The impact of migrant remittances on household welfare in Ghana

By

Peter Quartey
Research Fellow, Institute of Statistical,
Scientific and Economic Research
University of Ghana

Contents

List of tables

List of figures

Abstract

Migrant remittances have become a source of external finance whose magnitude exceeds the amount of official development assistance in some developing countries. Balance of payments statistics from the Bank of Ghana indicate the amount of remittances to Ghana exceeds ODA and is a potential force to reckon with particularly considering its growth rate in recent years. It is general knowledge in Ghana that families with migrant workers, particularly those in developed countries, are able to withstand shocks to income. This relationship has not been tested empirically, however, even though the Ghana Living Standards Survey is rich with such micro-data on the economy. This study therefore uses Waves 1 to 4 of the GLSS to investigate whether migrant remittances significantly affect household poverty (welfare). The study found that remittances improve household welfare and help to minimize the effects of economic shocks to household welfare. They do not offset the shocks completely, however, except for food crop farmers (the poorest in Ghana).

Acknowledgements

1. Introduction

Migrant remittances have become an important source of income and foreign exchange for many developing countries. Remittance flows globally currently exceed US$100 billion, which is higher than the value of official development assistance (ODA). Remittance flows have great potential to generate a positive impact in migrants' home region. Remittances to developing countries amount to some US$65 billion, and this amount exceeds ODA of US$55 billion (Maimbo, 2003). An IMF report (2001) has indicated that migrant remittances are increasingly becoming a more constant source of income to most developing countries with a doubling of annual remittances between 1988 and 1999. Sander (2003) also reported that remittances have proved to be the most stable flow compared with ODA and private capital flows. Solimano (2003) notes that remittance flows have concentrated in a group of developing countries. In 2002, Latin America and the Caribbean had the highest level of remittances, totalling US$25 billion, followed by South Asia with US$16 billion and the Middle East and North Africa (MENA) with US$14 billion. Sub-Saharan Africa had the lowest level of remittances, amounting to US$4 billion (with an annual growth rate of 5.2%).

Migrant worker remittances have been a useful source of income to many Ghanaians, particularly in times of economic shocks. The importance of migrant remittances to the economy is evidenced by the proliferation of money transfer institutions in Ghana (both formal and informal) and the rapid growth in the volume of such remittances. It has been argued that migrant remittances are becoming a potential source of foreign exchange whose magnitude exceeds the amount of ODA to Ghana. There are three ways of measuring remittance flows in Ghana. The first is the balance of payments (BOP) estimates and the second approach is based on inferences from the Ghana Living Standards Survey (GLSS). The third approach focuses on transfers through banks or financial institutions in origin countries (Addison, 2005).

Data from the Central Bank of Ghana (using BOP estimates), for example, show that private inward remittances through the banks and other finance companies amounted to about US$1.017 billion in 2003, compared with US$479 million for 1999. The 2003 figure is likely to be even lower than the actual figure as many migrants use informal mechanisms to send money.

Figure 1 clearly indicates that the share of migrant remittances exceeds ODA and FDI and has been increasing consistently since 1990. It must be pointed out that the BOP figures also include transfers for NGOs and other religious bodies. Thus, the second and third measures of private inward remittances present plausible estimates of intra-household transfers. Figure 2 reports data from resource transfer institutions in Ghana

and it is evident that the USA and Canada are the most important sources of regional flow of remittances. In 2004, a total of US$969.98 million was received through money transfer institutions as migrant remittances of which US$665.71 million came from these two countries. This was followed by the UK with US $163.3 million and the European Union with US$96.8 million, while other countries accounted for US$25.1 million of total remittances. ECOWAS and the rest of Africa accounted for US$11.7 million and US$7.5 million, respectively (Bank of Ghana, 2004).
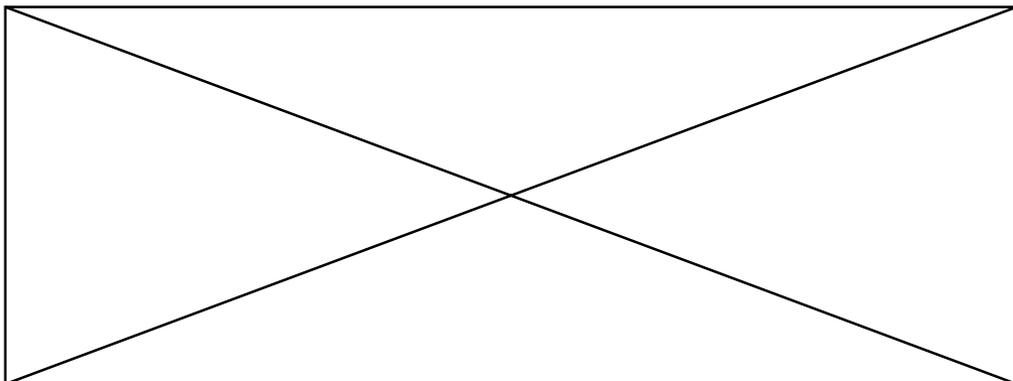
Figure 1: Shares of ODA, remittances and FDI to GDP
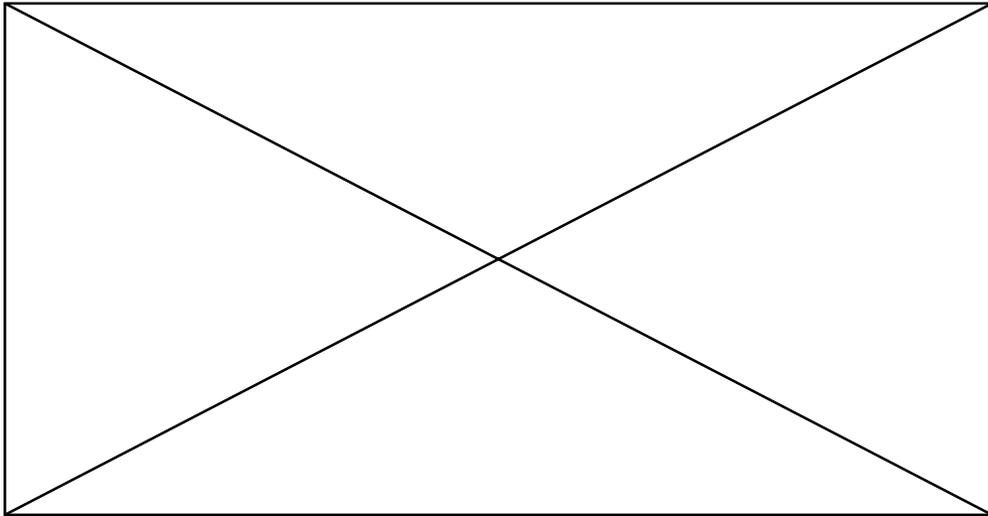
Source: Bank of Ghana (2005).

Figure 2: Sources of private inward remittances (2004)

US and Canada	UK	EU	ECOWAS	Rest of Africa	Others
68.63	16.83	9.97	1.21	0.77	2.59

Despite the increasing flow of migrant remittances to Ghana, the relationship between migrant remittances and household welfare in Ghana in times of economic shocks has received little empirical investigation (using household price shocks). Although earlier work by Quartey and Blankson (2005) investigated whether international remittances minimize the impact of macro-volatility on households, macro-data (CPI) that do not vary according to individual households were used. A second limitation of the study is that it did not empirically test for the counter-cyclical nature of migrant remittances to Ghana. These issues form the focus of the present study. The study specifically addresses the following research issues: Which group of households receives remittances? Is the flow of remittances counter-cyclical? Does the impact of economic shocks on households vary according to levels of income or to the amount of remittances received? Are remittance-receiving households better off in terms of higher average income and asset base than households that do not receive remittances? Do female-headed households receive more remittances than male-headed households?[1] Does family size influence remittances?

Research objectives

The principal aim of this study is to examine the impact of migrant remittances on household welfare. In doing so the study intends to:
- Investigate whether remittances significantly affect household welfare in Ghana.
- Ascertain the degree to which migrant remittances minimize the impact of economic shocks[2] on household welfare.
- Investigate which groups of households receive remittances. Richer households? Female-headed households? Larger or smaller families?
- Ascertain whether the flow of remittances to Ghana is counter-cyclical.

The study uses waves 1–4 of the Ghana Living Standards Survey to address these issues. The focus of analysis is on international remittances, although internal remittances are also an important contribution to household welfare. The reason for focusing on international remittances is that their total amount is greater than internal remittances and the impact on poverty is higher (see Adams, 2006). It must be pointed out that Waves 1–4 were used for the descriptive analysis, while Waves 3 and 4 were pooled into a pseudo panel for regression analysis because the structure of the earlier waves of the GLSS is completely different from the latest.

Organization of the study

Section two reviews the existing literature on remittances and welfare. This is followed by a section outlining the methodology of the study. The fourth section analyses the data and the final section provides concluding remarks.

2. Literature review

Remittances are financial flows into households that do not require a *quid pro quo* in economic value (Addison, 2005). They are usually viewed as private financial aid that flows directly into the hands of households and the fact that they tend to be counter-cyclical suggests that very often they serve as an important source of both income and consumption smoothing strategies for vulnerable poor and non-poor households. Similarly, the literature analysing the impact of remittance flows shows that these flows are beneficial at all levels – the individual, the household, the local community and the national level – and indicates that if well managed they can help reduce poverty at these four levels. Buch and Kuckulenz (2002) also report that worker remittances constitute an increasingly important mechanism for the transfer of resources from developed to developing countries and are the second-largest source, behind foreign direct investment, of external funding for developing countries.

The economic impact of remittances has been considered beneficial at both the micro and macro levels at least in the short term and there is increasing evidence that remittances from abroad are crucial to the survival of communities in many developing countries (Quartey and Blankson, 2003). However, there is scant literature available on the method and techniques for assessing the magnitude of both the micro and macroeconomic impact of remittances. The relevant literature concentrates primarily on the main uses of remittances and their impact on poverty, income inequality and development, with little or no reference to economic shocks to income.

Migrant remittances and economic shocks

Unanticipated economic shocks[3] affect consumption through income. The mechanisms households may employ to smooth out the impacts of such shocks can take different forms. One such means is to spend accumulated household wealth (Deaton, 1992), but there are many other mechanisms that individuals and households can use to smooth fluctuations in consumption. Households may seek to reallocate resources across time, by for example, borrowing from the formal financial markets (Rosenzweig and Wolpin, 1993; Udry, 1994). Households may also change the allocation of resources in any period and this might involve shifting consumption expenditure away from more durable and deferred expenditure items. A much more important and recent consumption smoothing mechanism is to share risk among people within an economy or across countries through private transfers.

In the case of private inward remittances, an unanticipated economic shock such as a fuel price increase or low rainfall recorded during the farming season, or elimination

of agricultural subsidies (on inputs such as fertilizer, etc.) will lead to low output and income shortfalls. Households with relatives abroad are likely to be remitted to augment their income and thereby reduce the impact of the shock on welfare. Similarly, a decline in rainfall patterns will lead to low agricultural output, which will in turn affect both rural and urban households disproportionately. In the case of rural households, the decline in yield will lead to a decline in farm income, which will then affect consumption and hence welfare. Similarly, urban households will experience a rise in food prices and since food accounts for a greater proportion of household budgets in Ghana, household welfare will decline unless incomes are augmented with migrant remittances or other means as noted above.

Ratha (2003) corroborates the point that migrants may increase remittances in times of economic hardship, especially in low-income countries where their families live at close to subsistence levels may depend significantly on remittances as a source of income. Ratha observes that economic downturns may also encourage workers to migrate abroad and thereby begin to transfer funds to families left behind. He further argues that while capital flows tend to rise during favourable economic cycles and fall in bad times, remittances appear to react less violently and show remarkable stability over time. For example, he shows that remittances to developing countries continued to rise steadily, especially during 1998–2001, a period characterized by a decline in private capital flows in the wake of the Asian financial crisis. Thus, remittances augment the recipient individuals' incomes and increase the recipient country's foreign exchange reserves. They thereby offset some of the output losses or economic shocks that a developing country may suffer from emigration of its highly skilled workers.

Negative economic shocks tend to have spill-over effects on various sections of an economy. The poor suffer disproportionately from shocks because they generally have limited savings and access to credit. They also rely heavily on public social services, which deteriorate as spending becomes constrained, and their limited skills mean higher income shortfalls. The shocks that hit low-income countries most frequently include natural disasters and large fluctuations in export or import prices. Natural disasters damage a country's stock of physical and human capital and reduce income and output, while fluctuating prices for a country's exports reduce income in the private and public sectors. Other types of external shocks can also be very costly. Conflicts in one country can spill over to neighbouring countries and create refugee problems, losses in export markets, higher transportation costs, lower remittances, and even conflict contagion and increased defence expenditures (See Happe et al., 2003).

In addition to physical damage and income losses, Happe et al. (2003) indicate that these shocks also have indirect effects that can reverberate through an economy, hampering output and investment, upsetting macroeconomic balances, and increasing debt and poverty over a number of years. The type and magnitude of indirect effects will depend on the size and duration of a shock, whether measures were taken in advance to mitigate its impact, the government's policy response, and the amount and form of external assistance a country receives. Estimating these effects can be tricky, however, because it is difficult both to identify the channels through which they are transmitted and to isolate the magnitude of their impact, especially when more than one shock has affected an economy or when an economy is recovering from a prior shock. Through direct and indirect effects, shocks can significantly impede growth.

Migrant remittances and welfare

T here has been a growing literature examining how migrant workers' remittances can affect households. Among these studies, some have documented how migrants have contributed to economic and social development in their country of origin. Thus, evidence suggests that remittances from abroad are crucial to the survival of communities in many developing countries as indicated in a World Bank Country Analyses report by Russell et al. (1990). One benefit expected from labour emigration was that migrants would be bringing an impetus to investments, transfer of technology and machinery and new enterprises. Thus, Russell et al. (1990) concluded that after satisfying subsistence needs, migrant remittances are used for investment purposes such as education, livestock, farming, and small scale enterprise. Taylor (1996) has also argued that remittances have multiplier effects that work to increase national income. In a study on Senegal, Diatta and Mbow (1999) found that remittances were a substantial source of revenue for families with migrant members and were also used to promote development in migrants' home communities.

Remittances significantly affect welfare and this was the focus of a study by Koc and Onan (2001).[4] They examined the impact of remittances on the standard of living of left-behind families in Turkey and found that remittances have a positive effect on household welfare. Their study shows that remittances have both direct and indirect income effects, which potentially have important influences on production, income inequality and poverty, at least at the local level. They found that 12% of households used about 80% of remittances to improve their standard of living, although it is argued that dependency on the same leaves households vulnerable to changes in migration cycles.

Migrant remittances also serve as a source of income for savings and investment, as confirmed by Taylor (1996), and thereby lead to growth and development of an economy. This is corroborated in a study on Mali by Findley and Sow (1998), who report that remittances not only covered basic food and cash needs but also allowed people to pay for irrigation in agriculture. Recent work in Somaliland has highlighted investment of remittances in production even in highly unfavourable economic and political conditions (Ahmed, 2000). Similarly, Kannan and Hari's (2002) study of the macroeconomic impacts of remittance flows in India indicates that remittances have made significant impact on savings.

Migrant remittances also affect the stability of the exchange rate and inflation, depending on how the inflows are managed. For example, Amuedo-Doranates and Pozo (2002), testing the impact of workers' remittances on real exchange rate using a panel of 13 Latin American and Caribbean nations, argue that workers' remittances have the potential to inflict economic costs on receiving economies. Their analysis revealed that these flows in the form of gifts usually cause growth of parallel foreign exchange markets, resulting in the appreciation of the real exchange rate. They also create dependency on unreliable sources of foreign exchange that are subject to cyclical fluctuations. In a related study, Swanson (1979) has also posited that although remitted earnings may prove to be useful in balance of payments problems, they generally contribute little to economic growth.

The importance of remittances has also been examined empirically in terms of its impact on poverty. Adams and Page (2003), using data from 74 low- and middle-income developing countries, found that international migration has a strong statistical impact on reducing poverty: On average, a 10% increase in the share of international migrants in a country's population will lead to a 1.9% decline in the share of people living in poverty. Thus, international remittances strongly affect poverty and they tend to minimize the negative effects of economic shocks in an economy.

Whilst some researchers hold the view that remittance flows reduce income inequality between the rich and the poor, others are of the view that the reverse is true because it is the rich that are able to get their family members to migrate. In a study based on a survey of 1,000 households in rural Egypt, Adams (1991) used income data from households with and without migrants to determine the effects of remittances on poverty, income distribution and rural development and found that although remittances were helpful in alleviating poverty, paradoxically they also contributed to inequality in the distribution of income. By contrast, Gustafson and Makonnen (1993) found that in Lesotho, migrant remittances actually decrease inequality. Chimhowu et al. (2004) support the view that remittances do increase inequality at the local level, but at the international level they transfer resources from developed to developing countries and so help to reduce inequality.

Studies on migrant remittances in Ghana

A number of studies carried out so far on migrant remittance flows to Ghana have focused mainly on the uses to which these funds are put, with less emphasis on the assessment of their magnitude and impact on households, particularly in times of shocks. In a much earlier study of internal migration in Ghana, Caldwell (1969) found that migrants spent remittances to pay for schooling and wages of farm labourers, and to develop small businesses. Also, a survey conducted by the Sussex Centre for Migration Research in Ghana, particularly in the Ashanti Region in March 2003, identifies three main uses of the remittances. First, remittances are used to satisfy individual needs such as smoothing consumption needs, organizing funerals and meeting other pressing social needs. The second motive is to support social projects in migrants' originating communities. The third motive, less common but perhaps the most important for the promotion of economic development, is for productive investments. Under this third category, the most common objective is for migrants to invest in businesses of their relatives in their home country.

A study by Litchfield and Waddington (2003) on Ghana also examined the welfare outcomes of migrants and non-migrants in Ghana using GLSS data. They found that migrant households have statistically significantly higher living standards than non-migrants, although there appears to have been a slight decline in the extent of migration over the decade. This study will try to fill the knowledge gap by specifically examining how remittance flows have helped to minimize the impact of macro volatility on the poor in Ghana, as observed during the 1990s.

There have been two recent studies on remittances and household behaviour in Ghana. The first, by Quartey and Blankson (2005), examined whether migrant remittances

minimize the effect of macro-volatility on households in Ghana using waves 3 and 4 of the Ghana Living Standards Survey. The authors found that migrant remittances offset the impact of macroeconomic shocks, particularly for food crop farmers who form the poorest of the poor in Ghana. A more recent study by Orozco et al. (2005) reviewed the trends, patterns and impact of remittances in Ghana. They conclude that Ghanaians are transnational agents whose ties and obligations occur in both Ghana and in their country of residence. Second, their attachment to their country of origin is manifested in the amount of remittances used as investment, the purchase of houses and alms giving.

In conclusion, despite the conflicting results of the impacts of remittance flows, an overwhelming amount of the empirical literature suggests that remittances make a powerful contribution to reducing vulnerability at least at the household and local community levels. It is important to emphasize that much of the effect is seen at the household level, suggesting that remittances underpin the welfare of households. Thus as much as it is important to assess the impact of remittance flows at the national and community levels, it is more important to consider the assessment of the impact at the household level to direct policy since it has the potential for reducing overall poverty and the vulnerability of the poor to macroeconomic volatility. In sum, the literature suggests that remittances have more positive than negative impacts.

Despite the importance of the studies discussed above on the uses of remittances and their likely impact on households, this relationship has not been empirically investigated in Ghana. It is common knowledge that households that receive remittances are able to withstand economic shocks since these inflows serve as a form of "insurance" against income shortfalls. This study therefore uses Waves 1 to 4 of the GLSS to investigate the impact of migrant remittances on household welfare in Ghana. A secondary objective is be to ascertain whether households receiving remittances are able to cope better than households without remittances in times of economic shocks.

3. Methodology

This section of the paper outlines the econometric theory drawn upon to investigate the impact of migrant remittances on household welfare and draws extensively on the work of Glewwe (1991). The objective of individuals and households according to economic theory is to maximize utility subject to a budget constraint. Utility is not observable, but is a construct representing household welfare. Empirically, we require something that is both observable and a good indicator of household welfare; for this we choose household consumption.

Duality theory allows us to express consumer decisions in terms of expenditure required (cost) functions, which specify the money needed by a utility-maximizing household to attain a certain level of satisfaction. The amount of expenditure required (denoted by X) to attain a given level of satisfaction depends on the prices of goods and services $(p_1,.....,p_n)$, characteristics of household members such as their ages and sex $(a_1,...,a_m)$, and the utility level (U) that the household wants to obtain. This can be expressed as:

$$X^h = E(U; p_1,...,p_n; a_1^h,...,a_m^h),\tag{1}$$

where, *h* superscript denotes a particular household. The model can be extended to compare utility levels of households living in regions with different price structures as follows:[5]

$$\frac{X_B^h/[m(\cdot)s_B]}{P_r(U^B,Q;\cdot)} = \frac{E_1(U^B; p_1^B,....,p_n^B)}{P_r(U^B,Q;\cdot)} = E_1(U^B; p_1^A,...,p_n^A) \geq or \leq E_1(U^A; p_1^A,...,p_n^A)\tag{2}$$

$$X^h/[m(\cdot)s_j] = \frac{A_A^h/S_A}{m(\cdot)} as U^B \geq or \leq U^A\tag{3}$$

We investigate the determinants of household welfare by regressing $X^h/[m(\cdot)s_j]$ on various explanatory variables assumed to be exogenous or predetermined. This is simply

a reduced form estimate of various structural relationships (earnings functions, agricultural production functions, etc.) that affect welfare. We group explanatory variables into five categories: (1) household composition variables; (2) regional dummy variables (R^h); (3) physical assets owned by the household (K^h); (4) human capital, e.g., education and work experience of household members (E^h); and (5) community characteristics (C^h). In generalizing Equation 3 across several regions, the function to estimate is:

$$\frac{X^h}{m\left(a_1^h,...,a_m^h; p_1^j,...,p_n^j\right)s_j} = $$
$$F\left(a_1^h,...,a_1^h; R_1^h,...,R_r^h; K_1^h,..., K_k^h; E_1^h,...,E_1^h,...,E_e^h; C_1^h,...,C_c^h\right)\varepsilon, \tag{4}$$

where ε is a multiplicative term accounting for random (unobserved) effects.

We can never estimate $m(\cdot)$ without making certain untestable assumptions (Deaton and Muellbaurer, 1986). An incorrect estimate of $m(\cdot)$ will affect the parameter estimates on $a_1^h,...,a_m^h$ in the function $m(\cdot)$ so that we cannot determine whether particular types of households are generally likely to have higher or lower levels of household welfare. Given this state of affairs, we allow a broader estimate to work this out. Specifically, if we multiply both sides of Equation 3 by $m(\cdot)$, take the logarithm of both sides and assume a convenient linear form of the logarithms of $F(\cdot)$ and $m(\cdot)$, we obtain

$$\log\left(X^h/s_j\right) = \sum_{j=i}^{r}\sum_{i=1}^{m}\alpha_{ij}a_i^h + \sum_{i=1}^{m}\beta_{ai}a_i^h + \sum_{i=1}^{r}\beta_{ki}K_i^h + \sum_{i=1}^{e}\beta_{ei}E_i^h + \sum_{i=1}^{c}\beta_{ci}C_i^h + e \tag{5}$$

The α's are the parameters of $m(\cdot)$, the β's are parameters of $F(\cdot)$, and e =log(ε). When estimating Equation (5) we identify $\left(\alpha_{ij} + \beta_{ai}\right)$ within any region j, not α_{ij} or β_{ai} separately. Intuitively, we can measure the impact of household expenditures, but we cannot relate this to unobservable household utility.

The empirical model

The principal hypothesis to be investigated by this study is that "migrant remittances significantly improve household welfare". Two approaches are used. First is a descriptive approach in which the broad developments in migrant remittances in Ghana are discussed. The second approach uses quantitative techniques to ascertain how a household poverty profile (welfare) is influenced by remittances and also economic

shocks. This basically involves formulating a standard poverty profile function that includes (in addition to the basic determinants) two other variables: remittances and variance of prices faced by households (an index for economic shocks). The data are extracted from the Ghana Living Standards Survey. The absence of earlier empirical work on the impact of migrant remittances on household welfare in Ghana presents a challenge to this study, as there are no existing results against which a comparison could be made.

In order to ascertain the impact of migrant remittances on household welfare or poverty profile, a poverty function is specified. The poverty profile function to be estimated is specified as:

$$\log(ui) = \alpha + \sum \beta_j X_{ij} + \varepsilon_i$$

where ε_I is the error term, which is assumed to be independent and normally distributed and is white noise and u_i is real per capita expenditure (denoted by X in the analytical framework above) and $X's$ are a vector of explanatory variables including migrant remittances and economic shocks (as measured by food and non-food prices). Other explanatory variables and their expected signs are discussed as follows.

Earlier studies (Glewwe, 1991; Grootaert, 1997; Teal, 2001; Tunali, 2000; Ravallion, 2001b; Litchfield and Waddington, 2003) on remittances and welfare have identified six broad categories of variables to explain household welfare or poverty. Following these earlier studies, it is postulated that household welfare is influenced by the following: First, migrant remittances, that is, access to foreign inflows or transfers, tend to supplement domestic resources and help smoothen consumption. However, the ways remittances are used may vary with respect to the economic status of the migrants' households. Richer households are expected to invest the remitted earnings on various forms of enterprises (either productive or unproductive), while poorer households are expected to give priority to satisfying their basic consumption needs. Thus, private remittances would be an important decision parameter for household consumption.

Economic volatility has been identified as one of the factors affecting the degree of income inequality in an economy thereby increasing poverty incidence. Economic shocks may take different forms. Low agricultural output due to poor rainfall, declines in real wages due to inflation, frequent terms of trade shocks, volatility in public consumption and volatility of credit to the private sector are all significant factors in explaining economic volatility. It has been observed that migrant remittances are pro-cyclical, i.e., the flow of remittances increases in times of economic shocks and therefore they tend to reduce the effects of shocks on household poverty (see Chami et al., 2005: 55-91).

Household welfare or poverty status is also influenced by household composition variables – a measure of the contribution of various household members to household income as well as household needs. It includes such variables as sex and household size. This argument is supported by the life-cycle hypothesis, which postulates that demographic variables affect consumption or welfare (Ando and Modigliani, 1963). The dependency ratio[6] is the most common demographic variable. The young and the

elderly are expected to consume out of past savings while those within the working age are expected to accumulate savings. A developed capital market as well as the number of children in the family are alternative means of maintaining income in old age.

Household size is also likely to affect consumption since there may be synergies from larger household size both in production and in consumption. Working in groups can be more productive through improved supervision, pooling of tools and experience, or higher motivation. Meanwhile, food preparation can be less costly for larger groups. The amount of land holdings is another useful determinant of consumption; the proportion of land holding area has a proportional direct effect on household consumption. Households with large land areas are likely to have higher income than households with low land holdings. Even in situations where householders do not cultivate the land by themselves, they could rent it out for a fee. Thus land holdings are expected to have a direct positive effect on consumption via income.

Generally, household education is likely to have a positive effect on household welfare (consumption). Since the mean level of education is expected to be significant this is likely to affect household welfare. A widely used measure of education is the maximum number of years of education per household member, the head of the household or the mother. It has been argued that the level of education of the mother is more likely to have a positive impact on household food consumption than the level of education of the male head of household (Bruck, 2003: 16). This study uses the maximum number of years of the head of the household.

According to Kyereme and Thorbecke (1991), the age composition of the household is important. This is measured using a fertility index (ratio of the number of children aged under than 15 to all other household members) and maturity index (the average age of these children divided by the average age of the remaining members. These two important household composition variables measure two opposing effects children may have on the household: first, the presence of children increases the dependency ratio; but second, as children become older, the net burden may diminish since they may add to the stock of earners, particularly in rural areas where children support their parents on the farm. In addition, employment variables such as the composition of the household's workforce, i.e., share of adults employed, share of adult females employed, etc., also explain household welfare.

Physical asset endowment also influences household poverty or welfare status. These variables include land ownership (in acres), real value of livestock, farm equipment and non-farm assets. The number of livestock is another important determinant of welfare. It is expected that farmers or households with larger livestock units have higher income, which bears a direct effect on welfare. Also, the sector of economic activity affects one's consumption. Households whose occupations fall within manufacturing, industry and services are better off than food crop farmers according to the GLSS report. In addition, households who have off-farm employment are likely to be better off than households without, particularly because of the seasonality of agriculture in Ghana

Locational variables such as region of residence, or rural versus urban, explain household poverty since they define the spatial contributions to affluence or poverty. Location effects are manifest in infrastructure and other unobserved geographical differences (Litchfield and Waddington, 2003).

Income is another major determinant of welfare. The Keynesian consumption function and the permanent income hypothesis of Friedman postulate a positive relationship between welfare (consumption) and income. According to the permanent income hypothesis, which distinguishes between permanent and transitory components of income, households will spend mainly the permanent income. The transitory income is channelled into savings with a marginal propensity to save from this income approaching unity. The positive relationship postulated by Keynes and Friedman's permanent income hypothesis has been confirmed by empirical studies (Rossi, 1988; Gupta, 1987; Koskela and Viren, 1982; Avery and Kannickel, 1991).

Data sources

Data sets from the Ghana Living Standards Survey (GLSS) Waves 1–4, available at the Ghana Statistical Service, were collected in the following periods: 1987/88, 1988/89, 1991/92 and 1998/99 for GLSS 1 to 4, respectively. Each GLSS contains information on whether an individual household member received remittances, the amount received, etc. It also has demographic information on households.

The pseudo panel data were complemented with data on economic shocks. Economic shocks are captured mainly through price data compiled by the Ghana Statistical Service for each household during the surveys. The economic shock variable was computed by calculating the variance of the prices for each household. The theoretical link between price shocks and household welfare is as follows: an increase in prices, perhaps due to petroleum price increases, will affect households since it results in price increases generally and food prices in particular. Since food accounts for a greater proportion of the poor households' budget, such increases have very severe welfare implications.

4. Data analysis and findings

The study used waves 1 to 4 of the Ghana Living Standards Survey to ascertain the impact of remittances on household welfare. All four waves of the GLSS were used for the descriptive analysis while the two recent waves[7] were pooled into a pseudo panel for the regression analysis.

Descriptive analysis

The GLSS 1, 2, 3 and 4 comprise 3,200, 3,456, 4,507 and 5,992 households, respectively, and cover all the ten regions of Ghana. The GLSS 1 survey data covered the period 1987/88 and GLSS 2 spanned the period 1988/89, while GLSS 3 covered the period 1991/92 and the GLSS 4 data spanned the period 1998/99. Out of the total number of households surveyed, 7.9%, 8.8%, 6.1% and 8.1% received remittances in the period 1987/88, 1988/89, 1991/92 and 1998/99, respectively. The proportion of households who received remittances from relatives in other African countries was 4.6% in GLSS 1, 4.5% in GLSS 2, 6.52% in GLSS 3 and 3.6% in GLSS 4. On the other hand, the proportion of household members receiving remittances from migrant family members living outside Africa was 3.1% in GLSS 1, 4.3% in GLSS 2, 10.4% in GLSS 3 and 12.1% in GLSS 4. Thus the proportion of households receiving remittances from relatives outside Africa increased consistently between 1987/88 and 1998/99. Several reasons have been given to explain this phenomenon. First, it has been suggested that the increasing exodus of Ghanaians to these countries accounts for this trend. Others posit that this may also be due to the confidence Ghanaians currently have in the economy. It has also been argued that the trend could be due to deteriorating living standards in Ghana and hence the need for migrants to assist their relatives in Ghana. Unfortunately, these assertions have not been subjected to any empirical investigation.

Sons and daughters of the household head were the major group of people who received remittances, followed by sisters or brothers of the household head. Other extended family members of the household head form the next group of recipients, followed by the spouse of the household head (Table 1). In terms of the two sexes, 70.9% of migrant remittances went to males in 1987/88, 70.7% in 1988/89, 60.2% in 1991/92 and 64.7% in 1998/99. While the proportion of females who received remittances between 1987/88 and 1988/1989 increased marginally, it declined by 4.5 percentage points between 1991/92 and 1998/99. An increase in the proportion of females receiving remittances is a positive sign since it is well known that transfers to female-headed households tend to have greater impact on household welfare than those of their male

counterparts. Another interesting revelation is that only a small proportion of migrant remittances had to be paid back; 1.86%, 0.68%, 3.2% and 3.6% of households receiving remittances in 1987/88, 1988/89, 1991/92 and 1998/99 were required to repay.

Table 1: Recipients of migrant remittances

Relationship to head of household	GLSS 1 (Per cent)	GLSS 2 (Per cent)	GLSS 3 (Per cent)	GLSS 4 (Per cent)
Son or daughter	30.4	37.8	26.3	32.6
Sister or brother	30.0	29.6	33.1	33.6
Other relations	10.7	7.2	13.5	18.1
Spouse	8.3	6.3	11.4	3.7

Source: GLSS 1–4.

Data on the regularity of remittance flows were not captured in the GLSS 1 and 2 survey but the GLSS 3 and 4 survey data revealed that a significant proportion of households do not regularly receive remittances. For example, 45.7% and 58.5% of households that received remittances in GLSS 3 and GLSS 4, respectively, said they do not receive them regularly. Another 29.4% and 17.3% of sampled households in GLSS 3 and 4, respectively, received remittances annually. Meanwhile, 14.9% and 14.0% of the total sample in GLSS 3 and GLSS 4, respectively, received remittances on a quarterly basis (Table 2). The high incidence of "not regular" inflows of remittances (as evident in Table 2) clearly demonstrates the widespread view that remittances are used as a means of coping with unexpected economic shocks.

Table 2: Regularity of inflow of remittances

Frequency	GLSS 3 (1991/92) (Per cent)	GLSS 4 (1998/99) (Per cent)
Weekly	1.8	0.2
Monthly	5.7	9.0
Quarterly	14.9	14.0
Annually	29.4	17.3
Not regular	45.7	58.5
Other	2.4	1.1

Source: Computed from GLSS 3 and 4.

Another interesting revelation is that the maximum value of remittances received by households was ¢850,000 in 1987/88, ¢1.8 million in 1988/89, ¢1.6 million (US$3,661.3) in 1991/92 and ¢5.64 million (US$21,307.1) in 1998/99.[8] The mean value of remittances received by household members in 1991/92 was ¢20,616; this increased significantly to ¢203,949 in 1998/99. Interestingly, 1991/92 marked a period in Ghana when inflation was relatively low (about 10%) compared with the about 16% rate of inflation recorded in 1998/99. Adjusting for the inflationary effects in the mean value of remittances for the two periods will still show considerable growth in migrant remittances between 1987 and 1999. The mean value of remittances in real terms amounted to ¢108,163.7 in 1991 and ¢153,310.5 in 1999, an increase of 41.74% over the two periods. The

considerable growth in the amount of remittances in 1998/99 compared with that of 1991/92 supports the assertion that migrant remittances to Ghana are counter-cyclical – they increase in times of economic shocks and therefore they are less regular as indicated in Table 3. We return to the issue of counter-cyclical nature of remittances in the regression analysis. It is noteworthy that remittances are mostly in the form of cash and non-food items (Table 4).

Table 3: Value of remittances received

	1987/88	1988/89	1991/92	1998/99
Maximum (¢)	850,000	1,800,000	1,600,000	5,640,000
Mean (¢)	41,923.6	57,452.5	108,163.7	153,310.5
Maximum ($)	3695.7	5940.6	3661.3	2130.7
Mean ($)	182.3	189.6	247.5	57.9
Number of observations	253	304	278	487

Source: Computed from GLSS 3 and 4.

Table 4: Types of remittances (mean values)

Type	GLSS 3 (1991/92)	GLSS 4 (1998/99)
	¢	¢
Cash	78,361	666,049
Food	2,813	12,187
Non-food	20,616	146,862

Source: Computed from GLSS 3 and 4.

Regression analysis

To determine the impact of remittances on household welfare, a pseudo-panel using households that received remittances during the two survey periods was constructed. Although the study initially proposed to pool the four waves into a pseudo panel, the format of the GLSS 1 and 2 data did not allow for such analysis. The concept of "pseudo-panel" was introduced by Deaton (1985) for the analysis of consumer demand systems. A pseudo-panel is formed by grouping households into cohorts based on some common characteristics. Cohort variables are then computed as the average values for the households included.

Our pseudo-panel was constructed on the basis of the following characteristics:*poverty status, location* and *region*. Poverty status defines households as very poor, poor or non-poor according to poverty benchmarks determined by the Ghana Statistical Service. Location is defined as either urban or rural, while region captures the ten administrative regions of Ghana. Thus, the total number of cohort groups is composed as follows: Poverty status (3), Location (2), Region (10). For example, a cohort group is formed through a combination of households with the following characteristics: Very poor households living in a rural area in region 1 form a group. A second group consists of very poor households living in a rural area in region 2, etc. This gives a linear combination of 60 cohort groups for GLSS 3 and a similar number for GLSS 4. The 120 cohort

groups (less 3 degrees of freedom) in the two waves put together is what forms the pseudo-panel.

The empirical model is estimated using the pseudo-panel data set where cohorts are defined by poverty status, location and region. Panel data sets contain two kinds of information: cross-sectional information, which reflects differences between cases, and time-series information, which reflects changes within cases over time. Therefore using ordinary multiple regression technique may not be robust, since this may result in omitted variable bias – a problem that arises when there is some unknown variable(s) that cannot be controlled for but can affect the dependent variable.

Table 5 gives a definition of variables used for the study. The index of economic shocks or volatility is measured as the standard deviation of prices faced by households during the survey period. Table 6 presents the econometric results of the pseudo-panel random effects model. As can be seen from the table, the *interact* variable carries a negative sign but is insignificant. Thus, one may conclude that even though household consumption (welfare) is positively affected by remittances, economic shocks reduce its impact on household welfare and the negative effect of the shock is not completely offset by the presence of remittances. In other words, remittances form one, but not the only, coping mechanism for economic shocks on household welfare.

Table 5: List of variables

Variable	Definition
Lwelfare	Log of per capita household consumption per adult equivalent
Lpremit	Log of per capita household remittance
Fpindex	Volatility index for food price in 1991/92 and 1998/99[9]
Interact	Interactive term: the product of *lpremit* and *Fpindex*
Agehead	Age of household head
Hhsize	Size of household
Sexhead	Gender of household head
Noeduc	Household head has no education (No formal education, cannot read or write)
Basic	Head of household has basic education (primary and middle school education)
Secondary	Head of household has secondary education (junior and senior secondary education)
Postsec	Head of household has post-secondary education (nursing training, teacher training, etc.)
Tertiary	Head of household has tertiary education (polytechnics, universities, higher professional training institutions, etc.)
Land	Household does not own land
ecozone2	Household located in forest belt
ecozone3	Household located in savannah belt
loc2	Household located in rural area
Year	Dummy for the period 1998/99

Note:

The Ghana Living Standards Survey has data on both food and non-food prices that are used to measure volatility for each individual within the various sectors of the economy for the regressions.

We may, for example, want to control for omitted variables that differ between cases but are constant over time (fixed effects), or to control for omitted variables that change over time but are constant between cases (between effects), or a combination (weighted

average) of the two (random effects). Statistically, fixed effects give consistent results but may not give efficient results. On the other hand, random effects give more efficient estimates. To choose the most appropriate model (fixed versus random), we subjected the two models to the Hausman test.[9] (see Greene, 2000: 837–841) Although it has been argued that the choice between the fixed and random effects can be based on certain institutional factors or characteristics of the data, unfortunately, this approach does not always provide guidance and hence the use of the Hausman test simplifies the problem (see Greene, 2000: 576). At the 5% significance level, we do not reject the Hausman test, implying that the more efficient random effects model also gives consistent results (see Appendix Table A1 for Hausman test results). Accordingly, we estimate our empirical model using the random effects technique.

Table 6: Random-effects GLS regression model

Regressors	Coefficient	Standard error	P-value
Lpremit	.226	.0109	0.038
Fpindex	-.0023	.0026	0.375
Interact	-.0002	.0003	0.494
Agehead	-.0011	.0069	0.868
Hhsize	-.1169	.0203	0.000
Sexhead	-.0088	.176	0.960
Basic	.3097	.224	0.167
Secondary	1.540	.350	0.000
Post-sec	1.693	.785	0.031
Tertiary	.965	.320	0.003
Land	-.296	.071	0.000
Constant	14.25	.434	0.000

R-Squared: Within = 0.1486   Observations = 117
           Between = 0.6849   Wald chi2(10) = 86.8
           Overall = 0.6591   Prob > chi2 = 0.0000

It is worth mentioning that the log of income was initially used but did not provide meaningful estimates and was therefore dropped from the model although the results are presented in the Appendix (Table A2). Secondly, to avoid the problem of endogeneity, remittances were instrumented using average remittances as per ecological zone (coastal, forest or savannah) as the instrument for per capita remittances. Again, that did not provide reasonable or better estimates. Rainfall shocks were also used in place of price shocks and the coefficient was positive but insignificant. Thus price shocks were used instead.

Results

First, remittances significantly increase household welfare; a 1% increase in the flow of migrant remittances will lead to 0.23% improvement in household welfare. The land variable in the pseudo model carries a negative sign and is significant. This shows that welfare is reduced for households without asset holdings. Education improves household welfare. Thus except for households headed by people with no education

(where the coefficient had a negative sign), household welfare positively correlates with some level of education by the household head, and this is significant for households headed by people with secondary, post-secondary and tertiary education. Age of household head is negatively correlated with welfare but is insignificant. Household size has a negative and statistically significant effect on welfare, implying that larger households have reduced welfare. This means that consumption synergies expected from larger household sizes may be absent. Households headed by females (*sexhead*) also have reduced welfare, but this is insignificant.

In addition to the pseudo model we also run a simpler model in which we pooled the data for the two periods, 1997–92 and 1998/99. This approach assumes that the data form a proper panel and attempts to investigate how remittances affect households within each of the seven sectoral occupations[10]. We then run a model for the complete set of observations as well as seven sectoral regressions. Table 7[11] presents the results of the pooled regressions. Column 2 (model 1) presents the results for all the observations. Columns 3 (model 2) through 9 (model 8) produce results for the various socioeconomic groupings defined earlier.

In model 1, the coefficient of the interaction term, *interact,* unlike in the pseudo model, takes on a positive sign but is insignificant, suggesting that migrant remittances minimize the impact of economic shocks on household welfare but the effect is not significant. At the sectoral level, that is public sector workers (model 2), food crop farmers (model 6) and non-workers (model 8), the coefficient for the interaction term is also positive but is significant only for food crop farmers. This means that remittances received by these households may have been enough to mitigate any negative impact of shocks on their welfare.

This has a very important policy implication; the GLSS 3 and 4 reports indicated that although poverty had declined between the two periods, it increased for some groups of people, the majority of whom were food crop farmers. Thus, it can be concluded that migrant remittances mitigate any impact of economic shocks on the welfare of the poorest of the poor. For private formal sector workers (model 3), private informal sector workers (model 4), export crop farmers (model 5) and non-farm workers, the coefficient is negative, but insignificant except for private informal sector workers, meaning that this group of workers was hardest hit by the shock.

There are some sectoral differences; whereas welfare significantly improved between the two periods for households headed by public sector workers, private formal sector workers and export farmers, it deteriorated for households headed by food crop farmers. For the others, i.e., private informal, non-farm and non-workers, no significant impacts occurred between the two periods.

Finally, we test whether migrant remittances to Ghana are counter-cyclical. If remittances are counter-cyclical, a negative correlation is expected between income or GDP and remittances (Chami et al., 2005). In other words, an increase in economic shocks is expected to increase remittance flows to Ghana.

Table 7: Pooled regression results

Regressor	Full sample	Public sector	Private formal	Private informal	Export farmers	Food crop farmers	Non-farm workers	Non-workers
Lpremit	.117	.1249	.384	.403	.165	-.002	.201	.114
	(0.0)	(0.016)	(0.09)	(0.017)	(0.307)	(.959)	(0.0)	(0.202)
Fpindex	-.007	-.0318	-.266	0.301	-053	-.011	.013	-.015
	(0.431)	(0.041)	(0.599)	(0.32)	(0.260)	(0.404)	(0.214)	(0.472)
Interact	.0005	.0002	-.003	-.003	-.002	.003	-.0007	.0008
	(0.151)	(0.800)	(0.27)	(0.094)	(.231)	(0.00)	(0.131)	(0.499)
Hhsize	-.061	-.0866	.060	.0438	-057	-.055	-.078	-.077
	(0.0)	(0.00)	(0.051)	(0.369)	(0.200)	(0.035)	(0.0)	(0.002)
Agehead	.0001	.0039	-.017	-.033	-.003	.0009	-.0009	.005
	(0.932)	(0.431)	(0.002)	(0.001)	(0.727)	(0.766)	(0.771)	(0.125)
Sexhead	-.108	-.0987	-.0585	0.396x	-0.38	-.0522	-.139	.003
	(0.014)	(0.286)	(0.698)	(0.698)	(0.886)	(.507)	(0.059)	(0.975)
Land	-.155	.1087	-.031	-.364	0.211	-.2733	-.105	.419
	(0.019)	(0.444)	(0.86)	(0.065)	(0.432)	(0.002)	(0.228)	(0.001)
Year	-.181	1.7202	4.57	.090	5.35	-1.454	-.703	.165x
	(0.720)	(0.014)	(.038)	(0.961)	(0.067)	(0.057)	(0.302)	(0.302)
Ecozone2	.043	.1444	-0.463	.081	.139	.0232	.104	-.088
	(0.471)	(0.139)	(.003)	(0.712)	(.732)	(.826)	(0.250)	(0.555)
Ecozone3	-.303	-.5634	-.86	1.842	-1.45	-0.069	-.254	-.502
	(0.012)	(0.0)	(0.049)	(0.002)	(0.160)	(0.662)	(0.091)	(0.174)
Loc2	-.346	-.7554	-.922	-.634	-1.79	.0511	-.189	-.147
	(0.0)	(0.0)	(0.001)	(0.09)	(0.007)	(0.713)	(0.080)	(0.398)
Noeduc	.088	.1419	-.070	-.203	.0054	.141	-.02	.325
	(0.224)	(0.478)	(0.83)	(0.309)	(0.982)	(0.209)	(0.870)	(0.014)
Basic	.274	.6389	-.754	-.298	.086	.2529	.053	.693
	(0.006)	(0.047)	(0.002)	(0.284)	(0.69)	(0.055)	(0.718)	(0.0)
Secondary	.329	.2394	-.331	0.378	0.507x	.972x	.200	.272
	(0.0)	(0.266)	(0.237)	(0.210)	(0.210)	(0.210)	(0.206)	(0.206)
Postsec	.291	.3341	-.100	1.052	.589	.4416	-.154	.192
	(0.004)	(0.162)	(0.658)	(0.004)	(.107)	(0.033)	(0.326)	(0.293)
Tertiary	.371	.4528	-.614	—-	—-	.1008	.345	.571
	(0.001)	(0.128)	(0.105)			(0.519)	(0.046)	(0.005)
Constant	13.65	14.1459	12.74	10.679	15.20	13.775	12.95	13.3
	(0.0)	(0.0)	(0.00)	(0.0)	(0.00)	(0.0)	(0.0)	(0.0)
R-Squared	0.5005	0.5245	0.613	0.767	.552	0.5240	0.4771	0.5707
No. of Obs.	765	96	96	34	39	183	283	83
F ( )	37.65	19.14	20.54	—	—	—	19.54	47.19
Prob > F	0.00	0.00		—	—	—	0.00	0.00

Table 8 presents the covariance between remittance income, income less remittances, inflation shock, GDP shock and rainfall shock. Except for the positive correlation coefficient between remittances and income less remittances, the rest carry the right sign. A positive correlation between GDP shock and remittances points to the fact that migrant remittances are counter-cyclical, which corroborates the work of Chami et al. (2005).

Table 8: Test for counter-cyclicality of migrant remittances (covariance)

	Income	Inflation shock	GDP shock	Rainfall Shock
Remittances	0.14	0.34	0.38	0.37
Expected sign	-	+	+	+

5. Conclusions and policy implications

The study investigated the impact of migrant remittances on household welfare in Ghana using waves 1-4 of the Ghana Living Standards Survey. The analysis revealed some very interesting findings. First it was found that migrant remittances improve household welfare and the flow of such remittances increases in times of economic shocks, hence they are counter-cyclical. Thus the remittances help to minimize economic shocks that reduce household welfare, particular for food crop farmers. Moreover, households that own land are able to withstand economic shocks and therefore tend to have better welfare than those without land. Whereas the level of education of the household head positively affects welfare, age of the head of the household negatively correlates with household welfare although this was not significant. The study also found that larger households have reduced welfare, an indication that there is an absence of consumption synergies within larger households. Finally, the proportion of males receiving migrant remittances exceeds that of females.

In conclusion, there has been considerable increase in inflows of migrant remittances to Ghana and these remittances have not only improved household welfare but have become an important source of income for consumption smoothing in Ghana. The study suggests that policies should be designed particularly for the poorest of the poor (food crop farmers) to ensure that the cost of transferring funds to relations in Ghana is reduced. Food crop farmers who receive remittances should be given a rebate (handling charges or higher conversion rate) to improve their welfare levels.

A related issue is that since migrant remittances have become important sources of income for consumption smoothing for households, policies should be designed to ensure that remittances sent through the banks and other transfer institutions attract little or no interest. The 2.5% charges on withdrawals of foreign currency from foreign currency accounts held locally should be abolished. The central bank in 2004 outlawed the system whereby foreign account holders pay interest on their balances, but banks have circumvented this by charging customers for withdrawals made on these accounts. If this is not checked, it will encourage the use of informal means of transferring funds to the country. Additionally, there are other informal means of sending remittances to Ghana and therefore the central bank should design a regulatory framework that will integrate the informal channels of sending migrant remittances into the formal.

Notes

1. It must be added that the impact of migrant remittances on household welfare depends significantly on household composition. For example, studies have shown that the distributional impact of poverty alleviation funds is greater in female-headed households.

2. Economic shocks is defined as household price level shocks as measured in the GLSS, not macro-volatility as measured in Quartey and Blankson (2005).

3. Defined as low agricultural output due to poor rainfall, declines in real wages due to inflation, frequent terms of trade shocks, volatility in public consumption, volatility of credit to the private sector, etc.

4. Their study was based on data from the 1996 Turkish International Migration Survey (TIMS-96).

5. Extensions of these equations are provided in Glewwe (1991).

6. Defined as the share of the population under 15 or over 65 years of age.

7. The GLSS 1 and 2 data are not well organized for easy pooling into a pseudo–panel.

8. The US$ exchanges for ¢230 = $1 in 1988, ¢303 = $1 in 1989, ¢437 = $1 in 1992 and ¢2647 = $1 in 1999.

9. The Hausman test tests the null hypothesis that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator.

10. The seven sectoral models were run according to the socioeconomic groupings (seg) of households as categorized in the GLSS 3 and 4. They are: (1) public sector, (2) private formal, (3) private informal, (4) export farmers, (5) food crop farmers, (6) non-farm workers and (7) non-workers. Volatility in each sector is obtained from the GLSS data using the food CPI.

11. See Appendix for detailed regression results for the pooled model.

References

Adams R.H. 1991. *The Effects of International Remittances on Poverty, Inequality, and Development in Rural Egypt*. Research Report No. 86. International Food Policy Research Institute, Washington, D.C.

Adams, R.H. 2006. "Remittances and poverty in Ghana". World Bank Working Paper WPS 3838, World Bank, Washington, D.C.

Adams, R.H. and J. Page. 2003. "Impact of international migration and remittances on poverty". Paper presented at the Department for International Development/World Bank Conference on Migrant Remittances. London, 9–10 October.

Addison. E.K.Y. 2005. "The macroeconomic impact of remittances". In Takyiwaa Manuh, ed., *At Home in the World, International Migration and Development, in Contemporary Ghana and West Africa,* pp. 118–38. Accra, Ghana: Sub-Saharan Publishers, Legon.

Ahmed, I. 2000. "Remittances and their economic impact in post-war Somaliland (2000)". *Disasters*, 24(4): 380–9.

Amuedo-Dorantes, C. and S. Pozo. 2002. "Workers' remittances and the real exchange rate: The paradox of gifts." http://homepages.wmich.edu/~pozo/remit.real.feb6.pdf. Accessed 22 May 2005.

Ando, A. and F. Modigliani. 1963. "The life-cycle hypothesis of saving: Aggregate implications and tests" *American Economic Review*, 53 (March):55–84.

Avery, R.B and A.B. Kennickel. 1991. "Household savings in the US". *Review of Income and Wealth*, Series 37(4): 409-432, December.

Azam J. and F. Gubert. 2002. "Those in Kayes: The impact of remittances on their recipients in Africa". http://www.nuff.ox.ac.uk/users/doornik/eswc2000/a/1762 Accessed 22 February 2006

Bank of Ghana. 2004. "Data on migration remittances by financial institutions in Ghana". Accra, Ghana.

Bruck, T. 2003. "Household coping choices and the determinants of income and consumption in post-war rural Mozambique". Paper presented at the European Economic Association Annual Meeting, Stockholm, February.

Buch, C.M. and A. Kuckulenz. 2002. "Worker remittances and capital flows to developing countries". Working Paper No.1130. Kiel Institute of World Economics, Germany.

Caldwell, J.C. 1969. *African Rural-Urban Migration: The Movement to Ghana's Towns*. Canberra: Australian National University Press.

Chami, S., C. Fullenkamp and S. Jahjah. 2005. "Are immigrant remittance flows a source of capital for development?" *IMF Staff Papers*, 52(1): 55–81.

Chimhowu, A., J. Piesse and C. Pinder. 2004. "The impact of remittances**". *Enterprise Development Impact Assessment Information Service EDIAIS,* Issue 29, April 2004.

Deaton, A. 1985. "Panel data from time-series of cross-sections". *Journal of Econometrics*, 30: 109–26.

Deaton, A. 1992. *Understanding Consumption*. Oxford: Clarendon Press.

Deaton, A. 2001. *Counting the World's Poor: Problems and Possible Solution.* World Bank Research Paper No. 3179. The World Bank, Washington, D.C., December.

Deaton , A. and J. Muellbaurer. 1986. "On measuring child cost: With applications to poor countries, *Journal of Political Economy*, 94: 720–744

Deaton, A. and S. Zardi. 1999. "Guidelines for constructing consumption aggregates for welfare analysis, 2002". Living Standards Measurement Study Working Paper: 135, v. 104, pp. xi. The World Bank, Washington, D.C.

Diatta, M.A. and N. Mbow. 1999. "Releasing the development potential of return migration: The case of Senegal". *International Migration*, 37(1): 243–66.

Findley, S. and S. Sow. 1998. "From season to season: Agriculture, poverty, and migration in the Senegal River Valley, Mali". In R. Appleyard, ed., *Emigration Dynamics in Developing Countries: Sub-Saharan Africa,* pp. 69-144. London: Ashgate Publishing Ltd..

Glewwe, P. 1991. "Investigating the determinants of household welfare in Cote d'Ivoire". *Journal of Development Economics*, 35: 307–37.

Greene, W.H. 2000. *Econometric Analysis*. Prentice-Hall International Incorporation. New York University.

Grootaert, C. 1997. "The determinants of poverty in Cote d'Ivoire in the 1980s". *Journal of African Economies*, 6(2): 169–96.

Gustafson, B. and N. Makonnen. 1993. "Poverty and remittances in Lesotho". *Journal of African Economics*, 2: 49–73. Oxford University Press.

Gupta, K.L. 1987. "Aggregate savings, financial intermediation and interest rate". *Review of Economics and Statistics*, 69(2): 303–311.

Happe, N., M. Hussain and L. Redifer. 2003. "Absorbing shocks". IMF Working Paper, Finance and Development, December 2003.

Hulme, D., K. Moore and A. Shepherd. 2001. "Chronic poverty: Meanings and analytical frameworks". Chronic Poverty Research Centre Working Paper 2, Institute for Development and Policy Management, University of Manchester.

International Monetary Fund. 2001. Public Information Notice (PIN) No. 01/97, 21 September 2001.

Kannan, K.P. and K.S. Hari. 2002. "Kerala's Gulf connection: Emigration, remittances and their macroeconomic impact 1972–2000". Centre for Development Studies Working Paper 328. http://cds.edu/download_files/328.pdf Accessed 22 February 2006.

Koc, I. and I. Onan. 2001. "The impact of remittances of international migrants on the standard of Living of the Left-Behind Families in Turkey"."Conference Proceedings, XXIV International Union for the Scientific Study of Population (IUSSP) General Conference, Salvador, Brazil, 18–24 April.

Koskela, E. and M. Viren. 1982. "Savings and inflation: Some international evidence". *Economic Letters*, 9(4): 247–267.

Kyereme, S. and E. Thorbecke. 1991. "Factors affecting food poverty in Ghana" *Journal of Development Studies*, 28(1): 39–52.

Litchfield, J. and H. Waddington. 2003. "Migration and poverty in Ghana: Evidence from the Ghana Living Standards Survey". University of Sussex, IDS Migration Working Paper Number 10: http://www.central.sussex.ac.uk/Units/SCMR/working_pap. Accessed 15 February 2005.

Maimbo, S. 2003."The money exchange dealers of Kabul: A study of the Hawala System in Afghanistan". Working Paper No.13. The World Bank, Washington, D.C.

Orozco, M., Micah Bump, R. Fedewa and K. Sienkiewicz. 2005. *Diaspora, Development and Transnational Integration: Ghanaians in US, UK and Germany*. A report commissioned by Citizenship International through the United States Agency for International Development (USAID).

Quartey, P. and T. Blankson. 2003. *The Sources and Uses of Migrant Remittances in Ghana*. Institute of Economic Affairs (IEA) Research Report, Ghana.

Quartey, P. and T. Blankson. 2005. "Do migrant remittances reduce the impact of macro-volatility on poor households in Ghana?"www.gdnet.org/pdf2/gdn_library/global_research_projects/macro_low_income/Quartey.pdf. Accessed 15 May 2005.

Ratha, D. 2003."Workers remittances: An external and stable source of external development finance". In *Global Development Finance.* Washington, D.C.: The World Bank.

Ravallion, M. 2001a. "Growth, inequality and poverty: Looking beyond averages". Development Research Group, The World Bank, Washington, D.C.

Ravallion, M. 2001b. "Measuring aggregate welfare in developing countries: How well do national accounts and surveys agree?" World Bank Working Paper No. 2665. The World Bank, Washington, D.C.

Rosenzweig, M.R. and K. Wolpin. 1993. "Credit market constraints, consumption smoothing and the accumulation of durable production assets in low income countries: Investment in bullocks in India". *Journal of Political Economy*, 101(2): 223–44.

Rossi, N. 1988. "Government spending, the real interest rate and the behaviour of liquidity constrained consumers in developing countries". *IMF Staff Papers*, 35(1, March):104–40.

Russell S.S., K. Jacobsen and W.D. Stanley. 1990. *International Migration and Development in Sub-Saharan Africa*, Volume 2, Country Analyses. World Bank Discussion Papers No. 102. The World Bank, Washington, D.C.

Sander, C. 2003. *Migrant Remittances to Developing Countries: A Scoping Study.* Paper Prepared for DFID, Bannock Consulting, June.

Solimano, A. 2003. *Remittances by Emigrants: Issues and Evidence.* WIDER Discussion Paper No. 2003/89. WIDER/UNU, Helsinki, Finland.

Stark, O. 1991. *The Migration of Labor*. Cambridge, Massachusetts: Basil Blackwell.

Swanson, J.C. 1979. *Emigration and Economic Development: The Case of Yemen Arab Republic.* Boulder, Colorado: Westview Press

Taylor, J.E. 1996. "International migration and national development". *Population Index*, 62(2): 181–212.

Teal, F. 2001."Education, incomes, poverty and inequality in Ghana in the 1990s". WPS/2001-21. Centre for the Study of African Economies, Oxford.

Tunali, I. 2000. "Rationality of migration". *International Economic Review*, 41(4): 893–902.

Todaro, M.P. 1999. *Economic Development*. Massachusetts: Addison Wesley.

Udry, C. 1994. "Risk and insurance in a rural credit market – An empirical investigation". *Review of Economic Studies*, 61(3): 495–526.

Appendix

Table A1: Hausman specification test

1welfare	Coefficients		
	Fixed effects	**Random effects**	**Difference**
1premit	-.000621	.0226359	-.0232569
agehead	.0041926	.0011455	.0030471
hhsize	-.0185661	-.1169321	.098366
sexhead	.0434108	-.008836	.0522468
basic	.1155182	.3097697	-.1942515
secondary	.7987847	1.535659	-.7368742
postsec	.1361816	1.693229	-1.557047
tertiary	.1672602	.9652869	-.7980268
land	-.1143708	-.2960978	.181727
ez	.0808267	.0681463	.0126803
inflation	-.0018292	-.0023012	.000472
interact	.0002241	-.0002254	.0004495

Test: Ho: difference in coefficients not systematicchi2(12) = (b-B)'[S^(-1)](b-B), S = (S_fe - S_re)
=   5.11   Prob>chi2 =   0.9543

Table A2: Random-effects GLS regression model (extended model)

Regressors	Coefficient	Standard error	P-value
lpremit	-.0357	.0322	0.267
lincomr	-.007	.01642	0.686
fpindex	.002	.0046	.664
interact	.0024	.0025	.340
agehead	-.0148	0.0132	.260
hhsize	-.0962	.0242	.000
sexhead	.128	.321	.691
basic	.378	.481	.432
secondary	1.05	.534	.049
post-sec	-.2303	1.26	.855
tertiary	1.044	.362	.004
land	-.342	.172	.048
constant	15.622	.998	.000

R-squared: Within   = 0.5456   Observations = 117
              Between = 0.6265   Wald chi2(10) = 53.29
              Overall = 0.6192   Prob > chi2   = 0.00

Other recent publications in the AERC Research Papers Series:

The Behaviour of Income Velocity in Tanzania 1967−1994, by Michael O.A. Ndanshau, Research Paper 50.

Consequences and Limitations of Recent Fiscal Policy in Côte d'Ivoire, by Kouassy Oussou and Bohoun Bouabre, Research Paper 51.

Effects of Inflation on Ivorian Fiscal Variables: An Econometric Investigation, by Eugene Kouassi, Research Paper 52.

European Economic Integration and the Franc Zone: The Future of the CFA Franc after 1999, Part II, by Allechi M'Bet and Niamkey A. Madeleine, Research Paper 53.

Exchange Rate Policy and Economic Reform in Ethiopia, by Asmerom Kidane, Research Paper 54.

The Nigerian Foreign Exchange Market: Possibilities for Convergence in Exchange Rates, by P. Kassey Garba, Research Paper 55.

Mobilizing Domestic Resources for Economic Development in Nigeria: The Role of the Capital Market, by Fidelis O. Ogwumike and Davidson A. Omole, Research Paper 56.

Policy Modelling in Agriculture: Testing the Response of Agriculture to Adjustment Policies in Nigeria, by Mike Kwanashie, Abdul-Ganiyu Garba and Isaac Ajilima, Research Paper 57.

Price and Exchange Rate Dynamics in Kenya: An Empirical Investigation (1970−1993), by Njuguna S. Ndung'u, Research Paper 58.

Exchange Rate Policy and Inflation: The Case of Uganda, by Barbara Mbire, Research Paper 59.

Institutional, Traditional and Asset Pricing Characteristics of African Emerging Capital Markets, by Ino L. Inanga and Chidozie Emenuga, Research Paper 60.

Foreign Aid and Economic Performance in Tanzania, by Timothy S. Nyoni, Research Paper 61.

Public Spending, Taxation and Deficits: What Is the Tanzanian Evidence? by Nehemiah Osoro, Research Paper 62.

Adjustment Programmes and Agricultural Incentives in Sudan: A Comparative Study, by Nasredin A. Hag Elamin and Elsheikh M. El Mak, Research Paper 63.

Intra-industry Trade between Members of the PTA/COMESA Regional Trading Arrangement, by Flora Mndeme Musonda, Research Paper 64.

Fiscal Operations, Money Supply and Inflation in Tanzania, by A.A.L. Kilindo, Research Paper 65.

Growth and Foreign Debt: The Ugandan Experience, by Barbara Mbire, Research Paper 66.

Productivity of the Nigerian Tax System: 1970–1990, by Ademola Ariyo, Research Paper 67.

Potentials for Diversifying Nigeria's Non-Oil Exports to Non-Traditional Markets, by A. Osuntogun, C.C. Edordu and B.O. Oramah, Research Paper 68.

Empirical Studies of Nigeria's Foreign Exchange Parallel Market II: Speculative Efficiency and Noisy Trading, by Melvin Ayogu, Research Paper 69.

Effects of Budget Deficits on the Current Account Balance in Nigeria: A Simulation Exercise, by Festus O. Egwaikhide, Research Paper 70.

Bank Performance and Supervision in Nigeria: Analysing the Transition to a Deregulated Economy, by O.O. Sobodu and P.O. Akiode, Research Paper 71.

Financial Sector Reforms and Interest Rate Liberalization: The Kenya Experience, by R.W. Ngugi and J.W. Kabubo, Research Paper 72.

Local Government Fiscal Operations in Nigeria, by Akpan H. Ekpo and John E.U. Ndebbio, Research Paper 73.

Tax Reform and Revenue Productivity in Ghana, by Newman Kwadwo Kusi, Research Paper 74.

Fiscal and Monetary Burden of Tanzania's Corporate Bodies: The Case of Public Enterprises, by H.P.B. Moshi, Research Paper 75.

Analysis of Factors Affecting the Development of an Emerging Capital Market: The Case of the Ghana Stock Market, by Kofi A. Osei, Research Paper 76.

Ghana: Monetary Targeting and Economic Development, by Cletus K. Dordunoo and Alex Donkor, Research Paper 77.

The Nigerian Economy: Response of Agriculture to Adjustment Policies, by Mike Kwanashie, Isaac Ajilima and Abdul-Ganiyu Garba, Research Paper 78.

Agricultural Credit under Economic Liberalization and Islamization in Sudan, by Adam B. Elhiraika and Sayed A. Ahmed, Research Paper 79.

Study of Data Collection Procedures, by Ademola Ariyo and Adebisi Adeniran, Research Paper 80.

Tax Reform and Tax Yield in Malawi, by C. Chipeta, Research Paper 81.

Real Exchange Rate Movements and Export Growth: Nigeria, 1960–1990, by Oluremi Ogun, Research Paper 82.

Macroeconomic Implications of Demographic Changes in Kenya, by Gabriel N. Kirori and Jamshed Ali, Research Paper 83.

An Empirical Evaluation of Trade Potential in the Economic Community of West African States, by E. Olawale Ogunkola, Research Paper 84.

Cameroon's Fiscal Policy and Economic Growth, by Aloysius Ajab Amin, Research Paper 85.

Economic Liberalization and Privatization of Agricultural Marketing and Input Supply in Tanzania: A Case Study of Cashewnuts, by Ngila Mwase, Research Paper 86.

Price, Exchange Rate Volatility and Nigeria's Agricultural Trade Flows: A Dynamic Analysis, by A.A. Adubi and F. Okunmadewa, Research Paper 87.

The Impact of Interest Rate Liberalization on the Corporate Financing Strategies of Quoted Companies in Nigeria, by Davidson A. Omole and Gabriel O. Falokun, Research Paper 88.

The Impact of Government Policy on Macroeconomic Variables, by H.P.B. Moshi and A.A.L. Kilindo, Research Paper 89.

External Debt and Economic Growth in Sub-Saharan African Countries: An Econometric Study, by Milton A. Iyoha, Research Paper 90.

Determinants of Imports in Nigeria: A Dynamic Specification, by Festus O. Egwaikhide, Research Paper 91.

Macroeconomic Effects of VAT in Nigeria: A Computable General Equilibrium Analysis, by D. Olu Ajakaiye, Research Paper 92.

Exchange Rate Policy and Price Determination in Botswana, by Jacob K. Atta, Keith R. Jefferis, Ita Mannathoko and Pelani Siwawa-Ndai, Research Paper 93.

Monetary and Exchange Rate Policy in Kenya, by Njuguna S. Ndung'u, Research Paper 94.

Health Seeking Behaviour in the Reform Process for Rural Households: The Case of Mwea Division, Kirinyaga District, Kenya, by Rose Ngugi, Research Paper 95.

Trade and Exchange Policy Options for the CFA Countries: Simulations with a CGE Model for Cameroon, by Dominique Njinkeu and Ernest Bamou, Research Paper 96.

Trade Liberalization and Economic Performance of Cameroon and Gabon, by Ernest Bamou, Research Paper 97.

Quality Jobs or Mass Employment, by Kwabia Boateng, Research Paper 98.

Real Exchange Rate Price and Agricultural Supply Response in Ethiopia: The Case of Perennial Crops, by Asmerom Kidane, Research Paper 99.

Determinants of Private Investment Behaviour in Ghana, by Yaw Asante, Research Paper 100.

An Analysis of the Implementation and Stability of Nigerian Agricultural Policies, 1970–1993, by P. Kassey Garba, Research Paper 101.

Poverty, Growth and Inequality in Nigeria: A Case Study, by Ben E. Aigbokhan, Research Paper 102.

Effect of Export Earnings Fluctuations on Capital Formation, by Godwin Akpokodje, Research Paper 103.

Nigeria: Towards an Optimal Macroeconomic Management of Public Capital, by Melvin D. Ayogu, Research Paper 104.

International Stock Market Linkages in South Africa, by K.R. Jefferis, C.C. Okeahalam and T.T. Matome, Research Paper 105.

An Empirical Analysis of Interest Rate Spread in Kenya, by Rose W. Ngugi, Research Paper 106.

The Parallel Foreign Exchange Market and Macroeconomic Perfromance in Ethiopia, by Derrese Degefa, Reseach Paper 107.

Market Structure, Liberalization and Performance in the Malawi Banking Industry, by Ephraim W. Chirwa, Research Paper 108.

Liberalization of the Foreign Exchange Market in Kenya and the Short-Term Capital Flows Problem, by Njuguna S. Ndung'u, Research Paper 109.

External Aid Inflows and the Real Exchange Rate in Ghana, by Harry A. Sackey, Research Paper 110.

Formal and Informal Intitutions' Lending Policies and Access to Credit by Small-Scale Enterprises in Kenya: An Empirical Assessment, by Rosemary Atieno, Research Paper 111.

Financial Sector Reform, Macroeconomic Instability and the Order of Economic Liberalization: The Evidence from Nigeria, by Sylvanus I. Ikhinda and Abayomi A. Alawode, Research Paper 112.

A Positive and Normative Analysis of Bank Supervision in Nigeria, by A. Soyibo, S.O. Alashi and M.K. Ahmad, Research Paper 145.

The Determinants of the Real Exchange Rate in Zambia, by Kombe O. Mungule, Research Paper 146.

An Evaluation of the Viability of a Single Monetary Zone in ECOWAS, by Olawale Ogunkola, Research Paper 147.

Analysis of the Cost of Infrastructure Failures in a Developing Economy: The Case of Electricity Sector in Nigeria, by Adeola Adenikinju, Research Paper 148.

Corporate Governance Mechanisms and Firm Financial Performance in Nigeria, by Ahmadu Sanda, Aminu S. Mikailu and Tukur Garba, Research Paper 149.

Female Labour Force Participation in Ghana: The Effects of Education, by Harry A. Sackey, Research Paper 150.

The Integration of Nigeria's Rural and Urban Foodstuffs Market, by Rosemary Okoh and P.C. Egbon, Research Paper 151.

Determinants of Technical Efficiency Differentials amongst Small- and Medium-Scale Farmers in Uganda: A Case of Tobacco Growers, by Marios Obwona, Research Paper 152.

Land Conservation in Kenya: The Role of Property Rights, by Jane Kabubo-Mariara, Research Paper 153.

Technical Efficiency Differentials in Rice Production Technologies in Nigeria, by Olorunfemi Ogundele, and Victor Okoruwa, Research Paper 154.

The Determinants of Health Care Demand in Uganda: The Case Study of Lira District, Northern Uganda, by Jonathan Odwee, Francis Okurut and Asaf Adebua, Research Paper 155.

Incidence and Determinants of Child Labour in Nigeria: Implications for Poverty Alleviation, by Benjamin C. Okpukpara and Ngozi Odurukwe, Research Paper 156.

Female Participation in the Labour Market: The Case of the Informal Sector in Kenya, by Rosemary Atieno, Research Paper 157.