

# Are Bilateral Remittances Countercyclical? Implications for Dutch Disease and Currency Unions

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The economic theory of migration tends to fall between the two stools of labor economics<sup>1</sup> and international trade.<sup>2</sup> But the connection to a third stool has in the past been especially under-studied: international finance and macroeconomics. The research described here concerns macroeconomic aspects of migrants’ remittances.

Remittances are a large and growing source of foreign exchange in many developing countries. Total recorded workers’ remittances received by developing countries increased 73% between 2001 and 2005, reaching a total of \$167 billion.<sup>3</sup> Remittances received by countries in East Asia and the Pacific more than doubled during this period ; transfers from Non Resident Indians to their country of origin are the spectacular example. Remittances have grown more rapidly than private capital flows, or official development statistics. They constitute more than 15% of GDP in Tonga, Moldova, Lesotho, Haiti, Bosnia, Jordan, Jamaica, Serbia, El Salvador and Honduras. In countries like the Philippines, El Salvador, the Caribbean, and North Africa, remittances can be the most important single source of foreign exchange. Remittances constitute a particularly valuable component of the balance of payments in downturns, when markets

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<sup>1</sup> Rapoport and Docquier (2005) review the theory that has been developed as part of the New Economics of Labor Migration. For a recent contribution, see Kugler and Rapoport (2007).

<sup>2</sup> Among trade economists, the subject goes back at least to Bhagwati and Hamada (1974).

<sup>3</sup> Statistics cited here come from “Economic Implications of Remittances and Migration” in *Global Economic Prospects 2006*, World Bank, pp. 86-92

in locally produced commodities are depressed or when international investors have lost interest.

The hypothesis of this study is that remittances for some countries can play the role that capital flows are in theory supposed to play. In theory, the increased integration of developing countries into the world financial system should have carried a variety of benefits: smoothing short-term income disturbances, diversification, helping to finance high-return investment opportunities in low capital/labor ratio countries, and disciplining policies and institutions in the recipient country. It is sometimes possible to observe these theoretical benefits in operation. In practice, however, capital flows have -- as often as not -- failed to deliver on this promise.<sup>4</sup> Rather than smoothing short-term disturbances such as fluctuations in conditions on world markets for a country's export commodities, private capital flows are often procyclical: pouring in during boom times and disappearing in recessions. (In the case of agricultural and mineral producers, this procyclicality of capital flows is a key component of the Dutch Disease). Rather than flowing on average from high capital/labor countries (e.g., the US) to low capital/labor countries, the tendency has been for capital often to "flow uphill."<sup>5</sup> Rather than rewarding only countries that follow sound economic policies and punishing only those that follow bad policies, capital often aids and abets irresponsible budget deficits, including among autocratic and kleptocratic rulers, especially if they have control of a natural resource (one component of the natural resource curse).<sup>6</sup>

What reasons are there, a priori, for thinking that remittances might be better than capital flows in delivering the benefits of smoothing, diversification, financing high-return investment opportunities, and disciplining policies? The sending of remittances is a decentralized decision made by individuals, based on a familiarity with and appreciation for the needs, desires, constraints, and opportunities faced by themselves and their families. These private individuals don't have the government's problem of needing to spend money in the short-term to win re-election or stave off coups. They are more likely than a central government to know which family members are in truly desperate circumstances through no fault of their own, or in which households the husband will "drink away" the money, or to know whether it makes sense to save up to buy a house or store or establish some other small business. Free-market theory says that private agents do a good job of making these decisions. In the case of private capital flows, historical and statistical evidence casts serious doubt on this claim. In the case of emigrants' remittances, it seems far more likely to be true.

This hypothesis is especially important because many governments in remittance-receiving countries reflexively treat remittances as a source of foreign exchange that needs to be harnessed for national development, rather than letting the recipients spend it on unproductive uses such as imports of consumer goods. This rhetoric is common even among benevolent governments, let alone the kleptocracies. A few observers have suggested that private citizens might do a good job determining and disposing of

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<sup>4</sup> Refernces to be added

<sup>5</sup> Lucas, ...other references to be added.

<sup>6</sup> References to be added.

remittances.<sup>7</sup> But the proposition remains more of a hope or assertion that has been expressed, than a hypothesis that has been tested or demonstrated. It remains a hypothesis much in need of empirical testing. If the hypothesis is true, then efforts by national governments to harness remittances are likely to be harmful, above and beyond the obvious point that taxing them could “kill the goose” that is flying the golden eggs into the country.

The specific hypothesis to be tested in this paper is that emigrants’ remittances are counter-cyclical: that they increase relatively when the recipient country is in recession and decrease relatively when the recipient country has above-trend income. Under this hypothesis, remittances tend to smooth consumption and investment intertemporally. As mentioned, this is a criterion that private capital flows usually fail. This hypothesis has been tested by others, and has often been found wanting. But some of these papers are missing something. Many simply do not have enough data. To specify an equation well-targeted to isolate the question of interest, it is best to use bilateral remittance data.<sup>8</sup> Yet such data are hard to come by; most countries don’t collect or report it at all. As a result, studies of bilateral remittances often have an inadequate number of observations. The other item missing in some studies is the cyclical position of the sending country, which should matter just as much as the cyclical position of the receiving country. If the recipient’s income is included without the senders’ one can estimate a coefficient of the wrong sign, when the recipient’s income is highly correlated with the sender’s (for example due to dependence on exports or other channels).

Indeed the same motivating issues of the countercyclical hypothesis and so forth apply just as much for countries that are net *hosts* to immigrants and net *senders* of remittances. Not all of these are industrialized countries.<sup>9</sup> If the inward flow of migrants and the outward payment of remittances is especially high in boom times and lower than average in bad times, this can be an important macroeconomic stabilizer. In the boom times it means alleviation of potential labor shortages and less danger of excessive monetary expansion, overheating, and inflation [which were serious problems in the Gulf countries and other mineral exporters in 2006-2008]. In the down times it means alleviation of domestic unemployment and a needed improvement in the balance of payments.

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<sup>7</sup> Chami, Barajas, Cosimano, Fullenkamp, Gapsen and Montiel (2008) see macroeconomic advantages of remittances of the sort considered here. Martin (1990) points out that a steady flow of remittances can undermine the incentive for governments to create a sound institutional framework – a sort of natural resource curse for remittances. See also the quote below from the World Bank (2006).

<sup>8</sup> Jiménez-Martin, Jorgensen, and Labeaga (2007) estimate bilateral workers’ remittance flows from the 27 members of the EU, to all recipient countries. Ratha and Shaw (2005), in the absence of hard data on bilateral flows, allocate the totals across partners

<sup>9</sup> Roughly 10 per cent come from developing countries. South Africa, for example, receives many immigrants from neighboring countries to work in its mines, farms, and factories, and sends remittances back to the home countries. In many Gulf countries, immigrants (called ex-patriate workers) constitute more than half of the private-sector labor force, both skilled and unskilled. For example, outward remittances from Saudi Arabia (not included in the developing country statistic) are about 7% of all remittances globally.

We have already mentioned one motivation for exploring the cyclical pattern of remittances: it is an indication whether they play the role of improving intertemporal welfare that capital flows are supposed to play in theory, but fail to provide in practice. (The procyclicality of capital flows is sometimes, for shorthand, given the name Dutch Disease.) This paper also has a second motivation: to shed light on the decision of countries to adopt a common currency. There are two possibly relationships between the currency union decision and remittances. On the one hand, if remittances are indeed counter-cyclical, then they belong on the lists of Optimum Currency Area criteria.<sup>10</sup> Optimum Currency Area theory says that the gains to a country of giving up its currency (particularly the facilitation of trade and other international transactions) outweigh the costs of losing monetary independence (which is losing the ability to respond to shocks) only if its shocks or highly correlated with those of the relevant neighbors *or* if it has alternative mechanisms to cushion itself against the effects of asymmetric shocks. The list of alternative cushioning mechanisms is headed by labor mobility, followed by possible international transfers or other financial flows. If remittances are countercyclical, then they belong on this list, and for some countries would be more important than the international transfers.

The World Bank (2006; Box 4.5) argues “In contrast [to oil windfalls], remittances are widely dispersed, the great bulk of them is allocated in small amounts, and for the most part, remittances avoid the government ‘middleman.’ Hence the expectation is that they can avoid the negative effects of natural resource windfalls on poverty, growth, and institutional capacity.” But so far this proposition appears to be more of an assertion than a hypothesis that has been widely tested empirically.

Where earlier authors have findings, the results are interesting, but mixed. On the one hand, Rajan and Subramanian (2005) find that although the Dutch Disease analogy does extend to foreign aid (leading to real appreciation and slow growth), it does *not* appear to extend to private remittances.<sup>11</sup> On the other hand, another study finds that an increase in workers’ remittances to countries in Latin America and the Caribbean leads to real appreciation of the currency, a major symptom of Dutch Disease.<sup>12</sup> There are also examples of violent conflict apparently sustained by inflows of remittances from emigrants -- Northern Ireland, Eritrea/Ethiopia, Israel/Palestine -- which again resembles effects of mineral wealth.

On the specific question of cyclicity, the World Bank has econometric evidence that per capita remittances respond significantly to per capita income in the home country.<sup>13</sup> But the evidence is weaker regarding the host country. Clearly remittances are a more stable source of foreign exchange than capital flows, including even Foreign Direct Investment. But are they actually countercyclical? An IMF study of 12

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<sup>10</sup> Mundell (1961). A relatively recent survey... Singer (2008) makes the argument that remittances should be and are a determinant of the currency decision. His equation uses the level of remittances, but he cites earlier authors’ evidence of countercyclicity.

<sup>11</sup> Rajan and Subramanian (2005).

<sup>12</sup> Amuendo-Dorantes and Pozo (2004).

<sup>13</sup> World Bank (2006, Tables 4A.2.1 and 4A.2.3)

developing countries finds “no.”<sup>14</sup> Others find more supportive results.<sup>15</sup> The area is wide open for research.

The recorded data on remittances in countries’ balance of payments are imperfect, and certainly undercount the flows.<sup>16</sup>

In the case of *bilateral* data on migration and remittances, availability of any sort has been extremely limited until now. Thus existing studies have either operated at the level of a large cross-section of each country’s data on their *aggregate* remittances<sup>17</sup> or have focused on bilateral flows as reported by a single country that is a center of immigration (such as the United States) or emigration (such as Jamaica<sup>18</sup>). The latter sort of data set – bilateral within a region – is needed to study questions such as those relevant for the regional currency area decision. The former sort of global data set can be used to study some questions along the lines of the Dutch Disease analogy. But a more comprehensive bilateral data set would help tremendously to study both categories of remittance issues. One can hope to attain far better estimates of the cyclicity of remittances (and the effects of a common currency) if one had a relatively large bilateral data set, rather than proceeding one country at a time or one region at a time as most researchers have had to do in the past.<sup>19</sup>

The present study resembles Lueth and Ruiz-Arranz (2006, 2008), and indeed uses the data set on bilateral remittances that they generously made available, among other data sources. But Lueth and Ruiz-Arranz find that “remittances may not play a major role in limiting vulnerability to shocks,” indeed that they are procyclical. Schiopu and Siegfried (2006) also created a data set on bilateral remittances between a subset of European Union countries and neighbors.

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<sup>14</sup> Sayan (2006).

<sup>15</sup> Clarke and Wallstein (2004) and Yang (2007) find that remittance receipts go up in response to a natural disaster. Kapur (2003) finds that they go up in response to an economic downturn. Yang and Choi (2007) find that they respond to rainfall-induced economic fluctuations.

<sup>16</sup> Ghosh (2006) and Jiménez-Martin, Jorgensen, and Labeaga (2007, p. 8, 14).

<sup>17</sup> In the Appendix to this paper, I estimate regression equations for remittances that are received by four of the smaller countries of southern Africa. In this case it is a safe bet that the majority of emigrants reside in South Africa, and so we can use South African income as foreign income. The results suggest countercyclicity for most of these countries, especially when the coefficients on domestic and foreign (i.e., South African) income are constrained to be equal in magnitude and of opposite signs.

<sup>18</sup> In a study of remittances into Jamaica, Lake (2006) finds that they do respond to the difference between US and Jamaican income. She also argues against Jamaican government taxes or regulation on remittances.

<sup>19</sup> For the question whether remittances have Dutch Disease type effects on the real exchange rate or conflict, a bilateral data set would allow the construction of an instrumental variable for remittances that otherwise in truth respond endogenously to factors like economic and political stability. One possible instrumental variable is the stock of emigrants residing outside the country of origin; but one could make the instrumental variable one step more exogenous by looking at geographic determinants of bilateral emigration, including geographical proximity and historical/linguistic links, and then aggregating up the bilateral migration flows, by analogy with the Frankel-Romer (1997) instrument for openness with respect to trade.

It is to be expected that the stock of immigrants is a major determinant of the remittances. Indeed Freund and Spatafora (2005) find it as a powerful determinant.<sup>20</sup> Figure 1 shows a plot of the relationship between the stock of immigrants and remittances; it is not as strong as one might expect, but it is clearly there.<sup>21</sup>

We begin with the data set collected by Lueth and Ruiz-Arranz, which includes 64 pairs of countries. (Most of the members of this eclectic set are in Europe and Asia; but the Middle East and Australia are also included among the sending countries, along with New Zealand, Liberia and Libya for one partner each.) In Table 1 we control explicitly for the lagged stock of bilateral migrants. This variable is only available for these countries in a few years. So we make a virtue out of necessity by running a pure cross-section (thereby maximizing the number of countries for which both variables are available) to explain remittances in 2005 and a function of the stock of migrants in 2000. The cyclicity of remittances in 2005 is likely to be determined not just by the behavior of remittances-per-2000-migrant, but also by the flow of migration in 2001, 2002, 2003, and 2004 (and perhaps 2005), to the extent that the cyclical position in those years is correlated with the cyclical position in 2005. In other words we will capture not only the decision of migrants whether to send money home in response to an international difference in the economic conjuncture, but also the decision of workers whether to migrate in the first place. But this combined effect is just as interesting as the pure remittance decision.<sup>22</sup>

The lagged stock of emigrants is very highly significant statistically, as expected. In column (2) we also control for income per capita in the sender country; it too is significant.

The variable of interest is the difference in cyclical position between the sender country and the recipient country. In this table, cyclical position is computed as the (logarithmic) difference between GDP in 2005 and the long run trend value of GDP. The estimated coefficient is positive and highly significant. (The t-statistic is almost 4.) This is evidence in favor of the countercyclical hypothesis: remittances sent back home are high when income is above potential in the country to which the worker has migrated or when income is below potential in the country of origin. The effect is evidently enormous. Apparently every 1% rise in sender-country income (or every 1% fall in recipient-country income) brings forth an increase in remittances of about 60%. If this is right, it means that remittances are very much a “luxury good.” Perhaps remittances are essentially zero until the income of the sender surpasses a threshold, so that a moderately

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<sup>20</sup> The other variables in their equation are per capita income in both countries, a measure of the transaction cost, and the exchange rate spread, and a dummy variable for dual exchange rates.

<sup>21</sup> The data point representing remittances from Portugal to Moldova looks like an outlier. But investigation revealed that this is a real phenomenon, not a data error.

<sup>22</sup> One might ask, if the behavior of migration flows is of equal interest to the behavior of remittances per migrant, why not drop the stock of migrants? Two answers. First, in most cases the stock of migrants has been determined over a long history (by geographic, political, cultural and other factors), during which cyclical considerations are not relevant; we should bet a better-specified equation and better estimates when controlling for it. It is only over a period of a few years that the cyclical question arises. Second, it is important to control for *some* sort of scale variable. It would not do to treat the absolute dollar level of US-Mexico remittances on a par with the absolute dollar level of Luxembourg-Lesotho remittances.

high marginal propensity to send remittances after that point shows up as an extremely high elasticity of remittances with respect to income.

Even when the stock of migrants is lagged five years, it may contain an element of endogeneity. (Japan, for example, was essentially in recession throughout the 1990s; ten years of stagnation continued to reduce the stock of immigrants.) Therefore we apply Instrumental Variables, in column (3) of Table 1. There are many plausible geographic, political and cultural determinants of migration. To keep it simple, we used two instrumental variables, two which showed up as significant (positive) determinants of migration in “first stage” regressions: the border dummy and the island variable. The change vis-à-vis the OLS equation is slight; while the overall significance of the regression falls slightly, the procyclicality of remittances is still significant at the 1% level.

Next, in Table 2, we expand our data set into a panel running from 1979 to 2005, thereby allowing a big increase in the number of observations, to 1200 or more. To do so, we have to drop the stock of migrants from the right-hand side of the equation. But we can replace it with a list of gravity-style determinants of migration, including size, bilateral distance, and other geographic and cultural variables. One advantage is that any suspected endogeneity of the lagged stock of migrants is eliminated. The barebones version includes only the size of the two countries, in this case represented by population, which is essential as a scale variable. (We also retain income per capita in the sender country, which is highly significant across all specifications.)

In Table 2 the cyclical position of the two countries is represented by their unemployment rates. It has the hypothesized negative sign, and the effect is even stronger statistically than before (a  $t$ -statistic between 6 and 10). When we add the other gravity determinants, in columns 1-3, most are of the hypothesized signs. Distance is the most highly significant, which is not much of a surprise. The landlocked and island variables are both statistically significant as well (with the hypothesized negative and positive coefficients respectively). Surprisingly, the common border and common language variable are not statistically significant. It seems likely that migration and remittances across a shared border are less likely to be captured by the official data. Regardless, the important point is that the countercyclicality of remittances is still highly significant. This is true even when allowing for time effects, country effects (whether they are fixed effects or random effects), and even country-pair effects. This robustness apparently testifies to a powerful empirical regularity.<sup>23</sup>

Finally, in Table 3, we expand the set of countries by merging the Lueth and Ruiz-Arranz data set with two others. One comes from the InterAmerican Development Bank, and reports bilateral observations on remittances from the United States to eight small countries in Central America (including Panama and the Dominican Republic). Because Panama and El Salvador are in this data set, we are able to add a dummy variable for a currency union. The third is the European Commission’s bilateral data set

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<sup>23</sup> The countercyclicality does not show up as well, however, if the income measure is used in the panel data set or if the unemployment measure is used in the pure cross-section. I am indebted to Maurice Kugler for one possible explanation of this puzzle: the relative variation of detrended unemployment across countries may be limited, and the same with the variation *over time* of detrended income.

for the 27 members of the EU.<sup>24</sup> We believe that this three-way merge produces the most comprehensive data set on bilateral remittances to date. To maximize the number of pairs of countries, we choose to conduct a pure cross-section in the years 2003-04 (averaged). We use as the lagged stock of migrants the level of 2000. This produces about 330 observation pairs, which we believe is the largest that has been analyzed to date.

The estimations reported in Table 3 shows a highly significant coefficient on the cyclical position. This finding is not changed when we controlling for the income in the sender country, though the latter is highly significant, as is the lagged stock of migrants. The use of instrumental variables for the stock of migrants diminishes the countercyclicality estimate slightly, but its *t*-statistic is still well above 3.

We added a dummy variable equal to 1 when the pair of countries in question were both members of a currency union. It appears highly significant statistically, which would suggest that the reduction of transactions cost and exchange risk from a common currency promotes the sending of remittances (even controlling for the enhanced ease of migration). However the currency union dummy loses all significance under instrumental variables. This suggest the possibility that the apparent correlation under the OLS estimates is not really attributable to the effect of currency unions on remittances but rather to the reverse causation: Central American countries are more likely to choose to adopt the dollar as their currency if they have a lot of emigration to the United States.<sup>25</sup> However the number of currency union pairs in this data set is so small that no conclusions can yet be reached.

To summarize the findings, the creation of a larger bilateral data set by splicing together three used by a few others, has allowed a moderately strong verdict on the question of cyclicity, which runs contrary to the analogy with capital flows and the Dutch Disease. Remittances do appear to respond positively to the cyclical position in the sending country and negative to the cyclical position in the receiving country. This counter-cyclical pattern is precisely what one wants. It suggests that emigrants' remittances can play some of the stabilizing role that capital flows often promise but seldom deliver. If this empirical finding holds up under further investigation, it carries at least two specific policy implications. First, it suggests that governments should not try to harness remittances in the name of national development, but rather in this area should allow private citizens to transact freely. Second, it suggests that remittances should join trade, labor mobility, and transfers, on the list of Optimum Currency Area criteria.

## References

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<sup>24</sup> Jiménez-Martín, Jorgensen and Labeaga (2007).

<sup>25</sup> Singer (2008) finds that remittances as a share of GDP are a statistically significant predictor of the probability that a country will choose a fixed over a floating exchange rate.

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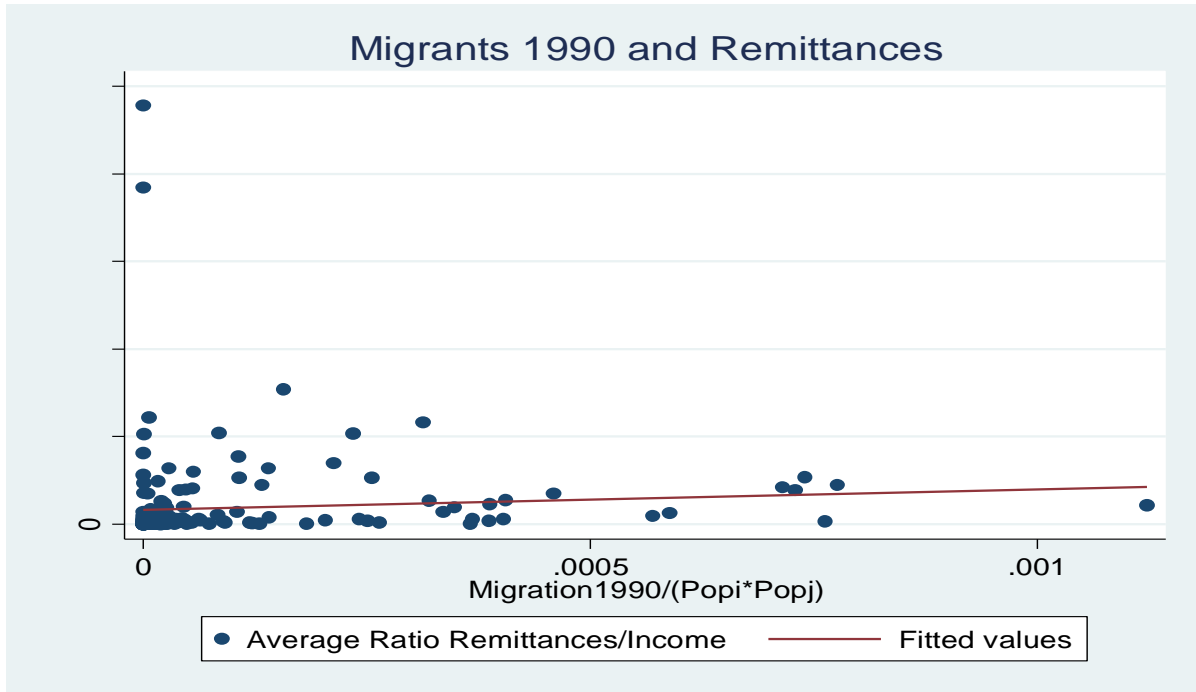
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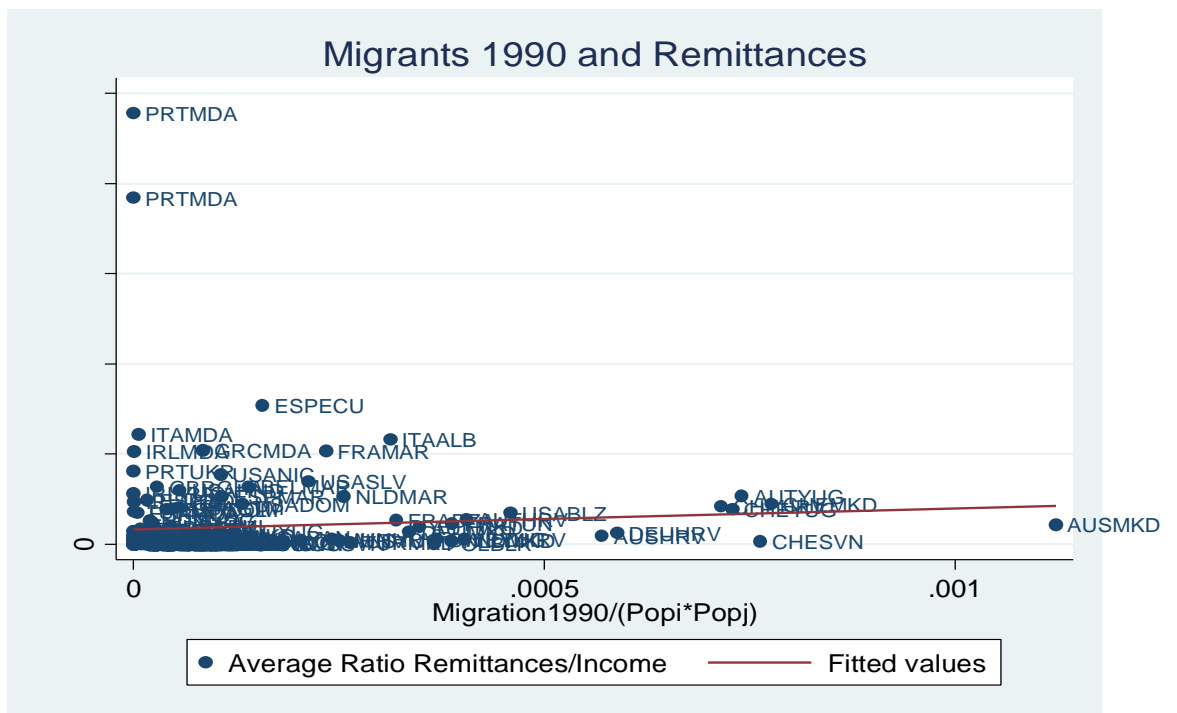
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Figure 1a : Bilateral stock of migrants (normalized by populations) versus remittances (normalized by GDPs)



Source: Central America data: FOMIN and the Central Banks. Data from 2000-2007 Jiménez-Martín, S., Jorgensen, N. and Labeaga, J. M. (2007). Data from 2000-2005 IMF. Lueth, E. and Ruiz-Arranz, M. (2006). Data from 1979-2005.

Figure 1b : Bilateral stock of migrants (normalized by populations) versus remittances (normalized by GDPs), with country identifiers



**Table 1: Pure Cross-Section Data, 2005** (Lueth&Ruiz-Arranz data set)

	<b>Dependent Variable:</b>		
	<b>Ln Remittances 2005 between Countries</b>		
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>
<b>Ln (Stock migrants 2000 )</b>	0.459*** (0.085)	0.449*** (0.0818)	0.327** (0.126)
<b>Difference in cyclical position (Ln (Real GDP/ Trend GDP))</b> sender country relative to recipient	57.585*** (15.875)	67.909*** (16.998)	65.300*** (17.335)
<b>GDP per capita Sender</b>		0.061*** (0.023)	0.062** (0.024)
<b>Estimated Method</b>	OLS	OLS	2SLS
<b>Instrumental variables</b>			Border/Islands
<b>F test</b>	22.63	19.27	9.35
<b>Prob &gt; F</b>	(0.000)	(0.000)	(0.000)
<b>Observations</b>	64	64	64
<b>R2</b>	0.373	0.448	0.4259
<b>Root MSE</b>	1.304	1.234	1.2577
<b>First stage F-statistic</b>			0.07
<b>P-value</b>			(0.933)
<b>J-test of overidentifying restrictions</b>			0.138
<b>P-value</b>			(0.620)

Standard errors in parenthesis

Constants not reported

Statistical significance: \* 10% level, \*\* 5% level and \*\*\* 1% level

**Table 2: Panel Data, 1979-2005** (Lueth&Ruiz-Arranz data set)

	<b>Dependent Variable:</b>				
	<b>Ln Remittances between Countries</b>				
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>
<b>Difference in cyclical position (unemployment rate)</b>					
sender country relative to recipient	-10.507***	-8.981***	-11.607***	-11.483***	-12.918***
	(0.995)	(0.976)	(1.125)	(1.947)	( 1.976)
<b>Sender's GDP per capita</b>	0.076***	0.026***	0.049***	0.049***	0.023
	(0.005)	(0.007)	(0.006)	(0.009)	(0.017)
<b>Colonial relationship?</b>	2.444**	0.076			
(0 = never, 0.5 = post-1945, 1 = always)	(1.082)	(1.007)			
<b>Islands ?</b>	0.644**	0.570**			
(0 = neither, 1 = one of the pair, 2 = both)	(0.317)	(0.284)			
<b>Landlocked</b>	-1.260*	-1.431***			
(0 = neither, 1 = one of the pair, 2 = both)	(0.288)	(0.259)			
<b>Language</b> (Dummy for common language)	0.572	0.575			
	(0.492)	(0.440)			
<b>Border</b> (Dummy for land border)	-0.409	-0.547			
	(0.582)	(0.523)			
<b>Ln (Distance between i and j)</b>	-0.909***	-0.561***			
	(0.191)	(0.174)			
<b>Ln (Product Population i and j)</b>	0.941***	0.609***	2.963***	3.017***	1.209
	(0.080)	(0.078)	(0.243)	(0.400)	(0.974)
Time Effects	no	yes	no	no	yes
Random Effects	yes	yes	no	no	no
Fixed Effects for Countries	no	no	yes	no	no
Fixed Effects for Country Pair	no	no	no	yes	yes
Wald test	731.55	1184.69	1306.28	71.76	44.69
Prob > $\chi^2$	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
<b>Observations</b>	1200	1200	1228	1228	1228
R2	0.389	0.414	0.696	0.304	0.331
Standard errors in parenthesis					
Constants not reported					
Significance					
* 10% level, ** 5% level, and *** 1% level					

**Table 3: Cross-Section 2003-04 -- Composite data set** (merging three sources)

<b>Dependent Variable:</b>				
<b>Ln Remittances 2003-04 between Countries</b>				
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>
<b>Ln (Stock migrants 2000 )</b>	0.762*** (0.040)	0.741*** (0.041)	1.061*** (0.088)	1.233*** (0.152)
<b>Difference in cyclical position (Ln (Real GDP/ Trend GDP))</b>	16.199*** (2.905)	16.099*** (2.765)	14.723*** (3.390)	13.983*** (3.927)
<b>GDP per capita Sender</b>		0.039*** (0.015)	0.028* (0.016)	0.022 (0.019)
<b>Currency Union</b>		1.345*** (0.222)	0.087 (0.389)	-0.590 (0.632)
<b>Estimation Method</b>	OLS	OLS	2SLS	2SLS
<b>Instrumental variables</b>			border/language/ islands/colonial	border/language
F test	185.27 (0.000)	601.76 (0.000)	488.06 (0.000)	420.49 (0.000)
<b>Observations</b>	331	328	328	328
R2	0.526	0.546	0.463	0.351
Root MSE	1.544	1.518	1.650	1.815
First stage F-statistic			2.92 (0.021)	3.85 (0.022)
P-value				
J-test of overidentifying restrictions			11.696 (0.008)	7.690 (0.005)
P-value				
Standard errors in parenthesis				
Constant not reported				
Statistical significance: * 10% level, ** 5% level, *** 1% level				

Three sources of remittance data for 2003-04: Central America data, FOMIN and the Central Banks; EU data: Jiménez-Martín, S., Jorgensen, N. and Labeaga, J. M. (2007); IMF data: Lueth, E. and Ruiz-Arranz, M. (2006).

Appendix: Determinants of overall remittances among some southern Africa countries  
*Acknowledgements: Thanks to Melesse Tashu for R.A. help with these results.*

**Regression Results of Remittances per capita for Selected Southern African Countries:**

- Dependent variable in all cases is log of per capita remittance
- Income refers to per capita GDP in 2000 \$US constant prices
- Numbers in parentheses are t-values
- Sample size: 1975-2004 for all countries except for Mozambique, which is 1980-2004
- All variables are in logs except trends
- Detrended 1: refers incomes detrended by cubic polynomial trend functions
- Detrended 2: refers incomes detrended by Hodrick-Prescott filter
- Data Source: World Development Indicators, Online Database

**Lesotho**

	Regression with separate incomes					Regression with restriction of equal and opposite sign on incomes	
	Constant	Domestic income	SA income	Trend	Adj-R <sup>2</sup>	Constant	Ratio of SA to Domestic income
Level	3.44 (0.28)	0.67 (0.84)	-0.24 (-0.18)	-0.02 (-0.81)	-0.08	8.04 (100.66)	-0.97 (-36.08)
Detrended 1	5.22 (46.06)	0.67 (0.84)	2.42 (0.89)	0.001 (0.14)	-0.06	5.22 (45.94)	-0.36 (-0.49)
Detrended 2	5.23 (45.79)	-1.15 (1.71)	4.02 (1.12)	0.0003 (0.05)	-0.05	5.24 (46.27)	1.61 (1.02)

**Botswana**

	Regression with separate incomes					Regression with restriction of equal and opposite sign on incomes			
	Constant	Domestic income	SA income	Trend	Adj-R <sup>2</sup>	Constant	Ratio of SA to Domestic income	Trend	Adj-R <sup>2</sup>
Level	5.91 (0.53)	1.36 (2.36)	-1.32 (-1.07)	-0.12 (-3.92)	0.67	7.94 (84.58)	-0.95 (-39.16)	-0.006 (-4.66)	0.99
Detrended 1	4.31 (38.86)	2.49 (2.05)	-0.89 (-0.33)	-0.04 (-7.05)	0.64	4.31 (39.35)	-2.26 (-1.99)	-0.04 (-7.14)	0.65

Detrended 2	4.31 (36.88)	3.00 (0.91)	1.04 (0.27)	-0.04 (-6.69)	0.60	4.31 (36.92)	-1.49 (-0.51)	-0.04 (-6.70)	0.60
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### Mozambique

	Regression with separate incomes					Regression with restriction of equal and opposite sign on incomes			
	Constant	Domestic income	SA income	Trend	Adj-R <sup>2</sup>	Constant	Ratio of SA to Domestic income	Trend	Adj-R <sup>2</sup>
Level	-2.63 (-0.26)	-0.13 (-0.29)	0.63 (0.44)	-0.02 (-1.31)	0.47	7.91 (25.96)	-0.96 (-19.97)	-0.006 (-3.29)	0.97
Detrended 1	1.85 (17.37)	1.14 (1.98)	-0.16 (-0.07)	-0.03 (-5.29)	0.56	1.86 (18.39)	-1.20 (-2.18)	-0.03 (-5.63)	0.58
Detrended 2	1.83 (16.59)	1.02 (0.93)	1.84 (0.60)	-0.03 (-4.95)	0.52	1.86 (17.12)	-1.26 (-1.17)	-0.03 (-5.22)	0.52

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### Swaziland

	Regression with separate incomes					Regression with restriction of equal and opposite sign on incomes			
	Constant	Domestic income	SA income	Trend	Adj-R <sup>2</sup>	Constant	Ratio of SA to Domestic income	Trend	Adj-R <sup>2</sup>
Level	-33.86 (-1.24)	3.01 (2.00)	2.10 (0.85)	-0.007 (-0.29)	0.32	8.07 (106.72)	-0.99 (-59.17)	-0.004 (-3.16)	0.99
Detrended 1	3.70 (20.25)	2.59 (1.37)	2.05 (0.46)	0.035 (3.43)	0.28	3.70 (20.22)	-2.16 (-1.17)	0.03 (3.42)	0.27
Detrended 2	3.70 (19.85)	4.03 (0.75)	2.15 (0.30)	0.03 (3.36)	0.23	3.70 (19.83)	-2.79 (-0.53)	0.03 (3.36)	0.25

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