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ABSTRACT

Clientelism and Aid*

Using a model of probabilistic voting, we analyse 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 on the political equilibrium and therefore on the quality of the policy (using the utilitarian social welfare as a benchmark) in the recipient country 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 that the clientelistic politician be elected increases and the expected policy outcome gets further away from the socially desirable policy set. This case of substitution of policy quality by aid can help to explain the poor performance of conditionality in improving policy. Perhaps more surprising is the opposite case, which arises for high values of the elasticity of marginal utility: an increase in aid worsens the clientelistic candidate's election prospects and thus improves the expected policy set.

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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 policy?

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, 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 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. We will indeed argue that there are good reasons to believe that 'pure' aid (without conditionality) does influence policy 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 two policy instruments: they chose a level of public goods, as well as a distribution of transfers (which can be negative) 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? how does aid alter the equilibrium policy? Section 4 provides a set of answers to these questions. We start with a simple version of the model where the clientelistic candidate receives a fixed benefit from holding office. We find that both the expected provision of public goods and the expected distribution of transfers do vary with the volume of aid. However, aid will not always favor clientelism. More aid can strengthen the hand of the clientelistic candidate – the problematic outcome, where policy is the most distant from the maximization of social welfare – or on the contrary can increase the likelihood of the benevolent candidate being elected – the virtuous outcome where the expected policy equilibrium is closer to the maximum social welfare. Strikingly, a single parameter of voter preferences determines the influence of aid into one of the two outcomes, namely the elasticity of the marginal utility of consumption – a measure of how voters' marginal utility responds to an increase of consumption. The first scenario, could help explain why policy conditionalities can be difficult to implement and why, under certain conditions in the economy, it is so difficult to buy local ownership of socially desirable policies. 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 action. In section 4, we expand the model to endogenous benefits for the clientelistic candidate. He can now decide on how much to capture while in office. The main finding of the model still holds: the impact of aid is again

[1] We use the term 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).

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 empirical results we reported above 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 analysis concentrate on the efficiency of conditionality, essentially treating policy as an 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-theoretic 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-theoretic 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

[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.

show that vote buying can lead to inefficient political equilibria.

3. The model

Our starting point is the version of the probabilistic voting model in 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 one 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, as in Verdier and Robinson [2002]. This asymmetry is useful in analyzing how variations of aid impact the relative political clout of that politician when competing with a benevolent rival.

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.

3.1. The citizens

The population is distributed over 2 groups $j = 1, 2$, of sizes n_j, with $n = n_1 + n_2$ 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 (we assume that each candidate belongs to a different political party). Each individual has a bias parameter δ 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 $[-1/2h, 1/2h]$.

There are two goods in the economy: one is public and accrues utility to the population at large, and the other one is private, being consumed individually. The utility function of a given individual i is given by

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

where $y(g)$, such that $y' > 0$ and $y'' < 0$, is the utility generated when g units of public good are produced and $u(c_i)$ is the utility of private 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 all earn an income $R > 0$. Therefore $c_i = R + T_i$, where T_i is the transfer received from the government (if positive). The government has the ability to tax individuals, in which case T_i is negative.

3.2. The candidates

There are two types of candidates: the clientelistic politician, labelled for convenience the "Bad" (B) politician and the benevolent, or "Good" (G) candidate. Denoting P^B the probability of election of the bad politician, the payoff of the latter is given by

$$\Pi^B = P^B W,$$

where W is the utility derived by B from holding office.

The utility of the good politician corresponds to the (utilitarian) social welfare:

$$U^G = \sum_{j=1}^{2} n_j \left[y(g) + u(c_j) \right]. \tag{3.1}$$

The probability that G is elected is of course $1 - P^B$. G's utility will provide a benchmark for evaluating the outcomes of the different political equilibria analyzed below.

The instruments available to both politicians consist of the public good level[3] g^k and of the taxes and transfers T_j^k, $k = B, G$, that apply to any individual in group j. Considering an

[3] In a different version of the model available from the authors, policy includes a level of governmental effort which is costly to the politician in power. While the results in that model are similar to the one presented here, that modelling poses the problem of the (un)observability of such governmental effort – leading to a possible inconsistency with the assumption of credible commitments of policy platforms.

exogenous amount a of aid, the government budget constraint then reads as

$$\sum_{j=1}^{2} n_j T_j^k + g^k = a, \tag{3.2}$$

where we have assumed that one unit of private good can be transformed into one unit of public good.

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 the public good volume. The citizens then vote and the candidate who receives the most votes is elected, following a simple majority rule. It is assumed that politicians are committed to the policy announced during the campaign.

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

$$y(g^B) + u(c_j^B) + \delta + \theta > y(g^G) + u(c_j^G).$$

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:

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

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 $1 - F_j(y(g^G) + u(c_j^G) - y(g^B) - u(c_j^B) - \theta)$. Summing up over the two groups, we obtain that the total number of votes received by B is

$$v^B = \sum_{j=1}^{2} n_j \left[1 - F_j\left(y(g^G) + u(c_j^G) - y(g^B) - u(c_j^B) - \theta\right)\right]$$

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

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

Similarly:

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

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

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

4. No capture: exogenous benefit of holding office

In this version of the model, we initially assume that the clientelistic candidate B receives a fixed benefit from holding office. More specifically, he cannot divert aid resources but values power for its own sake.

4.1. Political equilibrium

The programs of the two candidates are as follows.

Candidate B solves:

$$\begin{aligned}
\underset{T_j^B, g^B}{\text{Max}} \quad & \Pi^B = P^B W \\
\text{st} \quad & \sum_{j=1}^{2} n_j T_j^B + g^B = a.
\end{aligned}$$

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

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

which implies

$$s_1 u'(c_1^B) = s_2 u'(c_2^B). \qquad (4.1)$$

This condition defines the distribution of aid that will be proposed by candidate B. The intuition behind this condition is the following. If B announces a marginal transfer to one of the

two groups, 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 dollar 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 dollars, the politician has to raise taxes in an amount of n_1/n_2 dollars 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 (4.1).

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 groups 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 all groups. Candidate B has then an incentive to bias its redistributive policy towards the group with the highest density. In fact, B acts as if he is maximizing a distorted notion of social welfare, with the weights s_j attached to the respective groups.[4]

The first-order condition on g^B is:

$$\begin{aligned} & \frac{\partial P^B}{\partial g^B} W - \lambda^B = 0 \\ \Leftrightarrow \quad & h y'(g^B) W = \lambda^B \\ \Leftrightarrow \quad & y'(g^B) = \frac{s_j u'(c_j^B)}{\sum_{j=1}^2 n_j s_j}, \qquad j = 1, 2. \end{aligned} \tag{4.2}$$

This condition simply states that marginal utilities must be equalized across policy instruments.

The program of the benevolent candidate G is:

$$\begin{aligned} \underset{T_j^G, g^G}{\text{Max}} \qquad & \Pi^G = \sum_{j=1}^{2} n_j \left[y(g^G) + u(c_j^G) \right] \\ \text{st} \qquad & \sum_{j=1}^{2} n_j T_j^G + g^G = a. \end{aligned}$$

[4] Observe that the policy chosen by the clientelistic politician is the solution of the program $\max \sum_j n_j s_j \left[y(g) + u(c_j) \right]$. Thus it is as if this politician were maximizing a weighted sum of the groups utilities where the weights correspond to the density in each group. This is a standard result in the probabilistic voting literature that has been demonstrated in particular by Lindbeck and Weibull [1987].

The first-order condition on T_j^G yields

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

and thus

$$T_1^G = T_2^G. \tag{4.3}$$

Not surprisingly, G will thus always distribute transfers in an egalitarian fashion across groups.

After some manipulations, the first-order condition on g^G reads as

$$y'(g^G) = \frac{u'(c_j^G)}{n}, \qquad j = 1, 2, \tag{4.4}$$

which again states that marginal utilities must be identical across policy instruments.

Before concluding this section, we state an important property of the equilibrium concerning the public good levels chosen by both types of politicians.

Proposition 1. *The public good level chosen by the clientelistic candidate is lower than the level chosen by the benevolent candidate if and only if the elasticity of the marginal utility of consumption, denoted ε, is lower than 1.*

Proof. See Appendix. ■

To understand this result, we examine the effect of an increase of the public good on the Lagrangean of the bad politician's program (denoted $\pounds^B$), *starting from the point where it is equal to the public good level chosen by G.* If it is positive, it means that B wants more of the public good than G and vice versa.

$$\begin{aligned}
\left.\frac{\partial \pounds^B}{\partial g^B}\right|_{g^B=g^G} &= hy'(g^B)W - \lambda^B \\
&= hy'(g^G)W - h\frac{s_j u'(c_j^B)}{\sum_{j=1}^2 n_j s_j}W \\
&= h\frac{u'(c^G)}{n}W - h\frac{s_j u'(c_j^B)}{\sum_{j=1}^2 n_j s_j}W \\
> 0 \Leftrightarrow \quad & \frac{u'(c^G)}{n} - \frac{s_j u'(c_j^B)}{\sum_{j=1}^2 n_j s_j} > 0 \\
\Leftrightarrow \quad & u'(c^G) > \frac{n_1 s_1 u'(c_1^B) + n_2 s_2 u'(c_2^B)}{\sum_{j=1}^2 n_j s_j}.
\end{aligned}$$

When a politician increases public good spending, he necessarily decreases targeted redistribution (or equivalently increases taxation). The payoff cost to the benevolent politician corresponds

to the left-hand side of the above expression whereas the right-hand side corresponds to the pay-off cost to the clientelistic politician. Having the LHS larger than the RHS means that G wants less public good than B. We see from the above inequality that this depends on the convexity of $u'(.)$ (the RHS is a weighted sum of $u'(c_1^B)$ and $u'(c_2^B)$) which is itself governed by the value of ε. We show in the appendix that when ε is small (resp. large), the LHS is lower (resp. greater) than the RHS and therefore that $g^B <$ (resp. $>$) g^G.

The role of ε, the elasticity of marginal elasticity,[5] will prove central in the model. It provides a measure of how sensitive voters are to the strategic allocation of private consumption by B, with respect to the egalitarian allocation always offered by G. With a low ε, the marginal utilities associated to that strategic allocation (the $u'(c_j^B)$'s) stay relatively close to $u'(c^G)$. With a high ε, B's strategic allocation is increasingly hampered by changing $u'(c_j^B)$'s and is less effective in winning votes. Therefore, a low ε gives more clout to the B's strategic allocation of private consumption, which is why he will allocate more resources in private consumption with respect to public spending, hence the result in Proposition 1.

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. Results are summarized in the next proposition.

Proposition 2. *When aid a is increased,*

(i) both the public good levels and the transfers chosen by both types of politicians increase with aid.

(ii) the election probability of the clientelistic politician increases if and only if the elasticity of the marginal utility of consumption, ε, is lower than 1.

Proof. See Appendix. ■

Not surprisingly, the first part of the proposition simply says that, even in the presence of a clientelistic candidate, more aid resources to the economy always trickle down to the population as public or private goods. In this model, more aid always leads to more social welfare in the recipient country. This of course is not surprising since aid is a pure windfall resource to that economy.

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

However, what the second part of the proposition is telling us is that the efficiency with which additional aid translates into more welfare will, critically, vary. In this model, economies can be neatly classified into two types as a function of the elasticity of marginal utility ε. When this parameter is low, more aid implies that the clientelistic politician stands more chances of being elected. Here the welfare efficiency of aid is (in relative terms) low: B undersupplies public goods (Proposition 1) and strategically distorts private transfers, thus getting away with more chances of being 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 through strategic distributions of private consumption to political supporters (Svensson [2000]). It can help us understand why aid may not be so efficient in improving policy, here modelled as both the supply of public goods and the distribution of transfers across the population. The opposite case is perhaps more surprising. When the elasticity of the marginal utility of consumption is high, the election probability of the clientelistic politician decreases with aid. This case is thus more encouraging: it is associated with a higher expected social welfare and therefore a better impact of aid with respect to the former case.

What is the mechanism at work? To grasp a better intuition of the role of ε, it is useful to consider a simpler model with no public good. In this model, politicians simply allocate aid to the different groups so as to maximize their payoff. It can be shown that the result in proposition 1 is still valid in this modified framework. The argument runs as follows. We differentiate (3.3):[6]

$$\frac{dv^B}{da} = n_1 s_1 \left[\frac{dT_1^B}{da} u'(c_1^B) - \frac{dT^G}{da} u'(c^G) \right] + n_2 s_2 \left[\frac{dT_2^B}{da} u'(c_2^B) - \frac{dT^G}{da} u'(c^G) \right]. \tag{4.5}$$

The term $n_j s_j \left[dT_j^B/da \times u'(c_j^B) - dT_j^G/da \times u'(c^G) \right]$ represents the increase (if positive) of the votes in group j following an increase in the volume of aid. Suppose that s_2 is larger than s_1. In this case, the opportunistic politician B favors group 2, which are in effect B's "clients", and thus $c_2^B > c^G \Leftrightarrow u'(c_2^B) < u'(c^G)$. This implies that when a increases, voters in group 2 get less extra utility from B's allocation of private consumption than they would from G's – which tends to hurt B's political prospects. However, whereas aid is channeled equally to both groups by politician G, B transfers a bigger share of it to group 2: $dT_2^B/da > dT^G/da$. 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 actually increases with a.

[6] It is easy to see that the probability of election varies in the same way as the number of votes.

Symmetrically, the number of votes received by this politician in group 1 decreases with a. We can prove that the effects transiting through group 2 always dominate those taking place in group 1.

Equation (4.5) 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 $cu'(c)$ increases with consumption. With $\varepsilon > 1$, the opposite happens.

To summarize, 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 a group of voters – the clients – over the other one (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 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. The elasticity of marginal consumption fully determines which of the two effects (always) dominates – whatever the initial level of consumption of voter groups, and whatever the desire of clientelistic politicians for power.

Strikingly, the result just described also holds when considering the richer model in which politicians choose the public good provision besides the targeted redistribution to the voters groups. This is obtained by observing that the variation of the number of votes of the bad politician following an increase in aid is now, after some manipulations:

$$\frac{dv^B}{da} = (n_1 s_1 + n_2 s_2)\left(y'(g^B) - y'(g^G)\right).$$

Following proposition 1, we have the desired result, namely that the election probability of the bad politician increases with aid if and only if $\varepsilon < 1$.

4.3. The impact of income

What is the influence of R, the exogenous income earned by voters? First, it is straightforward that the results above hold for any value of R. Therefore, the impact of changing levels of aid as characterized above is independent of the level of income of the recipient country. Second, let us consider how the political equilibrium reacts to changes in R. Note that the budget constraint (3.2) can be rewritten as

$$\sum_{j=1}^{2} n_j c_j^k + g^k = a + nR,$$

which shows that the candidates can use the aggregate income nR as another source of resources which is exactly equivalent to a. In this setting, aid and exogenous income have the same effect on the political equilibrium. All the results demonstrated for changes in the level of a equally apply to changes in the level of nR, as the interested reader can readily verify. This formally shows that the analysis carried out with this model in fact applies to any windfall resource: aid, as emphasized here, or, for instance, natural resources. The same can be said of the results in the next section.

5. Clientelism and corruption: endogenous benefit of holding office

We now introduce the possibility for the clientelistic politician to misappropriate part of the public funds. We assume that W is endogenous and that the budget constraint facing politician k is now:

$$\sum_{j=1}^{2} n_j T_j^k + g^k + W^k = a.$$

Clearly, the benevolent politician will set W^G equal to zero. As a consequence, his program and the associated conditions are unchanged. On the contrary, there is now an additional first-order condition characterizing the optimal strategy of politician B:

$$\frac{\partial \Pi^B}{\partial W^B} - \lambda^B = 0 \Leftrightarrow P^B - \lambda^B = 0.$$

The variation with a of the number of votes received by B is now

$$\frac{dv^B}{da} = (n_1 s_1 + n_2 s_2)\left(y'(g^B)\left(1 - \frac{dW^B}{da}\right) - y'(g^G)\right).$$

When W is endogenous, the result in proposition 1 is not affected. This is readily checked by observing that the proof of proposition 1 is not modified. It follows that $g^B = g^G = g$ when

$\varepsilon = 1$ and thus

$$\frac{dv^B}{da} = (n_1 s_1 + n_2 s_2)\, y'(g) \left(-\frac{dW^B}{da} \right) < 0.$$

We further show in the appendices that $dW^B/da > 0$. So, regardless of how easily voters can be bought out (as measured by ε), the clientelistic candidate will always find it in his interest to increase his capture when aid resources increase. This leads to the following proposition:

Proposition 3. *When the benefit of holding office is endogenized,*

(i) the result in Proposition 1 still holds: $g^B > g^G$ *iff* $\varepsilon > 1$*;*

(ii) the threshold value for ε *below which the election probability of the bad politician increases with* a *is now lower than 1.*

The explanation for this proposition is simple. The bad politician (and not the good one) will now capture part of the aid resources. Therefore less money will be redistributed to voters either in the form of direct transfers or of public good provision. As a consequence, the electoral prospects of the clientelistic candidate are less favorable. Note that this is true even though voters need not be informed about the amount of available aid a nor of the amount of capture W (but only of the respective platforms offered to them).

We thus now have values of ε below unity for which the election probability of the bad politician decreases with aid. In other words, when endogenous capture is possible, there are fewer economies on a ε continuum in which an increase of aid resources will be relatively inefficient in raising welfare. But for those economies (with ε below the new threshold), the inefficiency is higher than in the corresponding case with an exogenous benefit of holding office, as not only there is capture, but capture also increases with a.

6. Conclusion

In this study, we have analyzed the effect of aid on the endogenous provision of public goods 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 to maximize his chances of being elected.

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, the political impact of this additional clientelistic allocation of private consumption is hindered by the fact that the favored voter group (the clients) have a lower marginal utility than they would have under the socially optimal distribution: they simply gain less private utility from B than they would from G. 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. If clients approach satiety relatively slowly as consumption increases (that is: a low elasticity of marginal utility), aid may well have a detrimental impact on the quality of policy, as clientelistic politicians become more powerful, undersupplying public goods and distorting the allocation of private consumption. Assuming that the elasticity of marginal utility is low, this therefore suggests yet another reason why conditionality has been disappointing in bringing policy closer to what is socially desirable.

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. 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 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

(i) We consider the situation where $g^B = g^G$. We want to show that

$$u'(c^G) > \frac{n_1 s_1 u'(c_1^B) + n_2 s_2 u'(c_2^B)}{\sum_{j=1}^{2} n_j s_j} \text{ if and only if } \varepsilon > 1.$$

When $g^B = g^G = g$, $n_1 c_1^B + n_2 c_2^B = nc^G = nR + a - g$. Using (4.1) and recalling that $u(.)$ is isoelastic, we have

$$\begin{aligned} & s_1 u'(c_1^B) = s_2 u'(c_2^B) \\ \Leftrightarrow \quad & s_1 (c_1^B)^{-\varepsilon} = s_2 (c_2^B)^{-\varepsilon} \\ \Leftrightarrow \quad & c_1^B = \left(\frac{s_2}{s_1}\right)^{-1/\varepsilon} c_2^B \end{aligned}$$

and

$$c^G = \frac{n_1 c_1^B + n_2 c_2^B}{n} = \frac{\left(n_1 \left(\frac{s_2}{s_1}\right)^{-1/\varepsilon} + n_2\right)}{n} c_2^B.$$

The condition above becomes:

$$\begin{aligned} & \frac{\left(n_1 \left(\frac{s_2}{s_1}\right)^{-1/\varepsilon} + n_2\right)^{-\varepsilon}}{n^{-\varepsilon}} \left(c_2^B\right)^{-\varepsilon} > \frac{n s_2}{\sum_{j=1}^{2} n_j s_j} \left(c_2^B\right)^{-\varepsilon} \\ \Leftrightarrow \quad & \left(n_1 \left(\frac{s_2}{s_1}\right)^{-1/\varepsilon} + n_2\right) (n_1 s_1 + n_2 s_2)^{-1/\varepsilon} > n^{-\frac{1-\varepsilon}{\varepsilon}} s_2^{-1/\varepsilon} \\ \Leftrightarrow \quad & \Phi \equiv \left(n_1 s^{1/\varepsilon} + n_2\right) (n_1 s + n_2)^{-1/\varepsilon} n^{(1-\varepsilon)/\varepsilon} > 1 \end{aligned}$$

where $s = s_1/s_2$. When $s = 1$, $\Phi = 1$. We now study how Φ varies with s:

$$\begin{aligned} \frac{\partial \Phi}{\partial s} &= n^{(1-\varepsilon)/\varepsilon} \left(\frac{1}{\varepsilon} n_1 s^{1/\varepsilon} (n_1 s + n_2)^{-1/\varepsilon} - \frac{1}{\varepsilon} n_1 \left(n_1 s^{1/\varepsilon} + n_2\right) (n_1 s + n_2)^{-(1/\varepsilon)-1}\right) \\ > 0 \Leftrightarrow & \quad (n_1 s + n_2)^{-1} \left(n_1 s + n_2 s^{(1-\varepsilon)/\varepsilon}\right) < 1. \end{aligned}$$

When $\varepsilon > 1$ and $s > 1$, $\left(n_1 s + n_2 s^{(1-\varepsilon)/\varepsilon}\right) < (n_1 s + n_2) \Rightarrow (n_1 s + n_2)^{-1} \left(n_1 s + n_2 s^{(1-\varepsilon)/\varepsilon}\right) < 1 \Leftrightarrow \partial\Phi/\partial s > 0$;

When $\varepsilon > 1$ and $s < 1$, $\left(n_1 s + n_2 s^{(1-\varepsilon)/\varepsilon}\right) > (n_1 s + n_2) \Rightarrow (n_1 s + n_2)^{-1} \left(n_1 s + n_2 s^{(1-\varepsilon)/\varepsilon}\right) > 1 \Leftrightarrow \partial\Phi/\partial s < 0$;

When $\varepsilon < 1$ and $s > 1$, $\left(n_1 s + n_2 s^{(1-\varepsilon)/\varepsilon}\right) > (n_1 s + n_2) \Rightarrow (n_1 s + n_2)^{-1} \left(n_1 s + n_2 s^{(1-\varepsilon)/\varepsilon}\right) > 1 \Leftrightarrow \partial\Phi/\partial s < 0$;

When $\varepsilon < 1$ and $s < 1$, $\left(n_1 s + n_2 s^{(1-\varepsilon)/\varepsilon}\right) < (n_1 s + n_2) \Rightarrow (n_1 s + n_2)^{-1}\left(n_1 s + n_2 s^{(1-\varepsilon)/\varepsilon}\right) < 1 \Leftrightarrow \partial\Phi/\partial s > 0$.

We can conclude that $\Phi > 1$ if and only if $\varepsilon > 1$ and thus that $g^B > g^G$ if and only if $\varepsilon > 1$. ■

(ii) To prove that $dT_j^k/da > 0$ and $dg^k/da > 0$, we differentiate the first-order conditions of the two politicians as well as the government budget constraint with respect to the endogenous variables T_j^k, g^k and the exogenous variable a.

Politician G:

$$ny''(g^G)dg^G - u''(c^G)dT^G = 0$$
$$ndT^G + dg^G - da = 0.$$

It is clear from these two conditions that $dT^G/da > 0$ and $dg^G/da > 0$.

Politician B:

$$s_1 u''(c_1^B)dT_1^B - s_2 u''(c_2^B)dT_2^B = 0$$
$$\sum_{j=1}^{2} n_j s_j y''(g^B)dg^B - s_1 u''(c_1^B)dT_1^B = 0$$
$$n_1 dT_1^B + n_2 dT_2^B + dg^B - da = 0.$$

Here again, we obtain that $dT_1^B/da > 0$, $dT_2^B/da > 0$ and $dg^B/da > 0$.

B. Proof of Proposition 2

The sign of dP^B/da is obviously the same as the sign of dv^B/da. We differentiate (3.3):

$$\frac{dv^B}{da} = \sum_j n_j s_j \left[\frac{dg^B}{da} y'(g^B) + \frac{dT_j^B}{da} u'(c_j^B) - \frac{dg^G}{da} u'(g^G) - \frac{dT_j^G}{da} u'(c^G)\right].$$

The differentiation of the government budget constraint leads to:

$$n_1 \frac{dT_1^k}{da} + n_2 \frac{dT_2^k}{da} + \frac{dg^k}{da} = 1.$$

This yields, using (4.4), (4.2) and (4.1),

$$\begin{aligned}
&\frac{dv^B}{da} \\
= &\sum_j n_j s_j \left[\frac{dg^B}{da} y'(g^B) + \frac{dT_j^B}{da} u'(c_j^B) - \frac{dg^G}{da} y'(g^G) - \frac{dT_j^G}{da} u'(c^G)\right] \\
= &\sum_j n_j s_j \left[\frac{dg^B}{da} y'(g^B) + \frac{dT_j^B}{da} \frac{\sum_j n_j s_j}{s_j} y'(g^B) - \frac{dg^G}{da} y'(g^G) - \frac{dT_j^G}{da} n y'(g^G)\right] \\
= &\sum_j n_j s_j \left[y'(g^B) - y'(g^G)\right].
\end{aligned}$$

Therefore $dv^B/da > 0$ iff $g^B < g^G$. From proposition 1, we know that it will be the case when $\varepsilon < 1$.

C. Proof of proposition 3: $dW^B/da > 0$

The result follows readily from the differentiation of B's program first-order condition:

$$
\begin{aligned}
&s_1 u''(c_1^B) dT_1^B - s_2 u''(c_2^B) dT_2^B = 0 \\
&(n_1 s_1 + n_2 s_2) y''(g^B) dg^B - s_1 u''(c_1^B) dT_1^B = 0 \\
&\frac{\partial P^B}{\partial T_1^B} dT_1^B + \frac{\partial P^B}{\partial T_2^B} dT_2^B + \frac{\partial P^B}{\partial g^B} dg^B - h y''(g^B) dg^B - h y'(g^B) dW^B = 0 \\
&n_1 dT_1^B + n_2 dT_2^B + dg^B + dW^B - da = 0.
\end{aligned}
$$

From the first two conditions, we know that dT_1^B/da, dT_2^B/da and dg^B/da are of the same sign. The third equation then implies that dW^B/da is also of the same sign. We finally deduce from the last condition that these four terms cannot be simultaneously negative. Therefore, they are all positive.

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