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Do Remittances Reduce Aid Dependency?

Kangni Kpodar and Maëlan Le Goff

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Prepared by Kangni Kpodar and Maëlan Le Goff[1]

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Abstract

Aid has been for decades an important source of financing for developing countries, but more recently remittance flows have increased rapidly and are beginning to dwarf aid flows. This paper investigates how remittances affect aid flows, and how this relationship varies depending on the channel of transmission from remittances to aid. Buoyant remittances could reduce aid needs when human capital improves and private investment takes off. Absent these, aid flows could still drop as remittances may dampen donors' incentive to scale up aid. Concurrently, remittances could be positively associated with aid if migrants can influence aid policy in donor countries. Using an instrumental variable approach with panel data for a sample of developing countries from 1975–2005, the baseline results show that remittances actually increase aid dependency. However, a refined model controlling for the channels of transmission from remittances to aid reveals that remittances lead to lower aid dependency when they are invested in human and physical capital rather than consumed.

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[1] K. Kpodar is an Economist at the International Monetary Fund (IMF) and Research Fellow at the Centre for Studies and Research on International Development (CERDI); M. Le Goff is an Economist at the French Centre for Research and Studies on the World Economy (CEPII). We would like to thank Enrico Berkes, Patrick Guillaumont, Elliott Harris, Patrick Imam, Salifou Issoufou, Thierry Kangoye, Nkunde Mwase, and Raju Singh for insightful comments and suggestions, and Jenny Kletzin DiBiase for helpful editorial comments. We are also grateful to participants at the CERDI Seminar in June 2010, and the 15th Annual Conference of the AES on Econometric Modeling for Africa in July 2010. The usual disclaimer applies.

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I. INTRODUCTION

In 2002, the UN Monterrey Report of the International Conference on Financing for Development recognized that official development assistance (ODA, henceforth aid) is, with trade and foreign direct investment (FDI), an essential tool for development financing. At that conference, the international community reached a consensus on increasing ODA to help countries reach the Millennium Development Goals (MDGs). However, international aid has fallen short of expectations, and many countries, in particular in sub-Saharan Africa, will not be able to meet the goal of halving extreme poverty by 2015.

Since 2002, remittances flows, which were barely mentioned in the Monterrey Consensus, have grown substantially; reportedly they now outpace public aid flows. The World Bank estimates that remittances are more than double official aid received by developing countries, reaching about US$325 billion in 2010. Increasingly, remittances are being recognized as an additional source of financing for development. For this reason, development initiatives have called for reducing the transfer costs of worker remittances and improving their impact on growth and poverty reduction by unlocking opportunities to channel remittances to productive investments.

Considering aid and remittance flows independently could be misleading. They share common determinant factors such as income per capita in receiving countries, and are geared to some extent toward similar development goals, for instance improving well-being in recipient countries. This paper investigates whether, and under what circumstances, remittances lead to lower aid dependency. A common belief is that remittances would complement aid in fostering growth and reducing poverty. Nevertheless, there are good reasons to believe remittances could actually lead to lower aid flows, as a country becomes less dependent on external assistance. This paper offers an explanation. When remittances are mostly invested in human and physical capital rather than consumed, they are likely to improve macroeconomic performance and access to health and education, thereby reducing aid needs. Conversely, aid flows could increase with remittances when the remittances improve absorption capacity through human capital accumulation, and when migrants are able to influence a host country's aid policy.

The issues raised in this paper relate to the literature on the determinants of aid allocation which, although large, has yet to examine how remittances can influence aid, even though some papers focus on the relationship between foreign aid and other external financing flows, such as FDI and migrations. The main contribution of this paper is to fill this gap by assessing the link between remittances and aid while controlling for reserve causation and simultaneous effects, and taking into account the different channels of transmission.

This paper is structured as follows: after a literature review of the factors determining aid allocation, we document channels through which remittances and aid are linked and how they shape this relationship. The following section describes the empirical analysis, including the model and methodology, and presents the main results. The last section concludes and draws some policy conclusions.

II. LITERATURE REVIEW

A. Factors Affecting Bilateral Aid Allocation

Early studies on aid investigate whether foreign aid is determined by the need of the recipient country (by using variables such as average income per capita of the recipient country to test whether countries with greater needs receive more aid) or by the interests of the donor country. In the latter case, foreign aid benefits more countries that are economically and strategically important, or those that share a similar culture and have historical ties with the donor country.

The first studies that test the "donor interest" against the "recipient need" model are McKinlay and Little (1977, 1978a, 1978b, 1979). The authors analyze the two models for four donors (United States, France, Germany, United Kingdom) using data for 1960–1970 and find that the donor interest model performed better than the recipient need model for all four donors. Maizels and Nissanke (1984) reach similar conclusions using total bilateral aid per capita received by 80 developing countries for 1969–70 and 1978–80. However, it appears that multilateral aid flows were allocated on the basis of recipient needs.

The main shortcoming of the "recipient need/donor interest" approach is that the two models are estimated separately, which may lead to model specification bias because of potential omitted variables. To address this, some studies adopt hybrid models that take into account both recipient need and donor interest variables, notably Levitt (1968), Wittkopf (1972), McGillivray and Oczkowski (1991), Poe and Sirirangsi (1993), Cassen (1994), Meernik, Krueger, and Poe (1998), Alesina and Dollar (2002), Alesina and Weder (2002), Neumayer (2003), and Berthelemy and Tichit (2004). Their findings generally confirm the importance in aid allocation of historical and commercial ties and of the strategic interests of donors. Donor foreign policy goals continue to be the most important motive for giving aid. For instance, Cassen (1994) shows that countries like Israel, Jordan, and Egypt are the largest aid recipients in per capita terms because of their strategic importance.

Subsequent studies revisit the hybrid model by adding variables on the quality of economic policy and institutional environment (openness, political regime, quality of institutions), on the assumption that donors give aid to countries that can make the most efficient use of it or countries where aid-funded projects would yield tangible outcomes. In a seminal paper, Alesina and Dollar (2002) find that aid allocation follows political and strategic considerations (colonial past and political alliances are significant determinants of aid allocation) rather than responding to the economic needs or policy performance of the recipients. The authors point out that, at the margin, changes in aid flows over time tend to reward "good" policies measured by trade openness and democratization, except for aid from Austria, Belgium, France, and Italy.

Svensson (2000) comes up with a more moderate finding. While there is evidence that Germany, Japan, and the United States tend to reward "good policies," he asserts that they do not appear to reward recipients with better political and civil rights. Similarly, Neumayer (2003) examines the allocation of aid of all 21 members of the OECD's Development Assistance Committee (DAC) for 1985–1997, and finds that almost all donors link a

country's eligibility to respect for civil and political rights, but "at the level stage, most donors fail to promote respect for human rights in a consistent manner and often give more aid to countries with a poor record on either civil/political or personal integrity rights."

In contrast, Gates and Hoeffler (2004), using panel data for 1980–99, find evidence that Nordic donors (Norway, Denmark, Sweden, Finland) tend to give more aid to democracies and to recipients with a good human rights record. Particular attention has been paid to whether corruption deters aid flows, but the evidence is rather inconclusive. Alesina and Weder (2002) also conclude that corruption of recipient governments has no significant effect on the amount of aid they receive; lower corruption is rewarded by higher aid only when Australia and the Nordic countries are the donors. Svensson (2000) also fails to demonstrate that less corrupt countries receive more foreign aid.

Some studies have addressed the population and middle-income bias that arise in the aid allocation process. The population bias occurs when donors prefer to give aid to small and less populous countries where the impact of foreign aid is likely to be more visible (Gillis and others, 1992) and where the cost of buying voting compliance in the UN General Assembly is lower. Dowling and Hiemenz (1985) provide evidence for the population bias while Maizels and Nissanke (1984) do not, probably because donors may also want to strengthen ties with large and potentially powerful developing countries in order to increase their political and cultural influence. The middle-income bias posits an inverted U-shaped relationship between income per capita in the recipient and the amount of aid it receives, on the grounds that the absorptive capacity constraint is less binding in middle-income countries. Dowling and Hiemenz (1985) note that middle income countries have more economic and political weight and well-developed bureaucracies that can administer the aid and use it more effectively are in place.

Finally, another strand of the literature has taken a normative approach of aid allocation by analyzing how aid should be allocated and how actual aid allocation deviates from that benchmark. To name a few, the egalitarian distribution of aid suggests that countries should receive the same amount of aid, either on a per capita basis or as a ratio to GDP. Collier and Dollar (2001) propose a different approach, aiming to maximize global poverty reduction, considering that good policies enhance the effectiveness of aid in spurring growth. Amprou, Guillaumont, and Jeanneney (2007) and Guillaumont (2008) argue that structural factors, such as vulnerability to exogenous shocks and low level of human capital should also be taken into account when allocating aid.

B.   Remittances and Aid

How could remittances reduce aid dependency?

Improvement in human capital has been one of the main goals of foreign aid. This stems from the belief that human capital accumulation is critical for sustainable growth and poverty reduction. Therefore to ensure that aid effectively contributes to these goals, and reflecting donors' commitment to the MDGs, a substantial portion of foreign aid to developing countries is geared toward improving school enrollment rates and health indicators. As a result, if external aid reacts to human capital needs, we should expect countries with better

human capital to receive less aid, everything being equal. Indeed, given that aid to health and education sectors accounts for the bulk of external assistance, the impact of an improvement in access to health and education financed by private sources might have a downward effect on aid flows—unless aid is reallocated to other sectors.

Micro evidence shows that remittances facilitate investment in human capital. Yang (2008) finds that increased remittances due to positive migrant shocks are associated with a rise in child schooling and education expenditure in Philippines. Calero, Bedi, and Sparrow (2009) find similar results for Ecuador. In addition, Acosta, Fajnzylber, and Humberto (2007) explore the development impact of remittances in a sample of 11 Latin American countries and find that remittances increase children's educational attainment and health, particularly in low-income households, though results vary by country, gender, and geographical location of households. Considering the potential positive effect of remittances on human capital accumulation, it is likely that remittances could be negatively linked to aid flows, because less aid flows would be needed to achieve the same level of human capital.

In addition to the human capital channel, the link between remittances and aid may also operate through the physical capital/financial development channel (henceforth the physical channel). When remittances are invested in physical assets rather than consumed, the impact on the local economy would be stronger because in highly open developing economies, the increase in consumption resulting from higher remittances could lead to higher imports with little impact on the domestic economy. Alternatively, when remittances increase households' savings in the formal sector, a well-functioning financial system may help direct this savings to projects that yield the highest returns and therefore enhance growth rates. In a sample of sub-Saharan African countries, Gupta, Patillo, and Wagh (2009) show that remittances promote financial development

Giuliano and Ruiz-Arranz (2009) underline that remittances can even compensate for lack of financial development because by loosening liquidity constraints, potential entrepreneurs could use remittances whenever the financial system does not help them start productive activities owing to lack of collateral or because of high lending costs. The authors find in a sample of 100 developing countries that remittances promote growth in countries with less developed financial systems by providing an alternative way to finance investment and helping to overcome liquidity constraints. With a positive impact on private domestic investment, financial development, and financial inclusion (see Toxopeus and Lensink, 2007), remittances could contribute to economic development, thereby lowering aid needs.[2] Also, because significant inflows of remittances can directly or indirectly raise the government revenue base in home countries, they improve the country's ability to raise taxes domestically and as result to rely less on foreign aid.

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[2] The impact of remittances on growth remains, however, heavily debated in the empirical literature with findings ranging from a negative impact (Chami, Fullenkamp, and Jahjah, 2003) to a positive impact depending on country's characteristics (Giuliano and Ruiz-Arranz, 2009; Singh and others, 2011).

It is worth noting that a drop in aid following sustained remittance inflows may not necessarily mean reduced aid needs, or lower aid dependency, but may reflect strategic decisions by donors. Indeed, increasing remittance flows could have a dampening impact on aid because they may reduce donors' willingness to scale up aid. Because the amount of aid is limited, donor countries may be tempted to reduce aid to high-remittance recipient countries and use the savings to increase aid to low-remittance recipient countries. In recent years, sluggish growth in donor countries and the resulting fiscal challenges have made many of them unable to meet aid commitments. Given the challenge of scaling up aid, it is becoming widely accepted that remittances can supplement aid in financing development, with the advantage that remittances do not create debt flows and are less volatile. Donors and receiving countries agree it is critical to ease remittance flows by lowering transaction costs to stimulate private capital inflows to developing countries.

A first look at the data appears to contradict our main hypothesis that remittances reduce aid dependency. Figure 1, which depicts a dual relationship between remittances and aid flows in a sample of developing economies, suggests that on average high-remittance recipient countries tend to receive more aid. The evidence is mixed when looking at the trend in remittances and aid over the time for selected economies (Figure 2). We find a co-movement between aid and remittances for some countries (for instance Benin and Botswana), and for other countries (for instance Bangladesh and Kenya) an opposite relationship when the surge in remittances since the 1990s has been accompanied by a decline in aid flows. This contrasting picture could be misleading because the statistical relationship between aid and remittances does not control for other variables influencing aid flows, country specific effects, the various channels from remittances to aid, and endogeneity issues.

The literature offers, nevertheless, some arguments supporting a positive link between remittances and aid flows. A rising migrant stock will result in higher remittances; but as the migrant population grows, its ability to influence foreign aid policy in host countries may increase, especially if it is large enough to undertake lobbying activities (the lobby channel). Many studies highlight the role played by ethnic lobbies in foreign policy of host countries (Levitt and de la Dehesa, 2003; Jones-Correa, 2001; Itzigsohn, 2000), and some of them find evidence that the migrant lobby groups may influence aid policy of host countries. Milner and Tingley (2010) argue that the percentage of Afro-Americans in a district makes the legislator more sensitive to the needs of foreigners and thus more inclined to support foreign aid. Figure 3 plots the number of migrants in four donor countries (United States, France, Canada, Germany) against bilateral aid received by their countries of origin; the correlation is positive, suggesting that migrants might use their political voice to influence donors' foreign aid policy.[3] The econometric analysis will provide a more rigorous framework to test this hypothesis.

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[3]Using a dyadic panel data set of 19 donors and 165 recipient countries from 1992- through 2005, Bermeo and Leblang (2009) find that aid recipient countries receive more aid with more migrants living in the donor country. But, they also argue that donor countries may use aid to decrease unwanted immigration. In that case remittances would be negatively correlated with aid flows.

Remittances could also be positively associated with aid because by enhancing the home country's absorption capacity—the lack of which has been often pointed out as a bottleneck to aid scaling up—remittances can in fact lead to an increase in aid. Thus remittances contribute to human capital accumulation by improving household access to education and health care, which would reduce barriers to aid effectiveness.[4] In addition, given the tremendous requirements in the health and education sectors, a scaling up of financing in these sectors from remittances is likely to accelerate the improvements of outcomes, and enhance the contribution of aid, which might encourage more aid to these sectors.

To sum up, remittances could lower aid dependency through the human and physical capital channels (Text Figure 1), but it is important to isolate these channels from donors' incentives to divert aid away from high remittance countries. Additionally, the lobby channel predicts that remittances and aid would be positively linked, with high-remittance recipient countries being more dependent on aid.

Text Figure 1. Channels of Transmission from Remittances to Aid Flows
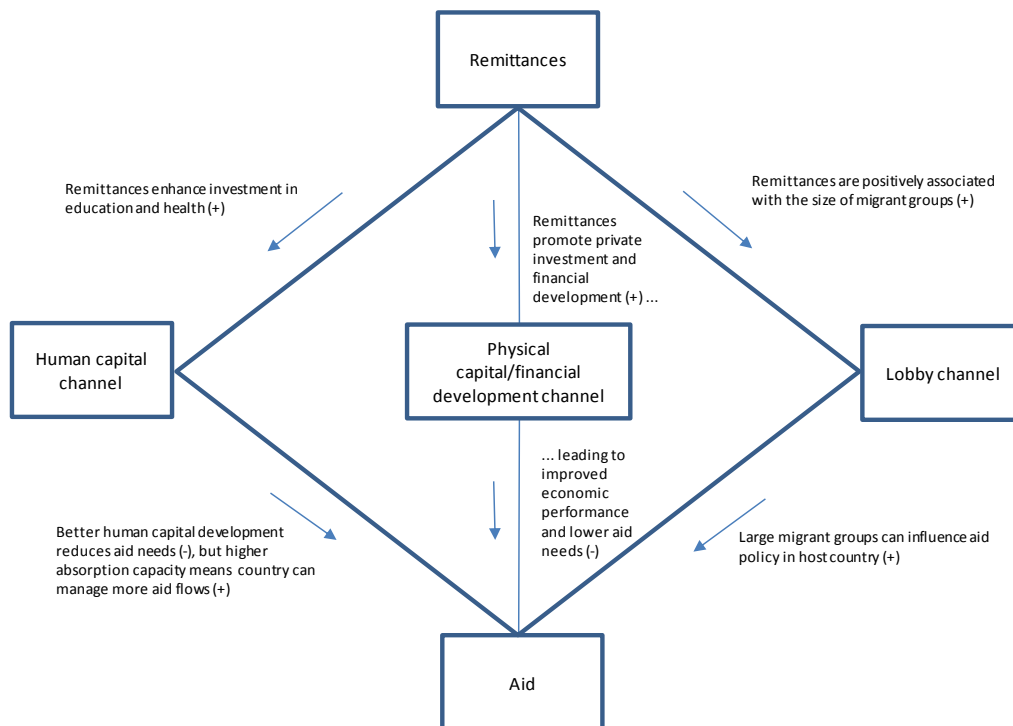
Source: Authors

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[4] This implies that through the human capital channel, remittances can have opposite effects on aid flows, though the net effect is likely to be a reduction in aid dependency.

Reverse causality issue

While remittances affect aid, this relationship could go in the opposite direction as well, raising a reserve causality issue that would need to be addressed in the empirical estimation. Aid could negatively affect remittances flows for several reasons. Because aid aims to reduce the income differential between the donor and the receiving country, at least at the margin, foreign aid could reduce migration, and even per-migrant remittances.

More aid could also lead to higher remittances. Aid can stimulate remittances by increasing income in the receiving countries, thus improving workers' ability to cover the cost of migration, especially in countries where migration costs are high relative to income, and capital markets are imperfect. Moreover, aid could be used to finance public infrastructure (roads for instance), thereby increasing business opportunities, which could result in higher remittances if migrants invest at home for self-interested reasons.

III. EMPIRICAL ANALYSIS

A. The Model and Data

In line with previous studies, the aid model adopted in this paper takes into account both recipient need and donor interest variables in the bilateral aid allocation process. The model is then augmented with the remittance variable. Following Trumbull and Wall (1994), we use panel data to control for country-specific effects to capture time-invariant variables, such as colonial ties, strategic alliances, cultural similarity, and geographic proximity between donor and recipient countries. The sample covers 100 developing countries receiving official development assistance from donors (see Appendix 1), of which 23 belong to the Development Assistance Committee (DAC). The period of study covers 1970–2005, with data averaged over five years for 1970–1974, 1975–1979, 1980–1984, 1985–1989, 1990–1994, 1995–2000, and six years for 2001–2005.

The baseline econometric model is as follows:

$$BILAID_{i,t} = \alpha_0 + \alpha_1 MULTIAID_{i,t} + \alpha_2 GDP_{i,t} + \alpha_3 GDP^2_{i,t} + \alpha_4 POP_{i,t} + \alpha_5 POP^2_{i,t} + \alpha_6 POL_{i,t} + \alpha_7 OPEN_{i,t} + \alpha_7 WALL + \alpha_8 REM_{i,t} + \mu_i + \varepsilon_{i,t}$$

Where $BILAID_{i,t}$ denotes total bilateral aid commitments by donors to country *i* in period *t* divided by total population, $MULTIAID_{i,t}$ the amount of multilateral aid per capita, $GDP_{i,t}$ the level of GDP per capita, $POP_{i,t}$ the size of the population, $POL_{i,t}$ an indicator of political stability and democracy compiled by the Polity IV database, $OPEN_{i,t}$ the level of trade openness, $WALL$ a dummy equal to one before the fall of the Berlin wall,[5] $REM_{i,t}$ the amount of remittances as a share of GDP, μ_i a country specific effect, and $\varepsilon_{i,t}$ the error term.

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[5] See Berthélemy and Tichit (2004).

A negative coefficient of $REM_{i,t}$, our main variable of interest, would mean that remittances reduce aid dependency. But a positive coefficient would imply that remittances lead to greater aid flows, suggesting a higher dependence on aid flows. This would also suggest that the channels through which remittances lower aid dependency (the human and physical capital channels) are dominated by those through which aid increases with remittances (mainly the lobby channel). We will refine the model to test how the impact of remittances on aid depends on each of the channels considered.

Turning to the control variables, multilateral aid is expected to be positively correlated with bilateral aid, because in some developing countries, financial assistance from international organizations like the International Monetary Fund (IMF) and the World Bank can be a catalyst for bilateral aid. But because studies find that multilateral aid tends to respond to a country's need while bilateral aid may follow the strategic interests of donors, the correlation between the two types of aid might not be positive. Nevertheless, controlling for GDP, which measures the country's need, and for country-specific effects accounting for donor interests, should ensure that the relationship between multilateral and bilateral aid is appropriately captured.

We expect per capita GDP to be negatively correlated with aid if donors mainly target their aid according to recipient needs, but if bilateral aid is guided by self-interest, the coefficient for GDP per capita could be positive. To account for the middle-income bias, the model includes the squared per capita GDP variable. Another donor interest variable is population size, because donors may seek to strengthen their ties with large and influent developing countries, leading to a positive correlation between aid and population size. Following Dowling and Heimenz (1985) and Wall (1995), the squared population variable is introduced in the model to test the population bias effect in aid allocation. Openness to trade enhances competitiveness and reflects a country's commitment to sound macroeconomic policies, which could be rewarded by higher development aid; therefore we expect the coefficient for trade openness to be positive. Finally, the model includes an index of political stability and democracy as an explanatory variable to assess whether respect for political and civil rights leads to higher aid.

We use the instrumental variable fixed effects estimator to account for country-specific effects and address endogeneity issues associated with reverse causation from per capita GDP and remittances to aid. Consistent with previous studies, remittances are instrumented by the lagged variable, the amount of remittances received by the entire sample minus the amount of remittances received by the country considered (Chami and others, 2008), and the geographical distance between the recipient and the main destination country weighted by the income gap between them—following World Bank (2006)—. Regarding per capita GDP, we use urban population share, population density, and the lagged per capita GDP as instruments.

B. Empirical Results

The baseline model

Table 1 sets out the results regarding the determinants of bilateral aid. Contrary to our expectations, it emerges that remittances are positively correlated with aid flows (column 1, Table 1), suggesting that remittances worsen aid dependency. Here, we interpret an increase in aid as a higher aid dependency because remittances would increase aid over and above the level implied by recipient needs and donor interests, variables which the model controls for. However, caution is needed in interpreting this result because the link between remittances and aid operates partly through a number of channels that are difficult to measure. We attempt to address this point in the subsequent regressions.

As for the control variables, the results support the middle income bias hypothesis. The level of per capita GDP and its squared term are highly significant in most regressions, pointing to an inverted-U relationship between per capita GDP and aid. The coefficient for population size is negative and significant in columns 1 and 5 (Table 1), suggesting that donors tend to give more aid to smaller countries; while the positive sign of the coefficient on squared population (columns 1 and 5, Table 1) indicates that population bias may be present in bilateral aid allocation. However the significance of the population variables is not robust across regressions. Aid seems to reward political stability and democracy, with the coefficient on the latter being positive and significant in all columns, but column 5 (Table 1). The results also show that multilateral aid stimulates bilateral aid, but trade openness does not, probably because even if aid is likely to go to countries where economic policy is trade-friendly, trade preferences granted to developing countries can also be used as a substitute for development aid.

Testing for the human capital, physical capital and lobby channels

As underlined in the theoretical section of this paper, we test how the relationship between remittances and aid is altered when considering the different channels of transmission between the two variables. Including the level of human capital, proxied by infant mortality, leads to dramatic changes in the results (column 2, Table 1). The coefficient on remittances turns negative when accounting for the human capital channel. Although the coefficient on infant mortality is not significant, its interaction term with remittances has a positive and significant coefficient, suggesting that the downward impact of remittances on aid dependency would be stronger if the former is accompanied by an improvement in human capital (captured by a reduction in infant mortality).

We introduce an indicator of financial development, the private credit ratio to GDP, to account for the physical capital channel. As expected, the coefficient for the interaction term between remittances and financial development is negative and significant, implying that remittances reduce aid dependency in more financially developed economies (column 3, Table 1). This suggests that as remittances are thought to favor financial development, higher remittances are likely to reduce aid dependency more strongly. We also test an alternative hypothesis assuming that remittances fuel domestic consumption rather than investment in

physical and human capital. The result in column 4 (Table 1) shows that a higher level of consumption is associated with a higher aid dependency. Although remittances would allow consumption smoothing, the higher the share of remittance consumed, the lower the share invested in human and physical capital. As a result, more aid would be needed to achieve the same target of human capital development if remittances are spent disproportionally on consumption.

To test the lobby channel, we use the Herfindhal index of migrant concentration in the main host countries:

$$Migrant\ concentration\ index = \frac{1}{n}\sum_{j=1}^{p}(\frac{Mig_{i,j,t}}{Mig_{i,t}})^2$$

Where $Mig_{i,t}$ represents the total number of migrants from country i and $Mig_{i,j,t}$ corresponds to the number of migrants from country i living in country j. As expected the coefficient of the interaction term between the index and remittances is positive and significant (column 5, Table 1). Aid dependency increases with the size of migrant groups, which we assume determines their ability to influence the host country's aid policy.

To ensure that a decline in aid reflects lower aid dependency rather than unfavorable economic conditions in donor countries or weak incentives for donors to provide aid to high-remittance countries, we include in the model the fiscal deficit of donor countries. The intuition behind this is that pressures to cut spending in donor countries could adversely affect aid flows or produce a shift in aid allocation away from countries experiencing sustained remittance flows. The results support the sensitivity of aid to economic conditions in donor countries, with the coefficient for fiscal deficit in donor countries being significant in 3 out of 5 specifications. The previous findings regarding the human capital, physical capital, and lobby channels remain unchanged.

Robustness tests

We use alternative indicators to capture the channels of transmission from remittances to aid. Indeed, our main conclusions remain when primary school enrollment rate is used as a proxy for the human capital channel, M2 as a share of GDP for the physical/financial development channel, and the number of migrants abroad for the lobby channel (Table 3). In addition, using lagged variables to control for endogeneity does not alter the previous findings (Table 4).

IV. CONCLUSION

This paper assesses whether remittances reduce aid dependency, and through which channels this relationship operates. It argues that, in theory, remittances can both lower or increase aid dependency measured by total bilateral aid flows per capita. By stimulating human and physical capital accumulation, remittances would dampen aid dependency (what we called the human and physical capital channels respectively), but at the same time they could increase it by improving aid absorption capacity. In addition, countries with more concentrated migrant groups could experience higher aid flows depending on their ability to

influence host countries' aid policy (the so-called lobby channel). These hypotheses were successfully tested in a sample of developing economies with data during 1970–2005. In carrying out the estimations, we carefully control for the endogeneity of remittances per capita and GDP per capita in the aid model and consider separately the channels from remittances to aid. The results suggest that remittances, in fact, increase aid dependency, contrary to expectations. But, by isolating the different channels, we find that, consistent with the theoretical predictions, remittances reduce a country's reliance on aid through the human and physical capital channels, while the opposite holds for the lobby channel. Put differently, remittances tend to reduce aid dependency if invested in physical and human capital rather than consumed. These results remain unchanged even after controlling for the fiscal stance of donor countries. Periods of fiscal tightening in donor countries coincide with declines in aid to developing countries.

The findings of the paper point out that remittances have not so far enabled developing countries to graduate from development aid. To do so, more needs to be done to channel remittances toward investment in human and physical capital. Although this reflects private decisions to some extent, macroeconomic policies to promote an investor-friendly business environment, deeper financial development and low financial transaction costs, and availability of health and education services can help.

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Figure 1. Remittances and Aid, 1975–2005
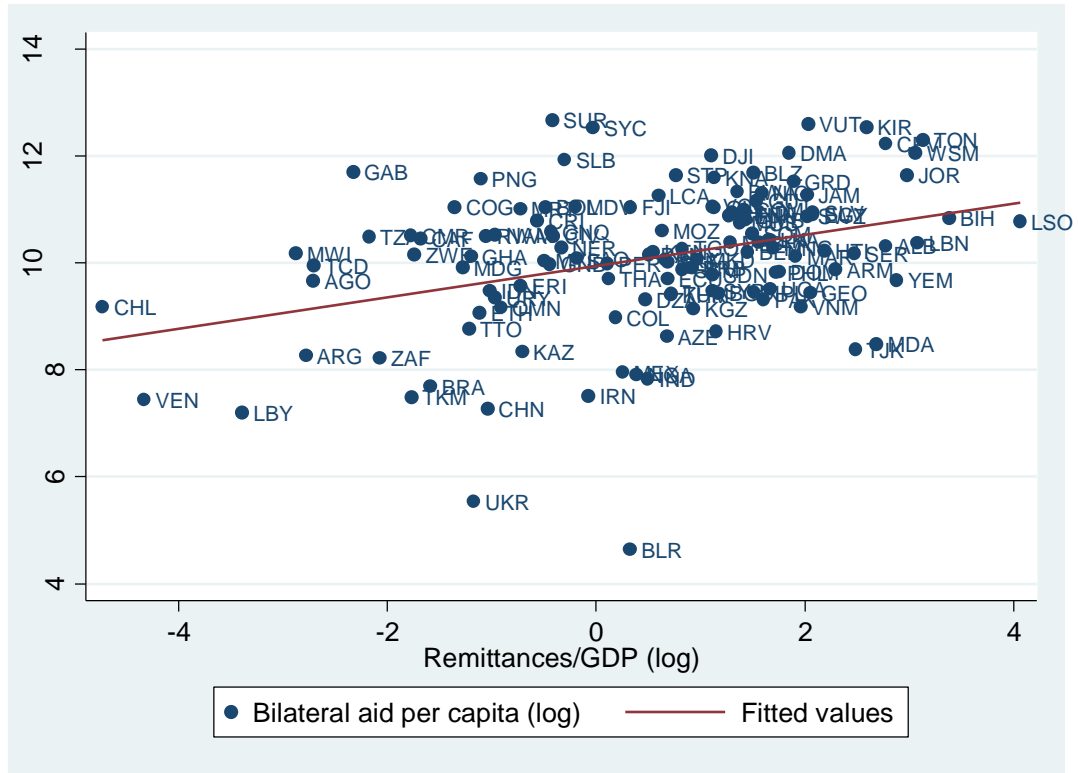
Sources: DAC-OECD, IMF.

Figure 2. Trends in Remittances and ODA for Selected Countries, 1975–2005
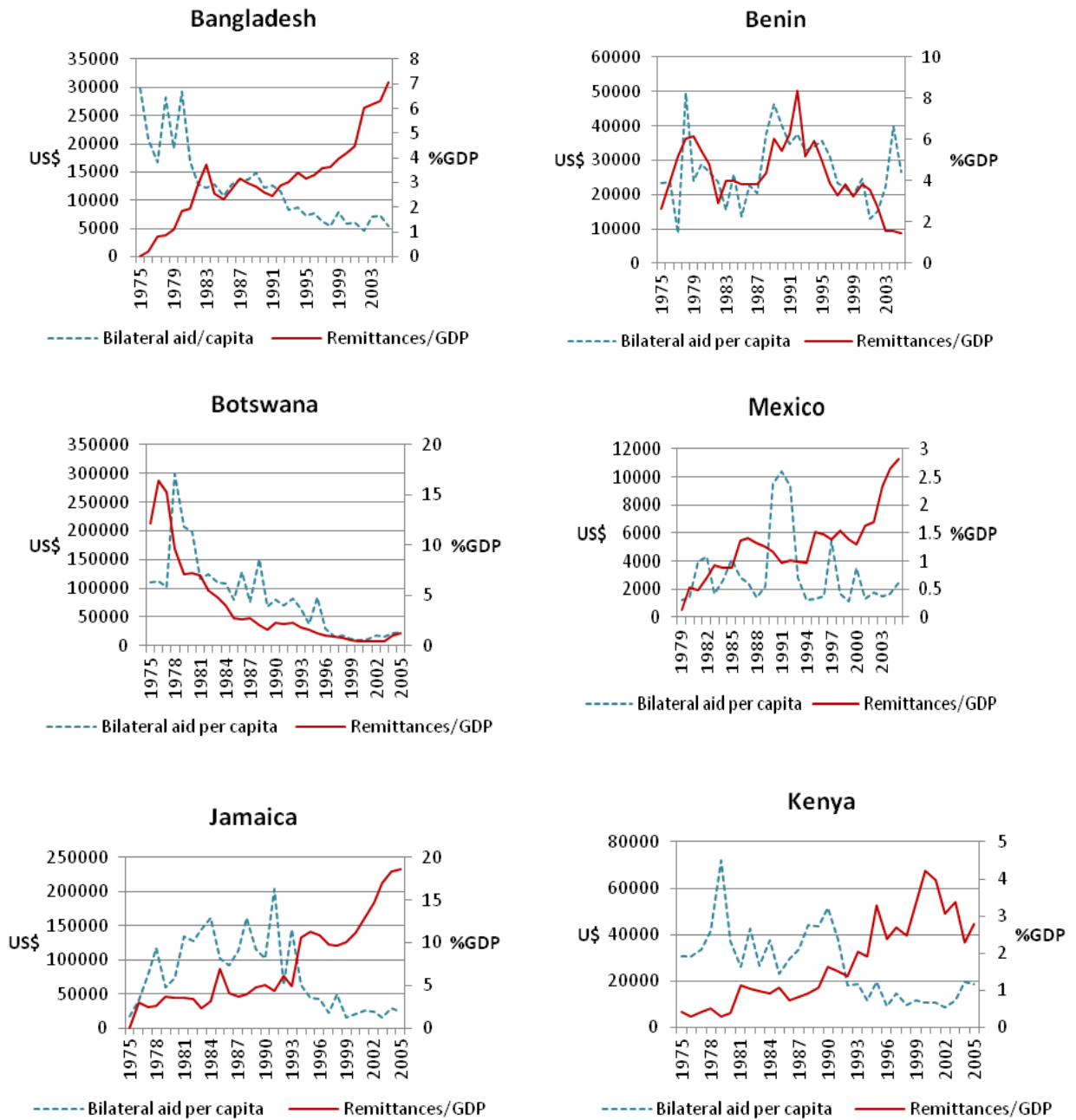
Sources: DAC-OECD, IMF.

Figure 3. Migrant Stocks and Bilateral Aid in 2000
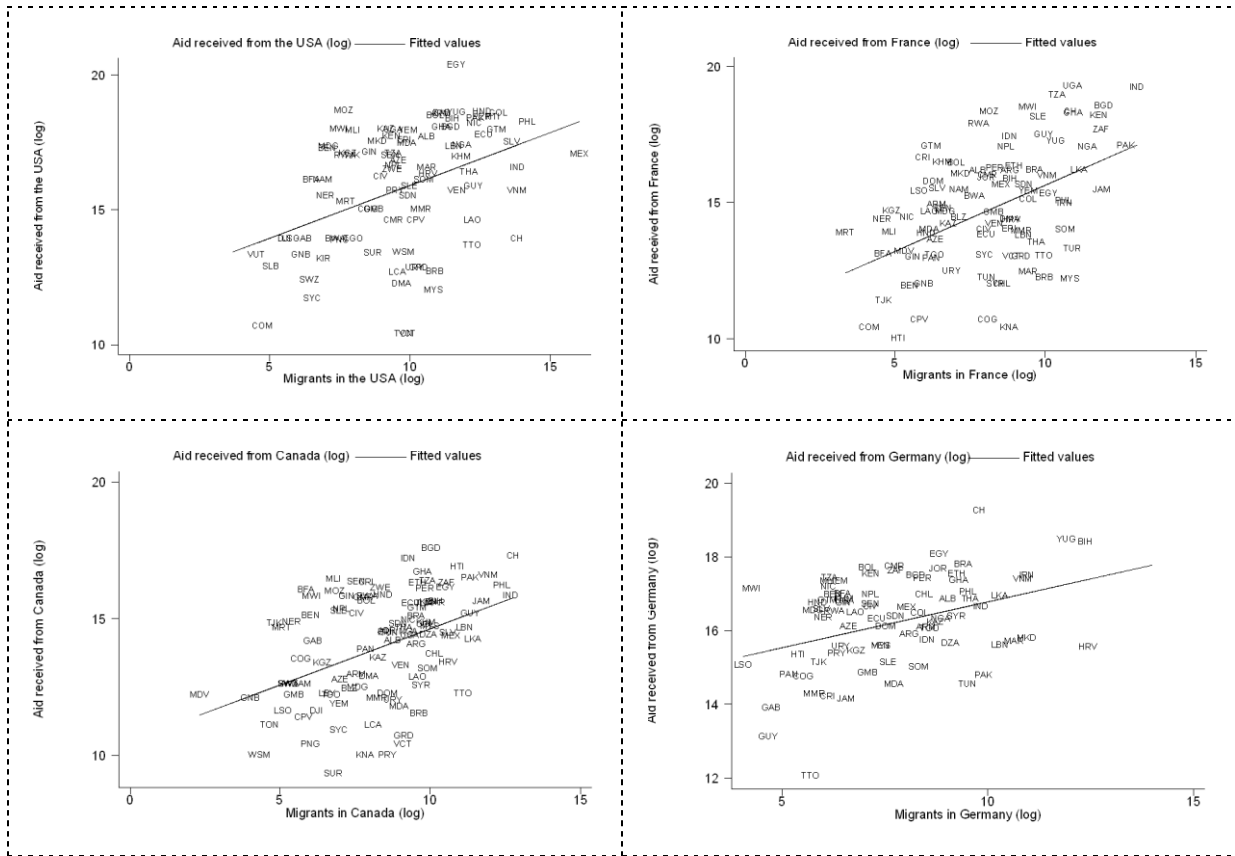
Sources: DAC-OECD, Schiff and Sjoblom (2011).

Table 1. Remittances and Aid: the Baseline Model

Variables	Log (BILAID)				
	(1)	(2)	(3)	(4)	(5)
Log (GDP)	2.762***	3.521***	9.585***	5.842***	-8.323**
	(3.06)	(3.04)	(2.85)	(3.02)	(-2.10)
(Log GDP)^2	-0.105***	-0.124***	-0.748***	-0.434	0.541**
	(-3.09)	(-2.82)	(-3.14)	(-3.01)	(2.01)
Log (MULTIAID)	0.358***	0.350***	0.334***	0.313***	0.387***
	(6.20)	(4.56)	(4.39)	(4.95)	(6.50)
Log (POP)	-4.045**	-0.471	-2.658	-1.898	-7.530***
	(-2.05)	(-0.17)	(-0.91)	(-0.87)	(-2.63)
(Log POP)^2	0.119*	0.0005	0.073	0.049	0.243***
	(1.91)	(0.01)	(0.81)	(0.71)	(2.65)
OPEN	0.003	0.0009	0.004	0.003	0.003
	(1.34)	(0.26)	(1.14)	(1.35)	(1.01)
POL	0.016*	0.026**	0.028**	0.017*	0.003
	(1.72)	(2.25)	(2.04)	(1.71)	(0.28)
WALL	0.149	0.027	0.037	0.072	0.189
	(1.44)	(0.21)	(0.28)	(0.64)	(1.47)
REM	0.016**	-0.150**	0.087**	-0.530**	-0.009
	(2.03)	(-2.01)	(2.14)	(-2.39)	(-0.41)
HEALTH		-0.005			
		(-0.79)			
REM*HEALTH		0.001**			
		(2.24)			
CREDIT			2.113***		
			(3.07)		
REM*CREDIT			-0.386*		
			(-1.81)		
CONSO				-0.466	
				(-1.10)	
REM*CONSO				0.110**	
				(2.46)	
LOBBY					0.110
					(0.88)
REM*LOBBY					0.058*
					(1.92)
Constant	22.383	-14.421	-4.939	2.559	90.002***
	(1.22)	(-0.57)	(-0.16)	(0.13)	(2.72)
Observations	300	296	261	289	300
Number of countries	90	90	79	88	90
R^2	0.37	0.43	0.40	0.49	0.10
Hansen p-value	0.140	0.388	0.728	0.346	0.127

Table 2. Remittances and Aid: Controlling for Fiscal Deficits in Donor Countries

Variables	Log (BILAID)				
	(1)	(2)	(3)	(4)	(5)
Log (GDP)	3.014***	3.649***	9.290***	5.999***	-7.926**
	(3.37)	(3.24)	(2.98)	(3.15)	(-1.96)
$(Log\ GDP)^2$	-0.114***	-0.130***	-0.729***	-0.445***	0.515*
	(-3.39)	(-3.04)	(-3.20)	(-3.12)	(1.87)
Log (MULTIAID)	0.336***	0.332***	0.316***	0.302***	0.379***
	(5.88)	(4.52)	(4.35)	(4.86)	(6.34)
Log (POP)	-4.301**	-0.642	-3.239	-2.150	-7.409**
	(-2.22)	(-0.24)	(-1.18)	(-1.00)	(-2.57)
$(Log\ POP)^2$	0.138**	0.007	0.101	0.065	0.242***
	(2.25)	(0.08)	(1.19)	(0.95)	(2.64)
OPEN	0.003	0.001	0.003	0.003	0.003
	(1.20)	(0.35)	(1.10)	(1.17)	(0.88)
POL	0.016*	0.026**	0.027**	0.017*	0.004
	(1.82)	(2.36)	(2.12)	(1.79)	(0.34)
WALL	0.187*	0.054	0.072	0.102	0.199
	(1.82)	(0.42)	(0.57)	(0.91)	(1.53)
DEFICIT	-0.016***	-0.007	-0.014**	-0.011**	-0.006
	(-3.06)	(-1.14)	(-2.32)	(-2.05)	(-0.98)
REM	0.014*	-0.140**	0.076**	-0.495**	-0.012
	(1.85)	(-2.29)	(2.09)	(-2.24)	(-0.51)
HEALTH		-0.006			
		(-1.01)			
REM*HEALTH		0.001***			
		(2.58)			
CREDIT			1.967***		
			(3.14)		
REM*CREDIT			-0.329*		
			(-1.72)		
CONSO				-0.514	
				(-1.23)	
REM*CONSO				0.103**	
				(2.32)	
LOBBY					0.087
					(0.68)
REM*LOBBY					0.063**
					(2.04)
Constant	19.707	-14.093	-1.938	1.936	86.709**
	(1.09)	(-0.59)	(-0.07)	(0.10)	(2.57)
Observations	300	296	261	289	300
Number of countries	90	90	79	88	90
R^2	0.39	0.41	0.29	0.35	0.10
Hansen p-value	0.211	0.544	0.578	0.216	0.139

Table 3. Alternative Indicators for the Channels of Transmission from Remittances to Aid

	Log (BILAID)		
	(1)	(2)	(3)
Log (GDP)	12.637***	6.125***	-6.026*
	(3.76)	(3.02)	(-1.83)
(Log GDP)^2	-0.989***	-0.470***	0.378*
	(-3.96)	(-3.06)	(1.65)
Log (MULTIAID)	0.259***	0.377***	0.394***
	(2.65)	(5.76)	(5.47)
Log (POP)	-6.055*	-3.503	-7.828***
	(-1.92)	(-1.53)	(-2.93)
(Log POP)^2	0.183*	0.097	0.227***
	(1.79)	(1.34)	(2.67)
OPEN	0.002	0.004*	0.006**
	(0.66)	(1.65)	(2.05)
POL	0.008	0.013	0.008
	(0.56)	(1.21)	(0.74)
WALL	-0.100	0.110	0.208*
	(-0.58)	(0.92)	(1.76)
REM	0.344**	0.071***	-0.071**
	(2.30)	(2.74)	(-2.33)
SCHOOLING	0.011		
	(1.10)		
REM*SCHOOLING	-0.004**		
	(-2.19)		
M2/GDP		0.011**	
		(2.41)	
REM*M2/GDP		-0.002**	
		(-2.37)	
Log MIG			0.415***
			(2.75)
REM*Log MIG			0.010***
			(2.94)
Constant	11.737	12.806	87.065***
	(0.42)	(0.61)	(3.02)
Observations	219	296	298
Number of countries	81	90	89
R^2	0.19	0.51	0.21
Hansen p-value	0.76	0.47	0.18

Table 4. Remittances and Aid: Using Lagged Variables to Control for Endogeneity

	Log (BILAID)					
	(1)	(2)	(3)	(4)	(5)	(6)
Log (GDP) *(lagged)*	1.056	6.435***	2.601	2.829**	2.781**	3.398**
	(1.60)	(3.27)	(1.72)	(2.15)	(2.09)	(2.46)
(Log GDP)^2 *(lagged)*	-0.047**	-0.509***	-0.242**	-0.237***	-0.244**	-0.289***
	(-2.00)	(-3.55)	(-2.19)	(-2.48)	(-2.52)	(-2.87)
Log (MULTIAID) *(lagged)*	-0.023	0.061	-0.050	0.031	-0.005	-0.016
	(-0.53)	(0.87)	(-0.86)	(0.72)	(-0.12)	(-0.36)
Log (POP)	-3.800**	-7.318***	-5.151***	-3.401**	-5.644***	-4.197**
	(-2.25)	(-3.12)	(-2.85)	(-2.00)	(-3.10)	(-2.28)
(Log POP)^2	0.076	0.186**	0.132**	0.074	0.139**	0.094*
	(1.43)	(2.49)	(2.35)	(1.38)	(2.42)	(1.65)
OPEN	0.003*	0.001	0.001	0.004*	0.003	0.003
	(1.67)	(0.53)	(0.34)	(1.93)	(1.39)	(1.46)
POL	0.018**	0.022**	0.021**	0.018**	0.020**	0.020**
	(2.35)	(2.16)	(2.39)	(2.24)	(2.52)	(2.58)
WALL	0.007	-0.080	0.064	0.013	-0.031	-0.044
	(0.08)	(-0.70)	(0.68)	(0.15)	(-0.35)	(-0.48)
REM *(lagged)*	-0.042*	0.161***	0.034**	-0.192**	0.022**	0.091***
	(-1.90)	(3.38)	(2.23)	(-2.19)	(2.17)	(3.56)
Health	-0.004**					
	(-2.38)					
REM*Health	0.001***					
	(2.77)					
Schooling		0.009				
		(1.57)				
REM*Schooling		-0.002***				
		(-3.04)				
Credit			0.994***			
			(3.11)			
REM*Credit			-0.104*			
			(-1.65)			
Conso				0.085		
				(0.26)		
REM*Conso				0.041**		
				(2.34)		
Lobby *(lagged)*					0.191***	
					(2.97)	
REM*Lobby					0.034***	
					(3.24)	
Log MIG *(lagged)*						0.015
						(0.16)
REM*Log MIG						0.011**
						(3.28)
Constant	38.814**	51.181**	44.564***	29.462*	49.584***	36.008**
	(2.50)	(2.44)	(2.64)	(1.88)	(2.96)	(2.10)
Observations	367	227	324	356	356	352
Number of countries	100	83	88	97	100	99
R^2	0.42	0.50	0.46	0.47	0.40	0.45

Appendix 1. List of the Sample Countries

ODA receiving countries

Albania	Lao PDR
Algeria	Lebanon
Angola	Lesotho
Argentina	Macedonia, FYR
Armenia	Madagascar
Azerbaijan	Malawi
Bangladesh	Malaysia
Benin	Mali
Bolivia	Mauritania
Botswana	Mauritius
Brazil	Mexico
Burkina Faso	Moldova
Cambodia	Mongolia
Cameroon	Morocco
Central African Republic	Mozambique
Chad	Namibia
Chile	Nepal
China	Nicaragua
Colombia	Niger
Comoros	Nigeria
Congo, Rep.	Oman
Costa Rica	Pakistan
Cote d'Ivoire	Panama
Croatia	Papua New Guinea
Djibouti	Paraguay
Dominican Republic	Peru
Ecuador	Philippines
Egypt, Arab Rep.	Rwanda
El Salvador	Senegal
Equatorial Guinea	Sierra Leone
Eritrea	Slovenia
Ethiopia	Solomon Islands
Fiji	South Africa
Gabon	Sri Lanka
Gambia, The	Sudan
Ghana	Swaziland
Guatemala	Syrian Arab Republic
Guinea	Tanzania
Guinea-Bissau	Thailand
Guyana	Togo
Haiti	Trinidad and Tobago
Honduras	Tunisia
India	Turkey
Indonesia	Turkmenistan
Iran, Islamic Rep.	Uganda
Jamaica	Uruguay
Jordan	Venezuela, RB
Kazakhstan	Yemen, Rep.
Kenya	Zambia
Kyrgyz Republic	Zimbabwe

ODA sending countries

Australia	Korea
Austria	Luxembourg
Belgium	Netherlands
Canada	New Zealand
Denmark	Norway
Finland	Portugal
France	Spain
Germany	Sweden
Greece	Switzerland
Ireland	United Kingdom
Italy	United States
Japan	Others (non DAC countries)

Appendix 2. Variable Definitions and Sources

Variables	Definitions	Sources
Dependent and explanatory variables		
BILAID	Per capita total ODA commitment by DAC and on DAC countries (constant US$ 2000)	DAC-OECD
MULTIAID	Per capita total ODA commitment by multilateral organizations (constant US$ 2000)	DAC-OECD
GDP	Per capita GDP of the recipient (constant US$ 2000)	World Development Indicators 2009, and International Financial Statistics
POP	Population of the recipient country	World Development Indicators 2009
POL	Indicator of political stability and democracy	Polity2 of Polity IV database
OPEN	Exports+Imports (in percent of GDP)	World Development Indicators 2009
REM	Amount of remittances received (in percent of GDP)	International Monetary Fund
MIG	Stock of migrants in the six key receiving countries in the OECD: Australia, Canada, France, Germany, the UK, and the US	Maurice Schiff and Mirja Channa Sjoblom. Panel Data on International Migration (PDIM) 1975-2000, 2011 (http://go.worldbank.org/4IJSEHH7P0)
Credit	Credit to private sector over GDP	International Financial Statistics
M2/GDP	Money and quasi money as percentage of GDP	International Financial Statistics
Schooling	Primary school enrollment rate	World Development Indicators 2009
Consumption	Household final consumption expenditure per capita (constant 2000 US$)	World Development Indicators 2009
Instruments		
ΔREM	Amount of remittances received by the entire sample minus the amount of remittances received by the country considered	Chami and others (2008)
ΔGDP/DIST	Per capita income gap between i and j, weighted by the geographical distance separating them	Spatafora (2005), CEPII and authors' calculations
DENSITY	Number of people per square kilometer	World Development Indicators 2009
URBAN	Percentage of the population living in urban areas	World Development Indicators 2009

Appendix 3. Correlation Matrix

	BILAID	MULTIAID	REM	GDP	POP	POL	OPEN	WALL	DEFICIT	INF. MORT.	CONS.	CREDIT	LOBBY
BILAID	1.00												
MULTIAID	0.61*	1.00											
REM	0.18*	0.26*	1.00										
GDP	-0.21*	-0.28*	-0.12*	1.00									
POP	-0.24*	-0.22*	-0.08	-0.08	1.00								
POL	0.03	-0.10*	-0.06	0.27*	0.01	1.00							
OPEN	0.34*	0.35*	0.28*	0.11*	-0.23*	0.02	1.00						
WALL	0.13*	0.05	-0.02	-0.06	-0.02	-0.30*	-0.15*	1.00					
DEFICIT	-0.08*	-0.01	-0.01	0.02	-0.02	0.22*	0.22*	-0.46*	1.00				
INFANT MORTALITY	0.02	0.24*	-0.05	-0.58*	-0.04	-0.38*	-0.38*	0.21*	-0.17*	1.00			
CONSUMPTION	0.09	0.27*	0.51*	-0.43*	-0.18*	-0.04	-0.04	-0.01	-0.02	0.40*	1.00		
CREDIT	0.009	-0.14*	-0.04	0.32*	0.01	0.15*	0.15*	0.04	0.02	-0.42*	-0.37*	1.00	
LOBBY	0.21*	-0.28*	-0.05	0.09*	0.42*	0.11*	0.11*	0.08	-0.09*	0.11*	-0.16*	0.06	1.00

Note: *significant at least at 10%

Appendix 4. Descriptive Statistics

	Obs	Mean	Std. Dev.	Min	Max
BILAID	371	35424.7	33614.8	491.9	222563.6
MULTIAID	371	18949.5	19897	28.8	142711.2
REM	371	3.3	8.4	0	8.4
GDP	371	1396.9	1595.2	107.9	8538.5
POP	371	4.83e+07	1.63e+08	402727.9	1.28e+09
POL	371	10.7	6.5	0	20
OPEN	371	70.4	38.0	12.7	224.2
WALL	371	0.361	0.480	0	1
DEFICIT	371	-14.338	7.018	-35.4	4.4
INFANT MORTALITY	367	105.7	70.7	7.8	320
CONSUMPTION	356	71.1	14.4	26.2	148.7
CREDIT	324	0.2	0.22	0.02	1.4
LOBBY	356	1.1	2.1	0.001	16.2