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International Remittances and Income Inequality in Africa

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International Remittances and Income Inequality in Africa

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Abstract

This paper investigates the impact of migrant remittances on income inequality in African countries, using a panel of five eight-year non-overlapping windows for the period 1960-2006. The results suggest that, first, international migrant remittances have a significant positive impact on income inequality in African countries. After instrumenting for the possible endogeneity of remittances, a 10 percent increase in remittances as a percentage of GDP will lead, on average, to a 0.013 percent increase in income inequality in Africa. Second, initial per capita GDP strongly increases income inequality. Third, inflation rate appears to be the strongest factor fueling income inequality in the Continent. Fourth, education significantly reduces income inequality. Fifth, the North African dummy and remittances inflows to North Africa largely reduce income inequality in the sub-region while doing the opposite in Sub-Saharan Africa. The policy implications of these results are discussed.

JEL Classification: D31, D36, F24.

Key Words: International Remittances, Income Inequality, Africa.

I. INTRODUCTION

Substantial slowdown in the progress towards reducing income inequality in Africa is expected as a consequence of the global economic crisis. Indeed, the multiple crises of high food and energy prices first, and the most recent global economic crisis subsequently, have created significant setbacks. Lower government revenue and income per capita will also lead to lower public and private spending on social services, adversely affecting income distribution. In the African Continent, as in other developing countries, the erosion of employment gains accumulated over the period of strong growth in the past few years has gathered further pace, both in terms of the number of jobs lost and the increase in vulnerable employment. In particular, the collapse of commodity prices forced a number of international mining companies to close, underpinning significant job losses for example in the Democratic Republic of the Congo, Zambia, and South Africa. In the Continent, the labor market picture is further compounded by the decline or delay of new construction projects due to credit crunch and international capital withdrawals, causing negative feed-through effects on the manufacturing and service sectors. Thus, unemployment and underemployment are forecast to increase throughout the developing countries in 2009, with any trend reversal depending on a sustained recovery in the developed economies (UNDESA, 2009a).

In the face of the financial and economic crisis, would international remittances prove to be potent in reducing income inequality, leading to a more egalitarian distribution of income that is necessary for the "take-off" of an equitable growth process? This is the core focus of this paper. The purpose of the paper, therefore, is to examine the impact of international remittances on income inequality in African countries. In the past, a number of studies have examined the effect of international remittances on inequality in specific village or country settings, but we are not aware of any studies which explicitly examine the impact of this phenomenon on income inequality in Africa as a whole (Sub-Saharan Africa (SSA) and North Africa combined). Few studies with marginal reference to SSA use SSA dummies and/or interaction of same with the remittances variable. Two factors seem to be responsible. The first is a lack of income inequality data; it is quite difficult to estimate accurate and meaningful income distribution in a number of African countries as in other developing countries. The second factor relates to the nature of data on international remittances. Available data on international remittances do not include the large (and unknown) sum of remittance monies which are transmitted through private, unofficial channels. As a result of these data problems, a host of key policy questions remain unanswered. Exactly what is the impact of international remittances on income inequality in Africa?

This paper presents empirical evidence of the link between international remittances and income inequality (Gini coefficient) in African countries (Sub-Saharan and North Africa) in the light of the financial crisis. This is done by means of panel regressions estimated by a two-step (IV) efficient generalized method of moments (GMM) estimation method, using five eight-year non-overlapping windows for the period 1960-2006.

The paper is structured as follows. Section II examines income inequality and inflow and characteristics of international remittances to African countries. Section III provides a brief literature review of the income inequality impact of international remittances. Section IV presents the model and data while section VI discusses the empirical results. Section VII concludes with policy implications.

II. OVERVIEW OF INCOME INEQUALITY AND INTERNATIONAL REMITTANCES TO AFRICA

2.1 Income Inequality in Africa

The rise in economic growth in the last decade in Africa has not translated into an improvement in the distribution of income. As UNDESA (2007) had shown, the share of national consumption going to the poorest quintile of Sub-Saharan African population in 2004 remained unchanged from its 1990 level of 3.4 percent while in North Africa it increased very marginally from 6.2 percent to 6.3 percent. Figure 1 and Table 1 show the degree of income inequality as measured by the Gini coefficient for survey countries with latest available data. For the 45 countries in the figure and table, the Gini index ranges from a low of 32.1 in Egypt to a high of 64.3 in Comoros (on a scale of 0 to 100). The data also show that the Southern African sub-region has the least egalitarian income distribution in Africa. Eight countries from the sub-region – Botswana, Namibia, Angola, South Africa, Lesotho, Swaziland, Zambia, and Zimbabwe – rank in the top ten of the most unequal countries in the Continent. Ironically, most of these countries are mineral-producing states where the economic crisis has led to the closure of a number of mines, resulting in large job losses and hence the prospect of worsening the income inequality situation.

Progress towards reducing income inequality in Africa is thus now threatened by sluggish — or even negative — economic growth, diminished resources, fewer trade opportunities for the developing countries, and possible reductions in aid flows from donor nations consequent on the financial and economic crises. The financial and economic crises and high prices for primary commodities have eroded labor markets around the world. The ILO projects that the global unemployment rate in 2009 could reach between 6.3 percent and 7.1 percent. The reduction in employment and income opportunities no doubt will lead to a considerable slowdown in progress towards reducing income inequality in the Continent.

Unemployment and precarious employment are on the rise, as lower export earnings and government revenue are affecting all economic activity. In addition, economies with large subsistence agriculture sectors that would seemingly insulate them from a global economic downturn are being hit hard, as their cash economies are heavily dependent on a few exports, including niche export industries, such as textiles, cut flowers, vegetables, and tourism.

Indeed, the deepening of the global financial crisis entails a heavy toll on employment worldwide. A rapid rise in the unemployment has been witnessed since 2008 and is expected to worsen in 2009-2010. Initial projections put the rise in unemployment at 50 million over the next two years, but as the situation continues to deteriorate, this number could easily double (ILO, 2009). Lessons from past financial crises indicate that it typically takes four to five years for unemployment rates to return to pre-crisis levels after economic recovery has set in. This is because massive increases in long-term unemployment and greater labor market "informalization"—exacerbated by return migrants and large-scale reverse migration from urban to rural areas—are very difficult to reverse. Thus, higher unemployment rates may persist for some time. If this trend takes root, the negative effects of the crisis will be long-lasting. In Zambia, for example, the mining sector lost 27 percent of its jobs in 2008. Also, each job in the formal sector is reported to support another 20 jobs in services and the wider informal economy (Green, 2009). The potential implications for poverty and inequality are indeed huge.

Worldwide, the number of people living in extreme poverty in 2009 is expected to be 55 million to 90 million higher than anticipated before the global economic crisis, though the impact will vary across regions and countries. In sub-Saharan Africa and Southern Asia, both the number of poor and the poverty rate are expected to increase further in some of the more vulnerable and low-growth economies.

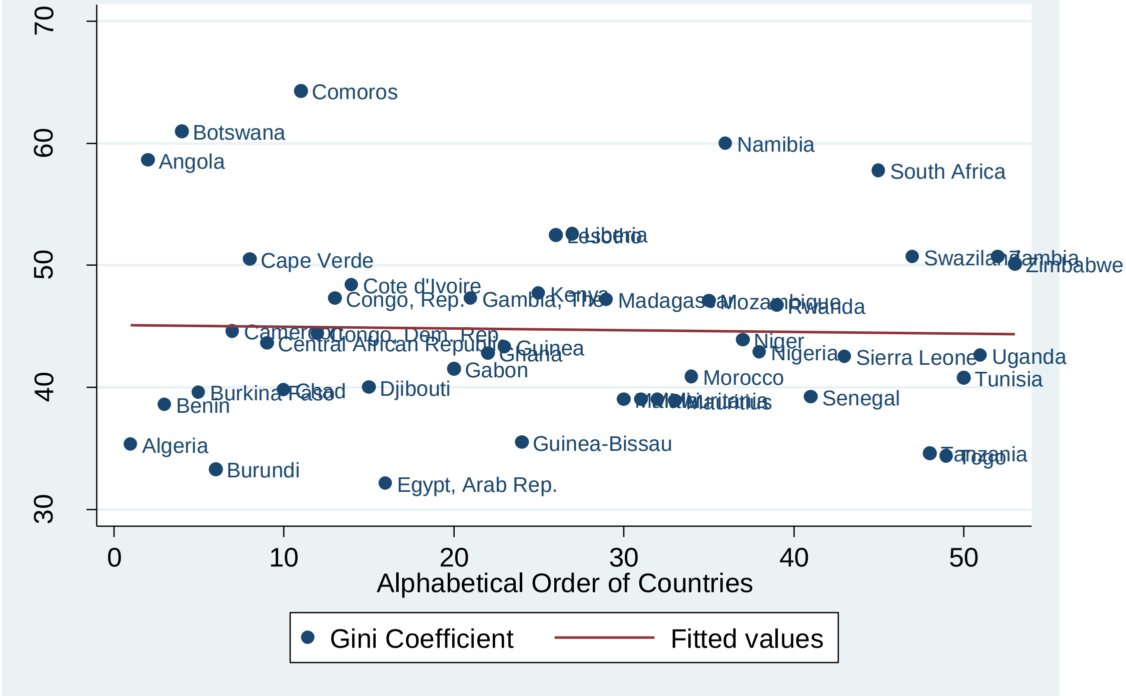
It has been estimated that the crisis could keep 12 to 16 million more people in poverty in Africa (UNDESA, 2009b). However, these estimates underestimate the true poverty impact of the crisis as the distributional consequences of the crisis are not adequately accounted for. Workers at the lower end of the job ladder, including youth and female workers, are more likely to lose their jobs or suffer income losses. In addition, workers are already visibly shifting out of dynamic export-oriented sectors, and either becoming unemployed or displaced to lower productivity activities (including moving back from urban to rural areas).

Estimates by Chen and Ravallion (2009) indicate that the 'triple F' crisis: financial collapse, combined with the food and fuel price crises, would have increased the number of poor by between 53 and 64 million people in 2009, based on estimates of those on less than $2 a day and $1.25 respectively. Also, DFID has estimated that an additional 90 million people will be living on less than $1.25 a day by the end of 2010 (McCord and Vandemoortele, 2009). Unfortunately, there had been a minimal social protection response to the crisis. Thus the combined effects of worsening poverty as a result of the financial crisis, and a weak social protection response set the scene, not only for severe and growing poverty and inequality in the medium and long term, but also for stifled growth when the upturn comes.

Signs of a recovery begun to appear in Africa and economic prospects for many mineral- and oil-exporters look brighter than they were in early 2009, in particular as world market prices of oil, minerals and metals have rebounded notably from the second quarter of the year. While economic conditions vary considerably, almost all African economies still have a long way to go for a return to the high rates of growth achieved during 2002-2007. Huge economic difficulties remain in the two largest sub-Saharan African economies. In Nigeria, the banking system is under severe distress leading to a generalized liquidity crunch and sharp increases in the interbank lending rates during September 2009. In South Africa, manufacturing activity and labor demand remain depressed. To worsen the situation, hunger levels are soaring in East Africa where seven countries have been experiencing a severe and persistent five-year drought.

Tackling the problem of income inequality is important because inequality negatively affects progress toward the Millennium Development Goals (MDGs) and poverty reduction generally; it results in inefficient resource allocation, wasted productive potential and impaired institutional development.

Figure 1: Scatter Plot of Income Inequality in African Countries



Source: Author using data from African Development Bank (2009).

Table 1: Distribution of Gini Coefficients for Selected African Economies

Range	Countries
30-39	Senegal, , Mauritania, Malawi, Mauritius, Benin, Chad, Burkina Faso, Burundi, Tanzania, Algeria, Togo, Egypt, Mali, Guinea-Bissau
40-44	Congo (DRC), Central African Republic, Ghana, Guinea, Niger, Nigeria, Sierra Leone, Uganda, Gabon, Morocco, Tunisia, Djibouti
45-49	Cameroon, Cote d'Ivoire, Congo Rep, Gambia, Kenya, Madagascar, Mozambique, Rwanda
50-55	Lesotho, Swaziland, Zambia, Zimbabwe, Liberia, Cape Verde
56-60	Namibia, Angola, South Africa
Above 60	Comoros, Botswana

Source: Author from AfDB (2009) data.

2.2 Recent Trends in International Remittances to Africa

Before the advent of the financial and economic crises, international remittances flowing into developing countries had been attracting increasing attention because of their rising volume and their impact on recipient countries (see review in Anyanwu and Erhijakpor, 2009a, 2010). However, the crises had reversed the rising trend. It has been estimated that in 2008, international remittances going to developing countries totaled US$337.8 billion out of the global amount of US$443.5 billion. However, in 2009, the estimations show a fall in global remittances to US$420.1 billion (a 5.3% fall) while the flows to developing countries fell to US$317.2 billion (a 6.1% decline). Though those flows are under-reported, a high proportion of the reported flows went to Africa. Between 2000 and 2008, remittances to the Continent increased by about 263.7 percent, from US$11.2 billion to over US$40.8 billion. Due to the financial and economic crises, the flows to Africa had been projected to fall to nearly US$38.2 billion in 2009 or a 6.3% decline from its 2008 level (Table 2).

As Table 2 and Figure 2 show, in 2008, East Asia and the Pacific region remains the largest recipient of recorded remittances, followed by South Asia, Latin America and the Caribbean (LAC) region, Europe and Central Asia, Africa (courtesy of favorable North African inflows), and the Middle East, in that order. This reversed the domination by Latin America and the Caribbean (LAC) region in earlier years. In addition, for the first time in many years, remittance inflows to Sub-Saharan Africa dominated those to North Africa (Figure 3). For example, in 2008, flows to North Africa were US$19.7 billion as against US$21.1 billion to Sub-Saharan Africa.

Figure 2: International Remittances Recipients By Region in 2008 (%)

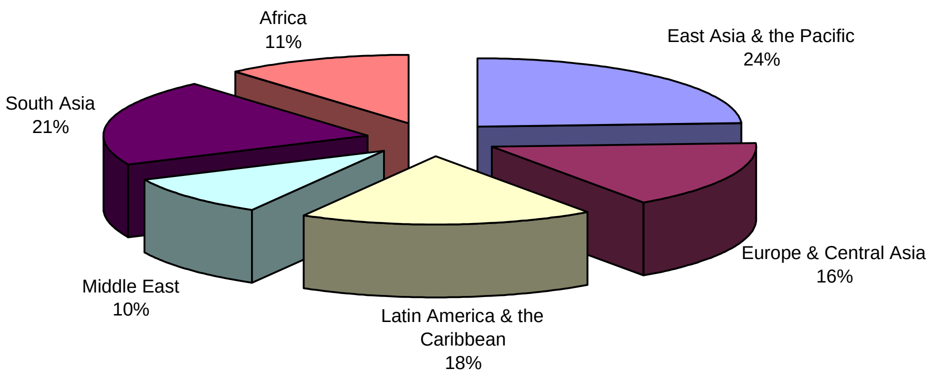
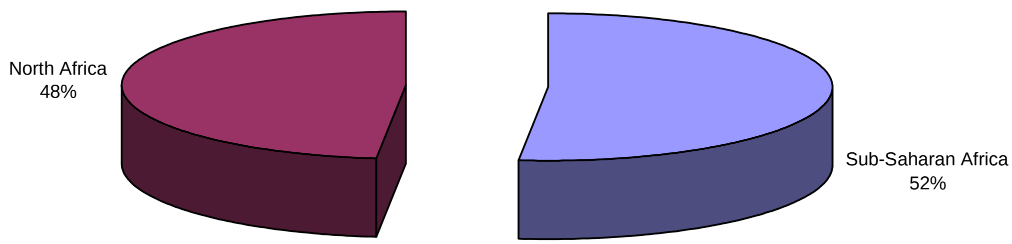


Table 2: Global Flows of International Migrant Remittances (US$ million)

Region	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009e	% Change (2006-2007)	% Change (2007-2008)	% Change (2008-2009)
All developing countries	82,537	93,122	112,609	140,420	164,370	198,932	235,403	289,376	337,761	317,237	22.9	16.7	-6.1
East Asia and Pacific	15,675	18,757	27,468	32,695	40,336	50,460	57,598	71,309	86,115	84,785	23.8	20.8	-1.5
Europe and Central Asia	12,143	11,647	12,844	14,418	20,955	30,089	37,341	50,777	57,801	49,279	36.0	13.8	-14.7
Latin America and Caribbean	19,987	24,229	27,918	36,609	43,330	50,122	59,199	63,239	64,717	58,481	6.8	2.3	-9.6
Middle-East and North Africa	12,898	14,653	15,211	20,361	23,034	24,958	26,112	31,364	34,696	32,212	20.1	10.6	-7.2
South Asia	17,212	19,173	24,137	30,366	28,694	33,924	42,523	54,041	73,293	71,955	27.1	35.6	-1.8
Sub-Saharan Africa	4,623	4,663	5,030	5,970	8,021	9,379	12,629	18,646	21,139	20,525	47.6	13.4	-2.9
Africa	11,231	12,442	12,948	15,578	19,509	22,479	26,575	36,913	40,842	38,145	38.90	10.64	-6.3
NB: e= Estimated													

Source: Author's Calculations from World Bank (2009).

Figure 3: Africa: Regional Share of International Remittances Receipts in 2008 (%)



As Figure 4 shows, the top 10 recipients of international remittances in 2008 (in dollar terms) include Nigeria, Egypt, Morocco, Sudan, Algeria, Tunisia, Kenya, Senegal, South Africa and Uganda. As a share of GDP, however, remittances to many of these countries were much smaller in 2008. In contrast, the top recipients in terms of the share of remittances in GDP included smaller economies such as Lesotho and Togo, where remittances exceeded ten percent of the GDP (Figure 5).

III. REVIEW OF RECENT LITERATURE

3.1 Linking the Financial Crisis and Remittances to Household Welfare, Including Income Inequality: A Framework

Figure 6 shows the transmission mechanism of the financial crisis to inequality and poverty. The very first observation of the current crisis is a considerable slowdown or negative growth in the developed economies. Such a slowdown leads to reductions in trade with, and remittances and capital flows to, African countries. In addition, the crisis may cause an external shock to the financial markets in the Continent, especially the few that are more integrated with the global financial system. All these are detrimental to economic growth in Africa. Reduced growth in the Continent, in turn, implies less government revenue and drops in household income. As a consequence, income inequality and poverty incidence rise and the social sectors as a whole are adversely affected.

Figure 4: Top Ten International Remittances Recipient Countries in 2008 (US$ million)

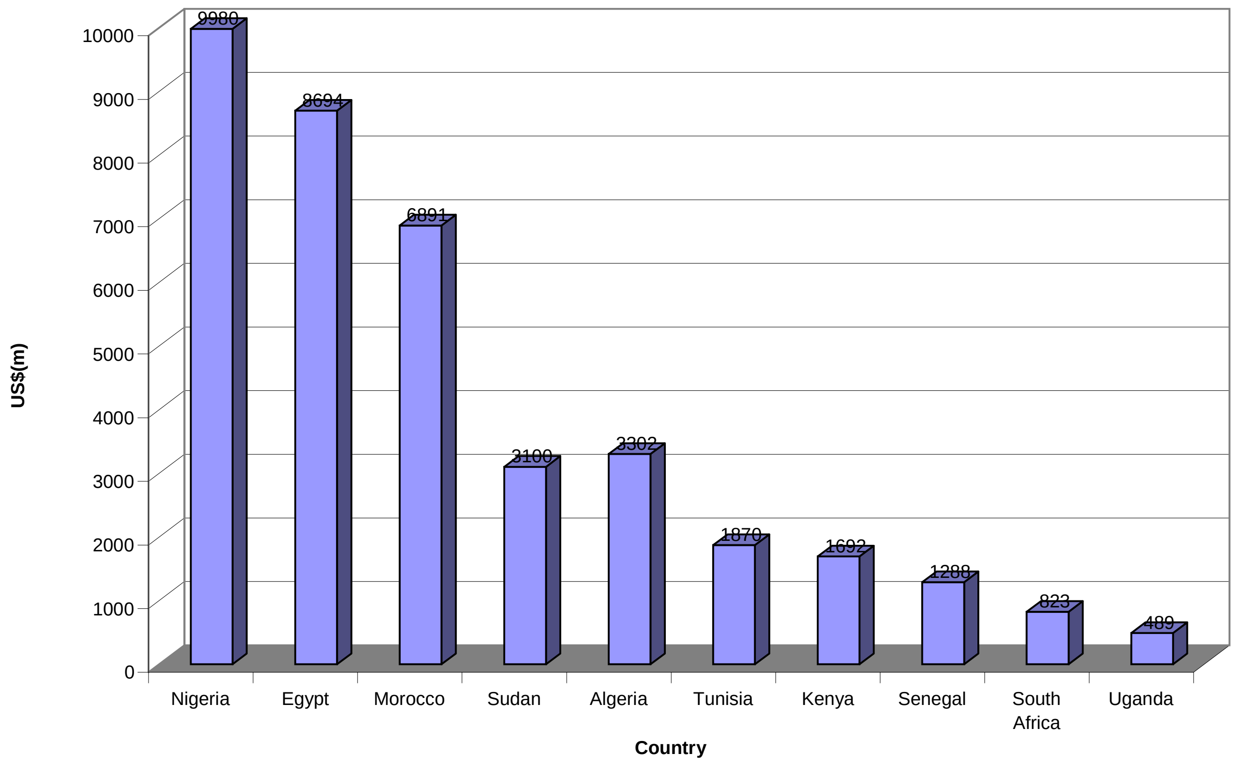


Figure 5: Top Ten International Remittances Recipient Countries in Africa in 2008 (as % of GDP)

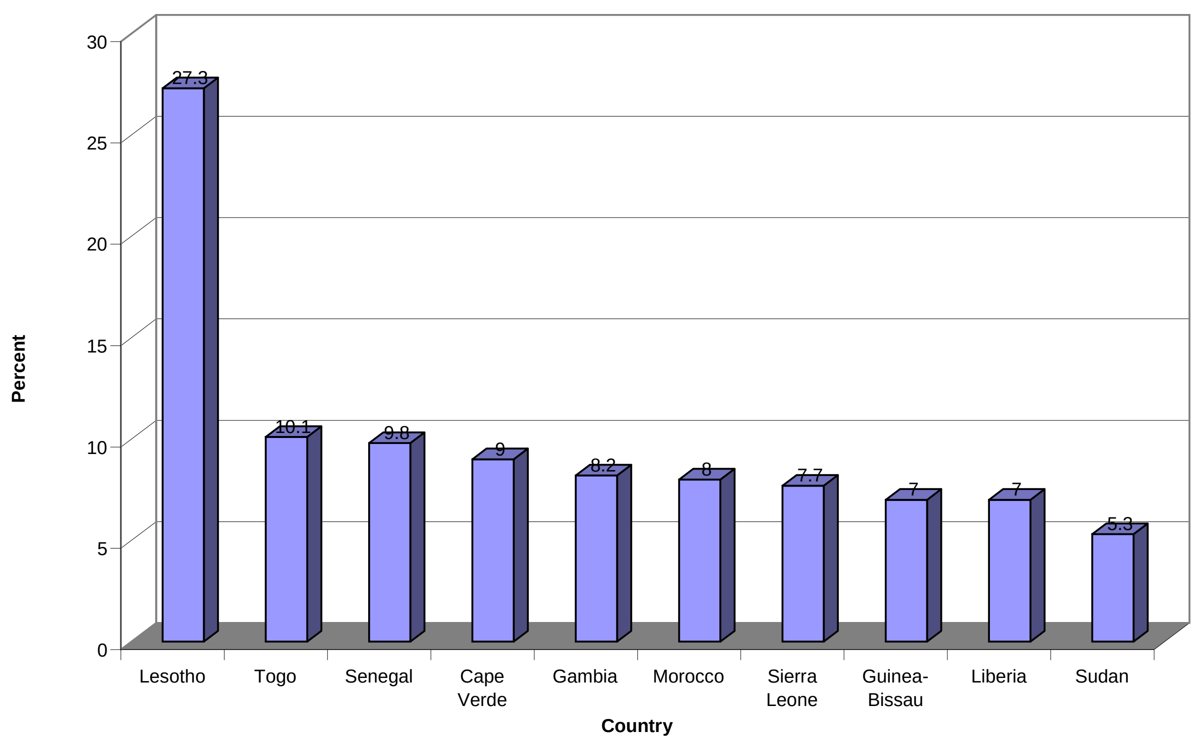
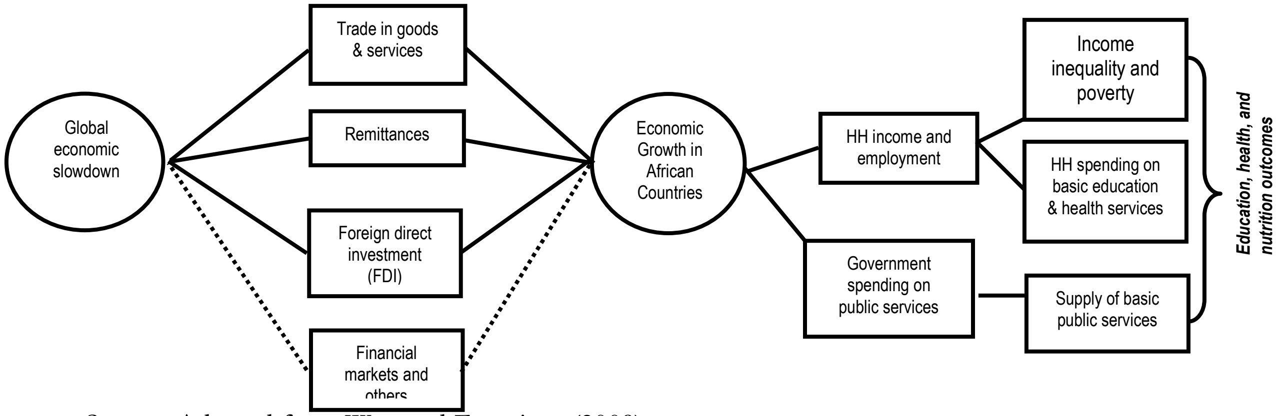


Figure 6: Transmission mechanism of the current crisis to inequality and other social outcomes



Source: Adapted from Wan and Francisco (2009).

Also, as the McCord and Vandemoortele (2009) had stated, the financial crisis exacerbates poverty and inequality and undermine progress towards the MDGs. Income inequality and poverty can also be transferred through five key transmission channels that link macro-level shocks to poor people (see also McCord and Vandemoortele, 2009; and Lustig and Walton, 2009): employment; prices; public and private transfers; assets; and access to goods and services. However, how shocks are transmitted through these channels determines who is affected, how deeply, and for how long.

With respect to remittances, in the literature, there are two contrasting views regarding the effects of international remittances on the economy of the labor-sending country: the optimistic view and the pessimistic view. The first one views remittances as mechanisms for economic development while the latter, on the other hand, perceives remittances as an “illness” that weakens the economy (Cattaneo, 2005). Following Capistrano and Sta Maria (2007), the beneficial and detrimental effects of migration and overseas remittances can be classified using three perspectives: at the macro or national level, at the community level and at the household level. At the macro/national level, one of the most significant benefits of the inflows of remittances to a country is that they increase the foreign exchange earnings of the labor exporting country (Ratha, 2003; Pernia, 2006).

In addition, workers’ remittances exert a positive impact on the balance of payments of many developing countries as well as promote economic growth, through their direct effects on savings and investment (human and physical capital) and indirect effects through consumption (Cattaneo, 2005; World Bank, 2008) (see Figure 8). Studies such as those of Hanson and Woodruff (2003) and Cox-Edwards and Ureta (2003) have found evidence for “forward” linkages between remittances and human capital formation in Latin America. Also, Ratha (2003) had suggested that remittances that raise the consumption levels of rural households might have substantial multiplier effects because they are more likely to be spent on domestically produced goods. However, as for countries with low GDP remittance receipts can distort the functions of formal capital markets and also destabilize exchange rate regimes through the creation of parallel currency markets (Chimhowu, Piesse and Pinder, 2003).

International remittances can also indirectly promote community development through spillover mechanisms. First, increased consumption of migrant households can generate multiplier effects. If recipient families increase their household consumption on local goods and services, this will benefit other members of the community through the increase in demand which stimulates local production, thereby promoting job creation and local development. Second, remittances are also found to prop up formation of small-scale enterprises, thereby, promoting community development. International remittances ease credit constraints by providing working capital for the recipients to engage in entrepreneurial activities. This results in job creation and enhancement of the development of the remittance-receiving community (Woodruff and Zenteno, 2001). Third, remittances, especially through migrant associations, may also contribute to the creation of new social assets and services and community physical infrastructures such as schools, health centers, roads and other community projects (Ghosh, 2006; Sorensen and Pedersen, 2002). Lastly, and on the negative side, international remittances are found to increase income inequality, especially for the rural dwellers (see, for example Ravanilla and Robleza, 2003; Agunias, 2006; Capistrano and Sta Maria, 2007).

At the household level, international remittances increase family incomes, thus raising consumption of both durable and non-durable goods and/or savings. Indeed, in Africa, remittances are part of a private welfare system that transfers purchasing power from relatively richer to relatively poorer members of a family. They reduce poverty, smooth consumption, affect labor supply, provide working capital, and have multiplier effects through increased household spending. For the most part, remittances seem to be used to finance consumption or investment in human capital, such as education, health, and better nutrition (Lopez-Cordova, 2004; Hildebrant and McKenzie, 2005; Adams, Cuecuecha and Page, 2008).

Remittances may also serve as capital for starting businesses. Thus, international remittances generally raise the immediate standard of living of their recipient families. However, this will only hold true for all households if families engage in wise expenditures. Therefore, the benefits that will be derived from these remittances will depend on how and where the families spend them. Indeed, although remittances provide households with considerable benefits, there are also substantial economic and social costs associated with it. On the economic side, international remittances, as pointed out by Bridi (2005), do promote idleness on the part of the recipients. Chami et al (2005) argued that migration and associated remittances may create a moral hazard problem, inducing disincentives to work among migrant household members (see also Azam and Gubert, 2006). On the social side, Rodriguez (2000) had argued that remittances have, quite apart from increased family tensions within households but also with migrants.

3.2. Empirical Literature on the Impact of International Remittances on Income Inequality

The empirical literature has shown that international remittances have mixed impact on income inequality at origin (Rapoport and Docquier, 2005). For example, Stark, Taylor and Yitzhaki (1986 and 1988) analyzed household data from two Mexican villages, one with a relatively recent Mexico-to-U.S. migration experience, and one with a longer history of migration. They found that the income distribution impact of international remittances strongly depends on the village's migration history, which in fact captures the magnitude of migration costs. They also showed that income dispersion reduced when migrants' remittances were considered in both villages, but more so in the second village, characterized by a longer migration tradition. From these results, the authors concluded that "the effect of remittances on inequalities over time depends critically upon how migration-facilitating information and contacts become diffused through the village population. If contacts and information are not household specific, that is, if there is a tendency for them to spread across household units, then receipt of remittances by households at the lower end of the income distribution is likely to occur. According to them, this would erode and possibly reverse any initially unfavorable effects of remittances on income inequality. Along similar research lines, Milanovic (1987) also tested for the possibility of such a "trickle down" effect using panel data from the 1973, 1978, and 1983 Yugoslavian household surveys. He found no empirical support for this hypothesis; rather, his results showed that international remittances tend to raise inequality. However, their effects differed over the periods and social categories considered – in fact, it was mainly for agricultural households that an inequality-enhancing effect was found.

Noting that migrant workers would otherwise be working and earning income at home, Adams (1989) predicted what income would have been without remittances in a sample of three villages in Egypt. His results show that the inclusion of international remittances worsens inequality. On the other hand, in another study of four districts in Pakistan, Adams (1992) concluded that international remittances have neutral impact on the rural income distribution. Also, Taylor (1992) and Taylor and Wyatt (1996), using a sample of 55 households from one part of Michoacan in Mexico, found that that international remittances reduce inequality. This was so because international remittances translated into greater increases in income for rural households with illiquid assets. Thus, by allowing poorer households access to credit, international remittances also finance the accumulation of productive assets, increasing future income. Such indirect effects of international remittances equalize incomes, apart from the direct immediate increase in income. The author concluded that international remittances can indeed ease credit constraints for liquidity constrained households, thus reducing income inequality. Further, Barham and Boucher (1998), using data from three neighborhoods in Bluefields, Nicaragua, found that when international remittances are treated as exogenous they would lead reduce income inequality, but when treated as a substitute for home earnings, they increase income inequality.

According to Stahl (1982) and Lipton (1980) migration is likely to increase rural inequality because only relatively better-off households were able to finance a member's search for better employment in urban areas or abroad. Likewise World Bank (2007) found that migration patterns in East, European and former Soviet Union countries are such that richer households receive greater remittances than do poorer household.

In addition, McKenzie and Rapoport (2004), using two survey data sets from Mexico found that at high levels of migration prevalence, migration leads to a reduction in inequality, with asset inequality declining more than consumption or income inequality; while, for the communities with a more diverse migration experience, migration increases inequality at lower levels of migration stock and then reduces inequality as one approaches the higher levels of migration.

Taylor et al (2005), utilizing data from the Mexico National Rural Household Survey, explored the impacts of remittances on rural inequality and poverty. Their findings suggest that remittances from international migrants become more equalizing (or less unequalizing) as the prevalence of migration increases.

Also, using a 2005/06 household survey to analyze the impact of internal remittances (from Ghana) and international remittances (from African and other countries) on poverty and inequality in Ghana, Adams (Jr), Cuecuecha, and Page (2008) found that both types of remittances increase income inequality in Ghana. In particular, for households with internal remittances, the inclusion of remittances causes income inequality to rise by 4 percent, and for households with international remittances, the inclusion of remittances causes income inequality to increase by 17.4 percent.

However, Koechin and Leon (2006), found that as migrant communities form a close networks in a foreign country, the cost of migration falls and remittances no longer reinforce inequalities in the recipient country. Other localized studies have concluded that remittances tend to improve the welfare of poorer rural households (Stark and Taylor 1989; Adams, 1991).

In relation to inequality, McKenzie (2006) studied Mexican data, using a sample of 214 municipalities with a population less than 100,000. As suggested by the migration literature, he noted that during the early stages of migration, inequality in a community increases, but this effect is reversed as migration opportunities become available to a wider section of the population. The impact of migration was large with a one-standard deviation increase in migration prevalence being associated with a 0.5 standard deviation improvement in the Gini coefficient.

Also, Yang and Martinez (2006) examined the effects of remittances upon poverty and inequality indicators in the Philippines. The authors use a set of linked household surveys and a sample of 26,121 households. They exploited a unique natural experiment, the major exchange rate shocks during the Asian crises, which provided them with an instrument that isolated the net impact of remittance flows on the outcome variables. The study found that the effect on the inequality indicator was not statistically significant.

Acosta et al (2007) conducted a cross-country analysis to explore how remittances are contributing to poverty in the Latin America and the Caribbean. The study used a different econometric approach which allows them to estimate the separate effects of remittances on two determinants of poverty: the average income growth and the degree of income inequality. The results have suggested that remittances exert a positive and significant effect on income growth and cause a slight reduction in inequality. In another recent study by Acosta, Calderon, Fajnzylber, and Lopez (2008), based on ten Latin American countries, the authors found that international remittances have negative, albeit relatively small, inequality-reducing effects, even after imputations for the potential home earnings of migrants.

In another recent study, Wouterse (2009) used 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 and found that intra-African remittances reduce inequality while intercontinental remittances have the opposite effect. In the same vein, Gubert, Lassourd and Mesplé-Somps (2009), using a 2006 household survey in Mali, showed that remittances reduce poverty rates by 5 percent to 11 percent and income inequality by about 5 percent. In another recent study, Giannetti, Federici, and Raitano (2009) found that, apart from Slovenia, where income inequality increased, the inclusion of income from remittances reduced income inequality. However, the magnitude of the reduction of income inequality is very small, possibly because of the low share of recipient households. At any rate also in Hungary (where the share is 12.8 percent) the income inequality decreasing effect of remittances is very low.

In the rest of the paper, we investigate the direct income inequality-reducing impact of international remittances in the face of the financial crisis, using five eight-year non-overlapping windows for the period 1960-2006.

IV. THE MODEL AND DATA: IMPACT OF REMITTANCES ON INCOME INEQUALITY IN AFRICA

The methodology employed is a modified version of that presented in Ernst and Escudero (2008) and Rancière et al. (2007) and the empirical works of Clarke et al (2006), Meschi and Vivarelli (2009), and Anyanwu and Erhijakpor (2009b, 2010). To capture the effects of financial crisis, existing studies have often used ad hoc assessments of crises and their lengths based on idiosyncratic interpretation of the data. In this study, instead, we follow a new methodology and use the skewness of the growth of real bank credit to the private sector as a de facto measure of systemic-risk or leading financial crisis indicator in the domestic African economy. The three moments (the mean, the standard deviation (volatility), and the skewness) of leading indicator are used to measure the effect of the financial crisis.

The purpose of this paper therefore is to present empirical evidence of the link between international remittances and income inequality (Gini coefficient) in African countries (Sub-Saharan and North Africa) in the light of the financial crisis. This is done by means of panel regressions estimated by a two-step (IV) efficient generalized method of moments (GMM) estimation method, using five eight-year non-overlapping windows for the period 1960-2006.

The following equation has been estimated:

$$g_{it} = \alpha_i + \beta_1(\mathrm{Re}\,m_{it}) + \beta_2(MBkCr_{it}) + \beta_3(VolBkCr_{it}) + \beta_4(SkBkCr_{it})$$
$$+ \beta_5(X_{it}) + \varepsilon_{it}(i = 1,....,N; t = 1,.....,T),...............(1)$$

where g is the gini coefficient in country i at time t; αi is a fixed effect reflecting time differences between countries; $\beta 1$ is the elasticity of income inequality with respect to international remittances as a percent of GDP; $\beta 2$ is the elasticity of income inequality with respect to mean bank credit growth (MbkCr); $\beta 3$ is the elasticity of income inequality with respect to volatility of bank credit growth (VolBkCr); $\beta 4$ is the elasticity of income inequality with respect to the skewness of bank credit growth (SkBkCr); and X is the control variables, including initial per-capita GDP (in logs), the initial ratio of secondary schooling, the inflation rate, the ratio of government consumption as a percentage of GDP and a measure of trade openness (X+M / GDP). Regional dummies are also included and interacted with international remittances as percent of GDP. The variables are in logs. Table 3 provides detailed descriptions of the raw dataset while table 4 presents the variable definitions and data sources.

Before proceeding to the regression analyses, it is instructive to present bivariate relationships between key variables using simple scatter plots. Figures 7 show clear and unambiguously positive relationship between international remittances and income inequality in Africa.

Table 3: Descriptive Statistics of Regression Variables

Variable	Observations	Mean	Median	Standard Deviation	Range
Gini coefficient	71	45.07	43.45	8.92	45.43
International Remittances	147	6.22	1.34	23.69	257.42
Initial secondary schooling	96	31.46	23.69	23.83	105.31
Initial GDP per capita	226	811.34	366.51	1127.72	6770.93
Real credit growth	184	7.72	6.77	12.29	97.54
Government consumption	232	16.26	14.84	7.24	51.08
Inflation rate	192	41.36	7.87	289.99	3722.11
Trade openness	235	67.84	58.8	35.09	231.13

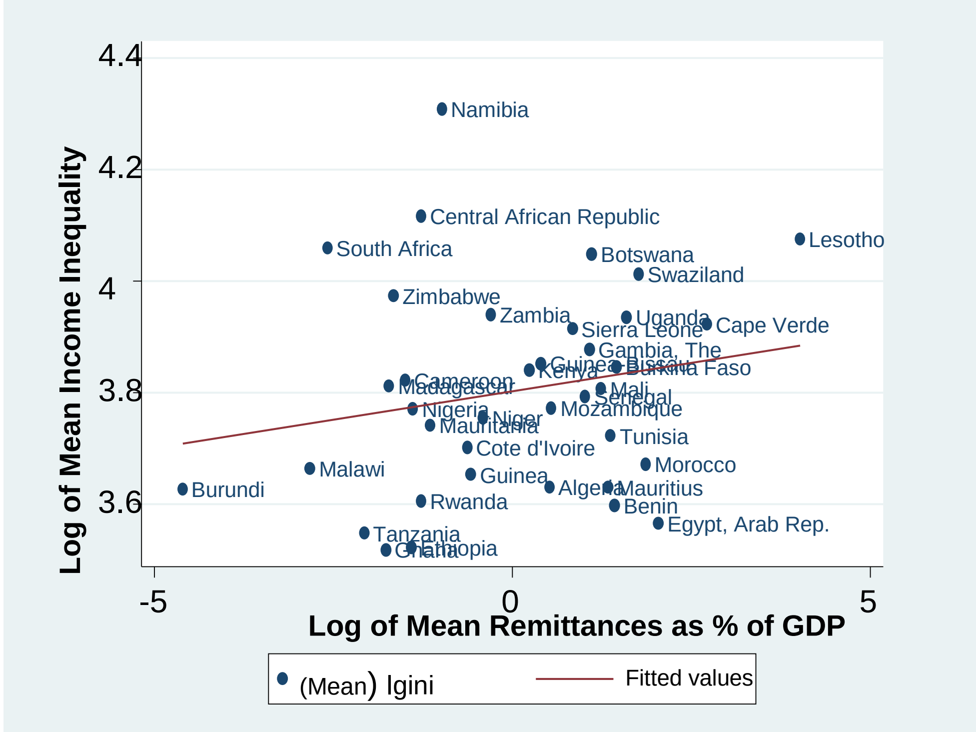
Note: These are raw data.
Source: Authors' Calculations.

Table 4: Definitions and sources of variable used in the regression analysis

Variable	Definition	Source
Gini coefficients	Measure of income inequality	PovcalNet database (available at http://iresearch.worldbank.org/PovcalNet/jsp/index.jsp and World Development Indicator (2007)
International remittances as % of GDP	International remittances-GDP ratio	World Development Indicator (2007)
Initial GDP per capita	Initial value of ratio of total GDP to total population (in logs). GDP is in 2000 constant US$	World Development Indicators (2007)
Initial secondary schooling	Ratio of total secondary enrolment to the population	World Development Indicators (2007)
Real credit growth	Annual growth rate of real domestic bank credit claims on the private sector	IMF's IFS – line 22: Claims on Private Sector. Domestic bank credit claims are deflated with end of the year CPI index
Government consumption	General government final consumption expenditure as a % of GDP. Expressed in logs	World Development indicator (2007)
Inflation rate	Annual % change in CPI	World Development Indicators (2007)
Trade openness	Trade (Exports + Imports) as a % of GDP	World Development Indicators (2009)

Initial data source before additions and transformations - Ernst and Escudero, as used in their 2008 paper.

Figure 7: Scatter Plot of Log of Mean Income Inequality and Log of Mean Remittances as % of GDP



Source: Author using estimation data.

V. EMPIRICAL RESULTS

5.1 OLS RESULTS

Table 5 shows the results when Equation (1) is estimated using Ordinary Least Squares (OLS). The log transformation of all the variables allows us to interpret the coefficients as elasticities. Sub-regional dummies (North Africa and Sub-Saharan Africa) were introduced to control for fixed effects. The remittance variable has a positive and statistically significant impact on income inequality in Africa. The estimates suggest that, on average, a 10 percent increase in official international remittances as a percentage of GDP will lead to between 0.02 and 0.044 percent increase in income inequality in the Continent. The results show that there is negative partial correlation between the mean of real bank credit growth and Africa's income inequality and this is consistent with the literature. The results indicate also show that the volatility of real credit growth nor its skewness has significant effect on income inequality in Africa, indicating that the financial crisis has no direct relationship with income inequality in the Continent.

With respect to the control variables, our results show that initial level of per capita GDP, inflation rates and government consumption have significant positive effects on Africa's income inequality. Also, the dummy variable for the North Africa has a strong negative effect on Africa's income inequality – and strongly positive for Sub-Saharan Africa. It is important to note, however, that the finding that higher remittances would lead to higher income inequality in Africa does not hold for all regions of the Continent. Indeed, the interaction term between remittances and the North African dummy shows a strong statistically negative coefficient, indicating that a 10 percent increase in remittances would lead to about 1.6 percent reduction in income inequality in North Africa.

5.2 IV-GMM RESULTS

However, one possible problem with Equation (1) is that it assumes that all of the right-hand side variables in the model—including international remittances— are exogenous to income inequality. However, it is possible that international remittances may be endogenous to income inequality. Reverse causality may be taking place: international remittances may be increasing income inequality, but income inequality may also be affecting the level of international remittances being received.

Without accounting for this reverse causality, all of the estimated coefficients in Table 5 may be biased. One way of accounting for possible endogenous regressors is to pursue an instrumental variables approach. Therefore, to deal with this problem, we follow Catrinescu et al (2006), Aggarwal et al (2006), and Anyanwu and Erhijakpor (2010) in estimating the equations instrumentalizing the remittances variable with its first and second lagged levels, using a the two-step (IV) efficient generalized method of moments (GMM) estimation method.

Table 5: Ordinary Least Squares (OLS) Estimates of the Effects of International Remittances on Income Inequality in Africa

Variable	(1)	(2)
International Remittances	.044 (3.00***)	0.042 (2.74***)
Bank credit growth	-.459 (-1.86*)	-.407 (-1.59*)
Bank credit variance	.003 (.06)	.001 (.02)
Bank credit skewness	.009 (0.00)	-.012 (-.01)
Initial level of GDP per capita	.084 (2.31**)	.075 (1.99**)
Initial secondary schooling	-.042 (-.94)	-.045 (-.98)
Inflation rate	.573 (1.97*)	.533 (1.76*)
Government consumption	.186 (2.18**)	.178 (2.00**)
Trade openness	-.082 (-1.35)	-.065 (-1.04)
North Africa	-.304 (-4.05***)	
Remittances*North Africa		-.163 (-3.46***)
Constant	2.673 (0.29)	2.737 (0.28)
R-Squared	0.4862	0.4450
Adjusted R-Squared	0.3667	0.3159
F-Statistic	4.07	3.45
Prob>0	.000	.00
N	54	54

Note: ***= 1% significant level; **=5% significant level; *=10% significant level.
Source: Authors' Estimations.

Table 6 shows the first-stage results from the IV-GMM estimations. We conduct and report two tests to show the validity of our instruments. First, we present the F-statistic for weak instruments. This is a test of the significance of our instruments in predicting remittances. The F-statistics is above the critical value, at 1 percent significance, indicating that our estimates do not suffer from a weak instruments problem. Second, we report the Hansen J test of overidenditfying restrictions. The joint null hypothesis in this case is that the instruments are uncorrelated with the error term and that excluded instruments are correctly excluded from the estimated equation. Again, these tests confirm the validity of our instruments.

Table 6: First-Stage IV-GMM Estimates for International Remittances to Africa

Variable	Coefficient	Coefficient
Instruments		
First Lag of Inflow of International Remittances (ratio of GDP)	.777 (3.63***)	.775 (3.58***)
Second Lag of Inflow of International Remittances (ratio of GDP)	-.030 (-.17)	-.027 (-.15)
Included exogenous variables		
Bank credit growth	-3.308 (-1.42)	-3.48 (-1.51)
Bank credit variance	-.266 (-.85)	-.266 (-.85)
Bank credit skewness	19.673 (1.55)	19.729 (1.54)
Initial level of GDP per capita	-.559 (-1.55)	-.543 (-1.51)
Initial secondary schooling	.346 (0.97)	.366 (1.03)
Inflation rate	3.448 (1.46)	3.460 (1.46)
Government consumption	-.022 (-.04)	-.025 (-.05)
Trade openness	.352 (.89)	.326 (.83)
North Africa	.278 (.58)	
Remittances*North Africa		.130 (.48)
Constant	-89.487 (-1.73*)	-89.057 (-1.70*)
N	39	39
Shea Partial R-Squared	0.6857	0.6857
F-Statistics of excluded instruments	29.45***	29.45***
P-value	0.0000	0.0000

Note: ***= 1% significant level; **=5% significant level; *=10% significant level.
Source: Authors' Estimations.

Tables 7 present the second-stage IV-GMM results. As for the impact of remittances, we continue to find that they have a positive and significant impact on income inequality in Africa. These results confirm that the positive impact of remittances on income inequality in Africa is not due to endogeneity biases.

Table 7: IV-GMM Estimates of the Effect of International Remittances on Income Inequality in Africa

Variable	(1)	(2)
Instrumented Endogenous Variable		
Inflow of International Remittances (ratio of GDP)	.079	0.76
	(4.70***)	(4.60***)
Exogenous Regressors		
Bank credit growth	.153	.357
	(.49)	(1.08)
Bank credit variance	.040	.029
	(1.19)	(.76)
Bank credit skewness	-.446	-.073
	(-.29)	(-.05)
Initial level of GDP per capita	.206	.190
	(5.99***)	(4.84***)
Initial secondary schooling	-.147	-.167
	(-4.66***)	(-4.72***)
Inflation rate	.640	.668
	(2.13**)	(2.21**)
Government consumption	-.046	-.031
	(-.82)	(-.52)
Trade openness	-.013	-.010
	(-.25)	(-.17)
North Africa	-.337	
	(-5.84***)	
Remittances*North Africa		-.184
		(-6.41***)
Constant	1.405	-1.350
	(.23)	(-.21)
Centered R-Squared	0.5992	0.5900
Hansen J Statistic	1.197	0.606
p-Value	0.27388	0.43648
Pagan-Hall Statistic	15.533	17.855
p-Value	1.0000	1.0000
N	39	39

Note: ***= 1% significant level; **=5% significant level; *=10% significant level.
Source: Authors' Estimations.

The IV-GMM results suggest that, on average, a 10 percent increase in official remittances will lead to between 0.076 percent and 0.079 percent increase in income inequality (Table 7), while the OLS estimates suggest that a similar increase in official remittances will lead to between 0.042 percent and 0.044 percent increase in income inequality (Table 5). Indeed, comparing the OLS and IV-GMM estimates for international remittances (Tables 5 and 7), we find that the coefficients for the instrumented international remittances variable in Table 7 are more positive for income inequality – but all at equal level of 1 percent significance. Considered as a whole, the IV-GMM results suggest that after instrumenting for the possible endogeneity of international remittances, this variable still has a positive and statistically significant impact upon income inequality in Africa. Evaluated at the sample mean, an increase in $1 in instrumented official international remittances (from $6.22 to $7.22) will lead to a 0.013 percent [(7.22/6.22 - 1)*(+0.079)] increase in income inequality. Given our earlier results that remittances are poverty-reducing in Africa (Anyanwu and Erhijakpor, 2010), when inequality-enhancing effects of remittances are small, the greater the reduction of poverty in the continent.

Financial sector development as represented by private credit as percent of GDP is insignificant, just as in Clarke et al (2006). Again, financial crisis does not appear to have a direct effect on income inequality in Africa. And as in the OLS results, initial level of per capita GDP and inflation rates continue to be significant determinants of income inequality in Africa, conforming to the findings of Ernst and Escudero (2008) and Roine, Vlachos and Waldenström 2009). Initial per capita GDP has a positive and significant coefficient of between 0.190 and 0.206. Inflation rate continues to exact the largest significant positive impact on income inequality, the coefficients ranging between 0.640 and 0.668, indicating the uncertainty represented by inflation. Bittencourt. (2009) has found similar results for Brazil. Another interesting result is that initial secondary education significantly reduces income inequality in Africa, with coefficients of between -0.147 and -0.167. This is in conformity with the findings of Calderon and Serven (2004). Government expenditure and trade openness turned out to have insignificant negative effects. Also, the dummy variable for North Africa is more strongly negative than in the OLS results – and strongly positive for sub-Saharan Africa – on income inequality. In particular, the interaction term between remittances and the North African dummy shows a strong statistically negative coefficient, indicating that a 10 percent increase in remittances would lead to about 1.84 percent reduction in income inequality in North Africa. This agrees with the results of Odedokun and Round (2004).

VI. CONCLUSIONS AND POLICY IMPLICATIONS

This paper has used a new five eight-year non-overlapping data for the period 1960-2006 for Africa to examine the impact of international remittances on income inequality in Africa. Some key findings and policy implications emerge. First, international remittances have a strong, statistically significant impact on increasing income inequality in Africa. After instrumenting for the possible endogeneity of international remittances, a 10 percent increase in official international remittances as a percentage of GDP will lead, on average, to a 0.013 percent increase in income inequality in the Continent. Indeed, the results provide strong, robust evidence of the inequality-increasing impact of international remittances to Africa. Two, initial per capita GDP strongly increases income inequality in Africa. Third, inflation rate appears to be the strongest factor fueling income inequality in the Continent. Fourth, education as proxied by initial secondary schooling significantly reduces income inequality in Africa. Fifth, the North African dummy and remittances inflows to North Africa largely reduce income inequality in the sub-region while doing the opposite in Sub-Saharan Africa.

Our findings point to some key policy recommendations. In particular, remittances-receiving countries of Africa need to develop a strategy to maximize the benefits of remittances while minimizing their negative repercussions. Indeed, a key concern from our findings relates to the inequality-reinforcing impact of migrant remittances. The question therefore arises: Why do international remittances generally increase inequality? The fact that households receiving international remittances are well-off to begin with, coupled with the very large improvements in expenditure that come with the receipt of international remittances, means that the receipt of international remittances raises income inequality. International migration like the adoption of a new production technology entails costs and risks. Given this fact, pioneer migrants tend to come from households at the upper-middle or top of the sending-area's income distribution (e.g., Portes and Rumbaut, 1990; Lipton, 1980), and the income they send home in the form of remittances is therefore likely to widen income inequalities in migrant-source areas. Indeed, as Adams, Cuecuecha and Page (2008) have noted, international remittances have a more negative impact on income distribution because households receiving international remittances are not poor in the first place, and with the receipt of remittances they tend to improve their expenditure status much more dramatically than households receiving internal remittances or those not receiving any remittances. We therefore propose that African governments design complementary policies to mitigate the adverse income distribution consequences of remittances. Such mitigation policies may range from setting up or improving safety nets, to better labor-market policies and institutions, and to investing in access roads to improve access by the poor to markets. In addition, well-designed additional policy interventions, especially those that improve education and infrastructure and address other “behind the border” investment climate reforms, can mitigate the adverse inequity changes that may result from international migrant transfers. And given the severe budgetary constraints faced by African governments, international organizations would have to play a pivotal role in this direction (ILO, 2004).

Our estimations show that inflation had a regressive and significant positive impact on income inequality. The implication of this result is that sound macroeconomic policies, which keep inflation low and stable in the long run, should be a necessary first step of any policy package to be implemented to alleviate inequality in African countries. Such stable macroeconomic environment would have to be achieved through the implementation of sound monetary and fiscal policies and/or a much better institutional framework.

Our results also indicate a strong positive relation between initial GDP per capita and income inequality in African countries, suggesting that the past decade’s high income benefitted the rich more than proportionately than the poor. A likely reason for this pro-rich outcome is simply that, top incomes are (and have been) more closely related to actual performance than incomes on average.

Indeed, the literature has identified a number of possible policy instruments to deal with inequality, including, conditional cash transfers, guaranteed employment schemes, labour market training, greater access to health, nutrition and education through increased social investments, affirmative action, and land and property rights reforms, especially to benefit rural dwellers (particularly women). Evidence has shown that conditional cash transfers and expenditures (for education, for example) are effective levers of redistribution (see Levy, 2006; Kanbur, 2008). Improving access to education, for example, can reduce inequality both by increasing individual productivity and by facilitating the movement of poor people from low-paying jobs in agriculture to higher-paying jobs in industry and services. More importantly, public spending on education (as well as on other human capacity), when targeted toward the poor, can produce a double dividend, reducing inequality and poverty in the short run and increasing the chances for poor children to access formal jobs and thus break free from the intergenerational poverty trap. Increasing educational levels (and its quality) should be accompanied by a strong investment climate to ensure that productive jobs are created for the newly educated.

Greater access to education will help to reduce income inequality in African countries. Thus, bottlenecks in the supply of educated and skilled labor may condemn African countries to high levels of income inequality. This calls for active social intervention, including targeted and high-quality education and training policies addressed to increasing the supply of skilled labor. Actions to equalize opportunities in formal education need to ensure that all children acquire at least a basic level of skills necessary to participate in society and in today's global economy. As the World Bank (2007b) had argued, greater access should be complemented by supply-side policies (to raise quality) and demand-side policies (to correct for the possibility that parents may under-invest in the education of their children for various reasons). Supply side policies would include increasing teachers' incentives, enhancing the basic quality of schools' physical infrastructure, and researching and implementing teaching methods to increase the learning performance of students who do not do well when left to their own devices. On the other hand, demand side policies would include scholarships conditional on attendance, bringing in excluded groups and to bring up those left behind through remedial education, and developing the accountability of schools and teachers to students, parents, and the broader to help ensure effective service provider behavior (World Bank, 2007b).

Other policy reforms should include a mixture of the following: Measures that guarantee that those being laid off in the course of the current financial and economic crises are properly protected against substantial losses of disposable income, including the use of unemployment benefits; during the crisis period, African governments should ensure that workers are not summarily laid off by encouraging social dialogue and ensuring that labor rules are respected and that the crisis does not become an excuse for government agencies and firms to fire workers; and since unemployment benefits, social protection and employment protection are part of the core ILO labor conventions that member states have ratified, it is imperative that these conventions are being upheld, in spite the adverse economic developments that countries are going through due to the crisis. Indeed, the crisis provides a unique opportunity for the majority of African countries that are still lacking proper social insurance systems to enact innovative policies and strengthen labor legislation.

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