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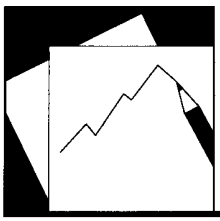

IMF Working Paper

Impact of Remittances on Poverty and Financial Development in Sub-Saharan Africa

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Abstract

This paper assesses the impact of the steadily growing remittance flows to sub-Saharan Africa (SSA). Though the region receives only a small portion of the total recorded remittances to developing countries, and the volume of aid flows to SSA swamps remittances, this paper finds that remittances, which are a stable, private transfer, have a direct poverty mitigating effect, and promote financial development. These findings hold even after factoring in the reverse causality between remittances, poverty and financial development. The paper posits that formalizing such flows can serve as an effective access point for "unbanked" individuals and households, and that the effective use of such flows can mitigate the costs of skilled out-migration in SSA.

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Contents

I. INTRODUCTION

The flow of remittances into developing countries is attracting increasing attention because of their rising volume and their impact on the receiving countries. In 2005, they totaled US$188 billion—twice the amount of official assistance developing countries received.[2] Moreover, there is evidence that such flows are underreported. Remittances through informal channels could add at least 50 percent to the globally recorded flows (World Bank, 2006).[3] Since 2000, remittances to developing countries have increased on average by 15 percent in annual terms. Though at least some part of the growth is attributable to better reporting by recipient countries, it appears that over the last decade remittances have outpaced private capital flows and official development assistance (World Bank, 2006).

Remittances are perceived as being more stable than other external flows. To the extent that migrants are motivated by altruism and send more money home in times of economic distress, remittances may actually be countercyclical. The stability of these inflows also opens up an opportunity for developing countries to lower borrowing costs in international capital markets by securitizing future flows of remittances.[4] Because remittance receipts are widely dispersed, they may not cause the real exchange rate to appreciate; they may also obviate the deleterious effect on home country institutions observed in short-lived natural resource booms.

There are marked regional differences in remittance flows.[5] Since the 1980s, remittances to countries in Latin America, the Caribbean, and the East Asia and Pacific regions have grown more rapidly than the average for developing countries generally. In 2005, the top three recipients—China, India and Mexico—accounted for more than one-third of the remittances to developing countries. Among the top 25 recipients of remittances, only one (Nigeria) is in

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[2] As in other studies on the topic, the remittance data referred to here are aggregate worker remittances, compensation to employees, and migrant transfers series from the IMF Balance of Payments database, supplemented by the data from World Bank (2006). All 2005 remittance data are estimates provided by Dilip Ratha of the World Bank. Appendix Table 1 has details on remittance flows to SSA countries over the last ten years.

[3] Even where migrants use formal channels, the reporting of "small" remittances is not mandatory in most countries.

[4] However, since remittances are private transfers foreign borrowing against such flows would only be possible with additional stipulations like surrender requirements, prohibition of foreign currency accounts and/or taxes on remittances.

[5] See Appendix Figure 1.

sub-Saharan Africa (SSA) but three of the eight countries in South Asia (Bangladesh, India, and Pakistan) appear on the list.[6]

Studies using household-level data from individual countries in SSA have yielded some insights into how remittances are used at the micro level. In studying the impact of remittances at the aggregate level most analysts have concentrated on Latin America or South Asia, where the volumes swamp those going to SSA. But at their core remittances are private intrafamily/intracommunity income transfers that directly address the single most relevant challenge for SSA—poverty. Further, the long-term development potential of such transfers is determined by the use of the portion of remittances left over after basic consumption needs are met. The purpose of this paper is to study both these issues in a part of the world where the role of remittances has received comparatively little attention.

This paper analyzes the size and significance of remittance flows to SSA. Section II documents the volume and characteristics of remittances to the region, and discusses the dimensions and the related cost of brain drain from SSA countries. Section III estimates their impact; first the immediate consumption effect of remittances on poverty is investigated, using a cross-section dataset comprised in significant proportion of SSA countries. This is followed by the analysis of the indirect consequence of remittances. Because migrant transfers entail cross-border flows of relatively modest sums of money to low-income households, they present an opportunity for these households to access formal financial services. The paper therefore investigates how remittances affect financial development in SSA countries. Section IV concludes with a discussion of the market for money transfers in SSA and suggests how to enhance the effectiveness of remittances in the region.

II. Remittances to Sub-Saharan Africa

A. Recent Trends

Sub-Saharan Africa has been part of the increasing global trend; remittances to SSA have increased by over 55 percent in U.S. dollar terms since 2000, while they increased for developing countries as a group by 81 percent.[7] However, the recorded remittances are only a small fraction of total remittances to SSA. Freund and Spatafora (2005) estimate that informal remittances to SSA are relatively high at 45–65 percent of formal flows, compared to only about 5–20 percent in Latin America.

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[6] Sub-Saharan Africa refers to the 44 countries listed in the Data Appendix.

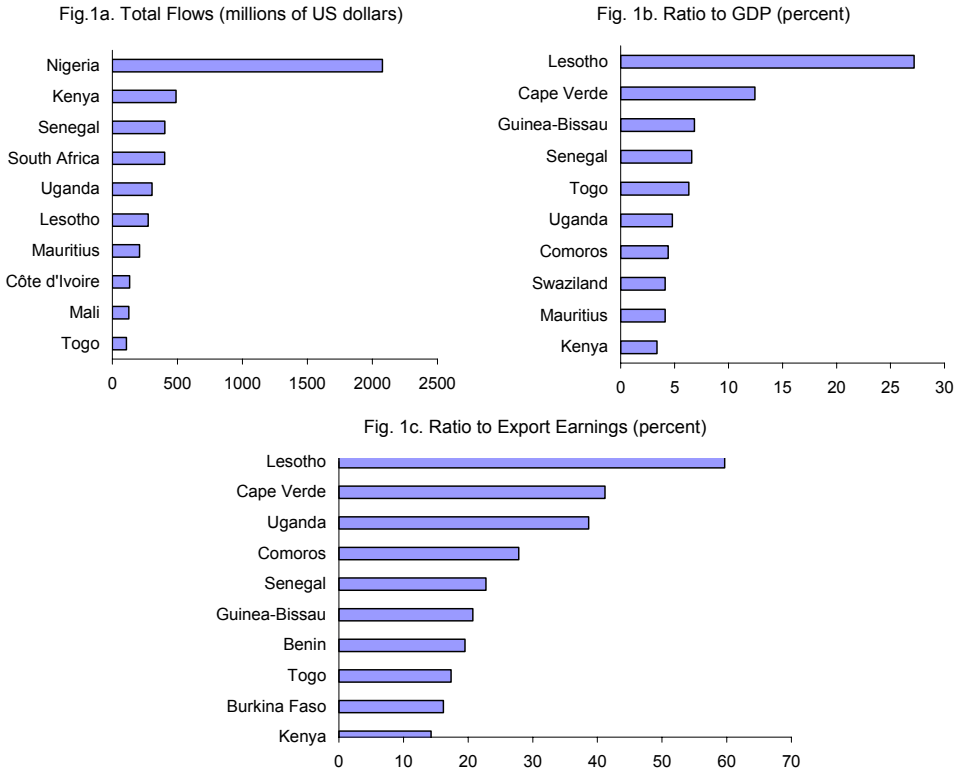
[7] This growth at least in some part reflects better reporting. Also, since the underlying data are in U.S. dollars, changes in the value of the dollar are captured in measuring the growth of nondollar remittances.

In 2005, remittances to the 34 SSA countries reporting are estimated to have been about US$6.5 billion. Remittance flows to SSA are relatively small, 4 percent of total remittances to developing countries and just 33 percent of those to India, which receives the most. In contrast, countries in Latin America and the Caribbean received 25 percent of all remittances, as did the countries of the East Asia and Pacific region.[8]

Relative to GDP, too, the volume of remittances to SSA is generally smaller than in other developing countries. On average remittances in the region are about 2.5 percent of GDP, compared to almost 5 percent for other developing countries. However, there are striking exceptions in SSA. In particular, remittances were almost 28 percent of GDP in Lesotho, and more than 5 percent in Cape Verde, Guinea-Bissau, and Senegal. In absolute terms, however, Kenya, Nigeria, and Senegal are the largest recipients of remittances in the region.

For some countries, remittances are also an important source of foreign exchange. For Lesotho, Cape Verde, Uganda, and Comoros, for instance, remittances have since 2000 amounted on average to more than 25 percent of export earnings (Figure 1).

Figure 1. Top Ten Recipients of Remittances in Sub-Saharan Africa

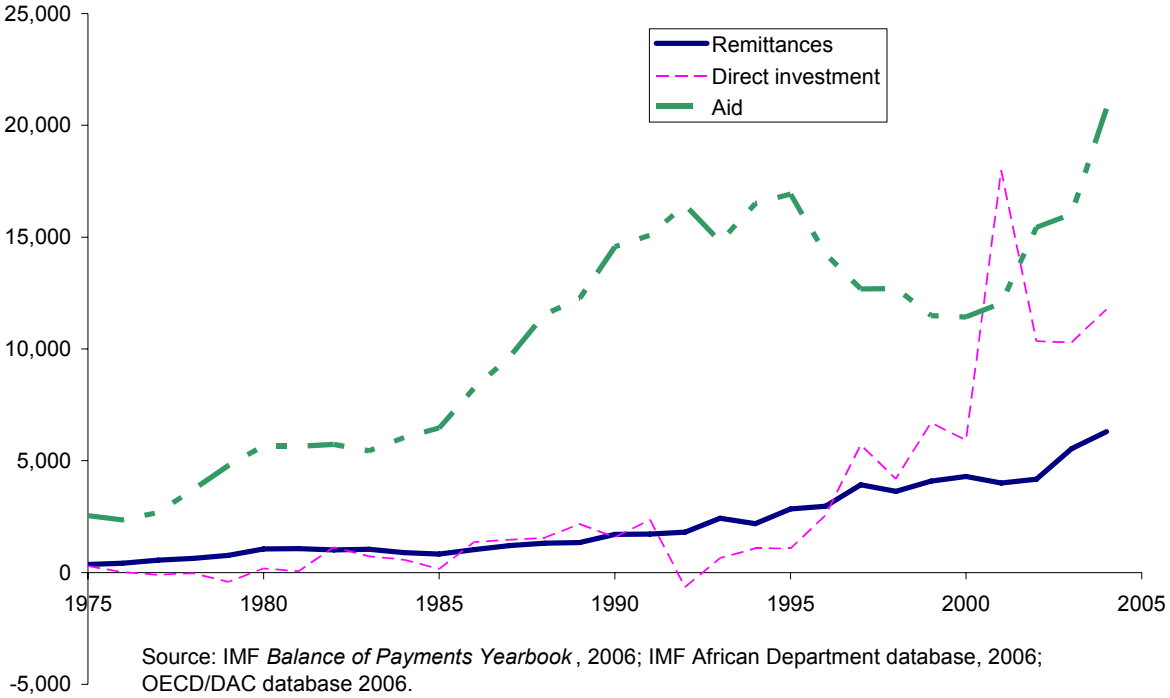


Source: IMF, *Balance of Payments Yearbook*, 2006; *World Economic Outlook*, 2006; World Bank staff estimates.
Note: Rankings are based on average remittance inflows for 2000–05.

[8] See Appendix Figure 2.

In SSA, aid flows are considerably higher than remittance receipts (Figure 2). Since 2000 aid flows to the region increased on average by about 13 percent a year and reported remittances by almost 10 percent. However, during the 1990s, when aid flows to the region were more or less stagnant, remittances grew annually at more than 13 percent. And in 2005 when aid flows to the region (excluding Nigeria) fell, remittances were stable (OECD/DAC, 2006). While it is true that the region as a whole receives more aid than recorded remittances, for countries like Lesotho, Mauritius, Nigeria, Swaziland, and Togo, remittances are consistently greater than official assistance.

Figure 2. Inflows to SSA countries, 1975-2004
(Millions of U.S. dollars)



Source: IMF *Balance of Payments Yearbook*, 2006; IMF African Department database, 2006; OECD/DAC database 2006.

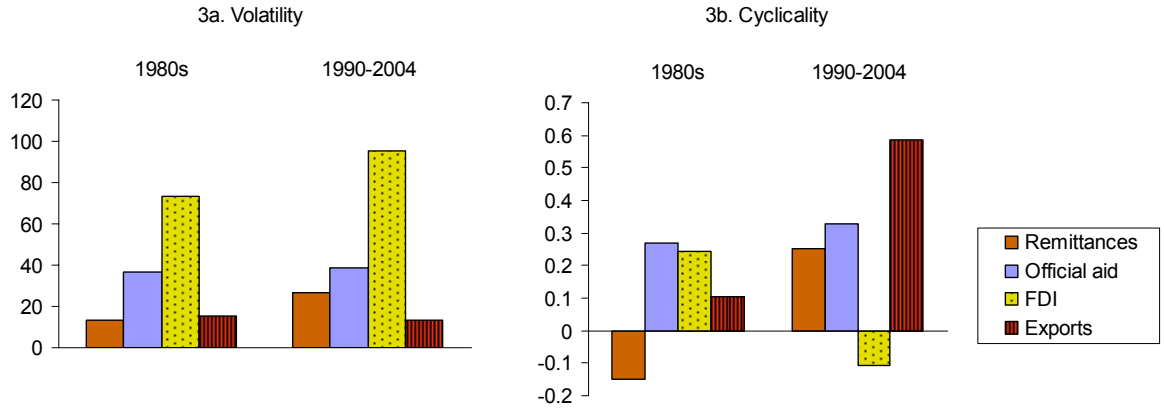
The balance of payments data used above probably underreports remittance flows between developing countries. Despite the paucity of records there is reason to believe that intraregional migration is common in SSA. Botswana and South Africa tend to attract migrants from neighboring countries (largely unskilled) in search of employment. The strong sociocultural ties in West Africa also encourage labor mobility. In East Africa, political turmoil seems to be the driving force in migration.

B. Characteristics of Remittances to SSA

One reason remittances have attracted attention is that they are seen as more stable than other foreign currency flows to developing countries. This is especially relevant to SSA, where official aid flows have fluctuated considerably from year to year. Remittances to SSA are not just consistently less volatile than official aid, they are also less volatile than FDI, which is usually seen as the most stable private flow (Figure 3a). In the 1990-2004 period however export earnings are more stable than remittances.

Remittances might also be expected to be countercyclical to the extent that they are motivated by the altruism of migrant workers and increase in times of economic distress in their home countries. Remittances to SSA are counter-cyclical only in the 1980s (Figure 3b). Since 1990 remittances have been procyclical, though less so than either official aid or export earnings. The low (though positive) correlation coefficient demonstrates the stability of remittances over time rather than any strong relationship to growth cycles.[9] The countercyclicality of FDI flows in the latter time period must be viewed in the context of the very high volatility of such flows.

Figure 3. Volatility and Cyclicality of External Flows to Sub-Saharan Africa



Source: IMF Balance of Payments Yearbook, 2006; IMF African Department database, 2006;World Bank staff estimates; OECD/DAC, 2006.

[9] Lueth and Ruiz-Arranz (2006) also find that remittances do not increase after a natural disaster, and are in fact aligned with business cycles for 11 recipient countries in Asia and Central Europe.

Remittances can also contribute to stability by lowering the probability of current account reversals. Because they are a cheap and stable source of foreign currencies, remittances are likely to stem investor panic when international reserves are falling or external debt is rising. These beneficial effects are particularly strong for countries where remittances are above 3 percent of GDP (Bugamelli and Paterno, 2006). While the average SSA ratio is just below that threshold and currrent account reversals driven by investor panic are rare, for some countries this effect might be an additional benefit from remittances.

The impact of remittances on the real exchange rate and export competitiveness, their Dutch disease effect, is a matter of debate. As in the case of any other transfer (for instance, official aid) the effect depends on the proportion of such flows spent on domestic goods, in particular non-tradables (Gupta, Powell, and Yang, 2006). Since remittances are private transfers dispersed over a large number of poor households it has been argued that their impact on domestic demand differs from that of donor-funded infrastructure projects (World Bank, 2006). Remittances may in fact be self-correcting as an overvalued currency deters remittances, and hence Dutch disease effects are not sustained (Rajan and Subramanian, 2005). However, studies in Latin America (Amuedo-Dorantes and Pozo, 2004) and Cape Verde (Bourdet and Falck, 2006) have found evidence that remittances do have Dutch disease effects on the competitiveness of the tradable sector. In countries where remittances inflows are large compared to the size of the economy, where supply constraints are a significant hindrance to the expansion of the nontradables sector, and where a significant portion of remittances are spent on domestic goods policymakers will need to be alert to the possibility of a Dutch disease phenomenon.

C. Remittances and Brain Drain

Remittances are only one dimension of the phenomenon of migration from low-income countries. In particular, skilled migration has always been associated with concerns about brain drain, which might be especially costly for some SSA countries (Kapur and McHale, 2005; Carrington and Detragiache, 1998). Pond and McPake (2006) detail the human resource crisis in the health sector in SSA countries that arises as skilled health care professionals increasingly find employment in the high-demand OECD countries. They calculate that almost a quarter of the new overseas-trained physicians that registered with the U.K.'s National Health Service between 2002 and 2003 came from SSA. Similarly, Bach (2006) documents the high job vacancy rates in the public health systems of countries like Ghana due to large-scale migration. He estimates that in Zambia and Zimbabwe the annual rate of attrition in public health employment can range from 15 to 40 percent.

On average 20 percent of the SSA tertiary-educated population older than 15 work in OECD countries. Less than 10 percent of the comparator group from South Asia is found there. For some countries, such as Angola, Guinea-Bissau, and Mozambique, expatriation rates are in excess of 50 percent of the educated population.

We look into the issue of brain drain by calculating the difference between the expatriation rates of the educated over-15 population from country i and the rate at which the general over-15 population migrate to an OECD country.[10] Because the emigrant population tends to be better educated, it is to be expected that in general the difference between the educated and the general expatriation rates will be positive. With a few exceptions, such as Mexico, Turkey, Bulgaria, and several OECD countries, this holds true. Moreover, the larger the difference between the educated and general expatriation rates, the higher the propensity of skilled workers to emigrate compared to the general propensity to emigrate.[11]

There are interesting regional differences in the extent to which the educated exceeds the general expatriation rate (Figure 4). Within the OECD countries there is almost no difference. Among developing countries the largest difference is observed for SSA countries, reflecting the strain on domestic economies from skilled emigration.[12]

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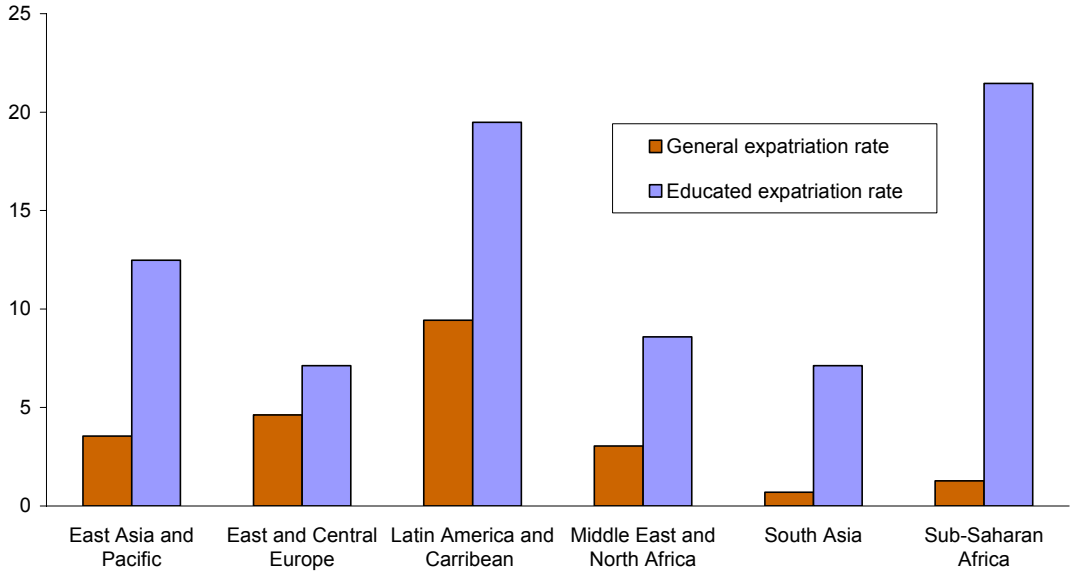
[10] "Educated" refers to the segment of the population that has received a tertiary education. Expatriation rates are calculated as the ratio of emigrant population to the total population (emigrant plus resident) within a group.

[11] This makes it possible to distinguish countries like Barbados where both general and educated migration rates are high from countries like Burundi where educated migration rates are far greater than the general propensity to migrate. The two phenomena are likely to impact the local labor markets quite differently, but the latter is closer to what we understand as brain drain.

[12]Since the data refer to migration to OECD countries, they may overstate the difference between general and skilled migration from SSA. General expatriation rates for SSA are likely to be underestimated given the high volumes of intraregional, undocumented migration by low-skilled workers.Low-skilled workers in SSA do not have the same geographic proximity to OECD countries as those in North Africa or East and Central Asia or Latin America, so in SSA intraregional migration is a more likely option for low-skilled workers. At the same time, the high expatriation rates of skilled workers reflect at least to some extent the small base of such workers in SSA populations.

Figure 4. Regional Expatriation to OECD Countries
(Percent)



Source: OECD, Trends in International Migration database, 2006.
Note: The data are from census and labor force surveys carried out in OECD countries in or about 2000.

For some countries in SSA the shortage of skilled personnel can be quite severe; more than a third of their educated workforce migrates (Table 1). Among the top 10 countries listed, six are from SSA. Among the top 20 countries, 75 percent are in SSA.

Table 1. Expatriation Rates: Top Ten Countries

	Educated Expatriation Rate	General Expatriation Rate	Difference
Guinea-Bissau	70.4	3.6	66.8
Haiti	68.0	8.8	59.2
Mozambique	52.3	0.8	51.5
Angola	53.8	2.9	51.0
Trinidad and Tobago	66.1	22.1	43.9
Jamaica	72.6	30.6	42.0
Mauritius	50.3	9.3	41.0
Guyana	76.9	36.5	40.4
Gambia	42.4	2.6	39.8
Burundi	35.0	0.3	34.7

Source: OECD, Trends in International Migration database, 2006.
Note: Countries are ranked by the difference between the educated and the general expatriation rates.

III. Impact of Remittances

A. Direct Income and Consumption Effect of Remittances

In SSA, remittances are part of a private welfare system that transfers purchasing power from relatively richer to relatively poorer members of a family or community. They reduce poverty, smooth consumption, affect labor supply, provide working capital, and have multiplier effects through increased household spending. Anecdotal evidence suggests that most often women head the recipient households.

For the most part, remittances seem to be used to finance consumption or investment in human capital, such as education, health, and better nutrition.[13] In Zimbabwe, for instance, households with migrants have less cultivated land but tend to be slightly better educated (de Haan, 2000). Quartey and Blankson (2004) find that migrant remittances to Ghana are in fact countercyclical and are effective in helping smooth household consumption and welfare over time, especially for food crop farmers, who are typically the most disadvantaged socioeconomic group. Similarly, using data from a large household survey Adams (2006) finds that international remittances significantly relieved poverty among the "poorest of poor households." Ratha (2003) suggests 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. Some studies (Hanson and Woodruff, 2003; Cox Edwards and Ureta, 2003) have found evidence for "forward" linkages between remittances and human capital formation in Latin America.

The evidence on the direct impact of remittances on poverty and inequality seems to vary according to the sample (Adams, 1991; Barham and Boucher, 1998). Earlier studies posited that migration was 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 (Stahl, 1982; Lipton, 1980). More recently, it has been found that migration patterns in East European and former Soviet Union countries are such that richer households receive greater remittances than do poorer households (World Bank, 2007). However, Koechlin and Leon (2006) find that as migrant communities form 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

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[13] Altruism may not completely explain the intrafamily transfer of resources. Often migrant workers remit money to maintain their stake in family property, perhaps with a view to returning in the future. Lucas and Stark (1985) found that in Botswana not only do remittances rise with the size of the migrant's income but there is also a positive relationship between the level of remittances and the receiving household's preremittance income. The insurance motive for remittances was supported by a study using survey data from Western Mali (Gubert, 2002).

of poorer rural households (Stark and Taylor, 1989; Adams, 1991). Studies covering a larger sample of countries have found evidence that remittances tend to lower poverty (Adams and Page, 2005; Spatafora, 2005).

In the rest of this section, we investigate the direct poverty-reducing impact of remittances using a sample that gives greater representation to SSA countries than other studies.[14]

Empirical model

We use a methodology similar to that of Adams and Page (2005), to examine the impact of incoming remittances on poverty. We build on their model by adopting the three-stage least squares estimation technique that allows for the simultaneous determination of poverty and remittances. Based on Ravallion (1997) and Ravallion and Chen (1997) we model poverty as a function of mean income, some measure of income distribution, and the variable of interest, remittances. The baseline specification is

$$\text{Log}\,(P_{it}) = \alpha_i + \beta_1 \log(\mu_{it}) + \beta_2 \log(g_{it}) + \beta_3 \log(x_{it}) + \varepsilon_{it}, \qquad (1)$$

$$(i = 1.....N,\ t = 1....T_i),$$

where P is poverty in country i at time t; α_i captures fixed effects; μ is per capita income, which functions as a measure of average consumption; *g* is income inequality as measured by the Gini index; and *x* is remittances. The model assumes that poverty is reduced as mean income rises; hence, β_1 is expected to be negative. Based on previous studies we expect higher poverty to be associated with greater income inequality; hence, β_2 is expected to be positive. Controlling for these two variables the model estimates the sign and magnitude of β_3, which indicates the direct impact of remittances on poverty.

Data

Making use of poverty surveys beginning in 1980, the dataset consists of 76 countries and 233 observations.[15] SSA countries are substantially represented: 23 percent of the

[14] Using poverty surveys restricts the number of data points so that estimation results from any single regional group are not significant.

[15] Appendix Table 2 lists the countries and survey years of the dataset.

observations come from the 24 SSA countries in the sample. To our knowledge giving this weight to SSA countries is atypical for cross-country studies on remittances.[16]

The poverty and inequality measures used here are from the World Bank's PovcalNet database,[17] which incorporates various measures of poverty: headcount poverty measures the percentage of the population living on less than one PPP dollar a day. The poverty gap, the mean distance below the poverty line as a proportion of the poverty line, tells us how poor the poor are—how far below the poverty line the average poor person's income is. The squared poverty gap, which is the mean of the squared distance below the poverty line as a proportion of the poverty line, is more sensitive to the distribution of the poor below the poverty line. The income distribution measure, the Gini coefficient, is available from the same survey data.

Remittances are expressed as a ratio of the GDP of recipient countries. The income variable is per capita GDP in constant 2000 U.S. dollars. Other variables used in the three-stage estimation are educational attainment, proxied by average years of schooling for the over-25 population, and openness, measured by the ratio of imports plus exports to GDP. These variables are all measured as five-year averages corresponding to the survey year in the PovcalNet database. (Appendix Tables 3 and 4 provide detailed descriptions of the raw dataset.)

Results

The following estimation techniques were applied to equation 1. The log transformation of all the variables allows us to interpret the coefficients as elasticities. Regional dummies have been introduced to control for fixed effects.

Ordinary least squares (OLS) estimates from our sample conform to the predictions of the model (Appendix Table 5). Regardless of the measure of poverty used as the dependent variable, per capita income has a negative and significant coefficient. A positive and significant coefficient for the Gini index indicates that greater inequality is associated with higher poverty. We estimate a negative elasticity between poverty and incoming remittances; this result is quite consistent. Except in the case where the left side variable is the squared poverty gap , this result is always significant. Prima facie our findings indicate that a 10 percent rise in the inflow of remittances is associated with about a 1 percent fall in

[16] Almost 32 percent of the observations in the dataset come from Latin American and Caribbean countries, 11 percent from the East Asia and Pacific region, almost 18 percent from East Europe and Central Asia, 10 percent from the Middle East and North Africa, and 6 percent from South Asia.

[17] For details on this and other data sources see the Data Appendix.

headcount poverty and the poverty gap. [18] In keeping with the regional focus of the paper, we also introduce an interaction term between remittances and a dummy for SSA (Appendix Table 6). While the overall poverty reducing effect of remittances remains, the coefficient on the interaction term comes in with a positive sign. Although this effect is not always significant it raises the possibility that in SSA the severity of poverty might be motivating greater out-migration, so that poverty is positively associated with remittances.[19] The issue of reverse causality is taken up next.

Ordinary least squares estimates are likely to be biased when any right side variable is endogenous. Moreover, we can argue that the relationship between poverty and remittances is unlikely to be unidirectional. To tackle this issue a system estimation technique that allows for both poverty and remittances to be determined simultaneously is adopted. *Three-stage least squares* is often described as the system equivalent of a two-stage least squares.[20] The advantage is that estimating a system of equations where both poverty and remittances are endogenously determined allows us to observe not just the effect of remittances on poverty, but also the reverse effect of poverty of remittances. The price for this is that a misspecification error in one of the system equations is transmitted through the system.

The specification for the poverty equation is the same as in equation 1. We also estimate remittances (Rem) as a function of poverty (Pov), trade openness (Trade), schooling (Sch), distance (Dist) from the main remittance source country, a dummy for dual exchange markets (Dual), and lagged remittances (Rem_{t-1}).

$$\text{Log}\,(Rem_{it}) = \alpha_i + \beta_1 \log (Pov_{it}) + \beta_2 \log (Trade_{it}) + \beta_3 \log (Sch_{it}) + \beta_4 \log (Dist) + \beta_5 \text{Dual} + \beta_6 \log (Rem_{it-1}) + \varepsilon_{it}, \quad (2)$$

$(i = 1.....N, t = 1....T_i)$,

[18] Appendix Table 7 reports the OLS results when the sample is restricted to countries where remittances amount to more than 1 percent of GDP. This is a macro replication of the micro idea that the poverty-reducing effect of remittances is likely to be enhanced when the sample includes only households that have migrant workers—those that actually receive income transfers. The higher elasticities with this restricted sample support the idea that a more general sample dilutes the poverty-reducing impact of remittances.

[19] A postestimation test of the OLS coefficients suggests that the sum of the average effect of remittances for all countries and the coefficient on the interaction term is not different from zero. While this does suggest that the relationship between poverty and remittances in SSA might be different there are not enough observations from the region to pursue this issue. Instead we explore the issue of reverse causality using a three-stage least squares estimation for the full sample.

[20] The three-stage least squares technique involves simultaneously generating two-stage least squares estimates of all the equations in the system. The technique allows for nonzero contemporaneous correlations between the disturbances in different equations. If the disturbances are uncorrelated, the three-stage least squares technique reduces to a two-stage least squares.

Migration is the best determinant of remittances, but migration data are likely to suffer from the same problems as data on remittances. Thus we use other variables suggested by the literature on the motivation to migrate and remit. To the extent that remittances represent a private welfare transfer, we can expect them to be higher where there is widespread poverty; hence, we expect a positive sign for β_1. If labor mobility and commodity trade are complementary in more open economies, we can also expect a positive sign on the openness variable. If, on the other hand, goods mobility substitutes for labor mobility, β_2 would be less than zero.

The sign of β_3 is subject to two countervailing influences. Because the general tendency is for the migrant population to be better educated than the general population, we can expect more schooling to be associated with greater migration and remittances. At the same time, educational attainment also serves as a proxy for development in the recipient country and hence more years of schooling may indicate less need to seek employment abroad. The distance variable here is the geographic distance between the recipient country and the OECD country with the largest migrant population from the recipient.[21] The expectations for the sign of its coefficient are ambiguous. On the one hand, because distance captures the difficulty of migration, one can expect β_4 to be less than zero. On the other hand, because of the implication that it takes a more educated migrant to overcome the higher cost of migration, one can expect higher remittances from the source country. Restrictions in the foreign exchange market can be deterrent to remittances (or at least the flows going through formal channels) and hence β_5 is expected to have a negative sign. And finally, given the stability of out-migration and remittance flows, we can expect the previous period's remittances to be a significant predictor of this period's remittances, and hence β_6 is expected to be greater than zero.

Table 1 reports the results from the *three-stage least squares* estimation. The hypothesis of reverse causality between poverty and remittances finds support in the positive coefficient on poverty as a right hand side variable when remittances are endogenously modeled. Trade openness is also a consistently positive and significant determinant of remittances in this two equation system. As expected lagged remittances are significant, positive predictor of current remittances. For our sample of countries, none of the other control variables are significant determinants of remittances.

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[21] Since only OECD members keep detailed records of their immigrant population we are restricted to using only these countries as the source countries for remittances. This assumption may be questioned in SSA where intraregional migration is common, and where, for instance, South Africa might be a more significant source country.

Table 2. Three-Stage Least Squares Estimation

	Headcount Poverty		Poverty Gap		Squared Poverty Gap	
	Poverty	Remittances	Poverty	Remittances	Poverty	Remittances
Per capita GDP (constant 2000 dollars)	-1.14***		-1.33***		-1.38***	
	(-10.06)		(-10.47)		(-9.43)	
Gini coefficient	1.97***		1.96***		2.44***	
	(4.16)		(3.66)		(4.04)	
Inflow of remittances (ratio to GDP)	-0.15***		-0.11**		-0.08	
	(-2.86)		(-1.89)		(-1.23)	
Poverty		0.21*		0.19**		0.21**
		(1.86)		(1.98)		(2.08)
Schooling		-0.05		-0.05		0.09
		(0.20)		(0.19)		(0.34)
Trade openness		0.65***		0.68***		0.65***
		(2.71)		(2.87)		(2.65)
Distance		0.01		0.08		0.10
		(0.08)		(0.58)		(0.72)
Dual exchange market (dummy)		-0.01		-0.02		-0.02
		(-0.05)		(-0.07)		(-0.09)
Lagged remittances		0.70***		0.69***		0.69***
		(11.52)		(11.52)		(11.36)
Europe and Central Asia	-1.94***		-1.05**		-0.38	
	(-4.69)		(-2.28)		(-0.72)	
East Asia and Pacific	-0.40		-0.50		-0.20	
	(-1.15)		(-1.27)		(-0.44)	
Latin America and Caribbean	-0.16		0.60		0.71	
	(-0.44)		(1.34)		(1.50)	
Middle East and North Africa	-1.86***		-1.72***		-1.57***	
	(-4.87)		(-4.03)		(-3.24)	
Sub-Saharan Africa	-0.70*		-0.28		-0.18	
	(-1.97)		(-0.71)		(-0.40)	
Constant	12.32***	-3.13*	11.92***	-3.54**	11.61***	-3.45**
	(12.47)	(-1.96)	(10.96)	(-2.24)	(9.21)	(-2.10)
Observations	156	156	155	155	152	152
Adj R^2	.72	0.53	0.70	0.54	0.64	0.55
F-Statistic	51.45	30.71	45.93	30.95	34.61	31.02

Note: ***,**,and *, indicate significance at the 1, 5 and 10 percent.

The effect of per capita income and income inequality is consistent with the OLS results. When endogenously determined in this manner, the poverty-reducing effect of remittances still remains, and the magnitude of this effect is very similar to the OLS estimates. However, the average remittance-inducing elasticity of poverty is consistently greater than the average poverty-reducing elasticity of remittances. This suggests that for SSA countries in the sample the impact of poverty on out-migration and remittances might be greater than the impact of remittances on poverty.

B. Impact on Financial Development

The immediate welfare-enhancing role of remittances is critical at both the household and the country level. However, it does not fully explain the usefulness of remittances as a source of

development finance. To understand how remittances affect long-term growth potential we next turn our attention to an indirect consequence of cross-border money transfers: their impact on financial development. Because migrant transfers entail cross-border flows of relatively modest sums of money, they present an opportunity for low-income households to access formal financial services. This most likely begins with savings products but the growing interest that microfinance institutions have shown in this segment of the market raises the possibility of access to small business start-up capital for individuals previously excluded from the formal sector.

The impact of remittances on growth depends on how recipient households use them. Once again empirical studies yield an array of possibilities. One view is that remittances would mostly be used for consumption, sometimes even conspicuous consumption, and that the same community characteristics that led to migration also dampen the productive use of incoming remittances. Caceres and Saca (2006) find that in El Salvador remittances were accompanied by a sharp decline in savings, so that economic activity actually contracted. Yet Woodruff and Zenteno (2001) estimate that remittances accounted for about 20 percent of the capital invested in microenterprises in urban Mexico and that the impact is stronger for female-owned businesses. Lucas (1987) found that any effects on rural output of the loss of labor due to migration to South African mines from Botswana, Lesotho, and Malawi are offset in the long run by investments in farm technology. However, Rozelle, Taylor, and deBrauw (1999) estimate that farm investments only partially offset the decline in rural output due to migration.[22]

Given the decentralized decision-making process that characterizes the use of remittances, it is difficult to gauge their aggregate effect. The impact of remittances on growth in cross-country studies is inconclusive. Studies that focus on the labor supply response of recipient households find that remittances lower growth (Chami, Fullenkamp, and Jahjah, 2003; Azam and Gubert, 2005). However studies that link remittances to investment, where remittances either substitute for or improve financial access, tend to conclude that remittances stimulate growth (Giuliano and Ruiz-Arranz, 2005; Toxopeus and Lensink, 2006). While the evidence on the contemporaneous impact of remittances on growth may be mixed, it is likely that remittances can affect long-term growth by fostering financial deepening.

The positive impact of financial development on growth has been extensively documented (Levine, 1997, 2004; Rajan and Zingales, 1998; Beck, Demirguc-Kunt, and Levine, 2004).

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[22] Asymmetric information does raise the possibility of moral hazard on the recipient's side. Since migrant workers are typically unable to monitor the use of their transfers, there is an incentive for household members to curtail their own labor effort, using the supplemental income from remittances to maintain their standard of living. Azam and Gubert (2005) found that in the Kayes region of western Mali widespread migration lowered recipient productivity.

For SSA countries in particular, lack of access to formal financial services is a significant impediment to financial deepening (Gulde and others, 2006). Migrant transfers can create an avenue for unbanked households to avail themselves of some of the products offered by formal financial providers.

Data and model

We investigate the impact of remittances on financial development in SSA countries using an unbalanced panel of 44 countries and six time periods, composed of five-year averages from 1975 through 2004. Our baseline specification closely follows Aggarwal, Demirguc-Kunt, and Peria (2006), but we restrict our sample to observations from SSA only. Financial development is alternatively proxied by the ratio of bank deposits to GDP and the ratio of M2 to GDP. Remittances are measured in relation to recipient country GDP, as defined elsewhere in the paper. The regressions also include the following control variables:

- The size of the economy is captured by the log of GDP in constant U.S. dollars.
- Per capita GDP is a proxy for the degree of institutional development.
- Inflation is measured as the annual change in the CPI.
- A dummy variable signifies a dual exchange rate regime as a measure of capital account openness.
- The ratio of import and exports to GDP proxies current account openness.
- The sum of FDI and development assistance to GDP serves as an alternative measure of openness.[23]

The core model can therefore be written as

$$FD_{it} = \beta_1 Rem_{it} + \beta_2 X_{it} + \alpha_i + u_{it} \qquad (3)$$

where i identifies the cross-section and t the time period, *Rem* is the variable of interest, *X* is the vector of control variables, α_i captures the country-specific effect, and u_{it} is the error term.

[23] The dataset is described in detail in Appendix Tables 8 and 9.

Results

Table 3 reports the results from both the random and the fixed effects panel regressions. In all instances remittances are significant as a positive determinant of financial development. For SSA countries the size of the economy seems unrelated to financial development.[24] Similarly, while per capita GDP seems to significantly affect financial development, the magnitude of the effect is surprisingly small. Capital and current account openness are both associated with greater financial development. [25]

Table 3. Baseline Panel Estimation

	Random Effects		Fixed Effects	
	Deposits	M2	Deposits	M2
Remittances to GDP	0.65***	0.44***	0.56*	0.47***
	(2.66)	(3.51)	(1.87)	(3.21)
Log(GDP)	3.06***	1.68	2.32	0.06
	(2.47)	(1.21)	(1.15)	(0.02)
Per capita GDP	0.01***	0.01***	0.01***	0.01***
	(7.39)	(5.48)	(5.92)	(4.57)
Inflation	-0.003	0.002	-0.001	0.004
	(-0.52)	(0.43)	(-0.11)	(0.71)
Dual	-3.46**	-3.04	-3.92**	-3.21*
	(-1.98)	(-1.61)	(-2.18)	(-1.66)
Trade openness	0.05	0.09***	0.08**	0.15***
	(1.62)	(2.51)	(2.04)	(3.18)
Other capital flows to GDP	0.2	-0.02	0.21*	-0.06
	(1.87)	(-0.18)	(1.70)	(0.46)
Constant	-62.75**	-23.32	-50.69	6.09
	(-2.30)	(-0.76)	(-1.18)	(0.12)
Observations	150	162	150	162
Adj R^2	0.46	0.35	0.36	0.29

Note:***,**, and * signify 1, 5, and 10 percent significance levels.

[24] This result holds even when South Africa is excluded from the sample.

[25] Recent studies have emphasized the role of non-economic factors in financial development among low-income countries (Detragiache, Gupta, and Tressel, 2005). In Appendix Table 10 we include corruption, internal conflict and political risks as additional control variables, though the limited time series availability of these variables restricts our observations to less than 60 percent of those reported in Table 2. The results indicate that even when the signifcant effect of internal conflict and political risk on financial development in SSA is taken into account, remittances are still positively and signicantly associated with financial development.

Once again these estimates can be biased by endogeneity between financial development and remittances. It can be argued that better-developed financial institutions have a positive effect on remittances flowing through formal channels. To address this we adopt three instrumental variables from Aggarwal, Demirguc-Kunt, and Peria (2006) based on macroeconomic conditions in source countries. Unemployment, GDP growth, and per capita GDP in the source country, while related to remittances, are independent of financial development and other conditions in the recipient country. The results are reported in Table 4.

Table 4. Fixed Effects Panel Instrumental Variables Estimation

	Deposits		M2	
	(1)	(2)	(1)	(2)
Instrumented Variable				
Remittances to GDP	3.47**	2.67***	0.39	4.75***
	(2.61)	(2.37)	(0.44)	(2.99)
Exogenous Variables				
Log(GDP)	2.36	-3.80	-2.07	-10.75
	(0.68)	(-0.61)	(-0.43)	(-1.25)
Per capita GDP	0.02***	0.014***	0.02***	0.01**
	(6.40)	(2.75)	(5.64)	(1.30)
Inflation	0.01	-0.001	0.004	0.003
	(0.18)	(-0.29)	(0.68)	(0.50)
Dual	-3.85	-4.10*	-3.25	-2.45
	(-1.52)	(-1.78)	(-1.49)	(0.71)
Trade openness	0.05	-0.09	0.18***	-0.05
	(0.88)	(-1.20)	(3.48)	(-0.42)
Other capital flows to GDP	0.19	0.48***	-0.03	0.14
	(1.09)	(2.70)	(-0.15)	(0.65)
Corruption		-1.67		-2.77
		(-1.20)		(-1.39
Internal conflict		-1.97**		-2.80**
		(2.46)		(-2.61)
Political risk		0.69**		0.99***
		(2.66)		(2.82)
Constant	-64.15	68.61	44.86	223.66
	(-0.86)	(0.52)	(0.44)	(1.25)
Observations	134	89	145	93
Cragg Donald F-statistic for weak instruments	2.05	3.47	2.13	3.18
Adj R^2	0.08	0.12	0.40	0.41

Note:***,**, and * signify 1, 5, and 10 percent significance levels.

The instrumented remittances variable comes in with a positive coefficient of a magnitude greater than previously estimated. While the impact of per capita GDP on financial development is consistent with the panel estimation, in this specification current and capital account openness are less significant. Source country variables do not perform very strongly as instruments for remittances in our sample, although the Cragg Donald statistic is above the

critical value. [26] In general, however, the estimated effect of remittances on financial development in SSA compares well with the effect estimated by Aggarwal and others (2006) using a larger sample.

IV. Improving the Effectiveness of Remittance Flows

A. Channeling Remittance Flows to Formal Providers

While remittances can facilitate the entry of households into formal financial markets, only a fraction of the sums remitted by migrant workers from SSA finds its way into the formal system. The high fees formal providers charge is a deterrent for poor migrants who want to send small sums of money home, and even if a migrant has access to banks the recipient may not. So migrants rely more on import-export operators, retail shops, and currency dealerships—but there are no records of the transactions these conduct (Sander and Maimbo, 2005). Informal money transfer systems modeled closely on the hawala system in the Middle East dominate the remittance market in several African countries (El Qorchi, Maimbo,and Wilson, 2003). Informal providers offer numerous client-friendly features, such as anonymity, minimal paperwork, and speed.

The cost of transferring funds, especially small sums, is indeed high. A survey of money transfer operators (MTO) in the U.K. found that the fee on money transfers was lower in high-volume corridors like U.K.-India and higher for UK-Africa (Table 5).[27]

Table 5. Fees for Remittances Sent Through Money Transfer Operators in the U.K.

(Percent of amount)

	Ghana		Kenya		Nigeria		India		Speed of transfer
Transfer amount	£100	£500	£100	£500	£100	£500	£100	£500	
Chequepoint	3	3	6	4.2	5	5	n.a.	n.a.	Up to 24 hours
First Remit	5	4.2	n.a.	n.a.	5	4.2	5	4.2	Up to 24 hours
Money Gram	12	7.2	12	7.2	7	5	12	4	10 minutes/instant
Travelex Money Transfer	7.5	4.8	n.a.	n.a.	7.5	4.8	n.a.	4.8	10 minutes/instant
Western Union	12	6.4	14	7.4	12	6.4	4	0.8	10 minutes/instant

Source: DFID, 2006.
Note: Since the fees can change due to exchange rate changes, the number should be interpreted as indicative rather than precise.

[26] We also weight the source country variables by the general expatriation rate to improve the fit of the instruments. The results are reported in Appendix Table 11 and are not materially different from those reported above.

[27] DfID, 2006. This pattern also holds for the high-volume U.S.-Mexico corridor, where since 2000 the cost of remitting money has almost halved (Serrano, 2006).

The market in money transfers between developing countries in SSA is underserved by formal institutions, and the prohibitive fees they charge severely depress their use. A study in South Africa (Genesis Analytics, 2003) found that the comparative cost of an R250 international transfer was the lowest when a "friend" or taxi driver was used to effect the transfer and highest when banks were used. Though cross-border Post Office transfers are competitively priced, they are not as fast or as secure. Table 6 compares the cost of remitting R300 from South Africa by provider and method of transfer.

The absence in South Africa of a major MTO like Western Union further limits competition among the players in the formal market and increases the likelihood that migrant workers will use informal channels to send money home. The terrorist attacks of September 11, 2001, have increased the scrutiny of international money transfers and many banks are imposing more identification requirements on both individuals and small MTOs (Sander and Maimbo, 2003). In South Africa only authorized dealers, who must have a banking license and have invested in an expensive exchange control reporting system, can remit funds. By further increasing the effective cost the rules discourage remittances through formal channels (Genesis Analytics 2005).

Table 6. Fees for Remittances from South Africa

(Percent of 300 Rand Transfer)

			Amount Received in Local Currency			
Method of Transfer	Provider	Transfer Fee	Botswana	Lesotho	Malawi	Mozambique
Bank draft	FNB	52.6	120.8	142.1	2688.5	142.1
	Nedbank	68.2	76.4	95.5	2005.5	95.5
	Standard Bank	35.0	195.0	195.0	195.0	195.0
Electronic	ABSA	33.3	178.3	200.0	4370.0	815660.0
	FNB	52.6	120.8	142.1	2688.5	142.1
	Nedbank	62.5	90.0	112.5	2362.5	112.5
	Postbank	19.2	242.5	254.0		
	Standard Bank	61.7	115.0	115.0	115.0	115.0
Mail transfer	Postbank	8.2	275.5	278.5	275.5	
Moneygram	Standard Bank	25.3	224.0	n.a.		
Online	iKobo	6.2	247.7	281.5		1239469.9

Source: DFID and FinMark Trust, 2006.

Note: Shaded cells indicate the rand value of the money transfer since the transfer is converted to local currency by the receiving organization.

Banks are not always interested in the small remittances market. Most analysts see significant opportunities for banks to reduce the transaction costs on remittances, especially small remittances sent by poor migrants. Freund and Spatafora (2005) find that concentration in the banking sector, financial risk, and exchange rate variability typically increase transaction costs. Financial sector reforms that address any or all of these structural problems in the receiving and sending countries are also likely to lower the cost of remittances.[28] Cross-border uniformity in the regulations related to remittances and regulatory interventions where fees are prohibitive have been proposed as other cost-reducing measures (Ratha and Riedberg, 2005; Sanders and Maimbo, 2005).

Among formal providers many smaller banks and microfinance institutions have already gauged the untapped potential of this market. Where there is a long history of migration some small banks have adapted to the needs of the migrant community. For instance, Theba Bank, a miners' bank, offers low-cost transfers from South Africa to families that have bank accounts in Mozambique and Swaziland (Orozco, 2003). International Remittance Network (IRnet) consists of about 200 credit unions that offer low-cost services in 40 countries in Asia, Africa, Europe, and Latin America (Samuels, 2003). The network does not require that the receiving family have an account with a credit union.

Lately, in well-developed financial markets like the United States the growing demand for remittance services has caught the attention of major commercial banks like Citizen's Bank and Wells Fargo. These banks see remittance services as an effective way to draw the attention of a significant unbanked population to their more mainstream financial products. In an arrangement with two banks in Cape Verde Citizen's Bank offers Cape Verdean migrants a remittance facility that is low cost compared to Western Union. In three years of operation this program has made over 1,000 formerly unbanked migrants Citizen's customers.[29]

There are already signs that the window of opportunity for financial institutions to tap into this highly profitable and rapidly innovating market might be narrow. Recent strides in cell phone encryption technology have facilitated fast, low-cost money transfers between OECD countries and recipient countries as diverse as the Philippines and Zambia, allowing

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[28] For instance, eliminating the discrepancies between the official and parallel market exchange rates in either the sending or the receiving country can make formal channels more attractive. In Uganda measures permitting residents to open foreign currency accounts led to a dramatic surge in private transfers in the early 1990s (Kasekende, 2000, cited in Ratha, 2003).

[29] However, since most such programs require that the migrant open a checking or savings account, they are unlikely to appeal to undocumented workers.

customers to avoid the higher fees and longer waiting periods associated with MTOs and banks (Jordan, 2006).

B. Using Remittances Effectively

Bringing recipient households into the formal financial sector is only the first step in using remittances more effectively. Country-specific surveys indicate that while typically a large proportion of remittances are spent the propensity to save from remittances among some households can be as high as 40 percent (UNDP, 2005). For policy-makers the challenge is to channel these savings into productive uses.

Most studies indicate that remittances not used to pay for the immediate consumption needs of the recipient household are used for human capital development or conspicuous consumption. While the long-term benefits of the former are apparent, not all conspicuous consumption is wasteful. The construction of very large houses for migrant workers in West Africa has spurred local economic activity through multiplier effects. In Mexico, the Sociedad Hipotecaria Federal, a government financial institution established to build primary and secondary mortgage markets, provides long-term financing and partial mortgage insurance to Mexican sofols (mortgage providers) that extend loans to immigrants for housing construction (Serrano, 2006). The loans are denominated in Mexican pesos. Migrant workers are given some flexibility about the method of income verification and there is no credit history requirement. Mortgage payments are made in the workers place of residence. Inadequate financial infrastructure makes launching of similar schemes in Africa more challenging, but they can spur a sustained housing boom with positive spillovers on both real and financial sectors of the economy.

By bundling financial services like savings products and entrepreneurial loans for remittance-receiving households, financial institutions, especially banks, can activate the investment channels through which remittances can promote growth.[30] Given the paucity of assets that can serve as collateral in SSA a steady future flow of migrant remittances could be used to secure small business loans—though small retail businesses started entirely with remittance savings face expansion limits unless they can access additional long-term funding. [31]

The surge in remittances to India over the last few years is attributed in some part to incentive schemes launched by the government such as the Resurgent India Bond to

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[30] At present the market is dominated by specialized MTOs like Western Union that are less likely to offer ancillary financial products to their clients.

[31] This micro-level replication of recipient countries gaining favorable access to capital markets by securitizing future remittance flows is likely to be perceived as less risky by local financial institutions if accompanied by entrepreneurial training for receiving households.

encourage the inflow of diaspora savings. While such flows are more likely to be subject to speculative reversals than intrafamily transfers they can significantly supplement domestic investible resources (World Bank, 2006).[32]

Remittances are not a panacea for all that ails low-income countries. They cannot be a substitute for a sustained, domestically engineered development effort. Moreover, large-scale migration can have a deleterious effect on domestic labor markets in specific sectors, particularly where those leaving are largely skilled workers. Nevertheless, migrant transfers can help ease the immediate budget constraints of recipient households. For developing countries as a whole they are a larger transfer of resources than all development assistance and have a more direct impact on poverty. And the vast untapped market in money transfers is an opportunity for small savers to gain a foothold in the formal financial sector.

[32] Funds invested directly at attractive rates in deposit schemes or bonds are not strictly speaking remittances; because they are not intrahousehold transfers and there is a monetary *quid pro quo*. However, since such funds are typically converted to local currency and stay in the recipient country they can be an important source of savings.

Appendix

Variable	Source
Remittances (sum of receipts of worker remittances, employee compensation, migrant transfers)	Balance of Payments (supplemented by World Bank staff estimates for 2005)
Poverty Regressions	
Poverty indicators	PovcalNet database (available at http://iresearch.worldbank.org/PovcalNet/jsp/index.jsp.)
Gini index	PovcalNet database (available at http://iresearch.worldbank.org/PovcalNet/jsp/index.jsp.)
Per capita GDP (constant 2000 US dollar)	World Development Indicators
Schooling (average schooling years among over 25 population)	Barro-Lee database
Trade openness ((imports + exports)/GDP)	World Development Indicators
Dual exchange market dummy	Annual Report on Exchange Arrangements and Exchange Restrictions, IMF
Financial Development Regressions	
M2/GDP	International Financial Statistics
Bank deposits/GDP	International Financial Statistics
GDP (constant 2000 U.S.$)	World Development Indicators
Per capita GDP (constant 2000 U.S $)	World Development Indicators
Inflation (annual percentage change in CPI)	World Development Indicators
Trade openness ((imports + exports)/GDP)	World Development Indicators
Foreign direct investment	World Economic Outlook
Official development assistance	OECD/DAC database
Dual exchange market dummy	Annual Report on Exchange Arrangements and Exchange Restrictions, IMF
General and Educated Expatriation Rate	OECD Trends in International Migration database
Corruption	ICRG database
Internal conflict	ICRG database
Political Risk	ICRG database

List of Countries

Angola	Cote d'Ivoire	Madagascar	Sierra Leone
Benin	Equatorial Guinea	Malawi	South Africa
Botswana	Eritrea	Mali	Swaziland
Burkina Faso	Ethiopia	Mauritius	Tanzania
Burundi	Gabon	Mozambique	Togo
Cameroon	Gambia, The	Namibia	Uganda
Cape Verde	Ghana	Niger	Zambia
Central African Republic	Guinea	Nigeria	Zimbabwe
Chad	Guinea-Bissau	Rwanda	
Comoros	Kenya	São Tomé & Príncipe	
Congo, Rep. of	Lesotho	Senegal	
Congo, Dem. Rep. of	Liberia	Seychelles	

Appendix Table 1. Workers' remittances, compensation of employees, and migrant transfers
(Millions of U.S. Dollars)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005 estimate	2006 estimate
Angola	..	5	..	..	..	..	..	..	..	..	..	..
Benin	100	86	71	90	77	87	84	76	55	55	55	55
Botswana	59	50	48	43	34	26	26	27	39	39	39	39
Burkina Faso	80	80	80	80	80	67	50	50	50	50	50	50
Burundi	..	..	..	..	..	..	..	..	..	0	0	0
Cameroon	11	11	11	11	11	11	11	11	11	11	11	11
Cape Verde	106	100	76	74	79	87	81	85	92	92	92	92
Central African Republic	..	..	..	..	..	..	..	..	..	..	..	..
Chad	..	..	..	..	..	..	..	..	..	..	..	..
Comoros	12	12	12	12	12	12	12	12	12	12	12	12
Congo, Dem. Rep.	..	..	..	..	..	..	..	..	..	..	..	..
Congo, Rep.	4	8	5	2	12	10	1	1	13	15	11	11
Cote d'Ivoire	151	147	136	143	138	119	116	120	142	148	148	148
Equatorial Guinea	0	0	..	..	..	..	..	..	..	..	..	..
Eritrea	..	..	..	3	4	3	..	..	..	..	..	..
Ethiopia	27	16	9	27	34	53	18	33	47	134	134	134
Gabon	4	6	6	6	4	6	5	3	6	6	6	6
Gambia, The	19	20	6	6	7	14	7	7	8	8	8	8
Ghana	17	28	26	30	31	32	46	44	65	82	99	120
Guinea	1	1	1	5	6	1	9	15	111	42	42	42
Guinea-Bissau	..	2	2	2	2	2	10	18	23	23	23	23
Kenya	298	288	352	348	432	538	517	395	494	494	494	494
Lesotho	411	388	379	295	276	252	209	194	288	355	355	355
Liberia	..	..	..	..	..	..	..	..	..	..	..	..
Madagascar	14	11	12	11	12	11	11	17	16	16	16	16
Malawi	1	1	1	1	1	1	1	1	1	1	1	1
Mali	112	111	92	84	86	73	88	137	154	155	155	155
Mauritius	132	160	168	180	178	177	215	215	215	215	215	215
Mozambique	59	61	64	46	38	37	42	53	70	58	57	57
Namibia	16	14	13	11	10	9	9	7	12	16	16	16
Niger	8	4	5	19	27	14	22	19	26	26	26	26
Nigeria	804	947	1,920	1,544	1,301	1,392	1,167	1,209	1,063	2,273	2,273	2,273
Rwanda	21	5	5	5	5	7	8	7	9	10	9	9
Sao Tome and Principe	..	..	..	1	1	0	1	1	1	1	1	1
Senegal	146	150	150	147	186	233	305	344	511	511	511	511
Seychelles	1	1	0	0	0	3	2	2	5	7	11	11
Sierra Leone	24	25	6	20	22	7	7	22	26	25	2	2
South Africa	105	102	206	283	327	344	297	288	435	523	658	658
Swaziland	83	76	84	78	70	74	74	62	88	89	89	89
Tanzania	1	19	2	12	7	8	16	12	9	11	16	16
Togo	15	29	26	19	23	34	69	104	148	148	148	148
Uganda	..	..	..	..	233	238	338	416	285	347	642	642
Zambia	..	..	..	..	..	..	..	..	..	..	..	..
Zimbabwe	..	..	..	..	..	..	..	..	..	..	..	..

Source: World Bank (2006)

Appendix Table 2: Poverty Dataset Details

Country	Survey Year	Country	Survey Year	Country	Survey Year
Albania	1996	Czech Rep.	1988	Iran	1998
Albania	2002	Czech Rep.	1993	Jamaica	1988
Algeria	1988	Czech Rep.	1996	Jamaica	1992
Algeria	1995	Dominican Rep.	1986	Jamaica	1996
Benin	2003	Dominican Rep.	1992	Jamaica	2000
Bolivia	1990	Dominican Rep.	1996	Jordan	1986
Bolivia	1997	Dominican Rep.	2000	Jordan	1992
Bolivia	2002	Ecuador	1987	Jordan	1997
Botswana	1985	Ecuador	1994	Jordan	2002
Botswana	1993	Ecuador	1998	Kenya	1992
Brazil	1981	Egypt	1990	Kenya	1997
Brazil	1987	Egypt	1995	Kyrgyz Rep.	1988
Brazil	1992	El Salvador	1989	Kyrgyz Rep.	1993
Brazil	1997	El Salvador	1997	Kyrgyz Rep.	1997
Brazil	2002	El Salvador	2002	Kyrgyz Rep.	2002
Burkina Faso	1994	Estonia	1988	Laos	1992
Burkina Faso	1998	Estonia	1993	Laos	1997
Burkina Faso	2003	Estonia	1998	Laos	2002
Cambodia	1997	Estonia	2002	Lesotho	1986
Cameroon	1996	Ethiopia	1981	Lesotho	1993
Cameroon	2001	Ethiopia	1995	Lesotho	1995
Central African Rep.	1993	Ethiopia	2000	Lithuania	1988
Chile	1987	Gambia, The	1992	Lithuania	1993
Chile	1992	Gambia, The	1998	Lithuania	1998
Chile	1998	Ghana	1988	Lithuania	2002
Chile	2000	Ghana	1991	Madagascar	1980
China	1984	Ghana	1998	Madagascar	1993
China	1987	Guatemala	1987	Madagascar	1997
China	1992	Guatemala	1998	Madagascar	2001
China	1997	Guatemala	2002	Malawi	1997
China	2001	Guyana	1992	Malawi	2004
Colombia	1980	Guyana	1998	Malaysia	1984
Colombia	1988	Haiti	2001	Malaysia	1987
Colombia	1991	Honduras	1986	Malaysia	1992
Colombia	1996	Honduras	1992	Malaysia	1997
Colombia	2003	Honduras	1998	Mali	1989
Costa Rica	1981	Honduras	2003	Mali	1994
Costa Rica	1986	India	1977	Mali	2001
Costa Rica	1993	India	1983	Mauritania	1987
Costa Rica	1997	India	1987	Mauritania	1993
Costa Rica	2001	India	1992	Mauritania	1995
Côte d'Ivoire	1987	India	1997	Mauritania	2000
Côte d'Ivoire	1993	Indonesia	1987	Mexico	1984
Côte d'Ivoire	1998	Indonesia	1993	Mexico	1989
Côte d'Ivoire	2002	Indonesia	1998	Mexico	1992
Croatia	1988	Indonesia	2002	Mexico	1996
Croatia	1998	Iran	1986	Mexico	2002
Croatia	2001	Iran	1994	Morocco	1984

Appendix Table 2: Poverty Dataset Details (Continued)

Country	Survey Year	Country	Survey Year
Morocco	1990	Rwanda	1999
Morocco	1998	Senegal	1991
Mozambique	1996	Senegal	2001
Namibia	1993	Sierra Leone	1989
Nepal	1995	Slovak Rep.	1988
Nepal	2003	Slovak Rep.	1992
Nicaragua	1993	Slovak Rep.	1996
Nicaragua	1998	Slovenia	1987
Nicaragua	2001	Slovenia	1993
Niger	1992	Slovenia	1998
Niger	1995	South Africa	1993
Nigeria	1985	South Africa	1995
Nigeria	1992	South Africa	2000
Nigeria	1996	Sri Lanka	1985
Nigeria	2003	Sri Lanka	1990
Pakistan	1987	Sri Lanka	1995
Pakistan	1992	Sri Lanka	2002
Pakistan	1996	St Lucia	1995
Panama	1979	Swaziland	1994
Panama	1989	Thailand	1981
Panama	1991	Thailand	1988
Panama	1997	Thailand	1992
Panama	2002	Thailand	1996
Paraguay	1990	Thailand	2002
Paraguay	1997	Trinidad & Tobago	1988
Paraguay	2002	Trinidad & Tobago	1992
Peru	1985	Tunisia	1985
Peru	1990	Tunisia	1990
Peru	1996	Tunisia	1995
Peru	2002	Tunisia	2000
Philippines	1988	Turkey	1987
Philippines	1994	Turkey	1994
Philippines	1997	Turkey	2002
Philippines	2000	Venezuela	1981
Poland	1987	Venezuela	1987
Poland	1992	Venezuela	1993
Poland	1998	Venezuela	1997
Poland	2002	Venezuela	2000
Romania	1989	Yemen	1992
Romania	1992	Yemen	1998
Romania	1998	Zimbabwe	1990
Romania	2002	Zimbabwe	1995
Russia	1988		
Russia	1993		
Russia	1998		
Russia	2002		
Rwanda	1984		

Appendix Table 3. Descriptive Statistics of Regression Variables

	Observations	Mean	Median	Standard deviation	Range
Headcount poverty	233	17.7	9.4	19.4	79.3
Poverty gap	233	6.4	2.7	8.8	51.4
Squared poverty gap	233	3.3	0.9	5.6	37.9
Gini index	233	0.4	0.4	0.1	0.5
Per capita income	228	1,770.3	1,352.7	1,581.1	8,361.2
Remittances to GDP	216	3.5	1.1	7.5	72.9
Trade openess	224	70.0	60.8	37.1	213.3
Schooling	187	4.9	4.7	2.3	10.0

Note: These are raw data series, before the log transformation.

Appendix Table 4. Bivariate Correlations of Regression Variables

	Headcount Poverty	Poverty Gap	Squared Poverty Gap	Gini Index	Per capita income	Remittances to GDP	Trade Openness	Schooling
Headcount poverty	1.00							
Poverty gap	0.94*	1.00						
Squared poverty gap	0.84*	0.97*	1.00					
Gini index	0.20*	0.31*	0.35*	1.00				
Per capita income	-0.58*	-0.49*	-0.41*	0.02	1.00			
Remittances to GDP	0.01	0.06	0.07	0.12*	-0.14*	1.00		
Trade openess	-0.25*	-0.16*	-0.11*	0.05	0.21*	0.26*	1.00	
Schooling	-0.61*	-0.55*	-0.48*	-0.22*	0.56*	-0.07	0.30*	1.00

Note: * indicates significant at 10 percent.

Appendix Table 5. Ordinary Least Squares Estimation (With and Without Regional Dummies)

	Headcount Poverty		Poverty Gap		Squared Poverty Gap	
	(1)	(2)	(1)	(2)	(1)	(2)
Per capita GDP (constant 2000 dollars)						
	-1.21***	-1.07***	-1.26***	-1.20***	-1.22***	-1.19***
	(-10.56)	(-6.62)	(-10.58)	(-5.93)	(-10.29)	(-5.07)
Gini coefficient	3.30***	1.95***	3.66***	2.03***	3.80***	2.36***
	(6.76)	(3.74)	(7.56)	(3.39)	(7.00)	(3.60)
Inflow of remittances (ratio to GDP)	-0.14***	-0.11**	-0.13**	-0.08	-0.10	-0.05
	(-2.53)	(-2.38)	(-2.07)	(-1.48)	(-1.55)	(-0.81)
Europe and Central Asia		-2.01***		-1.46**		-0.10
		(-3.84)		(-2.01)		(-1.10)
East Asia and Pacific		-0.48		-0.65		-0.45
		(-1.00)		(-0.98)		(-0.60)
Latin America and Caribbean		-0.26		0.27		0.39
		(-0.51)		(0.40)		(0.49)
Middle East and North Africa		-1.88***		-1.78***		-1.64**
		(-3.21)		(-2.43)		(-1.94)
Sub-Saharan Africa		-0.62		-0.28		-0.11
		(-1.46)		(-0.49)		(-0.16)
Constant	13.22***	11.86***	12.59***	11.22***	11.59***	10.45***
	(16.06)	(9.53)	(16.59)	(7.64)	(14.24)	(5.89)
Observations	212	212	211	211	208	208
Adj R^2	0.60	0.72	0.58	0.68	0.53	0.61
F-Statistic	58.93	44.10	87.21	53.30	71.35	33.58

Note: ***,**,and * indicate significant at 1, 5,and 10 percent. T-Statistics are reported in parentheses. Standard errors are clustered by country to eliminate any downward bias.

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Appendix Table 6. Ordinary Least Squares Estimation (With Interaction Term)

	Headcount Poverty		Poverty Gap		Squared Poverty Gap	
	(1)	(2)	(1)	(2)	(1)	(2)
Per capita GDP (constant 2000 dollars)	-1.24***	-1.08***	-1.29***	-1.21***	-1.25***	-1.21***
	(-10.69)	(-6.70)	(-10.61)	(-6.04)	(-10.26)	(-5.17)
Gini coefficient	3.29***	1.93***	3.66***	2.01***	3.80***	2.35***
	(6.86)	(3.77)	(7.76)	(3.39)	(7.16)	(3.59)
Inflow of remittances (ratio to GDP)	-0.18***	-0.16***	-0.17**	-0.12	-0.15*	-0.09
	(-2.65)	(-2.45)	(-2.15)	(-1.61)	(-1.68)	(-1.01)
Remittances*Sub-Saharan Africa (interaction term)	0.16*	0.14*	0.16*	0.14	0.16	0.12
	(1.70)	(1.91)	(1.71)	(1.54)	(1.42)	(1.11)
Europe and Central Asia		-2.06***		-1.50**		-1.03
		(-3.99)		(-2.10)		(-1.16)
East Asia and Pacific		-0.53		-0.69		-0.49
		(-1.11)		(-1.06)		(-0.67)
Latin America and Caribbean		-0.28		0.25		0.38
		(-0.56)		(0.37)		(0.48)
Middle East and North Africa		-1.86***		-1.76***		-1.62**
		(-3.28)		(-2.47)		(-1.95)
Sub-Saharan Africa		-0.62		-0.28		-0.11
		(-1.51)		(-0.51)		(-0.17)
Constant	13.38***	11.96***	12.76***	11.32***	11.76***	10.55***
	(16.40)	(9.70)	(16.83)	(7.70)	(14.44)	(5.92)
Observations	212	212	211	211	208	208
Adj R^2	0.61	0.72	0.58	0.68	0.53	0.61
F-Statistic	46.52	43.91	71.29	55.29	58.86	33.97

Note: ***,**,and * indicate significant at 1, 5,and 10 percent. T-Statistics are reported in parentheses. Standard errors are clustered by country to eliminate any downward bias.

Appendix Table 7. Ordinary Least Squares Estimation for Rem>1 Sample

	Headcount Poverty	Poverty Gap	Squared Poverty Gap
Per capita GDP (constant 2000 dollars)			
	-1.28***	-1.29***	-1.14***
	(-6.52)	(-5.55)	(-4.57)
Gini coefficient	3.03***	3.28***	3.74***
	(-4.20)	(4.42)	(4.817
Inflow of remittances (ratio to GDP)	-0.26**	-0.19*	-0.22
	(-2.06)	(-1.35)	(-1.40)
Europe and Central Asia	-1.80***	-1.50*	-1.36
	(-2.94)	(-1.84)	(-1.42)
East Asia and Pacific	-0.74	-1.08	-0.87
	(-1.26)	(-1.44)	(-1.18)
Latin America and Caribbean	-0.27	0.13	0.08
	(-0.45)	(0.17)	(0.09)
Middle East and North Africa	-1.86***	-1.96***	-1.96**
	(-3.30)	(-2.81)	(-2.40)
Sub-Saharan Africa	-0.75*	-0.37	-0.16
	(-1.45)	(-0.59)	(-0.21)
Constant			
	14.44***	13.20***	11.69***
	(9.31)	(7.72)	(6.34)
Observations	112	111	109
Adj R^2	0.75	0.74	0.71
F-Statistic	36.39	41.54	33.10

Note: ***,**,and * indicate significant at 1, 5,and 10 percent. T-Statistics are reported in parentheses. Standard errors are clustered by country to eliminate any downward bias

Appendix Table 8. Descriptive Statistics for Regression Variables

	Observations	Mean	Standard Deviation	Minimum	Maximum
Bank deposits to GDP	188	18.06	14.27	1.16	93.21
M2 to GDP	233	26.81	18.04	0.81	165.25
Remittances to GDP	198	3.62	9.94	0	75.33
Log(GDP)	245	21.38	1.42	17.42	25.68
Per capita GDP	245	807.16	1,210.59	84.76	7,164.45
Inflation	207	59.85	459.36	-5.61	6424.99
Trade openness	244	71.53	37.07	12.88	224.21
Other capital flows to GDP	248	14.91	14.66	-2.09	104.61

Appendix Table 9. Bivariate Correlations of Regression Variables

	Bank Deposits to GDP	M2 to GDP	Remittances to GDP	Log(GDP)	Per Capita GDP	Inflation	Dual Exchange Rate	Trade Openness	Other Capital Flows to GDP
Bank deposits to GDP	1.00								
M2 to GDP	0.97	1.00							
Remittances to GDP	0.22	0.15	1.00						
Log(GDP)	0.14	0.01	-0.25	1.00					
Per capita GDP	0.62	0.38	-0.08	0.14	1.00				
Inflation	-0.10	-0.06	-0.04	0.08	-0.05	1.00			
Dual exchange rate	0.07	0.05	0.08	0.23	0.03	-0.01	1.00		
Trade openness	0.43	0.34	0.33	-0.24	0.45	-0.03	0.04	1.00	
Other capital flows to GDP	-0.24	0.01	0.10	-0.60	0.23	0.04	0.02	0.15	1.00

Appendix Table 10. Baseline Panel Estimation

	Random Effects		Fixed Effects	
	Deposits	M2	Deposits	M2
Remittances to GDP	0.74**	1.66***	0.76*	1.72***
	(2.10)	(3.30)	(1.90)	(2.90)
Log(GDP)	3.69***	2.79**	0.97	-5.54
	(2.99)	(1.94)	(0.21)	(-0.81)
Per capita GDP	0.00***	0.01	0.01***	0.01
	(2.63)	(0.76)	(2.75)	(1.01)
Inflation	-0.02	0.002	-0.01	0.003
	(-0.59)	(0.52)	(-0.29)	(0.56)
Dual	-2.16	-0.98	-3.57**	-0.82
	(-1.29)	(-0.42)	(-1.87)	(-0.30)
Trade openness	-0.29	0.01	-0.01	0.08
	(-0.80)	(0.22)	(-0.14)	(0.98)
Other capital flows to GDP	0.24**	0.03	0.32**	-0.04
	(2.31)	(0.25)	(2.46)	(-0.27)
Corruption	-0.28	0.21	0.43	-1.20
	(-0.30)	(0.20)	(-0.42)	(-0.78)
Internal conflict	-1.14***	-1.50**	-1.06**	-1.69**
	(-2.49)	(-2.26)	(-1.99)	(-2.17)
Political risk	0.41***	0.48***	0.39**	0.61***
	(3.37)	(2.77)	(2.29)	(2.43)
Constant	-62.75**	-57.28*	-29.74	117.82
	(-2.30)	(-1.81)	(-0.30)	(0.83)
Observations	89	93	89	93
Adj R^2	0.45	0.36	0.38	0.26

Note:***,**, and * signify 1, 5, and 10 percent significance levels.

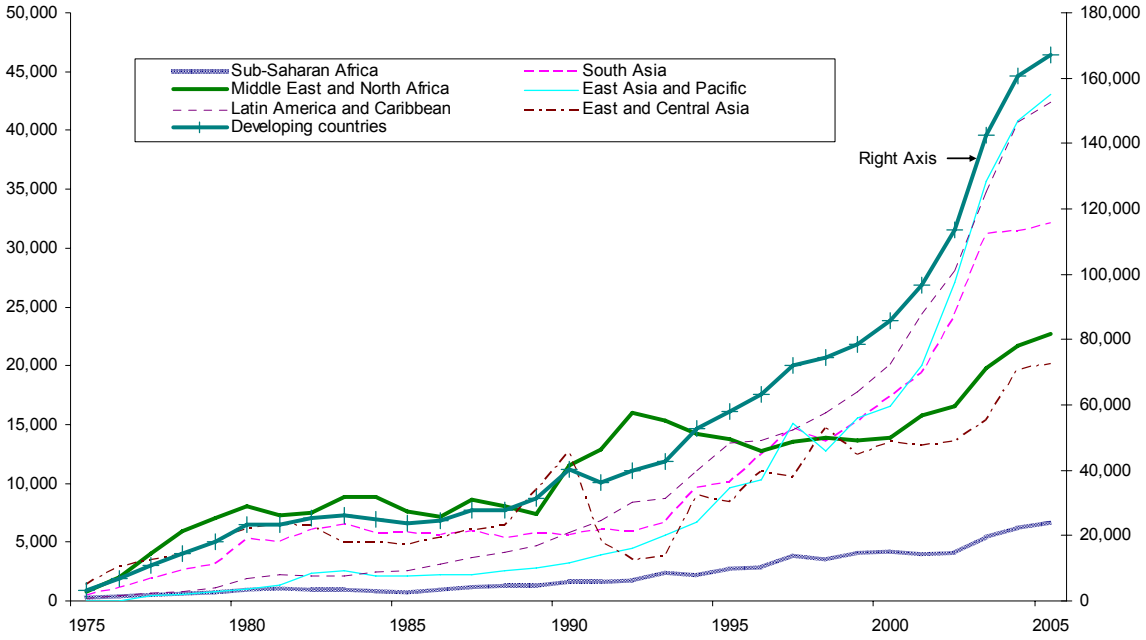
The ICRG database measures political risk on a scale of 1 to 100 with higher values implying less risk. So a positive coefficient on political risk indicates that lower political risk is associated with greater financial development.

Appendix Table 11. Fixed Effects Panel Instrumental Variables Estimation

	Deposits		M2	
	(1)	(2)	(1)	(2)
Instrumented Variable				
Remittances to GDP	4.04***	1.81*	3.71**	7.99***
	(2.39)	(1.67)	(1.91)	(2.74)
Exogenous Variables				
Log(GDP)	2.7	-1.64	12.34	-16.30
	(0.70)	(-0.29)	(1.12)	(-1.29)
Per capita GDP	0.02***	0.01***	0.01**	.014
	(5.84)	(2.79)	(2.04)	(1.25)
Inflation	0.002	-0.001	0.01	0.004
	(0.20)	(0.30)	(0.66)	(0.38)
Dual	-3.65	-3.86*	-6.07	-4.17
	(-1.30)	(-1.89)	(-1.17)	(-0.83)
Trade openness	0.04	-0.05	0.13	-0.18
	(0.66)	(-0.76)	(1.08)	(1.02)
Other capital flows to GDP	0.18	0.40***	-0.64	0.35
	(0.90)	(2.53)	(-1.36)	(1.03)
Corruption		-1.11		-4.45
		(-0.88)		(-1.49)
Internal conflict		-1.56**		-3.98
		(-2.11)		(-2.38)
Political risk		0.56**		1.39
		(2.32)		(2.53)
Constant	-72.40	24.16	-266.39	336.65
	(-0.88)	(0.20)	(-1.13)	(1.28)
Cragg Donald F-statistic for weak instruments	1.70	3.15	2.19	2.93
Observations	134	89	145	93
Adj R^2	0.50	0.30	0.29	0.02

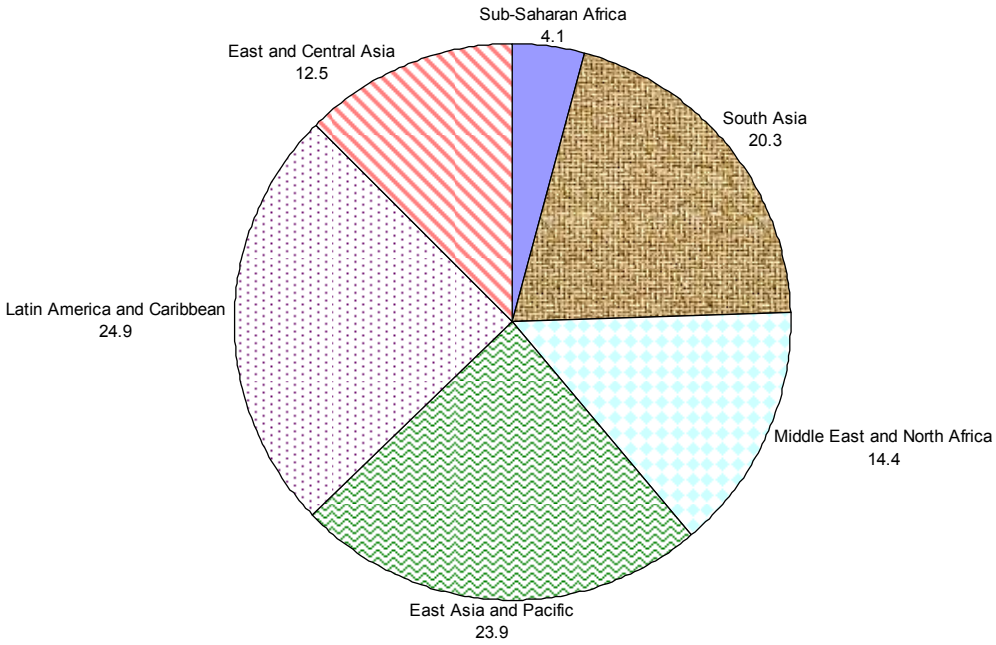
Note:***,**, and * signify 1, 5, and 10 percent significance levels.
Instruments weighted by expatriation rate

Appendix Figure 1. Remittances to Developing Countries by Region, 1975-2005
(Millions of US dollars)



Source: *IMF Balance of Payments Yearbook* , 2006; World Bank staff estimates

Appendix Figure 2. Regional Shares of Remittances to Developing Countries, 2000-05
(Millions of U.S. dollars)



Source: IMF, *Balance of Payments Yearbook* , 2006; World Bank staff estimates.

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