DOES FOREIGN AID DISTORT INCENTIVES AND HURT GROWTH?

Theory and evidence

by

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November 30, 2003

Abstract: This paper studies the effects of international transfer payments on the growth of recipient countries in the context of distorted incentives. We develop an otherwise standard general equilibrium model of long-term growth that distinguishes two effects from aid: (i) a direct positive effect, as higher transfers allow the financing of infrastructure and benefit growth; (ii) an indirect negative effect, as higher transfers also distort individuals' incentives, induce rent-seeking behavior and harm growth. In this framework, the growth impact of aid is examined jointly with the determination of rent seeking behavior. We test the main predictions of the model for a cross-section of 75 aid-recipient countries between 1975 and 1995. There is evidence that aid has a direct positive effect on growth, which is however significantly mitigated by the adverse effects of associated rent-seeking activities.

Keywords: Foreign aid. Incentives. Growth.
JEL classification numbers: F35, D7, D9, H2.

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Acknowledgements: We thank Costas Angelopoulos for excellent research assistance and many helpful comments. We have also benefited from suggestions by Panos Hatzipanayotou, Jim Malley, Thomas Moutos, Hyun Park, Albrecht Ritschl, Vangelis Vassilatos, and from disussions with seminar participants at the CESifo-Delphi conference on 'Designing the new EU', Munich. All errors are ours.

1. Introduction

A puzzle in the area of foreign aid transfers is that their effects on the recipient countries' economic growth are, at best, ambiguous. Despite earlier optimistic expectations, the success of aid programs has been largely disappointing: few recipient countries have managed to experience large growth rates and increase their productivity, whereas in many cases aid has failed to boost growth rates.[1]

A prevalent explanation seems to be that foreign aid is often misused and misappropriated by the recipient countries. In particular, a common argument is that aid may foster corruption and induce rent seeking in the recipient country. In this paper, we revisit this issue by studying, both theoretically and empirically, the joint determination of economic growth and rent-seeking behavior when the driving force is foreign aid.

As a first step, we build an otherwise standard general equilibrium model of growth that distinguishes two effects of foreign transfer payments: (i) a direct positive effect upon growth through the financing of infrastructure and other productive activities; (ii) an indirect negative effect upon growth through the distortion of individuals' incentives; the focus will be on rent-seeking competition for a share of the "pie" (the pie being here foreign aid transfers). Under certain conditions (depending on the relation between the magnitude of foreign aid as well as the size and functioning of the recipient country's public sector), we show that foreign aid initiates a growth-impeding redistributive struggle on the part of self-interested individuals, which counterbalances the manna-from-heaven effect that foreign aid is anticipated to have upon economic growth.

We test these predictions by using data for a pooled cross-section of 75 aid-recipient countries between 1975 and 1995 for which proxies of rent-seeking behavior are available. Our econometric results indicate that when growth and rent seeking are examined jointly with aid transfers, a rise in the latter exerts *ceteris paribus* a positive effect on growth. However, this positive effect is mitigated by an endogenous rise in rent-seeking activities triggered by the same rise in aid. Thus, after the induced distortion on incentives is taken into account, the net growth effect of aid is substantially smaller compared to the direct positive effect. Moreover, in accordance with the theory, we find that the deleterious effect of aid upon incentives appears particularly strong in recipient countries with "large" public sectors.

[1] See e.g. Drazen (2000, chapter 12.9) for a good survey of theoretical issues. Empirical studies on the growth impact of foreign aid include, among others, Mosley et al. (1987), Boone (1996), World Bank (1998) and Easterly (2001). Recently, Moreira (2003) has surveyed the relevant empirical evidence from cross-country regression studies and has found that out of seventy-two regressions the estimated effect is positive in forty regressions, non-significant in thirty-one and negative in one regression.

As mentioned above, the effects of foreign aid have been studied extensively in previous studies. Regarding the aid-corruption nexus, Alesina and Weder (2000) point out that foreign aid fosters corruption by increasing the size of resources that interest groups fight over. Svensson (2000) develops a game-theoretic model with rent seeking and shows how a cooperative solution, namely one without rent seeking, can be achieved if the game is repeated. Svensson's paper is closest in spirit to ours. Nevertheless, our theoretical model differs because we work in a rather standard general equilibrium model of endogenous growth. Specifically, based on the literature initiated by Barro (1990), we assume that the government uses domestic tax revenues, as well as foreign aid in the form of redistributive transfers from abroad, to finance the provision of public infrastructure. We feel that this is the idea behind most international transfer programs. We also get an analytic and testable solution that clearly distinguishes the direct and indirect effects of aid upon the macro-economy and rent-seeking incentives.

On the empirical counterpart, the existing econometric studies have so far focused on the bivariate relations between aid and corruption (see e.g. Svensson, 2000, Alesina and Weder, 2002, Tavares, 2003), growth and aid (see footnote 1) and growth and corruption (see e.g. Mauro, 1995, Knack and Keefer, 1995). Our paper bridges a gap between these empirical relations by examining the joint determination of endogenous rent-seeking behavior and economic growth in the presence of aid transfers. To our knowledge, there has been no attempt so far to examine these connections in an empirically unified framework.

The findings of the paper may help to explain why past studies were frequently unsuccessful in establishing a substantial positive impact of aid on growth, as aid-induced rent-seeking activities were typically ignored in theoretical and empirical modeling. The paper may also offer a potential resolution for the "micro-macro paradox" (Mosley, 1986), according to which aid is found to impact positively when it is evaluated at firms' investment level by means of cost-benefit project analysis, whereas this positive effect largely evaporates at the level of cross-country regression studies.

The rest of the paper is organized as follows. Section 2 presents the theoretical model and describes the properties of the competitive equilibrium. Section 3 outlines the econometric framework and describes the data utilized. Section 4 presents the econometric evidence. Section 5 concludes the paper.

2. The theoretical model

This section presents a general equilibrium model of growth in which foreign aid can trigger rent-seeking behavior. We will first discuss the key features of the model and then turn to formal modeling.

2.1. Informal description of the model

The main features of the model are as follows: (a) The government uses domestic tax revenues and foreign aid transfers to finance the provision of public production services. The latter provide a positive production externality to private firms and hence are the engine of long-term growth as in Barro (1990). (b) Only a fraction of foreign aid transfers can be actually used to finance public production services. The rest is extracted by rent seeking individuals. Specifically, we assume that private agents have the power to extract from total foreign transfers to increase their own personal wealth. In doing so, they compete with other private agents. This appropriative competition is modeled as a non-cooperative (Nash) game among selfish individuals. (c) Appropriation comes at a private cost.[2] Specifically, it requires labor effort. Thus, each private agent chooses optimally (in addition to consumption and saving) the allocation of its labor effort to work and appropriative activities.[3] (d) The amount of foreign aid appropriated by each individual is proportional to the effort he, or she, allocates to the appropriative competition relative to the total effort allocated to appropriative competition by all individuals. (e) The economy is small so that it takes the rest of the world as given. For simplicity, there is only one cross-country effect and this is generated by foreign aid. (f) We assume infinite-time horizons, continuous time and certainty.

We will now model the above story.

2.2. Firms' behavior

Firms are indexed by $i \in I$ and are modeled as in Barro and Sala-i-Martin (1995, chapter 4). Each firm i maximizes profits, π^i:

$$\pi^i = (1-\theta)y^i - rk^i - wl^i \tag{1}$$

[2] Extracting transfers and favors from the government, breaking the law, bribing, lobbying, etc, are costly activities.

[3] The idea is as in Baumol (1990), Murphy et al. (1991), Grossman and Kim (1996), Park et al. (2003), where individuals decide how to allocate their activities between "productive" ones (such as work, innovation, entrepreneurship) and "unproductive" ones (such as rent seeking and poaching).

where $0 < \theta < 1$ is a proportional output tax rate;[4] y^i is output produced by firm i; k^i and l^i are respectively capital and labor used by firm i; and r and w are respectively the market interest rate and wage rate.

At the firm's level, the production function is:

$$y^i = A(k^i)^{\alpha}(l^i)^{1-\alpha}G^{1-\alpha} \tag{2}$$

where G is aggregate public production services, and $A > 0$ and $0 < \alpha < 1$ are parameters.

Each firm i acts competitively by taking prices (r, w) and economic policy (θ, G) as given. The first-order conditions for k^i and l^i are respectively:

$$r = (1-\theta)\alpha\frac{y^i}{k^i} \tag{3a}$$

$$w = (1-\theta)(1-\alpha)\frac{y^i}{l^i} \tag{3b}$$

2.3. Households' behavior

Households are also indexed by $i \in I$. Each household i maximizes intertemporal utility:

$$U((c^i) = \int_0^{\infty} \log(c^i)e^{-\rho t} \tag{4}$$

where c^i is private consumption and $\rho > 0$ is the discount factor.

Households save in the form of capital, k. The flow budget constraint of household i is:[5]

$$\dot{k}^i + c^i = rk^i + w\eta^i h^i + \frac{(1-\eta^i)h^i}{\sum_{i=1}^{I}(1-\eta^i)h^i}\Delta T \tag{5}$$

where $0 < \eta^i \leq 1$ is the fraction of time (h^i) that household i allocates to work; $0 \leq (1-\eta^i) < 1$ is the fraction of h^i that household i allocates to the appropriative competition; T is foreign transfers (for which private agents compete each other); and

[4] The assumed type of distortionary taxation is not important for the results derived later on.

$0 \leq \Delta < 1$ is the economy-wide degree of extraction (see below for its determination at economy-wide level). Note that a positive value of Δ presupposes weak public institutions in the sense that an amount ΔT of foreign aid can be stolen with each agent i attempting to extract a fraction of ΔT.[6]

Household i acts competitively by choosing the paths of c^i, k^i, η^i, h^i, and by taking prices (r, w), economic policy (θ, G, T), and aggregate activity $(\sum_{i=1}^{I}(1-\eta^i)h^i, \Delta)$ as given.[7] Without loss of generality, we set $h^i \equiv 1$, i.e. total effort is equal to one in each time period. Then, the first-order conditions for consumption, saving and extraction, c^i, k^i, η^i, give:

$$\dot{c}^i = c^i(r-\rho) \tag{6a}$$

$$w = \frac{\Delta T}{\sum_{i=1}^{I}(1-\eta^i)} \tag{6b}$$

where (6a) is a standard Euler equation and (6b) implies that net returns from work and appropriative competition should be equal for the agent to be in equilibrium.

2.4. The government budget constraint

Assuming a balanced budget at each point of time, the government's budget constraint in each time-period is:

$$G = \theta\sum_{i=1}^{I} y^i + (1-\Delta)T \tag{7}$$

where $\theta\sum_{i=1}^{I} y^i$ is total domestic tax revenue. Hence, public services (G) are financed by domestic tax revenues and the fraction of foreign aid that is not captured by rent seekers, $(1-\Delta)T$.

[5] A dot over a variable denotes time derivative.
[6] For similar modeling, see e.g. Murphy et al. (1991), Grossman (2000) and Park et al. (2003). This is also the extraction technology used extensively by the literature on natural resources; see e.g. Dasgupta and Heal (1979).
[7] We could assume that each individual internalizes the effects of his own actions on aggregate outcomes. This is not important for the current setup and, hence, we prefer to keep the algebra as simple as possible.

2.5. Decentralized competitive equilibrium

In this subsection we solve for a Decentralized Competitive Equilibrium (DCE). To this end, we have to specify the amount of foreign aid (*T*) and the economy-wide degree of extraction (Δ). We start with *T* by assuming that in equilibrium:

$$T = \mu(\bar{y} - y) \tag{8a}$$

where $\mu > 0$ is a redistributive parameter. According to (8a), foreign transfers paid to a country are a fraction of the deviation of the country's income, y, from worldwide average income, $\bar{y}$. Thus, if $\bar{y} > y$, the country is a recipient in the world economy; if $\bar{y} < y$, the country is a donor.[8] Here, the analysis will be in terms of a recipient country. Since the rest of the world is taken as given, we assume without loss of generality:

$$\bar{y} = \lambda y \tag{8b}$$

where $\lambda > 1$ is a measure of inequality between the domestic economy and the rest of the world.[9] Obviously, λ depends on a number of socio-economic factors, whose specification is an empirical matter (see e.g. Williamson, 1998). We will return to this issue in the empirical section below. In this section, we will solve for a DCE given the value of λ. Combining (8a) and (8b), the foreign aid-to-output ratio is given by:

$$\frac{T}{y} \equiv \tau = \mu(\lambda - 1) \tag{8c}$$

where $\tau \geq 0$ will be called the effective redistributive parameter.

Turning to the economy-wide degree of extraction, Δ, we assume that in equilibrium Δ is a positive function of the total time spent in extraction activities:[10]

$$\Delta \equiv f\left(\sum_{i=1}^{I}(1-\eta^i)\right) = f(1-\eta) \tag{8d}$$

[8] See Park and Philippopoulos (2003) and the references cited there for similar state-contingent redistributive rules. Assumption (8a) is consistent with the idea of several institutional arrangements on aid transfers, like those of the Structural Funds in the EU.

[9] We set $\lambda > 1$ because, as mentioned above, our analysis will be in terms of a recipient country. It is important to point out that the assumed functional specification in (8a) and (8b) does not violate the log-linear structure of the underlying model, and hence allows us to get a convenient closed-form analytical solution for the competitive equilibrium in (9a)-(9c) below. This is as Barro (1990) type models.

[10] See also e.g. Zak and Knack (2001), Mauro (2002) and Park et al. (2003).

where $f'(.) > 0, f''(.) \leq 0$.[11] To keep in line with the linear *AK* structure of the model, we postulate - without loss of generality - a linear function for Δ of the form:

$$\Delta = \delta(1-\eta) \tag{8e}$$

where the parameter $\delta \geq 0$ translates rent-seeking effort into extraction from state coffers. Notice that it must always be $0 \leq \Delta < 1$.

We can now solve for a DCE. This is defined to be a Nash equilibrium in individuals' decisions in which: (i) each individual firm maximizes its own profits; (ii) each individual household maximizes its own utility by taking as given the actions of other individuals; (iii) all constraints are satisfied and all markets clear. For simplicity, we will focus on a symmetric DCE, i.e. in equilibrium private agents (firms and households) are alike. Thus, from now on, the superscript *i* will be omitted. Also, for simplicity, we set *I* = 1, i.e. there is one firm and one household. It is easy to show that equations (1)-(8) give:

$$\dot{c} = c\left[(1-\theta)\alpha A^{\frac{1}{\alpha}}\eta^{\frac{1-\alpha}{\alpha}}\left[\theta+(1-\delta)\tau\right]^{\frac{1-\alpha}{\alpha}} - \rho\right] \tag{9a}$$

$$\dot{k} = \left[1-\theta+\delta\tau\right]A^{\frac{1}{\alpha}}\eta^{\frac{1-\alpha}{\alpha}}\left[\theta+(1-\delta)\tau\right]^{\frac{1-\alpha}{\alpha}}k - c \tag{9b}$$

$$\eta = \frac{(1-\alpha)(1-\theta)}{\delta\tau} \tag{9c}$$

Equations (9a), (9b) and (9c) determine the paths of (c, k, η) for any feasible domestic economic policy, as summarized by the income tax rate $0 < \theta < 1$, and any degree of foreign aid, as summarized by the effective redistributive parameter $\tau \geq 0$.

An advantage of the model is its simplicity.[12] Equation (9c) is an equation in $0 < \eta \leq 1$ only. If $\tau = \frac{(1-\alpha)(1-\theta)}{\delta}$, then $\eta = 1$ and all effort is allocated to work. If, on the other hand, $\tau > \frac{(1-\alpha)(1-\theta)}{\delta}$, then $0 < \eta < 1$ and only a fraction of effort is allocated to work. In other

[11] Recall that, in equilibrium, all agents are alike and there is one agent.
[12] If $\delta = 0$ and consequently $\eta = 1$, we get Barro's (1990) model.

words, there is rent seeking activity, $0 < \eta < 1$, only if the foreign aid-to-output ratio, τ, is high enough. The rest of the solution is then simple. Once we obtain a solution for η, equation (9a) can be solved for the balanced growth path, $\gamma \equiv \frac{\dot{c}}{c} = \frac{\dot{k}}{k}$, and in turn (9b) can give a solution for the consumption-to-capital ratio, $\frac{c}{k}$. It is straightforward to see from (9a) and (9b) that equilibria with rent seeking ($0 < \eta < 1$) are associated with a lower growth rate and a lower consumption-to-capital ratio than equilibria without rent seeking ($\eta = 1$). Hence, we can call the former "bad" and the latter "good" equilibria. Notice here that the condition for rent seeking, $\tau > \frac{(1-\alpha)(1-\theta)}{\delta}$, implies that the possibility of ending up in an equilibrium with rent seeking increases with the domestic tax burden.[13]

At this point it is useful to present some comparative static results. First, it is convenient to consider the less interesting case without rent seeking, $\eta = 1$. In this case, η is obviously independent of the foreign aid-to-output ratio (τ), so that there is only a direct positive effect from aid on growth (γ), denoted by $\left.\frac{\partial \gamma}{\partial \tau}\right|_{direct} > 0$ in (9a). Regarding the effects of the tax rate (θ), η is also independent of θ, while (9a) gives a standard Laffer curve effect from θ on γ, denoted by $\left.\frac{\partial \gamma}{\partial \theta}\right|_{Laffer}$, as in Barro's (1990) model.

Consider next the case with rent seeking, $0 < \eta < 1$. Now, (9c) implies $\frac{\partial \eta}{\partial \tau} < 0$, i.e. a higher foreign aid-to-output ratio leads to a lower fraction of labor effort allocated to work relative to appropriative activities. In turn, equation (9a) implies $\left.\frac{\partial \gamma}{\partial \tau}\right|_{total} = \left.\frac{\partial \gamma}{\partial \tau}\right|_{direct}^{(+)} + \frac{\partial \gamma}{\partial \eta}^{(+)} \frac{\partial \eta}{\partial \tau}^{(-)}$, i.e. an increase in τ exerts now two effects on the growth rate, γ: (i) a direct positive effect in the case where $\eta = 1$; (ii) an indirect negative effect through smaller effort allocated to work, given by $\frac{\partial \gamma}{\partial \eta}\frac{\partial \eta}{\partial \tau} < 0$. Intuitively, the direct positive effect arises because more foreign aid implies more social resources available to finance public infrastructure. The indirect

[13] Also, the probability of a "bad" equilibrium increases with the effectiveness of illegal effort, δ, while it decreases with the productivity of public services, $(1-\alpha)$. These are intuitive results.

negative effect arises because the possibility of extraction distorts individuals' incentives and pushes them to appropriative activities, which are socially harmful. Specifically, when foreign aid is high enough, selfish individuals (who do not internalize the adverse effect of their appropriative activities on aggregate output) get the impression that the pie also gets bigger and so tend to become more aggressive by demanding higher transfers. This occurs at the cost of time allocated to work and is eventually at the society's expense (a lower η leads to lower growth).

Finally, notice that the effects of the tax rate are similar to those of foreign aid. Namely, (9c) implies $\frac{\partial \eta}{\partial \theta} < 0$, i.e. a higher tax rate distorts incentives. In turn, (9a) implies that there are two effects on the growth rate: a direct Laffer-curve effect plus a negative indirect effect via a lower η; thus, $\left.\frac{\partial \gamma}{\partial \theta}\right|_{total} = \left.\frac{\partial \gamma}{\partial \theta}\right|_{laffer} + \overset{(+)}{\frac{\partial \gamma}{\partial \eta}} \overset{(-)}{\frac{\partial \eta}{\partial \theta}}$.

To sum up, the main theoretical prediction is that foreign aid can increase the level of rent seeking activities on the part of individuals. In such a case, aid will exert an indirect negative effect on growth, which works in opposite direction from the direct positive effect that aid typically exerts on growth. By contrast, in countries that receive relatively small aid transfers, only the direct positive effect is present, so that rent-seeking activities (if any) are independent of foreign aid. Finally, a "bad" equilibrium with rent seeking is more likely to arise the larger size of the government in the recipient country.

3. Empirical evidence on the growth impact of aid under aid-induced rent-seeking

In this section we develop the empirical framework for testing the basic prediction of the model. In particular, the comparative statics of the model presented in the previous section yield the following central prediction about the growth impact of aid in the presence of aid-induced rent-seeking activities: *a rise in aid will have a direct positive growth effect by enhancing public infrastructure and a negative indirect growth effect by pushing individuals in recipient countries to rent-seeking activities*. Previous studies on the growth impact of aid have not examined the rent-seeking channel and its negative effect on growth. Taking this into account, we shall attempt to identify these two opposing effects in the context of the joint determination of growth, rent seeking and aid. In the next subsections we first describe the empirical framework within which the basic hypothesis of the model will be tested and then give a brief description of the data utilized for the model estimation.

3.1. From theory to testing

The basic prediction will be tested by use of a cross-country dataset, where the growth rates are related to aid and aid-induced rent-seeking activities. As Svensson (2000) points out, any test of this form is bound to be only suggestive. This is for several reasons. First, long-term time series observations are not available for aid and rent seeking, thus implying that the analysis can only be confined to the medium-term impact of these variables on growth. Second, rent-seeking activities are hard, if possible at all, to measure. Hence, any empirical methodology can only utilize proxy variables, which will hopefully provide adequate descriptions of this type of activities. In the next subsection we discuss how existing measures of similar variables, which are utilised in the current approach, can be correlated with these activities. We also use alternative specifications to ensure the robustness of our results.

In this vein, we examine the basic prediction for some candidate country groups where it is more likely to hold. This selection is made on the basis of findings by previous studies and careful examination of the figures for the countries at hand. Specifically, to test the model's implications, we specify the reduced-form system:[14]

growth rate = growth(rent seeking, aid, government size; control variables)

rent seeking = rent-seeking(aid, government size; control variables)

According to the theoretical model, we expect in the growth equation a positive sign for aid and a negative sign for rent seeking, combined with a positive sign for aid in the rent-seeking equation. Also, a larger government size is expected to increase rent seeking, whereas the (Laffer curve) effect on the growth rate is ambiguous depending on the absolute size of the government sector. Note that these predictions should hold in the high-aid countries, whereas in the low-aid countries any rent seeking behavior should be independent of both aid and the government size.

The theoretical model also suggests that aid should be treated as an endogenous variable (see (8a)-(8c) above). Specifically, our model predicts that aid is a function of the deviation of the recipient country's income from that of the rest of the world. Note that several authors have pointed out the potential pitfalls associated with simultaneity bias when aid is treated as an exogenous variable in growth regressions. This accords with the approach recently adopted

[14] Notice that we omit the equation for the consumption to capital ratio (11b). The main reason is that consistent data for capital stock series are not available for most aid-recipient economies.

by Burnside and Dollar (2000). We therefore treat aid as an endogenously determined variable along with growth and corruption.[15]

aid = aid(inequality and redistribution measures; control variables)

Our aim is to test whether there is a direct positive impact of aid on growth and a indirect negative one through a rise in rent seeking and corruption within the context of the above described system of equations. To control for other determinants of these variables, we use a number of variables with our choices mainly dictated by the existing literature. In particular, we broadly follow the studies by Burnside and Dollar (2000), Svensson (2000), Alesina and Weder (2002) and use the following variables to capture the growth process. Initial GDP is used to control for recipients' needs motives (Svensson, 2000). This may prove of particular importance in the current setup, as poorer countries may be more prone in raising impediments, as rent-seeking behavior and corruption, which aggravate poor growth performance. Also, according to the theoretical model a negative income shock will result in increased aid flows.

Regional dummies aim at capturing the particular geographical characteristics of the countries examined. Following Burnside and Dollar (2000), we include dummies for Sub-Saharan countries and East-Asian countries in the growth equation. The same regional dummies are used in the rent-seeking equation along with a dummy for Central American countries. In turn, the aid equation also follows the corresponding Burnside and Dollar (2000) specification by including the dummy for Central American countries (which receive special treatment by the US), and two additional dummies for Egypt (an important ally of the US) and the Franc zone countries (which are especially treated by France). Moreover, the log of the population size is included in the aid equation to account for the scale effect as countries with smaller populations are more likely to receive a relatively larger amount of transfers due to donors' strategic interests, and the donors' income consistent with the view that a rise in their income will increase the flow of aid to recipient countries.

Finally, two other variables, namely ethnic diversity and political instability, are included here as significant determinants of growth aid and corruption. Ethnic diversity captures the ethnolinguistic fractionalization of groups within a country, which is correlated with bad

[15] For a survey of the related empirical literature see Hansen and Tarp (2001). These authors stress that with a 5-year average data sample (as the one utilized in the current study) treating aid as endogenous but predetermined implies that any decisions on the allocation of aid are made on the basis of a 5 to 6 year planning horizon. We maintain this assumption here, but we also report below for comparison purposes some results when aid is exogenous.

policies and low growth (Easterly and Levine, 1997) and also takes into account Svensson's (2000) empirical finding that aid in countries suffering from competing social groups are associated with increased rent-seeking. In turn, political turmoil (captured by assassinations) is used to capture civil unrest that is also found to affect largely the growth pattern of countries. Another variable related to economic conditions and policies is openness. All these variables are included when we check the robustness of our empirical results.

As far as the estimation method is concerned, most of the empirical literature relies on Instrumental Variable techniques or Panel methods with fixed effects. Taking into account the data availability and the nature of the variables utilized, which are largely time-invariant, we opt here for a 2SLS estimation with a core set of instruments consisting of regional dummies, initial GDP, population, government size, as well as ethnic diversity and political instability measures, and openness. By this approach we attempt to address the issue of endogeneity of rent seeking and aid in the context of growth equations. As an additional testing device we report 3SLS results, because the simultaneous estimation of the system (compared to an equation-by-equation estimation method like 2SLS) has the advantage of not imposing any restrictions on the correlation between the error terms, which may improve substantially the estimates on grounds of efficiency in the case of non-zero elements in the variance-covariance matrix. This may also be important in the current setup where, for instance, an unexpected shock in aid is likely to be correlated with the disturbance in the growth equation.

3.2. Data

The data used in the study come mainly from three sources. The Penn World Tables, version 6.1 (Heston et al., 2002), the IRIS data set (obtained by *countrydata.com*), and the World Bank database on aid developed by Chang et al. (1998).

More specifically, we use data from the Penn World Tables for the following variables. GDP per capita in constant prices is used to obtain five-year average growth rate (*growth*), the log of initial GDP (*lgdp*) and the log of population (*lpop*). Government share in GDP is used to obtain the five-year average for *government size*; this variable is also used by Tanzi and Schuknecht (2000) to assess the impact of fiscal policy on economic outcomes. Also, *openness* is defined as the sum of exports plus imports over GDP in constant prices to obtain the five-year average. Finally, the log of per capita income in high-income OECD countries (following the World Bank classification) is utilized to approximate the log of donors' income (*ldon*).

We use aid data from the World Bank data base on foreign aid. The files included in this database contain the conventional and the adjusted measures of official development assistance to a set of 133 countries between 1975 and 1995. The principal component of the data set is Effective Development Assistance (EDA), an aggregate measure of aid flows combining total grants and the grant equivalents of all official loans. EDA is computed on a loan-by-loan basis to reflect the financial cost the creditor incurs in making loans on concessional terms. Details on this variable are presented in Chang et al. (1998). By use of this dataset, we construct five-year averages of the variable denoted *aid* as the ratio of EDA, which is expressed in current units, to current GDP.

To obtain the index of rent seeking we use the IRIS dataset (version IRIS-3), which contains annual values for indicators of the quality of governance over the period 1982-1997, as constructed by Stephen Knack and the IRIS Center, University of Maryland, from monthly ICRG data provided by Political Risk Services. This dataset has been used in a series of papers by, among others, Knack and Keefer (1995, 1997), Svensson (2000) and Fredriksson and Svensson (2003). From this dataset, we construct the weighted sum of five subjective indices in the IRIS dataset, namely 'corruption in government', 'rule of law', 'risk of repudiation of government contracts', 'risk of expropriation', and 'quality of bureaucracy'. From these variables, 'corruption in government', 'rule of law', and 'quality of bureaucracy' range in value from 0 to 6, whereas 'risk of repudiation of government contracts' and 'risk of expropriation' are scaled from 0 to 10 with higher values indicating better ratings, i.e. less corruption or less risk. A new variable is then constructed from these variables at a 50-point scale by converting 'corruption in government', 'rule of law', and 'quality of bureaucracy' to a 10-point scale and summing them with the remaining two indices. This sum is averaged for each country and multiplied by (-1) to yield a proxy for rent seeking (*rent seeking*) in the society at large.[16]

Finally, from the same dataset we use the index 'ethic tensions' to capture ethnic diversity (*ethnic*) in the countries at hand. Following related studies, we also utilize a measure of political instability, as measured by the average number of assassinations per year (*assassinations*) by following Knack and Keefer (1995).

[16] We should stress at this point that obviously rent seeking could take a variety of forms other than corruption, bureaucracy or property risks. This type of data, however, is not available at any form. Apart from data non-availability, our choice is also motivated by Svensson's (2000) point that in practice there is no discrimination between the various forms of rent seeking as presumably the competing groups are equalizing the marginal costs and benefits between these forms.

4. Evidence from pooled cross-section data

To estimate the empirical relationships described in the previous section we were able to collect 283 observations for 75 aid recipient countries for which *rent seeking* is available with each country having at most four observations.

Before moving on with the description of the empirical results, a remark should be made. The predictions of the theoretical model involve the division of countries into 'large' and 'small' aid-recipients. However, in the absence of any strict theoretical guideline posed by the model regarding the empirical classification of the countries in terms of aid size, this distinction can be to a large extent arbitrary. Therefore, given the data considerations we do not attempt to discriminate between countries receiving large and small aid flows within the available sample, but instead present the evidence for all the countries at hand. This is justified by the nature of the countries included; the dataset is comprised by the main aid-recipients for the period under consideration, which can be considered in the global context as the large aid recipients. Therefore, to utilize all available information we run the relevant regressions for all 75 countries at hand.[17]

4.1. Empirical results

Table 1 presents the results from the estimation of the core relationships consisting of *lgdp*, regional dummies, and the variables predicted by the theoretical model, namely *government size*, *aid* and *rent seeking*. For comparison purposes, we present in the first column next to each equation the OLS results. Starting from the control variables, the coefficients have the expected signs and are statistically significant in most cases. In particular, *lgdp* enters with a statistically significant negative sign. The dummy for Sub-Saharan and East-Asian countries is also found to be statistically significant with expected signs. The coefficients of *ldon* and *lpop* in the *aid* equation are also statistically significant at the 5% level. In fact, the hypothesis that the coefficients on *lgdp* and *ldon* are equal and of opposite sign, as predicted by assumption (8a), cannot be rejected by a standard F-test at the 1% significance level. The coefficient on the *government size* is significantly negative for the growth equation, and positive (but insignificant) in the *rent seeking* equation, whereas *assassinations* and *ethnic tensions* are found to be significant in the *rent seeking* equation with

[17] Obviously, an alternative interpretation of our theoretical findings could recommend the division of the available countries themselves into 'high' and 'low' aid-recipients. This discrimination is tempting as it is likely to correspond more closely to the concept of 'large' and 'small' aid-recipients predicted by the theoretical model and hence is likely to strengthen the empirical evidence in support of the model. However, the disadvantage of

positive signs, as intuitively anticipated. Regarding the coefficients for the variables of interest, although indicative, the estimates pinpoint a positive sign for *aid* and negative sign for *rent seeking* in the growth equation. However, *aid* enters with an insignificant coefficient in the *rent seeking* equation.

The second column next to each specification presents the results from the 2SLS estimation with endogenous aid and rent seeking determination. The estimates on the control variables and the regional dummies retain their signs and significance levels, with the exception of the dummy for East-Asian countries in the *growth* equation, which is now statistically insignificant (as in Burnside and Dollar, 2000). Regarding the size of the government and its impact on growth and rent-seeking, *government size* enters with the statistically significant negative sign in the *growth* equation with a coefficient value of -0.108, which is not far to that obtained by other growth studies; *ceteris paribus*, the estimated effect on growth implies that an increase in the government size by 1 percentage point of GDP will reduce the growth rate on impact by roughly 0.11 percentage points on an annual basis.[18] In contrast, *government size* is found to be significantly negative in the *rent seeking* equation. We do not further explore this finding here, but we test for the effect of government size and the robustness of our estimates below (see also next subsection). We briefly mention that albeit this coefficient turns out insignificant in all subsequent specifications, this finding are still somewhat against our theoretical findings. This result may be explained by the inclusion of *lgdp* in the estimated equation: Mauro (1998) shows that when one controls for initial GDP, the significance of public spending (with the exception of education expenditures) in explaining corruption is reduced substantially, possibly as a manifestation of Wagner's Law.

Turning to the main effects of interest, namely the direct and indirect impacts of aid on *rent seeking* and *growth*, we can see from the results in the lower part of Table 1 that, first, in line with the theoretical results *aid* is positively correlated with *rent seeking* with the relevant coefficient being statistically significant at the 5% level. This strong result accords well with the recent findings that '*…an increase in aid is associated with an increase in corruption and vice versa…*' by Alesina and Weder (2002, p. 1135). Moreover, the lack of statistical significance of *rent seeking* in the *aid* equation confirms the finding by the same authors that there is no evidence that more corrupt countries receive less aid. This combined evidence reinforces the view that causation runs from aid transfers to rent-seeking activities, whereas

confining our findings in a substantially smaller number of observations (only 80 observations correspond approximately to above median aid) is likely to outweigh the potential gains.

[18] For instance, Barro (2001) reports a corresponding coefficient of –0.157 in his equation for the growth rate.

there is no evidence that countries with a high degree of rent seeking and corruption attract more aid. This conjecture is further strengthened by the insignificance of *aid* in the *rent seeking* equation when aid enters as an exogenous variable (see the results from the OLS specification), thus confirming the view that the relationship between aid and corruption is dependent upon endogenous aid determination.

Next, we can examine the impact of *aid* and *corruption* on growth. As can be readily seen in the lower left part of Table 1, both coefficients have the expected signs and are statistically significant. The coefficient on *aid* implies that *a rise of aid as percentage of GDP by one point would raise the growth rate by 0.5 points in the absence of the impact on rent-seeking activities*. However, the latter exert a negative influence on the growth rate, which mitigates the impact of increased aid. Thus, the net effect of aid on the growth is found to be much smaller: according to the estimates presented here, *a rise of aid to GDP ratio by one percentage point raises the growth rate by 0.3 percentage points when the adverse effect of rent seeking activities is taken into account.* Thus, when examined in a more general setup, aid seems to trigger a rise in incentives' distortion, captured here by the rise in the *rent seeking* index, which dampens down the positive aid impact to a non-negligible degree.

We attempted to test the validity of our results in a number of manners. In the next subsection we report several robustness checks.[19] In addition, we mention here one amendment in the adopted estimation methodology. As mentioned earlier, we can estimate the full-fledged system of the *growth*, *rent seeking*, and *aid* equations by 3SLS to account for non-zero correlations in the unexplained parts of the regressions. The third column next to each specification reports the relevant results. All coefficients remain roughly unchanged, with the exception of the coefficient on *government size* in the *rent seeking* equation, which becomes insignificant. Regarding the coefficients of main interest, *aid* is again found to increase *rent seeking* (with a somewhat larger coefficient now), whereas *aid* and *rent seeking* appear with similar (though slightly larger) coefficients in the *growth* equation. The net effect, however, of a rise of aid to GDP ratio by one percentage point on the growth rate remains remarkably close to the one found via 2SLS, indicating that the overall picture is confirmed when the equations are estimated jointly, as long as aid and rent-seeking activities are treated as endogenous variables.

[19] In addition, we tested the robustness of our results for the possible effect of outliers by dropping one suspected country at a time. None of the resulting regressions for each equation is significantly different from the regressions presented in the paper after the exclusion of the following list of countries (observations), which had the highest residuals: Jordan (1975, 1980), Zaire (all observations), Philippines (all observations), Botswana (1975), Uganda (1980), Gabon: (1975, 1980), Guinea-Bissau (1975).

4.2. Robustness tests and extensions

We ran several robustness tests on the results presented in Table 1, all of which confirmed the robustness of the multivariate relationship between *growth*, *corruption* and *aid*. We present in Table 2 a subset of these results (estimated by 3SLS) that yield some worthy of note insights. The variants of the core specifications are, first, to augment the *growth* equation by including *assassinations* and *ethnic*, and, second, to include *openness* in all equations.[20] The first modification stems from the Burnside and Dollar (2000) approach and aims at capturing long-term characteristics affecting growth, civil status and policies. The second one allows for the widely established positive correlation between various measures of openness and growth. These variables are often included in empirical growth and aid equations.[21]

In the first column of Table 2 the results for *assassinations* and *ethnic* in the *growth* equation are reported; both variables are found to be insignificant, in line with the findings by Burnside and Dollar (2000). In the second column, the coefficient on *openness* in the *growth* equation is found to statistically significant, but insignificant in the *rent seeking* equation. These results are broadly not altered when all three variables are included in the *growth* equation.

Interestingly, the figures obtained for the coefficients of *aid* in the *growth* equation are less significant when *openness* is included, whereas the corresponding coefficient of *aid* in the *rent seeking* equation turns out larger in magnitude (and always significant at the 5% level). Consequently, the resulting net effect of *aid* on *growth* is now found to be close to zero. It thus appears that differences in openness of aid-recipient countries are an important determinant of the impact of aid flows on rent-seeking activities. A potential explanation may be that a rise in aid also prompts an increase in the degree of openness in aid-recipient countries, thus leading to an underestimation of the effect of *aid* on *rent seeking* when openness is omitted. This conjecture is in accordance with the recent findings by Neeman et al. (2003) who find that openness may aggravate the adverse effects of corruption and therefore hamper growth.

[20] Apart from the robustness checks reported below, our tests also involved the use of alternative definitions for the variables measuring aid flows and rent seeking. For instance, we experimented with the two other measures of aid available by the World Bank, namely Bilateral EDA and Multilateral EDA (see Chang, 1998, for the description of these variables) without any significant changes in the results. We also used the property rights index (available from ICRG), which is the sum of rule of law and expropriation risk, as suggested by Knack and Keefer (1995), and the results remained similar.

[21] Along this line we could include the Burnside and Dollar (2000) 'good policy' index as an additional variable in the growth and aid equations. We did not perform such an exercise because two of the three determinants of the policy index, namely the degree of openness and the budget surplus, are captured by the existing independent variables leaving only the less significant component of the index (inflation) out.

As a final step, we report some estimates for an important subgrouping of the countries at hand. In particular, recall that from our theoretical predictions the probability of an equilibrium with rent seeking increases with the government size. A clear-cut empirical implication of this finding is that in countries with a larger government sector the negative effects of aid-induced rent-seeking activities will be aggravated as a larger public sector triggers behavior towards rent-seeking activities.[22]

Table 3 checks this hypothesis by adopting the extended specifications of Table 2 for countries with 'large' and 'small' government size (based on 121 and 162 observations, respectively) with the average government size of the sample taken as the breaking point. In line with the theoretical suggestions, the empirical results indicate that in countries with 'large' government sectors *aid* affects *rent seeking* positively. In contrast, this effect evaporates in countries with 'small' government size, indicating that the previously established effect of aid on rent-seeking behavior is mainly driven by countries with large government sectors. Turning to the growth effects of rent seeking and aid, we find that *rent seeking* affects *growth* negatively irrespective of government size. The evidence is slightly less strong on the effect of *aid*: the estimated coefficients are statistically significant in three out of four specifications (in two of them at the 10% level).

This evidence may shed some more light in the context of Rodrik's (1998) finding that a rise in openness is associated with an increase in the size of the government. A possible explanation put forward by Rodrik (1998) was that in countries which are more vulnerable to external shocks the government sector mitigates risk by taking command of a larger share of the economy's resources. The evidence presented in Table 3 may bear a complementary explanation, particularly for aid-recipient countries, namely that aid increases openness and hence provides more scope for government activities, thus rendering the negative effect on rent-seeking (and growth) stronger.

We sum up the empirical part by stressing that although the findings describe above should be interpreted with some caution, they are quite instructive as it appears that the aid impact in rent-seeking activities is more likely to hold in aid-recipient countries with large public sectors, leaving a route for further explorations regarding the interconnections between aid, fiscal management, and the distortion of incentives, as well as their macroeconomic consequences.

[22] Our theoretical findings indicate that this possibility also increases with the effectiveness of illegal effort and decreases with the productivity of public services. However, we did not find any satisfactory proxies for these concepts for the countries at hand.

5. Conclusions

In this paper we investigated the interrelationship between growth, aid and rent seeking. The primary focus of the paper was to explain the poor performance of aid flows in terms of growth by developing a link between aid and rent-seeking behavior. To this end, we constructed a general equilibrium model of endogenous growth in which foreign aid can distort individuals' incentives by pushing them to rent-seeking activities. This indirect adverse effect can offset the direct positive growth impact of aid. Next, we tested this hypothesis for a cross-section of countries where measures of rent seeking are available. We found that the results support the main theoretical prediction, i.e. aid is far less effective in improving growth when its indirect distortion in incentives is taken into account.

We conclude the paper by stressing two points that merit special attention. First, as the recent debate on the effectiveness of aid under a good policy environment shows (see the comment by Easterly et al., 2004, and the reply by Burnside and Dollar, 2004), there is an ongoing discussion about the growth impact of aid and the role of distortionary activities, like corruption and rent seeking. In light of this, the paper provides a message against poor domestic institutions, which facilitate the distortion of individual incentives, and an argument in favor of conditional aid, where conditionality focuses upon transparency and good functioning of the public sector in recipient countries (see also Fischer, 2003). Second, albeit the paper stresses the importance of the adverse effects on incentives in aid-recipient countries, this should not be taken as a message against the provision of foreign aid. Rather, greater weight should be placed in the role of independent institutions and NGOs in delivering aid, thus leaving less room for governmental and private sector intervention in the allocation of available amounts.

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TABLE 1. Estimates of the aid impact on growth and rent-seeking: core model (1975-1995, 283 observations)

Dep. variable: *growth rate*	*OLS*	*2SLS*	*3SLS*	Dep. variable: *rent-seeking*	*OLS*	*2SLS*	*3SLS*	Dep. variable: *aid*	*OLS*	*2SLS*	*3SLS*
constant	11.540**	11.673**	11.740**	*constant*	16.489**	10.464**	9.890**	*constant*	9.879	9.730	10.541
	(3.61)	(3.08)	(3.14)		(4.14)	(2.25)	(2.18)		(1.10)	(1.08)	(1.27)
lgdp	-1.508**	-1.742**	-1.863**	*lgdp*	-4.676**	-3.767**	-3.863**	*lgdp*	-1.799**	-1.695**	-1.649**
	(-3.51)	(-2.67)	(-2.90)		(-9.48)	(-6.30)	(-6.64)		(-9.28)	(-6.19)	(-6.16)
Sub-Saharan	-3.499**	-4.020**	-4.369**	*Sub-Saharan*	-3.536**	-4.102**	-4.763**	*lpop*	-0.818**	-0.808**	-0.797**
	(-5.82)	(-5.19)	(-5.76)		(-4.63)	(-4.91)	(-5.98)		(-9.08)	(-8.77)	(-8.96)
East Asia	1.894**	1.568*	1.452	*East Asia*	-5.123**	-4.668**	-4.549**	*Franc Zone*	-0.114	-0.088	-0.020
	(2.58)	(1.72)	(1.63)		(-5.61)	(-4.73)	(-4.90)		(-0.31)	(-0.24)	(-0.06)
				Central America	2.378**	2.440**	2.337**	*Central America*	-0.641*	-0.736*	-0.797**
					(2.91)	(2.79)	(2.77)		(-1.74)	(-1.80)	(-2.00)
				assassinations	7.650**	7.470**	7.084**	*Egypt*	1.036	1.016	0.794
					(3.99)	(3.64)	(3.72)		(1.03)	(1.00)	(0.85)
				ethnic	1.009**	1.209**	1.046**	*ldon*	1.892**	1.867**	1.748**
					(4.28)	(4.65)	(4.30)		(2.03)	(2.00)	(2.03)
government size	-0.086**	-0.108**	-0.098**	*government size*	-0.013	-0.085**	-0.045				
	(-3.93)	(-3.85)	(-3.58)		(-0.49)	(-2.30)	(-1.29)				
aid	**0.275****	**0.493****	**0.549****	***aid***	**-0.003**	**0.785****	**0.876****				
	(2.85)	**(2.43)**	**(2.75)**		**(-0.03)**	**(2.84)**	**(3.29)**				
rent-seeking	**-0.148****	**-0.229****	**-0.257****					*rent-seeking*	-0.037	-0.014	-0.006
	(-3.44)	**(-2.25)**	**(-2.57)**						(-1.52)	(-0.28)	(-0.14)

Notes: t-ratios are in parentheses. An asterisk denotes significance at the 10% level and two asterisks at the 5% level.

TABLE 2. Estimates of the aid impact on growth and rent-seeking: robustness checks (3SLS, 1975-1995, 283 observations)

Dep. variable: *growth rate*				Dep. variable: *rent-seeking*				Dep. variable: *aid*			
constant	14.150**	16.276**	18.442**	*constant*	9.849**	8.027	8.009	*constant*	10.756	9.420	9.483
	(2.91)	(4.10)	(3.64)		(2.17)	(1.64)	(1.63)		(1.29)	(1.13)	(1.14)
lgdp	-2.800**	-2.678**	-3.608**	*lgdp*	-3.842**	-3.566**	-3.550**	*lgdp*	-1.675**	-1.648**	-1.654**
	(-2.42)	(-3.86)	(-3.06)		(-6.60)	(-5.43)	(-5.39)		(-6.24)	(-6.11)	(-6.13)
Sub-Saharan	-5.895**	-4.772**	-6.239**	*Sub-Saharan*	-4.817**	-4.424**	-4.740**	*lpop*	-0.799**	-0.770**	-0.770**
	(-4.13)	(-6.07)	(-4.36)		(-6.05)	(-4.72)	(-5.82)		(-8.98)	(-7.06)	(-7.06)
East Asia	-0.004	0.827	-0.573	*East Asia*	-4.600**	-4.685**	-4.475**	*Franc Zone*	-0.021	-0.004	-0.003
	(-0.00)	(0.91)	(-0.35)		(-4.95)	(-5.76)	(-4.77)		(-0.06)	(-0.01)	(-0.01)
assassinations	2.152	-	2.647	*assassinations*	7.153**	6.930**	7.131**	*Egypt*	0.792	0.684	0.688
	(0.73)		(0.89)		(3.73)	(3.68)	(3.72)		(0.85)	(0.73)	(0.74)
ethnic	0.410	-	0.370	*ethnic*	1.068**	1.105**	1.120**	*ldonor*	1.735**	1.804**	1.800**
	(1.13)		(1.01)		(4.37)	(4.37)	(4.37)		(2.02)	(2.11)	(2.10)
				Central America	2.176**	2.481**	2.275**	*Central America*	-0.727*	-0.740*	-0.723*
					(2.57)	(2.91)	(2.65)		(-1.81)	(-1.83)	(-1.79)
openness		0.020**	0.018**	*openness*		-0.009	-0.009	*openness*		0.001	0.001
		(2.84)	(2.20)			(-0.97)	(-0.96)			(0.43)	(0.43)
government size	-0.115**	-0.109**	-0.125**	*government size*	-0.046	-0.044	-0.045				
	(-3.08)	(-3.98)	(-3.29)		(-1.32)	(-1.27)	(-1.29)				
aid	**0.827****	**0.283**	**0.585***	***aid***	**0.884****	**1.028****	**1.033****				
	(2.73)	**(1.34)**	**(1.80)**		**(3.32)**	**(3.43)**	**(3.45)**				
rent-seeking	**-0.532***	**-0.317****	**-0.596****					*rent-seeking*	-0.011	-0.006	-0.007
	(-1.95)	**(-3.12)**	**(-2.19)**						(-0.23)	(-0.13)	(-0.16)

Notes: t-ratios are in parentheses. An asterisk denotes significance at the 10% level and two asterisks at the 5% level.

TABLE 3. Estimates of the aid impact on growth and rent-seeking for 'large' (121 obs.) and 'small' (162 obs.) government size (3SLS, 1975-1995)

Dep. variable: *growth rate*	'large' government		'small' government		Dep. variable: *rent-seeking*	'large' government		'small' government		Dep. variable: *aid*	'large' government		'small' government	
constant	11.031** (2.20)	14.791** (2.14)	8.975 (1.15)	16.366** (2.17)	*constant*	5.602 (0.88)	6.144 (0.88)	12.369** (1.26)	8.585 (0.92)	*constant*	31.532 (1.64)	29.398 (1.50)	0.522 (0.12)	0.648 (0.15)
lgdp	-1.797** (-2.31)	-3.606** (-2.47)	-1.745 (-1.47)	-3.020** (-2.39)	*lgdp*	-3.588** (-4.35)	-3.637** (-3.75)	-4.184** (-3.28)	-3.652** (-3.01)	*lgdp*	-1.796** (-3.21)	-1.855** (-3.26)	-1.360** (-8.85)	-1.453** (-8.73)
Sub-Saharan	-2.899** (-3.96)	-5.537** (-3.93)	-5.237** (-4.18)	-6.668** (-3.58)	*Sub-Saharan*	-2.957** (-2.58)	-6.171** (-4.38)	-5.876** (-4.54)	-5.315** (-3.84)	*lpop*	-1.044** (-5.93)	-0.970** (-4.42)	-0.373** (-6.41)	-0.429** (-6.69)
East Asia	-0.016 (-0.01)	-3.611 (-1.37)	2.047 (1.78)	1.255 (0.98)	*East Asia*	-5.972** (-4.21)	-6.171** (-4.38)	-3.774** (-3.01)	-3.414** (-2.72)	*Franc Zone*	0.444 (0.51)	0.544 (0.61)	0.206 (1.16)	0.177 (0.99)
assassinations	-	4.254 (1.07)	-	1.884 (0.65)	*assassinations*	8.827** (3.77)	8.820** (3.72)	5.584* (1.86)	4.885** (1.59)	*Egypt*	-	-	0.848** (2.20)	0.957** (2.43)
ethnic	-	0.815 (1.45)	-	0.153 (0.43)	*ethnic*	1.582** (4.50)	1.569** (4.00)	0.749** (2.12)	0.872** (2.46)	*ldonor*	0.075 (0.04)	0.151 (0.08)	1.766** (3.75)	1.915** (4.02)
					Central America	3.601** (2.82)	3.236** (2.63)	2.211* (1.92)	2.675** (2.29)	*Central America*	-1.425* (-1.79)	-1.227 (-1.45)	-0.116 (-0.50)	-0.056 (-0.24)
openness	-	0.014 (1.03)	-	0.030** (2.91)	*openness*	-	0.005 (0.41)	-	-0.020 (-1.47)	*openness*	-	0.004 (0.53)	-	-0.005** (-2.09)
government size	-0.085** (-2.03)	-0.082* (-1.66)	-0.114 (-1.43)	-0.197** (-2.14)	*government size*	0.057 (1.11)	0.0454 (0.89)	-0.083 (-0.80)	-0.039 (-0.35)					
aid	**0.324* (1.76)**	**0.447** (1.54)**	**1.283* (1.85)**	**1.038 (1.24)**	***aid***	**0.571** (2.47)**	**0.490* (1.76)**	**1.301 (1.30)**	**1.513 (1.61)**					
rent-seeking	**-0.266** (-2.25)**	**-0.762** (-2.31)**	**-0.321** (-2.24)**	**-0.460* (-1.93)**						*rent-seeking*	-0.038 (-0.43)	-0.050 (-0.55)	-0.012 (-0.44)	-0.027 (-0.93)

Notes: t-ratios are in parentheses. An asterisk denotes significance at the 10% level and two asterisks at the 5% level.