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Remittances and Poverty in Ghana*

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Abstract

This paper uses a large, nationally-representative household survey to analyze the impact of internal remittances (from Ghana) and international remittances (from African and other countries) on poverty in Ghana. With only one exception, it finds that both types of remittances reduce the level, depth and severity of poverty in Ghana. However, the size of the poverty reduction depends on how poverty is being measured. The paper finds that poverty is reduced more when international, as opposed to internal, remittances are included in household income, and when poverty is measured by the more sensitive poverty measures: poverty gap and squared poverty gap. For example, the squared poverty gap measure shows that including international remittances in household expenditure (income) reduces the severity of poverty by 34.8 percent, while including internal remittances in such income reduces the severity of poverty by only 4.1 percent. International remittances reduce the severity of poverty more than internal remittances because of the differential impact of these two types of remittances on poor households. Households in the poorest decile group receive 22.7 percent of their total household expenditure (income) from international remittances, as opposed to only 13.8 percent of such income from internal remittances. When these "poorest of the poor" households receive international remittances, their income status changes dramatically and this in turn has a large effect on any poverty measure – like the squared poverty gap – that considers both the number and distance of poor households beneath the poverty line.

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In the developing world internal and international migration is often caused by individuals seeking better economic opportunities for themselves and their families. Once these migrants find employment in urban cities or abroad, they tend to remit or send a sizeable portion of their increased earnings to families back home. While the total level of internal remittance flows in the developing world is unknown, in 2003 international remittances to the developing world amounted to US $75 billion.[1] In that year the level of international remittances was about 45 percent larger than the level of official development aid (US $52 billion) to the developing world.

What is the impact of these large remittance flows from migrants on poverty and inequality in the developing world? The answer to this question seems central to any attempt to evaluate the overall effect of migration and remittances on the labor-exporting countries of Latin America, Asia and Sub-Saharan Africa. While a handful of studies have examined the impact of internal and international remittances on poverty and inequality in Latin America or Asia,[2] only two known studies have ever tried to evaluate these issues in the region of the world where poverty rates are the highest: Sub-Saharan Africa.[3]

The purpose of this paper is to examine the impact of internal and international remittances on poverty and inequality in one specific Sub-Saharan African country: Ghana. Ghana represents a good case study for examining these issues. Not only is the estimated level of poverty high in Ghana,[4] but the country also produces a large number of internal migrants (to urban areas) and international migrants (to African and other

countries). Since households in Ghana are more likely to produce internal rather than international migrants, but the value of remittances received from internal migrants is much less than that received from international migrants, it is likely that these two types of resource transfers will have a differential impact on poverty and inequality.[5]

At the outset it should be noted that any effort to examine the impact of remittances (internal or international) on poverty and inequality involves several important methodological issues. On the one hand, it is possible to treat remittances as a simple exogenous transfer of income by migrants. When treated as an exogenous transfer, the economic question becomes: How do remittances, in total or at the margin, affect the observed level of poverty and inequality in a specific country? This is the basic question addressed by Gustafsson and Makonnen (1993) in their study of remittances and poverty in Lesotho. On the other hand, it is also possible to treat remittances as a potential substitute for domestic (home) earnings. When treated as a potential substitute for home earnings, the economic question becomes: How does the observed level of poverty and inequality in a country compare to a counterfactual scenario without migration and remittances but including an imputation for the home earnings of migrants had those people stayed and worked at home? This latter treatment seems to represent the more interesting (and challenging) economic question because it uses econometric techniques to compare the level of poverty and inequality in a country with and without remittances.[6]

One of the contributions of this paper is that it develops counterfactual income estimates for migrant and non-migrant households by using econometric estimations to predict the incomes of households with and without remittances. However, this approach has its own methodological difficulties. Most notably, the attempt to predict (estimate) the

incomes of migrant households on the basis of the observed incomes of non-migrant households becomes problematic if the two groups of households differ systematically in their expected incomes. In other words, if migrant and non-migrant households differ systematically in their unobservable characteristics (e.g. skills, motivation, ability), there will be selection bias in any estimates of income which are based on non-migrant households. To test for this possible selection bias, this paper employs a two-stage Heckman-type selection procedure, where the selection rules model the decision of the household to produce migrants and receive remittances using a multinomial logit-ordinary least squares two-stage estimation of income.

The paper proceeds in seven further parts. Section 1 presents the data set. Section 2 develops an econometric framework of household income determination where the decision to produce migrants, receive remittances and earn income is considered in correcting for sample selection bias. Section 3 estimates this selection control model and finds that the subsample of nonmigrant households is randomly selected from the population and that therefore the bias resulting from estimating predicted income equations using ordinary least squares without selection controls would be small. Section 4 discusses how counterfactual income estimates for households can be developed by using predicted income equations to identify the incomes of households with and without remittances. Section 5 then uses the results of these predicted income equations to examine the impact of internal and international remittances on poverty in Ghana in three situations: excluding remittances, including internal remittances and including international remittances. This section finds that internal and international remittances have a greater impact on reducing the severity as opposed to the level of poverty in Ghana. To pinpoint the reasons for this

finding, Section 6 analyzes the distributional effect of internal and international remittances on different decile groups of households. Section 7 concludes.

1. Data

Data for the study come from a Ghana Living Standards Survey (GLSS 4) done by the Ghana Statistical Service over a 12-month period, April 1998 to March 1999. The survey included 5998 urban and rural households and was designed to be statistically representative both at the national level and for urban and rural areas. The survey was quite comprehensive, collecting detailed information on a wide range of topics, including income, expenditure, education, employment, household enterprises, migration and remittances.[7]

It should, however, be emphasized that this survey was never designed as a migration or remittances survey. On the one hand, the survey collected a good deal of information – age, education, occupation – on household members who had once been migrants but have since returned to the household. However, the survey collected very little data either on migrants who are currently working outside of the household or on the remittances that these current migrants send home. For example, the survey collected no information on either the number of current migrants per household or on the characteristics of these migrants. This means that no data are available on the age, education or income earned outside the household by current migrants. With respect to remittances, the survey only asked five questions: (1) During the past 12 months has (your) household received money or goods from a migrant?; (2) What was the total amount of cash (your) household received from this migrant during the last 12 months; (3) What

was the total value of food (your) household received from this migrant during the last 12 months: (4) What was the total value of non-food items (your) household received from this migrant during the last 12 months? and (5) Where does this migrant live?[8] Lacking data on current migrants and their characteristics, the focus of this study will be on remittances and how the welfare – or poverty status – of households changes with the receipt of remittances.

Since the focus is on remittances, it is important to clarify how these income transfers are measured and defined. Each household that is recorded as receiving remittances -- internal or international -- is assumed to be receiving exactly the amount of remittances measured by the survey. This means that households which have migrants who do not remit are not recorded in this study as receiving remittances; rather these households are classified as non-remittance receiving households. This assumption seems sensible because migration surveys in other countries generally find that many migrants do not remit. Since no data are available on the number of current remitters per household, each household that is recorded as receiving remittances is assumed to be receiving remittances from just one migrant. Since the survey data also contain no information on the characteristics of current migrants, households may be receiving remittances from different people: family members or relatives. Because of data limitations, the focus throughout this study is on the receipt of remittances by the household rather than on the type of person sending remittances. Finally, remittances in this study include both cash and in-kind remittances. The inclusion of in-kind remittances (food and non-food goods) is important because it leads to a more accurate measure of the actual flow of remittances to households in Ghana.

Table 1 presents summary data from the survey. This table shows that 3517 households (58.6 percent of all households) receive no remittances, 2139 households (35.6 percent) receive internal remittances (from Ghana) and 488 households (8.1 percent) receive international remittances (from African or other countries). According to the data, 146 households receive both internal and international remittances and these 146 households are counted in both columns of remittance-receivers in Table 1.

The data in Table 1 reveal several interesting contrasts between the three groups of households, that is, those receiving no remittances, those receiving internal remittances (from Ghana) and those receiving international remittances (from African or other countries). On average, when compared to non-remittance households, households receiving remittances (internal or international) have older household heads, fewer children under age 5 and are more likely to belong to the Asante ethnic group.[9]

2. An Econometric Model of Household Incomes with Selection Controls

However, several of the comparisons in Table 1 – specifically, those concerning annual per capita household income (excluding remittances) – are potentially misleading because of the following problem. Since the data in Table 1 do not include the internal or international migrant, it is not known what the per capita income of the households would have been if those migrants would have stayed home. In other words, with respect to household incomes (excluding remittances), the comparisons between the three groups of households in Table 1 are probably misleading because these incomes do not include the potential home (domestic) income contribution of the migrant.

As discussed above, it is possible to overcome this methodological problem by

constructing a counterfactual scenario without migration and remittances that includes an imputation for the home earnings of migrants had those people stayed and worked at home. Constructing such a counterfactual can be done by treating households with no remittances as a random draw from the population, estimating a mean regression of incomes for these no-remittance households, and then using the resulting parameter estimates to predict the incomes of households with internal and international remittances. However, this approach becomes problematic if households with and without remittances differ systematically in their unobservable characteristics (e.g. skills, motivation, ability), because then the regression results will be biased. Empirical research has sometimes found evidence of selection bias in the production of migrants and the receipt of remittances. The purpose of this section is therefore to examine the extent of selection bias, if any, using the multinomial logit selection model developed by Lee (1983) and others.[10]

The multinomial logit selection model is based on two equations: first, a choice equation which captures migration and the receipt of remittances; and second, an income equation which measures the determination of household income conditional on the receipt of remittances. Denoting the receipt of remittances group by r, r=1 (no remittances), r=2 (receive internal remittances), r=3 (receive international remittances), this can be summarized in the following equations:

$$y_r^* = z_r\gamma_r + \eta_r \qquad (1)$$

$$y_r = x_r\beta_r + \sigma_r\mu_r \qquad (2)$$

where z_r and x_r are matrices of explanatory variable for households in group r, γ_r and β_r are group-specific coefficients, and where it is assumed that μ_r and η_r are independent of all of the components of x and z, for all j, j = 1,. . ., R, and that $\mu_r \sim N(0,1)$. The first equation is

estimated across all observations in the data set and represents the household choice decision to produce a migrant and receive remittances. Household i(i=1, . . .,N) selects group r if and only if:

$$y_{ri}^{*} > \text{Max}(y_{ji}^{*});\ j \neq r \qquad (3)$$

which can be interpreted as meaning that households obtain a higher level of income from that activity than any other. In reality, y_{ri}^{*} is not observable; what is observed is the index I_i where $I_i = r$ if group r is chosen by household i. This is modeled as a function of household-specific explanatory variables, estimated as a multinomial logit, and considering the same variables across all households.

The second equation then applies only to those households selected as belonging to group r (separate equations applying to households in other groups). This second equation estimates the income of the household as a function of relevant explanatory variables. In this case the dependent variable (household income) is both observable and continuous. Because of the possible selectivity bias, however, the two equations must be considered jointly. They can be estimated using a two-stage procedure as long as a Heckman-like selectivity term (lambda), derived from the multinomial logit estimation, is included in the second equation. Having included this term in the second equation, the second equation can then be estimated by ordinary least squares to give consistent coefficient estimates.

To operationalize such a two-stage procedure, it is necessary to identify variables that are distinct for migration and the receipt of remittances in the first-stage equation, and for the determination of household income in the second-stage equation. The model is identifiable if there is at least one independent variable in the first-stage choice function that is not in the second-stage income function. Factors that affect migration and the

receipt of remittances in the choice function, but do not affect household income in the income function would then identify the model.

The main econometric problem lies in selecting the variables that should go into the first- and second-stage equations. Specifying variables that are truly exogenous to migration and the receipt of remittances in the first-stage equation, and the production of household income in the second-stage is both difficult and complex. Some variables – such as age and ethnicity of household head – relate to factors that are largely exogenous to the household's decision-making process. However, other variables – such as those related to household education – reflect a series of more-or-less internal choices made by the household at some point in time. However, since the factors that affect such endogenous choices should be fixed, it is not likely that they will seriously bias any estimates.

With these considerations in mind, the first-stage choice function of the probability of a household having a migrant and receiving remittances can be estimated as follows:

Prob (Y = migration and receive remittances) = f [Human Capital (Number of household members with primary, junior secondary, secondary or university education), Household Characteristics (Age of household head, Household size, Number of males over age 15, Number of children under age 5), Migration Network, Locational Variables] (4)

The rationale for including these variables in the first-stage choice equation follows the standard literature on migration and remittances. According to the basic human capital model, human capital variables are likely to affect migration because more educated people enjoy greater employment and expected income-earning possibilities in destination areas

(Schultz, 1982; Todaro, 1970).[11] In the literature household characteristics – such as age of household head and number of male members and children – are also hypothesized to affect the probability of migration. In particular, some analysts (Adams, 1993; Lipton, 1980) have suggested that migration is a life-cycle event in which households with older heads, more males over age 15 and fewer children under age 5 are more likely to participate. With respect to migration networks, the sociological literature has stressed the importance of family and village networks in encouraging migration (Massey, Goldring and Durand, 1994; Massey, 1987). Since people of Asante ethnicity in Ghana have a longer tradition of migration and stronger migration networks in destination communities, in equation (4) it is hypothesized that households with an Asante head will be more likely to produce migrants and receive remittances. Finally, since it is likely that location of residence in Ghana will affect the probability of migration, six locational dummy variables (with capital city omitted) are included in the model.[12]

The second-stage income function can be estimated as follows:

Household income = g [Human capital (Number of household members with secondary or university education), Household Characteristics (Age of household head, Household size, Number of males over age 15, Number of children under age 5), Migration Network, Locational Variables]

(5)

In the second-stage equation the dependent variable is household expenditure, rather than household income. There are at least three reasons for using expenditure rather than income data in equation (5). First, the purpose of this paper is to estimate the impact of remittances on poverty, and most poverty economists prefer to use expenditure rather

than income data to identify poverty. Since people tend to use savings to smooth fluctuations in income, poverty economists generally believe that expenditures provide a more accurate measure of an individual's welfare over time. Second, in developing country situations like Ghana, expenditures are often easier to measure than income because of the many problems inherent in defining and measuring income for the self-employed in agriculture, who represent such a large proportion of the labor force. Third, the poverty line that will be used in this study to separate poor from non-poor households is based on expenditure rather than income data.[13] In order to keep the analysis consistent, it is therefore preferable to work with expenditure data in equation (5) and throughout the rest of the paper.[14]

The rationale for including the various variables in equation (5) is similar to that for including them in the first-stage choice equation.[15] However, it should be pointed out that one of the household characteristic variables in this equation – age of household head -- will identify the model. In other words, it is hypothesized that age of household head will positively affect household migration and the receipt of remittances, but that it will <u>not</u> have a positive impact on household income (excluding remittances).[16] The reasoning for this as follows. According to the literature, households with older heads are likely to produce more migrants because they have more household members in the "prime age span" for migration: ages 15 to 30. However, in equation (5) households with older heads are not expected to receive more income because while expenditure (income) generally increases with level of education, older household heads in Ghana tend to be less educated.

3. Estimating the Econometric Model with Selection Controls

The interpretation of the coefficients in the second equation is straightforward, being the same as in any conventional ordinary least squares estimation. However, the coefficients of the multinomial logit model in the first equation do not give the marginal effects of the variable in question on the probability of a household producing a migrant and receiving remittances. These marginal effects, however, can be readily computed by a standard transformation. It is these marginal effects from estimating the multinomial logit that are reported in Table 2.

Several of the outcomes in Table 2 are unexpected. For both sets of households (those receiving internal and international remittances), most of the human capital variables are statistically insignificant. However, for internal remittances, households with more educated members at the secondary school level are more likely to receive remittances. Likewise, for international remittances, households with more educated members at the university level have a higher propensity to receive remittances. In general, though, the marginal effects in Table 2 suggest that the relationship between education, migration and remittances is not exactly the strong, positive one hypothesized by human capital theory.

Table 3 presents results for the ordinary least squares (OLS) and the sample selection-corrected household income estimates. Many of the coefficients have the expected sign. As hypothesized, the coefficient for age of household head is negative and (sometimes) statistically significant, meaning that this variable has no positive effect on household expenditure. Also, as hypothesized, the coefficients for household size and migration network are negative and positive, respectively, and (usually) highly significant. However, in most cases the human capital coefficients – number of household members

with secondary or university education – are not statistically significant. These outcomes may reflect something of the nature of the employment market in Ghana, where educated people face large levels of under- and unemployment.

The most important finding in Table 3 is that the two selection control variables are statistically insignificant. Both the insignificant t-values on the selection control variables and the fact that the other coefficient estimates in the table are generally similar in the two specifications suggest that the subsample of households not receiving remittances is randomly selected from the population. This means that under the assumptions imposed, the bias resulting from estimating the equations by ordinary least squares without selection controls would be small.[17]

This finding of "no selection bias" is similar to the one reported by Barham and Boucher (1998) in their examination of selection bias among migrant households in Nicaragua. However, since this finding runs contrary to the common assumption in the literature that migrants are a "select" group (with respect to education, income, skill),[18] it is important to list some of reasons for this no selection bias finding in Ghana. The first reason for the finding has already been broached, namely, that households receiving internal and international remittances in Ghana are not positively selected with respect to education.[19] The results of the choice function model in Table 2 show that households with the most educated members – secondary and university education – do not always have the highest propensity to receive remittances. The second reason for the no selection bias finding relates to the nature of the data set. The Ghana data are based on information collected from households in a labor-sending country, and thus they include data on households which are producing both legal and illegal international migrants. It is likely

that illegal international migrants come from poorer and less educated households than legal international migrants. As Ibarraran and Lubotsky (2005) and Taylor (1987) have found for Mexico, many illegal international migrants from Ghana work in low-skill, low-income jobs in Europe and the United States which are not attractive to members of wealthier and more educated households. For this reason, any study – like the present one – which includes information on both legal and illegal migrants (and their remittances) is less likely to find selection bias than studies which are confined to legal migrants (and their remittances). In other words, including illegal international migrants in the data set reduces the likelihood that migrants are positively selected with respect to income, education or skill.

4. Estimating Predicted Income Functions for the No Migration/Remittance Counterfactual

This section discusses how counterfactual income estimates for households in the no migration/remittance situation can be developed by using predicted income equations to identify the incomes of households with and without remittances. These counterfactual income estimates can be developed by using the following three-step procedure. First, the parameters predicting per capita household expenditure (excluding remittances) are estimated from the 3517 households which do not receive remittances. The results of the preceding section showed that these parameters can be reliably estimated from the 3517 households not receiving remittances using ordinary least squares without significant selection bias. Second, the parameters estimated from the 3517 households with no remittances are applied to the 2139 households which receive internal remittances (from Ghana). Third, the parameters from the 3517 households with no remittances are applied

to the 488 households which receive international remittances (from African or other countries). This enables us to predict per capita household expenditures in the excluding remittances situation for the three groups of households: those receiving no remittances, those receiving internal remittances and those receiving international remittances.

Unfortunately, economic theory provides no guidance on the type of functional form that should be used in predicting per capita household expenditures. However, a linear function is sometimes used:

$$y_i = X_i \alpha + \varepsilon_i \qquad (6)$$

where y_i is the per capita expenditure of household i, X_i is a 1 x k vector of household characteristics of household i, α is a k x 1 vector of coefficients, and ε_i is a random disturbance term.

In equation (6) it can be hypothesized that per capita household expenditure (excluding remittances) can be predicted as the function of the same variables that were used in the first-stage choice equation of the multinomial logit model. That is:

$$\begin{aligned} PREX_i = {} & \alpha_0 + \alpha_1 EDPRIM_i + \alpha_2 EDJSS_i + \alpha_3 EDSEC_i \\ & + \alpha_4 EDUNIV_i + \alpha_5 AGEHD_i + \alpha_6 HSi \\ & + \alpha_7 MALE15_i + \alpha_8 CHILD5_i + \alpha_9 ETH \\ & + \sum_{j=1}^{6} \beta_{ij} LOC_{ij} + \varepsilon_i \qquad (7) \end{aligned}$$

where for the ith household, PREX is per capita household expenditure (excluding remittances), EDPRIM is number of household members over age 15 with primary education, EDJSS is number of household members over age 15 with junior secondary school education, EDSEC is number of household members over age 15 with secondary education, EDUNIV is number of household members over age 15 with higher (university)

education, AGEHD is age of household head, HS is household size, MALE15 is number of males in household over age 15, CHILD5 is number of children in household under age 5, ETH is the ethnic dummy variable (1 if household head is of Asante ethnicity) and LOC is six locational dummy variables (with capital city omitted).

Since the results of the predicting equation (7) depend to a large extent on the choice of regressors, it is important to discuss the reasons for including each independent variable in the model. Following the logic of the previous section, four human capital variables are included in the model. It is expected that each of these variables will be positive and significant. Four household characteristic variables also appear in the model. The household size variable captures the impact of family size on household expenditure and is expected to be negative. The other three household characteristic variables relate to the life-cycle factors discussed above:[20] age of household head, number of males over age 15, and number of children under age 5. It is expected that the age of household head will have a negative impact on household expenditure, and that the other two life-cycle variables will have a positive and negative impact, respectively, on household expenditure. Finally, since it is likely that location of residence in Ghana affects the level of household expenditure, six locational dummy variables (with capital city omitted) are included in the model.

Table 4 reports the results obtained from using equation (7) to predict per capita household expenditure (excluding remittances). Most of the coefficients have the right sign and level of significance; only the outcomes for the human capital variables are unexpected and merit discussion. In Table 4 the three lowest levels of education – including secondary school – do not have the hypothesized positive and significant impact

on expenditure. This unexpected result suggests that returns to education in the local employment for the lower levels of education are low (and possibly negative). In Table 4 only the highest level of education – university – has a positive and significant effect on household expenditure.

The parameter results from Table 4 can be used to predict per capita household expenditure in the excluding remittances situation for the three groups of households: (1) those receiving no remittances; (2) those receiving internal remittances (from Ghana); and (3) those receiving international remittances (from African or other countries).

Once counterfactual household expenditures have been predicted for the three groups of households in the excluding remittances situation, household expenditures in the including remittances situation can be calculated as follows. For households with no remittances, expenditures in the including remittance situation are calculated from the parameter results of the predicting equation (7). However, for households receiving remittances, expenditures in the including remittances situation are calculated by applying the parameter results from predicting equation (7) to the households receiving internal or international remittances, and then adding in the actual amounts of internal or international remittances received by households. In other words, since data on the number and characteristics of remitting migrants are not available, expenditures for remittance-receiving households in the including remittances situation represent the sum of household expenditures (excluding remittances) predicted from equation (7) and the actual amount of internal or international remittances received by the household. For households receiving remittances, internal and international remittances average 224,248 and 485,617 cedis per capita per year, respectively.

Table 5 summarizes our efforts to predict per capita household expenditure for the three groups of households in the two situations: (1) excluding remittances; and (2) including remittances. Two key findings emerge. First, in the excluding remittances situation, there appears to be an "income hierarchy" among households. On average, households receiving internal remittances are the poorest, households receiving no remittances are in the middle, and households receiving international remittances are the richest. In the excluding remittances situation, the average level of expenditures for households receiving internal remittances is 0.5 percent below that of households with no remittances, while the average level of expenditures for households receiving international remittances is 14.8 percent higher than that of no-remittance receiving households. The reasons for this seem clear. Internal migration, which involves the movement of people from poorer rural locales to Accra and other cities in Ghana, is much less costly than international migration. Because of its travel costs, international migration represents a more viable option for households with more disposable income (expenditure). The second finding in Table 5 is quite expected, namely that remittances greatly increase the level of household expenditure. In the including remittances situation, the average level of expenditures for households receiving internal and international remittances is 14.9 and 48.9 percent higher, respectively, than that for households not receiving remittances. Remittances – from within a country or from abroad – significantly boost the income (expenditure) of those households that are able to produce a migrant.

5. Remittances and Poverty

Now that per capita household expenditures have been predicted in the two situations – excluding and including remittances – for the three groups of households, it is possible to examine the impact of these financial transfers on poverty in Ghana. This is done in Table 6.

Table 6 is based on a poverty line of 684,401 cedis/person/year, which is equivalent to the poverty headcount index of 39.5 percent that is cited as the 1998/99 poverty line for Ghana (Ghana Statistical Service, 2000: Table 2).[21] Using this poverty line, Table 6 reports three different poverty measures. The first measure -- the poverty headcount -- shows the percent of the population living beneath the poverty line. However, this headcount index ignores the "depth of poverty," that is, the amount by which the average expenditure of the poor fall short of the poverty line. The table therefore also reports a second measure, the poverty gap index. This index measures in percentage terms how far the average expenditures of the poor fall short of the national poverty line. The third poverty measure -- the squared poverty gap index – shows the "severity of poverty." The squared poverty gap index possesses useful analytical properties, because it is sensitive to changes in distribution among the poor. In other words, while a transfer of expenditures from a poor person to a poorer person will not change the headcount index or the poverty gap index, it will decrease the squared poverty gap index.

Columns (1-4) of Table 6 report the results for the different poverty measures. With only one exception, all of the measures show that that the inclusion of remittances – either internal or international – in household expenditure reduces the level, depth and severity of poverty in Ghana.[22] However, the size of the poverty reduction depends very

much on the type of remittances (internal or international) received, and how poverty is being measured. According to the poverty headcount measure, including internal remittances in household expenditure (income) reduces the level of poverty by only 2 percent, while including international remittances in such income actually increases the level of poverty. However, poverty is reduced much more when measured by the more sensitive poverty measures: poverty gap and squared poverty gap. For example, the squared poverty gap measure shows that including internal remittances in household expenditure (income) reduces the severity of poverty by 4.1 percent, while including international remittances in such income reduces the severity of poverty by 34.8 percent. These results suggest that international remittances reduce the severity of poverty more than internal remittances.

Table 6 also reveals that the inclusion of internal or international remittances in household expenditure leads to only a slight increase in income inequality, as measured by the Gini coefficient.[23] With the receipt of internal remittances the Gini coefficient increases by 3.5 percent and with the receipt of international remittances the Gini rises by 2.7 percent. In both cases, however, the Gini coefficient of inequality remains relatively stable between 0.40 and 0.41. This suggests that most of the poverty-reducing effect of remittances in Ghana comes from increases in mean household income (expenditure) rather than from any progressive rise in income inequality caused by these income flows.

6. Remittances, Poverty and Income Distribution

One of the key findings in Table 6 is that international remittances have a greater impact on reducing the depth and severity of poverty in Ghana than internal remittances.

One way to explore the reasons for this finding is to examine what kinds of income (expenditure) groups of households receive internal and international remittances. If, for example, households at the bottom of the income distribution are receiving more international than internal remittances or if these "very poor" households are receiving a greater proportion of their income from international remittances, then international remittances will have a greater impact on poverty than internal remittances.

To pursue this analysis, Table 7 ranks all the households into decile groups on the basis of predicted per capita household expenditure (excluding remittances). Columns (1) and (3) then show the proportion of total households receiving internal and international remittances, respectively, in each decile group. For those households receiving remittances, columns (2) and (4) show the percent of total per capita household expenditure (including remittances) coming from internal or international remittances for each decile group.[24]

As expected, columns (1) and (3) in Table 7 show that rich households – specifically, those in the eight and ninth deciles of the expenditure distribution – account for the largest share of remittance-receivers. Households in these two deciles account for between 11 and 20 percent of all remittance-receivers for both internal and international remittances. However, surprisingly large shares of households receiving remittances – 10.7 percent for internal remittances and 6.3 percent for international remittances – are found in the lowest decile group. Of equal importance, columns (2) and (4) in Table 5 show that households in the bottom decile group receive very large shares of their total per capita household expenditure (income) from remittances. On average, households in the lowest decile group receive 13.8 percent of their total household expenditure (income) from

internal remittances, and 22.7 of such income from international remittances. In addition, households in the second lowest decile group receive almost 20 percent of their total household expenditure (income) from international remittances.

The fact that households in the bottom income decile groups are receiving a larger share of their total household expenditure (income) from international, as opposed to internal, remittances, serves to explain why international remittances have more of an impact on reducing the depth and severity of poverty in Ghana than internal remittances. When households in the poorest (and next to poorest) decile group receive international remittances their expenditure (income) increases by over 20 percent. This in turn has a huge effect on any poverty measure – like the poverty gap or squared poverty gap -- which considers both the number and the distance of poor households beneath the poverty line. By contrast, internal remittances account for a much smaller share of total expenditure (income) for households in the two poorest decile groups. As a consequence, when poor households in Ghana receive internal remittances, the poverty indices which measure both the number and distance of households beneath the poverty line do not show the same type of changes as with international remittances. In Ghana international remittances reduce the depth and severity of poverty more than internal remittances because poor households are receiving a greater share of their expenditure (income) from international remittances.

7. Conclusion

This paper has used a large, nationally representative household survey (N=5998 households) to analyze the impact of internal and international remittances on poverty in Ghana. Four key findings emerge.

First, with respect to methodology, this paper develops counterfactual income estimates for migrant and non-migrant households by using econometric estimations to predict the incomes of households with and without remittances. Since this method is problematic in the presence of selection bias, the paper uses a two-stage Heckman-type selection procedure, where the selection rules model the decision of the household to produce migrants and receive remittances. The extent of selection bias is found to be statistically insignificant. This means that the subsample of non-migrant households in Ghana is randomly selected from the population, and that the bias resulting from estimating predicted income equations based on the characteristics of these non-migrant households would be small.

Second, using predicted equations to estimate the incomes of households with and without remittances, the paper finds that – with only one exception -- internal and international remittances reduce the level, depth and severity of poverty in Ghana. However, the size of the poverty reduction depends very much on the type of remittances (internal or international) received, and how poverty is being measured. While the poverty headcount index, measuring the level of poverty, shows relatively little change with the inclusion of internal or international remittances in household expenditure (income), poverty falls considerably when measured by indices focusing on the depth and severity of poverty. For example, the squared poverty gap index, measuring the severity of poverty, falls by 4.1 percent when internal remittances are included in household expenditure (income), and by 34.8 percent when international remittances are included in such income.

Third, international remittances reduce the depth and severity of poverty in Ghana more than internal remittances because of the kinds of income (expenditure) groups

receiving remittances. Ranking all households into decile groups on the basis of per capita expenditure (excluding remittances) shows that households in the bottom decile group receive 22.7 percent of their total household expenditure (income) from international remittances, as opposed to only 13.8 percent of such income from internal remittances. As a result, the poverty gap and squared poverty gap measures – which consider both the number and the distance of poor households beneath the poverty line – change more with the receipt of international, as opposed to internal, remittances.

Finally, this study shows that including internal or international remittances in household income (expenditure) has only a small impact on income inequality, as measured by the Gini coefficient. With the receipt of internal remittances the Gini coefficient increases by 3.5 percent and with the receipt of international remittances the Gini rises by 2.7 percent. These relatively small increases in income inequality suggest that most of the poverty-reducing effect of remittances in Ghana comes from increases in mean household income (expenditure) rather than from any progressive rise in income inequality caused by these income flows.

Table 1. Summary Data on Non-Remittance and Remittance-Receiving Households, Ghana, 1998/99

Variable	Receive no remittances	Receive internal remittances (from Ghana)	Receive international remittances (from African or other countries)	t-test (Internal remittances vs. no remittances)	t-test (International remittances vs. no remittances)
Human Capital					
Number of members over age 15 with primary school education	0.32 (0.58)	0.30 (0.57)	0.31 (0.57)	-0.97	0.04
Number of members over age 15 with junior secondary school education	0.76 (0.91)	0.68 (0.86)	0.85 (0.93)	-4.29**	2.29*
Number of members over age 15 with senior secondary school education	0.06 (0.28)	0.06 (0.26)	0.09 (0.36)	-1.29	1.37
Number of members over age 15 with university education	0.01 (0.11)	0.01 (0.08)	0.03 (0.17)	-0.60	4.22**
Years of schooling of household head	5.72 (5.09)	4.94 (4.93)	6.91 (5.14)	-7.64**	4.98**
Household Characteristics					
Age of household head (years)	43.33 (13.40)	47.55 (17.13)	47.58 (16.34)	12.01**	7.25**
Household size	4.51 (2.58)	3.99 (2.42)	4.20 (2.28)	-7.18**	-1.65
Number of males over age 15	1.20 (0.88)	0.92 (0.90)	1.09 (0.95)	-11.18**	-2.33**
Number of females over age 15	1.27 (0.88)	1.28 (0.88)	1.45 (0.99)	1.03	3.96**
Number of children under age 5	0.75 (0.92)	0.62 (0.85)	0.52 (0.76)	-5.04**	-5.17**

Table 1: Summary Data on Non-Remittance and Remittance-Receiving Households, Ghana, 1988/99 (cont'd)

Variable	Receive no remittances	Receive internal remittances (from Ghana)	Receive international remittances (from African or other countries)	t-test (Internal remittances vs. no remittances)	t-test (International remittances vs. no remittances)
Networks					
Head of household is of Asante ethnicity (1 = yes)	0.15 (0.36)	0.21 (0.41)	0.29 (0.45)	3.91**	7.59**
Income					
Mean annual per capita income (excluding remittances) in Ghanaian cedis	687,912 (1,104,368)	530,201 (821,350)	724,078 (1,245,911)	-6.28**	0.06
N	3,517	2,139	488		

Notes: N = 5,998 households; 146 households receive both internal and international remittances. All values are weighted; standard deviations in parentheses. In 1999, US$ 1.00 = 2,394 Ghanaian cedis.

Source: 1998/99 Ghana Living Standards Survey (GLSS 4).

* Significant at the 0.05 level.
** Significant at the 0.01 level.

Table 2. Multinomial Logit Model for Ghana (Marginal Effects)

Variable	Receive internal remittances (from Ghana)	Receive international remittances (from African or other countries)
Human Capital		
Number of members over age 15 with primary school education	0.016 (1.36)	0.001 (0.29)
Number of members over age 15 with junior secondary school education	0.013 (1.57)	0.004 (1.08)
Number of members over age 15 with secondary education	0.059 (2.54)*	0.009 (0.86)
Number of members over age 15 with university education	-0.125 (-1.75)	0.068 (3.15)**
Household Characteristics		
Age of household head	0.004 (8.85)**	0.001 (4.53)**
Household size	-0.011 (-2.91)**	0.001 (0.63)
Number of males over age 15	-0.084 (-8.42)**	-0.005 (-1.15)
Number of children under age 5	0.002 (0.21)	-0.010 (-1.89)
Migration Networks		
Head of household is of Asante ethnicity (1 = yes)	0.021 (1.21)	0.038 (4.25)**
Constant	-0.286 (-8.67)**	-0.143 (-8.21)**
Log likelihood	-5023.47	
Restricted log likelihood	-5288.27	
Chi-squared (30)	529.59	
Significance level	0.0000	
N	5998	

Notes: Table reports the marginal effects of a variable on the probability of a household receiving internal or international remittances. Six locational dummy variables are included in the model, but not reported in the table. All values are weighted. Figures in parentheses are t-values.

* Significant at the 0.05 level.
** Significant at the 0.01 level.

Table 3. Per Capita Household Expenditure Estimates (Selection Corrected) for Ghana

Variable	Receive internal remittances (from Ghana)		Receive international remittances (from African or other countries)	
	OLS	Selection Corrected	OLS	Selection Corrected
Human Capital				
Number of members over age 15 with secondary education	130,238.9 (1.51)	54,480.9 (0.44)	338,529.6 (1.90)	525,128.2 (2.64)**
Number of members over age 15 with university education	853,179 (3.34)**	580,091.9 (1.51)	421,254.5 (1.24)	178,448.3 (0.22)
Household Characteristics				
Age of household head	-10,846.8 (-8.49)**	-10,676.9 (-1.80)	-9,444.6 (-2.69)**	-16,314.5 (-1.43)
Household size	-173,367.6 (-14.25)**	-183,495.7 (-10.14)**	-239,621.1 (-7.37)**	-276,308.1 (-6.44)**
Number of males over age 15	96,527.5 (3.48)**	79,885.2 (0.62)	85,802.7 (1.16)	134,897.8 (1.56)
Number of children under age 5	-109,208.3 (-3.42)**	-143,904.6 (-4.24)**	-157,015.4 (-1.67)	-94,722.6 (-0.41)
Migration Networks				
Head of household is of Asante ethnicity (1 = yes)	361,000.7 (6.27)**	361,207.5 (5.36)**	443,127.0 (3.25)**	321,861.6 (0.71)
Lamda (Selection control)		203,026.9 (0.25)		-947,900.3 (-0.51)
Constant	3,048,656 (31.41)**	2,795,416 (2.35)*	3,780,232 (16.46)**	4,793,133 (1.59)
Adjusted R^2	0.296	0.336	0.332	0.354
F-test	70.19	73.18	18.09	20.13
N	2139	2139	488	488

Notes: Dependent variable is annual per capita household expenditure (excluding remittances). Six locational dummy variables are included in the model, but not reported in the table. All values are weighted. Figures in parentheses are t-values.

* Significant at the 0.05 level.
** Significant at the 0.01 level.

Table 4. Regression to Estimate Predicted Per Capita Household Expenditure (Excluding Remittances)

Variable	Regression Coefficient	t-ratio
Human Capital		
Number of members over age 15 with primary education	-43,338.74	-1.25
Number of members over age 15 with junior secondary school education	-22,501.79	-0.95
Number of members over age 15 with secondary school education	92,400.01	1.32
Number of members over age 15 with university education	2,324,060	11.03**
Household Characteristics		
Age of household head	-7,268.74	-4.91**
Household size	-183,474.1	-16.22**
Number of males over age 15	117,629.4	4.28**
Number of children under age 5	-91,195.63	-3.35**
Migration Networks		
Head of household is of Asante ethnicity (1 = yes)	275,391.2	4.90**
Constant	3,118,120	37.94**
Adjusted R^2	0.302	
F-statistic	102.45	

Notes: Regression is based on those 3,517 households which receive no remittances; the dependent variable is annual per capita household expenditure (excluding remittances). Parameters from the regression are used to predict annual per capita household expenditure (excluding remittances) for households which receive internal remittances (from Ghana) or international remittances (from African or other countries). Six locational dummy variables are included in the equation, but not reported in the table. All values are weighted. Figures in parentheses are t-values.

* Significant at the 0.05 level.
** Significant at the 0.01 level.

Table 5. Predicted Per Capita Expenditures for Non-Remittance and Remittance-Receiving Households, Ghana, 1998/99

	Receive no remittances	Receive internal remittances (from Ghana)	Receive international remittances (from African or other countries)	Percent change (internal remittances vs. no remittances	Percent change (international remittances vs. no remittances)
			(in cedis)		
Predicted mean annual per capita expenditures (excluding remittances)	1,424,153	1,413,069	1,635,431	(-0.48)	+14.83
Predicted mean annual per capita expenditures (including remittances	1,424,153	1,637,317	2,121,048	+14.96	+48.93
N	3,517	2,139	488		

Notes: N = 5,998 households; 146 households receive remittances from more than one source. All values are predicted from equation (7); see text. All values are weighted.

In 1999, US$ 1.00 = 2,394 Ghanaian cedis.

Source: Calculated from 1998/99 Ghana Living Standards Survey (GLSS 4).

Table 6. Effects of Remittances on Poverty for Non-Remittance and Remittance-Receiving Households, Ghana, 1998/99

	Receive no remittances	Receive internal remittances (from Ghana	Receive international remittances (from African or other countries)	Receive internal and international remittances	Percent change		
					Internal remittances vs. no remittances	International remittances vs. no remittances	Internal and international remittances vs. no remittances
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Poverty headcount (percent)	33.23	32.91	38.69	32.56	(-2.02)	+16.43	(-2.02)
Poverty gap (percent)	14.15	13.95	13.70	13.78	(-1.42)	(-3.19)	(-2.62)
Squared poverty gap (percent)	10.26	9.84	6.69	9.82	(-4.10)	(-34.80)	(-4.29)
Gini coefficient	0.402	0.416	0.413	0.414	+3.48	+2.70	+2.94
Predicted mean per capita household expenditure (including remittances) in Ghanaian cedis	1,424,153	1,523,462	1,460,281	1,534,467	+6.97	+2.50	+7.46
N	5,998	5,998	5,998	5,998			

Notes: Column (1) uses predicted income equations to measure the situation excluding remittances for all 5,998 households. Column (2) measures the situation for all households when only internal remittances (from Ghana) are included in predicted household expenditure. Column (3) measures the situation for all households when only international remittances (from African or other countries) are included in predicted household expenditure. Column (4) measures the situation for all households when both internal and international remittances are included in predicted household expenditure. Poverty calculations made using poverty line of 684,401 Ghanaian cedis per person per year, which is equivalent to poverty headcount index of 39.5 percent that is cited as Ghana poverty line in Ghana Statistical Service (2000: Table 2).

In 1999, US$ 1.00 = 2,394 Ghanaian cedis.

Source: Calculated from 1998/99 Ghana Living Standards Survey (GLSS 4).

Table 7: Distribution of Remittance-Receiving Households by Decile Group, Ranked by Predicted Per Capita Household Expenditure, Excluding Remittances

Rank	Households receiving internal remittances (from Ghana)	Internal remittances as percent of total per capita household expenditure (including remittances)	Households receiving international remittances (from African or other countries)	International remittances as a percent of total per capita household expenditure (including remittances)
	(1)	(2)	(3)	(4)
(decile)	(percent)	(percent)	(percent)	(percent)
Lowest 10	10.7	13.8	6.3	22.7
Second 10	4.9	7.6	2.1	19.4
Third 10	5.2	7.8	6.2	8.2
Fourth 10	7.8	5.1	5.5	10.3
Fifth 10	10.5	6.5	5.6	15.0
Sixth 10	13.0	5.5	11.9	13.5
Seventh 10	13.6	7.9	14.1	12.0
Eighth 10	13.1	8.2	11.2	13.7
Ninth 10	13.0	11.3	19.8	17.2
Top 10	8.2	18.8	17.3	25.6
	100.0		100.0	

Notes: Households ranked into decile groups on the basis of predicted per capita household expenditure (excluding remittances). For those households receiving internal remittances (from Ghana), column (2) shows the percent of total per capita household expenditure (including remittances) coming from internal remittances. For those households receiving international remittances (from African or other countries), column (4) shows the percent of total per capita household expenditure (including remittances) coming from international remittances. See equation (7) and text for predicted income equation.

Source: Calculated from 1998/1999 Ghana Living Standards Survey (GLSS 4).

Appendix A: Checking the Robustness of Findings Using Observed Expenditure Data

The purpose of this appendix is to see if the poverty and inequality findings of Tables 6 and 7 of this paper are robust for different ways of defining household income (expenditure). Therefore, in this appendix all of the calculations are based on observed – rather than predicted – data. In other words, all calculations in this section are based on observed per capita household expenditures, and the income contribution of the migrant in the excluding remittances situation is assumed to be zero.

Using the observed data on per capita household expenditures, Appendix Table 1 replicates Table 6 in the text. With only a few exceptions, all of the main results are as before. For example, the three poverty measures in Appendix Table 1 show that the inclusion of remittances – either internal or international – in household expenditure reduces the level, depth and severity of poverty in Ghana. Moreover, just as in Table 6, the size of the poverty reduction depends very much on the type of remittances (internal or international) received, and how poverty is being measured. At first glance, results for the poverty headcount and poverty gap measures in Appendix Table 1 suggest that poverty falls more with the inclusion of internal, as opposed to international, remittances. However, just as in Table 6, the results for the most sensitive poverty measure – squared poverty gap – shows that poverty actually falls more with the inclusion of international remittances. The results in columns (5) and (6) for the squared poverty gap show that including international remittances in household expenditure reduces the severity of poverty by 11.1 percent, while including internal remittances in such expenditure reduces the severity of poverty by only 5.8 percent.

Appendix Table 1 also reveals that the inclusion of internal or international remittances in observed household expenditure has little impact on income inequality, as measured by the Gini coefficient. With the receipt of either internal or international remittances, inequality remains relatively stable with a Gini coefficient of about 0.42. This finding is identical to that recorded in Table 6.

Using the observed data on per capita household expenditure, Appendix Table 2 replicates Table 7 in the text in order to examine what kinds of expenditure (income) groups of households receive remittances. Almost all of the main results are as before. As in Table 7, a surprisingly large share of households receiving remittances – 9.4 percent for internal remittances and 8.1 percent for international remittances -- is found in the lowest decile group. Of equal importance, columns (2) and (4) of Appendix Table 2 show that households in the poorer decile groups receive large shares of their total per capita household expenditure (income) from remittances. If the poverty line in Ghana is considered to include the four lowest decile groups, "poor" households receive between 7 and 12 percent of their total household expenditure (income) from internal remittances, while "poor" households" receive between 11 and 18 percent of their income from international remittances. As in Table 7, the fact that households in the poorer decile groups are receiving larger shares of their total household expenditure (income) from international, as opposed to internal, remittances, serves to explain why international remittances have more of an impact on reducing the severity of poverty in Ghana than internal remittances. When "poor" households receive international remittances their income (expenditure) increase considerably and this in turn has a large effect on any poverty measure – like the squared poverty gap – which considers both the number and distance of poor households beneath the poverty line. Regardless of how households are ranked (by observed or predicted

per capita expenditure), the inclusion of international remittances in expenditure (income) in Ghana has a larger impact on reducing the severity of poverty than the inclusion of internal remittances in such expenditure (income).

Appendix Table 1. Effect of Remittances on Poverty for Non-Remittance and Remittance-Receiving Households, Ghana, 1998/99

	Receive no remittances	**Receive internal remittances (from Ghana)**	**Receive international remittances (from African or other countries)**	**Receive internal and international remittances**	**Percent change (Internal remittances vs. no remittances)**	**Percent change (International remittances vs. no remittances)**	**Percent change (Internal and international remittances vs. no remittances)**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Poverty headcount (percent)	39.49	38.01	39.16	37.61	(-3.75)	(-0.84)	(-4.77)
Poverty gap (percent)	13.97	13.30	13.82	13.11	(-4.80)	(-1.08)	(-6.16)
Squared poverty gap (percent)	6.71	6.32	6.64	6.21	(-5.82)	(-11.05)	(-7.46)
Gini coefficient	0.412	0.419	0.420	0.423	+1.70	+1.94	+2.67
Observed mean per capita household expenditure (including remittances) (cedis)	1,099,913	1,142,750	1,125,581	1,160,293	+3.89	+2.33	+5.49
N	5,998	5,998	5,998	5,998			

Notes: All values based on observed – not predicted – per capita household expenditure. Poverty calculations made using poverty line of 684,401 Ghanaian cedis per person per year, which is equivalent to poverty headcount index of 39.5 percent that is cited as Ghana poverty line in Ghana Statistical Service (2000: Table 2). All values are weighted.

In 1999, US $1.00 = 2,394 Ghanaian cedis.

Source: Calculated from 1998/99 Ghana Living Standards Survey (GLSS 4).

Appendix Table 2. Distribution of Remittance-Receiving Households by Decile Group, Ranked by Observed Per Capita Household Expenditure, Excluding Remittances

Rank	Households receiving internal remittances (from Ghana)	Internal remittances as percent of total per capita household expenditure (including remittances)	Households receiving international remittances (from African or other countries)	International remittances as percent of total per capita household expenditure (including remittances)
	(1)	(2)	(3)	(4)
(decile)	(percent)	(percent)	(percent)	(percent)
Lowest 10	9.4	10.8	8.1	10.5
Second 10	11.1	11.7	6.0	11.8
Third 10	9.7	8.4	4.7	18.1
Fourth 10	11.5	7.1	6.1	11.4
Fifth 10	10.5	9.2	8.7	13.9
Sixth 10	10.0	7.3	7.2	9.9
Seventh 10	9.7	12.3	13.1	20.7
Eighth 10	9.1	10.2	10.5	18.8
Ninth 10	9.2	8.8	13.9	12.5
Top 10	9.8	14.8	21.7	20.4
	100.0		100.0	

Notes: All values based on observed – not predicted – data. Households ranked into decile groups on the basis of observed per capita household expenditure (excluding remittances). For those households receiving internal remittances (from Ghana), column (2) shows the percent of total per capita household expenditure (including remittances) coming from internal remittances. For those households receiving international remittances (from African or other countries), column (4) shows the percent of total per capita household expenditure (including remittances) coming from international remittances.

Source: Calculated from 1998/99 Ghana Living Standards Survey (GLSS 4).

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Notes

[1] International remittances are defined here as "workers' remittances," as listed in the 2004 issue of the IMF, Balance of Payments Statistics Yearbook. International remittances in this paper do not include other items listed in the IMF Yearbook – such as "compensation of employees" and "migrant transfers" -- because it is not clear if these items are, in fact, remittances.

[2] The following studies have analyzed the impact of remittances on poverty and inequality in Latin America and East Asia: Adams on Guatemala (2004), Taylor, Mora and Adams on Mexico (2005) and Yang and Martinez on the Philippines (2005).

[3]The two known studies on remittances and poverty in Sub-Saharan Africa are: Gustafsson and Makonnen on Lesotho (1993), and Litchfield and Waddington on Ghana (2003). Like the present paper, Litchfield and Waddington (2003) use the 1998/99 Ghana Living Standards Survey (GLSS 4) to analyze the impact of migration and remittances on poverty in Ghana; however, their study focuses more on migration than on remittances.

[4] According to the Ghana Statistical Service (2000: Table 2), in 1998/99 the poverty headcount index in Ghana was 39.5 percent. This index measures the share of the population living below the poverty line. For more details, see text.

[5] According to the 1998/99 Ghana Living Standards Survey (GLSS 4), while roughly four times as many households in Ghana receive internal as opposed to international remittances (2139 versus 488 households, respectively), the average value received of internal remittances is about one-half that of international remittances: 224,248 versus 485,617 cedis per capita per year, respectively.

[6] For other attempts to treat remittances as a substitute for home earnings and to predict (estimate) the incomes of households with and without migration, see Barham and Boucher (1998) and Adams (1991).

[7] For more details on this 1998/99 Ghana Living Standards Survey (GLSS 4), see Ghana Statistical Service (2000).

[8] The nine possible responses to this "where does this migrant live" question were: (1) this town; (2) Accra; (3) Kumasi; (4) Sekondi; (5) Tamale; (6) Other urban; (7) Rural; (8) Abroad (Africa); and (9) Abroad (outside Africa).

[9] Nineteen ethnic groups are included in the 1998/99 Ghana Living Standards Survey (GLSS 4). The largest of these ethnic groups is the Asante group, accounting for 17.6 percent of all households. Other large ethnic groups in the survey include "other Akan" (18.7 percent), Fanti (12.8 percent) and Ewe (12.4 percent).

[10] See also Bourguignon, Fournier and Gurgand (2004) and Schmertmann (1994) for a more formal and detailed explanation of this multinomial logit selection model.

[11] While early work on the human capital model found that education had a positive impact on migration (Schultz, 1982; Todaro, 1976), more recent empirical work in Egypt (Adams, 1991and 1993) and Mexico (Mora and Taylor, 2005; Taylor, 1987) has found that migrants are not necessarily positively selected with respect to education.

[12] The six locational dummy variables (with capital city omitted) in the 1998/99 Ghana household survey are: urban coastal, urban forest, urban savannah, rural coastal, rural forest and rural savannah.

[13] For more information on this expenditure-based poverty line for Ghana, see page 20 of text.

[14] From this point on, the terms "expenditure" and "income" will be used interchangeably in this paper.

[15] Since the income function in equation (5) is estimated at the household level – and not at the individual level – it is impossible to add the usual "experience" and "experience squared" terms that often appear in income (earnings) functions.

[16]Other work has found that while age of household head will affect household migration, this variable will have no impact on pre-migration household income. See, for example, Adams (2005) in Guatemala.

[17] This finding is robust to alternative ways of specifying the first and second equations in the multinomial logit selection model. For more information, contact the author.

[18] See, for example, Chiswick (2000) and Carrington and Detragiache (1998).

[19] In a recent study of the determinants of international migration from rural Mexico, Mora and Taylor (2005) also find that international migrants to the United States are not positively selected on the basis of education.

[20] For more on the life-cycle effects of household expenditure, see Deaton (1992, 1997).

[21] This poverty line is defined as the level of per capita expenditures needed to meet the costs of meeting basic food and non-food requirements in Ghana. For more details on this expenditure-based poverty line, see Ghana Statistical Service (2000).

[22] The poverty and inequality results in Table 6 are based on including remittances – internal or international – in predicted per capita household expenditure. However, as shown in Appendix A, the poverty and inequality results are similar when remittances are included in observed – rather than predicted – per capita household expenditure. See Appendix A, and Appendix Tables 1 and 2.

[23]These results are different from those reported in Adams (1995) for rural Pakistan, where internal remittances were found to reduce income inequality, and international remittances represented an inequality-increasing source of income.

[24] Since the decile rankings in Table 7 are based on per capita household expenditure (excluding remittances), the findings in this table may appear to differ from those of Table 6, where the ranking of households is based on per capita household expenditures (including remittances). As noted in the text, households receiving internal or international remittances make considerable changes in their decile rankings between the excluding and including remittances situations.