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*Aid and Corruption: Do Donors Use Development
Assistance to Provide the “Right” Incentives?*

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Abstract

In this paper, we focus on the determinants of the relationship between aid and corruption. We propose a static principal-agent model where a donor faces the problem of giving aid to a recipient country in which the phenomenon of corruption is widely spread. We distinguish among two different types of corruption: one, that we call *endemic*, that depends on the political and institutional environment of the recipient; the other, that we call *aid related*, is the consequence of moral hazard arising from the ability of corrupt bureaucracies to divert resources from their intended use. Through the design of appropriate contracts, donors can act only on the second type of corruption, contributing to reduce the entity of the phenomenon.

We use the restrictions implied by our theoretical framework to test a model of aid allocation. For the majority of the donors (Germany, Italy, the Netherlands, Norway, Spain and the UK), we find some indication that efficiency considerations are taken into account in allocating aid. For some of them (Germany, Italy and the Netherlands), however, strategic/economic considerations are important, while the UK is also motivated by purely altruistic concerns. According to our model, Denmark and Japan are mainly driven by recipient needs, while the USA, and to a lesser extent France, allocate aid mainly on the basis of strategic/economic interests.

JEL Classification: F35, D82

Key words: Aid Allocation, Corruption, Moral Hazard.

1 Introduction

Corruption is a very serious problem, particularly widespread in developing countries¹. It aggravates poverty by having a significant and detrimental impact on the lives of the poor; it reduces their net income and wrecks the programs related to their basic needs. In societies where corruption and clientelism are pervasive, competition is severely distorted and in the long run, corruption not only affects the distribution of resources, but also the process of economic growth, encouraging people to apply their skills and energies in non productive ways². Last but not least, the phenomenon of corruption is also capable of frustrating the efforts of aid agencies in their fight against poverty and underdevelopment.

There is today an increased awareness of the development community³, in both donor and recipient countries that, without countering corruption, aid is in danger of not achieving its goals failing to reach the poor or just reaching them partially. Regardless of the general agreement on the relevance of this issue, and despite the many declarations of intent, do actually donors take the problem of corruption into account in their development policies?

Anecdotal evidence⁴ suggests that corruption is capable of reducing aid effectiveness both directly, by diverting a percentage of aid from intended purposes or indirectly, by promoting inappropriate uses of aid. Rigorous studies on this issue, however, are relatively few. To our knowledge, the only paper that provides a comprehensive empirical assessment of whether donors consider the level of corruption in allocating aid to developing countries is the one by Alesina and Weder (2002). These authors show that, for most donors, corruption is not a significant explanatory variable in bilateral aid allocation. Only for Australia and Sweden they find evidence that low corruption is rewarded with higher levels of aid, while the US seem to give more aid to more corrupt countries. Consistently with the aid allocation literature, which stresses the important role of strategic/economic interests⁵, Alesina and Weder conclude that there is no evidence that less corrupt governments receive more foreign aid.

The purpose of this paper is twofold. First, we provide new evidence that in many cases corruption is not relevant for aid allocation decisions and in some other cases there is even a positive relationship between aid and corruption. Second, and more importantly, we ask *why* corrupt governments do not receive less foreign aid. In other words, we study the possible motives that lie behind this behavior. In order to do this, we explicitly identify three possible motives for giving aid: the *purely altruistic* motive, the *strategic/economic* motive and the *efficiency* motive.

¹According to the Corruption Perception Index (2006) almost three-quarters of the countries (including all low-income countries and all but two African states) score below five and seventy one countries (nearly half) score below three.

²See for example Mauro, (1995).

³The global consensus on this objective is reflected by the ratification of the UN Convention against Corruption (UNCAC). The need to fight corruption is also an important part of the Millennium Development Goals and of the global Poverty Reduction Strategy Paper (PRSP) process of the World Bank and the IMF.

⁴For some interesting examples on the issue of aid and corruption in Africa, see Cooksey (2003).

⁵See for example Alesina and Dollar, (2000); McGillivray, (2003), (2004).

The first two motives are not a novelty in the aid allocation literature which, traditionally, has concentrated on the dichotomy between strategic/economic interest and recipient needs. The third motive intends to capture the idea that donors may also decide to allocate aid favoring the project with the highest probability of success. This is different from the purely altruistic motive because imposing incentives, when there is risk of waste and mismanagement, may actually cause a reduction in aid and even aid rationing.

In order to clarify this issue and derive some useful restrictions that can be applied in the estimation process, we propose a static principal-agent model. A crucial assumption is that corruption and rent seeking in developing countries can be classified into two broad categories. The first type of corruption, that we call *endemic*, represents the structural feature of the country and is modeled as an exogenous bias in the distribution of income. The second one, that we define as *aid related*, is represented by the private benefit that the elite of the recipient country can capture during the implementation of aid projects, on which donors feel they can exercise some influence.

These two definitions reflect the complex nature of corruption which is linked to the inner structure and to the history of a country. Turning from a tribal society into an advanced democracy is a painful and long process that depends on the internal evolution of social and economic relationships. In some respects, the ability of local elites to obtain, through corruption and rent seeking, a larger part of the resources of the society can be viewed as a “structural” distortion in the distribution of income. Donors that are interested in promoting economic development and helping the poor, often feel that they can hardly attack, from the outside, these type of problems. Having little leverage on the political process, donors know that, to some extent, they must accept the existence of corruption in order to operate inside the country and achieve their objectives. This is what we define, in this paper, as *endemic* or *structural* corruption.

On the other side, corruption is also a problem that is encountered by donors in the actual implementation of development projects, often plagued by information and incentive issues. Projects must be realized in difficult environments that require the cooperation of local elites, which are extremely difficult to monitor. Corruption and rent seeking, therefore, can be viewed also as the result of moral hazard, arising from the ability of corrupt bureaucracies to divert resources from their intended use. In this type of context, donors can actually intervene through an appropriate contract design. In other words, an optimizing donor can propose aid contracts that take into account agency problems, adapting aid allocation decisions to the “environment” in which development assistance operates. This is what we mean by *aid related* corruption.

The model allows for three possible equilibria. In the first one, the donor does not perceive the existence of a significant moral hazard problem, and therefore, it will grant aid according to standard altruistic or economic/strategic motives. In the second equilibrium, the donor tries to influence the behavior of the elite of the recipient country by offering an incentive compatible contract. In the third equilibrium, the moral hazard problem is so serious that the optimal behavior of the donor requires a no aid policy. These three equilibria imply two different types of decisions: one is the decision whether to give aid or not (first and second equilibria vs. the third) and the other is the decision

concerning the amount of aid (first equilibrium vs. the second).

Empirically, the first type of decision can be analyzed by estimating a model where the dependent variable is dichotomous (aid eligibility equation). The second decision can be instead studied by estimating an equation where the dependent variable is the level of aid (aid levels equation).

In order to compare our results with the existing literature, we start our empirical analysis by providing some Tobit estimates. These regressions confirm only partially the Alesina and Weder (2002) results on the relationship between aid and corruption, since we find a larger number of donors that tend to give more aid to less corrupt countries. The Tobit procedure, however, does not allow us to discriminate among the aid eligibility stage and the decision concerning aid levels. We proceed, therefore, by estimating together the two equations using Heckman's (1979) estimator, correcting for sample selection bias.

Combining the results from the two sets of regressions, we are able to classify donors according to the three motives for giving aid we mentioned above. The USA and, to a lesser extent, France appear motivated mainly by strategic/economic interests, while Japan and Denmark seem to grant aid with a particular focus on recipient needs. Spain and, to a minor degree Norway, seem instead to base their aid allocation decisions on the need to provide the "right" incentives to recipients. Our analysis tells us that the remaining donors give aid according to a mix of motives: Italy, Germany, the Netherlands and Sweden take into account not only strategic/economic issues, but are also concerned about efficiency. Also the UK cares about efficiency in the allocation of aid but exhibits, at the same time, altruistic behavior.

The paper is organized as follows: Section 2 describes the theoretical model. Section 3 defines the variables included in the regressions. Section 4 describes the empirical results. Last section concludes.

2 A Simple Model of Aid Allocation Under Asymmetric Information

We consider a bilateral cooperation program⁶ between two countries: a donor and a recipient⁷, where the government of the donor country decides the amount of resources, a , that should be devoted to implement a development project in the recipient country⁸. The project can be realized only if the recipient country is involved.

⁶The bilateral Official Development Assistance (ODA) flows still represent the 75% of the sources of aid.

⁷This paper abstracts from issues of inter-recipient competition for aid, by assuming that this feature may affect budget decision but the aid allocation process itself.

⁸A static model is obviously an over simplification with respect to reality, where usually there are repeated interactions between donors and recipients (see Isopi and Mattesini (2006) for example). This crude assumption, however, wants to capture the fact, that in bilateral aid programs, conditionality on project performance is rarely observed. Not only most countries do not carry out systematic evaluations of the success of development projects, but previous performance does not seem a widely adopted criterion for giving aid.

The recipient country is inhabited by a continuum of agents with unit mass. Agents are divided in two groups: type I agents that we also call *the elite* and type II agents defined as *the poor*. Only the *elite* has access to a stochastic technology to influence the outcome of the project; the poor cannot affect this outcome but receive, at the end of the production process, a fraction of the output.

We assume that the distribution of the output inside the country is exogenous and reflects its institutional characteristics. The government of the recipient country is run by the elite which is able to capture a fraction, γ of the output of the project. This fraction expresses: i) the compensation, γ_0 , for the marginal contribution to the realization of the project, which may be due to the ownership of the technology or to the human capital invested; ii) the extra amount the elite is able to capture through its political power, rent seeking and corruption, that we denote by γ_1 . The poor receive instead the remaining $(1 - \gamma)$.

Production is stochastic and is affected by the actions undertaken by type I agents. For the sake of simplicity we assume that the production function is isoelastic, i.e. $y(a) = a^\alpha$. Type I agents can undertake two types of actions that assume the values $i = 0$ or $i = 1$. When $i = 0$, the agent diverts resources from the project to a private use; if $i = 1$, the agent devotes all the available funds to the project. We assume that the donor cannot observe the level of effort exerted by the elite and this gives rise to a moral hazard problem.

Depending on the action undertaken, output can assume the values $\{\underline{\theta}y(a), \bar{\theta}y(a)\}$ with $\bar{\theta} - \underline{\theta} = \Delta\theta > 0$ and the stochastic influence of the agent's action on production is characterized by the probabilities $Pr(\tilde{\theta} = \bar{\theta} \mid i = 0) = \pi_0$ and $Pr(\tilde{\theta} = \bar{\theta} \mid i = 1) = \pi_1$ with $\pi_1 > \pi_0$. Notice that effort improves production in the sense of first order stochastic dominance, i.e. $Pr(\tilde{\theta} \leq \theta^* \mid i)$ is decreasing in i for any given level of production θ^* .

When the agent undertakes action $i = 0$, that we also denote as the *bad* action, he is able to extract an extra private benefit, which is given by a further fraction b of the output in addition to the fraction $\gamma = \gamma_0 + \gamma_1$ to which he is entitled. We assume $\gamma_0 + \gamma_1 + b < 1$. It is important to observe that both γ_1 and b reflect the level of rent seeking and corruption which is widespread in less developed countries. However, while γ_1 , that we define as the level of *endemic* corruption, is independent of the level of effort undertaken by the elite of the recipient country, b , that we define as *aid related* corruption, is the extra amount the elite is able to capture because of asymmetric information and moral hazard. With this assumption, we want to highlight the fact that corruption and rent seeking represent a structural distortion that alters the distribution of resources in the society. Since γ_1 can be eliminated only through complex institutional reform⁹ on which donors can exercise only indirect influence, we assume that they take it as given. There is, also, another level of waste, which is reflected by the parameter b , on which donors can more easily intervene through direct bargaining with local elites, i.e. by designing appropriate contracts.

Type I agents, when undertake $i = 1$, bear a cost, ψ , expressed in terms of utility.

⁹For a comprehensive discussion on this issue see *The institutional economics of foreign aid* by Martens, Mummert, Murrell and Seabright, (2003).

Assuming, to keep the analysis simple, that type I agents' utility u^e is linear, we have

$$u_0^e = (\gamma_0 + \gamma_1 + b)[\pi_0 \bar{\theta} a^\alpha + (1 - \pi_0) \underline{\theta} a^\alpha] \quad (1)$$

if they undertake the bad action and

$$u_1^e = (\gamma_0 + \gamma_1)[\pi_1 \bar{\theta} a^\alpha + (1 - \pi_1) \underline{\theta} a^\alpha] - \psi \quad (2)$$

if they undertake the good action.

The utility function of type II agents, u^p , depends on the final output of the project undertaken by the elite. We also assume a linear utility function for type II agents. The expected utility of the poor, therefore is given by:

$$u_0^p = (1 - \gamma_0 - \gamma_1 - b)[\pi_0 \bar{\theta} a^\alpha + (1 - \pi_0) \underline{\theta} a^\alpha] \quad (3)$$

if type I agents undertake the *bad* action and

$$u_1^p = (1 - \gamma_0 - \gamma_1)[\pi_1 \bar{\theta} a^\alpha + (1 - \pi_1) \underline{\theta} a^\alpha] \quad (4)$$

if type I agents undertake the *good* action.

The government of the donor country gives aid in order to enhance the development process in the recipient. The main objective of the donor is to favor the poor and this is captured by the fact that the donor maximizes the utility of type II agents. However, the form of the donor's utility function takes into account the effects that its actions have on the utility of type I agents which, in this model, have an active role in the production process. This intends to capture the idea that donors may not be entirely oriented toward the needs of the poor but may also desire to influence the elite of the recipient country for political and strategic/economic reasons.

Hence, the utility function of the donor will be a weighted average of the utility of the two social groups in the recipient country, minus the cost of giving aid, that is:

$$V_d = E[\lambda u^e + (1 - \lambda) u^p - C(a)] \quad (5)$$

$$\text{where } C(a) = \delta a \quad (6)$$

The parameter λ represents the weight that the donor assigns to the utility function of the *elite* of the recipient country. The cost function, which for simplicity we assume linear, represents the opportunity cost for the donor of giving foreign aid.

Notice that, in this model, the only variable on which agents can contract is the level of aid. In a situation characterized by moral hazard, where future punishments are excluded by the absence of repeated interactions, the choice of a must take into account the distortion created by asymmetric information. We assume, therefore, that a donor maximizes its utility subject to three constraints: the individual rationality constraint (to ensure that the recipient will want to sign the contract), the incentive compatibility constraint (to ensure that, once the contract is signed, it will be optimal for the elite to undertake the best action) and the non negativity constraint (which excludes the possibility of negative transfers).

Substituting (1), (2), (3), (4) and (6) into (5) and defining:

$$\Phi_1 = E(\theta_1) = [\pi_1 \bar{\theta} + (1 - \pi_1) \underline{\theta}] \quad \text{and} \quad \Phi_0 = E(\theta_0) = [\pi_0 \bar{\theta} + (1 - \pi_0) \underline{\theta}]$$

an optimal aid contract is the one that solves the donor's maximization problem:

$$\max_a \quad \Phi_1 [\lambda(\gamma_0 + \gamma_1) + (1 - \lambda)(1 - \gamma_0 - \gamma_1)] a^\alpha - \delta a \quad (7)$$

$$\text{sub} \quad \Phi_1 \beta (\gamma_0 + \gamma_1) a^\alpha - \Phi_0 \beta \left[(\gamma_0 + \gamma_1 + b) \right] a^\alpha - \beta \psi \geq 0 \quad (8)$$

$$\Phi_1 \beta (\gamma_0 + \gamma_1) a^\alpha - \beta \psi \geq 0 \quad (9)$$

$$a \geq 0 \quad (10)$$

where equation (8) represents the incentive compatibility constraint, equation (9) the individual rationality constraint and equation (10) is the non negativity constraint on a , which rules out the possibility of negative transfers.

Denoting, now, by $A(\gamma_1, \lambda) = \left(\frac{[\lambda(\gamma_0 + \gamma_1) + (1 - \gamma_0 - \gamma_1)(1 - \lambda)]}{\delta} \right)^{\frac{1}{1 - \alpha}}$, by $B(\gamma_1, b) = (\Phi_1 - \Phi_0)(\gamma_0 + \gamma_1) - \Phi_0 b$ and defining by a^* the optimal level of aid given by the donor, the solution to problem (7)-(10) implies:

Proposition 1. *If $B(\gamma_1, b) > 0$ then the optimal contract between a donor and a recipient implies a positive level of aid. In this case, we can have:*

1. *If $A(\gamma_1, \lambda)^\alpha B(\gamma_1, b) - \psi \geq 0$, then donors choose the first best equilibrium and:*

$$a^* = A(\gamma_1, \lambda) \quad (11)$$

2. *If $A(\gamma_1, \lambda)^\alpha B(\gamma_1, b) - \psi < 0$ then the optimal level of aid is:*

$$a^* = \left[\frac{\psi}{B(\gamma_1, b)} \right]^{\frac{1}{\alpha}} \quad (12)$$

When instead we have $B(\gamma_1, b) < 0$, then equilibrium implies aid rationing and;

3. $a^* = 0$

The proof of Proposition 1 is reported in Appendix 1. The optimal aid policy described by Proposition 1 identifies three possible equilibria depending on the value of the parameters. Two of them imply that the donor provides a positive level of aid, while the third one is given by a corner solution, where no aid is granted: we define it as an *aid rationing* equilibrium. Both the conditions determining the three equilibria and those defining the optimal size of aid transfers depend on the parameter ψ and on the composite parameters $A(\gamma_1, \lambda)$ and $B(\gamma_1, b)$. $A(\gamma_1, \lambda)$ is the sum of two terms: i) the weight a donor assigns to the elite in his utility function multiplied by the share of output the elite receives and ii) the weight a donor assigns to the poor multiplied by the share of

output the poor receive. The composite parameter $B(\gamma_1, b)$, instead, can be interpreted as the expected gain that the elite obtains from undertaking the good project.

This last composite parameter is crucial in determining the occurrence of the three possible equilibria. Notice in fact that equilibria 1 and 2 occur when $B(\gamma_1, b) > 0$ while equilibrium 3 occurs when $B(\gamma_1, b) \leq 0$. Therefore, donors grant a positive amount of aid only when $B(\gamma_1, b) > 0$ and grant no aid when $B(\gamma_1, b) \leq 0$. A no aid equilibrium (equilibrium 3) is obtained when the moral hazard problem is so serious that the donor will never be able to induce the elite to provide the high level of effort. The existence of an equilibrium where aid is rationed suggests that the aid allocation process, although simultaneous in this model, can be logically decomposed into two decisions: i) whether to grant aid or not and ii) how much aid should be granted. Notice that $B(\gamma_1, b)$ is increasing in γ_1 , i.e. the level of *endemic* corruption and is also decreasing in b , i.e. the level of *aid related* corruption.

Let us now focus on equilibria 1 and 2 that determine the size of aid. Equilibrium 1, i.e. the first best equilibrium, implies that $a^* = A(\gamma_1, \lambda)$ and it occurs when $A(\gamma_1, \lambda)^\alpha B(\gamma_1, b) - \psi \geq 0$, i.e. when the net gain for the elite from undertaking the good project is greater than the disutility of effort. In this case, the amount of aid is sufficiently high to induce good behavior, i.e. the elite does not have an incentive to undertake the low level of effort. The size of the aid transfer in the first equilibrium reflects the preferences of the donor, expressed by the parameter λ , the marginal cost for the donor of giving aid δ and the share of output that goes respectively to the elite and the poor.

The distribution of output is affected also by the *endemic* level of rent seeking and corruption, measured by the parameter γ_1 . We can easily verify that a^* is increasing in γ_1 if $2\lambda - 1 > 0$. If the donor has a strong preference for the elite for economic/strategic reasons, then, as corruption and rent seeking increase, also aid should increase. On the other hand, if donor's interests are more oriented towards the needs of the poor, than an increase in γ_1 will decrease the level of aid.

The second possible equilibrium of the model occurs when $A(\gamma_1, \lambda)^\alpha B(\gamma_1, b) - \psi < 0$. Technically, this result is obtained when the incentive compatibility constraint is binding. In this equilibrium, the level of aid is not influenced by a donor's preferences but is increasing in the level of effort ψ and decreasing in the composite parameter $B(\gamma_1, b)$.

Since $B(\gamma_1, b)$ is decreasing in b , an increase in the private benefit will induce donors to grant a higher volume of aid. If the donor perceives that the local elite responds to incentives, and knows that it will provide the right level of effort only if it finds it worthwhile, it will be optimal to provide a larger amount of aid, the larger is the risk that this aid is diverted. In this situation, where donors can only act on the size of the aid transfer, a donor is aware that the elite of the recipient country will work toward the success of the project only if the amount of aid is large and it is able to obtain a significant size of it. An increasing relationship between the size of aid and the private benefit may, therefore, be the consequence of a simple consideration: only by providing enough aid it is possible to avoid the failure of aid programs, even if this implies rewarding excessively the local elites.

3 Definitions of Variables and Data Issues

In line with the empirical literature on foreign aid allocation, we study the motivations behind development assistance by regressing the amount of aid, for each donor, on a series of explanatory variables that describe the main institutional and economic features of the recipients. Our sample covers 168 recipients and 12 donors, members of the Development Assistance Committee (DAC) of the OECD, spanning the period 1985-2004. The descriptive statistics are reported in Table (4).

As suggested by McGillivray and White (1993), we use, as dependent variable, per capita *Aid Commitments* rather than disbursements¹⁰ and we include, among the explanatory variables, indicators of recipient needs (which reflect the altruistic motive for giving aid), and donors' strategic/economic interests.

The most relevant indicator of recipient needs is a country's per capita income, measured at international prices, *GDP per capita*. We expect this variable to have a negative sign for those donors who target their transfers according to recipients needs.

In order to test whether donor countries value the level of democracy as an important goal of aid assistance, we also include in our regressions the Index of Civil Liberty by the Freedom House, labeled *Democracy*¹¹.

Donors' strategic and economic interests are measured using a series of variables that reflect historical or economic ties between donor and recipient countries. The variable *Colony* is a dummy indicating whether the recipient country was a colony or was administered as a protectorate by the donor prior to independence¹². Former colonial powers usually have remaining political, economic, cultural and other interests in their former colonies. In the case of the United States, we consider two other dummy variables *Egypt* and *Israel* that take into account the high volume of aid traditionally granted to these

¹⁰A commitment is a firm obligation expressed in an agreement or equivalent contract and supported by the availability of public funds, undertaken by the government, an official agency of the reporting country or an international organization, to furnish assistance of a specified amount under agreed financial terms and conditions and for specific purposes, for the benefit of a recipient country. A disbursement represents the actual international transfer of financial resources. They may be recorded at one of several stages: provision of goods and services, placing of funds at the disposal of the recipient in an earmarked fund or account, withdrawal of funds by the recipient from a earmarked fund or account payment by the donor of invoices on behalf of the recipient. The disbursement mechanism used tends to vary as a function of the type of financial (or technical) co-operation flow involved. Regarding the choice between aid per capita and aid in levels in foreign aid allocation regressions see McGillivray and Oczkowski (1992), and Neumayer (2003).

¹¹This index measures freedom according to two broad categories: political rights and civil liberties. Political rights enable people to participate freely in the political process, including the right to vote, compete for public office, and elect representatives who have a decisive impact on public policies and are accountable to the electorate. Civil liberties allow for the freedom of expression and belief, associational and organizational rights, rule of law, and personal autonomy without interference from the state. The survey includes both analytical reports and numerical ratings for 192 countries and 18 select territories. Each country and territory is assigned a numerical rating, which is calculated based on the methodology described below, on a scale of 1 to 7. The total number of points awarded to the political rights and civil liberties checklists determines the political rights and civil liberties ratings. Each point total corresponds to a rating of 1 through 7, with 1 representing the highest and 7 the lowest level of freedom.

¹²Other papers, such as Alesina and Weder (2002) use instead the number of years a recipient country has been a colony of the donor in the last century. Unfortunately, these data were not available to us.

countries. Moreover, always for the US, we include a measure of political proximity labeled *UN*, which measures the voting behavior of the country in the UN General Assembly, i.e. the percentage of times in which the country has voted in line with the United States. Some degree of donors' strategic/economic interest may also be reflected by the variable *Military Expenditure*, which is measured as the amount of military exports of a donor to the recipients, scaled by the recipient's GDP.

A last important variable reflecting donors' economic interests is the variable *Trade*, which measures bilateral trade, and is given by the sum of the exports and imports between a donor and recipient country¹³.

If donors are interested in maximizing the efficiency of projects and provide the "right" incentives to recipients, they will prefer, for a given level of development, to give aid to countries where it is relatively less costly, for local elites, to cooperate successfully to the completion of the project. The variables we choose to proxy for what we previously called the cost of exerting the right amount of effort are *Education*, *Technology*, *Infrastructure*.

A recipient country will be able to contribute to the success of development projects if the ruling class is more educated. As a proxy for the competence of the local elite, we take the variable *Education* which is defined as the percentage of the population in the relevant age group enrolled in tertiary education institutions, i.e. universities, teachers' colleges, or higher-level professional schools.

A country that has a more modern technological infrastructure is also more likely to provide a better environment for the success of development projects. To indicate the situation of a country in its acquisition of modern technology, we consider the World Bank Technology Index, i.e. a composite index, that we denote as *Technology*, that summarizes the use of internet, telephone lines, mobile phones in the country and its high technology exports¹⁴. Undertaking projects is obviously less costly the higher is the general level of infrastructure in the country. We include among the regressors, therefore, the variable *Infrastructure* which indicates the availability of roads, access to improved sanitation facilities and to drinking water¹⁵.

¹³Differently from other papers, where the economic interests of the donor are usually measured by the ratio of the sum of exports and imports over its GDP, here we use the simple sum of bilateral exports and imports in order to capture the measure of interest that the donor has for the economy of the recipient country; foreign development assistance based on self interest will be biased toward countries that tend to have more trade with the donor.

¹⁴The internet index shows the ratio (per 10,000 people) of the number of computers with active internet protocol addresses connected to the internet. The telephone index shows the ratio (per 1000 people) of the number of telephone lines connected to public telephone network. The mobile phones index refers to the ratio(per 1000 people) of the number of people using portable telephones and subscribing to a mobile telephone service. Finally, the high technology exports index gives the percentage of manufacturing exports products that contain products with high research and development intensity such as aerospace, computers, pharmaceutical products, scientific instruments and electrical machinery.

¹⁵The road index shows total length of roads in a country compared with its expected length conditioned on the population size, population density per capita income, urbanization and region-specific dummy variables (World Bank, 2002). The share of population with access to improved sanitation and drinking water facilities are taken from household surveys conducted by the WHO and UNICEF, including the Demographic Health Surveys.

As we argued in the previous pages, the possibility to capture private benefits may significantly undermine the success of development projects, and therefore donors that are particularly interested in the results of their efforts will pay close attention to this variable, which we measure in this paper through the variable *Corruption*. Following the existing literature, we use the index provided by the *International Country Risk Guide*(ICRG)¹⁶.

Although it doesn't have a clear interpretation in terms of altruism, strategic/economic motivations or efficiency considerations, we include among the regressors also the variable *Population*, which is a measure of the size of the country. By doing this, we follow the existing literature which has found, in many cases, the presence of a significant population bias in aid allocation.

The costs for a donor of providing aid are proxied, in this analysis, by the variable *Gov. Surplus*, which is simply the annual government surplus of every single donor as a percentage of GDP. The lower is the surplus (i.e. the higher is the deficit), the higher the competing claims for government resources inside the donor country and the lower the amount of funds available for foreign aid assistance, i.e. the higher is the cost of providing aid.

4 Empirical Analysis

4.1 Tobit Estimates

Most donors target a selected group of recipients, giving a positive amount of aid to some countries and nothing to others. Our dependent variable, *Aid Commitments per capita*, is therefore only partly continuous with positive probability mass at zero. Since the dependent variable is left censored, the estimation method that is most commonly used in models of aid allocation is the Tobit model¹⁷. This method takes into account the endogenous selection of recipients, and estimates the determinants of per capita aid commitments in one step.

Consistently with this literature we start our analysis by running a set of Tobit regressions for every donor country included in the sample. In doing this, we follow the analysis of Alesina-Weder (2002), who already studied the relationship between aid and corruption, but we extend their sample by almost ten years and we include a larger set of regressors.

¹⁶This index is one of the most frequently used measure of corruption and as shown by Alesina and Weder, is widely correlated with other existing measure of the same phenomenon. It is based on a set of 22 components grouped into three major categories of risk: political, financial, and economic, with political risk comprising 12 components (and 15 subcomponents), and financial and economic risk each comprising five components. Each component is assigned a maximum numerical value (risk points), with the highest number of points indicating the lowest potential risk for that component and the lowest number (0) indicating the highest potential risk. The maximum points awarded to any particular risk component is pre-set within the system and depends on the importance (weighting) of that component to the overall risk of a country.

¹⁷For an extensive discussion of this estimation method in the context of aid allocation, see Neumayer (2003). See also Berthelemy and Tichit (2005) and McGillivray (2004).

For every donor country we estimate three different equations. The first follows a specification similar to the one provided by Alesina and Weder. *Per capita Aid Commitments* are regressed on *GDP per capita*, *Population*, *Democracy*, *Corruption*, *Trade*, *Colony* and, for the US, the variables *UN*, *Egypt*, *Israel*. With respect to the Alesina and Weder specification we add the variable *Military Expenditure* as a further indicator of strategic/economic interests. In the second specification we add the variables *Education*, *Infrastructure*, *Technology*, which are meant to capture the costs of undertaking aid projects efficiently, and donors' *Gov. Surplus*. Since the inclusion of this last variable implies a significant reduction in the number of observations, we then estimate a third equation without the donors' *Gov. Surplus*.

In tables (5) (6) and (7) we report the results of our Tobit regressions. They are largely consistent with the aid allocation literature. All countries show a mix of altruistic motives and strategic/economic considerations in their aid allocation choices. The variable *GDP per capita* is negative and significant for all donors, showing that they tend to give a larger amount of aid to poorer countries. At the same time, also the variable *Democracy* is highly significant in almost all equations (with the exception of Denmark and Spain) and always enters with the negative sign, indicating a clear willingness by donor countries to promote democracy. As was recently argued by Dollar and Levin (2004), since democracy is associated to better institutions and a healthier economic/social environment, this could also indicate that donors tend to select countries that undertake “good policies”.

There is, however, a clear bias, in aid flows, towards countries that have strong political, historical and economic ties with donors. Except for Italy, the coefficient of the variable *Colony*, when included in the regression, is positive and significant. The US give a strong preference to Israel and Egypt although, unlike what was found in earlier studies, the variable *UN* is not significant. Also economic ties are very strong determinants of aid: for all countries and in almost all the equations the coefficient of the variable *Trade* is positive and significant. Almost all countries, except for the US and Finland, tend to give more per capita aid to more populated countries.

Unlike previous variables, the sign of the variable *Corruption* differs across countries. Its coefficient is negative and significant in all the equations regarding Italy and the US. Corruption turns out to have a negative coefficient in the equations concerning the Netherlands and Finland. This variable, instead, enters significantly and with the positive sign in almost all regressions regarding the UK, Japan, France, Norway, Denmark and Spain. In the cases of Sweden and Germany, the variable *Corruption* is always non significant. It is interesting to notice that our results do not confirm entirely those found by Alesina and Weder. While these authors find that most donors do not reward with more foreign aid less corrupt governments, according to our results half of the donors in our sample tend to favor less corrupt recipients.

Consider now the three indicators that measure, to some extent, the preference of donors for countries where aid projects are more likely to be successful. The results suggest that these *environmental* indicators are not very important for aid allocation decisions. Only in the equations concerning Sweden, we find that the coefficients of *Technology*, *Infrastructure* and *Education* are positive and significant, indicating that

this country tends to privilege recipients whose local elites are better equipped to carry out the projects. The coefficient of the variable *Education* is positive (and significant in the last equations) only for Norway and Spain but is negative and significant in almost all regressions pertaining the US, UK, France, Italy, Japan and the Netherlands. In this case, *Education* is an indicator of low human capital and therefore the negative sign indicates altruistic concerns. *Technology* tends to enter significantly in the equations concerning Italy, Sweden, Finland and the Netherlands (in one of the two equations). The level of infrastructure seems to carry a positive weight only for the US and the Netherlands. The donors *Gov. Surplus* is not very significant in almost all the equations although it is positive and significant for the US, and negative and significant for Japan and Sweden.

4.2 Testing the Relationship Between Aid and Corruption

The Tobit estimates we reported in the previous paragraph allowed us to verify the existence of an important relationship between aid and corruption. This method however implies that the same variables that determine aid eligibility also determine the size of aid and, moreover, imposes the constraint that the variables that affect aid eligibility and the ones that explain the amount of aid have the same sign. These assumptions are certainly plausible but do not necessarily hold.

The interesting aspect of the theoretical model is that it is possible to derive some restrictions on the sign of the parameters that allow us to discriminate among the three equilibria and, therefore, among the motivations behind aid allocation. In our discussion of Proposition 1 we argued that, beside considering how much aid must be granted to a possible recipient, a donor faces the choice of whether to grant aid or not. Empirically, therefore, aid allocation decisions should be modeled as a two-step process, where in the first step a dichotomous choice is considered and then, in the second step, the donor chooses the amount of aid.

In order to appropriately analyze this problem, we use the maximum likelihood estimator developed by Heckman (1979), which consists in jointly estimating a model determining the probability of receiving aid (*aid eligibility equations*), and a model explaining aid transfers based only on strictly positive observations (*aid levels equations*). To take into account the panel dimension, we correct for the possible clustering of the data, specifying that the observations are independent across groups but not necessarily independent within groups¹⁸.

For every donor country included in the sample, we estimate four equations. Equation 1 is an aid eligibility equation where the dependent variable, *DAid*, is a dummy taking the value 1 if a recipient obtains a positive level of aid and the value 0 otherwise. We include, among the regressors, *GDP per capita*, *Population*, *Trade*, *Corruption*, *Military Expenditure*, *Infrastructure*, *Technology*, *Education*, *Colony*¹⁹ and *Democracy*. Equation

¹⁸This method affects the estimated standard errors and variance-covariance matrix of the estimators but not the estimated coefficients, allowing us to obtain robust variance estimates.

¹⁹This regressor is usually in both eligibility and levels equation, but because of collinearity problems sometime is dropped out of the eligibility equation.

2 is an aid levels equation where the dependent variable is given only by positive levels of aid. In this equation we include, among the regressors, the variable *Gov.Surplus* and we exclude the variable *Democracy*²⁰. In order to increase the number of observations in equations 3 and 4 we perform the same exercise but we drop, from the aid levels equation, the variable *Gov.Surplus*. Equations 1-2 and 3-4 are estimated simultaneously through Heckman's maximum likelihood estimator.

In our model, the problem of corruption is captured by the parameters γ_1 , which expresses its *endemic* aspect and the parameter b , which instead represents the level of corruption that could be overcome through appropriate contract design. The variable *Corruption* that we use in the econometric analysis is a *proxy* for both parameters and this implies that the sign of the relationship between aid and corruption is not informative, in itself, to infer the possible motivations behind aid allocation decisions.

In order to distinguish the real meaning of the aid-corruption relationship, we follow a testing strategy based on our theoretical model. Let us first consider an aid eligibility equation where the dependent variable is the dummy *DAid* and remember that, from our theoretical model, the condition under which recipients do not receive any aid is given by $B(\gamma_1, b) = (\Phi_1 - \Phi_0)(\gamma_0 + \gamma_1) - \Phi_0 b \leq 0$ which is more likely to be satisfied the lower is γ_1 and the greater is b . This implies that the greater is b , the lower is the probability for a country of receiving aid, while the greater is γ_1 the greater is the probability of receiving aid.

Suppose now that, in our aid eligibility regression, we observe a decreasing relationship between the dependent variable and the variable *Corruption* ($\frac{\partial DAid}{\partial Corruption} < 0$). In this case clearly *Corruption* is proxied by the parameter b and this implies that the donor is trying to impose an incentive mechanism. If instead we find that the relationship between *DAid* and *Corruption* is positive ($\frac{\partial DAid}{\partial Corruption} > 0$), then *Corruption* is proxied by the parameter γ_1 and this means that donors are likely to give aid to more corrupt recipients because of strategic economic interests. Notice that in this first step of the decision process *pure* altruistic motivations do not play any role because according to our model, aid can be rationed only when there is no level of aid that is incentive compatible. The selection equation, therefore, allows us to discriminate between equilibria 1 and 2 ($B(\gamma_1, b) > 0$) and equilibrium 3 ($B(\gamma_1, b) \leq 0$). These hypotheses are summarized in the first section of the table 1.

The aid level regressions include as a dependent variable only positive levels of aid, and therefore, relate only to the first and the second equilibria of the model. Remember that in the first equilibrium, where donors do not consider incentive problems as relevant, they will offer a level of aid that does not depend on b and that is increasing in γ_1 if $\lambda > 1/2$ and decreasing in γ_1 if $\lambda < 1/2$. When donors, instead, provide aid with the attempt of inducing the right incentives (the second equilibrium of the model), then the optimal level of aid is given by (12), which implies that aid is increasing in both b and ψ and decreasing in γ_1 .

²⁰By doing this, we assume that this variable affects aid eligibility but not the amount of aid allocated. Strictly speaking, not such exclusion restriction is necessary for estimation but, in its absence standard errors are often inflated and estimates of eligibility equations are unreliable due to collinearity problems (Vella, 1998).

Therefore, if in the estimation of the aid levels equation, we find that the size of aid is decreasing in the variable *Corruption* this can be either due to the fact that $a^* = A(\gamma_1, \lambda)$ and $\lambda < 1/2$ (in which case the aid-corruption relationship reflects $\frac{\partial a^*}{\partial \gamma_1} < 0$), or to the fact that $a^* = \left(\frac{\psi}{B(\gamma_1, b)}\right)^{\frac{1}{\alpha}}$ (in which case the aid-corruption relationship reflects $\frac{\partial a^*}{\partial \gamma_1} < 0$). In both cases donors are granting aid on the basis of altruistic motives (see the second part of table 1).

If, instead, we find that the size of the aid transfer is increasing in *Corruption*, this can be due either to the fact that $a^* = A(\gamma_1, \lambda)$ and $\lambda > 1/2$ (in which case the aid-corruption relationship reflects $\frac{\partial a^*}{\partial \gamma_1} > 0$) and donors are motivated by strategic economic interests, or to the fact that $a^* = \left(\frac{\psi}{B(\gamma_1, b)}\right)^{\frac{1}{\alpha}}$ (in which case the aid-corruption relationship reflects $\frac{\partial a^*}{\partial b} < 0$) and donors are motivated by the desire to induce the right incentives in the recipients.

We can deal with this last ambiguity by considering that the parameter ψ , i.e. the cost for the elite of exerting the appropriate level of effort, affects only the second equilibrium. This cost depends on a series of *environmental* variables that influence the possibility of success of the project and empirically can be proxied by the variables *Technology*, *Infrastructure* and *Education*. If we find that these variables are significant in the aid levels equations, we take it as an indication that a donor is motivated by efficiency considerations.

Table 1: Testing Aid-Corruption Relationship

Aid Eligibility Equation			
$\frac{dDAid}{dCorruption} < 0 \implies$	$Corruption \approx b$	$\implies$	(incentive mechanism)
$\frac{dDAid}{dCorruption} > 0 \implies$	$Corruption \approx \gamma_1$	$\implies$	(strategic/economic interests)
Aid Levels Equation			
$\frac{dDAid}{dCorruption} < 0 = \begin{cases} \text{If } a^* = A(\gamma_1, \lambda), & \lambda < 1/2 \implies Corruption = \gamma_1 \text{ (altruistic behaviour)} \\ \text{If } a^* = \left(\frac{\psi}{B(\gamma_1, b)}\right)^{\frac{1}{\alpha}} & \implies Corruption = \gamma_1 \text{ (altruistic behaviour)} \end{cases}$			
$\frac{dDAid}{dCorruption} > 0 = \begin{cases} \text{If } a^* = A(\gamma_1, \lambda), & \lambda > 1/2 \implies Corruption = \gamma_1 \text{ (strategic/economic interests)} \\ \text{If } a^* = \left(\frac{\psi}{B(\gamma_1, b)}\right)^{\frac{1}{\alpha}} & \implies Corruption = b \text{ (incentive mechanism)} \end{cases}$			

4.3 Heckman Estimates

4.3.1 The Determinants of Aid

Our Heckman estimates are reported in tables (8), (9), (10) and (11). Consistently with our Tobit results, the effect of *GDP per capita* on aid, both in the level and in the eligibility equations, is always negative and highly significant²¹. This confirms that there are altruistic motives behind aid allocation decisions. Analogously, also the variable *Democracy*, which appears only in the probit regression, turns out to be negative in all equations and highly significant in almost all of them.

Among the indicators of strategic/economic interest, the most relevant are the variables *Colony* and *Trade*. Both the decisions of whether aid should be granted or not and those relative to the size of the aid transfer are positively affected by the former colonial status of the recipient country. The UK, France, Italy, the Netherlands and Spain tend to favor their former colonies, especially in the aid level equations. Only Japan does not appear to grant more aid to former colonies. For the US, beside the variable *Colony*, we use, as an indicator of strategic/economic interests, the dummy variables *Egypt* and *Israel* and the variable *UN*. In the aid levels equation the coefficients of the first two variables turn out to be positive and highly significant; the UN vote, that we inserted in the eligibility regressions, appears always with the positive sign, even though is significant in only one of the two equations.

The variable *Trade* is positive and significant in almost all equations²² and this consistently with the Tobit estimates, confirms that there exist important economic motivations behind aid allocation. The variable *Military Expenditures* does not appear to have a great explanatory value. It is positive and significant only in some aid eligibility equations regarding US, France and Finland and in the levels equation regarding Sweden; it is, instead, negative and significant in some equations concerning Italy, Japan and Norway. The variable *Gov. Surplus* does not play an important role in explaining aid allocation; a higher surplus (a lower deficit) is positively and significantly (at the 10% level) related to aid levels only for the US and Spain.

The effect of the variable *Population* on aid varies according to the equations we take into account. In particular, some donors like the UK, Germany and the Netherlands tend to transfer a higher amount of aid to the larger recipients. Other donors instead, such as Italy, Norway, Finland and Denmark, use this variable as a discriminating factor on whether to give or not a positive amount of aid. In equations regarding Japan, this variable turns out to be positive and highly significant in both steps.

4.3.2 The Effect of Corruption on Aid

Let us now turn to the relationship between aid and corruption. As tables (8), (9), (10) and (11) show, the sign of this relationship varies greatly from country to country.

²¹The variable is not significant in both the aid eligibility equations for Japan and in one aid eligibility equation for Germany.

²²It is not significant only for the US, where however has a positive sign, in two equations regarding Japan and the Netherlands and in one equation regarding Germany.

Starting with the aid eligibility estimates, we can see that in five countries (US, France, Germany, the Netherlands and Sweden) the coefficient of the variable *Corruption* is negative and significant, meaning that an increase in the level of corruption increases the probability of receiving a positive level of aid. For the UK, Spain and Norway, instead, a decrease in the level of corruption increases the probability of receiving aid.

In light of our model, these results suggest that the first group of countries are mainly motivated by strategic/economic motives, while the second group of countries seems to use aid to induce the right incentives in the recipients. Aid, in fact, is rationed when contracts are incentive incompatible, in which case the decision not to give aid is an optimal response to the moral hazard problem: the threat of not receiving aid becomes an important incentive for the elites to not divert resources from their intended use. There is finally a third group of countries (Denmark, Japan and Finland) for which the level of corruption does not significantly affect the probability of giving aid.

Consider now the aid levels regressions. The USA stand out as one of the few countries where the result is clear-cut. The aid levels regressions for this country show that also the size of aid is increasing in the level of corruption indicating that US foreign policy concerns are a leading factor behind aid allocation. For France, Germany, the Netherlands and Sweden, the aid eligibility equations show the presence of strategic/economic concerns. *Corruption*, however, does not enter significantly as an explanatory variable in the aid levels regressions. For all these donors, except for France, however, some environmental indicators are significant and have the positive sign suggesting that these donors may also be motivated by incentive concerns²³.

For Denmark, Italy and Japan, although the level of corruption does not seem relevant in deciding whether to give aid or not, the aid levels regressions provide some further indications about the motives behind their aid allocation choices. In the Italian case, *Corruption* has a positive effect on the size of aid and moreover some environmental indicators are significant and have the right sign²⁴. Therefore, we classify this donor as being motivated by strategic/economic considerations and incentive concerns. Japan and Denmark, instead, can be classified as purely altruistic donors since aid levels are decreasing in the level of corruption.

Consider, now, the group of countries (Norway, Spain and the UK) that as we saw from the aid eligibility equations seem to ration aid to more corrupt recipients. Spain is the only country for which we have a clear indication that incentives matter, since aid levels are increasing in the variable *Corruption*. For the UK instead *Corruption* has a negative effect on aid levels and therefore, we can conclude that the UK are motivated also by altruistic concerns²⁵. The aid levels regressions for Norway signal that there

²³For Germany, the variable Education has a positive and significant impact on the level of aid granted. In the case of Netherlands, the only environmental indicator that has a positive and significant effect on the dependent variable is the level of technology of the recipient country. For Sweden, both the level of infrastructure and the level of technology of the recipient country affect positively the level of aid granted.

²⁴The significant environmental variables are *Technology* and *Infrastructure*.

²⁵It is interesting to notice that the environmental variable Technology is positive and significantly related to the level of aid.

Table 2: Aid Allocation and Corruption

	AID ELIGIBILITY	AID LEVELS	EFFECT OF ψ	DONOR'S BEHAVIOUR
USA	+	+	0	strongly strategic
UK	-	-	+ / 0	altruistic/efficiency
FRANCE	+	0	0	weakly strategic
ITALY	0	+	+ / 0	strategic/efficiency
JAPAN	0	-	+ / 0	altruistic
GERMANY	+	0	+ / 0	strategic/efficiency
NETHERLANDS	+	0	+ / 0	strategic/efficiency
SPAIN	-	+	0	strongly efficiency
SWEDEN	+	0	+ / 0	strategic/efficiency
FINLAND	0	0	+ / 0	—
DENMARK	0	-	+ / 0	altruistic
NORWAY	-	0	0	weakly efficiency

is no impact of the level of corruption on the size of aid; although, the significance of *Corruption* in the aid eligibility equation and its negative sign induces us to classify Norway as a donor concerned about incentives. Finally, we find that Finland's aid policies are not at all affected by the problem of corruption. Those results are summarized in Table 2.

5 Conclusions

In this paper, we focus on the determinants of the relationship between aid and corruption. We consider a static principal-agent model where a donor faces the problem of giving aid to a recipient country in which the phenomenon of corruption is widely spread. We distinguish between two different types of corruption. One that can be considered *structural* or *endemic*, in the sense that it depends on the political and institutional environment of the recipient and is rooted in the lack of transparency and democracy that often characterizes developing countries. The other type of corruption is the consequence of the moral hazard problem that inevitably belongs to aid relationships. Designing contracts that can induce the right incentives, donors can act on the second type of corruption, contributing to reduce the entity of the phenomenon.

Our model suggests that there can be three types of equilibria. In the first one the moral hazard problem is not perceived as relevant and foreign aid depends only on the preferences of the donor. In the second equilibrium, moral hazard becomes important and the donor decides to use aid transfers to reduce the incentives for local elites to divert resources from their intended use. In the third equilibrium, there is no level of aid

that satisfies the incentive compatibility constraint. In this case, the donor should resist the temptation of giving aid because, due to the environmental conditions existing in the recipient country, those resources will not reach people in need but will only contribute to fuel and tolerate the degree of existing corruption.

In order to test whether donors take into account efficiency in aid allocation policies, we focus on this last equilibrium of the model: if the probability of receiving aid decreases with the level of corruption, then we infer that donors are actually trying to induce some kind of incentive on the recipient country. We also use regressions on the volume of aid to discriminate on the other two equilibria of the model.

Our empirical results allow us to group donors according to the motives that are behind the apparent attitude toward corruption in developing countries. The only clear-cut cases are the USA, that seem mainly motivated by strategic/economic interests and Spain that instead seems focused on providing the right incentive to the recipients. Italy, Germany, the Netherlands and Sweden appear to be motivated by a mix of strategic/economic interests and incentive concerns. Altruistic motivations can be detected for the UK(although with some attention to incentives) and for Japan and Denmark. There is finally some evidence that Norway's aid policy is incentive driven.

Summing up, even though the recent debate on foreign aid and the Millennium Development Goals stress the importance of making a more efficient use of funds, only for some donors we find empirical evidence that these principles are a driving force behind aid policies. For the other donors, the standard dichotomy between recipient needs and strategic/economic interests still holds.

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A Mathematical Appendix

Proof 1. First, notice that if the incentive compatibility constraint is satisfied, then:

$$\Phi_1(\gamma_0 + \gamma_1)a^\alpha - \Phi_0[(\gamma_0 + \gamma_1) + b]a^\alpha \geq \psi \quad (13)$$

which implies that the individual rationality constraint (9) is also satisfied.

Assume, now, that the incentive compatibility constraint is not binding, then the solution to the maximization problem is given by (11).

Substituting (11) into (8) and rearranging, we obtain:

$$\left(\frac{[\lambda(\gamma_0 + \gamma_1) + (1 - \gamma_0 - \gamma_1)(1 - \lambda)]}{\delta} \right)^{\frac{\alpha}{1-\alpha}} \left[(\Phi_1 - \Phi_0)(\gamma_0 + \gamma_1) - \Phi_0 b \right] - \psi \equiv A^\alpha B - \psi \geq 0 \quad (14)$$

If $A^\alpha B - \psi \geq 0$, then (11) is an equilibrium. If however, after substituting (11) into (8), we get $A^\alpha B - \psi < 0$, this means that contract (11) does not satisfy the incentive compatibility constraint (14) and therefore, the incentive compatibility constraint must be binding. If $B > 0$, the equilibrium can be found solving for the aid transfer that satisfies (14) as an equality, which implies that equation (12) is an equilibrium of the model. If $B \leq 0$, then the non negativity constraint is violated and (12) cannot be a solution to the problem (7) – (10). The solution, therefore, must be found either for $a^* = 0$ or (11). We know, however, that when equation (11) is the optimal transfer, $A^\alpha B - \psi < 0$, therefore the equilibrium can only be found for $a^* = 0$. Q.E.D.

B Tables

Table 3: Variables and Source

Variable	Description	Source
Aid per capita	Total real ODA commitments divided by the population of the recipient country	OECD Development Aid Committee Database (International Development Statistics)
GDP per capita	Real GDP per capita in constant dollars (base year 1985)	World Bank, World Development Indicators (2005)
Trade	Net bilateral exports between donor and recipient country	IMF bilateral trade statistics
Population	Population expressed in millions, total	World Development Indicators
Democracy	House Democracy Index	Freedom House Evaluation website
Education	School enrolment, tertiary (%)	United Nations Educational, Scientific and Cultural Organization (UNESCO). Institute for Statistics
Infrastructure Index	Composite index combining Road Index, Sanitation Index and Water Access Index	World Development Indicators, WB
GDP Growth	GDP growth (annual %) of the recipient, lagged one period	World Development Indicators
Arms Transfers	Bilateral military exports from donor country to the recipient	SIPRI database
Technology Index	Technology Index combines the Internet Index, Telephone Index, Mobile Index and HiTech Index	World Development Indicators, WB
Donor Surplus	Overall budget balance is current, capital revenue and official grants received less total expenditure and lending minus repayments	
Corruption	Composite International Country Risk Guide risk rating	http://www.ICRGonline.com

Table 4: Summary Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
Per Capita Aid Commitments					
Denmark	3528	2.662894	10.7767	0	169.45
Finland	3097	1.47567	5.680569	0	80.9
France	3192	25.53054	72.21475	0	1439.08
Japan	3173	64.87866	245.4909	0	4344.68
Italy	3097	8.692451	31.74083	0	626.5
Germany	2584	31.35739	69.69138	0	1130.01
Netherlands	3078	8.443483	22.27827	0	269.29
Norway	3097	3.163613	10.21524	0	231.26
Spain	3192	2.636714	13.21749	0	399.47
Sweden	3021	4.363082	14.61178	0	342.29
UK	3097	9.403235	27.79108	0	421.61
USA	3192	46.84632	287.5828	0	12346.67
Gov. Surplus					
Denmark	2352	-0.98571	1.884112	-3.8	2.3
Finland	2352	-0.06429	5.123673	-8.3	6.9
France	2352	-3.27143	1.497186	-5.9	-1.5
Germany	2352	-2.16429	1.30664	-3.6	1.3
Italy	2352	-6.62857	3.883466	-11.4	-0.9
Japan	2352	-3.57857	3.616445	-8.2	2.1
Netherlands	2352	-2.2	1.981763	-5.1	2
Norway	2352	4.785714	5.158734	-1.9	15.6
Spain	2352	-3.4	2.156182	-6.9	-0.3
Sweden	2352	-1.58571	5.184573	-11.3	5
UK	2352	-2.35	3.40529	-7.9	4
USA	2352	-2.42857	2.28629	-5.8	1.6
Trade					
Denmark	2743	67.82743	213.7671	0	2458.52
Finland	2724	20.44152	89.21822	0	1673.85
France	2710	594.5005	1532.243	0	19178.31
Italy	2712	571.8793	1474.022	0	18600.04
Japan	2724	1942.47	7229.815	0	133573.4
Germany	2710	1066.976	3788.789	0	52064.6
Netherlands	2705	370.4567	965.4387	0	15438.74
Norway	2724	35.57724	113.9987	0	1764.78
Spain	2912	529.0242	1601.086	0	41873.22
Sweden	2705	108.5205	307.8921	0	4169.03
UK	2743	656.3062	1837.209	0	19585.14
USA	2704	3571.793	15646.37	0	287974
Colony					
France	3339	0.163522	0.369897	0	1
Italy	3339	0.025157	0.156626	0	1
Japan	3339	0.012579	0.111464	0	1
Netherlands	3339	0.012579	0.111464	0	1
Spain	3339	0.113208	0.316894	0	1
UK	3339	0.389937	0.487809	0	1
USA	3339	0.031447	0.174547	0	1
Dummy Variables for US					
Israel	3528	0.005952	0.076933	0	1
Egypt	3528	0.005952	0.076933	0	1
GDP per capita					
Population	2822	2.82E+07	1.20E+08	14000	1.28E+09
Education	1888	12.2899	11.87509	0.11	82.03
Infrastructure Index	3024	-4.8695	-87.6937	-3908.004	4.8339
Technology Index	3024	-0.01602	0.203505	-0.3231	1
Military Expenditure	3024	1.568985	3.675508	0	117.3
Corruption Index	1735	59.18968	13.1615	14	91.25
Democracy Index	2908	4.166094	1.893562	1	7
UN	3008	0.274109	0.323919	0	10.7

Table 5: Tobit Results for Big Donors(1985-2004)

	USA			UK			FRANCE			ITALY		
	1	2	3	1	2	3	1	2	3	1	2	3
GDP per capita	-0.92599 (7.35)***	-0.82851 (3.65)***	-0.95484 (5.64)***	-0.5589 (8.42)***	-0.67851 (6.29)***	-0.56348 (7.81)***	-0.18768 (2.84)***	-0.1958 (2.06)***	-0.1886 (2.42)***	-0.47844 (5.66)***	-0.62812 (3.66)***	-0.64283 (3.65)***
POPULATION	0.03426 (0.34)	-0.03886 (0.30)	-0.05445 (0.45)	0.35538 (6.10)***	0.33579 (4.48)***	0.45796 (9.58)***	0.33416 (5.62)***	0.43356 (6.47)***	0.39161 (7.30)***	0.04051 (0.45)	0.28405 (2.65)***	0.20694 (1.72)*
TRADE	0.15426 (3.08)***	0.16634 (1.93)*	0.21305 (3.70)***	0.08324 (2.27)**	0.14238 (2.61)***	0.08151 (2.23)**	0.10169 (2.79)***	0.08054 (1.79)*	0.1345 (3.63)***	0.10112 (2.15)**	0.02453 (0.33)	0.11742 (1.77)*
DEMOCRACY	-0.23991 (6.45)***	-0.28015 (5.67)***	-0.24455 (6.04)***	-0.10642 (4.77)***	-0.13396 (4.84)***	-0.10317 (4.51)***	-0.03844 (1.76)*	-0.03826 (1.35)	-0.04661 (1.88)*	-0.08481 (2.58)***	-0.13402 (2.83)***	-0.11491 (2.96)***
UN	-0.28837 (0.99)	-0.1306 (0.30)	-0.01621 (0.05)									
COLONY	0.85666 (0.81)	0.37574 (0.31)	0.42681 (0.36)	1.05011 (6.30)***	0.91923 (5.08)***	1.06028 (7.64)***	2.21813 (10.33)***	2.34086 (11.02)***	2.10905 (9.92)***	1.45501 (1.28)	1.02111 (0.85)	0.98188 (0.78)
EGYPT	4.63063 (3.14)***	4.66328 (2.80)***	4.24841 (11.43)***									
ISRAEL	4.08861 (2.72)***	3.53625 (2.05)**	5.09163 (3.01)***									
MILITARY EXP.	-0.00269 (0.17)	-0.00343 (0.16)	0.00997 (0.62)	0.01793 (2.10)**	0.00357 (0.37)	0.01969 (2.40)**	0.00411 (0.51)	0.00899 (0.97)	0.00602 (0.74)	-0.01361 (1.03)	0.00813 (0.46)	-0.01489 (0.99)
CORRUPTION	-0.01076 (2.38)**	-0.02192 (3.53)***	-0.01658 (3.26)***	0.00861 (3.49)***	0.01051 (3.24)***	0.01008 (3.84)***	0.00418 (1.72)*	0.007 (2.04)**	0.00812 (2.81)***	-0.0366 (9.76)***	-0.02443 (4.34)***	-0.02414 (5.03)***
TECHNOLOGY		0.38922 (0.57)	-0.08688 (0.14)		0.25394 (0.71)	0.21462 (0.72)		0.22561 (0.56)	0.26584 (0.80)		2.40333 (3.61)***	2.37956 (4.38)***
INFRASTRUCTURE		-0.00042 (1.86)*	-0.00044 (1.95)*		-0.00008 (0.61)	-0.00009 (0.71)		0.00012 (0.84)	0.00014 (0.95)		0.00029 (1.23)	0.00031 (1.34)
EDUCATION		-0.01294 (1.17)	-0.0249 (2.75)***		0.00486 (0.85)	-0.00331 (0.70)		-0.01038 (1.83)*	-0.01229 (2.43)**		-0.00526 (0.53)	-0.01997 (2.28)**
DON. SURPLUS		0.08866 (4.90)***			0.00404 (0.59)			-0.00735 (0.45)			0.00579 (0.54)	
Constant	9.04417 (4.56)***	10.73228 (3.70)***	10.84095 (4.53)***	-1.27438 (1.12)	-0.36892 (0.25)	-2.88719 (3.01)***	-2.91869 (2.50)**	-4.35488 (3.26)***	-3.97128 (3.88)***	5.88387 (3.53)***	3.0784 (1.45)	4.00509 (1.52)
LogLikelihood	-2097.7552	-1067.6467	-1633.2805	-1608.6954	-756.4657	-1185.5795	-1712.8914	-849.3736	-1355.9069	-2085.6407	-1109.9547	-1701.1215
σ_u	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	1.4405	1.6186	1.5672	0.7508	0.6546	0.7274	0.7874	0.8132	0.7754	1.0848	1.1266	1.1882
σ_e	13.2700	12.5000	12.4100	12.6300	10.7800	13.5400	12.2800	12.8100	13.0100	12.7700	10.0900	9.9800
	1.0825	1.0142	1.0218	0.6801	0.5953	0.6067	0.6909	0.6350	0.6760	1.0691	1.0564	1.0628
	47.0600	33.0400	41.7300	49.0800	34.3100	44.0400	51.5500	36.0500	46.0000	48.1900	34.2400	43.0900
ρ	0.6391	0.7181	0.7017	0.5493	0.5473	0.5897	0.5650	0.6212	0.5682	0.5073	0.5321	0.5556
Observations	1460	753	1170	1505	770	1197	1506	771	1198	1505	770	1197
Number of id	91	77	91	92	78	92	92	78	92	92	78	92

Method of estimation: Random-effects Tobit model ρ ho: standard deviation of the random effects/standard deviation of residuals;

σ_{μ} : panel level standard deviation;

σ_{ϵ} : standard deviation of the errors;

$\ln \sigma$: variance of the reduced-form equation for the endogenous regressor;

ρ : correlation between the errors in the probit equation and the reduced-form equation for the endogenous regressor;

Standard errors are displayed below the coefficients and z provides information regarding the statistical significance of the variables.

Table 6: Tobit Results for Other Donors (1985-2004)

	JAPAN			GERMANY			NETHERLANDS			SPAIN		
	1	2	3	1	2	3	1	2	3	1	2	3
GDP per capita	-0.41371 (4.52)***	-0.23216 (1.48)	-0.33171 (2.63)***	-0.35155 (5.06)***	-0.35338 (3.38)***	-0.38865 (4.43)***	-0.86376 (10.48)***	-0.7183 (5.98)***	-0.73253 (6.35)***	-0.99492 (7.39)***	-1.08118 (4.44)***	-0.99413 (4.97)***
POPULATION	0.54768 (7.17)***	0.80465 (7.51)***	0.6171 (6.92)***	0.3839 (6.26)***	0.56433 (7.11)***	0.42071 (6.26)***	0.07852 (1.15)	0.23091 (2.55)**	0.18199 (2.22)**	0.30194 (2.99)***	0.02163 (0.13)	-0.07023 (0.55)
TRADE	0.14322 (3.12)***	-0.01896 (0.28)	0.19935 (3.61)***	0.18165 (4.89)***	0.02377 (0.39)	0.19422 (4.43)***	0.17864 (4.09)***	0.03984 (0.56)	0.17332 (3.55)***	0.20159 (2.22)**	0.33741 (2.24)**	0.39712 (3.40)***
DEMOCRACY	-0.12735 (4.10)***	-0.17833 (4.37)***	-0.16534 (4.83)***	-0.07744 (3.56)***	-0.09595 (3.29)***	-0.0949 (3.83)***	-0.14452 (5.76)***	-0.15096 (4.29)***	-0.15129 (5.05)***	-0.06306 (1.10)	-0.07112 (0.72)	-0.08577 (1.13)
COLONY	1.70983 (1.57)	3.2221 (2.60)***	2.54316 (2.31)**				1.92453 (2.79)***	1.93207 (2.49)**	1.47102 (1.88)*	1.81497 (6.40)***	1.53012 (4.16)***	1.32871 (4.42)***
MILITARY EXP.	-0.00203 (0.18)	0.03138 (2.20)**	0.00958 (0.82)	0.00559 (0.72)	0.00999 (1.03)	0.00175 (0.22)	-0.0089 (0.85)	-0.00753 (0.58)	-0.00316 (0.28)	0.01967 (0.76)	0.05954 (1.47)	0.04959 (1.61)
CORRUPTION	0.02381 (7.07)***	0.03183 (6.67)***	0.03213 (7.96)***	-0.00252 (1.08)	0.00291 (0.85)	0.00223 (0.78)	-0.00571 (2.07)**	-0.00637 (1.59)	-0.00273 (0.79)	0.13226 (15.92)***	0.11749 (8.00)***	0.11114 (9.88)***
TECHNOLOGY		0.39675 (0.69)	-0.589 (1.28)		0.60611 (1.46)	0.25825 (0.77)		0.30644 (0.62)	-0.05224 (0.13)		-7.79531 (3.40)***	-7.60181 (6.92)***
INFRASTRUCTURE		0.00034 (1.69)*	0.00033 (1.61)		0.00005 (0.36)	0.00009 (0.64)		0.00023 (1.33)	0.00032 (1.90)*		-0.00056 (1.23)	-0.00058 (1.42)
EDUCATION		-0.03378 (4.38)***	-0.02875 (4.05)***		0.00298 (0.48)	-0.0078 (1.44)		0.00051 (0.07)	-0.01319 (1.98)**		0.08072 (5.62)***	0.07281 (6.10)***
DON. SURPLUS		-0.01812 (1.86)*			0.00401 (0.22)			-0.01595 (1.03)			0.00661 (0.12)	
Constant	-4.79654 (3.24)***	-9.10753 (4.33)***	-6.68535 (3.76)***	-1.47073 (1.25)	-3.68739 (2.50)**	-1.84612 (1.42)	6.31142 (5.21)***	3.50071 (2.13)**	3.68855 (2.30)**	-7.58689 (3.80)***	-4.82822 (1.62)	-3.31376 (1.34)
LogLikelihood	-2231.8945	-1112.6457	-1747.5200	-1625.1575	-847.0692	-1327.8219	-1725.1732	-893.7173	-1373.4022	-1455.1575	-583.4573	-948.5397
σ_u	1.0349 12.9500	1.1345 10.9900	1.0154 12.3100	0.7599 11.6100	0.7606 11.2300	0.7518 12.4000	0.9384 13.6000	0.9423 11.9300	1.0108 12.2000	1.0674 8.7800	0.7571 6.2200	0.8058 7.4700
σ_e	0.9929 51.5600	0.9076 36.2700	0.9497 46.0200	0.6725 52.0300	0.6549 36.5000	0.6737 46.3400	0.7898 47.1900	0.7665 33.2000	0.7723 42.0900	1.6718 28.2900	2.0460 15.8900	1.8714 21.2600
ρ	0.5207	0.6098	0.5334	0.5608	0.5743	0.5547	0.5854	0.6018	0.6314	0.2896	0.1204	0.1564
Observations	1505	771	1198	1455	750	1172	1495	763	1190	1550	796	1232
Number of id	92	78	92	93	79	93	91	77	91	94	80	94

Method of estimation: Random-effects Tobit model ρ : standard deviation of the random effects/standard deviation of residuals;

σ_u : panel level standard deviation;

σ_e : standard deviation of the errors;

$\ln \sigma$: variance of the reduced-form equation for the endogenous regressor;

$athan\rho = \frac{1}{2} \ln \left(\frac{1+\rho}{1-\rho} \right)$: correlation between the errors in the probit equation and the reduced-form equation for the endogenous regressor;

Standard errors are displayed below the coefficients and z provides information regarding the statistical significance of the variables.

Table 7: Tobit Results for Scandinavian Donors (1985-2004)

	SWEDEN		FINLAND		DENMARK		NORWAY			
	1	2	3	1	2	3	1	2	3	
GDP per capita	-0.57759 (6.04)***	-0.8259 (5.26)***	-0.80539 (6.58)***	-0.33366 (5.05)***	-0.55295 (4.44)***	-0.62137 (6.16)***	-0.23971 (2.13)***	-0.4836 (2.58)***	-0.42243 (2.58)***	-0.65107 (9.13)***
POPULATION	0.40516 (6.13)***	0.44008 (4.94)***	0.36694 (4.85)***	0.32495 (6.54)***	0.33856 (4.81)***	0.36049 (6.40)***	0.01255 (0.14)	0.17213 (1.70)*	0.04909 (0.48)	0.36494 (7.32)***
TRADE	0.03299 (0.78)	0.02129 (0.33)	0.07305 (1.43)	0.01269 (0.67)	0.04743 (1.71)*	0.02362 (1.08)	0.11938 (1.72)*	0.0297 (0.35)	0.11787 (1.59)	0.03732 (2.75)***
DEMOCRACY	-0.17304 (5.43)***	-0.19824 (4.34)***	-0.16327 (4.62)***	-0.07633 (2.62)***	-0.09148 (2.11)**	-0.05566 (1.70)*	-0.00556 (0.12)	-0.00986 (0.17)	0.02494 (0.48)	-0.08111 (2.03)**
MILITARY EXP.	-0.00757 (0.59)	0.01031 (0.63)	0.00036 (0.03)	0.04905 (3.33)***	0.06984 (3.64)***	0.06586 (4.10)***	-0.01532 (0.61)	0.01303 (0.42)	-0.02872 (1.11)	-0.02165 (1.89)*
CORRUPTION	0.00333 (0.96)	-0.00375 (0.71)	-0.00386 (0.90)	-0.01173 (3.71)***	-0.00836 (1.72)*	-0.00518 (1.33)	0.00568 (0.95)	0.01489 (1.86)*	0.01506 (2.14)**	0.01442 (3.09)***
TECHNOLOGY		1.7355 (2.59)***	1.71579 (3.22)***		1.3246 (2.44)**	2.21035 (4.79)***		1.03187 (0.89)	1.1071 (1.15)	-3.08236 (5.46)***
INFRASTRUCTURE		0.00037 (1.93)*	0.00031 (1.66)*		0.0004 (0.22)	0.00002 (0.10)		0.00038 (1.62)	0.00044 (1.88)*	-0.00009 (0.48)
EDUCATION		0.02421 (2.61)***	0.02358 (3.08)***		0.00239 (0.31)	0.00009 (0.01)		0.00976 (0.67)	0.01917 (1.41)	0.01886 (2.38)**
DON. SURPLUS		-0.0179 (2.27)**			-0.00596 (0.77)			-0.03558 (1.04)		0.00305 (0.44)
Constant	-1.60173 (1.07)	-0.45395 (0.23)	0.94428 (0.54)	-1.89053 (1.73)*	-0.85793 (0.57)	-0.91426 (0.74)	2.38099 (1.34)	0.86212 (0.43)	2.30889 (1.13)	-2.48779 (2.29)**
										-1.53731 (1.06)
LogLikelihood	-1471.0699	-699.2194	-1086.3588	-1075.4208	-559.8054	-891.1624	-770.9680	-397.8087	-630.2461	-1478.3231
σ_u	1.1660	1.1931	1.3285	0.7169	0.7164	0.7593	0.7944	0.5942	0.8139	0.8223
σ_e	12.6200	10.1100	11.4200	10.9200	9.0100	10.6800	8.8300	6.4800	8.7900	12.2200
ρ	0.9034	0.8561	0.8488	0.7673	0.7734	0.7783	0.9764	0.9416	0.9437	0.8307
	37.0400	24.5600	31.5900	35.8300	24.6800	31.9100	29.5700	21.2800	26.6600	39.7600
	0.6249	0.6602	0.7101	0.4661	0.4618	0.4876	0.3983	0.2848	0.4265	0.4949
Observations	1468	752	1170	1139	590	918	512	273	424	1458
Number of id	92	78	92	92	74	89	73	54	70	93
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Method of estimation: Random-effects Tobit model ρ : standard deviation of the random effects/standard deviation of residuals;

σ_u : panel level standard deviation;

σ_e : standard deviation of the errors;

$\ln \sigma$: variance of the reduced-form equation for the endogenous regressor;

$\text{atan} \rho = \frac{1}{2} \ln \left(\frac{1+\rho}{1-\rho} \right)$: correlation between the errors in the probit equation and the reduced-form equation for the endogenous regressor;

Standard errors are displayed below the coefficients and z provides information regarding the statistical significance of the variables.

Table 8: Heckman Results for Big Donors (1985-2004)

	USA		UK		FRANCE	
	1	2	1	2	1	2
	Aid eligib.	Aid levels	Aid eligib.	Aid levels	Aid eligib.	Aid levels
GDP per capita	-0.7145 (2.70)***	-0.3599 (1.38)	-0.9105 (6.08)***	-0.6134 (4.89)***	-0.7418 (1.72)*	-0.3194 (1.95)*
POPULATION	-0.1427 (1.06)	0.16429 (1.10)	-0.0572 (0.52)	0.18726 (2.83)***	0.18032 (0.84)	0.18015 (1.22)
OPENESS	0.06256 (0.55)	0.09329 (0.70)	0.17187 (1.55)	0.20561 (1.80)*	0.27415 (1.65)*	0.36353 (2.57)**
TECHNOLOGY	-1.838 (1.99)**	1.53338 (1.54)	-0.0897 (0.12)	0.04246 (0.10)	-0.0568 (0.05)	-0.4455 (0.73)
INFRASTRUCTURE	-0.0014 (0.80)	0 (0.03)	-0.0013 (1.32)	-0.0002 (1.47)	-0.0018 (0.98)	0.00021 (1.47)
EDUCATION	0.00447 (0.35)	0.01519 (0.77)	-0.0006 (0.05)	0.00973 (1.40)	-0.0345 (2.14)**	0.00096 (0.11)
DEFICIT		0.05041 (1.77)*		-0.0081 (0.76)		-0.0321 (1.13)
MILITARY EXP.	0.02523 (1.17)	0.02379 (0.58)	-0.0044 (0.21)	0.00196 (0.12)	0.0614 (1.29)	-0.0205 (0.84)
COLONY		0.52363 (0.79)	-0.3549 (1.41)	1.01185 (4.94)***	4.53267 (1.34)	1.73339 (4.46)***
CORRUPTION	-0.0156 (1.75)*	-0.0201 (1.97)**	0.01841 (2.28)**	0.00979 (2.15)**	-0.0369 (1.73)*	0.00315 (0.48)
EGYPT		3.50927 (12.08)***		3.89469 (14.95)***		0.0058 (1.24)
ISRAEL		3.54392 (4.83)***		4.19993 (6.95)***		0.00295 (0.18)
DEMOCRACY	-0.3691 (5.98)***	-0.4002 (4.16)***	-0.3133 (4.77)***		-0.2501 (1.37)	0.08238 (3.46)***
UN	1.26235 (1.56)	1.43351 (1.71)*				1.61999 (4.46)***
Constant	10.0082 (3.56)***	3.80147 (1.25)	8.31402 (4.02)***	0.6224 (0.45)	7.43875 (1.72)*	-0.6854 (0.25)
AT ρ		-0.786 (1.25)		-0.823 (0.45)		-1.0897 (0.25)
LN σ		-2.140 (1.25)		-4.4100 (0.45)		-1.4100 (0.25)
		0.300 (1.25)		-0.134 (0.45)		-0.0295 (0.25)
		3.880 (1.25)		-1.910 (0.45)		-0.3900 (0.25)
Observations	822	822	812	812	777	777
					1224	1224

Method of estimation: Heckman;

 σ_u : panel level standard deviation; σ_e : standard deviation of the errors;ln σ : variance of the reduced-form equation for the endogenous regressor;athan $\rho = \frac{1}{2} \ln \left(\frac{1+\rho}{1-\rho} \right)$: correlation between the errors in the probit equation and the reduced-form equation for the endogenous regressor;

Standard errors are displayed below the coefficients and z provides information regarding the statistical significance of the variables.

Table 9: Heckman Results for Other Donors (1985-2004)

	ITALY			JAPAN			GERMANY		
	1	2		1	2		1	2	
	Aid eligib.	Aid levels	Aid eligib.	Aid levels	Aid eligib.	Aid levels	Aid eligib.	Aid levels	Aid levels
GDP per capita	-0.542 (2.86)***	-0.29708 (1.63)	-0.47306 (1.99)**	0.25326 (0.80)	0.27163 (0.88)	-0.68651 (4.57)**	-0.73589 (2.28)**	-0.38676 (2.39)**	-0.53474 (1.21)
POPULATION	0.30384 (2.12)**	-0.0181 (0.17)	0.34163 (2.07)**	0.50252 (2.50)**	0.56198 (2.72)**	0.27922 (2.88)**	0.05684 (0.32)	0.60095 (5.62)**	0.11851 (0.44)
OPENESS	0.25695 (2.27)**	0.06384 (0.72)	0.27339 (2.09)**	-0.11095 (0.80)	-0.12183 (0.80)	0.38756 (4.59)**	0.49678 (2.63)**	-0.07657 (0.75)	0.50158 (2.72)**
TECHNOLOGY	-0.54337 (1.09)	1.38505 (1.65)*	-1.03576 (1.55)	1.39264 (1.51)	-1.17024 (1.12)	-1.58176 (2.90)**	-0.65209 (0.48)	0.97423 (1.17)	-1.23545 (0.91)
INFRASTRUCTURE	0.0052 (2.07)**	0.00015 (1.18)	0.00075 (2.73)**	0.00019 (1.41)	-0.00598 (0.99)	0.00043 (3.37)**	0.00022 (0.07)	0.00012 (1.00)	0.00028 (0.08)
EDUCATION	-0.00747 (1.07)	0.00258 (0.24)	-0.0108 (0.97)	-0.00271 (0.25)	-0.0428 (2.63)**	0.02582 (2.50)**	-0.05126 (2.47)**	0.02809 (2.67)**	-0.06121 (3.16)**
DEFICIT		0.02066 (1.18)			-0.01208 (0.70)			0.01383 (0.52)	
MILITARY EXP.	-0.03242 (1.70)*	0.05088 (2.52)**	-0.02133 (0.93)	0.02087 (0.50)	0.01861 (0.39)	-0.06345 (2.91)**	0.0607 (1.48)	-0.0081 (0.27)	0.0669 (1.17)
COLONY		1.25409 (3.41)**		1.32437 (4.25)**	0.15015 (0.17)	0.93026 (1.80)*			
CORRUPTION	-0.00897 (1.34)	-0.01988 (2.48)**	-0.00972 (0.98)	-0.01622 (1.15)	-0.01465 (0.95)	0.03928 (6.09)**	-0.05987 (4.43)**	0.00596 (1.30)	-0.06204 (5.21)**
DEMOCRACY	-0.22692 (4.08)***	-0.26169 (3.23)**	-0.26169 (3.23)**	-0.24311 (1.65)*	-0.21695 (1.31)		-0.35807 (2.64)**		-0.39777 (2.65)**
Constant	0.48237 (0.16)	5.27364 (2.57)**	-0.25872 (0.07)	-4.54868 (1.09)	-5.58932 (1.36)	-1.23659 (0.62)	10.37087 (2.66)**	-4.21681 (2.06)**	8.55669 (1.38)
AT ρ		-0.9817		-0.8667		-0.9617		-0.9377	-0.7761
LN σ		-4.8700		-4.4600		-2.0600		-3.6300	-1.9700
		0.3724		0.3391		0.2515		-0.0002	0.0054
		8.16		7.77		5.65		0.00	0.10
Observations	840	840	1197	776	1198	1198	778	778	1200

Method of estimation: Heckman;

σ_u : panel level standard deviation;

σ_e : standard deviation of the errors;

ln σ : variance of the reduced-form equation for the endogenous regressor;

$athan\rho = \frac{1}{2} \ln \frac{(1+\rho)}{(1-\rho)}$: correlation between the errors in the probit equation and the reduced-form equation for the endogenous regressor;

Standard errors are displayed below the coefficients and z provides information regarding the statistical significance of the variables.

Table 10: Heckman Results for Other Donors (1985-2004)

	NETHERLANDS			SPAIN			NORWAY		
	1	2		1	2		1	2	
	Aid eligib.	Aid levels	Aid eligib.	Aid levels	Aid eligib.	Aid levels	Aid eligib.	Aid levels	Aid eligib.
GDP per capita	-0.83585 (5.56)***	-0.42149 (2.12)**	-0.84232 (5.43)***	-0.48377 (2.76)***	-0.11293 (4.49)***	0.51828 (2.47)**	-0.69534 (6.43)***	-0.36411 (3.22)***	-0.62568 (5.06)***
POPULATION	0.04568 (0.34)	0.3329 (2.40)**	0.05893 (0.44)	0.2636 (1.94)*	0.09581 (0.62)	0.13379 (0.13)	0.13547 (2.13)**	0.134 (1.57)	0.1226 (1.59)
OPENESS	0.17927 (1.96)**	-0.14631 (1.16)	0.19205 (1.98)**	-0.06634 (0.52)	0.28152 (1.95)*	0.09653 (0.77)	0.08423 (2.33)**	0.07326 (1.30)	0.10005 (2.38)**
TECHNOLOGY	-0.08954 (0.15)	1.7098 (3.11)***	-0.14916 (0.27)	1.19794 (1.98)**	-3.94813 (4.43)***	0.10917 (0.07)	-2.73875 (2.79)***	0.6341 (0.69)	-2.71132 (3.48)***
INFRASTRUCTURE	-0.00019 (0.79)	0.00019 (0.92)	-0.00003 (0.11)	0.00017 (0.87)	0.00009 (0.11)	0.00103 (5.25)***	-0.00853 (2.49)**	-0.00008 (0.68)	-0.00076 (1.97)**
EDUCATION	0.0078 (1.05)	0.01215 (0.93)	0.00665 (0.89)	0.00689 (0.57)	0.00188 (4.61)***	-0.03944 (2.35)**	0.01795 (2.00)**	0.00809 (1.03)	0.01301 (1.31)
DEFICIT		-0.03368 (1.50)			0.08193 (1.76)*			0.0085 (0.88)	
MILITARY EXP.	-0.01601 (0.85)	0.00744 (0.32)	-0.01003 (0.57)	0.01955 (0.88)	0.01156 (0.42)	0.06136 (1.68)*	-0.04787 (2.66)***	0.04189 (1.10)	-0.02786 (1.24)
COLONY	0.12391 (0.32)	1.36219 (2.30)**	-0.0772 (0.22)	1.4262 (2.42)**	1.93866 (3.54)***				
CORRUPTION	-0.01769 (2.01)**	0.00499 (0.60)	-0.01745 (2.10)**	0.0073 (0.95)	0.03099 (0.57)	-0.04167 (2.77)**	0.02573 (3.44)***	-0.01017 (1.18)	0.02135 (2.97)***
DEMOCRACY	-0.31727 (4.94)***		-0.34814 (5.79)***		-0.0657 (1.30)		-0.16186 (3.18)***		-0.17278 (3.25)***
Constant	7.68075 (3.38)***	-0.21877 (0.09)	7.80955 (3.22)***	0.85143 (0.36)	-4.23724 (1.33)	-0.32243 (0.11)	1.57737 (1.11)	1.84094 (0.92)	1.83625 (1.09)
AT ρ		-1.1277		-1.2075	0.6540	-1.0962		-0.3307	
LN σ		-2.6800		-3.4000	0.4400	-5.0000		-1.3900	
		0.2268		0.2300	0.1925	0.4763		-0.0709	
		3.1100		4.2600	0.4000	5.8200		-0.9600	
Observations	845	845	1198	1198	1104	1232	908	908	1153

Method of estimation: Heckman;

 σ_u : panel level standard deviation; σ_e : standard deviation of the errors;ln σ : variance of the reduced-form equation for the endogenous regressor; $athan\rho = \frac{1}{2} \ln \left(\frac{1+\rho}{1-\rho} \right)$: correlation between the errors in the probit equation and the reduced-form equation for the endogenous regressor;

Standard errors are displayed below the coefficients and z provides information regarding the statistical significance of the variables.

Table 11: Heckman Results for Scandinavian Donors (1985-2004)

	FINLAND		SWEDEN		DENMARK	
	1	2	1	2	1	
	Aid eligib.	Aid levels	Aid eligib.	Aid levels	Aid eligib.	Aid levels
GDP per capita	-0.67114 (4.78)***	-0.38041 (3.07)***	-0.63473 (4.64)***	-0.41667 (3.32)***	-0.59504 (3.74)***	-0.43014 (3.32)***
POPULATION	0.37053 (4.13)***	0.07752 (0.80)	0.38432 (4.63)***	0.07573 (0.87)	0.01393 (0.13)	-0.17608 (2.44)**
OPENESS	0.06478 (1.60)	0.03921 (0.91)	0.06362 (1.67)*	0.0199 (0.54)	0.26533 (3.28)***	0.03394 (0.49)
TECHNOLOGY	0.33452 (0.64)	2.30105 (3.28)***	0.44158 (0.79)	2.25463 (3.47)***	-1.26677 (2.10)**	1.96804 (1.28)
INFRASTRUCTURE	-0.00184 (0.71)	0.00017 (2.54)**	-0.00302 (1.78)*	0.00013 (1.88)*	-0.008 (2.21)**	0.00036 (0.58)
EDUCATION	0.0175 (1.94)*	-0.00632 (0.69)	0.01403 (1.51)	-0.00807 (0.98)	0.0122 (1.23)	-0.00102 (0.11)
DEFICIT		-0.00041 (0.04)		0.00004 (0.00)		-0.00489 (0.13)
MILITARY EXP.	0.05137 (1.99)**	0.01297 (0.53)	0.05543 (2.16)**	0.00021 (0.01)	-0.00257 (0.09)	-0.00886 (0.40)
CORRUPTION	-0.00273 (0.37)	-0.00756 (1.18)	-0.00251 (0.40)	-0.00274 (0.47)	-0.01746 (2.31)**	0.01232 (0.21)
DEMOCRACY	-0.1126 (2.04)**	-0.11083 (2.04)**	-0.11083 (2.04)**	-0.30479 (5.68)***	-0.2739 (4.50)***	-0.09811 (1.65)*
Constant	-0.89078 (0.48)	2.98394 (1.64)	-1.05802 (0.62)	3.06713 (1.77)*	5.07397 (2.11)**	-0.15388 (0.09)
AT ρ		-0.472 (2.750)		-0.466 (2.990)		-0.745 (1.63)
LN σ		-0.025 (0.280)		-0.004 (0.060)		-0.15388 (1.63)
Observations	697	697	918	918	1172	1022

Method of estimation: Heckman;

σ_u : panel level standard deviation;

σ_e : standard deviation of the errors;

$\ln \sigma$: variance of the reduced-form equation for the endogenous regressor;

$atan \rho = \frac{1}{2} \ln \left(\frac{1+\rho}{1-\rho} \right)$: correlation between the errors in the probit equation and the reduced-form equation for the endogenous regressor;

Standard errors are displayed below the coefficients and z provides information regarding the statistical significance of the variables.