Credible national data on bilateral remittances are not available. Even when such data are reported, they may not be accurate, because funds channeled through international banks may be attributed to a country other than the actual source country. For example, funds flowing from the Gulf region through international banks may be attributed to New York or London (Ratha 2005). Market players and researchers, therefore, have attempted to derive bilateral remittance flows indirectly using bilateral migrant stock data and estimates and assumptions about the remittance behavior of migrants. Harrison, Britton, and Swanson (2005), for example, assume that each migrant sends a fixed average amount.

We have calculated bilateral remittances by allocating remittances received by each developing country among the countries of destination of its migrant nationals. We use three different allocation rules: (i) weights based on migrant stocks abroad; (ii) weights based on migrant incomes, proxied by migrant stocks multiplied by per capita income in the destination countries; and (iii) weights that take into account migrants’ incomes abroad as well as source-country incomes (the resulting data sets can be accessed at www.worldbank.org/prospects/migrationandremittances). Each of the three methods is discussed in more detail below.

Using the Share of Migrants in Different Destination Countries as Weights

The first method of estimating bilateral remittances assumes that remittances $R_i$ received by country $i$ are proportional to migrant stocks in the different destination countries.
Hence, the weight attached to destination country \( j \) is

\[
W_j = \frac{M_{ij}}{\sum_i M_{ij}}
\]

(1)

where \( M_{ij} \) is the number of migrants from country \( i \) in destination country \( j \). Bilateral remittances received by country \( i \) from destination country \( j \) are therefore \( w_j R_i \).

A shortcoming of this method is that it assumes that each migrant sends the same amount of remittances regardless of where she lives and no matter what her income in the host country. The large variance of incomes across migrant-receiving countries (and even across countries within each income group) limits the usefulness of this method. This method yields an upper bound estimate of South-South remittances, however, since it attributes the same amount of remittances to a developing country as to a high-income country.

Using Both Migrants Abroad and Income Level in the Host Country

The second method of estimating bilateral remittances uses migrant stocks in different destination countries and host-country incomes to construct weights. The weight attached to destination country \( j \) is:

\[
W_j = \frac{M_{ij}Y_j}{\sum_i M_{ij}Y_j}
\]

(2)

where \( M_{ij} \) is the number of migrants from country \( i \) in destination country \( j \) and \( Y_j \) is the average per capita GNI of migrant-receiving country \( j \). Bilateral remittances received by country \( i \) from destination country \( j \) are therefore \( w_j R_i \).

Although this method is superior to the first one, as it takes into account both migrant stocks and the average income of the country where the migrant resides, it assumes that each migrant sends a fixed share of her income, regardless of the level of that income or the needs of the family back home. This method yields a lower-bound for South-South remittances.

Using Weights Based on Migrant Stocks, Per Capita Income in the Destination Countries, and Per Capita Income in the Source Countries

The third method tries to correct for the shortcomings of the first two methods. The average remittance sent by a migrant in destination country \( j \) \( (r_j) \) is modeled as a function of the per capita income of the migrant-sending country and the host country.

\[
r_j = f(\overline{Y}_i, Y_j) = \begin{cases} \overline{Y}_i & \text{if } Y_j < \overline{Y}_i \\ \overline{Y}_i + (Y_j - \overline{Y}_i)^\beta & \text{if } Y_j \geq \overline{Y}_i \end{cases}
\]

(3)

where \( Y_j \) is the average per capita GNI of migrant-receiving country \( j \), \( \overline{Y}_i \) is the per capita GNI of the migrant’s home country, and \( \beta \) is a parameter between 0 and 1. The amount
sent by an average migrant is assumed to be at least as much as the per capita income of the home country, even when the individual migrates to a lower-income country. The rationale is that the migration occurs in the expectation of earning a higher level of income for the dependent household than what the migrant would earn in her home country. Ideally, the migrants’ income should be taken from household survey data; but in the absence of such data, we use per capita GNI in the host country as a proxy for the migrant’s income abroad and per capita GNI in the sending country as a proxy for the dependent household’s income (assuming that the migrant’s remittances compensate at least the counter-factual loss of income due migration).

The level of remittances is assumed to increase with the level of host country income, but at a decreasing rate: \( f' > 0 \) and \( f'' < 0 \). The total amount of remittances received by country \( i \) is therefore

\[
R_i = \sum_j r_i M_j
\]  

The parameter \( \beta \) in equation (3) is estimated for each country such that the total of remittances received is equal to \( R_i \) in equation (4). The parameter \( \beta \) is found to be remarkably stable across developing countries (0.74 for Bangladesh and China, 0.78 for India, 0.77 for Philippines, and 0.67 for Vietnam). In order to estimate bilateral remittances for all countries, we use the average \( \beta \) (equal to 0.75) for the top 20 remittance-receiving countries. Equation (3) is then used to create weights so that individual remittances from equations (3) and (4) add up to the total remittances received.

A comparison of these estimates for South-South and North-South remittances calculated using the three different methods is provided in Table 3 in the main text. It is usually impossible to verify the accuracy of these bilateral estimates as most countries in the South as well as in the North do not report sources or destinations of remittance flows. A handful of countries (for example, Bangladesh and the Philippines) do report sources of remittance inflows, but in these data, more flows are likely to be attributed to the United States and Europe where international banks have headquarters (Ratha 2005). Remittances from South countries may also be underestimated due to restrictions on outward remittance flows and irregular status of migrants (for example, Bangladesh does not report any remittance inflows from India even though it has a large migrant population in India).