

**REMITTANCES, POVERTY, INEQUALITY AND WELFARE:**

**EVIDENCE FROM THE CENTRAL PLATEAU OF BURKINA FASO\***

## ABSTRACT

*This paper applies Gini and concentration coefficient decomposition as well as the Foster-Greer-Thorbecke poverty index and the Stark-Yitzhaki welfare index to new data from four villages in Burkina Faso to compare the marginal effects of remittances from intercontinental and intra-African migration on inequality, poverty, and social welfare. I find evidence that intra-African remittances reduce inequality while intercontinental remittances have the opposite effect. I also find that although remittances from intercontinental migration are associated with much lower incidence, depth, and severity of poverty, the marginal impact of remittances from this form of migration on social welfare is limited because recipients do not include the rural poor.*

## 1. INTRODUCTION

Migration has been identified as a pathway out of poverty for rural households in developing countries because it provides households with a source of income uncorrelated with agricultural income and reduces consumption pressure (World Bank, 2007). However, the beneficiaries of migration may not include the rural poor. It has been suggested that more risky and costly long-distance international migration, which is also the most lucrative in terms of remittances, is most accessible, at least initially, to the wealthiest of the rural population (Lipton, 1980; Stark *et al.*, 1986; Taylor *et al.*, 2005). If this hypothesis is correct, the presence of a long-distance migrant in a particular household may well be associated with a lower level of poverty in that household, but also with greater inter household income inequality when compared with non-migrant and intra-African migrant households.

The relationship between migrant remittances and income inequality in developing countries has been the focus of considerable economic research, and linkages between migration, remittances, and poverty—long ignored in the development economics literature—have recently been explored. However, until now not much has been written on Africa (notable exceptions include Azam and Gubert [2006], Wouterse and Taylor [2008], and Mesnard [2004]), and findings concerning the relationship between migrant remittances, inequality, and poverty have often been contradictory. Contradictory findings are partly due to a lack of differentiation between the various forms of migration. Although the different contributions to the sending economies made by migrants to destinations outside the African continent and migrants within the African continent are increasingly recognized, studies that address this distinction in their analyses of the relationship between migrant remittances, inequality, and poverty are rare in general, and virtually nonexistent for Sub-Saharan Africa.

Ambiguous results also arise due to differences in the economic question under investigation because remittances can be treated as a potential substitute for home earnings or as an exogenous transfer by migrants. When treated as a potential substitute for home earnings, estimates of the migrants' net contributions to household income take the full opportunity cost of migration into account, including the income migrants would have contributed to their households had they not migrated. In contrast, if remittances are treated as an exogenous transfer, this provides a direct measure of their contribution to the observed inter household income distribution, or poverty of a household but does not address the economic issue of what the migrants would be contributing at home had they not migrated. This study takes the latter approach and contributes to the debate by using Gini and concentration coefficient decomposition, as well as poverty and welfare indices and new data from Burkina Faso to explore how remittances on the margin affect observed poverty, inequality and social welfare.

The analysis is based upon unique new data collected by the author in a 2003 survey of 223 households in four villages situated on the Central Plateau of Burkina Faso. Burkina Faso, a country where conditions for agriculture are far from favourable, has a long history of migratory movement. In West Africa, the distinction between migration within a country and migration within the region is often blurred by a close cultural affinity between homogeneous peoples on opposite sides of national borders—which leads migrants to regard intraregional migration merely as an extension of internal movement (Adepoju, 2007). To allow for comparability of results, following Adams on Pakistan (1998), De la Briere *et al.* (2002) on the Dominican Republic; and Mora and Taylor (2006) on Mexico, when analyzing the impact of remittances I make a distinction between intercontinental migration and migration within the African continent.

I test separately the marginal effect of remittances from intra-African and intercontinental migration on poverty, inter household inequality, and welfare using Gini and concentration coefficient decomposition, the Foster-Greer-Thorbecke poverty index, and the Stark-Yitzhaki welfare index. Results show that remittances from intercontinental migration are associated with higher village income inequality, while the opposite holds for remittances from intra-African migration. Intercontinental remittances are associated with much lower incidence, depth, and severity of poverty. However, the lack of diffusion of intercontinental migration among poorer households limits its potential for poverty reduction and welfare improvement.

I begin by presenting, in Part 2, a discussion of empirical work on the relationship between remittances, inequality, and poverty, including the diffusion hypothesis, which may partly explain the negative association between intercontinental migration and poverty encountered in the literature. Part 3 describes the study area and data. Part 4 presents the methodology, including the Gini and concentration coefficient decomposition, poverty measures, and social welfare function used to explore the relationship between remittances from intra-African and intercontinental migration and inequality, poverty and welfare. It provides the conceptual basis for the empirical analysis. Part 5 reports findings on how remittances on the margin affect inequality, poverty and welfare. I conclude in Part 6 by discussing some of the implications of the findings for understanding the influence of migrant remittances on income inequality, poverty and welfare in source areas.

## **2. RESEARCH ON REMITTANCES, INEQUALITY, AND POVERTY**

The interactions between migrant remittances, poverty, and changes in the income distribution are of primary interest to researchers and policymakers, and have been well studied in the past (e.g., Lipton [1980]; Stark *et al.* [1986]; and De Haan [1999]). In an analysis confined to internal migration, Oberai and Singh (1980) compared Gini coefficients with and without migrant remittances and found for the Indian Punjab that urban-to-rural remittances widened the gap between rich and poor in the rural areas. For Kenya, Knowles and Anker (1981) found that urban-to-rural remittances had very little effect on the overall distribution of income. Taking into account the opportunity cost of migration and explicitly incorporating international migration, Adams (1991) finds, after constructing a counterfactual income scenario of no migration, that international remittances reduced the number of poor households by 9.8 per cent in rural Egypt but had a negative impact on the income distribution. For Burkina Faso, Lachaud (1999), treating remittance income as a potential substitute for home earnings, demonstrated that the percentage of the population living below the poverty line was reduced by 7.2 per cent in rural households as a result of international remittances from Côte d'Ivoire. Barham and Boucher (1998) extend Adams' econometric model to control for the (individual or household) selection problem involved in the original migration decision. They find for Nicaragua that migration and remittances increased income inequality when compared with the no-migration counterfactual, but did not distinguish between internal migration and migration abroad.

The methodology of the construction of a counterfactual no migration income enables researchers to address an interesting economic question regarding remittances and inequality by

comparing income distributions in a community with and without migration and remittances. However, Barham and Boucher's methodology poses a number of challenges. An important challenge is in the econometrics of devising representative income imputations for the counterfactual and in constructing representative income distributions. In addition, it relies on the availability of suitable instruments to address self-selection of household members in a migration regime. When remittances are considered as an exogenous transfer, econometric estimations are not required and endogeneity issues do not arise unless the analysis of poverty, inequality and welfare attempts to incorporate the indirect effects of remittances. Although migrants' net remittances are likely not to represent the full effect of migration on village income inequalities, they do constitute the most important direct impact of migration, are relatively easily measured, and are a logical and useful starting point for understanding the distributional consequences of migration for migrant sending areas (Stark *et al.*, 1988).<sup>1</sup>

When remittances are considered as an exogenous transfer, the related analysis yields important insights into the comparative impacts on poverty, inequality and welfare of a marginal change in the level of remittances sent by internal versus international migrants. Taylor *et al.* (2005), for example find for Mexico that where international migration prevalence is low, remittances from migrants abroad slightly increase rural income inequalities while remittances from internal migrants are income equalizers. International migrant remittances were found to reduce rural poverty, by a greater amount than internal remittances. The findings of Taylor *et al.* (2005) lend support to the diffusion hypothesis, which postulates that expansion of migration eventually makes the effect of remittances on rural incomes more equitable (or at least, less inequitable).

Different migrant destinations must also be distinguished when studying the impact of remittances in West Africa: intercontinental migration to Europe and internal migration within the African continent. Migration to distant labour markets generates large amounts of remittances but usually entails high costs, particularly in the form of transport, and risks associated with border crossing, often attempted without documents. Intra-African migration is less costly but generates comparatively few remittances. Given the higher costs and risks, migration to intercontinental destinations is likely to involve, at least initially, households at the upper middle or top of the sending area's income distribution. If only relatively wealthy households are able to engage in migration, remittance income from these migrants would accrue to the already better-off and would increase income inequality in the source area. If richer households gain both absolutely and relatively more from migration and remittances than do poorer households, then, despite sizable remittances, the role of remittances from intercontinental migration in poverty alleviation and welfare improvements may be limited.

### **3. DATA**

Data used to test the marginal effect of intra-African and intercontinental remittances on interhousehold inequality and poverty are from a household survey conducted in four villages in Burkina Faso in February and March 2003. The four villages are situated on the Central Plateau—Niaogho and Béguédo in the south and Boussouma and Korsimoro in the north. The Central Plateau constitutes the central region of Burkina Faso, where the intensity of soil use is high compared with other regions. High population density is said to have led to a saturation of

space in this region, and lands on the Central Plateau are generally overexploited and degraded (Brasselle *et al.*, 2002; Breusers, 2001; Reyna, 1987).

The four villages were purposively selected according to several criteria. A first consideration was their difference in accessibility. Boussouma and Korsimoro are situated on the main road from the capital of Burkina Faso (Ouagadougou) to the north. Niaogho and Béguédo are isolated and can only be reached by a 3-hour journey on a dirt road. A second selection criterion for Niaogho and Béguédo was the prominence of intercontinental migration (primarily to Italy) by people from these villages. Cross-section data on socio-demographic characteristics and production and consumption activities were gathered from a random sample of about 60 households in each of the four villages.<sup>2</sup> Households were selected as randomly as possible in the absence of any pre-existing census maps. After mapping a village, each enumerator was sent out in a different direction to select households at an equal distance from one another, ensuring that all peripheral areas were covered.

Farm households in the four villages can generally be described as extended, as, in a polygamous setting, they often comprise not only the household head and his wives, but also their grown sons along with their wives and children. Family members were included in the extended household definition on the basis of living in the same compound and normally eating meals together.

Agriculture (staple cropping, cash cropping, and livestock) is the primary activity of the households. Cropping is characterized by a single short cropping season per year. Labour productivity tends to be low. There is a general lack of irrigation, rainfall is low, and soils are generally poor (Kessler and Geerling, 1994). The consequence of engaging in rainfed agriculture in a drought-prone environment is that households face substantial risk. Formal crop insurance is

not available to mitigate this risk in the West African Semi-Arid Tropics (WASAT). The lack of such insurance is thought to be due to the high spatial covariance of rainfall shocks and to moral hazard problems associated with crop insurance in general (Reardon *et al.*, 1992).

The lack of collateral is compounded by the absence of a land market. In rural Africa, land markets often barely function and are generally quite thin (Lanjouw *et al.*, 2001). In Burkina Faso, commercial land market transactions were found to be extremely rare (Ouedraogo *et al.*, 1996). Udry (1999), using a four-year panel study (ICRISAT) of households in three different agroclimatic zones of Burkina Faso, found evidence for a missing land market when testing for profit maximization in agriculture. In the study villages, where high population density has led to land scarcity (Kessler and Geerling, 1994), not a single land transaction was recorded in the data. The lack of commercial land market transactions implies that land cannot function as collateral for credit.

Uncertainty combined with a lack of markets for risk creates incentives to diversify income-generating activities. Diversification of activities enables a household to reduce the risk it faces by generating income from sources not correlated with cropping income. Specific characteristics of the WASAT include a scarcity of low-barrier-to-entry labour-intensive jobs due to an underdeveloped farm labour market and predominantly traditional production technologies using family inputs (Reardon and Taylor, 1996). Households in the study area diversify their income by engaging in migration, livestock production, and nonfarm activities. Poor WASAT households appear to face important entry barriers to capital-intensive subsectors (Reardon and Taylor, 1996). If, as is widely believed, risk aversion decreases with income and wealth, then the poor will display a greater demand for diversification, other things being equal (Barrett *et al.*,

2001). However, if diversification is costly (i.e., has high entry barriers) and initially risky, wealthy households are likely to be in a better position to diversify into noncrop activities.

In agrarian societies, the major form of wealth is land. In the absence of a land market, landholdings are a more suitable indicator than income for assessing the ability of households to diversify. Table 1 shows income composition and participation across landholding quintiles. Consistent with agricultural household theory (e.g., Singh *et al.* [1986]), net income from each household production activity was calculated as total revenue minus the costs of purchased inputs. For crop production this includes the value of subsistence output, using the average local price received by sellers of the crop. The livestock income calculation takes into account the net change in value of herds as well as the sale of animal products.

*Table 1 Income composition and activity-participation across landholding quintiles (2002)*

<i>Quintile</i>	<i>Income per capita (FCFA)<sup>a</sup></i>	<i>Staple cropping</i>	<i>Cash cropping</i>	<i>Live-stock</i>	<i>Non-farm activities</i>	<i>Remittances intra-African</i>	<i>Remittances intercontinental</i>
Lowest	35,387	49 (100) <sup>b</sup>	8 (53)	6 (36)	31 (62)	6 (51)	0 (0)
Second	46,527	52 (100)	9 (56)	4 (51)	22 (71)	8 (56)	6 (13)
Third	41,492	56 (100)	12 (68)	7 (64)	18 (64)	4 (50)	4 (14)
Fourth	52,084	51 (100)	10 (64)	7 (53)	16 (53)	7 (47)	10 (20)
Highest	66,337	53 (100)	10 (75)	6 (75)	17 (68)	2 (48)	12 (25)

Source: Author's survey

Notes: Migrants are not included as household members.

<sup>a</sup> 168 FCFA=\$1 (PPP 2002) (World Bank, 2005)

<sup>b</sup> The figures in parentheses are the percentage of households in the income quintile that participated in the respective activity.

In all four villages household members were found to engage in migration; around 64 per cent of

households that were interviewed had one or more migrant during 2002. Adult household members were classified as migrants if they had been absent from the household for a period of more than a month during the year. Migrants were included as household members if they were included by the head of the household in the household inventory. Migrants were found to be male in almost all cases.<sup>3</sup> Seasonal migration was found to be rare and household members who had migrated generally stayed away for more than one year. Information on migrants who were away at the time of the survey was supplied by the head of the household.

Population movements in Burkina Faso date back several centuries, but large-scale migration finds its origin in colonial times. During this period large numbers of rural Burkinabe migrated to work on plantations and in mines in Ghana, Nigeria, Côte d'Ivoire, and other countries as a means to pay taxes imposed by the colonial government (Adepoju, 1977; Arthur, 1991; Cordell *et al.*, 1996). Intercontinental migration, in particular to Western Europe, has become more important for Africans in recent decades (Adepoju, 1977; Arthur, 1991; Findley, 1997; Yusuf, 2003). Within Burkina Faso, rural out-migration has contributed to the urbanization process (Cordell *et al.*, 1996). From the Central Plateau of Burkina Faso, migration primarily by the Mossi ethnicity to unexploited lands in the south and west has taken place since the 1960s. This form of migration accelerated after the droughts of 1968–73 and 1983–84 (Laurent *et al.*, 1994).

The village surveys reveal two principal types of migrant destination: intra-African and intercontinental to Europe. Households from all four villages engage in intra-African migration. Households in Niaogho and Béguédo also participate in migration to Europe. Selected characteristics of households and migrants are given in Table 2. Intra-African migrants are

generally young men with very little formal education who attempt to find work elsewhere on the African continent and stay away for prolonged periods of time, about 8 years on average. Almost all intra-African migrants to a destination outside Burkina Faso had left prior to 2003 to find work in Côte d'Ivoire, sometimes using Ouagadougou, the capital of Burkina Faso as a stepping-stone. However, due to the unstable political situation, ethnic tensions, and antiforeigner sentiment there, the migrant flow to Côte d'Ivoire has now all but ceased. Intra-African migration that had taken place after 2003 was found to be mainly national and directed towards the capital. Long-distance international migration to Europe from Niaogho and Béguédo is in nearly all cases comprised of young males of the Bissa ethnicity who leave for Italy, initially to engage in horticulture around Naples.<sup>4</sup> Intercontinental migrants are older than intra-African migrants but still have very little formal education, averaging less than three years. Duration of absence of intercontinental migrants is much shorter than for intra-African migrants suggesting that migrants have left relatively recently. The average number of migrants per migrant household is similar for intra-African and intercontinental migrant households, 1.58 and 1.68 respectively. Intercontinental migration is highly lucrative in terms of remittances sent back to the household; an intercontinental migrant remits 262,363 FCFA (US \$ 1562 (PPP2002)) on average, which is about 10 times as much as remittances of an intra-African migrant. However, intercontinental migration involves high entry costs, particularly for transportation.<sup>5</sup>

*Table 2 Selected household and migrant characteristics*

<b><i>Household averages</i></b>	
Household size	7.89 (4.45) <sup>a</sup>
Share of households with at least 1 intercontinental migrant (%)	14 (35)
Number of intercontinental migrants per intercontinental migrant household	1.68 (1.09)
Share of intercontinental remittances in total household income (%)	0.06 (0.13)
Share of households with at least 1 intra-African migrant (%)	50 (0.35)
Number of intra-African migrants per intra-African migrant household	1.58 (1.39)
Share of intra-African remittances in total household income (%)	0.06 (0.18)
<b><i>Intercontinental migrant averages</i></b>	
Years of absence	2.33 (3.85)
Age	35.21 (8.25)
Years of completed schooling	2.63 (3.87)
Remittances (FCFA) <sup>b</sup>	262,363 (337,402)
<b><i>Intra-African migrant averages</i></b>	
Years of absence	8.42 (10.83)
Age	30.92 (7.91)
Years of completed schooling	2.25 (3.63)
Remittances (FCFA)	30,351 (71,731)

Notes: <sup>a</sup> standard deviation in parentheses

<sup>b</sup>168 FCFA=\$1 (PPP 2002) (World Bank, 2005)

Migration, by providing households with a source of income that is uncorrelated with agriculture, can facilitate investments in other activities. However, migration itself represents a diversification strategy with costs and risks that are greater for intercontinental migration. Because of this, it is likely that only comparatively wealthy households, at least initially, are able to engage in this form of migration. Table 1 shows that household participation in intra-African migration tails off towards the higher end of the land distribution although differences are small, whereas intercontinental migration is most common among households in the upper land quintiles.

Households in the four villages can be grouped on the basis of their migration status: non-migrant, intra-African migrant, and intercontinental migrant.<sup>6,7</sup> An overview of the endogenous income and participation variables by household migration status (non-migrant, intra-African, and intercontinental) is given in Table 3.

*Table 3 Income per capita from different activities by household migration status (2002)*

<i>Mean net income (FCFA)<sup>a</sup> and activity participation<sup>b</sup></i>			
	<i>Nonmigrant (N=79)</i>	<i>Intra-African (N=112)</i>	<i>Intercontinental (N=32)</i>
Total income	42,621	47,060	67,803
Staple cropping	24,420 (100)	26,219 (100)	22,168 (100)
Cash cropping	4,940 (66)	4,604 (64)	6,031 (88)
Livestock	2,710 (37)	2,327 (57)	4,313 (97)
Nonfarm activities	10,551 (61)	9,024 (72)	7,779 (41)
Remittances	~	4,886	27,512

Notes: Migrants are not included as household members.

<sup>a</sup> 168 FCFA=\$1 (PPP 2002) (World Bank, 2005)

<sup>b</sup> The figures in parentheses are the percentage of households in the income quintile that participated in the respective activity.

The three household groups display differences in both per capita income and activity mixes. Remittance income of households with intercontinental migrants is about six times that of intra-African migrant households. Almost all households with intercontinental migration own livestock, but participation in livestock production is much lower for households without migrants and those with intra-African migrants. Participation rates in nonfarm activities are lower among households with intercontinental migrants than among the other two groups. Nonfarm activities tend to be self-employment activities such as food preparation and sales for women and artisan activities for men. Most nonfarm activities are intensive in labour but not in

capital, although a small number of households was found to engage in high-return commercial activities. A missing market for labour implies that these labour intensive activities may compete with long-term migration for scarce household time.

#### 4. METHODOLOGY

Four types of analyses will be carried out to shed light on the relationship between remittances from intra-African and intercontinental migration and income inequality, poverty and welfare. I first use income data to construct a Gini and concentration coefficient decomposition. A modification of the Foster-Greer-Thorbecke (1984) poverty index is then used to analyze the poverty implications of remittances. I follow Taylor *et al.*, (2005) and others in their analysis of migration and poverty in Mexican rural households and take into account the incidence, depth, and severity of poverty. Finally, I use the Stark-Yitzhaki welfare index to assess the relationship between migration and social welfare.

##### **Remittances and Inequality**

To explore the impact of remittances from intra-African and intercontinental migration on rural income inequality, we need to select an inequality index. Although various indices exist, the Gini is probably the most intuitive and allows for decomposition by income source (Taylor *et al.*, 2005). If we let  $y = (y_1, \dots, y_I)$  represent  $I$  components of household income, and if we define

total income as  $Y = \sum_{i=1}^I y_i$ , we can write the extended Gini coefficient for village incomes as a

function of the covariance between income and its cumulative distribution:

$$G_Y = \frac{2 \text{cov}[Y, F(Y)]}{\bar{Y}} \quad (1)$$

where  $\bar{Y}$  is the mean of total income  $Y$  and  $F(Y)$  is the cumulative distribution of total incomes in the village. If we utilize the properties of covariance, we can write equation (1) as

$$G_Y = \frac{2 \sum_{i=1}^I \text{cov}[y_i, F(Y)]}{\bar{Y}} = \sum_{i=1}^I R_i G_i S_i \quad (2)$$

In equation (2),  $S_i$  is the share of income from source  $i$  in total income,  $S_i = \bar{y}_i / \bar{Y}$  and  $R_i$  is the Gini correlation of income from source  $i$  with the distribution of total income, and  $G_i$  is the Gini index corresponding to the distribution of income from source  $i$ .<sup>8</sup>

$$R_i = \frac{\text{cov}[y_i, F(Y)]}{\text{cov}[y_i, F(Y_i)]} \quad (3)$$

Equation (2) enables us to decompose the role of remittances in inequality into three terms: first, the magnitude of remittances relative to total income; second, the inequality of remittances; and third, the correlation of remittances with total income (Stark *et al.*, 1986). We can then calculate the effect of a small percentage change in any one component on the Gini of total income.

Taking household labour and production decisions as given, if we increase an income source  $j$  by a factor  $e$  such that  $y_j(e) = (1 + e)y_j$ , the marginal effect on the Gini of total income is

$$\frac{\partial G_Y}{\partial e} = S_j (R_j G_j - G_Y) \quad (4)$$

where  $S_j$ ,  $R_j$ ,  $G_j$  and  $G_Y$  are measured prior to the marginal income change, and the relative effect is given by

$$\frac{\partial G_Y / \partial e}{G_Y} = \frac{S_j G_j R_j}{G_Y} - S_j \quad (5)$$

If remittances play a role in village income, then if  $R_j$ , the Gini correlation between remittances and total income, is negative or zero, an increase in remittances would decrease inequality; if

$R_j$ , however, is positive, then the impact of an increase in remittances on inequality depends on the sign of  $R_j G_j - G_Y$ . Inequality will increase if the inequality of remittances exceeds the inequality of total household income:  $G_j > G_Y$  (Stark *et al.*, 1986).

The Gini coefficient decomposition is useful for examining the effects of different sources of income on overall income inequality. However, it cannot be used to examine whether income from different sources can affect income inequality arising from differences in landholdings (Leones and Feldman, 1998). For example, if remittance income contributes to greater overall income inequality, and intercontinental migration is prominent among already wealthy households, intercontinental migration may thus further inequality that arises between households because of differences in landholdings. The concentration coefficient for income source  $i$  may be written as:

$$C_i = 1 - 2 \int_0^{\infty} F_1[g(Y)] f(Y) dY \quad (6)$$

where  $Y$  is income, as defined before,  $F_1[g(Y)]$  is the cumulative distribution function for function  $g(Y)$ , which is a continuous function of  $Y$  and everywhere greater or equal to zero and for which a first derivative exists (Kakwani, 1977). An alternative formulation for the concentration coefficients is given by:

$$C_i = 1 - 0.1(19q_1 + 17q_2 + 15q_3 + 13q_4 + 11q_5 + 9q_6 + 7q_7 + 5q_8 + 3q_9 + 1q_{10}) \quad (7)$$

where the  $q_i$  are the shares of income for each source that accrue to each decile. Deciles may be based on household rankings by, for example, income or landholding. The concentration coefficient for total income is the sum of the concentration coefficient for each income source

times its share of total income or  $C_Y = \sum_i (S_i C_i)$ , where  $S_i$  represents the share of income source  $i$  in total income. Taking household labour and production decisions as given, we can assess the impact of an exogenous change in each household's income component  $j$  by a factor of  $e$ , such that  $y_j(e) = (1 + e)y_j$ . The concentration elasticity may be calculated as:

$$\frac{\partial C_Y / \partial e}{C_Y} = \left[ \frac{S_j C_j}{C_Y} \right] - S_j \quad (8)$$

### Remittances and Poverty

To analyze the poverty implications of remittances, a modification of the Foster-Greer-Thorbecke (FGT) poverty index can be used. If we let  $y = (y_1, y_2, \dots, y_K)$  represent household income in increasing order and  $z > 0$  denote the predetermined poverty line, the FGT poverty measure is defined by:

$$P(y; z) = \frac{1}{nz^\alpha} \sum_{k=1}^q g_k^\alpha \quad (9)$$

where  $n$  is the total number of households,  $q = q(y; z)$  is the number of poor households,

$g_k = z - y_k$  is the income shortfall (the gap between the household's income and the poverty

line) of the  $k$ -th (poor) household, and  $\alpha$  is a parameter. This index satisfies the two axioms

formulated by Sen (1976; 1979) for poverty measures and confirms (1) that a reduction in the

income of a poor household, *ceteris paribus*, increases the poverty measure (monotonicity); and

(2) that a pure transfer of income away from a poor household increases the poverty measure (the transfer axiom).

Three variants of the FGT poverty index are used to estimate the impacts of changes in migration on rural poverty: the head-count measure  $\alpha = 0$ ,  $P_H(y; z) = \frac{q}{n}$  measures the incidence of changes in migration on rural poverty (i.e., the share of the population living below the poverty line); the poverty gap  $\alpha = 1$ ,  $P_G(y; z) = \frac{1}{nz} \sum_{k=1}^q z - y_k$  measures the depth of poverty, or how far below the poverty line the average poor household's income falls; and finally, the squared poverty gap  $\alpha = 2$ ,  $P_{SG}(y; z) = \frac{1}{nz^2} \sum_{k=1}^q (z - y_k)^2$  measures the severity of poverty and is sensitive to changes in the distribution of income among the poor (Taylor *et al.*, 2005).

### Remittances and Social Welfare

Changes in inequality do not have unambiguous implications with regard to social welfare. To assess the relationship between migrant remittances and social welfare, we use a social welfare function invoking direct welfare judgment as proposed by Stark and Yitzhaki (1982).

$$W = \bar{Y}(1 - G_Y) \quad (10)$$

where  $\bar{Y}$  is mean village income, as defined before. Using this measure of social welfare, we can assess the impact of a small percentage change in income from source  $j$  on village welfare by a factor of  $e$ , such that  $y_j(e) = (1 + e)y_j$ , that is

$$\frac{\partial W / \partial e}{\partial e} = \frac{(\partial \bar{Y} / \partial e)(1 - G_Y) - \bar{Y} \partial G_Y}{\partial e} \quad (11)$$

The derivative of mean income with respect to  $e$  is given by  $\bar{Y}_j$ , the mean income from source  $j$ . The derivative of  $G_Y$  is given by equation (4). If we substitute these two derivatives into (11) and rearrange, we obtain the following expression:

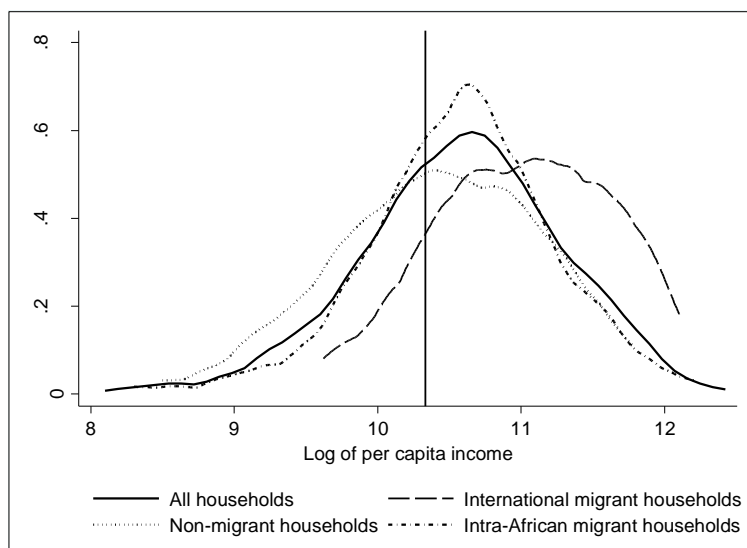
$$\frac{\partial W}{\partial e} = \bar{Y}_j(1 - R_j G_j) \quad (12)$$

Where  $R_j$  is the Gini correlation of income from source  $j$  with total income and  $G_j$  is the Gini index of income source  $j$ . Equation (12) states that the effect of a small change in an income source on welfare depends on an income effect given by  $\bar{Y}_j$ , which is always positive and a distributional effect  $\bar{Y}_j R_j G_j$ , the sign of which depends on the effect of income from source  $j$  on inequality (Stark *et al.*, 1986).

## 5. FINDINGS

When we are interested in issues of poverty and distribution, income averages such as those in Table 3 conceal as much as they reveal. If it is true that remittances from intercontinental migration accrue to the already better-off households, while poor households produce very few intercontinental migrants, then the direct effects of these remittances might well be to worsen the distribution of real income. Figure 1 shows the estimated density functions of the logarithm of household per capita income for the different migration regimes as well as for all households.

*Figure 1 Kernel density estimates of household income*



Notes: kernel = epanechnikov, bandwidth = .2

In Figure 1 the density function for intra-African migrant households is similar to the general density function. However, the distribution for intercontinental migrant households is shifted

toward the right, reflecting higher incomes for these households. In contrast, the function for non-migrant households is shifted toward the left, reflecting lower incomes. For non-migrant households, almost half of the function lies to the left of the \$0.50/day ultra-poverty line (vertical line in figure), implying that almost half of non-migrant households live in absolute poverty (Ahmed *et al.*, 2007).<sup>9</sup> Among intercontinental migrant households, ultra-poverty is much less prevalent than among households in the other groups. It should also be noted that distributions of intercontinental and non-migrant households are more dispersed compared to the other distributions.

The Gini decomposition in Table 4 reveals interesting differences between remittances from intra-African and intercontinental migration and inequality.

*Table 4 Gini decompositions of income*

	<i>Income share</i>	<i>Gini coefficient for income source</i>	<i>Gini correlation with total income rank</i>	<i>Share in Gini of total income</i>	<i>% change in Gini coefficient</i>
Staple cropping	0.52	0.38	0.73	0.41	-0.11 (-0.20, -0.03) <sup>a</sup>
Cash cropping	0.10	0.69	0.42	0.08	-0.02 (-0.04, 0.01)
Livestock	0.06	0.88	0.64	0.09	0.04 (0.01, 0.06)
Nonfarm activities	0.20	0.68	0.60	0.23	0.03 (-0.01, 0.08)
Remittances (intra-African)	0.05	0.86	0.37	0.05	-0.01 (-0.02, 0.02)
Remittances (intercontinental)	0.08	0.94	0.57	0.10	0.04 (-0.01, 0.06)
Total income	1.00	0.35		1.00	0

Notes: <sup>a</sup> Bootstrapped percentile confidence intervals in parentheses

The source Gini is highest for intercontinental remittances compared to all other income sources. Although a high source Gini does not imply that an income source has an unequalizing effect on total-income inequality, as an income source may be distributed unequally favouring the poor (Taylor *et al.*, 2005), Table 4 also shows that remittances from intercontinental migration have a much larger share in total-income inequality compared to remittances from intra-African migration. The Gini correlation of remittances from intra-African migration is comparatively low, 0.37, indicating that intra-African migration remittances favour the poor more than any other income source does. The last column of Table 4 shows that remittances from intra-African migration have an equalizing effect on the distribution of total rural income. In contrast, a 1 per cent increase in intercontinental remittances increases income inequality, and more so than increases in any other income source.

Concentration coefficients are calculated by income source based on total income ranking, and on landholdings. Unlike the Gini coefficient, which is always positive, the concentration coefficient may be negative if the correlation between the ranking variable and income from a source is negative and large. Table 5 shows that the concentration coefficient elasticities based on income rank are very similar in magnitude and sign to the Gini coefficient elasticities. However, when households are ranked according to landholdings, concentration coefficients are very different. Coefficients for both nonfarm income and remittances from intra-African migration are now negative, indicating that the more land is available to the household, the less income it is likely to obtain from nonfarm activities and intra-African migration.

*Table 5 Decomposition of the concentration coefficient for income*

	<i>Income share</i>	<i>Concentration coefficient</i>		<i>Elasticities</i>	
		<i>Income</i>	<i>Land</i>	<i>Income</i>	<i>Land</i>
Total income	1.00	0.33	0.10	0	0
Staple cropping	0.52	0.27	0.11	-0.10	0.03
Cash cropping	0.10	0.29	0.14	-0.01	0.03
Livestock	0.06	0.55	0.15	0.04	0.02
Nonfarm activities	0.20	0.40	-0.02	0.04	-0.23
Remittances (intra-African)	0.05	0.33	-0.04	-0.01	-0.07
Remittances (intercontinental)	0.08	0.51	0.43	0.04	0.22

It should also be noted that although most coefficients are much smaller when incomes are ranked according to landholding, the coefficient for remittances from intercontinental migration changes only slightly and far exceeds all the others, indicating that the greater the landholdings of a household, the more income it is likely to obtain from intercontinental migration, bearing in mind that in the absence of a land market, migration cannot influence landholdings. Both nonfarm income and intra-African remittances reduce income inequality between households with different landholdings. An increase in remittances from intercontinental migration has a strong positive effect on income inequality.

The contrasting findings of the unequalizing versus the equalizing effect on household income of, respectively, intercontinental and intra-African remittances are similar to those of Taylor *et al.* for rural Mexico (2005) for areas with low prevalence of the former and high prevalence of

the latter. Long-distance intercontinental migration, which is risky and costly, involves so-called pioneer migrants from households at the upper middle or top of the sending area's income distribution so that remittances accrue to already wealthy households, widening income inequalities. Although the hypothesis cannot be tested here, it is possible that as access to migrant labour markets becomes diffused through the growth and elaboration of migrant networks, households at the middle or bottom of the income distribution could gain access to migrant labour markets, dampening or reversing the initial unequalizing effect of remittances.

In order to estimate the effects of a marginal change in remittances on poverty, a poverty line,  $z$ , is required. Although a national poverty line for Burkina Faso exists for the year in which the survey was held (82,672 FCFA), applying this line to the data would mean that 93 per cent of households would have to be considered poor. As the normal proportion of the population below the poverty line is around 50 per cent (International Monetary Fund, 2005), this poverty line does not appear appropriate here. In the absence of any other poverty lines emerging from the literature for Burkina Faso, I opted to use the poverty line for the ultra-poor, those living on less than \$0.50 a day.

*Table 6 Poverty measures*

	<i>Headcount ratio</i>	<i>Poverty gap</i>	<i>Squared poverty gap</i>
All households	0.3318 (0.03) <sup>a</sup>	0.1150 (0.01)	0.0560 (0.01)
Non-migrant households	0.4557 (0.06)	0.1686 (0.03)	0.0850 (0.02)
Intra-African migrant households	0.2946 (0.04)	0.0993 (0.02)	0.0479 (0.01)
Intercontinental migrant households	0.1563 (0.07)	0.0371 (0.02)	0.0134 (0.01)

Notes: <sup>a</sup>Robust standard errors in parentheses

Table 6 shows that households with intercontinental migrants are less poor by all three variants of the FGT poverty measure. Within the group of households with intercontinental migrants, less than a fifth are living below the poverty line, compared to about half and a third, respectively, for non-migrant and intra-African migrant households. The poverty gap is also smaller for households with intercontinental migrants; the average poor household's income falls only four per cent below the poverty line, compared to 10 and 17 per cent for, respectively, intra-African and non-migrant households. Finally, poverty is less severe for intercontinental migrant households. To test for the robustness of these poverty comparisons, I use stochastic dominance tests for the head-count index of poverty by plotting the cumulative distribution of income for the different migration regimes.

*Figure 2 Cumulative distribution function of household income*

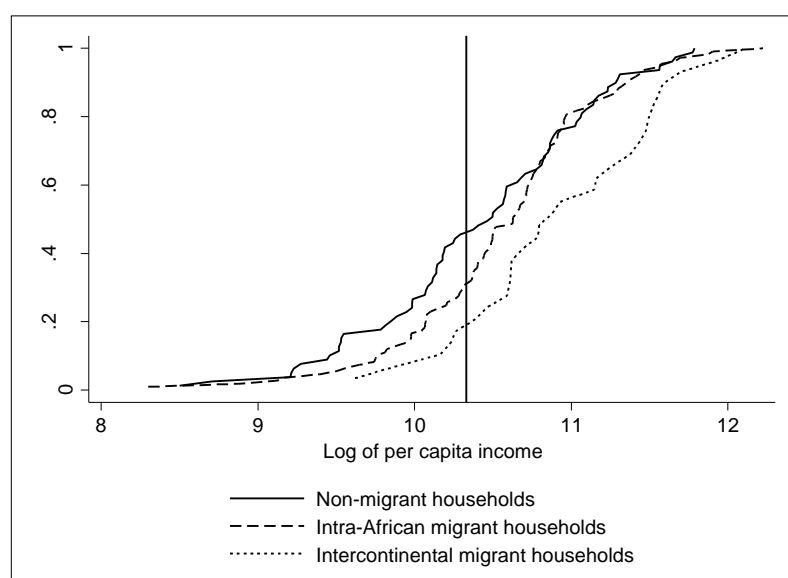


Figure 2 shows that the group ranking as given in Table 6 holds at the selected poverty line (vertical line in figure) and for the largest part of the income distribution. However, it should also be noted that had the poverty line selected been either much higher or much lower, the ranking of

non-migrant versus intra-African migrant households might have changed. Stochastic dominance of intercontinental migrant households holds across the entire income distribution.

Table 7 summarizes the net welfare changes for households corresponding to a one per cent increase in respective income sources.

*Table 7 Welfare effects of a 1 per cent increase in household income from respective sources*

	Percentage change in welfare index			
	All households	Non-migrant	Intra-African migrant	Intercontinental migrant
Staple cropping	0.58	0.67	0.56	0.34
Cash cropping	0.11	0.12	0.09	0.12
Livestock	0.04	0.03	0.04	0.05
Nonfarm activities	0.18	0.17	0.20	0.11
Remittances (internal)	0.05		0.10	
Remittances (international)	0.04			0.38

Welfare changes vary dramatically across income sources. Similar to the findings of Stark *et al.* for rural Mexico (1986), when all households are grouped together, the most dramatic improvement in welfare results from a marginal increase in non-remittance income, and in particular in staple cropping income. Welfare gains from a marginal increase in remittances from both intra-African and intercontinental migrants are small. As shown in Table 2, remittances from intercontinental migration are much larger than those from intra-African migration. The limited impact of an increase in remittances from intercontinental migration on village welfare can be attributed to the distributional effect, which weakens the income effect. When we group households according to their migration status, more interesting differences in welfare effects are

uncovered. In contrast to findings for the other groups, for intercontinental migrant households the strongest improvement in welfare comes from a marginal increase in remittance income. In addition, an increase in staple cropping income improves welfare much less dramatically compared to households in the other groups.

## **6. CONCLUSION**

The impact of remittances on inequality, poverty, and social welfare depends on migrant destination as well as on the diffusion of migration opportunities within a community. Using Gini decomposition, I find that a marginal increase in remittances from intra-African migration reduces inequality, whereas a marginal increase in remittances from the more costly and risky intercontinental migration has the opposite effect. The concentration coefficient decomposition reveals that remittances from intercontinental migration accrue to households with larger landholdings, whereas the opposite holds for remittances from intra-African migration.

Households with intercontinental migrants are found to be much less poor in terms of head-count, depth, and severity measures, suggesting that this form of migration in particular could play an important role in poverty reduction. However, the limited prevalence of intercontinental migration among poorer households negatively affects the capacity of related remittances to alleviate poverty. Results from social welfare analysis shows that welfare gains from an increase in intercontinental remittances are small due to the limited distributional effect. The distribution and poverty impacts of remittances from intercontinental migration thus appear dependent on the diffusion of migration opportunities.

In combination, the conclusions drawn on the basis of changes in poverty, inequality and welfare resulting from a marginal increase in remittances reveal that households participating in intercontinental migration strongly benefit from resulting remittances, but that beneficiaries do not include the rural poor resulting in increasing inter household inequality and limited improvements in social welfare. Results obtained here need to be qualified, however; limitations in the scope of this analysis do not allow for a more rigorous analysis of the impact of migration on incomes in source economies using for example a counterfactual income methodology to identify household income without remittances. A more broad analysis of the impacts of migration would require addressing the endogeneity issue that arises due to self-selection in the migration regimes by for example applying instrumental variable techniques. Although it has been suggested that lucrative migration opportunities will spread to poorer households over time, the availability of only cross-section data and insufficient variation of intercontinental migration prevalence across the four villages prevents us from testing this hypothesis at this point. Future research regarding the broader and longer-term impact of migration on rural households in developing countries would greatly benefit from longitudinal data.

## NOTES

1. Indirect effects of remittances have been demonstrated to exist, for example on other income sources of receiving households, such as farm income for a credit constrained household (Taylor, 1992). A study on the impact of migration on activity choices and incomes using the same data has been published elsewhere (Wouterse and Taylor, 2008).
2. The sample is slightly smaller for Béguédo, where 43 households were surveyed.
3. Women who left the household upon marriage were not considered as migrants.
4. According to in depth interviews with 20 migrants from Niaogho and Béguédo located in Italy, the migration movement to Italy started in the early 1980s in both villages when a couple of migrants from these villages, working in Côte d'Ivoire, were invited to Italy by their (Italian) employers. The movement gained momentum through a network of information dispersed along ethnic lines.
5. There are only a limited number of observations on the costs of migration. Households spent about 200,000 FCFA (West African Franc) per intercontinental migrant and between 3,000 and 7,000 FCFA per intra-African migrant (168 FCFA =US\$1) (PPP 2002) (World Bank, 2005). No significant difference was found to exist between costs of national and international migration to the neighboring Côte d'Ivoire.
6. Although a few households had both continental and intercontinental migrants, continental migration for these households had taken place in nearly all cases for educational purposes or had taken place to Côte d'Ivoire, preceding intercontinental migration. In addition, testing for equality of means for income and household characteristics does not reveal any significant differences between the few households with both types of migration and households with only intercontinental migrants. Bearing this and the limited number of observations in mind, households with both types of migrants were included in the group of intercontinental migrant households.
7. A migrant within Burkina Faso sent on average 21,414 FCFA during 2002; a migrant outside Burkina Faso (but within Africa) sent 37,469 FCFA during the same period ((168 FCFA=\$1) (PPP 2002) (World Bank, 2005)). A t-test reveals that remittances of these two groups of migrants do not differ significantly at the migrant or at the household level, supporting the merging of these forms of migration into one group.
8. Properties of the Gini correlation are discussed in, among others, Stark *et al.* (1988).
9. \$0.50=84 FCFA (PPP 2002) (World Bank, 2005)

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