Clientelism and aid

Georges Casamatta*and Charles Vellutini†

Preliminary, October 2004

Abstract

We analyze the impact of aid on the political equilibrium in the recipient country or region. We consider two kinds of politicians: the benevolent one is interested in promoting social welfare whereas the other one is clientelistic, his only goal being to maximize his chances of being elected. We find that the impact of aid ultimately depends on the value of the elasticity of marginal consumption, which governs how the sensitivity of voters to a clientelistic allocation of resources (over a socially optimal one) varies with the level of consumption. When the elasticity is low, the probability of election of the clientelistic politician increases and his effort level decreases with aid. This case of substitution of effort by aid can help to explain the poor performance of conditionality in improving policy performance. Perhaps more surprising is the opposite case, which arises for high values of the elasticity of marginal utility: an increase in aid induces the clientelistic politician to exert more effort and nevertheless worsens his election prospects.

*GREMAQ, Université des Sciences Sociales, 21, allée de Brienne, 31000 Toulouse, France. E-mail: georges.casamatta@univ-tlse1.fr

†ARQADE, Université des Sciences Sociales, 21, allée de Brienne, 31000 Toulouse. E-mail: charles.vellutini@.univ-tlse1.fr.

1. Introduction

The moral hazard of external aid is a long-running theme in the literature and has troubled many designers of aid programs (Svensson [2000], Azam and Laffont [2003]). By providing an exogenous pool of windfall resources, could not aid, just like natural resources, twist the incentives faced by governments to deliver a socially optimal performance?

The relevance of this question to aid effectiveness can hardly be over-emphasized. It has become widely accepted in recent years that if and when appropriate policies and institutions are in place in recipient countries, aid is instrumental in fostering growth (Burnside and Dollar [2000], Svensson [1999], Collier and Dollar [2002]). However, how to improve, or make improve, policies and institutions in poor countries remains the unresolved, central challenge facing the donor community. To begin with, conditionality – which is routinely used by major donors – does not work: such is the alarming message conveyed by Collier [1997] and World Bank [1998]. The failure of conditionality has been explained by a variety of factors: pervasive fungibility, that thwarts donor attempts to target aid at growth and/or poverty alleviation (Feyzioglu, Swaroop and Zhu [1998]); the (strong) incentives faced by donors to disburse funds regardless of the actual attainment of the agreed policy conditions (Birdsall, Claessens and Diwan [2002] and Svensson [2003]); and the conflicting views of donors and elites in developing countries about the desirability of policy changes, for example more emphasis on fighting poverty (Azam and Laffont [2003]). As a result, international donors are increasingly turning to selectivity, that is, the allocation of aid to countries which have, *ex ante*, a proven track record of satisfactory policy reforms. This approach has already influenced the distribution of aid across countries to a significant degree. For example, the World Bank now uses ratings of policy and institutional performance to allocate assistance among eligible low-income countries (World Bank [2000]). However, few would claim that selectivity is the final word in aid effectiveness. Far from it, it leaves unresolved the crucial question of poor countries with bad governments (see The Economist [2004] for a vivid recapitulation of the argument).

In this paper, we propose to revisit the relationship between aid and policy performance by treating the latter as an endogenous outcome of a local political process, which in turn can be influenced by the presence of aid. In doing so, our objective is to disentangle the influence of aid as the provision of windfall resources from the influence of the conditionality attached to it. We focus here on the first effect, leaving the explicit addition of conditionality to further research.

Still, because conditionality has been implemented, by definition, as an instrument appended to aid flows, its apparent failure could, *a priori*, be explained by the deeper influence of aid itself on policy performance. We will indeed argue that there are good reasons to believe that 'pure' aid (without conditionality) does influence policy performance in recipient countries, but does so in a complex fashion that ultimately depends on the deep characteristics of the latter.

After a brief overview of the related literature (section 2), section 3 introduces our modelling approach. We use a simple probabilistic voting model of electoral competition where candidates credibly commit to both a level of governmental effort – policy performance – and a distribution of transfers across voter groups. We introduce the additional assumption that one of the two candidates has an inherently clientelistic behavior[1] – choosing his electoral platform so as to maximize his chances of being elected – while the other one is benevolent, promoting social welfare. This asymmetry between the two candidates enables us to concentrate on the following questions: does aid strengthen the hand of clientelistic politicians? therefore, does aid alter the equilibrium policy performance? Section 4 provides a set of answers to these questions. We start with a basic version of the model where the benevolent candidate is also blind to the real underlying political process. In the context of developing countries, this 'naive' benevolent candidate can be interpreted as one who abides to donor-sponsored policies – as donors are likely to be less informed that local politicians about the true nature of the political game. We find that both the expected governmental effort and the expected distribution of transfers do vary with the volume of aid. However, we also find that aid will not always favor clientelism: it either induces a substitution of effort with assistance flows – the problematic outcome where clientelism is reinforced – or on the contrary provides an incentive for all competing candidates to make the best use of such flows by increasing their effort – the virtuous outcome. Strikingly, a single parameter of voter preferences determines the influence of aid into one of the two outcomes, namely the elasticity of marginal utility – a measure of how voters' marginal utility responds to an increase of consumption. The first scenario, where substitution effects dominate, could help explain why policy conditionalities can be inefficient and why, under certain conditions in the economy, it is so difficult to buy local ownership of policy changes. The existence of the other scenario, on the other hand, could help us think about the conditions under which aid can be efficient in improving governmental effort. In sub-section 4.3, we generalize the model to a

[1] We define clientelism as in Verdier and Robinson [2002]: a form of redistributive politics based on the political exchange of votes against government transfers to targeted voter groups (the clients).

'sophisticated' benevolent candidate, who now forms correct expectations about the true political process, and alters its platform accordingly. The main (numerical) results of the extension is that the main finding of the basic model still holds: the impact of aid is again only determined by the elasticity of marginal utility of citizens. Section 5 concludes.

2. Overview of the related literature

In addition to having a deep influence on the practice of development assistance, the above empirical results on aid effectiveness have inspired new theoretical research relating aid to growth, policy and institutions in developing countries. Our contribution belongs to this line of work. A first series of analyses concentrate on the efficiency of conditionality, essentially treating policy as a exogenous variable chosen by donors. Azam and Laffont [2003], Svensson [2003] and Coate and Morris [1996] use contract theory to show how conflicting incentives between donors and social groups in the recipient country can reduce the policy impact of conditionality. Interestingly, Svensson [2003] emphasizes that the absence of a credible commitment technology *on the donor side* can dramatically reduce the impact of conditionality. These predictions (which are consistent with Azam and Laffont [2003]) do fit the observed facts on the effectiveness of conditionality, as noted.

Other studies have put more emphasis on the endogeneity of policy to aid flows *per se*, with only a limited role for conditionality. Casella and Eichengreen [1996] uses a dynamic game-theoric model to show that the prospect of aid can increase delays in macroeconomic stabilization by encouraging social groups to postpone sacrifices until aid materializes. Svensson [2000], also using a dynamic game-theoric model with competing social groups, shows why aid, or any kind of windfall revenues, tends to be associated with increased rent-seeking. Svensson reports specific evidence supporting this prediction.

We are close in spirit to Svensson [2000] in the sense that we are interested in exploring the theoretical reasons why aid flows may (or may not) favor socially sub-optimal political equilibria. We rely however on a very different underlying political structure. Our model rests of the probabilistic voting model widely used in the political economic literature to analyze the influence of interest groups on policy decisions (Dixit and Londregan [1996], Persson and Tabellini [2000, section 3.4]). Our study is thus also related to Verdier and Robinson [2002], who model clientelism within the same probabilistic voting setting – albeit without any role for aid or windfall resources[2]. Finally, clientelism has also been analyzed outside the probabilistic voting setting. For example, Dekel, Jackson and Wolinsky [2004] model a sequential game to show that vote buying can lead to inefficient political equilibria.

The modelling we propose therefore rests on the premise that aid-dependant economies have political systems based on (free and fair) elections. Arguably, this is a brave assumption for a good number of developing countries. However, there is little doubt that leaders in the developing world, even in countries where elections would not be described as free, need some political support from their population to stay in power over the medium run. In this sense, we are willing to take the election process in our analysis as a representation of a mechanism through which different population groups bring or withdraw their political support to competing political leaders, just like in Svensson [2000].

In addition, there is no need to restrict the interpretation of our analysis to developing countries. Many regions of developed countries, in Europe and elsewhere, receive massive transfers from their central government and we submit that they are faced with the same fundamental impact of windfalls on their local political process.

3. The model

Our starting point is the version of the probabilistic voting model of Persson and Tabellini [2000, section 3.4]. The main novelty in our approach is that we introduce asymmetric politicians, with one of them pursuing power for its own sake, while the other politician favors social welfare. We think of the first candidate as being typically clientelistic in the sense that his behavior consists in buying office with targeted transfers to specific voter groups. This asymmetry is useful in analyzing how variations of aid impacts the relative political clout of that politician when competing with a benevolent rival.

3.1. The citizens

The population is distributed over N groups $j = 1, \ldots, N$, of size n_j, with n the total number of individuals. All individuals are identical (in particular, they earn the same income and have each one voting right) except for their ideological preferences towards political parties – assuming that each candidate belong to a different political party. Each individual has a bias parameter δ

[2] Another difference is that Verdier and Robinson [2002] focuses on public employment as a redistribution channel while we retain the emphasis on redistribution through monetary tranfers.

representing his ideological leaning. The c.d.f. of this parameter in group j is noted F_j and the density function is f_j. In addition to this individual bias, there is a general bias θ distributed uniformly on $[-1/2h, 1/2h]$. The utility function of a given individual i is given by

$$U_i = y(e) + u(c_i),$$

where $y(e)$, such that $y' > 0$ and $y'' < 0$, is the utility generated by the politician's effort e (when in office) and $u(c_i)$ is the utility of consumption c_i. Throughout the paper $u(.)$ is a standard isoelastic utility function

$$u(c) = \begin{cases} \dfrac{c^{1-\varepsilon}}{1-\varepsilon} \text{ when } \varepsilon \neq 1 \\ \ln c \text{ when } \varepsilon = 1 \end{cases}.$$

Individuals are initially all identical, earning an income $R > 0$. Therefore $c_i = R + T_i$, where T_i is the transfer (if positive) received from the government. The government can tax individuals, in which case T_i is negative.

3.2. The candidates

There are two types of candidates. Abstracting for now from the voting mechanism, the utility that the clientelistic politician, labelled for convenience the 'Bad' (B) politician, seeks to maximize is given by

$$U^B = W - \phi(e^B),$$

where W is the (exogenous and constant) utility derived by B from holding office and $\phi(e^B)$ is the cost of his effort e^B; $\phi(.)$ is a standard neo-classical cost function verifying $\phi' > 0$ and $\phi'' > 0$.

The utility of the 'Good' (G), benevolent candidate is given by a measure of social welfare, corrected for the cost of his own effort:

$$U^G = \sum_{j=1}^{N} n_j \left[y(e) + u(c_j)\right] - \phi(e^G), \tag{3.1}$$

The instruments available to both politicians consist of the taxes and transfers T_j^k, $k = B, G$, that apply to any individual in group j. Assuming an exogenous amount a of aid, the government budget then reads as

$$\sum_{j=1}^{N} n_j T_j^k = a. \tag{3.2}$$

Finally, besides these redistributive tools, candidates must also choose their level of effort e^k, $k = B, G$.

3.3. Electoral competition

The political process through which candidates are voted into power follows a standard procedure of electoral competition. During the electoral campaign, the two politicians announce a platform consisting of a distribution of transfers to voter groups and an effort level. The citizens then vote and the candidate that receives the largest share of the votes is elected, following a simple majority rule. It is assumed that politicians are committed to the policies announced during the campaign.[3]

An individual in group j with bias parameter δ will vote for B if and only if

$$y(e^B) + u(c_j^B) + \delta + \theta > y(e^G) + u(c_j^G),$$

where c_j^k, $k = B, G$, is the consumption of group j individuals under candidate k's policy.

For given platforms of the two candidates, the cut-point δ_j for group j is defined as the value of δ that makes a voter of this group indifferent between the two platforms:

$$\delta_j = y(e^G) + u(c_j^G) - y(e^B) - u(c_j^B) - \theta.$$

People of group j located to the left (resp. right) of δ_j will vote for G (resp. B).

The proportion of individuals voting for B in group j is thus $1 - F_j(y(e^G) + u(c_j^G) - y(e^B) - u(c_j^B) - \theta)$. Summing up over all groups, we obtain that the total number of votes received by B is

$$v^B = \sum_{j=1}^{N} n_j \left[1 - F_j\left(y(e^G) + u(c_j^G) - y(e^B) - u(c_j^B) - \theta\right)\right]$$

If we assume that F_j is the uniform distribution on $[-1/2s_j, 1/2s_j]$,

$$\begin{aligned} v^B &= \sum_{j=1}^{N} n_j \left[1 - \left(s_j\left(y(e^G) + u(c_j^G) - y(e^B) - u(c_j^B) - \theta\right) + \frac{1}{2}\right)\right] \qquad (3.3) \\ &= \sum_{j=1}^{N} n_j \left[\frac{1}{2} - s_j\left(y(e^G) + u(c_j^G) - y(e^B) - u(c_j^B) - \theta\right)\right]. \end{aligned}$$

[3] The assumption that the effort level is part of the platforms is not trivial. Candidates rarely announce effort levels and if they do, they should always claim to provide the best possible effort! To make sense of this assumption, it is convenient to interpret the model as a reduced form of a dynamic political game. In this dynamic game, the opportunistic politician is initially in power and is challenged by the benevolent politician for the election in the next period. Also, the level of effort may be interpreted as the observable provision of public goods (well-researched and sound macroeconomic policy, public education, police...) – which renders the assumption of policy commitment more realistic, as the delivery of such public goods arguably comes at a cost for the politician in power.

Similarly:

$$v^G = \sum_{j=1}^{N} n_j \left[s_j \left(y(e^G) + u(c_j^G)] - y(e^B) - u(c_j^B) - \theta \right) + \frac{1}{2} \right].$$

Denoting $\alpha_j = n_j/n$, the probability that B wins the election is then

$$\begin{aligned} P^B &= \Pr\left(v^B > \frac{1}{2}n\right) \qquad (3.4) \\ &= \Pr\left(\sum_{j=1}^{N} \alpha_j \left[\frac{1}{2} - s_j\left(y(e^G) + u(c_j^G) - y(e^B) - u(c_j^B) - \theta\right)\right] > \frac{1}{2}\right) \\ &= \Pr\left(\theta > \sum_{j=1}^{N} \alpha_j s_j \left(y(e^G) + u(c_j^G) - y(e^B) - u(c_j^B)\right) / \sum_{j=1}^{N} \alpha_j s_j\right) \\ &= \frac{1}{2} - h\frac{\sum_{j=1}^{N} \alpha_j s_j \left(y(e^G) + u(c_j^G) - y(e^B) - u(c_j^B)\right)}{\sum_{j=1}^{N} \alpha_j s_j}. \end{aligned}$$

Of course, $P^G = 1 - P^B$.

4. Political equilibrium

4.1. Naive benevolent politician

In the basic version of the model, we initially assume that the clientelistic candidate B fully anticipates the impact of the two announced platforms on P^B. However politician G is 'naive' in the sense that it does not. These hypotheses reflect a situation where a politician – B – has a full understanding of the country's political game and is willing to use it for his own benefit; his opponent G, on the other hand, has a purely technocratic approach to policy-making and does not understand the true underlying political process[4]. In the context of developing countries, G can be thought of as abiding to donor-imposed conditionality, which is not likely to account for local politics, while being driven by social welfare considerations[5].

From a methodological standpoint, this basic setting is useful in uncovering in a simple fashion the key mechanism driving the political equilibrium, which will also be at work in the more general case presented below (in which both candidates form correct expectations over the true political process).

[4] Note that in equilibrium this is equivalent as postulating that G assumes that all candidates also maximize social welfare as speficied in (3.1).

[5] One should be cautious not to push this interpretation too far, however, as one key feature of conditionality is missing in the model; full conditionality would be consistent with a varying with the effort level e.

To simplify our problem, we concentrate on the case $N = 2$. The government budget constraint (3.2) becomes

$$\begin{aligned} & n_1 T_1 + n_2 T_2 = a \\ \Leftrightarrow \quad & T_2 = \frac{a - n_1 T_1}{n_2}. \end{aligned} \tag{4.1}$$

The programs of the two candidates are as follows.

Candidate B solves:

$$\begin{aligned} \underset{T_j^B, e^B}{\text{Max}} \; \pounds^B \quad &= \quad P^B \times [W - \phi(e^B)] \\ & \text{st } (4.1)\,. \end{aligned}$$

Denoting λ^B the Lagrange multiplier of the resource constraint, the first-order condition on T_j^B is:

$$\begin{aligned} & \frac{dP^B}{dT_j^B}[W - \phi(e^B)] - \lambda^B n_j = 0 \\ \Leftrightarrow \quad & h \frac{\alpha_j s_j u'(c_j^B)}{\sum_{j=1}^2 \alpha_j s_j}[W - \phi(e^B)] - \lambda^B n_j = 0, \; j = 1, 2 \end{aligned}$$

which yields

$$s_1 u'(c_1^B) = s_2 u'(c_2^B). \tag{4.2}$$

This condition defines the distribution of aid that will be proposed by candidate B. The intuition for this behavior is as follows. If B announces a marginal transfer to a given group, it induces some voters previously indifferent or slightly favorable to G to change their vote. This corresponds to the term $u'(c)$ (the higher the marginal utility of consumption, the larger the impact of a marginal transfer on the voting decision). This effect is all the more important that the number of concerned individuals is large, this number being equal to the number of individuals in the group times the density at the cut-point. With a uniform distribution, this density is s_j. When making a transfer of one euro to every member of group 1, the total gain in votes is thus $n_1 s_1 u'(c_1^B)$. To collect n_1 euros, the politician has to raise taxes in an amount of n_1/n_2 euros from every member of group 2. The total loss of votes is thus $n_1 s_2 u'(c_2^B)$. Candidate B will adjust his redistributive policy so as to equalize these two measures. Hence condition (4.2).

It is worth emphasizing that the tax and transfer policy does not depend on the sizes of the groups, which should be clear from the previous argument. Another important feature of B's policy is that the group with the largest density (that is, the group with more moderate voters) will obtain the largest transfer. Because all individuals, whatever the group they belong to, have the same income and preferences, it is clear that with equal transfers, the marginal utilities would be the same in both groups. Candidate B has then an incentive to bias its redistributive policy towards the group with the highest density.

The first order condition on e^B is:

$$\begin{aligned}
& \frac{dP^B}{de^B}[W-\phi(e^B)] - P^B \times \phi'(e^B) = 0 \\
\Leftrightarrow \quad & h\frac{\sum_{j=1}^{2}\alpha_j s_j y'(e^B)}{\sum_{j=1}^{2}\alpha_j s_j}[W-\phi(e^B)] - P^B \times \phi'(e^B) = 0 \\
\Leftrightarrow \quad & hy'(e^B)[W-\phi(e^B)] - P^B \times \phi'(e^B) = 0. \qquad (4.3)
\end{aligned}$$

This relationship defines the optimal level of $B's$ (costly) effort. This level depends on the other endogenous variables of the model (aid a, G's policy and B's own redistributive policy) through the probability of election P^B.

The program of the benevolent candidate G is:

$$\begin{aligned}
\underset{T_j^G, e^G}{\text{Max}} \ \pounds^G &= \sum_{j=1}^{N} n_j[y(e^G) + u(c_j^G)] - \phi(e^G) \\
& \text{st } (4.1).
\end{aligned}$$

The first order condition on T_j^G yields

$$u'(c_1^G) = u'(c_2^G)$$

and thus (through 4.1)

$$T_1^G = T_2^G = a/n. \qquad (4.4)$$

Not surprisingly, G will thus always distribute aid in an equalitarian fashion across groups.

The first order condition on e^G reads as

$$ny'(e^G) = \phi'(e^G). \qquad (4.5)$$

In this version of the model, the effort level of G does not vary neither with the level of aid a nor with the other variables in the model. Knowing the cost and benefit that effort generates is sufficient to pin-down its optimal value for G.

4.2. The impact of aid

In this section, we analyze the impact of aid on the political equilibrium, studying how the respective platforms (and associated election probabilities) respond to changes in a. While $G's$ platform does not react to a variation of aid — except for uniformly increasing aid distribution across groups (see (4.4) and (4.5)) — the behavior of B is, on the other hand, clearly affected by the volume of aid as shown in the following proposition.

Proposition 1. *One of the following cases will occur:*

1. $\varepsilon < 1$ *implies* $dP^B/da > 0$ *and* $de^B/da < 0$;

2. $\varepsilon > 1$ *implies* $dP^B/da < 0$ *and* $de^B/da > 0$.

Proof. See Appendix. ■

The Proposition is telling us that economies can be neatly classified into two types as a function of the elasticity of marginal utility ε.[6] Strikingly, these two types display opposite reactions to a variation of a. With $\varepsilon < 1$, we have a clear-cut case of substitution of effort with aid. The clientelistic candidate finds it optimal to reduce his effort as aid increases, and is all the same more likely to be elected. This first outcome after all satisfies intuition: it is reminiscent of countless stories of leaders using exogenous resources to consolidate their grip on power (Svensson [2000]). The second type, $\varepsilon > 1$, is perhaps more surprising. This case of complementarity between aid and effort is also more encouraging: an increase in aid extracts more effort from B and still makes the benevolent candidate G more likely to be elected.

What is the mechanism at work? In the presence of a clientelistic politician strategically allocating transfers across the population in order to secure his political power, aid seems to work both ways: on the one hand, it increases the room for manoeuvre of that politician, B, by providing him with more resources to be allocated among voter groups. On the other hand, since B always favors some groups of voters over the other ones (as opposed to G's perfectly equalitarian distribution), those favored voters, having a lower marginal utility under B's platform than under G's, will be less sensitive to an extra dollar transferred to them by B – than they would be to the same extra dollar transferred by G. With a low elasticity of marginal (ε), the difference of marginal utilities across platforms will be relatively small. With a high

[6] The elasticity of marginal utility with respect to c is given by $-\frac{d(u'(c))/u'(c)}{dc/c} = -\frac{u''(c).c}{u'(c)} = \varepsilon$.

ε, this difference will be relatively large, which will tend to run against the direct effect of aid bringing in additional resources for B to allocate strategically. In this abstract specification, the elasticity of marginal consumption fully determines which of the two effect (always) dominates – whatever the initial level of consumption of voter groups, and whatever the desire of clientelistic politicians for power.

What have we learned on the relationship between clientelism and aid? Remember that B allocates transfers across voter groups so as to maximize total votes in his favor, which respond to the utility derived from consumption (in addition to the utility derived from governmental effort). ε describes how rapidly voters approach consumption satiety (that is, get closer to $u'(c) = 0$) as consumption increases. With a low ε, marginal utility decreases relatively slowly when consumption increases. Because of this, and because B has now more aid to be strategically allocated among voter groups for consumption, his political clout tends to rise with a. On the contrary, with a high ε, the satiety effect dominates: the overall increase in the transfers that B can now afford is more than compensated by the (rapidly) increasing satiety of voters. In addition, Proposition 1 establishes that B does not find it optimal to offset this satiety effect by an increased (costly) effort – whatever his desire for power, W.

In terms of the impact of aid on governmental effort, Proposition 1 is also quite specific: with a low (high) elasticity of marginal utility, the expected governmental effort will decrease (increase) when a increases. Assume that the elasticity of marginal utility is low: the model then readily provides theoretical reasons why aid, even with attached conditionality, could in fact negatively influence policy performance.

More formally, and following the logic of the proof given in appendix, let us examine how the result in Proposition 1 comes about in the model. Consider first how B adjusts his effort level when the volume of aid changes. Effort is set by B so as to equalize his expected marginal benefit to his expected marginal cost (see (4.3)). Because utility is separable, only the expected marginal cost of effort, $P^B\phi'(e^B)$, is affected by the level of aid, through its effect on the probability of election P^B. When a increases, the redistributive policy of both candidates is modified, which has an impact on the probability of election. If the probability of election of candidate B increases (resp. decreases), the expected marginal cost of effort increases (resp. decreases), and as a consequence B decides to reduce (resp. augment) its effort level. This change in the effort level has in turn a feedback effect on the probability of election: when the level of effort decreases, the probability of election decreases as well. We show in the appendix (Lemma 2) that this feedback effect on the probability of election is dominated by the direct effect. This implies that B's effort and his probability of election move in opposite directions. We can thus safely focus on the way the probability of election P^B reacts to a variation in a, *for a given effort level.* A convenient expression of the variation of the number of votes received by B when a increases (see appendix, (A.4)), holding the level of effort e^B constant[7], is:

$$\frac{\partial v^B}{\partial a} = n_1 s_1 \left[\frac{dT_1^B}{da} u'(c_1^B) - \frac{dT^G}{da} u'(c^G) \right] + n_2 s_2 \left[\frac{dT_2^B}{da} u'(c_2^B) - \frac{dT^G}{da} u'(c^G) \right]. \qquad (4.6)$$

The term $n_1 s_1 \left[dT_1^B/da \times u'(c_1^B) - dT_1^G/da \times u'(c^G) \right]$ (resp. $n_2 s_2 \left[dT_2^B/da \times u'(c_2^B) - dT_2^G/da \times u'(c^G) \right]$) represents the increase (if positive) of the votes in group 1 (resp. 2) following an increase of the volume of aid. Suppose that s_2 is larger than s_1. In this case, the opportunistic politician B favors group 2 and thus $c_2^B > c^G \Leftrightarrow u'(c_2^B) < u'(c^G)$. This should imply that when a increases, the support for B in group 2 decreases. However, whereas aid is channeled equally to both groups by politician G, B transfers a bigger share of it to group 2. When the elasticity of marginal utility with respect to consumption is below unity ($\varepsilon < 1$), this second effect dominates and the number of votes received by B in group 2 increases with a. Symmetrically, the number of votes received by this politician in group 1 decreases with a. We show in the appendix that the effects transiting through group 2 always dominate those taking place in group 1.

Equation (4.6) illustrates the central role of the elasticity of marginal utility in how aid influences the political equilibrium. A nice feature of the model (essentially due to the properties of the isoelastic utility function) is that dT/da is proportional to c. Thus the political clout of B in group 2 depends on the relationship between, on the one hand, the marginal utilities ($u'(c_2^B)$ and $u'(c^G)$) and, on the other hand, the consumption levels (c_2^B and c^G). But $\varepsilon < 1$ precisely implies that the product $cu'(c)$ increase with consumption. With $\varepsilon > 1$, the opposite happens.

4.3. Full expectations

We now assume that the benevolent politician is perfectly rational and as such proposes the platform that maximizes his expected utility. Formally, the program he now solves is

$$\begin{aligned} \underset{T_j^G, e^G}{\text{Max}} \ \pounds^G &= (1 - P^B)[\sum_{j=1}^{N} n_j [y(e^G) + u(c_j^G)] - \phi(e^G)] + P^B \sum_{j=1}^{N} n_j [y(e^B) + u(c_j^B)] \\ & \text{st } (3.2)\,. \end{aligned}$$

[7] Note that $\frac{\partial v^B}{\partial a}$ is of the sign of $\frac{\partial P^B}{\partial a}$.

a	$e^{G,n}$	$e^{B,n}$	$T_1^{G,n}$	$T_1^{B,n}$	$P^{B,n}$	ESW^n	$e^{G,s}$	$e^{B,s}$	$T_1^{G,s}$	$T_1^{B,s}$	$P^{B,s}$	ESW^s
0	0.877	1.026	0	0.6	0.63	39.99	0.909	1.021	-0.06	0.6	0.646	39.98
1	0.877	1.022	0.25	1	0.642	40.90	0.917	1.014	0.157	1	0.664	40.89
2	0.877	1.018	0.5	1.4	0.653	41.72	0.926	1.008	0.372	1.4	0.682	41.71
3	0.877	1.014	0.75	1.8	0.663	42.48	0.934	1.002	0.584	1.8	0.698	42.45
4	0.877	1.011	1	2.2	0.673	43.18	0.942	0.997	0.793	2.2	0.714	43.15
5	0.877	1.008	1.25	2.6	0.682	43.83	0.951	0.992	1	2.6	0.729	43.80

Table 4.1: Numerical illustrations when $\varepsilon = 1/2$.

The first order conditions on T_j^G and e^G are respectively

$$\frac{dP^B}{dT_j^G}[\sum_{j=1}^{N} n_j[y(e^B) + u(c_j^B)] - \sum_{j=1}^{N} n_j[y(e^G) + u(c_j^G)] + \phi(e^G)] - P^B n_j u'(c_j^G) - \lambda^G n_j = 0$$

$\Leftrightarrow$

$$h\frac{s_j u'(c_j^G)}{n\sum_{j=1}^{N}\alpha_j s_j}[\sum_{j=1}^{N} n_j[y(e^B) + u(c_j^B)] - \sum_{j=1}^{N} n_j y[(e^G) + u(c_j^G)] + \phi(e^G)] + P^B u'(c_j^G) + \lambda^G = 0$$

and

$$\frac{dP^B}{de^G}[\sum_{j=1}^{N} n_j[y(e^B)+u(c_j^B)] - \sum_{j=1}^{N} n_j[y(e^G)+u(c_j^G)] + \phi(e^G)] - (1-P^B)[\phi'(e^G) - \sum_{j=1}^{N} n_j y'(e^G)] = 0$$

$\Leftrightarrow$

$$-hy'(e^G)[\sum_{j=1}^{N} n_j[y(e^B)+u(c_j^B)] - \sum_{j=1}^{N} n_j[y(e^G)+u(c_j^G)] + \phi(e^G)] - (1-P^B)[\phi'(e^G) - \sum_{j=1}^{N} n_j y'(e^G)] = 0.$$

We resort to numerical simulations to handle this particularly complex problem. We use the following functional forms and parameter values: $y(e) = 5(e+10)^{0.2}$, $\phi(e) = e^5/5$, $n_1 = n_2 = 2$, $s_1 = 2$, $s_2 = 1$, $h = 1$, $W = 5$, $R = 1$. The tables below report the results of the simulations, comparing for each value of ε the two versions of the model, respectively noted n for 'naive' and s for 'sophisticated' (full expectations). ESW is defined below.

The main insight that we get from these simulations is that *the full-expectations case is qualitatively similar to the naive case*. In particular the probability of election of the bad politician and his level of effort vary in opposite directions as a increases, which depend on whether ε is lower or larger than 1. This therefore suggests that the effect we have identified in the basic version of the model continues to drive a more general model where both politicians have a full understanding of the political process.

a	$e^{G,n}$	$e^{B,n}$	$T_1^{G,n}$	$T_1^{B,n}$	$P^{B,n}$	ESW^n	$e^{G,s}$	$e^{B,s}$	$T_1^{G,s}$	$T_1^{B,s}$	$P^{B,s}$	ESW^s
0	0.877	1.046	0	0.33	0.581	32.1127	0.882	1.045	-0.005	0.33	0.582	32.1125
1	0.877	1.046	0.25	0.66	0.581	33.0053	0.882	1.045	0.244	0.66	0.582	33.0051
2	0.877	1.046	0.5	1	0.581	33.7346	0.882	1.045	0.493	1	0.582	33.7344
3	0.877	1.046	0.75	1.33	0.581	34.3512	0.882	1.045	0.742	1.33	0.582	34.351
4	0.877	1.046	1	1.66	0.581	34.8853	0.882	1.045	0.99	1.66	0.582	34.8851
5	0.877	1.046	1.25	2	0.581	35.3564	0.882	1.045	1.239	2	0.582	35.3562

Table 4.2: Numerical illustrations when $\varepsilon = 1$.

a	$e^{G,n}$	$e^{B,n}$	$T_1^{G,n}$	$T_1^{B,n}$	$P^{B,n}$	ESW^n	$e^{G,s}$	$e^{B,s}$	$T_1^{G,s}$	$T_1^{B,s}$	$P^{B,s}$	ESW^s
0	0.877	1.056	0	0.17	0.555	28.1806	0.866	1.057	0.006	0.17	0.554	28.1805
1	0.877	1.05931	0.25	0.46	0.5496	28.9942	0.863	1.05933	0.26	0.46	0.5495	28.994
2	0.877	1.0609	0.5	0.76	0.5461	29.5365	0.861	1.0607	0.514	0.76	0.5464	29.5362
3	0.877	1.062	0.75	1.05	0.543	29.9238	0.86	1.061	0.768	1.05	0.544	29.9235
4	0.877	1.063	1	1.34	0.541	30.214	0.859	1.062	1.022	1.34	0.542	30.213
5	0.877	1.064	1.25	1.64	0.54	30.44	0.858	1.063	1.276	1.64	0.541	30.4397

Table 4.3: Numerical illustrations when $\varepsilon = 2$.

The main difference between the two versions of the model is that when the good politician is (also) fully rational, his level of effort varies with a: it increases (resp. decreases) with a when ε is lower (resp. larger) than 1. Interestingly, B's effort varies in opposite direction: when a increases, either G's effort increases and B's effort decreases or the other way round.

These simulations also reveal that B's effort is always larger than G's effort. However this result depends very much on the value of W and does not hold generally, as other simulations not reported here show. Still, it is interesting to note that if the bad politician's desire for power is strong enough (a high value of W), he will deliver a higher level of effort than the benevolent one's, regardless of the volume of windfall resources a.

Turning to the comparison of endogenous variables in both versions of the model, we observe that the redistributive policy of B is the same whether G is naive or sophisticated. This is readily explained by noting that B's redistributive policy does not depend at all on G's platform (see 4.2). As for G's redistributive policy, it differs in the two cases but the change can go in either directions: it is possible that G favor more – or less – the individuals in group 1 when becoming sophisticated. The same conclusion applies to the comparison of the effort levels.

Lastly, the behavior of ESW in these simulations is also interesting. ESW is the expected social welfare when the cost of B's effort is not taken into account. It corresponds to G's payoff when the latter behaves in a fully rational way. Formally:

$$ESW = (1 - P^B)[\sum_{j=1}^{N} n_j[y(e^G) + u(c_j^G)] - \phi(e^G)] + P^B \sum_{j=1}^{N} n_j[y(e^B) + u(c_j^B)].$$

An interesting result of these simulations is that ESW is lower when G is fully rational. This is, *a priori*, surprising because ESW is precisely the payoff of the benevolent politician with fully rational expectations. An explanation of this result relates to the strategic interaction between the two candidates. Starting from the naive equilibrium, the good politician wants to deviate, for example by lowering his effort level and increasing his transfer to the individuals in group 1. This enables him to increase his chances of being elected and thus his payoff ESW. This is not however the end of the story as B may want deviate in turn. We end up with a new equilibrium that entails a value of ESW which is lower than in the naive case.

5. Conclusion

In this study, we have analyzed the effect of aid on the endogenous governmental effort and redistributive policy emerging from a model of probabilistic voting where two different types of candidates are confronted: one is benevolent and seeks to maximize cost-adjusted social welfare; the other one is a clientelistic candidate using transfers to voter groups in order to maximize his chances of being elected, also accounting for the cost of his governmental effort.

The model suggests that aid works both ways: on the one hand, because it provides the clientelistic candidate with more resources to be strategically distributed among voter groups, it tends to increase his political clout; on the other hand, by increasing overall consumption, aid reduces the marginal utility from consumption, which tends to lessen the sensitivity of voters to a clientelistic distribution of transfers over a socially optimal one, and therefore brings down the political clout of the clientelistic candidate. In our specification, it turns out that a single parameter of voter preferences determines which of the two effects always dominates: the elasticity of marginal utility, which governs how quickly marginal utility decreases when consumption goes up.

This result can help us understand the different possible effects of aid on policy performance – which we modelled as governmental effort. If voters approach satiety relatively slowly as consumption increases (that is: a low elasticity of marginal utility), aid may well have a detrimental impact on policy performance, as clientelists become more powerful – cutting down their effort while being more likely to be elected. Assuming that the elasticity of marginal utility is low, this therefore suggests yet another reason why conditionality has been so disappointing in improving policy performance.

Of course, we have dispensed with many institutional details, and caution should be used when transposing these results into the real world. Particularly, further research could explicitly include conditionality, for example by making the volume of aid endogenous to policy performance – which is clearly a non-trivial extension, as familiar issues of non-observability of effort would then become important. Secondly, the isoelastic utility function used in this paper, if useful to uncover the mechanism at work, is clearly restrictive. A functional form where the elasticity of marginal utility ε varies with the level of consumption could bring additional insights to the model, possibly suggesting critical values of aid (for example at $\varepsilon(c) = 1$, as our results would seem to imply), below and above which its impact on policy performance could be very different. Also, the true value of the elasticities of marginal utility in aid-dependent countries or regions is an empirical issue that we think should be tackled in the framework of that less abstract model. It may then be instructive to explore the empirical correlations of elasticities of marginal utility with aid effectiveness, possibly controlling for conditionality or other variables that an extended model may suggest.

Appendix

A. Proof of Proposition 1

To simplify notation, consider that, while P^B, e^B, e^G, T_1^B, T_2^B, T_1^G, and T_2^G are all endogenous variables, it is convenient to write P^B as a function of two arguments: $P^B = P^B(a, e^B(a))$, where we emphasize the fact that a influences P^B both directly and through its effect on e^B. We then note $\partial P^B/\partial a$ as the *partial* derivative of P^B with respect to a, holding e^B fixed. Correspondingly, we note the total derivative as

$$\frac{dP^B}{da} = \frac{\partial P^B}{\partial a} + \frac{\partial P^B}{\partial e^B}\frac{de^B}{da}. \tag{A.1}$$

We first need to prove the following Lemma:

Lemma 1. *The derivatives dP^B/da and de^B/da have opposite signs.*

Proof. Taking the derivative of (4.3) with respect to a leads to the following expression for the total derivative of P^B with respect to a:

$$\frac{de^B}{da} = \frac{\phi'(e^B)}{hy''(e^B)(W - \phi(e^B)) - hy'(e^B)\phi'(e^B) - P^B\phi''(e^B)}\frac{dP^B}{da}. \tag{A.2}$$

It is straightforward from this expression together with our assumptions on $\phi(.)$ and $y(.)$ that $(de^B/da)/(dP^B/da) < 0$, which proves the Lemma. ∎

Lemma 2. *dP^B/da is of the sign of $\partial P^B/\partial a$.*

Proof. We use the distinction introduced above between dP^B/da and $\partial P^B/\partial a$. Observing that (3.4) implies $\partial P^B/\partial e^B = hy'(e^B)$, and substituting into (A.1) and (A.2) leads to

$$\frac{de^B}{da} = \frac{\phi'(e^B)}{hy''(e^B)(W - \phi(e^B)) - 2hy'(e^B)\phi'(e^B) - P^B\phi''(e^B)}\frac{\partial P^B}{\partial a}. \tag{A.3}$$

Combining (A.3) and (A.2), we obtain

$$\frac{dP^B}{da} = \frac{hy''(e^B)(W - \phi(e^B)) - hy'(e^B)\phi'(e^B) - P^B\phi''(e^B)}{hy''(e^B)(W - \phi(e^B)) - 2hy'(e^B)\phi'(e^B) - P^B\phi''(e^B)}\frac{\partial P^B}{\partial a},$$

which implies that dP^B/da is of the sign of $\partial P^B/\partial a$. ∎

This is an interesting intermediary result. It implies that the direction of the direct effect of a on P^B (described by the sign of $\partial P^B/\partial a$) is not altered by any feedback effect transiting through $e^B(a)$. Therefore, we can safely ignore the latter in the rest of the proof.

Next, using (3.3), it is noted that $\partial P^B/\partial a$ is of the sign of

$$\frac{\partial v^B}{\partial a} = n_1 s_1 \frac{dT_1^B}{da} u'(c_1^B) - n_1 s_1 \frac{dT^G}{da} u'(c^G) + n_2 s_2 \frac{dT_2^B}{da} u'(c_2^B) - n_2 s_2 \frac{dT^G}{da} u'(c^G) \qquad \text{(A.4)}$$

where we similarly note $\partial v^B/\partial a$ as the (partial) derivative of v^B holding e^B constant.

Differentiating the government budget constraint, $n_1 T_1^B + n_2 T_2^B = a$, we then get

$$n_1 \frac{dT_1^B}{da} + n_2 \frac{dT_2^B}{da} = 1. \qquad \text{(A.5)}$$

We now use the first-order condition of B's program (4.2):

$$\begin{aligned} \frac{u'(c_1^B)}{u'(c_2^B)} &= \frac{s_2}{s_1} \\ \Leftrightarrow \quad \left(\frac{R + T_1^B}{R + T_2^B}\right)^{-\varepsilon} &= \frac{s_2}{s_1} \\ \Rightarrow \quad \frac{dT_1^B}{da} &= \frac{dT_2^B}{da} \left(\frac{s_1}{s_2}\right)^{1/\varepsilon} \end{aligned}$$

and, combining with (A.5),

$$\begin{aligned} \frac{dT_2^B}{da} &= \frac{1}{n_1 \left(\frac{s_1}{s_2}\right)^{1/\varepsilon} + n_2} \\ \frac{dT_1^B}{da} &= \frac{1}{n_1 + n_2 \left(\frac{s_2}{s_1}\right)^{1/\varepsilon}}. \end{aligned}$$

Using once again (4.2) and the government budget constraint (4.1),

$$\begin{aligned} & n_1 c_1^B + n_2 c_2^B = nR + a \\ \Rightarrow \quad & n_1 c_1^B + n_2 \left(\frac{s_2}{s_1}\right)^{1/\varepsilon} c_1^B = nR + a \\ \Leftrightarrow \quad & c_1^B = \frac{nR + a}{n_1 + n_2 \left(\frac{s_2}{s_1}\right)^{1/\varepsilon}} = \frac{dT_1^B}{da} (nR + a). \end{aligned} \qquad \text{(A.6)}$$

Similarly,

$$c_2^B = \frac{dT_2^B}{da} (nR + a). \qquad \text{(A.7)}$$

Substituting these expressions into (A.4) and noting that $T_1^G = T_2^G = a/n$ and $c_1^G = c_2^G = c^G = R + a/n$ leads to

$$\begin{aligned} \frac{\partial v^B}{\partial a} &= n_1 s_1 \frac{c_1^B}{nR + a} u'(c_1^B) - n_1 s_1 \frac{c^G}{nR + a} u'(c^G) + n_2 s_2 \frac{c_2^B}{nR + a} u'(c_2^B) - n_2 s_2 \frac{c^G}{nR + a} u'(c^G) \\ &= \frac{(1 - \varepsilon)}{nR + a} \left[n_1 s_1 u(c_1^B) - n_1 s_1 u(c^G) + n_2 s_2 u(c_2^B) - n_2 s_2 u(c^G) \right]. \end{aligned}$$

It is clear that $\partial v^B / \partial a = 0$ when $s_1 = s_2$ as in this case $c^G = c_1^B = c_2^B$. We now differentiate this expression with respect to s_2, using the fact that c^G does not depend on that parameter:

$$\frac{\partial^2 v^B}{\partial a \partial s_2} = \frac{(1-\varepsilon)}{nR+a} \left[n_1 s_1 \frac{dc_1^B}{ds_2} u'(c_1^B) + n_2 u(c_2^B) + n_2 s_2 \frac{dc_2^B}{ds_2} u'(c_2^B) - n_2 u(c^G) \right].$$

From $n_1 c_1^B + n_2 c_2^B = nR + a$,

$$n_1 \frac{dc_1^B}{ds_2} + n_2 \frac{dc_2^B}{ds_2} = 0.$$

Using (4.2) leads to

$$n_1 s_1 \frac{dc_1^B}{ds_2} u'(c_1^B) + n_2 s_2 \frac{dc_2^B}{ds_2} u'(c_2^B) = 0.$$

Therefore

$$\frac{\partial^2 v^B}{\partial a \partial s_2} = \frac{(1-\varepsilon)\, n_2}{nR+a} \left[u(c_2^B) - u(c^G) \right]. \tag{A.8}$$

It is straightforward that when $\varepsilon < 1$, $\partial^2 v^B / \partial a \partial s_2 > 0$ if and only if $s_2 > s_1$. It follows that $\partial v^B / \partial a$ is always positive when $\varepsilon < 1$. Symmetrically it is always negative when $\varepsilon > 1$. ■

References

Azam, Jean-Paul and Jean-Jacques Laffont, Contracting for aid, *Journal of Development Economics*, 2003, *70*, 25–58.

Birdsall, Nancy, Stijn Claessens, and Ishac Diwan, *Will HIPC Matter? The Debt Game and Donor Behaviour in Africa*, Discussion Paper 50, UN/WIDER 2002.

Burnside, Craig and David Dollar, Aid, Policies, and Growth, *American Economic Review*, 2000, *90* (4), 847–868.

Casella, Alessandra and Barry Eichengreen, Can Foreign Aid Accelerate Stabilisation?, *The Economic Journal*, 1996, *106*, 605–619.

Coate, Stephen and Stephen Morris, *Policy Conditionality*, Working Paper 97-013, Penn Institute for Economic Research 1996.

Collier, Paul, The failure of conditionality, in C. Gwin and Nelson J., editors, *Perspectives on Aid and Development*, Washington, DC: Overseas Development Council, 1997.

—— and David Dollar, Aid allocation and poverty reduction, *European Economic Review*, 2002, *46*, 1475–1500.

Dekel, Eddie, Matthew Jackson, and Asher Wolinsky, *Vote Buying*, Working Paper 17-2004, The Foerder Institute for Economic Research and The Sackler Institute of Economic Studies 2004.

Dixit, Avinash and John Londregan, The Determinants of Success of Special Interests in Redistributive Politics, *The Journal of Politics*, 1996, *58* (4), 1132–1155.

Feyzioglu, T., V. Swaroop, and M. Zhu, A panel data analysis of the fungibility of foreign aid, *World Bank Economic Review*, 1998, *12*, 29–58.

Persson, Torsten and Guido Tabellini, *Political Economics: Explaining Economic Policy*, The MIT Press, 2000.

Svensson, Jakob, Aid, growth and democracy, *Economics and Politics*, 1999, *11*, 275–297.

—— , Foreign Aid and Rent-Seeking, *Journal of International Economics*, 2000, *51* (2), 437–456.

——— , Why Conditional Aid Does Not Work and What Can Be Done About It?, *Journal of Development Economics*, 2003, *70* (2), 2003.

The Economist, Economis focus: too many countries?, July 17th 2004.

Verdier, Thierry and James Robinson, *The Political Economy of Clientelism*, Discussion Paper 3205, CEPR 2002.

World Bank, *Assessing Aid: What Works, What Doesn't and Why*, New York: Oxford University Press, 1998.

——— , Reforming Development Cooperation to Attack Poverty, in World Development Report 2000/2001, Oxford University Press, 2000, chapter 11, pp. 189–204.