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**Aspects of the Political Economy of
Foreign Aid**

by

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Aspects of the Political Economy of Foreign Aid*

Rune Jansen Hagen[†]

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Abstract

The interaction of external financing with economic reforms in developing countries has been at the forefront of the policy debate for the last 15-20 years. In this paper, a simple model in which an aid donor faces either a reform-minded recipient country government or one defending the status quo is constructed to investigate the impact of aid on political and economic outcomes. The main contributions of this paper are to i) show that when the aid budget is exogenous, commitment versus discretion is irrelevant to the outcome of the aid game studied here while the recipient government's ability to tax transfers to the private sector is very important; ii) provide a definition of aid fungibility when both the donor and the recipient act strategically; iii) point out that very large sums seems to be needed if donors are to have any influence over aggregate outcomes; and iv) demonstrate that the impact of foreign aid on the political equilibrium in democratic recipient countries can be counterproductive from the point of view of the donor.

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1 Introduction

In the literature on economic development, the 1980s has been dubbed "the lost decade". It was the decade of the debt crisis, when many developing countries saw their ability to borrow internationally severely restricted, real interest rates rose, and arrears on debt payments mounted. Equally notable was the trend in economic policies world-wide. In rich and poor countries alike, reforms aimed at increasing the role of markets and reducing the role of the state were initiated. In the former, problems connected with financing ambitious welfare state programmes in the aftermath of the oil price shocks of the 1970s, which caused a significant increase in unemployment, prompted a reassessment of which tasks the government should carry out. In the latter, the above-mentioned financing problems in many cases forced governments into adjustment mode. However, the economic difficulties were rarely of a purely external nature. Many developing countries had clearly followed unsustainable macroeconomic policies, while at the same time over-extending the role of the state. This was only reluctantly conceded by some of these governments, and others refused to mend their ways even in the face of external financing problems. The resulting economic crises, though, forced even some of the hardliners to turn to the international financial institutions (IFIs) and bilateral donors as substitutes for the private funds that were no longer forthcoming. These actors, however, were generally of the opinion that reforming economic policies was necessary, and this opinion was bolstered as the decade proceeded, resulting in increasingly insistent demands for reforms. Project-based funding was replaced by policy-based funding. The reluctance to reform on the part of governments receiving public bilateral and multilateral funding resulted in a proliferation of conditions attached to both grants and loans. Conditionality became in vogue.

The track record of conditionality in terms of instigating comprehensive and lasting reforms of economic policies is far from impressive. This has led some observers to advocate the more consensual approach of local "ownership" of reforms, i.e., that reforms should not be forced through by foreigners and should only be supported if the political will to reform is present domestically. All along, critical voices have contended that the reforms advocated by the international community will cause political and social instability in low-income countries and that the result could be that reforms are never fully implemented or are reversed because even pro-reforms government will lack

the political power to implement and sustain them. In Hagen (1999), I have investigated the relative influence of political "will" - ideology - and political "power" - support of the electorate - in fostering or preventing economic reforms in democratic low-income countries. Therein, I have also analysed whether lack of access to international credit markets influences the reform choices of governments. Here, I consider how external assistance affects the extent of reforms in a recipient country, a pertinent subject given the observation of widespread donor "fatigue". I also study the impact of aid on the domestic political equilibrium, a highly relevant topic in the light of the debate about reform ownership.

2 The Model

The population of the recipient country (which is also the electorate) is normalised to 1. The level of aggregate income is assumed to be fixed at $y > 0$, which is equally divided amongst the inhabitants.

The government taxes private income in order to supply a public consumption good, g , to the population.¹ A unit of public income is assumed to generate a unit of g . The government can be of two types. It either wants a relatively high or a relatively low level of public consumption. The former type of government will be labeled S for status quo, since the status quo in many developing countries before the onset of the reform period of the last 15-20 years was a balance between state and market that was tilted rather heavily in the direction of the former.² The other type of government will be called a reform government, denoted by superscript R , as the essence of most of the reforms that have been proposed by the international community has been to tip the scales at a level implying a greater role for the private

¹The assumption that y is fixed is equivalent to assuming that taxation is non-distortionary. This is unrealistic, of course, but for our purposes nothing is lost by abstracting from the well-known efficiency losses of taxation.

²This statement must be interpreted in relation to the level of economic development in these countries. Rich countries have much larger public sectors than poor countries, but are better equipped to finance them, c.f. the fiscal crises that have been a persistent feature in many developing countries over the last few decades. The size of the public sector in the current low-income countries is also greater on average than the size of the public sectors of the current high-income countries when these were at a similar stage of economic development.

sector.³

A government of type j determines its optimal tax rate by maximising

$$(1) U^j(c, g) = \beta^j \ln c + (1 - \beta^j) \ln g,$$

where c (g) is private (public) consumption. As should be clear from the above, I assume that $1 > \beta^R > \beta^S > 0$.

In the absence of aid, the total income of the economy is y . The private and public budget constraints are therefore simply

$$(2a) (1 - \tau) y = c;$$

$$(2b) \tau y = g.$$

τ is the tax rate, and it is easily demonstrated that the optimal level from the perspective of a type j government is

$$(3) \tau^*(j) = 1 - \beta^j.$$

The result is that private and public consumption becomes

$$(4a) c^*(j) = (1 - \tau^{j*}) y = \beta^j y;$$

$$(4b) g^*(j) = \tau^{j*} y = (1 - \beta^j) y.$$

We see that $c^{S*} < c^{R*}$ and $g^{S*} > g^{R*}$. That is, there is greater private and less public consumption under a status quo government compared to a situation where a reform government is in power, as should be expected.

These outcomes and the underlying optimal tax rate constitute the "fall-back" position of the economy should the government and the donors fail to come to agreement on the terms of the aid. If an agreement can be reached, it follows from (4a) and (4b) that a government of type j aims for the outcome $c^*(j) = \beta^j (y + A)$ and $g^*(j) = (1 - \beta^j) (y + A)$, where A is the total amount of aid available.

³For example, Killick (1998) notes with respect to the IMF that "the Fund's move into 'structural' conditionality has had three thrusts: 1. to increase the role of markets and private enterprises relative to the public sector, and to improve incentive structures; 2. to improve the efficiency of the public sector; and 3. to mobilize additional domestic resources." (p.1)

The donor has the same kind of objective function as potential recipient country governments. It is assumed to be even more reform-minded than a type R government. This seems the natural assumption to make, given the conditionality debacle that has characterised North-South relations since the onset of the debt crisis. Specifically, I assume $\beta^D > \beta^R$.⁴

The donor has a fixed budget of size A (measured in the same currency as recipient country variables). The "unconstrained" optimum of the donor is thus at $c^*(D) = \beta^D (y + A)$ and $g^*(D) = (1 - \beta^D) (y + A)$, since the total income of the economy with aid is $y + A$. However, the giving of aid is not unconstrained. First of all, a donor cannot tax a recipient in any way. Secondly, a recipient country government can refuse to accept foreign assistance if it is made worse off by it. Because the donor and the recipient governments do not concur in the optimal distribution of resources, it is conceivable that the donor's offer would entail such a "bad" distribution of resources from the perspective of the recipient government that the extra income does not compensate for it.

I will assume that the donor can split its budget between aid given to the private sector, a_c , and aid given to the government, a_g .⁵ These must thus both be non-negative, and the sum cannot exceed the donor's total budget. While most bilateral aid is state-to-state, some is given directly to the private sector, partly through private humanitarian organisations. Donors sometimes implement their own projects without involving the government in the country in question financially. In any case, it is interesting to see if having two types of aid makes any difference, particularly in the face of the widespread notion that aid is *fungible*. If aid is completely fungible, this implies that in whichever way it is given and irrespective of any conditions attached to it, it ends up as "free funds" for the government, which therefore can use it for whatever purpose it wants. If aid is not completely fungible, then some of it must be spent on the purpose(s) envisaged by the donor.⁶

⁴The case $\beta^D = \beta^R$ is not of great interest, for obvious reasons. The case $\beta^R > \beta^D > \beta^S$, which could have interesting implications for domestic politics in the recipient country, is left for future research. If, for some reason, $\beta^D < \beta^S$, the outcomes would be mirror-images of the ones presented below.

⁵Aid given to the private sector can either be direct transfers or come in the form of investments that generate income for individuals in that sector. Since domestic income is exogenous in the current set-up, it is modelled in the first way here.

⁶The concept is used in several different ways in the literature. The definition here is essentially that of Pedersen (1997), who states that aid is fungible if it is possible for the

As we shall see, the view that aid is fungible is in general not correct, and if the donor's budget is large enough fungibility is zero. However, for practical purposes, it seems to be the case that aid is fungible to some extent. For "intermediate" levels of the donor's budget, aid is partially fungible. Aid is perfectly fungible only if either a) the government can tax any aid given to the private sector or b) it cannot tax a_c , but the donor's total budget is "small". Thus, the details of the tax system, or the government's administrative capacity in a wider sense, might make a great difference with respect to the effects of aid on the final allocation of resources in the economy. We shall consider the two extreme cases in which a) the government can tax a_c in the same way as it taxes domestic incomes and b) it cannot tax a_c at all.

In a game-theoretic perspective, the order in which the donor and the recipient make their moves must be expected to be important. In economic policy games, it is in general an advantage to move first. By committing one's policy, taking into account the consequences of one's choices on the optimal response of the opponent, one can influence the outcome of the game in favour of oneself. We shall therefore investigate both the case where the donor moves last and the case where it moves first.⁷ In game-theoretic parlance, we shall see what happens both when the donor is a Stackelberg-follower and when it is a Stackelberg-leader. The former case will be examined first, as it is the most realistic one. It is hard to think of mechanisms by which a bilateral donor can "tie its own hands" unilaterally. Still, it is interesting to see how the equilibrium strategies and the outcome in this case differ from the more realistic one considered next.

recipient to divert resources away from the activity the donor seeks to finance. As pointed out by him, the possibility of diversion is but a necessary condition for actual diversion; in order to divert, the recipient must also wish to do so. Below, I discuss fungibility in relation to the model used here in more depth.

⁷The former case has been analysed by Pedersen (1995a, 2000), Svensson (2000) and Bruun (1998). Pedersen (1995a) has also analysed the latter. However, these authors assume that donors care about poverty or income distribution within or across recipient countries. Bruun (1998) studies an altruistic donor which is to divide its budget between two recipient countries in which the governments only care about aggregate consumption. Svensson (2000) analyses competition for aid between recipient countries too, but assumes that the donor only cares about the consumption of the poor, a feature he shares with Pedersen (1995a). In Pedersen (2000), where the donor cares about income distribution instead of poverty, both single and multiple recipients cases are investigated.

3 The Donor as a Follower

3.1 Aid to the Private Sector Is Taxable

The timing is now as follows. First, the recipient country government chooses its tax policy. Then the donor chooses its aid policy taking the tax rate as given and disburses the optimal sums. Finally, taxes are collected and c and g are consumed. To distinguish optimal actions and outcomes from those resulting from reversing the order in which the donor and the recipient move, I use the superscript F .

When that tax rate is applied to both private domestic income and aid given to the private sector, it is easy to show that aid is perfectly fungible. If the recipient country government sets the tax rate equal to its first-best tax rate⁸

$$(5) \hat{\tau}^F(j) = \tau^*(j) = 1 - \beta^j,$$

the outcome will be

$$\begin{aligned} (6a) \hat{c}^F &= \beta^j (y + A) \equiv c^*(j); \\ (6b) \hat{g}^F &= (1 - \beta^j) (y + A) \equiv g^*(j). \end{aligned}$$

That is, the government achieves its "first-best" combination of private and public consumption given a total income level of $y + A$.

This is so because the donor will be facing the budget constraints $c = [1 - \hat{\tau}^F(j)] (y + a_c) = \beta^j (y + a_c)$ and $g = \hat{\tau}^F(j) [y + a_c] + a_g = (1 - \beta^j) (y + a_c) + a_g$. Its first-best outcome has a budget share for private consumption equal to β^D . When the government has set $\hat{\tau}^F(j) = 1 - \beta^j$, $\frac{c}{y+A} = \frac{\beta^j (y+a_c)}{y+A}$ which is increasing in a_c with a maximum at $a_c = A$. Then $\frac{c}{y+A} = \beta^j < \beta^D$, $j = R, S$. Clearly the donor would like to increase private consumption from this level, but it is unable to do so. This holds regardless of the level of the aid budget. Thus the optimal aid strategy for the donor when he is a follower is always $\{\hat{a}_c^F, \hat{a}_g^F\} = \{A, 0\}$.

Summing up, when is a_c taxable, the donor is unable to influence both the recipient's policy and the final outcome. Hence, aid is completely fungible; it is distributed according to the preferences of the recipient government.

⁸Here and in the next section, I use a hat to denote actions and outcomes when aid to the private sector is taxable.

3.2 Aid to the Private Sector Is Not Taxable

The case where the government cannot tax aid given to the private sector is more complicated, and thus, in its own way, more interesting. It is perhaps unrealistic to assume that a_c cannot be taxed at all. And there is clearly no reason within the confines of the model why this should be so. However, tax systems in many developing countries are highly rudimentary and tax administration is notoriously lax, with corruption, tax avoidance, and tax evasion constituting very real constraints on the government's ability to raise revenues. While this presumably applies equally well to income from both domestic and foreign sources, our focus is on the consequences of aid, so here we assume that τ applies to y but not to a_c , while admitting that the intermediate case of both being imperfectly taxable is the most realistic.⁹

On the face of it, the donor faces a quite complex optimisation problem once the government has determined the tax rate. The donor must choose its aid policy respecting its own budget constraint, the non-negativity constraints on a_c and a_g , as well as the constraint that the utility of the government must be as high with aid as without aid in order to induce it to accept the offer. However, it turns out that in the sub-game perfect equilibrium of the aid game, the government will always be strictly better off accepting aid (see the appendix). Hence, this constraint will not be binding along the equilibrium path, which we shall focus on here.

Ignoring the constraint on the government's utility, the Lagrange function the donor will be maximising for each given τ and A is $\Lambda^D = U^D(c, g) + \lambda(A - a_c - a_g)$. The first-order conditions are

$$\begin{aligned} (7a) \quad \frac{\partial \Lambda^D}{\partial \lambda} &= A - a_c - a_g \geq 0; \lambda \geq 0; \lambda \frac{\partial \Lambda^D}{\partial \lambda} = 0; \\ (7b) \quad \frac{\partial \Lambda^D}{\partial a_c} &= \frac{\beta^D}{c^F} - \lambda \leq 0; a_c \geq 0; a_c \frac{\partial \Lambda^D}{\partial a_c} = 0; \\ (7c) \quad \frac{\partial \Lambda^D}{\partial a_g} &= \frac{1 - \beta^D}{g^F} - \lambda \leq 0; a_g \geq 0; a_g \frac{\partial \Lambda^D}{\partial a_g} = 0. \end{aligned}$$

The conflict between the donor and the government is over the relative

⁹It can be shown that all the results generalise to the intermediate case when $\gamma > \beta^D$ and $\eta < \beta^S$, where γ (η) is the fraction of a_c (y) which is *not* taxable. Moreover, the results hold if the government uses lump-sum taxation and in a "pure" budget model (i.e., where the government, like the donor, has a given budget to allocate to the two goods).

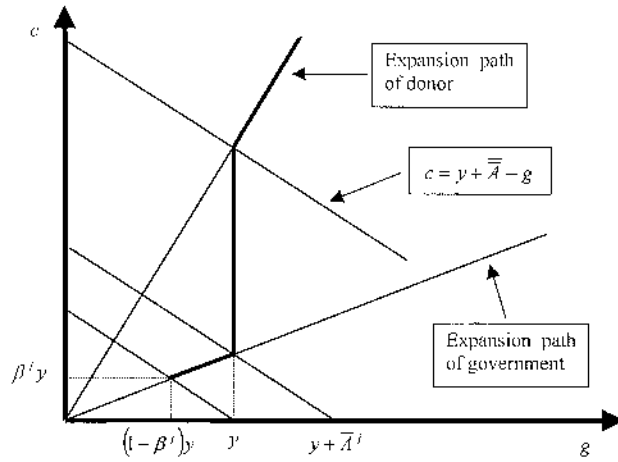


Figure 2: outcomes when donor moves after government

sumption, $g = y$, by keeping $\tau = 1$. The donor will still be spending all of its budget on a_c , so any increase in the donor's budget will end up as private consumption until the donor's budget is so large that it optimally spends at least y on public consumption (that is, until A is so high that $(1 - \beta^D)(y + A) = y$). From then on, the donor will have complete control, in the sense that the outcome is as good as it gets for it: $c^F = \beta^D(y + A) = c^*(D)$ and $g^F = (1 - \beta^D)(y + A) = g^*(D)$. This outcome is generated by the "first-best" aid policy $\{\beta^D(A + y) - (1 - \tau)y, (1 - \beta^D)(A + y) - \tau y\} \equiv \{a_c^*, a_g^*\}$. Figure 2 illustrates the outcome (the bold line segments) as a function of A .

As we have seen, the critical level of the aid budget at which the donor starts to have some influence is $\bar{A}^j = \left(\frac{\beta^j}{1 - \beta^j}\right)y$, which is a function the preferences of the government. Since $\beta^R > \beta^S$, $\bar{A}^R > \bar{A}^S$. That is, when a status quo government is in power the donor starts to have influence at lower budget levels than when a reform government is in power. This is due to the fact that the status quo government ideally wants a higher level of public consumption than a reform government. It therefore hits the constraint $\tau \leq 1$ before a reform government does.

The donor has complete control when its budget exceeds $\bar{A} = \left(\frac{\beta^D}{1 - \beta^D}\right)y$. Depending on its the preferences, this might entail unrealistically large budgets, sizeable budgets for development assistance to the country in question,

or small sums. We shall discuss this matter later. For now, it suffices to point out that since $\beta^D > \beta^R$, $\bar{A} > \bar{A}^R$, which confirms that the donor must have more resources in order to achieve complete control than it must have to have some influence.

Note that in this case, when determined by the equilibrium concept, $\tau^F(j) \geq 1 - \beta^j$ with a strict inequality for all positive levels of aid. That is, the donor influences recipient policy, but moves it in a direction which is the exact opposite of what it would have liked to see. This holds for both types of governments, which optimally tax harder when aid is given than when it is not. Of course, at the end of the day, it is the outcome that matters, not the policy, but in light of the debate on conditionality vs. ownership, it is interesting to see that even a reform government would optimally act contrary to the donor's wishes.

Summing up, the optimal actions of the donor along the equilibrium path are

$$(8) \{a_c^F, a_g^F\} = \begin{cases} \{0, 0\}, A = 0; \\ \{A, 0\}, A \in (0, \bar{A}]; \\ \{a_c^*, a_g^*\}, A > \bar{A}. \end{cases}$$

The best response of the government is (along the equilibrium path)¹²

$$(9) \tau^F(j) = \begin{cases} \tau^*(j), A \in [0, \bar{A}^j]; \\ 1, A \in (\bar{A}^j, \bar{A}]; \\ \text{any } \tau \in [0, 1], A > \bar{A}. \end{cases}$$

Finally, the outcome as a function of the donor's budget and the government's type is in equilibrium

$$(10) \{c^F, g^F\} = \begin{cases} \{c^*(j), g^*(j)\}, A \in [0, \bar{A}^j]; \\ \{A, y\}, A \in (\bar{A}^j, \bar{A}]; \\ \{c^*(D), g^*(D)\}, A > \bar{A}. \end{cases}$$

¹²The assumption that $\tau \geq 0$ is innocuous. The alternative specification for $A > \bar{A}$ - any $\tau \leq 1$ - does not change the outcome.

3.3 The Issue of Fungibility

It is difficult to define fungibility in a precise way. In the literature, the example that is ordinarily used to illustrate the concept is a situation where a donor wants to support a specific activity in the recipient country through an earmarked grant. Aid is then said to be fungible if expenditures on that activity do not rise by the full amount of the grant. But this is a naive representation of the donor, particularly if fungibility is indeed an important problem.¹³ In the present model, the donor acts strategically, taking into account the possibility of diversion of resources by the recipient.¹⁴ Therefore, it optimally adjusts its aid policy in order to achieve as much as possible. It follows that in the current context, fungibility is better defined in terms of influence over the final allocation. That is, aid is perfectly fungible if the donor has no influence on the outcome, partially fungible if it has some, and not fungible if the donor is in complete control over the outcome.

An alternative view would be that foreign development assistance is not fungible at all when the government cannot tax a_c . For $A \leq \bar{A}^j$, the donor allocates its total budget to private consumption. While the government controls the final allocation, $c = (1 - \tau)y + A \geq A$ in this range (since $\tau \leq 1$). For $A > \bar{A}^j$, the donor has some limited influence on the final allocation. It still chooses $a_c = A$, and since $c = A$, no part of the donation is spent on g . Finally, when the donor is in complete control, aid is clearly not fungible. But this position will not do; the donor acts in this way precisely because it realises that aid is fungible (partially or completely) for $A \leq \bar{\bar{A}}$.

Hence, I suggest that in aid games, fungibility should be defined in terms of the extent of the influence that the donor has over the final allocation. A simple though arbitrary measure of donor influence in the current model is

¹³See e.g. Feyzioglu, Swaroop, and Zhu (1998). Even in this apparently simple setting, however, there are some loose ends. These authors for some reason assume that the recipient must spend at least the size of the grant on the activity supported by the donor. Presumably this is because the donor will "punish" the recipient if it spends less than this amount. But then why does not the donor punish the recipient if it diverts part of the grant to other activities? Given the problem of punishing straying recipients, there is an untold story here that needs elaboration.

¹⁴That there is no crowding-out of domestic spending here even when aid is perfectly fungible (c.f. $c = \beta^j(y + A)$, while in the absence of aid, $c = \beta^j y$; i.e., domestic spending is constant at $\beta^j y$) is an artifact of the particular form chosen for the utility functions, which yields linear expansion paths.

$$(11) \Delta(\{c^F, g^F\}) = \frac{d(\{c^F, g^F\}, \{c^*(j), g^*(j)\})}{d(\{c^*(D), g^*(D)\}, \{c^*(j), g^*(j)\})},$$

where $d(v, w)$ is the Euclidean distance between the points v and w . Thus, $\Delta(\{c^F, g^F\})$ measures the distance between the outcome and the government's "first-best" allocation as a proportion of the distance between the "first-best" allocations of the donor and the government. The measure therefore requires $\{c^*(D), g^*(D)\} \neq \{c^*(j), g^*(j)\}$, but, as noted by Devarajan, Rajkumar, and Swaroop (1999), "[T]he question of what aid ultimately finances is interesting only if the preferences of the donor are different from those of the recipient".

It is easily seen that $\Delta(\{c^*(j), g^*(j)\}) = 0$ and $\Delta(\{c^*(D), g^*(D)\}) = 1$. This confirms that the donor has no influence for $A < \bar{A}^j$, and is in complete control once $A > \bar{A}$. It is straightforward to verify that $\Delta(\{c^F, g^F\})$ is an increasing function of A on $[\bar{A}^j, \bar{A}]$, with $\Delta(\{c^F, g^F\}) = 0$ at \bar{A}^j and $\Delta(\{c^F, g^F\}) = 1$ at \bar{A} . Thus, the donor has some influence when $A \in (\bar{A}^j, \bar{A})$, and its influence over the final allocation increases with its budget until it is in complete control, as previously shown.

4 The Donor as the Leader

I now change the order in which the donor and the recipient make their moves. Thus, I assume that the donor moves before the recipient. It should be clear that if a_c is taxable in the same way as y , development assistance is for all practical purposes still completely fungible.¹⁵ The budget constraints facing the government after the donor has chosen its aid policy are $c = (1 - \tau)(y + a_c)$ and $g = \tau(y + a_c) + a_g$. There is no way the donor can

¹⁵An analogous result has been derived by Pedersen (1995) for the case he labels "the donor as a passive Stackelberg leader". His "active Stackelberg leader" is assumed to be able to write binding contracts with the government in a recipient country. It can thus keep the government at its "participation constraint", i.e., the level of "utility" it will have in the absence of aid. However, in practice, such contracts are not legally enforceable. There are no international courts in which redress for breach of contract can be sought. Therefore, the approach chosen here, which assumes that no legal means are available to alter the outcome relative to the subgame-perfect equilibrium, seems more realistic.

manipulate these through a_c and a_g to prevent the government from achieving its optimal distribution of $y + A$ into c and g by way of τ that would improve the outcome from its point of view.¹⁶ We shall therefore concentrate on the case where a_c cannot be taxed. Whenever it is necessary, I will use the superscript L to distinguish strategies and outcomes from those derived in the last section.

It is straightforward to calculate that at an interior solution, the government would choose the following tax rate as a function of a_c and a_g :

$$(12)\tau^L(j) = \frac{1}{y} \left[(1 - \beta^j)(y + a_c) - \beta^j a_g \right].$$

Now the donor must try to exploit the constraint $\tau \leq 1$. This it can do if its budget is large enough. $\tau^L(j) \leq 1 \Leftrightarrow a_c \leq \left(\frac{\beta^j}{1 - \beta^j} \right) (y + a_g)$, so even utilising its resources maximally (setting $a_c = A$ and $a_g = 0$), the donor will not be able to influence the outcome until $A > \left(\frac{\beta^j}{1 - \beta^j} \right) y = \bar{A}^j$. For budgets lower than this, aid is completely fungible and the government achieves its "first-best" outcome. For $A \geq \bar{A}^j$, the donor finances private consumption and the government finances public consumption until the maximum level of public consumption that the government can secure (y) is the optimal one from the donor's perspective. This occurs at a level of the aid budget equal to $\bar{A} = \left(\frac{\beta^D}{1 - \beta^D} \right) y$. Thus, the degree of fungibility exhibits the same pattern as in the situation where the donor moved last.

In sum, the optimal actions of the government along the equilibrium path are

$$(13)\tau^L(j) = \begin{cases} \tau^*(j), A = 0; \\ \frac{1}{y} \left[(1 - \beta^j)(y + a_c) - \beta^j a_g \right], A \in \left(0, \bar{A}^j \right]; \\ 1, A > \bar{A}^j. \end{cases}$$

¹⁶The qualification relates to the possibility that we must have $\tau > 0$, i.e., subsidiation is not allowed. The donor could set $a_g = A$. Then $g \geq A$ if $\tau \geq 0$. If $A > \left(1 - \beta^D \right) (y + A)$, the government ideally wants a lower level of g , but is constrained by the impossibility of setting a negative tax rate. a_c cannot be used in the same way, since any fraction of it can be turned into g through τ . Of course, the donor does not want to force the government into this corner, because the outcome would be even more g than at the government's "first-best" allocation, which still has more g than the donor wants. The donor is powerless to influence the outcome in the desired direction in this case as well, so according to the definition used here, aid is completely fungible.

The donor's best response is (along the equilibrium path)

$$(14) \{a_c^I, a_g^I\} = \begin{cases} \{0, 0\}, A = 0; \\ \{a_c, A - a_c\}, A \in (0, \bar{A}^j]; \\ \{A, 0\}, A \in (\bar{A}^j, \bar{\bar{A}}]; \\ \{a_c^*, a_g^*\}, A > \bar{\bar{A}}. \end{cases}$$

The equilibrium outcome produced is the same as when the donor is a follower

$$(15) \{c^L, g^L\} = \begin{cases} \{c^*(j), g^*(j)\}, A \in [0, \bar{A}^j]; \\ \{A, y\}, A \in (\bar{A}^j, \bar{\bar{A}}]; \\ \{c^*(D), g^*(D)\}, A > \bar{\bar{A}}. \end{cases}$$

We see that both \bar{A}^j and $\bar{\bar{A}}$ are unchanged from the case where the donor moved last. This is perhaps surprising *prima facie*, but it turns out that the two cases are mirror-images of each other. When the donor moves last, the government is able to exploit the non-negativity constraint on a_g until it cannot increase the level of public consumption in the absence of aid, that is, until $\tau = 1$. Hence, the government corners the donor by making $a_c = A$ its optimal choice. From then on, even by setting $\tau = 1$, the government is powerless to stop the donor from turning any increase in its budget into more c . Here, the donor is not able to prevent an interior solution to the government's optimisation problem if its budget is small. But once its total budget is large enough for the extreme aid policy $a_c = A$ to make an impact, it will exploit the government's incomplete ability to tax total private sector income. $a_c = A$ will make an impact when the government ideally wants a level of c which is lower than this (given total income $y + A$). Thus, the government gets pinned down at $\tau = 1$ by the donor.

The conflict between donor and recipient is over how to split the pie. Lacking the powers to tax, the donor must exploit any weaknesses on the part of the government. The government's weakness is that it has incomplete control over private sector income. The donor can use this to its advantage when it has enough resources to make c inoptimally high from the perspective of the government even when all domestic income is taxed away. However, it is not in complete control until it wants to increase g from the level at which the government has fixed it. Conversely, the government takes advantage

of the donor's inability to tax when it moves first. This works as long as it can secure more g through its own resources than is optimal from the donor's point of view. For low levels of A , it can attain its "first-best" allocation through this strategy. For medium levels of the donor's budget, the government can secure a minimum level of g by spending all domestic income on this good. It becomes powerless to affect the outcome once the donor wants $g \geq y$. So the underlying logic of the conflict is that, if possible, both the donor and the recipient exploit the incomplete control of the other party over the pie to increase the share allocated to the good it prefers the most relatively speaking. Since their preferences are thus in effect strictly opposed, each of them are drawn to the extreme positions that the other party uses against them when it has a first-mover advantage.

5 Domestic Political Equilibrium and Aid

Let us now assume that the government is chosen through democratic elections. That is, before the aid game starts, there is an election in which voters vote for either R or S . This choice is determined by comparing the outcomes with the two governments in power. Hence aid will affect the domestic political equilibrium if the donor influences outcomes. Because aid is completely fungible when the government can tax whatever amount is given to the private sector, the outcome then only depends on the government's type. Therefore, I ignore these cases here. When a_c is not taxable, we have seen that aid sometimes affects the relative level of private and public consumption. Table 1 summarises the outcomes, given the level of the donor's aid budget and the government's type. Since the outcomes do not depend on the order in which the donor and the government moves, the following applies to both cases analysed above.

Table 1: outcomes under different types of government

A/j	R	S
$0, \bar{A}^S$	$\{c^*(R), g^*(R)\}$	$\{c^*(S), g^*(S)\}$
(\bar{A}^S, \bar{A}^R)	$\{c^*(R), g^*(R)\}$	$\{A, y\}$
(\bar{A}^R, \bar{A})	$\{A, y\}$	$\{A, y\}$
$> \bar{A}$	$\{c^*(D), g^*(D)\}$	$\{c^*(D), g^*(D)\}$

Voters have utility functions which are analogous to the objective func-

tions of the government and the donor. We can, for each of the four categories of aid levels in the table, find the preferences of the voter who is indifferent between the two types of government. It is immediate from Table 1 that for $A > \bar{A}^R$, all voters are indifferent between R and S because the outcome is the same regardless of the choice of government. This is so even if the election would produce a clear-cut winner in the absence of foreign aid. With no aid forthcoming, the indifferent voter(s) I has a weight on the utility of private consumption equal to¹⁷

$$(16)\beta^I = \frac{\ln(1 - \beta^S) - \ln(1 - \beta^R)}{[\ln \beta^R - \ln \beta^S] + [\ln(1 - \beta^S) - \ln(1 - \beta^R)]}.$$

It can be shown that $\beta^I \in (\beta^S, \beta^R)$.¹⁸ If the preferences of the median voter are such that $\beta^M < \beta^I$, S wins the election.¹⁹ On the other hand, for $\beta^M > \beta^I$, R wins the election. Only in the unlikely case $\beta^M = \beta^I$ would the outcome of the election be indeterminate in the absence of aid. If the median voter resolves his indifference by flipping a fair coin, a donor might contribute to turning a certain victory for a reform government into a mere 50-50 chance of winning! The giving of aid, however, can even turn the domestic political equilibrium upside down when $A \in [\bar{A}^S, \bar{A}^R]$.

To see this, we must find the indifferent voter for those levels of the aid budget. When $A = \bar{A}^S$, β^I is still given by (16), since in this borderline case S achieves its optimal allocation at a tax rate of unity. For $A > \bar{A}^S$, the calculation is complicated by the fact that it is no longer only the ideology of the two alternatives that matter. S is now at a corner solution, and the level of aid therefore plays a role. The problem is best solved by defining a "virtual" opponent to R , that is, a government with preferences such that the

¹⁷For the sake of completeness, note that the indifferent voter is the same when the outcome is independent of the level of the aid budget.

¹⁸ β^I is found by calculating the β for which the utility from electing R is equal to the utility from electing S . See Appendix A of Hagen (1999) for the details.

¹⁹The conditions ensuring that the median voter is decisive are clearly satisfied here (in particular, preferences are single-peaked) even though he cannot choose his most preferred tax rate. The median voter model is unrealistic for national elections, three notable features of which are a fixed set of alternatives (parties or candidates with party labels), uncertainty about voter preferences, and voter uncertainty about what policy will result from the election of a particular alternative. Only the first is present here, but there is no point in introducing the last two features in the current model, which has only one period.

outcomes produced under an S -government equal its "first-best" outcomes. β^I can then be calculated in analogy with (16).

The weight the "virtual" opponent attaches to the utility of private consumption, $\tilde{\beta}$, must satisfy $\tilde{\beta}(y + A) = A$, or

$$(17) \tilde{\beta}(A) = \frac{A}{y + A}.$$

Clearly, $\tilde{\beta}(A) \in (0, 1)$ as required (since $A \geq \bar{A}^S > 0$). Moreover, $\frac{\partial \tilde{\beta}(A)}{\partial A} > 0$. The more aid is given in this range, the higher is private consumption (public consumption is constant). Thus, to make the outcome a "first-best" outcome for the "virtual" opponent when foreign assistance goes up, it must attach a greater weight to private consumption. Furthermore, as $\tilde{\beta}(\bar{A}^S) = \beta^S$, $\tilde{\beta}(\bar{A}^R) = \beta^R$, and $\beta^R > \beta^S$, $\tilde{\beta}(A) \in [\beta^S, \beta^R]$.

β^I is now a function of the aid budget:

$$(18) \beta^I(A) = \frac{\ln(1 - \tilde{\beta}(A)) - \ln(1 - \beta^R)}{[\ln \beta^R - \ln \tilde{\beta}(A)] + [\ln(1 - \tilde{\beta}(A)) - \ln(1 - \beta^R)]}.$$

In the appendix, it is demonstrated that $\frac{\partial \beta^I(A)}{\partial A} > 0$, with $\lim_{A \rightarrow \bar{A}^R} \beta^I(A) = \beta^R$. That is, the identity of the indifferent voter is moved "to the right" as the aid budget goes up, and in the limit (in this range of aid budgets), even a voter with a weight on the utility of private consumption equal to β^R is indifferent between the two types of government! The latter is due to the fact that in the borderline case of $A = \bar{A}^R$, the outcome is $\{A, y\}$ regardless of which government is in power.

What is happening is that as the aid budget increases, the outcomes under the two types of governments are converging, c.f. Figure 3. In the end, the outcomes are the same, and the label of the government does not matter for outcome-oriented voters. The country is effectively under foreign administration, and domestic politics therefore is devoid of any real content.

If $\beta^M \in (\beta^I(\bar{A}^S), \beta^I(\bar{A}^R))$, a reform government would have won in the absence of aid. $\beta^I(\bar{A}^S)$ is equal to β^I as given by (16), which in turn lies between β^S and β^R . Therefore, if $\beta^M > \beta^I(\bar{A}^S)$, a reform government would

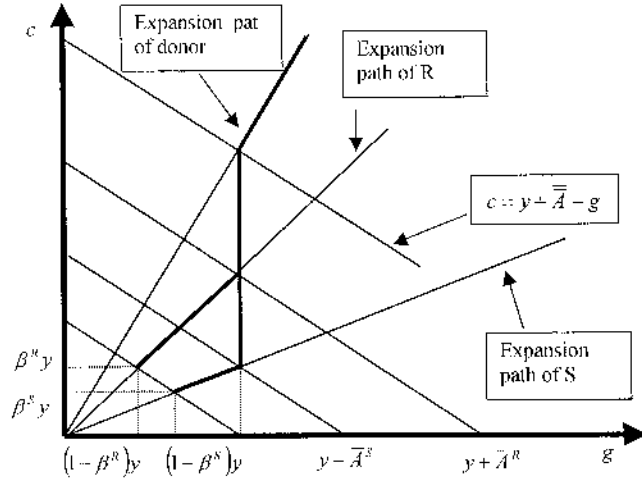


Figure 3: convergence of outcomes under R- and S-Governments

have been preferred to a status quo government by a majority of the voters if no aid was forthcoming. But with aid, there clearly exists an aid budget $A' \in (\bar{A}^S, \bar{A}^R)$ such that $\beta^M = \beta^I(A')$ (since $\beta^I(\bar{A}^R) = \beta^R$, $\beta^M < \beta^R$, and $\frac{\partial \beta^I(A)}{\partial A} > 0$), c.f. figure 4. Hence, for $A \in (A', \bar{A}^R)$, a reform government will now certainly lose the election!

Such an outcome would clearly make the donor worse off. Even though it has some influence with a status quo government compared to none with a reform government, outcomes are still better under the latter from the donor's point of view. In Figure 3, it is easily seen that for any aid budget in the region $[\bar{A}^S, \bar{A}^R)$, the point on R 's expansion path, which will be the outcome if it is in power, is closer to the corresponding point on the donor's expansion path than $\{A, y\}$ is.

While this need not happen, it is clear that if aid decisively affects the domestic political equilibrium, it is in this direction. If $\beta^M < \beta^I(\bar{A}^S)$, a reform government loses the election $\forall A < \bar{A}^R$. From \bar{A}^R on, it has a 50% chance of winning. If $\beta^M > \beta^I(\bar{A}^R)$, a reform government wins the election until $A = \bar{A}^R$. For higher levels of the aid budget, its probability of winning drops from 1 to 0.5. Finally, as just noted, if $\beta^M \in (\beta^I(\bar{A}^S), \beta^I(\bar{A}^R))$, R

for example, Mozambique received aid equivalent to 101% of its GNP in 1994, and the corresponding number for Rwanda was 95,9%.²⁰ However, these are clear outliers in the sample, and there is no reason to believe that the picture is very different in other years. Moreover, these numbers are for total aid given to the country, so single donors (whether bilateral or multilateral) would clearly see the requirement for complete influence exceed their resources. If we interpret the donor as the international community, it is thus possible to come up with country examples where the sums are so great that development assistance might be expected to determine recipient country resource allocation according to the current model. Though, these are exceptional, and as we are about to see, the expectation is probably still not realistic.

What then of the critical level of aid needed to have some influence? Numbers for the size of the public sector in developing countries are hard to come by. A recent study by Commander, Davoodi, and Lee (1997) provides data for public consumption as a share of GDP that can be used for illustrative purposes. Taking their data for government consumption in 1987 US-dollars (aid budgets are not measured in terms of purchasing power parity), the average for the developing countries in their sample was 14,7% in 1974-83. If we take this as the status quo, and add some for other components of the government's budget, we might take $1 - \beta^S$ to be about 0,3 in an average developing country. Using these numbers, $\bar{A}^S = 2,33y$. So even with governments wanting a large public sector, which presumably also had great problems financing their expenditure plans in the aftermath of the debt crisis, the donor community would have a hard time buying any influence whatsoever.

Granted, in a more disaggregated model, it seems reasonable to expect that the requirement for being influential for specific goods or sectors would be less daunting. Still, the conclusion that aid ceases to be fungible if the sum is large enough is supported by the empirical study of Boone (1996). He finds that "[i]n small countries, or countries where the aid/GNP ratio is

²⁰If aid influences the level of income, these are not the kind of numbers we really want. Many empirical studies have investigated the relationship between aid and economic growth, but I do not know of any studying how aid affects levels of income (presumably this is due to the fact that aid is primarily given to relatively poor countries). The unconditional relationship between aid and growth seems weak. In any case, we are looking for a hypothetical counterfactual (aid/income in the absence of aid), and so for purposes of illustration numbers like these will have to do.

extremely large (over 15% of GNP) [...] aid does lead to higher investment.” This contrasts with his general conclusion, namely, “[t]he marginal propensity to consume from aid is insignificantly different from one and the marginal propensity to invest is insignificantly different from zero.” In this perspective, donor fatigue is to be expected.

7 Is Donor Influence Desirable?

Given the current emphasis on ownership, the implication of the “back-of-the-envelope” calculations of the last section might not be negative. And the conclusion fits well with the generally negative reviews of the effectiveness of conditionality in inducing policy reform. According to Killick (1998), for instance,²¹ “Our country survey attested to the frequency with which differences of interest [between IFIs and governments in recipient countries] occurred and the negative effects of these on conditionality implementation. It was precisely because of the strength of these considerations that we could show in Chapter 4 the large importance of ‘ownership’ as a determinant of implementation, and why the evidence in Chapter 6 showed domestic political forces normally carry the day in decisions about economic policy.” (pp. 171-72, quotes in original) I have not explicitly modelled conditionality, for exactly the reason that it cannot be expected to work well given the lack of legal means by which enforcement of the conditions could be made credible. It is clearly possible to design “contracts” which would hold the governments to their participation constraints, but there are no courts in which to enforce these, and one is thus left with the carrot and stick of giving or withholding financial assistance.²² Whether such threats and promises are credible, and if credible, sufficient, to instigate reform in recipient countries must thus be examined.

I have examined the credibility issue by using an equilibrium concept that rules out empty threats and promises. For instance, when the donor moves last, we have seen that it will spend its total budget, even though

²¹Other notable studies on conditionality (in relation to both aid and multilateral lending) include Mosley, Harrigan, and Toye (1991) (on the World Bank), Killick (1995) (on the IMF), and World Bank (1998) (on aid in general).

²²On the design of formal aid contracts, see e.g. Pedersen (1995a,b) and Svensson (1995). Killick (1998) provides “meat to the formal bone” by discussing the principal-agent approach to multilateral lending based on an extensive review of the empirical literature and new country case studies from South-east Asia and Latin-America.

it could have withheld funds if their contribution to the final outcome was negative given the tax rate chosen by the government. It is never optimal for the donor to do so, but this just goes to show that statements like "we will reduce our disbursements of aid by $x\%$ if you do not choose a tax rate of z " are not credible.²³ The constraints on donor behaviour implied by the concept of sub-game perfectness put a question mark on the results derived in a well-known paper by Rodrik (1989). He studies the impact of aid on trade reforms assuming that a donor makes a one-time offer of aid contingent on reforms and finds that this may lead a government which is not in favour of reform to pretend otherwise in order to cash in before reversing its trade policy stance. The possibility of reform reversal has a negative impact on domestic investment. However, the problem is founded on the unrealistic assumption that aid can be made contingent on the actions of the recipient country government. Thus, whether they hold up in a more realistic model remains to be seen.

I have also shown that the funds required to influence resource allocation are sizeable compared to real aid flows. True, the reform I consider is very stylised, amounting to a reduction in the average tax rate compared to the status quo. Still, a non-trivial pattern of the impact of aid on policies emerged. Researchers such as Burnside and Dollar (1997) has found that, empirically, aid seems to have had little impact on economic policies in recipient countries.²⁴ Based on the model developed here, this is to be expected from an average of countries, since the link from aid to policies will depend on e.g. the details of the tax system. While the model is admittedly simple, its implications thus sits well with the well-documented lack of success of conditionality.

According to the model, this is perhaps all the better, even for the donor, at least in democratic recipient countries. We have seen that the level of development assistance might affect whether the median voter of a recipient country prefers a reform government to one wedded to the status quo. In fact, if the donor's actions decisively affects the domestic equilibrium, i.e., changes the probability that one of the political alternatives wins from 1 to 0 (or vice versa), it is to the disadvantage of a reform government! In light of

²³Of course, a model in which the aid budget is endogenous is even better equipped to deal with the credibility issue. This must await future research.

²⁴Admittedly, much can be said about the construction of their "policy index", consisting of measures of inflation, budget surplus, and trade openness, even beyond the obvious that strictly speaking none of the components are policy variables.

the finding of Dollar and Svensson (1998) - that democratic governments tend to be more successful reformers - it is therefore tempting to advise donors (and public lenders) not to leverage their resources in order to achieve a level of aid at which influence can be had, and to concur with the conclusion of these authors: "[T]he role of adjustment lending is to identify reformers not to create them." (p.4)²⁵

8 Final Comments

The conclusion in the last paragraph does not necessarily imply that the task of donors becomes simpler, only that they should stop throwing good money after bad. In the model used here, neither aid nor policies affects the size of the domestic pie (aid increases the total pie 1:1). The size of the domestic pie is given, and both aid and tax policy only affect the allocation of the sum of domestic and foreign resources available to the country in question to private and public consumption. In reality, of course, both matter. A strong conclusion of the extensive empirical literature on policies and growth, for example, is that good policies foster economic growth. And some evidence is starting to accumulate to the effect that while the unconditional relationship between aid and growth is weak, aid works when policies are sound. Thus, the next step should be to allow for links from policies to the income level (or the growth of income). Foreign development assistance will then have an impact whether it affects domestic policies or not (the former should be expected, though).²⁶

²⁵Dollar and Svensson (1998) consider a range of political variables such as regime type and degree of political instability, as well as input variables under the control of the World Bank (e.g. amount of resources allocated to loan preparation and supervision). They find that the former predicts reform success (as defined by the Operations Evaluation Department of the Bank) in a sample of adjustment loans made by the World Bank, while there is no connection between the latter and outcomes.

²⁶Such an extension would make possible an investigation of two competing hypotheses about the impact of aid on the decision to reform; i) that the decision hinges on foreign assistance to help smooth the transition to a new equilibrium, and ii) that crises are the midwives of reform, and that concessional financing will thus induce governments to postpone the hard choices. A formal model of the benefits of crises for reforms is provided by Drazen and Grilli (1993), based on the work by Alesina and Drazen (1991) on the delay of fiscal stabilisations. Casella and Eichengreen (1994) have studied the effects of aid in that framework, and conclude that these depend crucially on the timing of both announcements and disbursements.

It follows from the above that development assistance will be most valuable if it is directed towards countries in which the government pursues, or intends to pursue, policies that increase the level of income or its growth rate and reduce income inequality and poverty. I have assumed that everybody has the same share of income, but this is, alas, not a realistic description of actual developing countries. Income distributions are highly skewed in favour of the upper deciles (or worse), so the task facing donors is not only to pick governments which will increase the aggregate or average income of their poor country, but to single out those which are willing to distribute the resources of their societies more equitably too. This is no mean task. Setting preconditions for loans already has a long tradition with the multilateral lending institutions, but to repeat myself once again, this has not had much of an impact on reform success. Preconditions are meant as a screening device to help "good" governments separate from bad ones. However, the practice has not solved the adverse selection problem in which status quo governments pose as reformers in order to cash in on "conditional" foreign financing.²⁷ This they can do because there is a great difference between adopting reforms on paper and actually implementing them, and the punishment for non-implementation has been weak, due to e.g. the disbursement imperative of the multilateral financial institutions (or the "Samaritan's Dilemma" of bilateral donors piggy-backing on the conditionality of the multilaterals).²⁸

To this, it might be added that governments change, particularly in low-income countries, which are more unstable politically than high-income countries. Sometimes, and more regularly in recent years, this is by democratic means. It is therefore not only the intentions of the current government that must be probed, the path of likely governments must be forecasted. This requires a greater understanding of the political economy of recipient countries - e.g. how interests are organised, the ideology of the main parties, and the electoral system - in order to be able to predict the impact of reforms on the distribution of income among politically influential groups, the support of

²⁷This is an adverse selection problem because it seems reasonable to assume that different types of governments have different intentions with respect to fulfilling the requirements of conditionality. In addition, there will usually be a moral hazard problem regardless of the intentions of the government, because the benefits and/or costs of carrying out reforms might vary with the state of the economy or polity.

²⁸I use quotes on the "Samaritan's Dilemma" because most bilateral donors are not (pure) Samaritans. See for example Alesina and Dollar (1998) for an empirical investigation of bilateral donors' motivations for giving aid.

political parties, and, ultimately, on the domestic political equilibrium which determines whether reforms will be adopted, implemented, and sustained.

But the picture is not all gloom and doom. There are many examples of surprise reformers (see e.g. Cukierman and Tommasi 1998a,b). Policy choice is a function of not only political preferences, but of beliefs about the links between policies and outcomes. Beliefs might change even when ideologies do not, whether on the basis of accumulated experience or through persuasion. So even if money cannot buy reformers, careful analysis of where to put one's bets might in combination with a policy dialogue based on long-standing relationships enable donors to make a difference.²⁹

In conclusion, the main contributions of this paper are

- * to show that while commitment versus discretion is irrelevant to the outcome of aid games of the type studied here, the recipient government's ability to tax transfers to the private sector (or administrative capacity more generally) is very important;

- * to provide a definition of fungibility when both the donor and the recipient acts strategically;

- * to show that very large sums are needed if donors are to have any influence over outcomes;

- * and to investigate the effect of foreign aid on the political equilibrium in democratic recipient countries.

As already noted, there is plenty of room for expanding on this simple model, something I hope to do in the future.

9 Appendix

9.1 Subgame-Perfect Strategies of Donor and Recipient When a_c Cannot be Taxed

As noted in the main text, for all practical purposes, the strategies of the donor and the recipient are the same regardless of which one of them moves

²⁹That information transmission is most efficient when preferences are similar, is well-known from "cheap-talk" games. A similar mechanism is what lies behind the results of Cukierman and Tommasi (1998a,b), who demonstrates that sometimes, it takes a Nixon to go to China; i.e., that one's own kind is best placed to convince one of the need for bold action given the state of the world. This is because someone with similar preferences will not try to take advantage of one's incomplete knowledge of decision-relevant information the way a political adversary might.

first. Therefore, we shall only derive these strategies for the case where the donor moves last. The proof will be somewhat informal.

Define $U^{j*} \equiv U^j(\beta^j y, (1 - \beta^j) y)$, and note that this is the level of utility achieved by a government of type j in the absence of aid given that it chooses its utility-maximizing tax rate $1 - \beta^j$.

The optimisation problem of the donor is

$$\underset{a_c, a_g}{Max} U^D(c, g)$$

subject to $c = (1 - \tau)y + a_c$, $g = \tau y + a_g$, $a_c + a_g \leq A$, and $U^j(c, g) \geq U^{j*}$; with τ predetermined by the government. The Lagrange function for this problem is thus $\Lambda^D = U^D(c, g) + \lambda(A - a_c - a_g) + \mu[U^j(c, g) - U^{j*}]$. The first-order conditions are

$$\begin{aligned} (A1a) \quad \frac{\partial \Lambda^D}{\partial \lambda} &= A - a_c - a_g \geq 0; \lambda \geq 0; \lambda \frac{\partial \Lambda^D}{\partial \lambda} = 0; \\ (A1b) \quad \frac{\partial \Lambda^D}{\partial \mu} &= U^j(c^F, g^F) - U^{j*} \geq 0; \mu \geq 0; \mu \frac{\partial \Lambda^D}{\partial \mu} = 0; \\ (A1c) \quad \frac{\partial \Lambda^D}{\partial a_c} &= \frac{\beta^D}{c^F} - \lambda + \mu \frac{\beta^j}{c^F} \leq 0; a_c \geq 0; a_c \frac{\partial \Lambda^D}{\partial a_c} = 0; \\ (A1d) \quad \frac{\partial \Lambda^D}{\partial a_g} &= \frac{1 - \beta^D}{g^F} - \lambda + \mu \frac{1 - \beta^j}{g^F} \leq 0; a_g \geq 0; a_g \frac{\partial \Lambda^D}{\partial a_g} = 0. \end{aligned}$$

Define \tilde{A}^j by $U^j(\beta^D(y + \tilde{A}^j), (1 - \beta^D)(y + \tilde{A}^j)) = U^{j*}$. This is the level of the aid budget at which the "participation constraint" of the government is not binding at the outcome produced by the donor's "first-best" policy $\{\beta^D(A + y) - (1 - \tau)y, (1 - \beta^D)(A + y) - \tau y\} \equiv \{a_c^*(\tau; A), a_g^*(\tau; A)\}$. As $\beta^D \neq \beta^j$, $j = R, S$, $\tilde{A}^j > 0$ since a strictly positive amount of resources is necessary to compensate the government for the "inoptimal" distribution of consumption sought by the donor.

Consider first the case $A \geq \tilde{A}^j$, that is, the case where the participation constraint of the government is not strictly binding at $\{a_c^*(\tau; A), a_g^*(\tau; A)\}$. Then the participation constraint is clearly not binding for any other tax rate (than $1 - \beta^j$) the government might choose. Thus $\mu = 0$, and the donor need only worry about the non-negativity constraints on a_c and a_g . We shall concentrate on the latter, as this is the one which is of importance for the

equilibrium outcome. As $(1 - \beta^D)(y + A) > 0$, $\exists 0 < \tau' \leq 1$ such that $\tau'y = (1 - \beta^D)(y + A)$, $\forall A \leq \bar{A} = \left(\frac{\beta^D}{1 - \beta^D}\right)y$. Thus, for $\tau \leq \tau'$, the non-negativity constraint on a_g is not strictly binding at $\{a_c^*(\tau; A), a_g^*(\tau; A)\}$. By choosing this policy, the donor achieves its "first-best" outcome, so it is clearly optimal. For $\tau > \tau'$, the non-negativity constraint on a_g is strictly binding at $\{a_c^*(\tau; A), a_g^*(\tau; A)\}$, and the donor therefore optimally chooses $a_g = 0$ and $a_c = A$.

When $A < \bar{A}^j$, there is a range of tax rates $[\tau'', \tau^{j*}]$, $\tau'' > \tau'$, such that the participation constraint of the government is strictly binding at $\{a_c^*(\tau; A), a_g^*(\tau; A)\}$. However, since indifference curves are convex and $\beta^D > \beta^j$, $j = R, S$, it is obviously the case that the non-negativity constraint on a_g is binding at the aid policy that satisfies the participation constraint. Therefore, the donor cannot settle for satisfying the participation constraint, and will still choose $\{A, 0\}$ for $\tau > \tau'$. It follows that we have $\mu = 0$ at the donor's optimum in this case as well.

For $A > \bar{A}$, $\nexists \tau' \leq 1$. Therefore, neither the participation constraint nor the non-negativity constraint on a_g is strictly binding at $\{a_c^*(\tau; A), a_g^*(\tau; A)\}$. The donor is therefore free to choose this policy regardless of τ .

Finally, to complete the proof, we must show that $\bar{A} > \tilde{A}^j$. Since $U^j(\cdot, \cdot)$ is strictly increasing in both arguments, $\bar{A} > \tilde{A}^j \Leftrightarrow U^j\left(\beta^D(y + \bar{A}), (1 - \beta^D)(y + \bar{A})\right) > U^j\left(\beta^D(y + \tilde{A}^j), (1 - \beta^D)(y + \tilde{A}^j)\right) = U^{j*}$, where the equality follows from the definition of \tilde{A}^j . The proof is then immediate from comparing U^{j*} and $U^j\left(\beta^D(y + \bar{A}), (1 - \beta^D)(y + \bar{A})\right)$; noting that as $1 > \beta^D > \beta^j$, $\beta^D(y + \bar{A}) = \left(\frac{\beta^D}{1 - \beta^D}\right)y > \beta^j y$ and $(1 - \beta^D)(y + \bar{A}) = y > (1 - \beta^j)y$.

In sum, the best response of the donor given its budget and the tax rate, $\{a_c^F(\tau; A), a_g^F(\tau; A)\}$, is³⁰

³⁰This is not a complete description of the sub-game perfect equilibrium strategy of the donor since we have not investigated its optimal response if for some reason the non-negativity constraint on a_c is binding. It can be shown that for certain levels of the donor's budget, there exists a $\tau''' < \tau'$ such that for $\tau < \tau'''$, the non-negativity constraint on a_c is strictly binding. Faced with such tax rates, the donor will choose $\{0, A\}$. Such tax rates would thus result in an outcome with more c and less g than the donor wants. Since the government wants less c and more g than the donor, instigating such sub-games is clearly not optimal for the government. Hence, for the sake of brevity we ignore them.

A/τ	$[0, \tau']$	$> \tau'$
0	$\{0, 0\}$	$\{0, 0\}$
$(0, \bar{A}]$	$\{a_c^*(\tau; A), a_g^*(\tau; A)\}$	$\{A, 0\}$
$> \bar{A}$	$\{a_c^*(\tau; A), a_g^*(\tau; A)\}$	$\{a_c^*(\tau; A), a_g^*(\tau; A)\}$

The government knows $\{a_c^F(\tau; A), a_g^F(\tau; A)\}$ when it chooses its tax policy. If there is no aid, we know that the tax rate $1 - \beta^j$ is its optimal choice. Since $\frac{\partial U^j(\beta^D(A-y), (1-\beta^D)(A+y))}{\partial c} < 0$ and $\frac{\partial U^j(\beta^D(A+y), (1-\beta^D)(A+y))}{\partial g} > 0$ at $\{\beta^D(A+y), (1-\beta^D)(A+y)\}$, it is in the government's interest to increase g and decrease c relative to this point. Its "first-best" tax rate given a level of income in the private sector equal to $A+y$ (of which A is not taxable), $\frac{1}{y}(1-\beta^j)(A+y) \equiv \tau^*(j)$, ensures that the final allocation is $\{\beta^j(A+y), (1-\beta^j)(A+y)\} \forall A \leq \bar{A}^j = \left(\frac{\beta^j}{1-\beta^j}\right)y$. This claim is proved by noting that, as $\beta^D > \beta^j$, $\tau^*(j) = \frac{1}{y}(1-\beta^j)(A+y) > \frac{1}{y}(1-\beta^D)(A+y) = \tau'$. Hence, the donor gets stuck at its corner solution, unable to affect the outcome. As it can attain its "first-best" outcome by choosing $\tau^*(j)$, this tax rate is obviously the optimal choice of the government. $\tau^*(j) \leq 1 \Leftrightarrow A \leq \bar{A}^j = \left(\frac{\beta^j}{1-\beta^j}\right)y$. Thus, for $A > \bar{A}^j$, the government cannot attain its "first-best" allocation for an income level equal to $A+y$ because of its inability to tax a_c . $\tau = 1$ is then clearly optimal for $A \leq \bar{A}$, as any reduction in the tax rate would lead to more c and less g and thus move the outcome further away from the government's "first-best allocation" given the sum of domestic income and aid. When $A > \bar{A}$, the government is powerless to affect the outcome, because the donor now wants $g > y$. The optimal strategy of the government is therefore as given by (9) in the main text (if negative values of τ are disallowed, but this is of no importance for the equilibrium), and the outcome follows straightforwardly from the strategies of the two players.

9.2 Political Equilibrium

The "virtual" opponent of R when $A \in [\bar{A}^S, \bar{A}^R]$ is defined as the type of government that would have optimally chosen the outcome generated under an S -government. Since private consumption is equal to A with an S -government in power, the preferences of the "virtual" opponent can be derived from $\tilde{\beta}(y+A) = A \Leftrightarrow \tilde{\beta}(A) = \frac{A}{y+A}$. As $\bar{A}^S > 0$, $\tilde{\beta}(A) \in (0, 1)$. More-

over, $\frac{\partial \tilde{\beta}(A)}{\partial A} = \frac{y}{(y+A)^2} > 0$. Thus, as $\tilde{\beta}(\bar{A}^S) = \beta^S$, $\tilde{\beta}(\bar{A}^R) = \beta^R$, and $\beta^R > \beta^S$, $\tilde{\beta}(A) \in [\beta^S, \beta^R]$. $\beta^I(A)$ is then found from $U^I(\beta^R(A+y), (1-\beta^R)(A+y)) = U^I(\tilde{\beta}(A)(A+y), (1-\tilde{\beta}(A))(A+y))$, i.e., it is the weight placed on the utility of private consumption by the voter(s) who is (are) indifferent between electing R and S (represented by its "virtual" sister party). It is straightforward to verify that $\beta^I(A)$ is given by (17) in the main text; and, using the procedure in Appendix A of Hagen (1999), that $\beta^I(A) \in (\tilde{\beta}(A), \beta^R)$, $\forall A \in [\bar{A}^S, \bar{A}^R)$. The derivative of (18) with respect to A is

$$(A2) \frac{\partial \beta^I(A)}{\partial A} = \frac{1}{\left[\ln \beta^R - \ln \tilde{\beta} \right] + \left[\ln(1-\tilde{\beta}) - \ln(1-\beta^R) \right]} \frac{\partial \tilde{\beta}}{\partial A} \left[\frac{\beta^I}{\tilde{\beta}} - \frac{1-\beta^I}{1-\tilde{\beta}} \right] > 0,$$

$\forall A \in [\bar{A}^S, \bar{A}^R)$ since $\beta^I(A) \in (\tilde{\beta}(A), \beta^R)$ and $\frac{\partial \tilde{\beta}(A)}{\partial A} > 0$. We have

$$(A3) \lim_{A \rightarrow \bar{A}^R} \beta^I(A) = \lim_{A \rightarrow \bar{A}^R} \frac{\frac{1}{1-\tilde{\beta}}}{\frac{1}{\tilde{\beta}} + \frac{1}{1-\tilde{\beta}}} = \beta^R.$$

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