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# **WHO'S AFRAID OF FOREIGN AID? THE DONORS' PERSPECTIVE**

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## Abstract<sup>1</sup>

Since efforts by industrial countries to increase the amount of foreign aid they provide have been on the rise recently, it is important to understand the determinants involved. This paper examines the factors affecting support for foreign aid among voters in donor countries. The theoretical model, which considers an endogenous determination of official and private aid flows, suggests that government efficiency is an important factor in this regard, and also ties individual income to aid support through the elasticity of substitution. An empirical analysis of individual attitudes, based on the World Values Surveys, reveals that two factors are positively related to an individual's willingness to support foreign aid: satisfaction with own government performance and individual relative income. Furthermore, when using donor country data, we find that aid is negatively tied to inequality, corruption and taxes. These results are quite consistent with the analytical framework.

**Keywords:** Foreign Aid, Donors, Perceptions, Development, Corruption, Institutions

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<sup>1</sup> Gianmarco León provided excellent research assistance. The findings and interpretations are those of the authors and do not necessarily represent the views of the Inter-American Development Bank or its corresponding executive directors. Alberto Chong: Research Department, Inter-American Development Bank, Stop B-602, 1300 New York Ave, NW, Washington, DC 20577, USA. Fax: (202) 623-2481, Tel: (202) 623-1536. E-mail: albertoch@iadb.org. Mark Gradstein: Department of Economics, Ben Gurion University, Beer Sheva 84105, Israel, Tel: (972)-8-647-2288 Fax: (972)-8-647-2941. E-mail: grade@bgu.ac.il.

## 1. Introduction

For many developing countries, foreign aid constitutes a significant part—often in excess of 10 percent or more—of national income (World Bank, 2005a). By contrast, foreign aid represents a relatively miniscule portion of the donor countries' national accounts. Despite the recognition that donations to poor countries may serve the rich countries' interests—either because of strategic, economic or humanitarian concerns—and despite many pledges by rich countries' governments to significantly increase their aid amounts, the flows of foreign aid from any given country do not typically exceed 1 percent of the national product.<sup>2</sup>

Because of the belief that foreign aid may be essential for maintaining minimal living standards in poor countries, providing immediate humanitarian relief, or even spurring investment and growth, international agencies, NGOs and other organizations have been conducting vigorous campaigns for years to enhance aid flows—with very limited success. It appears, therefore, that the relatively small amount of aid provided reflects deeply rooted priorities, ideologies or political forces in donor countries. Indeed, Kopczuk, Slemrod and Yitzhaki (2003) show that actual levels of foreign aid relative to domestic income transfers correspond to the fact that citizens in rich countries attach only 1/2,000 of the weight to the welfare of citizens in poor countries that they do to the welfare of their own poor.

Additionally, the amount of foreign aid differs significantly across donor countries. For example, official development assistance constitutes around 1 percent of GDP in Denmark, Sweden and the Netherlands, but only one-tenth of a percent in the United States. The total amount of aid (including, in particular, private flows) reaches almost 2 percent of GDP in Sweden and the Netherlands, but only one-fourth of a percent in the United States (USAID, 2004; World Bank, 2005a).

It is therefore important to have a better understanding of the forces that shape the overall levels of aid flows and their differences across the countries. To this end, this paper offers a political economy model of international giving, where politically determined amounts of official aid interact with private donations.<sup>3</sup> While the weight assigned to foreign aid by the citizens in

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<sup>2</sup> At recent international forums, donor countries were called upon to increase their aid commitment up to 0.7 percent of their national income (Roodman, 2004).

<sup>3</sup> In the United States, at least, the argument is often made that whereas the amount of official aid is relatively small, private flows more than compensate for this (USAID, 2004). Private flows of aid often constitute a significant aid

rich countries obviously plays a crucial role in the analysis (Kopczuk, Slemrod and Yitzhaki, 2003), we identify additional potentially important elements. One is that the perceived inefficiency of the recipient countries' use of aid, as well as the domestic government's inefficiency, can potentially shape political support for foreign aid. Another element has to do with incomes. Though it is generally ambiguous, under empirically plausible assumptions on preferences the income effect implies that more affluent individuals should be no less supportive of aid—and should likely be more so—than poorer individuals. This also implies that in the resulting equilibrium, richer countries are more generous; lower degrees of income inequality lead to more affluent, politically decisive voters and higher levels of political support for more generous giving.

We also consider the case of multiple donors and the free-riding effect, in which there is an inverse relationship between the number of donors and the amount of aid provided by an individual donor country. One possible limitation of the main analysis is that it ignores the cross-country variation in tax policies that may affect aid incentives.<sup>4</sup> An extension of the basic analysis reveals that the amount of foreign aid is neutral with respect to these provisions, implying that any difference in giving across countries is unlikely to be explained by the different tax policies.

The empirical findings strongly support the predictions of the model. The empirical analysis of individual attitudes, based on the World Values Surveys, reveals that individual income and satisfaction with government performance are positively related to a willingness to provide foreign aid. In particular, this implies that more efficient and less corrupt governments would be more conducive to public support for foreign aid. Furthermore, an analysis of actual foreign aid flows finds that they are linked to domestic institutional quality and income inequality, as predicted by the model.

Earlier theoretical works (Dudley and Montmarquette, 1976; Mosley, 1985 and Hatzipanayotou and Michael, 1995) provide valuable insights into the modeling of foreign aid. Some of these papers particularly emphasize the public good aspect of foreign aid, as seen from the donors' perspective. The recent paper by Lahiri and Schweinberger (2006) in the political

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component, about two-thirds of the total aid in the United States, but only around one-fourth in Denmark and France.

<sup>4</sup> For example, the tax treatment of donations is different across countries; in the United States and many other countries these donations are at least partially tax deductible, and in other countries they are not.

economy tradition is closer to the present work. They, too, are interested in the interaction between government and private aid. We extend their political economy analysis to the standard majority voting framework and incorporate the “warm-glow” motive for giving. More importantly, perhaps, we also incorporate factors that were neglected in the literature but which nevertheless may have empirical significance, such as the aid inefficiency described above.

The existing empirical literature on foreign aid has been almost entirely devoted to issues of aid allocation and the effects of aid in receiving countries (Alesina and Weder, 2002; Boone, 1996; Burnside and Dollar, 2000; Collier and Dollar, 2002 and Easterly, 2003). By considering the attitudes toward foreign aid in donor countries, the empirical focus presented here is different, but should be viewed as complementary to the existing line of research.

The paper is organized as follows. The next section describes the basic theoretical framework, which is then followed by an equilibrium analysis in Section 3. Section 4 focuses on the effects of aid inefficiencies, and Section 5 considers the case of multiple donors. Section 6 extends the main framework to study the potential effects of tax policy. The empirical part begins in Section 7 with the description of the data, followed by the data analysis in Section 8. Finally, Section 9 concludes.

## 2. Basic Framework

Consider an economy populated by a continuum of individuals, indexed  $i$ , whose measure is normalized to 1. The individuals differ only in terms of their initial income endowment,  $y_i$ , whose distribution is exogenously given, and are assumed to derive utility from private consumption,  $c_i$ ; from the aggregate amount of donated foreign aid,  $A$ ; and from their private donation,  $z_i$ , which captures the warm-glow motive for giving. In order to avoid the loaded discussion of aid effectiveness (Easterly, 2003), the assumption is made that what matters is the input (the aid amount) and not the output (poverty reduction, growth or other potentially beneficial consequences for poor countries). This modeling approach, which perceives foreign aid as a public good, is quite standard (Dudley and Montmarquette, 1976 and Lahiri and Schweinberger, 2006). This approach also reflects the idea that, whatever the motivation (strategic or humanitarian), foreign aid is often perceived as a national interest (USAID, 2004).

Thus, individual preferences are:

$$U(c_i) + V(A) + W(z_i) \tag{1}$$

where  $U$ ,  $V$  and  $W$  satisfy the standard assumptions and, in particular, are monotonic and concave.<sup>5</sup> Income is allocated between consumption and paying taxes to finance the official or publicly provided aid as well as private aid donations. We assume that a proportional income tax is used to finance official aid and let  $T$ ,  $0 \leq T \leq 1$ , denote the tax rate. Then, normalizing prices to unity, the individual budget constraints can be written as:

$$y_i = c_i + Ty_i + z_i \quad (2)$$

Letting  $Y$  denote the aggregate income and  $Z$  the aggregate amount of private aid, the total amount of donation is:

$$A = TY + Z \quad (3)$$

The decision as to the amount of official aid, or alternatively, the tax rate used to finance this aid, is made collectively by a majority vote among the individual voters; it is then followed by individually made decisions on the allocation of disposable income between consumption and private donations of aid. The equilibrium consists of the majority-supported tax rate and individual optimal donations, which are mutually consistent.

### 3. Analysis

The analysis proceeds backwards. Suppose first that the tax rate is exogenously given and consider the individual allocations of disposable income between consumption and private aid. The optimal individual allocation maximizes the utility (1) subject to (2) and (3). The first-order condition is:

$$-U'(c_i) + W'(z_i) = 0 \quad (4)$$

whose solution can be written as:

$$c_i = h(y_i(1-T)), z_i = y_i(1-T) - h(y_i(1-T)) \quad (5)$$

where  $0 < h' < 1$  ; so that, integrating across individuals,

$$Z = Y(1-T) - \int h(y_i(1-T))di \quad (6)$$

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<sup>5</sup> The separability assumption, while substantially simplifying the analysis, is not essential.



and

$$A = TY + Z = TY + Y(1-T) - \int h(y_i(1-T)) di \quad (7)$$

Differentiating, we obtain:

$$dA/dT = \int h'(y_i(1-T)) y_i di > 0 \quad (8)$$

This result implies that the crowding out of private donations by official aid is incomplete, so that a marginal increase in official aid is not fully offset by a corresponding decrease in private aid, thus causing an increase in the overall amount of aid. Suppose now that, in anticipation of the private donation equilibrium stated above, individuals vote on the tax rate. The preferred tax rate for individual  $i$  satisfies the first order condition:

$$-U'(c_i) y_i + V'(A) dA/dT \leq 0 \quad (9)$$

where  $dA/dT$  is given by (8), and (9) is strictly negative if  $T=0$ . In general, the relationship between individual income and foreign aid preferences is complex. To facilitate its understanding, suppose that the all sub-utilities are isoelastic functions, so that (1) has the form:

$$c_i^{1-\sigma}/(1-\sigma) + \alpha A^{1-\sigma}/(1-\sigma) + \beta z_i^{1-\sigma}/(1-\sigma), \quad \alpha, \beta > 0 \quad (1')$$

The parameter  $\alpha$  reflects the taste for foreign aid as such, whereas  $\beta$  represents the warm glow motive from making a donation. When  $\sigma > (<) 1$ , the elasticity of substitution is smaller (larger) than unity;  $\sigma = 1$  corresponds to the case of logarithmic preferences. Straightforward calculations reveal then that, for a given tax rate,

$$\begin{aligned} c_i &= \beta^{-1/\sigma} y_i(1-T) / (1 + \beta^{-1/\sigma}), \quad z_i = y_i(1-T) / (1 + \beta^{-1/\sigma}), \quad Z = Y(1-T) / (1 + \beta^{-1/\sigma}), \\ A &= TY + Y(1-T) / (1 + \beta^{1/\sigma}) \end{aligned} \quad (10)$$

The first-order condition for the tax rate (9) in this case takes the form:

$$\begin{aligned} -c_i^{-\sigma} y_i + \alpha A^{-\sigma} (Y + dZ/dT) &= -c_i^{-\sigma} y_i + \alpha A^{-\sigma} Y(1 - 1/(1 + \beta^{-1/\sigma})) = \\ -[\beta^{-1/\sigma} y_i(1-T) / (1 + \beta^{-1/\sigma})]^{-\sigma} y_i + \alpha [TY + Y(1-T) / (1 + \beta^{-1/\sigma})]^{-\sigma} Y(1 - 1/(1 + \beta^{-1/\sigma})) &\leq 0 \end{aligned} \quad (11)$$

where the second line is obtained by substituting from (10); this condition can be rewritten as follows:

$$-(1-T)^{-\sigma} (y_i/Y)^{1-\sigma} + \alpha[T + (1-T) / (1 + \beta^{1/\sigma})]^{-\sigma} \leq 0 \quad (12)$$

Differentiation of the left-hand side in (12) reveals that the second-order condition holds, implying that individual preferences are single-peaked, and that the median voter is decisive in determining the political outcome.

It follows from differentiating (12) that the preferred tax rate increases (decreases) with the relative individual income depending on whether the elasticity of substitution is greater (less) than unity. Because in any case tax preferences depend monotonically on individual income, in the political equilibrium the median income voter is decisive, and the equilibrium condition is:

$$-(1-T)^{-\sigma} (y_m/Y)^{1-\sigma} + \alpha[T + (1-T) / (1 + \beta^{1/\sigma})]^{-\sigma} \leq 0 \quad (13)$$

where  $y_m$  is the median income. The ratio  $y_m/Y$  will be interpreted as being inversely related to income inequality (as would be the case, for example, with lognormal income distribution).

The above analysis bears implications for the resulting amounts of private aid. The relative share of private aid out of the total amount of aid is  $Z/A = 1/[1 + T(1+\beta^{1/\sigma})/(1-T)]$ , which clearly decreases in  $T$ . Since total aid is an increasing function of the tax rate, this implies a negative relationship between the amount of total aid and the share of private aid in it.

In sum, we can formulate **Proposition 1**: Support for government-provided foreign aid increases (decreases) with income depending on whether the elasticity of substitution is greater (less) than one. Correspondingly, income inequality reduces political support for official aid when the elasticity of substitution is greater than 1; enhances it when the elasticity of substitution is less than 1; and is irrelevant in the case of logarithmic preferences. The share of private aid out of total is a decreasing function of the tax rate used to provide aid financing.

Some related research strongly suggests that the elasticity of substitution in many applications slightly exceeds 1. Thus in a seminal study, Bergstrom and Goodman (1973) estimate the income elasticity of the demand for public good to be around two-thirds and the price elasticity to be around one-fourth. This would then imply that richer people are more supportive of higher official aid, despite their increased tax obligations, and that income inequality enhances its political support. A subsequent micro survey study (Gramlich and Rubinfeld, 1982) generally concurs with these results, noting that support for more public spending increases with income, but that the relationship is only marginally significant. This

leads us to interpret the empirically relevant values of the parameter  $\sigma$  as marginally exceeding 1. From (10), the aggregate amount of foreign aid then depends positively on the aggregate income in the donor economy, and negatively on the degree of its inequality, while the relative share of private aid depends positively on income inequality.

#### 4. Government Inefficiencies

Inefficiencies in both the donor government and the recipient government may potentially affect the donor country's citizens' support for providing aid. In particular, one often-articulated reason for the limited amount of aid is its inefficient use by recipients. Government corruption, lack of accountability and transparency, bureaucratic incompetence—all these may give rise to a wasteful allocation of aid from the donor's perspective, which, in turn, may have an effect on aid decisions. Indeed, recipient countries' inefficiencies have often been cited as reasons to withhold aid.

To study the effect of such inefficiencies on the equilibrium donations, we now suppose existence of a wedge between the amount of aid and its effective quantity. The simplest way to do this is by assuming that a share  $(1-\varepsilon)$ , of aid does not reach its designed destination (such as the poor in recipient countries). In other words, the effective amount of aid, from which the donors derive utility, is now:

$$A = \varepsilon(TY + Z) \quad (3')$$

While this assumption does not change the equilibrium in private donations, the individual preferences over the tax rate are now modified as follows:

$$-(1-T)^{-\sigma} (y_i/Y)^{1-\sigma} + \alpha \varepsilon^{1-\sigma} [T + (1-T) / (1 + \beta^{-1/\sigma})]^\sigma \leq 0 \quad (12')$$

and differentiation reveals that the preferred (hence, the equilibrium) tax rate decreases, increases or remains unchanged as a function of the inefficiency parameter depending on whether  $\sigma > 1$  ( $< 1$ ;  $= 1$ ). Inefficiency has both income and substitutions effects. While the latter work to decrease the preferred amount of aid, the former work in the opposite direction to increase aid so as to compensate for waste.

Perhaps surprisingly perhaps, the effect of inefficiency on the preferred amount of aid is thus generally ambiguous. In the logarithmic case,  $\sigma=1$ , for example, the two factors just cancel

each other out. In the empirically plausible case where  $\sigma$  slightly exceeds 1, inefficiency does reduce the amount of official aid—hence its total amount—but the reduction is not dramatic. This result is consistent with the empirical findings that the amount of aid is not significantly correlated with the recipient countries' degree of corruption (Alesina and Weder, 2002).

Alternatively, another factor affecting willingness to provide aid is the relative inefficiency of an individual's *own* government relative to private giving. In the United States, for example, there is much skepticism as to how effective the government can be in delivering foreign aid, and this is a frequent obstacle to enhancing its amount. Thus, suppose that a dollar of government taxes generates a lower amount of aid than private donations. This would imply that the aggregate amount of aid can be written as:

$$A = \gamma TY + Z, 0 < \gamma < 1 \quad (3'')$$

One interpretation of such relative inefficiency has to do with productive efficiency, whereby the government, because of bureaucratic corruption, rent seeking, etc., is less efficient in supplying aid than private donors are. Alternatively, the specification in (3'') can also be conceived as a reduced form of a model with distortive tax effects, say, in the labor market.<sup>6</sup> Again, such waste leaves private aid equilibrium unchanged, but individual tax preferences now have the following form:

$$-[\beta^{-1/\sigma}(1-T) / (1 + \beta^{-1/\sigma})]^{-\sigma} (y_i/Y)^{1-\sigma} + \alpha[\gamma T + (1-T) / (1 + \beta^{-1/\sigma})]^{-\sigma} (\gamma - 1 / (1 + \beta^{-1/\sigma})) \leq 0 \quad (12'')$$

In general, the relationship between the government inefficiency parameter  $\gamma$  and the preferred tax rate is complex and is mediated by the additional parameters. When the elasticity of substitution is close to 1, however, differentiation of (12'') reveals that government inefficiency reduces the preferred tax rate, hence aid.

These results lead to **Proposition 2:** For empirically plausible values of the elasticity of substitution, the amount of aid is not very sensitive with respect to its use efficiency by the recipient country; on the other hand, the preferred amount of aid is negatively related to own government inefficiency.

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<sup>6</sup> An analysis of a fully specified model that contains labor-market distortion did not generate any different insights and is available from the authors upon request.

## 5. Multiple Donors

While the basic framework established above focuses on a single donor case, in reality many industrialized countries are active donors, sometimes with overlapping interests. For example, some cases of humanitarian aid are typically viewed as a public good by multiple potential donors, and sometimes there is alignment of donors' strategic interests, such as in the case for the aid to Russia in the 1990s.

These considerations imply that an extension of the above model to the case of multiple donor countries may be realistic. To simplify matters, this section assumes away the warm-glow motive,  $\beta=0$ , which implies that there will be no private donations,  $Z=0$ . Thus, suppose there are  $K$  donor countries, indexed  $k$ , and that for the sake simplicity the population in each country is normalized to measure 1. Letting the subscript  $ik$  refer to individual  $i$  in country  $k$ , a citizens' preferences are represented as follows:

$$c_{ik}^{1-\sigma}/(1-\sigma) + \alpha A^{1-\sigma}/(1-\sigma) \quad (14)$$

The aggregate amount of aid,  $A$ , is then as follows:

$$A = \sum_{k=1}^K T_k Y_k \quad (15)$$

where  $Y_k$  is the aggregate income level in country  $k$ . The initial distributions of income in each country are exogenously given, and the individual budget constraints are as follows:

$$y_{ik} = c_{ik} + T_k y_{ik} \quad (16)$$

In each country, a majority vote is independently conducted to determine the amount of official aid. The equilibrium consists of the majority-supported tax rates for each donor country, which are mutually consistent with respect to each other. While countries occasionally try to coordinate the amount of giving—such as, for example, the recent attempts within the European Union to coordinate foreign aid among individual member countries—most aid-giving is carried out independently by the donors. Thus, the non-cooperative view of foreign aid policies seems to be an accurate description of the institutional reality.

Differentiation of (14) subject to (15) and (16) yields the individually preferred tax level in a donor country:

$$-y_{ik}^{1-\sigma}(1-T_k)^{-\sigma} + \alpha \left( \sum_{k=1}^K T_k Y_k \right)^{-\sigma} Y_k \leq 0 \quad (17)$$

and the second order condition holds. Specification (17) is strictly negative when the preferred tax rate is 0. Clearly, given the tax choices in other countries, the tax preference in country  $k$  is a monotonic function (increasing or decreasing, depending on the elasticity of substitution) of income. Let then  $T_{mk}(T_{-k})$  denote the preferred choice of country  $k$ 's median voter for any configuration of tax choices in other countries—the best reaction function—and consider the vector of taxes satisfying:

$$-y_{mk}^{1-\sigma}(1-T_{mk})^{-\sigma} + \alpha \left( \sum_{k=1}^K T_{mk} Y_k \right)^{-\sigma} Y_k \leq 0 \quad (18)$$

Because the tax rates belong to the unit interval, and given the concavity of the utility function, there exists a unique solution of (18). These tax rates are the preferred choices of the majority of each country's population given the tax rates in other countries, and hence constitute the equilibrium. It should also be clear that, because of the free-riding problem, this equilibrium can be improved upon from the perspective of all countries' majorities through universal marginal aid increases.<sup>7</sup> Moreover, the number of donor countries is detrimental to the amount of aid each country is willing to provide. A simple way to see that is by replicating the world economy, so that, say, we have  $K$  twin donor countries -  $2K$  altogether. From (17), this will reduce the preferred tax rate in each country, hence, at equilibrium.

In sum, we can formulate **Proposition 3**: Because of free-riding, the aid equilibrium with multiple donors generates too little aid from the point of view of the population majorities in the donor countries; these majorities could become better off by a marginal increase in aid by all countries. Moreover, donations by any giving country decline as the number of donors increases.

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<sup>7</sup> An especially stark interpretation of this result is obtained in the case of logarithmic preferences, since the equilibrium tax rates are then independent of country incomes: see (25) with  $\sigma=1$ . In this case, the equilibrium is Pareto inefficient from the donors' perspective, and, in particular, an improvement is obtained by a universal marginal increase in aid.

This proposition may explain why, among other things, donor countries have contributed relatively generous amounts of aid to former colonies, as has often been noted in the literature (Dudley and Montmarquette, 1976). While stronger emotional ties may constitute one important explanation, the specificity of the relationship and hence, the absence of additional potential donors, might be another factor. It also may explain the relative failure of mobilizing efforts for massive humanitarian aid, where many donors' altruistic interests potentially overlap.

The Appendix extends the above analysis to the multiple recipients case. It shows in particular that free riding is alleviated, and that the donation equilibrium is efficient when each recipient country gets aid from only one donor—as may be the case when the donor and its group of recipients are linked by specific historical or geographical ties.

## 6. An Extension: Tax Policy Effects

Tax regulations regarding the treatment of private aid donations vary across countries. In the United States, such donations are fully tax deductible, whereas in some other donor countries such as Sweden they are not deductible at all.<sup>8</sup> Consequently, it is of some importance to study the equilibrium effects of tax policies and to assess in their light the robustness of our modeling of the tax system. To this end, suppose that private aid is subsidized at the rate of  $s$ , and that the cost of the subsidy is offset through the tax system. One way of doing this is to interpret  $T$  as the general tax rate, a part of which, say  $q$ , is used to balance the subsidy, whereas the complementary part  $1-q$  is used to finance official aid. A balanced budget then implies that:

$$qTY = sZ \tag{19}$$

The effective amount of official aid is:

$$(1-q)TY \tag{20}$$

and individual budget constraints are now:

$$y_i = c_i + Ty_i + (1-s)z_i \tag{21}$$

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<sup>8</sup> See Roodman (2004) for a more detailed account of the treatment of foreign aid by the national tax codes. It follows from the description there that some kind of tax credit for aid donations is offered by most countries, the exceptions being Austria, Finland and Sweden.

Larger values of  $s$ , hence of  $q$ , will be interpreted as more generous tax deductions from private aid donations. We are interested in studying how the aggregate amount of aid responds to such policies. We will further simplify by considering logarithmic preferences,  $\sigma=1$ .<sup>9</sup>

Taking all policy parameters as given, consider the individual donation choices. These maximize the utilities (1') subject to the constraints (19)-(21). Calculations reveal that the corresponding equilibrium decisions are given by:

$$z_i = y_i(1-T) / [1-s + (1-s)/\beta], Z = Y(1-T) / [1-s + (1-s)/\beta] \quad (22)$$

In particular, the amount of private donations is an increasing function of tax deductions. The economy's budget constraint (19) implies that:

$$q = s(1-T)/[T(1-s + (1-s)/\beta)] \quad (23)$$

The aggregate amount of aid then is:

$$A = (1-q)TY + Z = (1-q)TY + qTY / s \quad (24)$$

where  $q$  is given by (123). Differentiation reveals then that for a given tax rate, the aggregate amount of aid remains unchanged under different tax policies.

These results lead to **Proposition 4**: The amount of aggregate aid is not affected by tax policies. This neutrality result is broadly consistent with the detailed calculations of net foreign aid flows in Roodman (2004), which detects only a marginal impact of tax incentives on aid donations.

## 7. Data

Empirically, the predictions of the model can be approached from two perspectives: individual attitudes with respect to foreign aid in donor countries, and actual aid disbursement. The data source for the former is the World Value Survey (WVS), a worldwide survey carried out by the Inter-University Consortium for Political and Social Research (ICPSR) that consists of individual cross-national data on a wide variety of topics such as the economy, politics, foreign policy and identity, and includes the socio-economic background of individual respondents and their attitudes on several topics. The data are derived from face-to-face interviews with people 15

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<sup>9</sup> Again, as long as  $\sigma$  is not too different from 1, the results go through.



years of age and older from more than 81 developed and developing countries. Though our empirical work focuses on donor countries only,<sup>10</sup> our interview sample nonetheless consists of more than 10,000 individuals who were surveyed in two waves: during 1995-1997 and during 1999-2000.<sup>11</sup>

Our particular interest focuses on questions regarding people's opinion of foreign aid and its management by the government. Specifically, the key dependent variable comes from the following question: "Some people favor, and others are against, having this country provide economic aid to poorer countries. Do you think that this country should provide more or less economic aid to poorer countries?" Based on the analytical model above, the explanatory variables considered include the income decile, income inequality, government efficiency as reflected by the degree of corruption, government performance and several others mentioned below. Table 1 shows the definitions and questions of the variables employed. All the regressions include country fixed effects as well as standard errors adjusted for clustering on country.<sup>12</sup> Table 2 provides basic summary statistics of all the variables employed.

The second data set employed in this paper is from the Organisation for Economic Co-operation and Development (2006) and consists of foreign aid data provided by official agencies (including state and local governments) or their executing agencies. In particular, we use the series entitled Official Development Assistance (ODA), which is based on the standard definition of aid according to the Development Assistance Committee of the OECD. It takes into account grants and concessional loans net repayment of previous aid loans and treats forgiveness of past loans as current aid. In general, it is considered a reasonable measure of actual transfer to liquidity-constrained governments. For this variable we have annual data for 22 donor countries

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<sup>10</sup> We replicated all our empirical tests using the full sample and including a donor country dummy. The results are very similar. These findings can be provided upon request.

<sup>11</sup> The sample design and field work were carried out by professional survey organizations, typically members of Gallup, but also by national academies of sciences or university-based institutes. Each sample has a multi-stage design and random selection of sampling points after stratification by region and degree of urbanization. National samples were used in all countries, but some of them were country sub-samples (Russia, Northern Ireland, Chile, Puerto Rico, Argentina, India, Nigeria and China). The response rates display great variability, going from 25 percent in Spain to 95 percent in Slovakia. To correct for the sample design and the response rate, sample weights were constructed with specific criteria for each country. We use the most recent wave of this survey—the fourth wave—taken between 1999 and 2000, although we are able to enlarge our sample by appending to our data set the third wave of the same survey (1995-1997) for the countries that were not included in the fourth wave.

<sup>12</sup> When using country-level variables the application of fixed effects is obviously unnecessary. Also, it is important to note that fixed-effects estimates of ordered probits may lead to inconsistent estimates. However, as explained by Mayda (2005), this is not an issue with the World Values Surveys data, since they cover many individuals for each country.

for the period 1973-2002.<sup>13</sup> All the measures of foreign aid used are in 1995 U.S. dollars. In particular, we assemble a bilateral relation-level data set, which consists of about 8,000 observations that provide an account of any bilateral foreign aid relationship between the 22 industrial donor countries and other countries in the rest of the world.<sup>14</sup> The definitions of the variables employed in this second data set are also shown in Table 1, and summary statistics are provided in the lower panel of Table 2.

## 8. Hypotheses and Results

The analytical framework generates several main predictions. For one, it predicts that an individual's income has a positive effect on his/her willingness to enhance foreign aid; therefore, a derived result is that income inequality reduces public demand for aid. Also, an increase in government-sponsored aid results in an overall larger amount of aid. Additionally, the model generates a negative relationship between the own government's corruption and the willingness to disburse aid, while not discerning a negative aid effect of the recipient government's inefficiency. Finally, free-riding incentives imply that with multiple donors, the amount of aid by an individual donor country is reduced.

Our econometric results are designed to test these propositions and are presented in Tables 3 and 4 for the individual-level data and in Tables 5 and 6 for the country-level data.

### 8.1. Individual-Level Attitudes Data

While our dependent variable has five categories, we first use a very simple approach by re-categorizing this variable as a binary variable that responds to the statement: "*agree with more aid?*" This proxy is constructed by assigning a value of 1 to the responses of those who say that their country should give either *a lot more* or *somewhat more* aid to poorer countries, and a value of 0 otherwise.<sup>15</sup> This allows a straightforward interpretation of the coefficients for the probit estimates (Mayda, 2005). As can be seen from Table 3, we find that consistent with the

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<sup>13</sup> Another aid indicator is effective development assistance (Chang et. al., 1998). This measure includes the grant element of aid and excludes the loan component of concessional loans, which are made at extremely low interest rates. The correlation between official development assistance and effective development assistance is extremely high, about 0.94. A third concept of aid is based on country commitments, which reflect firm obligation, expressed in writing and backed by the necessary funds, undertaken by an official donor to provide specified assistance to a recipient country or a multilateral organization. Commitments are provided by OECD (2006).

<sup>14</sup> The donor countries are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and the United States.

<sup>15</sup> The response "do not know" is included here. Exclusion of this category does not affect the results.

predictions in Proposition 1, agreement with foreign aid is an increasing function of the income level proxied by individual income deciles. When including this variable, we obtain positive and highly significant coefficients: moving from one income decile to the next increases the probability of agreeing with the provision of more foreign aid between 0.8 percent and 1.9 percent. Furthermore, a positive attitude toward aid is negatively linked with income inequality: a 1 percent increase in income inequality decreases the probability of agreeing with giving more aid by 2.5 percent.

Own-government inefficiencies have a bearing on people's attitude toward development aid, consistent with Proposition 2. In all specifications shown in Table 3, we include a donor country's corruption measure generated by the International Country Risk Guide (ICRG). This variable yields a positive sign and is significant at 1 percent. (The higher the number, the lower the degree of corruption and thus, the better the institutions in the country.) A one-point increase in the ICRG index increases the probability of agreeing giving more aid by around 7 to 10 percent, depending on the specification chosen.<sup>16</sup> Given the importance of this issue from the policy perspective, we further explore government efficiency issues by adding relevant individual opinion controls. In particular, we include the variables "*satisfaction with people in office*" and "*confidence in the government*," in both cases obtaining positive and statistically significant coefficients.

Table 3 also includes tax revenues, treating this variable as a proxy for government's involvement in aid. The reason for using this imperfect variable is that the data pertaining to the decomposition of aid into official and private sources are very limited.<sup>17</sup> The inclusion of this variable yields a positive and statistically significant coefficient in all the specifications. Moreover, from the marginal coefficients, we can state that a one-percentage-point increase in the tax revenues to gross domestic product increases the probability of providing foreign aid by 9 percent. Additionally, in order to capture basic macroeconomic conditions we also include the rate of the growth in the economy between 1990 and 1995. This variable is also significant and positive in all our specifications. Furthermore, we follow some recent work that uses World

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<sup>16</sup> For the sake of robustness, we also run regressions using the "corruption control index" (Kaufmann, Kraay and Mastruzzi, 2005) instead of the ICRG index and obtain very similar results. The advantage of the ICRG variable is that it is available for a relatively long time series, which allow us to use it in our panel specifications and make our results comparable. This is not the case with the other data.

<sup>17</sup> We ran panel cross-country regressions with whatever limited data we have been able to collect (World Bank, 2005b), with the qualitative results being similar to the ones reported here.

Value Surveys data and include a specification that considers some basic individual characteristics (Mayda and Rodrik, 2005; Mayda, 2005). We find that more educated people are more prone to agree with an increase in foreign aid, whereas age and gender differences are not very statistically significant.

Since the original question from which we created our aid agreement dummy has five categories, we also run corresponding ordered probits.<sup>18</sup> Table 4 shows the coefficients for the same regressions run in Table 3. Table 4B shows the marginal coefficients after running the model with the most complete specification (see the last column in Table 3).<sup>19</sup> The results reinforce what we have been stating so far. Notice that, given the fact that we are estimating an ordered probit, the signs of the changes in  $Pr(Y_i=1)$  and  $Pr(Y_i=5)$  are unambiguous. For instance, under the assumption that the coefficients of the regression are positive, the model predicts that  $Pr(Y_i=1)$  must decline and  $Pr(Y_i=5)$  must increase. Similarly, when the coefficients of the regression are negative, the probability of the first category is expected to increase while that of the fifth category is expected to decline.<sup>20</sup>

Perhaps the most striking finding about our estimates in Table 4B is the consistency of the signs and the statistical significance of most of the regressors along the categories. For instance, as expected, the coefficients of income deciles are negative and statistically significant for the categories that agree with giving less aid. Also as expected, the categories agreeing with more aid are positive and statistically significant. In other words, richer individuals have a higher probability of agreeing with giving more aid to poorer countries. On the other hand, the marginal effects in the case of income inequality follow the exact opposite pattern, being negative for the first two categories and positive for the latter two, which is consistent with the results shown in Table 3 and, more importantly, with the predictions of Proposition 1 in the model.

In the ordered probit regressions in Tables 4A and 4B, we obtain a positive and significant coefficient for the ICRG index, meaning that more risky environments in terms of government management promote less support for increasing foreign aid. Also, public satisfaction with people in the office and trust in the government also increase the probability of

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<sup>18</sup> A technical appendix available upon request provides further details of this analysis.

<sup>19</sup> All the specifications ran show results similar to those found in Tables 5 and 6. To save space, we do not show all the marginal coefficient of the ordered probit, but they are available upon request.

<sup>20</sup> In this context, the marginal effects are interpreted as the partial derivatives of the probability with respect to an exogenous variable when the variable is not a dummy. On the other hand, when the variable is discrete, we analyze the marginal effect on the whole distribution by computing  $Pr(Y_i=j)$  over the range of  $\beta'x$  with the two extreme values of the binary variable. The marginal effect is equal to the difference in these values.

agreeing with an increase in foreign aid. Similarly, an increase in the tax revenues yields a higher approval for increases in development aid.

## ***8.2. Actual Foreign Aid Disbursements***

Our results with respect to attitudes toward aid are complemented with actual foreign aid disbursement at the country level. As described above, we employ an annual unbalanced panel of bilateral relationships for the period 1973-2002. We run a fixed-effects model at the bilateral relationship level, controlling for year dummies of the amount of each project in real 1995 thousands of U.S. dollars against our variables of interest, and the findings are shown in Table 5. According to Proposition 1, we should expect a positive sign on gross domestic product and a negative sign on the income inequality of the donor country, which is precisely what we obtain. Both variables yield coefficient signs that are statistically significant at 1 percent regardless of the specification employed. Richer and more egalitarian countries are more likely to provide higher amounts of aid than poorer and more unequal societies.<sup>21</sup>

To test for the effects of government inefficiencies, we include the corruption index for the recipient as well as for the donor country in the fourth column in Table 5. Here we obtain a positive and statistically significant coefficient for the latter and a non-statistically significant one for the former. This means that the amount of aid is significantly and negatively affected by corruption in the donor country, but is not affected at all by the inefficiencies in the recipient country.<sup>22</sup> Analogous to the findings based on attitudes, tax revenues have a positive and highly statistically significant coefficient in all specifications. We also test the effects of multiple donors on an individual country's aid giving. In the third column of Table 5, we control for the number of donors that each recipient country has in each year for the period under consideration. Remarkably, we obtain a negative and statistically significant coefficient, which reinforces the idea of free riding in foreign aid donations: as the number of donors increases, the total amount of aid given by each country tends to decrease.<sup>23</sup>

Finally, we also employ dynamic panel data techniques (Arellano and Bover, 1995) to minimize possible endogeneity problems. By using this method, we estimate a regression

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<sup>21</sup> An interesting and somewhat puzzling result is the independence found between the recipient's level of inequality and the amount of foreign aid. One may have expected to see larger amounts of foreign aid flowing to more unequal countries, but when we include the recipient's Gini coefficient, as shown in the third column and eight column in Table 5, we find no statistical significance at conventional levels.

<sup>22</sup> These results are consistent with previous findings by Alesina and Weder (2002).

<sup>23</sup> See also Knack and Rahman (2004) for similar results.

equation in differences and a regression equation in levels simultaneously, with each equation using its own specific set of instrumental variables. The consistency of the GMM estimator depends on whether lagged values of the explanatory variables are valid instruments in the regression. We address this issue by considering two specification tests.<sup>24</sup> The findings, presented in Table 6, reinforce the previous results; in fact, there are no substantial differences between these results and the ones presented in Table 5.

## 9. Conclusions

Recently industrial countries have been hard pressed to re-consider their foreign aid policies by focusing on good policies and good institutions in the recipient countries. While some influential research has studied the efficiency of aid disbursement in this regard, no attention has focused on the possible determinants of aid-giving in donor countries despite policymakers' commonplace rhetoric on enhancing aid. Given the relatively small amounts of foreign aid flows, it is important to understand their determinants. This paper examines the factors affecting the support for foreign aid among voters in donor countries.

The theoretical model, which considers an endogenous determination of official and private aid flows, suggests that own government efficiency is an important factor in this regard, and also relates individual income to aid support through the elasticity of substitution, which implies that income inequality is detrimental to political support for foreign aid. An empirical analysis of individual attitudes, based on the World Values Surveys, reveals that satisfaction with one's own government performance and individual income are positively related to a willingness to provide foreign aid. Consistent with these results, we find when using donor country data that aid is linked to inequality, corruption and taxes in giving countries, but has little connection to the economic conditions in the receiving country, particularly income inequality and corruption. It is noteworthy—and runs counter to perceived wisdom—that aid generosity is affected mainly by own government efficiency and much less by the efficiency of the recipient country's government. Interestingly, we also find that the reticence of countries in providing more aid to poor countries has an economic bearing, since countries free ride on the donations of others.

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<sup>24</sup> A technical appendix contains further explanatory details and is available on request.

**Table 1. Variable Description**

A. Cross-Country Individual-Level World Value Surveys Data

Do you think that this country should provide more or less economic aid to poorer countries?	Some people favor, and others are against, having this country provide economic aid to poorer countries. Do you think that this country should provide more or less economic aid to poorer countries? 1—A lot less than we do now; 2—Somewhat less than we do now; 3—About the right amount/same; 4—Somewhat more than we do now; 5—A lot more than we do now. Source: World Value Surveys (2006).
Agree with your country giving more aid to poorer countries	Variable that takes the value of 1 when people think their country should give “a lot more then now” or “somewhat more then they do now” with respect to development assistance; and 0 otherwise (including those who responded “don't know”). Source: World Value Surveys (2006).
Income deciles	A scale of household income before taxes and other deductions. This variable takes values from 0 to 10, with 0 being the lowest decile and 10 the highest. The data are recollected in local currency, scaled and then aggregated so the deciles represent a country level income raking. Source: World Value Surveys (2006).
Satisfaction with people in office	How satisfied are you with the way the people now in national office are handling the country's affairs? Would you say you are 1—Very dissatisfied? 2—Fairly dissatisfied? 3—Fairly satisfied? 4—Very satisfied? Source: World Value Surveys (2006).
Confidence in the government	Could you tell me how much confidence you have in the government? 1—None at all. 2—Not very much. 3—Quite a lot. 4—A great deal. Source: World Value Surveys (2006).
Corruption	Average corruption index from ICRG for 1990-1995. (Range 0 - 6; 6 = less risk) 1982 – 1998. Source: ICRG (2006).
Growth	Average rate of growth of per-capita gross domestic product for the period 1990-1995. Source: World Development Indicators (World Bank, 2005).
Gini coefficient	Average Gini coefficient 1991-1995. Source: World Development Indicators (World Bank, 2005).
Tax revenue	Average tax revenue as a percentage of gross domestic product for 1990-1995. Source: World Development Indicators (World Bank, 2005).
Age	Respondent's age. Source: World Value Surveys (2006).
Gender	Gender of the respondent. Male = 1. Source: World Value Surveys (2006).
Educational attainment	What is the highest educational level that you have attained? 1—Incomplete primary; 2—Complete primary; 3—Incomplete secondary; 4—Complete secondary; 5—University without degree; 6—university with degree. Source: World Value Surveys (2006).

## B. Panel Regressions Using Country-Level Foreign Aid Data

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Foreign Aid	Defined as Overseas Development Assistance by OECD. In particular, we use the log of the amount donated from country j to country i in year t, expressed in thousands of PPP real 1995 U.S. dollars. The data is available annually for the period 1973-2002. Source: OECD (2006)
Real GDP, donor country	Real GDP Per Capita donor economy expressed in thousands of real 1995 U.S. dollars. The data is available annually for the period 1973-2002. Source: World Development Indicators (World Bank, 2005).
Gini coefficient., donor country	Gini coefficient of the donor economy. The data is available for the period 1973-2002. Source: World Development Indicators (World Bank, 2005).
Gini coefficient, recipient country	Gini coefficient of the recipient economy. The data is available for the period 1973-2002. Source: World Development Indicators (World Bank, 2005).
Tax revenues, donor country	Tax revenue as a percentage of gross domestic product for donor country for the period 1973-2002. Source: World Development Indicators (World Bank, 2005).
Corruption, donor country	Corruption index of the donor country. (Range 0 - 6; 6 = less risk), the data is available for the period 1982 – 2002. Source: ICRG (2006).
Corruption, recipient country	Corruption index of the recipient country. (Range 0 - 6; 6 = less risk), the data is available for the period 1982 – 2002. Source: ICRG (2006).
Number of donors	Number of donor countries from which each recipient country received donations in year t. Source: OECD (2006).

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**Table 2. Summary Statistics****A. Cross-Country Individual-Level World Value Surveys Data**

Variable	Obs	Mean	Std. Dev.	Min	Max
This country should provide more or less economic aid to poorer countries?	10370	3.34	1.21	1.00	5.00
Agree with more aid	11070	0.58	0.49	0.00	1.00
Income decile	8823	5.30	2.70	1.00	10.00
Gini coefficient	11070	0.34	0.05	0.26	0.41
Rate of growth	11070	0.07	0.05	0.00	0.18
Corruption	11070	5.41	0.59	4.40	6.00
Tax revenues	11070	0.24	0.06	0.17	0.32
Satisfaction with people in office	10667	2.37	0.78	1.00	4.00
Confidence in the government	9739	2.25	0.79	1.00	4.00
Age	11048	44.81	17.05	15.00	97.00
Gender (Male =1)	11067	0.46	0.50	0.00	1.00
Educational attainment	10926	3.89	1.35	1.00	6.00

**B. Panel Country-Level Foreign Aid Data**

Foreign Aid	8001	14.15	1.15	9.83	16.52
Real GDP, donor country	8001	25289.79	6147.52	10398.93	44426.11
Gini coefficient donor country	8001	31.01	5.48	19.60	49.59
Gini coefficient, recipient country	2262	44.27	9.77	19.30	74.61
Tax revenues, donor country	7931	28.75	9.05	11.19	44.21
Corruption, donor country	8001	5.47	0.78	3.00	6.00
Corruption, recipient country	8001	2.77	1.14	0.00	6.00
Number of donors	8001	10.67	3.59	1.00	18.00

**Table 3. Cross-Country Probits: Marginal Effects**

	Agree with your country giving more aid to poorer countries			
Income decile	0.019 (0.002)***	0.019 (0.002)***	0.017 (0.003)***	0.008 (0.002)***
Gini coefficient	-2.518 (0.656)***	-2.556 (0.425)***	-2.580 (0.281)***	-2.868 (0.343)***
Rate of growth	6.557 (1.193)***	6.402 (0.802)***	7.387 (0.578)***	7.709 (0.665)***
Corruption	0.106 (0.052)**	0.075 (0.032)**	0.087 (0.016)***	0.076 (0.014)***
Tax revenues		0.939 (0.260)***	0.759 (0.074)***	0.967 (0.076)***
Satisfaction with people in office			0.066 (0.013)***	0.067 (0.013)***
Confidence in the government			0.060 (0.016)***	0.062 (0.012)***
Age				-0.002 (0.001)*
Gender (Male=1)				0.010 (0.013)
Educational attainment				0.041 (0.012)***
Pseudo R2	0.07	0.08	0.09	0.10
Log pseudo likelihood	-5671.34	-5631.47	-4607.15	-4483.22
Observations	8883	8883	7471	7361

The dependent variable takes the value of 1 when people think that their country should give “a lot more than now” or “somewhat more than they do now” with respect to development assistance; and 0 otherwise (including those who responded “don’t know”). Robust standard errors are in parentheses. Standard errors are adjusted for clustering on country. \* Significant at 10 percent; \*\* significant at 5 percent; \*\*\* significant at 1 percent. Because of data limitations in the WVS surveys, the number of observations drops when including the variables “satisfaction with people in office” and “confidence in the government.”

**Table 4A. Cross-Country Ordered Probits**

	Do you think that this country should provide more or less economic aid to poorer countries?			
Income decile	0.039 (0.005)***	0.037 (0.006)***	0.035 (0.006)***	0.015 (0.006)**
Gini coefficient	-4.493 (2.089)**	-4.760 (0.517)***	-5.586 (0.349)***	-6.415 (0.522)***
Rate of growth	9.036 (3.403)***	8.795 (1.700)***	13.715 (0.615)***	14.625 (0.872)***
Corruption	0.103 (0.142)	-0.001 (0.058)	0.072 (0.013)***	0.046 (0.012)***
Tax revenues		3.128 (0.729)***	1.842 (0.107)***	2.403 (0.157)***
Satisfaction with people in office			0.123 (0.035)***	0.125 (0.033)***
Confidence in the government			0.164 (0.033)***	0.166 (0.024)***
Age				-0.003 (0.002)*
Gender (Male =1)				-0.042 (0.036)
Educational attainment				0.114 (0.038)***
Observations	8297	8297	7061	6958

Robust standard errors are in parentheses. Standard errors are adjusted for clustering on country. \*

Significant at 10 percent; \*\* significant at 5 percent; \*\*\* significant at 1 percent. Because of data limitations in the WVS surveys, the number of observations drops when including the variables “satisfaction with people in office” and “confidence in the government.”

**Table 4B. Cross-Country Ordered Probits: Marginal Effects**

	Do you think that this country should provide more or less economic aid to poorer countries?							
	A lot less		Somewhat less		About the right amount		Somewhat more	A lot more
Income decile	-0.002 (0.001)	**	-0.004 (0.001)	**	0.000 (0.000)		0.003 (0.001)	0.003 (0.001)
Gini coefficient	0.873 10)	***	1.537 (0.128)	***	0.003 (0.003)		-1.223 (0.15)	-1.191 (0.051)
Rate of growth	-1.990 (0.21)	***	-3.504 (0.268)	***	-0.008 (0.007)		2.788 (0.284)	2.714 (0.108)
Corruption	-0.006 (0.001)	***	-0.011 (0.003)	***	0.000 (0.000)		0.009 (0.003)	0.009 (0.002)
Tax revenues	-0.327 (0.032)	***	-0.576 (0.057)	***	-0.001 (0.001)		0.458 (0.042)	0.446 (0.038)
Satisfaction with people in office	-0.017 (0.004)	***	-0.030 (0.009)	***	0.000 (0.000)		0.024 (0.006)	0.023 (0.007)
Confidence in the government	-0.023 (0.004)	***	-0.040 (0.006)	***	0.000 (0.000)		0.032 (0.004)	0.031 (0.006)
Age	0.000 (0.000)	**	0.001 (0.000)		0.000 (0.000)		-0.001 (0.000)	-0.001 (0.000)
Gender (Male = 1)	-0.006 (0.005)		-0.010 (0.008)		0.000 (0.000)		0.008 (0.007)	0.008 (0.006)
Educational attainment	-0.016 (0.006)	**	-0.027 (0.008)	***	0.000 (0.000)		0.022 (0.007)	0.021 (0.007)
Observations	577		1,866		440		3,251	824

Robust standard errors are in parentheses. Standard errors are adjusted for clustering on country. \* Significant at 10 percent; \*\* significant at 5 percent; \*\*\* significant at 1 percent.

**Table 5. Panel Regressions Using Foreign Aid Bilateral Data**

	Foreign Aid					
Real GDP, donor country	0.0001 (0.0000)***	0.0001 (0.0000)***	0.0001 (0.0000)***	0.0001 (0.0000)***	0.0001 (0.0000)***	0.0001 (0.0000)***
Gini coefficient., donor country	-0.0099 (0.0020)***	-0.0085 (0.0011)***	-0.0073 (0.0011)***	-0.0085 (0.0011)***	-0.0073 (0.0011)***	-0.0074 (0.0024)***
Gini coefficient., recipient country	-0.0003 (0.0015)					0.0003 (0.0022)
Corruption, donor country		0.0757 (0.0155)***	0.0814 (0.0173)***	0.0757 (0.0154)***	0.0814 (0.0173)***	0.0966 (0.0292)***
Corruption, recipient country		0.0081 (0.0075)	0.0091 (0.0076)	0.0093 (0.0074)	0.0091 (0.0076)	0.0352 (0.0170)*
Tax revenues, donor country			0.0212 (0.0023)***		0.0212 (0.0023)***	0.0169 (0.0054)***
Number of donor countries			-0.0123 (0.0026)***	-0.0126 (0.0026)***	-0.0123 (0.0026)***	-0.0124 (0.0062)**
Constant	12.7447 (0.1520)***	11.6664 (0.1050)***	11.2238 (0.1343)***	11.7720 (0.1079)***	11.2238 (0.1343)***	9.9077 (0.3340)***
Observations	3329	8001	7931	8001	7931	2235
Number of panelid	1066	1370	1366	1370	1366	805
R-squared	0.35	0.31	0.32	0.31	0.32	0.35
F test	10442.97	183.64	151.95	175.76	151.95	30.60
Rho	0.93	0.95	0.95	0.95	0.95	0.95

Foreign aid data are from OECD (2006). Robust standard errors are in parentheses. Standard errors are adjusted for clustering on country.

\* Significant at 10 percent; \*\* significant at 5 percent; \*\*\* significant at 1 percent. Because of data limitations, the number of observations drops drastically when including the Gini coefficient of the recipient country.

**Table 6. Dynamic Panel Data Regressions Using Foreign Aid Bilateral Data**

	Foreign Aid				
Real GDP, donor country	0.0000 (0.0000)	0.0001 (0.0000)***	0.0000 (0.0000)	0.0001 (0.0000)***	0.0002 (0.0000)***
Gini coefficient., donor country	-0.0124 (0.0043)***	-0.0128 (0.0018)***	-0.0082 (0.0038)**	-0.0129 (0.0018)***	-0.0171 (0.0049)***
Gini coefficient., recipient country					-0.0029 (0.0034)
Corruption, donor country	0.6426 (0.1518)***	0.2864 (0.0707)***	0.5893 (0.1567)***	0.2824 (0.0715)***	0.3799 (0.1696)**
Corruption, recipient country	-0.2964 (0.0707)***	-0.0032 (0.0307)	-0.2737 (0.0608)***	-0.0077 (0.0319)	-0.0136 (0.0256)
Tax revenues, donor country		0.0029 (0.0006)***		0.0028 (0.0006)***	0.0020 (0.0005)**
Number of donor countries			-0.0511 (0.0169)***	-0.0311 (0.0080)***	-0.0015 (0.0112)*
Constant	2.1170 (0.6279)***	1.1661 (0.2063)***	1.9532 (0.7185)***	1.6588 (0.2772)***	2.4369 (0.4880)***
Observations	3560	3560	3560	3560	1053
Number of panelid	665	665	665	665	400
Hansen test of overidentification restrictions	427.73	651.10	402.10	622.58	302.50
Prob > chi2	0.00	0.76	0.00	0.93	1.00
Test for AR(1)	-7.38	-9.58	-7.43	-9.77	-3.90
Test for AR(2)	-1.56	0.21	0.04	0.63	-0.64

Foreign aid data are from OECD (2006). Robust standard errors are in parentheses. Standard errors are adjusted for clustering on country.

\* significant at 10 percent; \*\* significant at 5 percent; \*\*\* significant at 1 percent. Because of data limitations, the number of observations drops drastically when including the Gini coefficient of the recipient country.

## Appendix—Model Extension: Multiple Donors and Multiple Recipients

Suppose now that there is more than one recipient country, say,  $r = 1, \dots, R$ , and that the donors derive utility from the destination of aid, not only from its total amount. Let  $A_{kr}$  denote the amount of aid flows from donor country  $k$  to a recipient country  $r$ , and  $T_{kr}$  the tax rate used to finance such aid flows, so that  $A_{kr} = T_{kr} Y_k$ . The aggregate amount of aid received by country  $r$  is then:

$$A_r = \sum_{k=1}^K A_{kr} = \sum_{j=1}^K T_{jr} Y_j \quad (\text{A1})$$

The budget constraint facing an individual in a donor country is:

$$y_{ik} = c_{ik} + \sum_{m=1}^R T_{km} y_{ik} \quad (\text{A2})$$

To make the analysis of this essentially multidimensional aid allocation problem tractable, we assume logarithmic preferences whose structure is somewhat generalized to allow for different altruism configurations across the donors, which after substituting (A1) and (A2) can be written as follows:

$$\log(c_{ik}) + \sum_{m=1}^R \alpha_{km} \log(A_m) = \log[y_{ik}(1 - \sum_{m=1}^R T_{km})] + \sum_{m=1}^R \alpha_{km} \log(\sum_{j=1}^K T_{jm} Y_j) \quad (\text{A3})$$

where we normalize so that  $\sum_{m=1}^R \alpha_{km} = 1$ .

Country  $k$  chooses the vector of aid flows to the recipients, or alternatively, it chooses the vector of tax rates  $T_k = (T_{k1}, \dots, T_{kR})$ , and the equilibrium consists of such mutually consistent decisions  $(T_1, \dots, T_K)$ . The logarithmic specification implies that individual citizen preferences are independent of incomes and, in particular, the first order conditions are:

$$-1 / (1 - \sum_{m=1}^R T_{km}) + Y_k \alpha_{kr} / \sum_{j=1}^K T_{jr} Y_j \leq 0, \quad r = 1, \dots, R; \quad k = 1, \dots, K \quad (\text{A4})$$

The second order conditions are satisfied implying equilibrium existence. Consider a recipient country  $r$  and suppose that, at equilibrium, receives aid from at least two sources, say countries  $k$  and  $\kappa$  for which (A4) holds with an equality:

$$-1 / (1 - \sum_{m=1}^R T_{km}) + Y_k \alpha_{kr} / \sum_{j=1}^K T_{jr} Y_j = 0 \quad (\text{A5a})$$

$$-1 / (1 - \sum_{m=1}^R T_{\kappa m}) + Y_{\kappa} \alpha_{\kappa r} / \sum_{j=1}^K T_{jr} Y_j = 0 \quad (\text{A5b})$$

In this case, arguments similar to those used in the main text make clear that, because of free riding, the equilibrium amount of aid received by country  $r$  is inefficiently low. In contrast, suppose that any recipient  $r$  receives aid from only one donor, say  $k$ :

$$-1 / (1 - \sum_{m=1}^R T_{km}) + \alpha_{kr} / T_{kr} = 0 \quad (\text{A6a})$$

$$-1 / (1 - \sum_{m=1}^R T_{\kappa m}) + Y_{\kappa} \alpha_{\kappa r} / T_{kr} Y_k < 0, \quad \kappa \neq k \quad (\text{A6b})$$

Then any reallocation of aid will make at least one donor worse off implying that the equilibrium is efficient. This situation is more likely to arise when the donors differ in terms of their national income or have different degrees of altruism with regard to the recipients. If, for example, each donor country has altruistic preference, hence donates to a different group of recipients—because because of a specific relationship such as colonial history or geographic neighborhood—the equilibrium is more likely to be efficient.



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