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The Remitting Patterns of African  
Migrants in the OECD

*Albert Bollard, David McKenzie and Melanie Morten*

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## Non-Technical Abstract

Recorded remittances to Africa have grown dramatically over the past decade. Yet data limitations still mean relatively little is known about which migrants remit, how much they remit, and how their remitting behavior varies with gender, education, income levels, and duration abroad. We construct the most comprehensive remittance database on immigrants in the OECD currently available, containing microdata on over 12,000 African immigrants. Using this microdata we establish several basic facts about remitting patterns of Africans, and then explore how key characteristics of policy interest relate to remittance behavior. Africans are found to remit twice as much on average as migrants from other developing countries, while those from poorer African countries are more likely to remit than those from richer African countries. We find male migrants remit more than female migrants, particularly among those with a spouse remaining in the home country; that more educated migrants remit more than less educated migrants; and that while the amount remitted increases with income earned, the gradient is quite flat over a large range of income. Finally, we find little evidence that the amount remitted decays with time spent abroad, with reductions in the likelihood in remitting offset by increases in the amount remitted conditional on remitting.

**Keywords:** Remittances, Migration, Africa.

**JEL Classification:** O15, F22, J61.

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### Abstract

Recorded remittances to Africa have grown dramatically over the past decade. Yet data limitations still mean relatively little is known about which migrants remit, how much they remit, and how their remitting behavior varies with gender, education, income levels, and duration abroad. We construct the most comprehensive remittance database on immigrants in the OECD currently available, containing microdata on over 12,000 African immigrants. Using this microdata we establish several basic facts about remitting patterns of Africans, and then explore how key characteristics of policy interest relate to remittance behavior. Africans are found to remit twice as much on average as migrants from other developing countries, while those from poorer African countries are more likely to remit than those from richer African countries. We find male migrants remit more than female migrants, particularly among those with a spouse remaining in the home country; that more educated migrants remit more than less educated migrants; and that while the amount remitted increases with income earned, the gradient is quite flat over a large range of income. Finally, we find little evidence that the amount remitted decays with time spent abroad, with reductions in the likelihood in remitting offset by increases in the amount remitted conditional on remitting.

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## 1. Introduction

Recorded remittances to Africa have dramatically increased over the past decade, with remittances to sub-Saharan Africa increasing five-fold from US\$4 billion in 2002 to \$20 billion in 2008 (Sander and Maimbo, 2002; Ratha et al, 2009). While much of this improvement likely reflects improvements in measurement and a shift towards more formal remittance channels, actual flows are still believed to notably exceed this recorded amount. Although 70 percent of sub-Saharan migrants are believed to migrate to other countries in the region (Ratha and Shaw, 2007), remittance flows are believed to be dominated by flows from outside the region. For example, one estimate suggests that slightly less than three-quarters of all remittances to sub-Saharan Africa were sent from the United States and Western Europe.<sup>1</sup>

Yet despite the increasing attention being given to remittances in international policy circles as a result of this rapid growth, the poor quality of existing data has limited what is known about the characteristics of these remitters. There are a few studies which have looked at the determinants and consequences of receiving remittances based on surveys fielded in the source countries (see Azam and Gubert, 2006 and Shaw, 2007 for recent reviews), while Gupta et al. (2007) examine the same issues from a macro perspective. Even fewer studies have occurred from the sending side, and those that do exist focus on a single destination country (e.g. Miotti et al, 2009) and often on a single source country migrant group (e.g. Osili, 2007). As a result, currently there is nothing that can examine in a systematic way which African migrants remit and which don't, and how much they send, yet alone answer key questions of interest to policymakers such as whether the more educated remit less or whether women remit more.

This paper aims to address this information gap by providing a detailed look at the remitting behavior of African migrants in the OECD. We focus on the OECD both because of data availability and because this is the source of the majority of remittances. We put together a new database on immigrants and use this to consider remittances of over 12,000 sub-Saharan and North African migrants in nine OECD destination

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<sup>1</sup> See World Bank estimates cited in <http://allafrica.com/stories/200811111001.html> [accessed August 8, 2009].

countries. Only one-third of the migrants in our sample remit, with those remitting sending an average of \$US2,638 annually – a sizeable amount relative to sub-Saharan Africa’s GNI per capita of \$1082.<sup>2</sup> Compared to other developing country immigrants in the OECD we find African migrants to be both more likely to remit, and to remit more. Within Africa we find a strong negative association between the likelihood of remitting and country income.

We use this microdata to explore the determinants of remitting as a function of individual characteristics which theory suggests should matter. We focus in on four areas of particular interest to recent policy debates. The first is gender. There has been an increasing feminization of global migration flows, and there is often a belief that women are better and more reliable remitters. For example, Lindley (2007, p. 12) remarks that in Somali communities it is sometimes said that “women are ‘better’ remitters than men (even that it is better to have one daughter abroad than ten sons)”, although in practice she finds Somali men to remit more. We find for Africans as a group that female migrants are less likely to be remitting, and that men remit more than women when they do remit. This is particularly the case when comparing individuals with a spouse remaining at home – men with a spouse outside the country remit \$US3,879 more per year than women with a spouse remaining at home.

Second, and third we focus on the roles of education and income. The issue of brain drain is always quick to arise when discussing migration out of Africa. From the remittances standpoint, there is a fear that more-educated migrants will send less remittances, perhaps because they have less intention to return, and are more likely to move their whole families with them. With this same database, we have recently shown that for developing country emigrants as a whole, more educated migrants in fact remit more (Bollard et al, 2009). We find here, if anything, this relationship is stronger when we just consider African emigrants. Furthermore, we show there is a strong non-linearity among African migrants, with the amount remitted relatively constant with respect to education until completion of high school, and then strongly rising with education thereafter. Similarly, we find a strong positive association between income earned abroad

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<sup>2</sup> Source: World Bank Gross National Income per capita. <http://siteresources.worldbank.org/DATASTATISTICS/Resources/GNIPC.pdf>

and amount remitted, with this relationship quite flat over middle ranges of income and steeper at the tails. These findings suggest that from a remittances viewpoint, African countries have more to gain from promoting migration for skilled work than for less skilled migration.

Finally, there is now a growing literature which asks whether remittances decay with time spent abroad (e.g. Brown, 1997; Simati and Gibson, 2001; Amuedo-Dorantes and Pozo, 2006; Miotti et al., 2009). This issue enters the policy debate over discussions as to whether temporary or longer-term migration episodes have greater development impact. There is a concern that as individuals spend more time abroad they will lose ties with their home countries, and remittances will fall. In contrast, we find that the likelihood of remitting and amount remitted increase over the first five to ten years of migration. While the likelihood of remitting begins to fall after 20 or so years, we have little data for such migrants, and the data we do have suggest that the total amount remitted doesn't fall since migrants who have been abroad longer will remit more on the occasions they do remit.

## **2. Data**

Few surveys in OECD countries collect data on remittances. Data on the number and characteristics of immigrants from different countries can be readily obtained from Census microdata and labor force surveys. However, neither contains information on remittances. Instead one must rely on special purpose surveys of immigrants. With an intensive effort we have combined together all the publicly available datasets we are aware of, as well as obtained access to a number of non-publicly available datasets which have been graciously shared by the researchers or sponsoring organizations. The resulting database comprises information on more than 12,000 African immigrants from 11 surveys in 9 OECD countries (Australia, Belgium, France, Italy, Netherlands, Norway, Spain, United Kingdom and United States). The surveys cover a wide range of populations, covering both nationally representative surveys of recent immigrants (the New Immigrant Survey (NIS) in the U.S., the Longitudinal Survey of Immigrants in Australia (LSIA), and the DREES survey in France), nationally representative surveys of all immigrants (the Spanish National Survey of Immigrants (ENI)), and surveys which

attempt to sample migrants from particular countries (the NiDi surveys in Spain and Italy, the International Remittance Senders Household Survey of migrants from Senegal, Nigeria, and Congo in Belgium, the France 2MO survey, the Black/Minority Ethnic Survey (BME) in the United Kingdom, the Living Conditions of Immigrants (LKI) survey in Norway, and the CSR survey in the Netherlands). A full description of these surveys can be found in Bollard et al. (2009).

The use of destination country data is crucial for answering the questions of interest to this study. Surveys in African countries can tell us which households have a migrant, and which receive remittances, but cannot inform us about which migrants have moved abroad with their whole household and whether they send remittances or not. Asking household members in sending countries to report on the incomes, education and other characteristics of the migrant members abroad is also infrequently done, and subject to substantial problems of household members not being able to report such information.

For each dataset we construct comparable covariates to measure household income, remittance behavior, family composition, and demographic characteristics, measured at the individual level of the survey respondent. Remittances and income are typically measured at the household level, not the individual level. All financial values are reported in constant 2003 \$US. In addition, we drop any observations where reported annual remittances are more than twice annual household income. For each survey we utilize survey weights if provided with the data. We also present pooled results using weights post-stratified by country of birth and education to match the cross-sectional distribution of African migrants to OECD countries in the year 2000.

Table 1 summarizes the characteristics of African migrants in each of our datasets. We present summary statistics for each of our surveys, as well as the pooled sample. Concentrating on the pooled data in the final column, a typical migrant is a 36 year-old male who has completed high school and has an annual household income of \$26,000. However, there is considerable heterogeneity between the datasets. One-third of the pooled sample has completed an undergraduate university degree, but this ranges from 53% in the Belgian IRSHS survey to 3% in the Spain NIDI survey. The average years spent abroad over the whole sample is 9.4 years, ranging from a low of 3.6 years in the Australian data (which is a survey of recent immigrants) to 18.2 years in the French

2MO survey, which surveys remittance senders at French post offices. Family characteristics, especially family members living away from the migrant, are an important determinant for understanding remittance behavior. In our database 64% of migrants on average are married, and 10% of migrants on average have a spouse outside the country.

### **3. The incidence and level of remitting by African migrants**

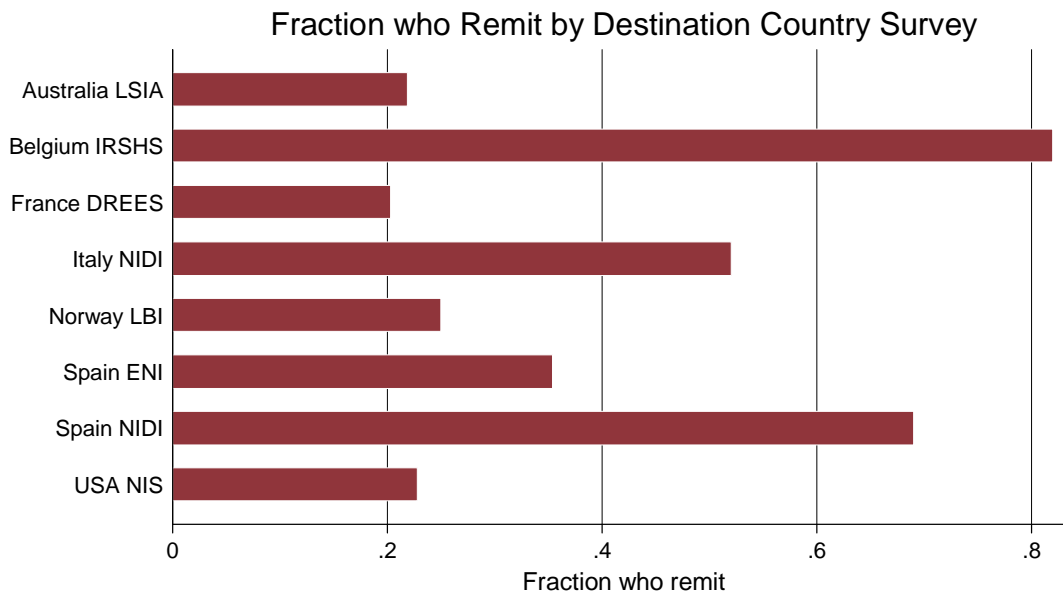
We start with establishing the prevalence and the pattern of remittances by the migrants in our database. We consider two key dimensions of remittance behavior. Firstly, whether migrants choose to remit at all or not (the extensive margin), and secondly the total amount remitted (including as zero those who did not remit anything). There is considerable variation among the different surveys in sampling methodology, and target population, as well as differences arising from the self-selection of immigrants moving to different countries and in the income-earning opportunities they face once they arrive there. It is therefore useful to begin by illustrating the differences in the incidence of remitting and amount remitting by survey, which is done in Figures 1 and 2.

Figure 1 shows the extensive margin. There is substantial variability between the different surveys: for example, over 80% of migrants in the Belgium IRSHS survey remit, while only 20% of migrants in the French DREES survey remit. Figure 2 summarizes total remittances sent by migrants in each destination country. Total remittances are a composite of the number of migrants who choose to remit, and the amount remitted by those who send back some money. There is less heterogeneity between countries on this measure than in the extensive margin – four countries have mean remittances over \$2000 per year, and all but two of the surveys have total remittances higher than \$1000. Because of the differences in survey methodology and target population across countries, neither figure should be used to make statements of the nature “Africans in country X remit more than Africans in country Y”. Rather the purpose of showing these figures is to give the reader a sense of the range in variation across destination country samples, and so that this heterogeneity can be kept in mind when examining differences across origin countries.



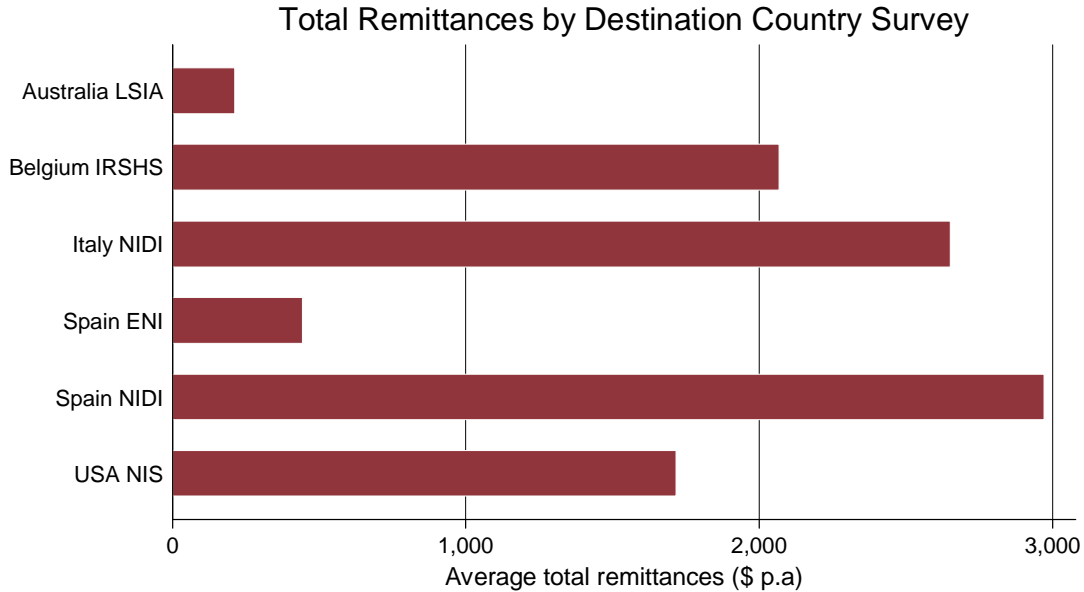
We next summarize remitting patterns by country of origin. For the pooled African sample as a whole, we find one-third of migrant households in the OECD remitting, with the mean (median) amount remitted conditional on remitting equal to US\$2,638 (US\$1,088) annually. Combining the extensive and intensive margins gives a mean annual amount remitted of US\$1,263, twice as large as the value for the rest of the developing world’s migrants (US\$668). Table 2 shows in more detail the distribution of the amount remitted for Sub-Saharan, North Africans, and the rest of the developing world.<sup>3</sup> We see few migrants remit amounts of \$5,000 or more annually – 5 percent of Sub-Saharan and 7 percent of North Africans, while 80 percent of Sub-Saharan migrants and 72 percent of North African migrants remit \$500 or less per year.

**Figure 1**



<sup>3</sup> This table is based on the set of surveys and observations which report the amount remitted. It therefore differs from the extensive margins in Figures 1 and 3 which also use surveys that collect information just on the extensive margin. This makes little difference for the SSA sample, but there are more North Africans and rest of the developing world migrants remitting in the surveys which also measure how much is remitted than in the surveys which just measure whether individuals remit.

**Figure 2**



The large differences across surveys in both the fraction of migrants who remit and the average total remittances across surveys suggest caution in interpreting any raw statistics from the pooled dataset of all surveys, given that each survey focused on sampling different nationalities and sub-populations of African migrants. With these caveats in mind, Figures 3 and 5 present statistics on remitting by country within Africa for the pooled dataset, and then later in the paper we explore whether any differences observed across source countries remain significant after controlling for survey dataset fixed effects and the effects of observable characteristics of the migrants. We present statistics for each African country that has 30 or more observations for the remittance measure being studied.<sup>4</sup>

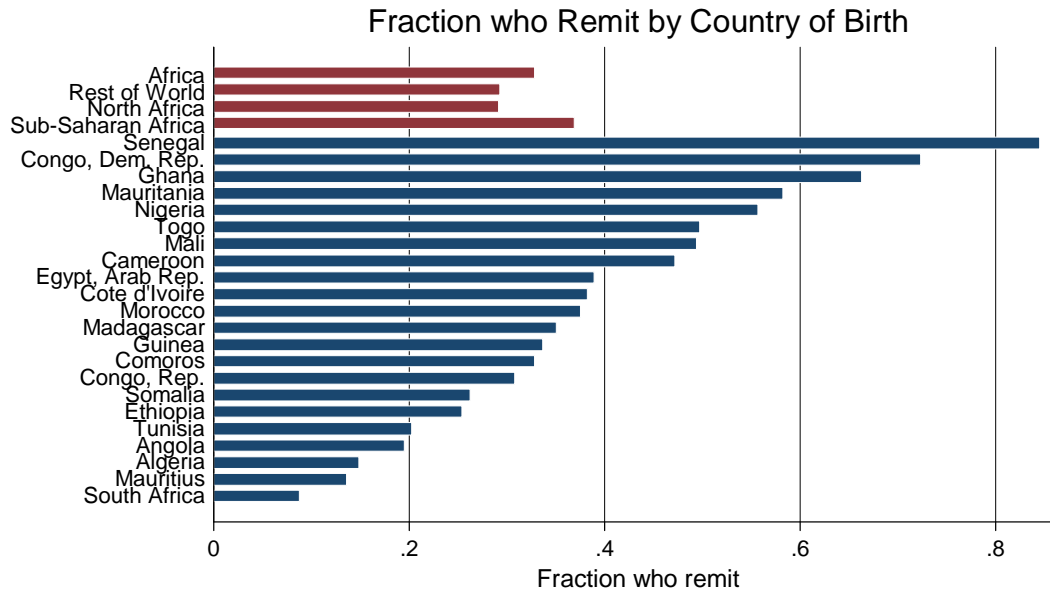
Figure 3 shows the fraction of migrants who remitted money in the past year (extensive margin) by country of birth, including a comparison of African migrants compared with migrants from other developing countries (rest of world) in our database.

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<sup>4</sup> Restricting it to 100 or more observations per country would eliminate Somalia from Figures 3 and 4, and Mauritania, Mali, Togo, Cameroon, Cote d'Ivoire, Madagascar, Guinea, Comoros, Republic of Congo, Tunisia, Angola, and Mauritius from Figure 3.

There are large differences in remitting patterns across countries in the raw data. More than 70% of migrants from the Democratic Republic of Congo and Senegal remitted money, while fewer than 20% of migrants from Algeria, Mauritius and South Africa remitted anything.

**Figure 3**



Examining the differences across countries in Figure 3 suggests that emigrants from poorer African countries are more likely to remit than emigrants from richer African countries. However, one concern is whether these differences are all driven by differences in the destination countries these migrants are located in. To test this, we regress the proportion remitting on destination survey fixed effects to remove this source of variation, and then graph the residual variation against GDP per capita (expressed in PPP terms from the Penn World Tables) in Figure 4. We see that there is a strong and significant negative slope: for each doubling in GDP per capita, the fraction of migrants from that country who remit drops 6 percentage points. The t-statistic on GDP per capita is -3.8.

**Figure 4**

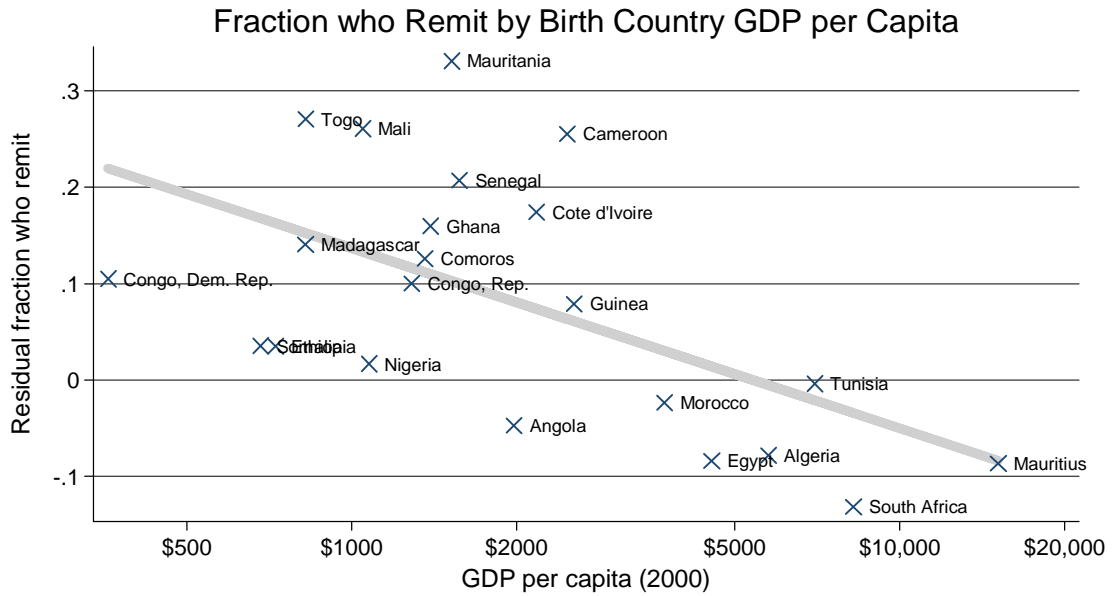
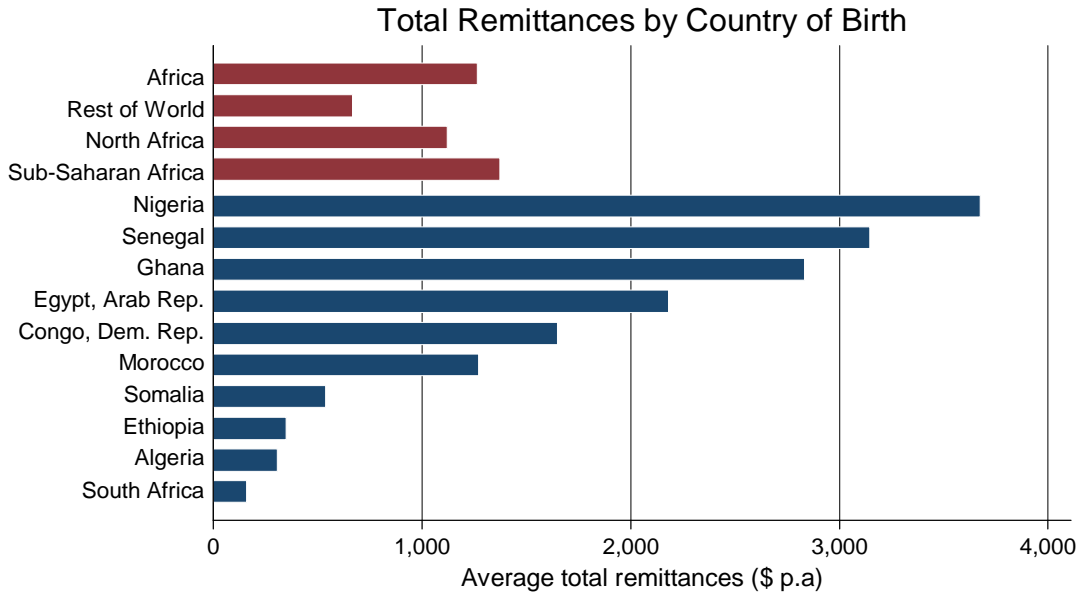


Figure 5 completes the descriptive figures by showing differences in mean total amount remitted in the past year by source country. This incorporates those who remit zero. There is also considerable heterogeneity in the raw data across countries in the amount remitted. Migrants from Ghana, Nigeria and Senegal each sent home more than \$2,500 on average, while those from Algeria, Ethiopia, and South Africa remit less than \$500.

**Figure 5**



#### **4. Which characteristics explain the remitting behavior of Africans?**

The differences observed in the raw data reflect differences in which destination country surveys emigrants from different origin countries are in, as well as differences in the characteristics of the emigrants from different countries. We therefore next examine whether these country of origin differences persist once we control for these other factors, as well as investigating which characteristics describe the remitting behavior of African migrants at the micro level. To do this we estimate the following regression for individual  $i$  from country  $j$  now living in country  $k$ :

$$\text{Remitting Behavior}_{i,j,k} = \alpha + \beta X_{i,j,k} + \gamma \text{Origin}_{i,j,k} + \delta \text{Destination}_{i,j,k} + \varepsilon_{i,j,k}$$

Here *remitting behavior* is measured in three ways – as total remittances which includes zero for those who do not remit, as a binary indicator of whether or not an individual remits (the extensive margin), and as log of the amount remitted for those who remit (the intensive margin). Our aim through these regressions is to describe the characteristics of this remitting behavior, and to test whether there are differences in remitting behavior

across origin countries after controlling for destination country survey fixed effects and for differences in observable characteristics across individuals.

There is now a rich theoretical literature which describes a variety of different reasons individuals remit (see Rapoport and Docquier, 2006). Our choice of which individual characteristics to control for is motivated by these theories, but it should be noted that our intent is not to test which of these theories best describes the remitting behavior of Africans, but merely to use these theories to help understand which characteristics might be associated with remitting behavior. The comprehensive dataset we have constructed contains a number of variables of interest, but is lacking in several key variables that would be needed to adequately test different theories of why people remit. For example, we do not have information on the income levels of the family members left in the home country, or on the shocks experienced by either the migrant or their family. This prevents attempts to tease out whether altruism or insurance motives are driving the results. Likewise we know whether remittances are being made, but not whether they are being used to repay a loan or to invest in property, which are other important reasons for remitting.

Nevertheless, we believe that the descriptive regression analysis is itself of interest, since many of the questions of remitting behavior in the policy arena are ones of a descriptive not a causal nature. Thus policymakers are interested in whether male or female migrants remit more or less, not whether gender has a causal impact on remitting behavior. Likewise, there is interest in whether high-skilled migrants (measured by either education or income earned) remit more or less, rather than in whether causing a migrant to stay in school longer would change that particular migrant's remitting behavior. This is because migration policy questions generally concern who is migrating, which involves comparing different groups of individuals, rather than with what the effects would be of changing the characteristics of the same group of people who migrate.

With our dataset we are able to control for a number of important characteristics of individuals which theory suggests should be associated with remitting behavior. These include demographic characteristics of the migrant (age and sex), differences in household demographics and the presence of family abroad (marital status, household

size in the destination country, whether or not the spouse, children, and parents of the interviewee are abroad), income and employment status, years of education, the length of time spent abroad, and some qualitative indicator of intent to return home, and legal status.<sup>5</sup>

Table 3 presents the results of these regressions. All regressions contain dataset fixed effects. For each remittance measure the first column shows results excluding the individual characteristics, while the second adds these individual characteristics. This allows us to see whether differences in remittance behavior remain across source countries after controlling for destination dataset fixed effects, and whether these differences persist after also controlling for observable characteristics of these migrants. The coefficients on country of birth indicate whether migrants born in a given country remit differently from those born in Ghana. An F-test tests the null hypothesis of joint equality of these country fixed effects.

For total remittances the first column shows we can reject equality of source country fixed effects, with South Africans remitting significantly less. Several other countries show large, but insignificant differences from Ghana. However, after controlling for observable characteristics of the migrants we can no longer reject equality. Thus the fact that South Africans remit less appears to be mostly due to differences in the education, income, time abroad, and family composition of South African migrants. When we examine the extensive margin, we see more significant differences, in part due to more countries having data at this margin. Even after controlling for observable characteristics of the migrants, we find Egyptians, South Africans and Mauritians being less likely to remit than Ghanaians, and migrants from the Democratic Republic of Congo, Cameroon, Mali, and Mauritania being more likely to remit. Finally, at the intensive margin, we see that while Egyptians are less likely to remit, they remit more conditional on remitting, and Ivorians remit more conditional on remitting.

Therefore some differences do still remain in the remitting patterns of African migrants from different countries, even after controlling for observable characteristics of

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<sup>5</sup> We dummy out missing covariates, which largely occur because not all covariates are available in all datasets (see Table 1).

the migrants and the different destination countries they are located in. These differences might arise from differences at the migrant level in important variables we cannot measure – for example, we do not measure the income level or shocks being experienced by family members at home. Thus, if we were to compare a South African and a Malian earning the same amount abroad, and with similar family compositions and education levels, we would still expect the Malian to be more likely to remit because their family at home are likely to be poorer. An alternative explanation could be that these differences in remitting behavior reflect country-level factors influencing remittance behavior. For example, if the exchange rate is temporarily undervalued, we might expect all migrants from a particular country to be remitting more to be taking advantage of investment opportunities and greater purchasing power at home. We cannot separate these two competing explanations for country differences, but it is notable that there are few such differences in total remittance behavior.

In terms of the covariates, the regression results are generally consistent with theoretical predictions. For all three measures of remittance behavior we see that remitting increases with household income and the respondent being employed, and with the presence of a spouse or child outside the destination country. The effects are both statistically and economically significant – a 10% increase in household income is associated with an additional \$110 remitted each year on average, while an additional child outside the household is associated with remitting an additional \$496 per year. A spouse outside the country is associated with remitting an additional \$1,339 per year. This is not statistically significant for the total amount remitted, but is significant at both the extensive and intensive margins when considered separately.

Legal status has a strong positive effect on the extensive margin: migrants who are legally in a country are approximately 12% more likely to remit. This may reflect differences in access available to formal financial institutions, such as banks, between legal and illegal migrants. An intent to return home is also strongly significant for the extensive margin. This may reflect a desire to retain strong ties with family in the home country or investment in the home country by migrants while they are abroad. Conditional on these other covariates, the respondent's education, sex and age have no significant relationship with total remittances in the first column, although they do predict



the extensive margin to some extent. The number of years the migrant has spent abroad is never significantly associated with any measure of remittances conditional on these other covariates.

#### ***4.1 Remittance patterns by gender***

The regressions in Table 3 show the linear association of particular variables with remittances, conditional on other variables. We now turn to exploring four key variables of interest to policymakers more closely. The first is gender. The percentage of respondents who are female varies from only 12 percent in the Italian NiDi survey, to 49 percent in the United States New Immigrant Survey and 51 percent in the French DREES survey. Table 4 summarizes the patterns of remitting by gender. In all surveys, women report remitting less money on average than men in the past year, and this difference is statistically significant in two of the surveys. In five of the surveys women are significantly less likely to remit than men. Overall, men remit an average of \$568 per person than women (although this difference is not statistically significant). In the pooled sample, only 26% of female respondents remit, which is statistically different than the 42% of male respondents who remit. These differences appear to be largely driven by the differences in the observable characteristics of male and female migrants controlled for in Table 3, since after controlling for these characteristics males only remit \$71 more and are only 2.8 percentage points more likely to remit, neither difference being statistically significant.

The second half of Table 4 examines differences in remitting patterns by gender for the group of migrants who migrate without their spouse. This is a more common occurrence for male migrants than females. Thus male migrants are 64 percent of total migrants in these six surveys, but are 87 percent of the migrants with a spouse outside the country. Among those in this category, men remit a lot more than women. Men with a spouse outside the country remit an average of \$3,879, while women with a spouse outside the country remit \$771, which amounts to a statistically significant difference of \$3,108.

#### 4.2 Semi-parametric remittance patterns

The other three key relationships of interest which we wish to examine in more detail are the association between remittance behavior and time abroad, education, and income. Each of these is a continuous variable, and it is of interest to flexibly examine the association between remittance behavior and this characteristic, whilst still controlling for other important factors such as the destination country survey and other basic migrant characteristics. To do this, we use semi-parametric regression to estimate the partial linear model:

$$y = f(x) + z'\beta + \varepsilon,$$

where  $y$  is the remittance measure,  $x$  is the migrant characteristic of interest,  $f(\cdot)$  is an unknown function and  $z$  is a vector of controls which enter linearly. We always include dataset fixed effects in  $z$ , and then examine how the relationship  $f(\cdot)$  changes when we include further demographic controls. To obtain consistent estimates of  $f(\cdot)$  and  $\beta$ , we use the following procedure (Robinson 1988):

1. Non-parametrically regress each variable in  $y$  and  $z$  on  $x$ .
2. Obtain a consistent estimate of the vector of linear parameters,  $\beta$ , by regressing the first-stage residual of  $y$  on the residuals of  $z$ .
3. Use the second-stage estimate of  $\beta$  to form  $y - z'\beta$ , and non-parametrically regress this on  $x$  to estimate  $f(\cdot)$  consistently.
4. Use these estimates to plot the predicted values  $f(x) + z'\beta$  evaluated at the means of  $z$  over an interval of  $x$ .
5. Bootstrap this procedure 500 times to obtain a 95% pointwise confidence interval for this relationship

Figures 6-11 present these relationships. The panels on the left control only for the datasets being used, while the panels on the right also include demographic controls, such as sex, marital status and a quadratic in age. Each figure plots the estimated non-parametric relationship between a measure of remittances and a variable of interest, evaluating all controls at their means, together with a 95% confidence interval. Monetary values of remittances are estimated linearly, but plotted on a log scale. The dashed

vertical lines demarcate the quartiles (i.e the lowest 25%, the median, and the highest 75%) of the variable of interest.

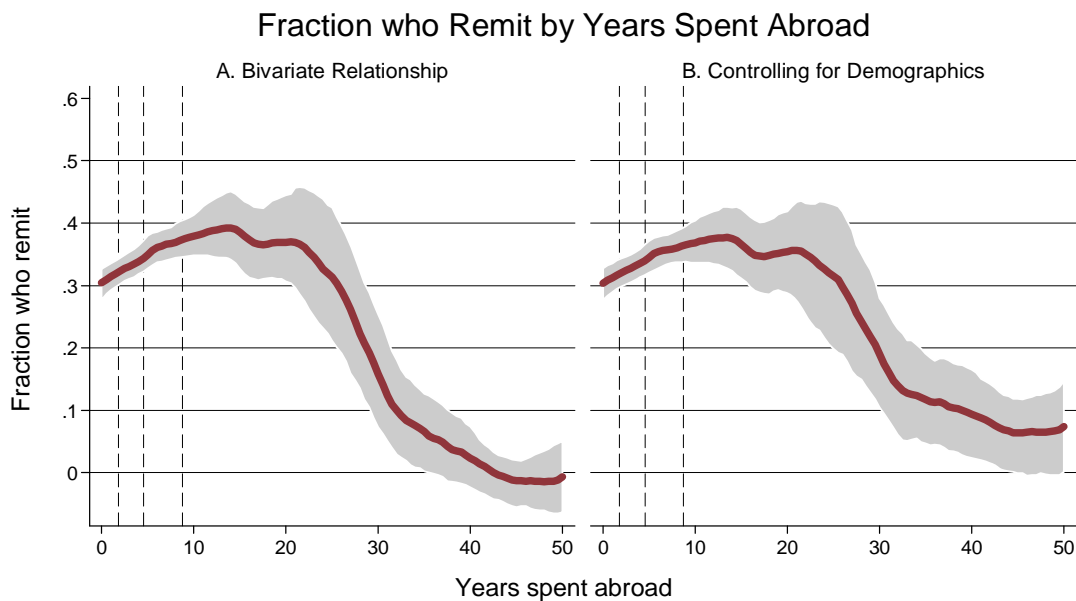
### ***4.3 Remittance patterns by years spent abroad***

As noted in the introduction, one of the key variables of policy interest is the length of time migrants have spent abroad. In particular, the general issue of interest is whether there is remittance decay. One formulation of remittance decay pertains to individuals, asking whether particular individuals start to remit less as they spend more time abroad and presumably weaken their ties with their host country. The second formulation of this hypothesis thinks about comparing different migrants, such as permanent and temporary migrants, and asks whether the types of migrants who remain in destination countries for longer periods of time are less likely to remit. While much of the literature has been motivated by the first question, the majority of studies have used a single cross-section to infer the relationship, making it more likely they are answering the second question. This is the approach we take too, given our data. Note that even with panel data which tracks the same migrants over time, the difficulties of dealing with non-random return migration and with separating age, cohort and time effects makes the first question hard to answer. Of course if we assume that there are no cohort and time effects, and no selectivity of return migration, then the results of the cross-sectional estimation will address both questions.

Figure 6 examines how the extensive margin of whether or not individuals remit varies with years spent abroad. The relationship is non-linear, and robust to whether or not we control for years of education, sex, marital status and a quadratic in age as demographic controls. The vertical lines show that more than 75% of migrants in the sample have spent fewer than 10 years abroad – over this range, the propensity to remit increases with time spent abroad. Beyond about 20 years spent abroad, however, the likelihood of remitting decreases sharply. In contrast, when we examine the total amount remitted in Figure 7, there is little relationship with years spent abroad. Given Figure 6, this suggests that the lower tendency to remit after many years abroad is offset by individuals remitting more when they do remit. Note that these results differ from Table 3, where a quadratic in years abroad was always insignificant in predicting remittance

behavior. Apart from the greater flexibility of functional form, the difference here is that we are not conditioning on income, work status, presence or not of family abroad, intent to return, or legal status. These are all variables which are likely to change with time spent abroad, so if we want to ask how time spent abroad is correlated with remittance behavior, we do not want to condition on them.

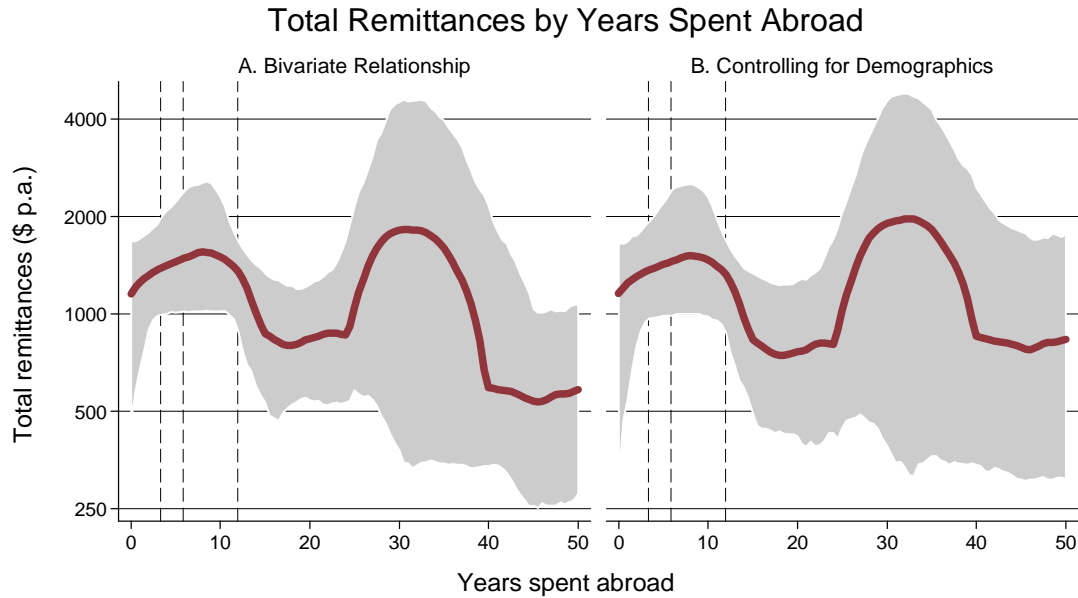
**Figure 6**



These results therefore suggest that while there is something to the idea that migrants are less likely to remit as they spend more time abroad, this negative relationship only kicks in when migrants have been abroad twenty years or more – where we have fewer observations. The positive slope seen over the first 10 years, where the majority of our data is located, is consistent with some migrants taking some time to earn at a level which allows them to remit. Moreover, both of these patterns are offset by the intensive margin, resulting in a flat pattern with total amount remitted. As noted, it is possible that this pattern purely reflects selection differences arising from cohort effects in migration and selective return migration. But it seems unlikely to us that this would give such different patterns for the likelihood of remitting as compared to total remitted,

leading us to believe there is some signal as to remittance patterns over time contained in these figures.

**Figure 7**



#### ***4.4 Remittance patterns by education***

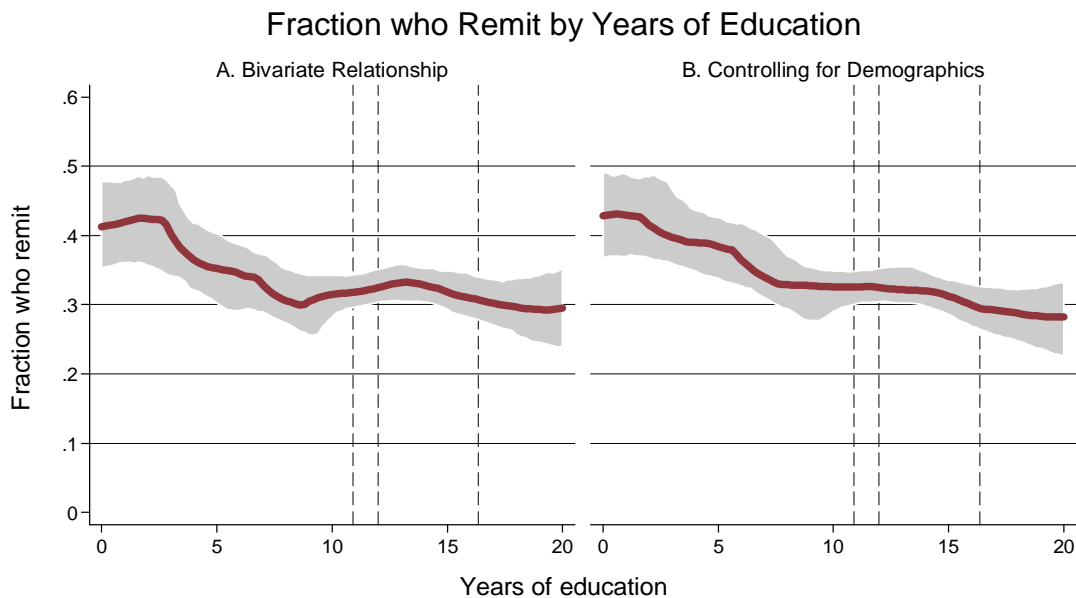
The relationship between education and remittances is an important component in the debate over “brain drain” for African economies, and enters into the policy debate as to whether more low-skilled or more high-skilled job opportunities abroad are likely to result in more remittances. Of course maximizing remittances is in itself unlikely to be a sensible policy goal, and requires assuming large positive externalities from remittances through channels such as multiplier effects or financial development for what are otherwise private transfers between family members to have any role in policy decisions.<sup>6</sup>

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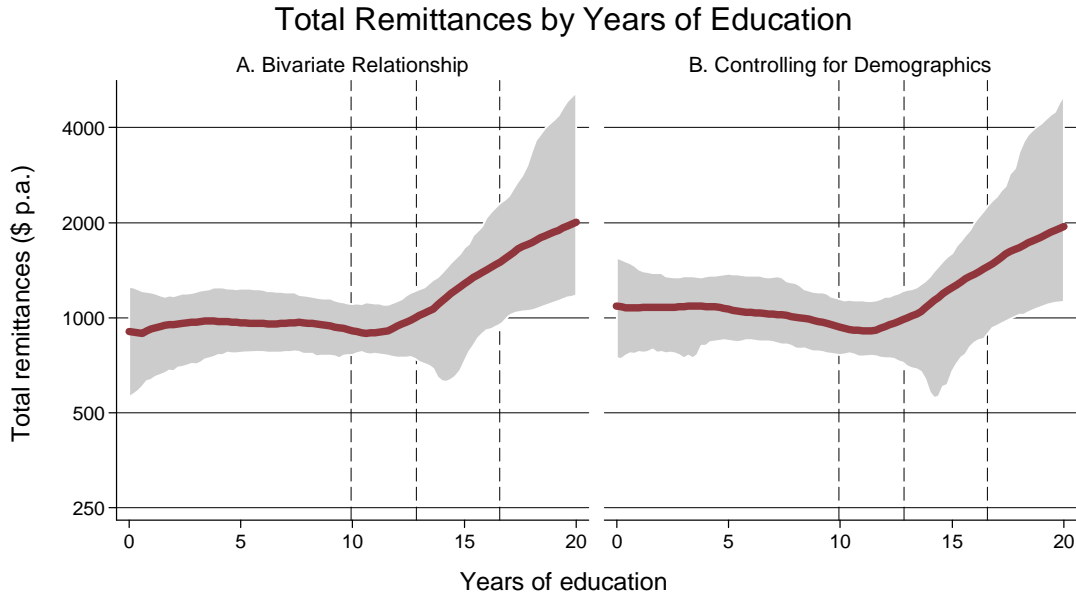
<sup>6</sup> Instead, maximizing the income-earning opportunities of people from the given country makes more sense, and from a welfare perspective, we would prefer people to not have to separate from their families to do so. Moreover, as Bollard et al. (2009) show, there is no evidence that there is a trade-off between the two types of migration, in contrast high-skilled and low-skilled migration appears to be complements, not substitutes. So in many cases the choice between the types of migration to promote may be an artificial one.

Figures 8 and 9 present the non-parametric relationships between remittance patterns and years of education – with panel A in each case controlling only for dataset fixed effects and panel B also controlling for a quadratic in years abroad, sex, marital status, and a quadratic in age. In the baseline linear specification education was not statistically significant for total remittances, but had opposing effects on the extensive and intensive margins: more educated individuals were less likely to remit, but conditional on remitting, would remit more. This result is reaffirmed by the semi-parametric regressions below. Figure 7 shows that the likelihood of remitting is decreasing gradually in years of education. Figure 8, however, shows that the intensive margin more than offsets this effect: average total remittances are remarkably constant up to a full high school education, and sharply increasing beyond this. Thus while they remit less often, the highly educated remit more in total, with this driven by the tertiary educated. The main reason for the more educated remitting more is that they earn more, so that controlling for income and other controls in Table 3 results in an insignificant effect of education on total amount remitted.

**Figure 8**



**Figure 9**



#### ***4.5 Remittance patterns by income***

Finally, in Figures 10 and 11, we examine the relationship between remittance behavior and the (destination country) household income of the migrant. This is of interest both as a proxy for skill level, and directly, for examining whether richer migrants are less likely to remit than poorer migrants. We saw already that income is an important predictor of remittances in the baseline linear specifications in Table 3. Figure 10 confirms this positive relationship between income and the probability of remitting for incomes less than \$40,000, which accounts for more than 75 percent of the migrants in our database, and shows an imprecise somewhat downward trend after this. Again this is robust to whether or not we control linearly for individual characteristics (years of education, a quadratic in years spent abroad, sex, marital status and a quadratic in age).

**Figure 10**

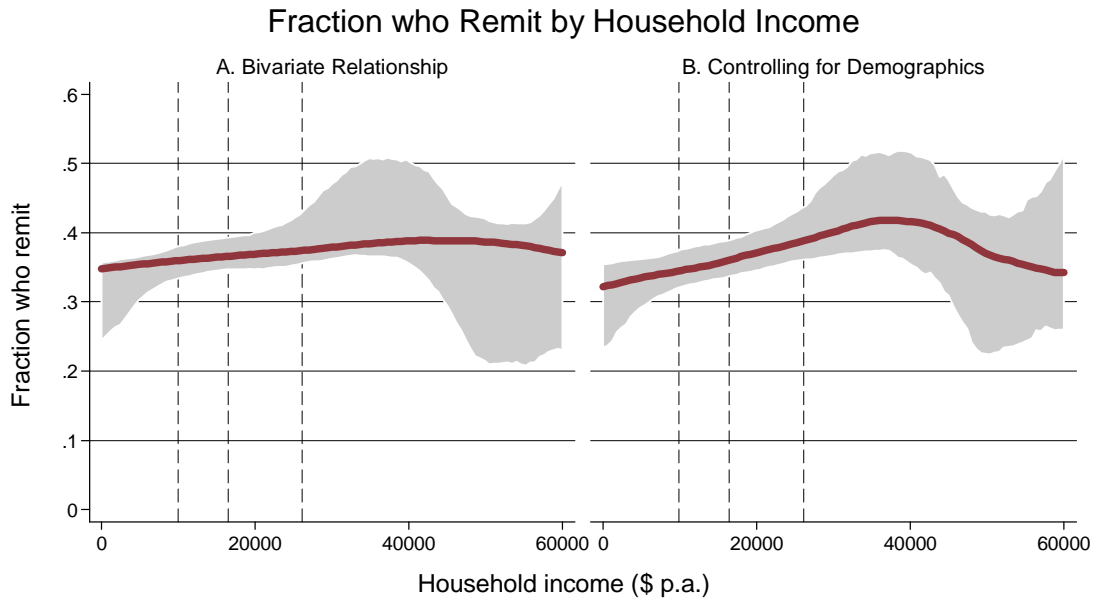
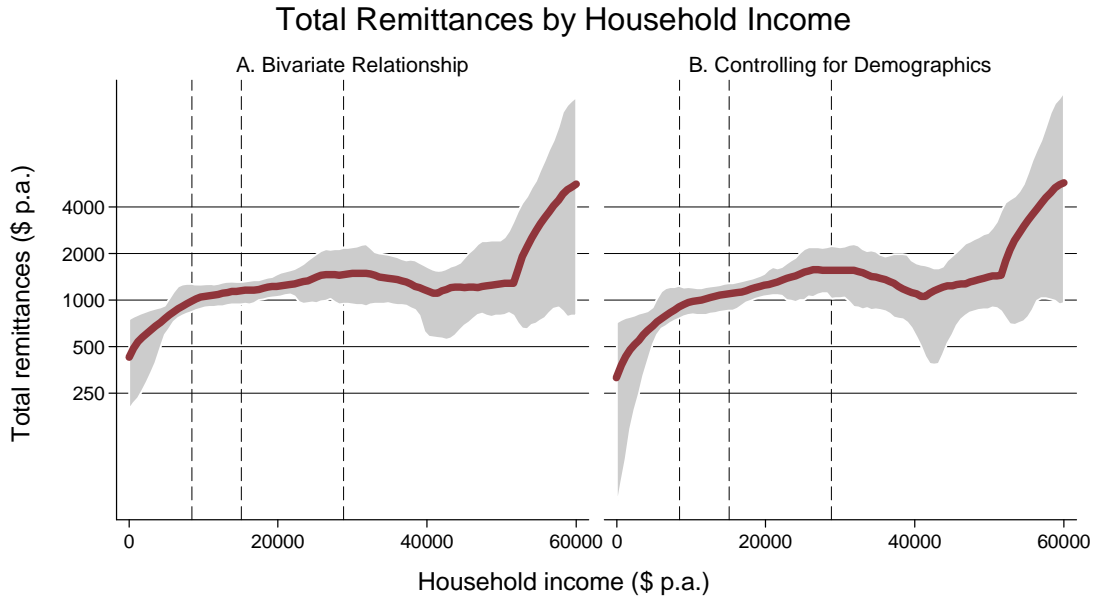


Figure 11 shows that the overall positive relationship between total income and total amount remitted masks considerable non-linearity. The relationship is gradually rising over the interquartile range of incomes roughly between \$10,000 and \$30,000, and is sharply rising for incomes below and above this. This relationship differs somewhat from the extensive margin relationship in Figure 10. So for the poorest migrant households, they are only marginally less likely to remit than households earning \$10,000-20,000, but remit a lot less. And households earning more than \$40,000 are remitting amounts two to four times the African average amount remitted per year. If income is viewed as a reflection of skill, then this is again evidence that more-skilled migrants are remitting more.



**Figure 11**



It is thus notable that the pattern here with respect to income contrasts quite sharply with what we see with comparisons across countries. We have found African migrants remit more than migrants from other developing countries, with the average other developing country being richer than the average African country. And among African countries, we find migrants from richer countries are less likely to remit than migrants from poorer countries – although little relationship with total amount remitted. Yet among migrants from a given African country, migrants who earn more abroad are more likely to remit and remit more. One possible reason for this could be if there is little relationship between how much people earn abroad and the income level of the household members remaining in their home country, especially once we have conditioned on education. Another potential explanation involves temporary income shocks. Among migrants from a given source country, those who are experiencing high income in the current period because of a positive shock should be remitting more, whereas those who have low income because of a negative shock will remit less or not remit. This could explain the patterns seen in Figures 10 and 11. Once we aggregate individuals from the same country, these shocks will average out, and what remains is a

relationship between permanent income and remittances. We believe this is a fruitful area for further research which collects detailed information on shocks.

## 5. Conclusions

Using a new database of over 12,000 African migrants we have provided a detailed analysis of which migrants remit and which don't, and how remitting patterns vary with key variables such as gender, education, income, and time abroad. In doing so, we have refuted several common perceptions about remitting patterns. We find male migrants to remit more than female migrants, contrary to the perception that women are better remitters. We find the more educated and those earning higher incomes remit more, contrary to the belief that the high-skilled are less likely to remit than the lower skilled. And we find that the likelihood of remitting and the amount remitted increase over the first ten years of time abroad, contrary to fears of remittance decay, and that even with more time abroad, the drop in the likelihood of remitting with time abroad is offset by individuals remitting more when they do remit.

We consider this a reasonable start in overcoming the data limitations and information gaps that currently restrict understanding of remittance behavior of Africans. Nevertheless, it is but a start. The data we have is the most comprehensive currently available. Yet ideally one would like to extend the analysis to also include representative datasets on African migrants in major migrant destinations within Africa; to provide more detail on the circumstances of the household members remaining in the origin country; and to incorporate a panel data element that would enable study of how the behavior of the same particular migrants changes with time spent abroad and with shocks experienced. The household surveys which we use have the advantage of capturing informal transfers that are not recorded in official remittance flows. However, there are likely to be lingering concerns about the quality of the remittance figures being reported. We believe that migrants are less likely to underreport amounts remitted than might be the case in surveys in receiving countries, where household members might be concerned about tax and theft.<sup>7</sup> In future work it would be useful to extend the matched sample

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<sup>7</sup> Conversely, there is the possibility that migrants might be overreporting the amounts they remit, in order to make themselves look better in the eyes of the interviewer.

approach of Osili (2007), by surveying both the remittance sender and recipient and comparing the remittance figures obtained to give a better sense of the accuracy of these reports.<sup>8</sup>

Finally, the analysis in this paper is by necessity descriptive. Ideally one would like to directly link policy changes to changes in remittance behavior to more definitively answer the policy questions which motivate some of this paper. Thus, for example, as OECD countries change their migration policies, it is of interest to see whether changes in the gender, education, income level, and duration abroad of migrants induced by these policies lead to changes in remittance transfers. Regular surveys of remittances of Africans abroad would be one first step in creating the necessary data infrastructure needed to carry out such studies.

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<sup>8</sup> Osili (2007) notes that because migrants remit to multiple source country households and that source country receivers receive remittances from more than one migrant household abroad, she cannot directly compare the remittance figures on both side of a transaction. More detailed remittance questionnaires and careful attention to survey timing would allow this to be done.

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**Table 1: Migrant Characteristics**

	Australia LSIA	Belgium IRSHS	France 2MO	France DREES	Italy NIDI	Netherlands CSR	Norway LBI	Spain ENI	Spain NIDI	UK BME	USA NIS	Pooled All
<b>Binary variable means</b>												
University degree	0.39	0.53	0.08	0.18	0.17	0.10	0.06	0.14	0.03	0.26	0.34	0.33
Male	0.61	0.69	0.64	0.49	0.88	0.63	0.56	0.62	0.82	0.54	0.50	0.62
Working	0.61	0.67	0.77	0.40	0.80		0.19	0.56	0.78	0.82	0.52	0.61
Married	0.66		0.70	0.64	0.61		0.50	0.60	0.63		0.64	0.64
Spouse outside country	0.03				0.24		0.15	0.11	0.41		0.08	0.10
Legal immigrant	1.00			1.00	0.85			0.58	0.67		1.00	0.86
Will return home	0.04		0.47	0.06	0.42		0.00	0.03	0.35	0.76	0.16	0.17
<b>Years of education</b>												
Mean	14.54	13.59	8.25	11.78	13.74	10.30	11.35	9.91	6.77	13.93	13.57	12.50
Std deviation	3.61	4.14	4.89	2.86	4.28	4.23	4.21	3.88	5.86	2.20	4.73	4.64
<b>Age</b>												
Mean	38.6	35.2	42.1	31.6	33.4	38.0	65.3	39.3	34.0	36.7	36.3	35.9
Std deviation	12.8	9.4	11.4	9.0	6.4	10.7	7.8	14.7	8.1	9.7	12.1	11.3
<b>Household income (\$)</b>												
Mean	10,608	21,929	23,495	19,915	11,407		22,900	15,438	9,114	45,658	38,170	26,344
Std deviation	16,864	16,545	16,438	44,968	9,114		15,737	11,698	9,355	37,608	171,270	104,004
<b>Household size</b>												
Mean	3.49	2.25		2.37	1.87		1.13	3.95	1.84	3.07	3.52	2.89
Std deviation	1.64	1.66		1.78	1.24		0.34	2.09	1.48	1.56	1.83	1.83
<b>Number of children</b>												
Mean	1.44			1.22	1.05		2.89	2.64	1.54		1.64	1.41
Std deviation	1.51			1.65	1.28		2.03	1.70	1.99		2.30	1.71
<b>Children outside country</b>												
Mean	0.22		0.09	0.31	0.67		0.21	0.29	1.07		0.56	0.32
Std deviation	0.68		0.29	0.93	1.17		0.73	0.90	1.84		1.34	0.96
<b>Number of parents</b>												
Mean	1.91			0.90			1.20	1.24	1.27		2.20	1.66
Std deviation	1.38			0.94			0.72	0.79	0.85		1.28	1.21
<b>Parents outside country</b>												
Mean	1.61		0.81	0.89			1.08	0.91	1.23		1.23	1.15
Std deviation	1.29		0.39	0.94			0.76	0.85	0.86		0.83	0.97
<b>Years spent abroad</b>												
Mean	3.63	10.95	18.24	3.85	6.77	16.44		16.10	7.25	12.21	6.70	9.37
Std deviation	0.48	8.91	11.53	5.36	3.49	9.13		16.34	5.42	9.60	9.31	10.92
All Observations	358	472	560	4,424	1,160	522	304	2,494	1,113	586	763	12,481

*Note:* All migrants born in Africa. Sample weights post-stratified by country and income.

**Table 2: Distribution of Total Annual Remittances by Migrant Origin (%)**

	Sub-Saharan Africa	North Africa	Rest of World
Nothing	66.6	66.3	73.8
\$1 - \$200	4.3	0.9	3.6
\$200 - \$500	5.5	4.9	4.6
\$500 - \$1000	5.1	3.7	4.1
\$1000 - \$2000	5.8	7.7	5.1
\$2000 - \$5000	7.8	9.4	6.0
\$5000 - \$10,000	2.9	5.2	2.0
\$10,000 +	2.0	2.0	0.8

*Note:* Each column sums to 100%. Sample weights post-stratified by country and income. Trimmed remittances greater than twice annual income.

**Table 3: Remittances on Migrant Characteristics and Country of Birth**

	Total Remittances		Extensive: Remits indicator		Intensive: Log remittances	
	(1)	(2)	(3)	(4)	(5)	(6)
Years of education		19.7 (19.9)		-0.005* (0.002)		0.014 (0.007)
Male		71.1 (389.7)		0.025 (0.015)		0.105 (0.082)
Age / 100		-3,657.5 (5,451.9)		0.588* (0.300)		0.700 (2.143)
Age squared / 100		32.1 (52.6)		-0.009** (0.003)		0.011 (0.026)
Log income		1,096.1* (441.6)		0.034** (0.007)		0.468** (0.061)
Working		775.2** (275.9)		0.110** (0.017)		0.410** (0.110)
Household size		-12.6 (110.6)		-0.010* (0.005)		0.006 (0.029)
Married		112.1 (385.3)		-0.013 (0.018)		-0.067 (0.100)
Spouse outside country		1,339.3 (818.5)		0.170** (0.031)		0.331* (0.140)
Number of children		-232.3 (123.1)		-0.000 (0.008)		-0.112 (0.058)
Children outside country		495.7** (150.7)		0.046** (0.011)		0.227** (0.069)
Number of parents		-52.3 (414.4)		-0.039* (0.015)		-0.113 (0.126)
Parents outside country		35.2 (320.3)		0.079** (0.016)		0.199 (0.117)
Years spent abroad / 100		-4,650.8 (5,411.4)		0.086 (0.211)		-0.530 (0.973)
Years spent abroad squared / 100		69.4 (72.3)		-0.005 (0.004)		-0.010 (0.022)
Legal immigrant		-197.2 (259.0)		0.119** (0.025)		0.046 (0.090)
Will return home		1,518.8 (1,242.1)		0.087** (0.029)		0.002 (0.100)
Algeria	-225.4 (393.2)	252.5 (428.8)	-0.207** (0.069)	-0.094 (0.067)	-0.092 (0.208)	-0.072 (0.199)
Congo, Dem. Rep.	1,169.4 (1,280.1)	1,554.4 (1,278.3)	0.083 (0.084)	0.150* (0.076)	-0.362 (0.257)	-0.168 (0.236)
Egypt, Arab Rep.	-615.3 (401.2)	-250.6 (387.4)	-0.263** (0.043)	-0.172** (0.038)	0.304* (0.149)	0.398** (0.145)
Ethiopia	-2,909.3 (1,869.3)	-2,359.1 (1,605.7)	-0.068 (0.096)	-0.031 (0.101)	-0.105 (0.421)	0.098 (0.369)
Morocco	-11.9 (400.1)	660.9 (439.7)	-0.160* (0.069)	-0.041 (0.067)	-0.014 (0.167)	0.182 (0.161)

Nigeria	1,935.9 (1,521.0)	1,715.1 (1,367.5)	-0.006 (0.080)	0.014 (0.079)	0.039 (0.235)	-0.082 (0.219)
Senegal	994.6 (638.5)	783.7 (688.7)	0.125 (0.070)	0.117 (0.068)	-0.089 (0.181)	0.013 (0.177)
Somalia	-450.3 (378.0)	570.9 (438.2)	0.063 (0.127)	0.124 (0.124)	-0.050 (0.183)	0.146 (0.174)
South Africa	-805.0* (349.5)	-266.2 (377.4)	-0.471** (0.069)	-0.392** (0.068)	-0.108 (0.340)	-0.138 (0.297)
NIS Other: Sub-Saharan Africa	-2,622.5 (2,419.7)	-3,019.1 (2,458.2)	-0.028 (0.093)	-0.024 (0.094)	-0.163 (0.580)	-0.274 (0.493)
Angola			-0.179 (0.099)	-0.080 (0.094)		
Cameroon			0.129 (0.093)	0.203* (0.084)		
Comoros			0.003 (0.106)	0.141 (0.097)		
Congo, Rep.			-0.027 (0.079)	0.055 (0.077)		
Cote d'Ivoire			0.051 (0.087)	0.110 (0.086)	0.594* (0.249)	0.616** (0.228)
Guinea			-0.055 (0.100)	0.059 (0.091)		
Madagascar			0.016 (0.104)	0.140 (0.099)		
Mali			0.131 (0.094)	0.200* (0.088)	0.256 (0.274)	0.376 (0.249)
Mauritania			0.197 (0.118)	0.211* (0.095)		
Mauritius			-0.282** (0.087)	-0.219** (0.080)		
Togo			0.142 (0.141)	0.282 (0.153)		
Tunisia			-0.129 (0.075)	-0.016 (0.071)	0.387 (0.228)	0.258 (0.217)
DREES Other: Rest of Africa			-0.086 (0.099)	0.009 (0.101)		
BME Other: Africa					-0.028 (0.319)	-0.080 (0.304)
F-stat for shown countries = Ghana	2.88	1.59	15.455	8.448	2.21	2.24
p-value of F-stat	0.00	0.10	0.000	0.000	0.01	0.01
Number of observations	5,171	5,171	8,953	8,953	3,838	3,838

*Note:* \*  $p < 0.05$ , \*\*  $p < 0.01$ . Omitted country is Ghana. Fixed effects are included for all countries of birth, but only shown and tested if there are at least 30 observations. All specifications also include survey fixed effects and dummy variables for missing covariates. Sample weights post-stratified by country and income. Trimmed remittances greater than twice annual income.



**Table 4: Average Total Remittances by Sex of Respondent**

	Australia LSIA	Belgium IRSHS	France DREES	Italy NIDI	Norway LBI	Spain ENI	Spain NIDI	USA NIS	Pooled Total
<b>All Migrants</b>									
Observations	358	470	4,418	1,160	304	2,494	1,112	754	5,618
Fraction male	0.61	0.69	0.49	0.88	0.56	0.62	0.82	0.51	0.64
Fraction who remit									
Male	0.30	0.88	0.27	0.56	0.34	0.49	0.79	0.26	0.42
Female	0.22	0.88	0.19**	0.60	0.18**	0.24**	0.70*	0.17*	0.26**
Average total remittance									
Male	320	2,305		2,661		759	3,139	2,337	1,446
Female	82**	1,714		2,207		283**	2,879	1,428	878
<b>Migrants with Spouse Outside Country</b>									
Observations				301	32	266	455	78	1,020
Fraction male				0.97	0.68	0.95	0.93	0.53	0.87
Fraction who remit									
Male				0.73	0.69	0.85	0.94	0.42	0.77
Female				0.49	0.20**	0.40**	0.77	0.05**	0.27**
Average total remittance									
Male				4,080		1,753	4,011	3,842	3,879
Female				728**		785	2,852*	42	771**

*Note:* \*  $p < 0.05$ , \*\*  $p < 0.01$ . Showing all countries and statistics with at least 30 male or female observations. Sample weights post-stratified by country and income. Trimmed remittances greater than twice annual income.