; (b) paying off debts; (c) maintenance of farm; (d) support of friends and relatives. Of the 1,140 males in the sample who had some income in December 1970, 88.9 percent responded that they regularly sent some money out of Nairobi. The average amount remitted (including the zero amount for the 11.1 percent who remitted nothing) was 85.7 shillings per month. The average monthly income for the sample was 411.5 shillings per month, so 20.7 percent of the sample urban wage bill was remitted.⁵ Most of the money was intended for consumption by the extended family, as table 1 (the distribution of responses to question [3] above) shows rather clearly. This, of course, presents a rather difficult interpretive problem. Even if the typical urban worker sends money which

⁴ Details of the urban study are found in W. E. Whitelaw, "Nairobi Household Survey: Description of the Methodology and Guide to the Data," Institute for Development Studies Discussion Paper no. 116 (Nairobi, September 1971).

⁵ This obviously does not make allowance for the size of rural-urban transfers, for which we have no data. Generally, these are the resources raised by rural residents to finance job search in the urban area by a member of the family.

TABLE 1
PURPOSE OF SENDING MONEY FROM NAIROBI—
PERCENTAGE OF THOSE WHO REMIT MENTIONING
EACH CATEGORY

Purpose	%
a) School fees	12.1
b) Paying off debts	1.7
c) Maintenance of farm	3.6
d) Support of family and friends	96.2

he intends for consumption purposes, he cannot control how the recipients dispose of their other income. They may increase their expenditures on farm improvements, education, and other nonconsumption items as a result of receiving additional income from the urban member of the family.

III. An Estimated Remittances Function

We now turn to the question of the relation between the total income transferred out of Nairobi each month (T) as a function of monthly income in Kenya shillings (Y). Table 2 presents two sets of regression results, the first in which the fraction of income remitted, T/Y , is a function solely of a cubic in income and the second in which T/Y depends on income and a set of relevant demographic characteristics available in the survey. These include: T , income (in Kenyan shillings) sent out of Nairobi each month;

TABLE 2
ESTIMATED-REMITTANCES FUNCTIONS FOR KENYA
WITH AND WITHOUT ADJUSTMENTS FOR DEMOGRAPHIC
CHARACTERISTICS

Variable	Unadjusted	Adjusted
$Y/100$	-.0454 (.0110)	-.0501 (.0107)
$(Y/100)^2$ .....	.00369 (.00142)	.00468 (.00135)
$(Y/100)^3$	-.000103 (.000049)	-.000139 (.000047)
EL .....	...	.0391 (.0111)
WI .....	...	-.0208 (.0139)
WR .....	...	.0141 (.0120)
CI .....	...	-.0118 (.0036)
CR .....	...	.0164 (.0031)
ED .....	...	.0035 (.0017)
YAN .....	...	.00101 (.00047)
Constant .....	.353 (.022)	.239 (.038)
R^2 .....	.052	.174

Y , income earned per month; L , whether any member of individual's family cultivates land outside of Nairobi (one/zero variable); CI , number of children living in Nairobi; CR , number of children living outside of Nairobi; WI , number of wives in Nairobi; WR , number of wives outside Nairobi; YAN , year arrived in Nairobi; and ED , educational attainment (in years). The land cultivation variable, L , has two potential influences on transfers. First, it is to some extent a proxy for the income of the rural household and would have a negative effect on T . Second, cultivation of land by his family may imply present or future ownership of land by the urban worker, and this naturally increases his attachment to the rural area and increases T . The number of family members in and out of Nairobi can be broken down by wives and children, which is reasonable, for wives are potential income earners, whereas children are dependents. It would have been desirable to have information on the number of dependent parents and siblings, but such information was not available from the urban study. The year the individual arrived in Nairobi, YAN , is an index of the degree of rural attachment. The longer the individual has lived in Nairobi, the less he feels he is just a temporary resident. Finally, the coefficient on ED , the urban worker's level of educational attainment, should be positive. A high level of educational attainment often indicates that a large amount was invested in the individual by a family member or friend, and this would tend to increase the degree to which the worker feels beholden—legally or otherwise—to someone in the rural areas.

We first discuss the unadjusted results. Each of the coefficients on the cubic in income is significant at conventionally acceptable test levels. A quartic in income was also run, but this did not add significantly to the explanation of transfers ($F = .76$). Table 3 presents predicted values of T/Y from the unadjusted results for selected values of Y , as well as predicted values of T ; $\partial T/\partial Y$, which is the marginal propensity to transfer; and $\epsilon = (\partial T/\partial Y)/T/Y$, which is the elasticity of transfers with respect to income. Notice that T/Y declines monotonically with income—from about 33 percent at the low end of the range of incomes to 10 percent at the high end. Similarly, the marginal propensity to transfer declines with income up to about 700 shillings per month. For incomes in excess of about 1,600 shillings per month, the estimated marginal propensity to remit is negative but is not significantly different from zero.

We now turn to the results for the adjusted regression. Each of the coefficients on the demographic variables has the expected sign, and all but WI and WR are significantly different from zero at conventionally acceptable test levels. Why the number of wives does not have a significant effect on T/Y , whereas the number of children residing both in and out of Nairobi does, is a matter of speculation. Perhaps the reason lies in the fact that wives are potential income earners. Thus, for example, an urban resident with a wife in a rural area would on the one hand have a greater attachment to a rural area and on the other hand feel less necessity to support their

TABLE 3
ESTIMATED REMITTANCES FOR SELECTED INCOME LEVELS

<i>Y</i>	<i>T/Y</i>	<i>T</i>	$\partial T/\partial Y^*$	ϵ^\dagger
50	332	17	.311 (.014)‡	0.937
100	312	31	.273 (.009)	0.877
150	293	44	.241 (.009)	0.821
200	277	55	.213 (.012)	0.770
250	262	66	.189 (.014)	0.724
300	248	74	.170 (.016)	0.685
350	236	83	.154 (.017)	0.653
400	224	90	.141 (.018)	0.630
500	206	103	.125 (.019)	0.608
600	192	115	.119 (.021)	0.619
700	181	127	.120 (.026)	0.660
800	174	139	.126 (.033)	0.722
900	169	152	.134 (.041)	0.791
1,000	166	166	.142 (.048)	0.855
1,250	162	203	.146 (.060)	0.898
1,500	156	234	.095 (.082)	0.607
1,750	139	243	-.049 (.170)	-0.356
2,000	099	198	-.325 (.347)	-3.275

* Marginal propensity to remit.

† Elasticity of remittances with respect to income.

‡ Estimated standard errors of $\partial T/\partial Y$.

children since she has an income anyway. Each child residing in a rural area increases the fraction of income remitted by .0164; each child in Nairobi reduces the fraction by .0118. The absolute values of these estimated coefficients are not significantly different from one another (the test of the null hypothesis that the sum of the coefficients was different from zero yielded $t = .92$), so one cannot say that fathers who are urban residents put a different "value" on their urban and rural children. The *CI* and *CR*, as well as *WI* and *WR*, were also entered into the regression in quadratic-interactive form to see if their effect was in fact nonlinear, but this modification did not add sufficiently to the explanation of (*T/Y*) to justify itself ($F = .73$). At the mean income level, each child living in a rural area receives 6.75 shillings per month from his employed father living in Nairobi.

IV. Some Further Implications

Urban-rural income transfers represent about a fifth of the urban wage bill in Kenya, and our analysis shows that the amount which individuals transfer is systematically related to income and other socioeconomic variables. In this concluding section we look into a few of the implications of this phenomenon.

First, to the extent that rural and urban residence is a useful distinction in a country like Kenya, the magnitude of urban-rural income transfers implies a very significant increase in rural welfare from what is implied by comparisons of relative incomes alone. If, as is roughly the case for Kenya, the urban and rural wage bills are equal, then aggregate rural income is

increased by 20 percent by the institution of remittances. This interpretation, however, may be somewhat misleading. Most urban residents still consider their home to be the village in which they grew up; their stay in Nairobi is principally for the purpose of making a good income. The extent to which this is true is indicated by table 4, which gives the percentage

TABLE 4
LOCATION OF WIVES OF EMPLOYED MALES
IN NAIROBI, 1970

Situation	%
No wife.....	13.2
Wives out of Nairobi.....	45.9
Wives in Nairobi.....	34.0
Both in and out.....	6.9

breakdown of location of wife (or wives) for the sample. Given that individual families are spread out in both urban and rural locations, it is not useful to consider the welfare of urban residents and rural residents as independent of each other.

Second, the results simply imply that the welfare of the typical individual in Kenya depends rather significantly on the number and closeness of relatives working in the high-wage sector. A crucial question is thus the distribution of modern-sector jobs across family units; it is rather similar to and perhaps as important as the question of the distribution of land. Our data on the characteristics of the urban population are obviously of no use in this regard, but future surveys of the rural population would do well to include some questions on the subject.⁶ We would expect there are important forces which tend to lead to a concentration of urban jobs among families. Families which have a member employed in a regular urban job will have a ready source of information on new job openings; this member may also be able to influence the employment decision in favor of other family members. Further, an employed member of the family can provide funds for the education of his younger brothers and sisters, which in turn gives them a greater chance of obtaining high-wage positions.

A final implication follows from the fact that the proportion of income remitted to rural areas declines as income increases. A general increase in the urban wage level has the effects of: (a) lowering the fraction of the wage bill remitted to rural areas and (b) lowering the level of employment. The net effect of an increase in the urban wage on aggregate urban-

⁶ For a household survey of rural areas these might include the following. How many members of the family (and which ones) have permanent jobs in the urban sector? How much income do they remit each year? What (to the best of the respondent's knowledge) is the age, income, education, and occupation of each of the urban family members?

rural transfers is positive only if the elasticity of transfers with respect to income (ϵ in table 2) exceeds the absolute wage elasticity of labor demand.⁷ It is unlikely that the long-run wage elasticity of labor demand is less than unity, and our estimates of ϵ are between .55 and .7 over the relevant range.

⁷ Let Z be aggregate transfers and N total employment in the urban sector. Then $Z = TN$, and $dZ/dY = Z/Y(\epsilon - \eta)$, where $\eta = (-\delta N/\delta Y)(Y/N)$ is the absolute wage elasticity of employment. If $\eta = 1$ and we take ϵ to be .65, a 10 percent increase in the urban wage rate would reduce Z by 3.5 percent.



The Timber Economy of Puritan New England

Charles F. Carroll

This is the first major study of the English colonists' encounter with the New England forest. Historian Charles F. Carroll tells how the seventeenth-century settlers, coming from a land almost cleared of forests, adjusted to and eventually exploited the wilderness, creating a timber-based society and developing an Atlantic trade in forest products to sustain it.

236 pages, maps, appendixes,
notes, index, cloth, \$12.50



Brown University Press Providence, Rhode Island 02912