Clientelism and aid*

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Abstract

Using a model of probabilistic voting, we analyze the impact of aid on the political equilibrium in the recipient country or region. We consider politicians with mixed motives: they are interested in promoting social welfare but also value the benefit of holding office. We label as clientelistic the politician who most values the benefit of being in power. We find that the impact of aid on the political equilibrium and therefore on the quality of policy in the recipient country (using utilitarian social welfare as a benchmark) ultimately depends on the value of the elasticity of marginal consumption. When elasticity is low, the expected policy outcome gets further away from the socially desirable policy set. This substitution of policy quality for aid can help to explain the poor performance of aid in improving policy. Perhaps more surprising is the opposite case, which arises for high values of elasticity of marginal utility: an increase in aid tilts the equilibrium policy towards the welfare-maximizing policy set.

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1. Introduction

The moral hazard of external aid is a long-running theme in the literature of development economics and has troubled many designers of aid programs (Svensson (2000), Azam & Laffont (2003)). The danger is that, by providing an exogenous pool of windfall resources, aid may, as with income from 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 & Dollar (2000), Svensson (1999), Collier & Dollar (2002)). However, the issue of how to improve, or engender improvement in policies and institutions in poor countries remains the central, unresolved challenge facing the donor community.

In this paper, we propose to revisit the relationship between aid and policy by treating policy as an endogenous outcome of a local political process, which in turn can be influenced by the presence of aid. We focus here on the windfall effect of aid, leaving policy conditionality to further research. We will argue that there are good reasons to believe that aid itself (without conditionality) influences policy in recipient countries, but that it 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 a policy platform consisting of the distribution of transfers (which can be negative) across voter groups. We consider two politicians valuing social welfare in the population *and* the benefit of holding office. Each therefore pursues an altruistic objective – maximizing social welfare – mixed with a clientelistic, selfish objective.[1] These politicians may be heterogenous in the sense that one of them (whom we call the benevolent candidate) places a greater weight on social welfare and a lower weight on the benefit of office than the other (labelled the clientelistic candidate). In this setting, we concentrate on the following question: what is the effect of aid on social welfare? Does aid alter the equilibrium policy towards a clientelistic transfer distribution – or towards a socially optimal distribution?

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

Our modelling thus concentrates on the redistributive aspects of policy-making. This is motivated by the fact that distributional considerations are a key ingredient of politically-determined economic policies, as recalled in the literature review below. In the specific context of developing economies, they are also a crucial component of development policies,[2] including in their relationship with aid conditionalities, as noted above.

Section 4 provides a first set of answers. We find that the distribution of transfers across the population does vary with the volume of aid. However, aid will not always favor clientelism. More aid can indeed favor a clientelistic transfer policy – a problematic outcome, where policy is the most distant from the maximization of social welfare – or on the contrary can lead to a more social welfare-enhancing policy – a 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 in consumption. The first scenario could help explain why, under certain conditions in the economy, it is so difficult to buy local ownership of socially desirable policies and why aid could drive policy away from what is socially desirable. 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 5, we extend the model to endogenous benefits of holding office (corruption).

2. Overview of the related literature

In addition to having a deep influence on the practice of development assistance, the empirical result that aid effectiveness is largely conditional on the quality of policies and institutions in recipient countries has inspired new theoretical research relating aid to growth, policy and institutions in developing countries. A first strand of the literature concentrates on the efficiency of conditionality – which is still routinely used by major donors –, essentially treating policy as an exogenous variable chosen by donors. To begin with, conditionality does not work: such is the alarming message of Collier (1997) and World Bank (1998). Azam & Laffont (2003), Svensson (2003) and Coate & 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

[2] See Bourguignon (2000).

on the donor side can dramatically reduce the impact of conditionality. These predictions (which are consistent with Azam & Laffont (2003)) fit the observed facts on the (low) effectiveness of conditionality.

Other studies have put emphasis on the endogeneity of policy to aid flows *per se*, as opposed to conditionality. Our contribution belongs to this line of work. Casella & Eichengreen (1996) use 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. However, we rely on a very different underlying political structure. Our model rests on the "tactical" redistribution voting model widely used in the political economic literature to analyze the influence of interest groups on policy decisions (Lindbeck & Weibull (1987), Dixit & Londregan (1996), Persson & Tabellini (2000)). Our study is thus also related to Robinson & Verdier (2002), who model clientelism within the same voting framework – albeit without any role for aid or windfall resources.[3] Clientelism has also recently been analyzed by Dekel et al. (2006), who model a sequential game to show that vote-buying can lead to inefficient political equilibria.

Finally, our study belongs to the literature on electoral competition with policy motivated candidates. When those candidates are uncertain about voters' behavior for given electoral platforms, and thus are expected utility maximizers, there is *policy differentiation* (Wittman (1983), Hansson & Stuart (1984), Calvert (1985), Roemer (1994)). Our model confirms this general result: we find that the clientelistic and benevolent candidates adopt different redistributive policies at equilibrium.

3. The model

Our starting point is the tactical redistribution model in Dixit & Londregan (1996). In that model, two identical political parties sharing the sole objective of being elected make transfers

[3] Another difference is that Robinson & Verdier (2002) focuses on public employment as a redistribution channel while we retain the emphasis on redistribution through monetary transfers.

to voter groups, to maximize the number of votes obtained. In our approach, parties have a mixed motive. On the one hand, they want to be elected, pursuing power for its own sake. This is their clientelistic motive in the sense that this behavior consists of buying office with targeted transfers to specific voter groups (the clients), as in Robinson & Verdier (2002). On the other hand, they also value social welfare in the population. Politicians may be heterogenous, one of the two placing a higher weight on the benefit of being in office and a lower weight on social welfare than the other. Even though both politicians have mixed motives, we call the former the *clientelistic* and the latter the *benevolent* politician. This asymmetry will lead the politicians to divergent platforms, which in turn will again be impacted by a variation of aid.[4]

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, as 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 J groups $j = 1, 2, \ldots, J$ of sizes n_j, with $n \equiv \sum_j n_j$ the total number of individuals. All individuals in a given group are identical (in particular, they earn the same income and have one voting right each) except for a *bias* parameter δ that measures their (exogenous) preferences towards political parties.[5] The cumulative distribution function

[4]Dixit & Londregan (1998) also consider an extension of the model in Dixit & Londregan (1996) with asymmetric politicians. The focus is however different. In their model, politicians differ in the way they trade-off social welfare with the efficiency cost of redistribution. A purely rightist candidate is only interested in minimizing the distortions induced by the redistribution of income. A purely leftist candidate wants to minimize inequality, no matter the size of the distortions. Another example of a probabilistic voting model with heterogenous politicians can be found in Bardhan & Mookherjee (2005).

[5]This modelization has been introduced by Lindbeck & Weibull (1987) and Dixit & Londregan (1996).

(c.d.f.) of this parameter in group j is noted F_j and the density function is f_j. The meaning of this bias is that individuals have some *a priori* preferences for the parties, irrespective of the platforms proposed during the campaign. This can be due to the ideological positions of the parties, historical events, or any other consideration that makes a politician/party look more attractive to a given voter, independently of the policy proposed. Candidates can overturn this exogenous bias by proposing to a given voter a particularly favorable policy compared to the one proposed by the other candidate. It is assumed that f_j is symmetric around a zero mean, thus ruling out any aggregate exogenous bias for one or the other candidate – the objective being to concentrate on endogenous outcomes resulting from the candidates' behavior.

There is only one (private) good in the economy. The utility function of a given individual i is $u(c_i)$ where c_i is the level of consumption. Throughout the paper, $u(.)$ is a standard isoelastic utility function

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

where $\varepsilon > 0$. All individuals in group j earn an (exogenous) income $R_j > 0$; average income in the total population, $\sum_j n_j R_j / n$, is denoted R. Therefore the consumption of an individual belonging to group j is $c_j = R_j + T_j$, where T_j is the transfer received from the government (if positive). The government has the ability to tax individuals, in which case T_j is negative.[6]

3.2. The candidates

There are two candidates B and G in the election, who maximize the expected utility of being elected. Denoting the election probability of politician K ($K = B$, G) by P^K, his payoff is given by:

$$U^K \equiv P^K(\alpha^K SW^K + (1-\alpha^K)(Q + \xi u(Z^K))) + (1-P^K)\alpha^K SW^{K'}, \tag{3.1}$$

where

$$SW^K \equiv \sum_j n_j u(c_j^K) \tag{3.2}$$

is the utilitarian social welfare in the population when K is elected.

With probability $1 - P^K$, candidate K is not elected, in which case he cares only about the welfare generated by his opponent, K'. With probability P^K, candidate K is elected, in

[6] Each member of a given group pays or receives the same tax/transfer. This comes from the fact that the δ_is are unobservable to the parties and that there is no other source of heterogeneity inside the groups. The parties have thus no interest in proposing different taxes/transfers to individuals in a given group.

which case he puts weight α^K on social welfare and weight $(1-\alpha^K)$ on the benefit of holding office. This benefit consists of two parts. There is first an exogenous utility derived from holding office, represented by the exogenous term Q.[7] Secondly, we will make it possible for politicians to endogenously misappropriate part of the public resources (Z^K), and label this behavior as corruption. Corruption will be possible in our model when $\xi = 1$. When $\xi = 0$, corruption is not taken into account in the analysis.

The instruments available to politicians consist of the taxes and transfers T_j^K, that apply to any individual in group j. Considering an exogenous amount a of aid, the government budget constraint reads as

$$\sum_{j=1}^{J} n_j T_j^K + Z^K = a, \tag{3.3}$$

where Z^K is the amount diverted from public funds by K for his personal consumption. We discuss the implications of considering this kind of corruption in section 5. Until then, it will be assumed that such behavior is not possible and thus that $Z^K = 0$.

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 candidates announce a platform consisting of a distribution of transfers to voter groups. 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

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

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

$$\delta_j = u(c_j^G) - u(c_j^B).$$

Citizens in 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 $1 - F_j(u(c_j^G) - u(c_j^B))$. Summing up over all groups,

[7]While the model could accommodate differing $Q's$ across candidates, this would not bring any additional insight to our results as this term is exogenous. We maintain an identical Q for simplicity.

we obtain that the number of people who prefer to vote for B is

$$v^B = \sum_{j=1}^{J} n_j(1 - F_j(u(c_j^G) - u(c_j^B))).$$

We assume that the candidates are uncertain about the number of votes they will receive for given platforms T_j^K.[8] The true number of votes received by B is $v^B + \theta$, where θ is distributed according to the c.d.f. Φ and the density ϕ. Again, we assume that ϕ is symmetric around a zero mean. The probability that B wins the election is then

$$\begin{aligned} P^B &= \Pr(v^B + \theta > \frac{n}{2}) \\ &= \Pr(\theta > \frac{n}{2} - \sum_{j=1}^{J} n_j(1 - F_j(u(c_j^G) - u(c_j^B)))) \\ &= 1 - \Phi(\frac{n}{2} - \sum_{j=1}^{J} n_j(1 - F_j(u(c_j^G) - u(c_j^B)))). \end{aligned} \tag{3.4}$$

The probability that G is elected, P^G, is of course $1 - P^B$. In the remainder of the paper, we will use the notation $\Delta \equiv n/2 - \sum_j n_j(1 - F_j(u(c_j^G) - u(c_j^B)))$.

4. No capture: exogenous benefit of holding office

In this version of the model, we initially assume that the candidates have a fixed benefit from holding office, valuing power for its own sake. This is the case $\xi = 0$.

4.1. Political equilibrium

We study the Nash equilibrium of the electoral competition game between the two candidates. The program of candidate K is:

$$\max_{T_j^K} P^K(\alpha^K SW^K + (1 - \alpha^K)Q) + (1 - P^K)\alpha^K SW^{K'} \tag{4.1}$$

$$\text{st} \quad \sum_{j=1}^{J} n_j T_j^K = a. \tag{4.2}$$

[8]Even though the parties know the voters preferences perfectly as well as the distributions of the biases within groups, there are still some unpredictable events that affect the response of the voters to the parties platforms. The following example is given in Roemer (2001): if some voters are more likely than others to abstain on rainy days then the weather represents an uncertain event that affects the probability of victory of the different candidates. Other examples could easily be developed. The essential point is that the candidates face substantial uncertainty on aggregate voting outcomes.

Denoting λ^K the Lagrange multiplier of the resource constraint, the first-order conditions on T_j^K are:

$$\frac{\partial P^K}{\partial T_j^K}(\alpha^K(SW^K - SW^{K'}) + (1-\alpha^K)Q) + P^K \alpha^K \frac{\partial SW^K}{\partial T_j^K} - \lambda^K n_j = 0, \quad j = 1, \dots, J \tag{4.3}$$

where, differentiating (3.4) and (3.2), $\partial P^K / \partial T_j^K = n_j u'(c_j^K) f_j(\delta_j)\phi(\Delta)$ and $\partial SW^K / \partial T_j^K = n_j u'(c_j^K)$.

A standard existence result states that if each player's payoff is continuous in the action of the other player and quasi-concave in its own action then there is a Nash equilibrium. Continuity follows immediately from our assumptions but quasi-concavity is not guaranteed in the general case and we shall assume it when needed. We show in the next section that, with identical candidates, an equilibrium exists even if payoffs are not quasi-concave.

When an equilibrium exists, it is characterized by the $2J$ following equations:

$$\begin{aligned}
u'(c_j^B)\left(x^B f_j(\delta_j) + y^B\right) &= u'(c_k^B)\left(x^B f_k(\delta_k) + y^B\right) \text{ for all } j \neq k \\
u'(c_j^G)\left(x^G f_j(\delta_j) + y^G\right) &= u'(c_k^G)\left(x^G f_k(\delta_k) + y^G\right) \text{ for all } j \neq k \\
\sum_{j=1}^{J} n_j c_j^B &= nR + a \\
\sum_{j=1}^{J} n_j c_j^G &= nR + a,
\end{aligned} \tag{4.4}$$

where $x^K \equiv \phi(\Delta)(\alpha^K(SW^K - SW^{K'}) + (1-\alpha^K)Q)$ and $y^K \equiv \alpha^K P^K$ and the two last equations are the government budget constraints expressed as functions of the c_js. The first two lines of equations follow from a re-arrangement of the first-order conditions of the two parties.

It should be noted that the equilibrium is necessarily *interior*. To see this suppose that party K chooses the minimum transfer for one group, for example group j: $T_j^K = -R_j$. The impact on party K's payoff of increasing marginally T_j^K is:

$$\frac{\partial U^K}{\partial T_j^K} = u'(c_j^K)\left(x^K f_j(\delta_j) + y^K\right) - u'(c_k^K)\left(x^K f_k(\delta_k) + y^K\right).$$

It is strictly positive if and only if

$$\frac{u'(c_j^K)}{u'(c_k^K)} > \frac{f_k(\delta_k) + (y^K/x^K)}{f_j(\delta_j) + (y^K/x^K)}.$$

As $u'(c_j^K) \to +\infty$ when $T_j^K \to -R_j$, this is always true and thus party K should not adopt a corner solution for its transfer policy.

In the next section, we first deal with the case of identical candidates who place the same weight on social welfare: $\alpha^B = \alpha^G \equiv \alpha$.

4.1.1. Identical candidates

We start by showing that a symmetric equilibrium exists (additionally we will show that there is a unique symmetric equilibrium). In a symmetric equilibrium the two candidates adopt the same platforms: $c_j^B = c_j^G \equiv c_j$ for all j. This implies that the cut-point in every group, δ_j, is 0 and that both election probabilities are 1/2. With this, the equilibrium conditions (4.4) simplify to

$$\begin{aligned} u'(c_j)\left[f_j(0)\phi(0)(1-\alpha)Q + \frac{1}{2}\alpha\right] &= u'(c_k)\left[f_k(0)\phi(0)(1-\alpha)Q + \frac{1}{2}\alpha\right] \text{ for all } j \neq k \quad (4.5) \\ \sum_{j=1}^{J} n_j c_j^B &= nR + a. \end{aligned}$$

When $\alpha = 0$ – the standard assumption of candidates only motived by power – the political equilibrium would imply a pure clientelistic transfer distribution such that $u'(c_j^{\#})f_j(0) = u'(c_k^{\#})f_k(0)$, which maximizes the sum of group utilities weighted by the bias density at the cut-point $(f_{j,k}(0))$. The purely clientelistic distribution typically favors the groups which are the most responsive to transfers, namely the ones with the highest density at the cut-point.[9]

On the other hand, with $\alpha \neq 0$, we have an equilibrium transfer distribution which is a mix across the pure clientelistic distribution and the pure welfare-maximizing distribution. When $\alpha = 1$, the welfare-maximizing distribution holds, producing at equilibrium the maximum utilitarian social welfare SW^*. The distribution policy associated with SW^* is evidently egalitarian, satisfying $u'(c_j^*) = u'(c_k^*)$ and thus $c_j^* = c^* = R + a/n$ for all j.

There is a unique solution to (4.5),[10] implying that *there exists a unique symmetric equilibrium*. However, one cannot exclude a priori the possibility of an asymmetric equilibrium, this depending on the shape of the parties' reaction functions. In the remainder of the section, we focus on the symmetric equilibrium.

We now study how a variation of aid can shift the equilibrium distribution towards one or the other of these two polar distributions. In the lemma below, we determine how platforms

[9] This is a standard result of the probabilistic voting literature. See Dixit & Londregan (1996) and Lindbeck & Weibull (1987).

[10] To see this, fix one of the consumption levels, say c_1. Then conditions (4.5) define a linear relationship between c_j and c_1, $j \neq 1$. Substituting into the government budget constraint, we obtain the unique equilibrium value of c_1.

respond to aid variations.

Lemma 1.

$$\frac{dT_j}{da} = \frac{c_j}{nR+a}, \text{ for all } j.$$

Proof. See Appendix A. ■

This lemma is telling us that the increase in the transfer to any individual in a given group j following an increase in a is proportional to the consumption level of that individual.

Observe that Lemma 1 implies that the share of each group in total consumption, $c_j/(nR+a)$, remains constant as a changes. This is because the growth rate of c_j as a increases is identical across the j's (using $dT_j/da = dc_j/da$):

$$\frac{dc_j/da}{c_j} = \frac{1}{nR+a} \text{ for all } j.$$

It is straightforward to determine this share using the first-order conditions (4.5) together with the government budget constraint (4.2):

$$\frac{c_j}{nR+a} = \frac{\beta_j^{\frac{1}{\varepsilon}}}{\sum_k n_k \beta_k^{\frac{1}{\varepsilon}}} \text{ for all } j \text{ and } a \tag{4.6}$$

where $\beta_j \equiv f_j(0)\phi(0)(1-\alpha)Q + (1/2)\alpha$.

A few comments can be made on this equilibrium platform. Firstly, the share of each group in total consumption is, as one expected, an increasing function of its responsiveness to transfers, as measured by $f_j(0)$. Secondly, this implies that horizontal equity[11] is generally violated at equilibrium, except of course in the case $\alpha = 1$. To see this, consider the simple case of homogenous groups that have the same income level. From the above (equation 4.6), we know that politicians generally treat voters groups differently: they favor groups with a large number of unbiased voters, irrespective of the fact that these groups might have exactly the same economic characteristics. A similar comment can be made in terms of vertical equity. As is clear from equation (4.6), the distribution of $c_j = R_j + T_j$ across groups only depends on the political characteristic of groups (specifically, $f_j(0)$), not on their income level R_j. This gives rise to all sorts of possible configurations, depending on the relationship between the inter-group

[11]Horizontal equity means that citizens with the same economic characteristics – namely, in the context of our model, income – are treated equally. We similarly use the following notion of vertical equity: individuals who are in a position to pay higher taxes than others should do so. In our model, this means that transfers T_j should decrease with income R_j; in other words, vertical equity is taken as equivalent to positive redistribution. To clarify our discussion, we use the utilitarian distribution as the benchmark for equity.

distributions of respectively $f_j(0)$ and R_j, as well as on the value of α. If the lower levels of income are associated with the lower levels of political responsiveness $f_j(0)$, then negative redistribution may ensue, clearly violating vertical equity. Interestingly, if the contrary happens, then *excessive* redistribution could happen with respect to the benchmark provided by the welfare-maximizing distribution.

Turning now to the main topic of the paper, we determine the effect of aid on welfare. First, observe that Lemma 1 implies that more aid always leads to more *ex post* social welfare[12] in the recipient country, since we have

$$\frac{dSW}{da} = \sum_{j=1}^{J} n_j \frac{c_j}{nR+a} u'(c_j) > 0.$$

This of course is not surprising since aid is a pure windfall resource to the economy. However this is not the end of the story, as we now show. Crucially, the effectiveness with which more aid translates into more social welfare varies across economies as a function of the elasticity of marginal utility. In the proposition below we state that, following an increase in aid, equilibrium welfare may get closer or further away from the social optimum, all depending on the elasticity of marginal utility.

Proposition 1. *When identical politicians maximize the expected utility of being elected, one of these three cases will occur:*

1. $\dfrac{d(SW^* - SW)}{da} > 0 \Longleftrightarrow \varepsilon < 1$
2. $\dfrac{d(SW^* - SW)}{da} = 0 \Longleftrightarrow \varepsilon = 1$
3. $\dfrac{d(SW^* - SW)}{da} < 0 \Longleftrightarrow \varepsilon > 1.$

Proof. Knowing that $dT_j/da = c_j/(nR+a)$, we have (using the properties of the isoelastic utility):

$$\frac{d(SW^* - SW)}{da} = \sum_j n_j \frac{c^*}{nR+a} u'(c^*) - \sum_j n_j \frac{c_j}{nR+a} u'(c_j) \tag{4.7}$$

[12]Note that with identical candidates adopting the same platforms and thus generating the same welfare ex post ($SW^B = SW^G \equiv SW$), ex ante social welfare coincides with ex post social welfare:

$$\begin{aligned} ESW &\equiv P^B SW^B + P^G SW^G \\ &= \frac{1}{2} SW + \frac{1}{2} SW \\ &= SW. \end{aligned}$$

$$= \frac{(1-\varepsilon)}{nR+a}\sum_j n_j u(c^*) - \frac{(1-\varepsilon)}{nR+a}\sum_j n_j u(c_j)$$
$$= \frac{(1-\varepsilon)}{nR+a}(SW^* - SW)$$

where it is noted that the quantity $SW^* - SW$ is always positive. ■

We learn from the proposition that the efficiency with which additional aid translates into more social welfare varies. Economies can be neatly classified into three types as a function of the elasticity of marginal utility ε. When this parameter is low, more aid implies that the distance between SW^* and SW, the welfare resulting from the equilibrium distribution, will increase. In this situation, the welfare efficiency of aid is (in relative terms) low: the candidates accentuate their tactical clientelistic behavior by increasingly distorting private transfers, away from the welfare-maximizing equalitarian distribution corresponding to SW^*. 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 tactical 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 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 equilibrium transfer distribution shifts towards the welfare-maximizing distribution. This case is thus more encouraging: it is associated with a higher social welfare for a given volume of aid. In the case $\varepsilon = 1$ (logarithmic utility), the distance between SW^* and the welfare obtained from the equilibrium transfer distribution is unaffected by a change in a. Figure 4.1 below illustrates the behavior of SW as a increases. Starting at $a = 0$, the case $\varepsilon < 1$ implies that there is divergence between SW^* and SW. This key point is that more aid drives the equilibrium welfare away from its maximum SW^*. The contrary happens with $\varepsilon > 1$: SW converges towards SW^* as aid increases.

Note that this result can also be interpreted in terms of horizontal and vertical equity. In the case $\varepsilon < 1$, an increasing distance between SW^* and SW implies that horizontal equity is increasingly violated as a increases. The contrary obviously happens in the case $\varepsilon > 1$. Similarly, any deviation from strict vertical equity will be magnified (reduced) with $\varepsilon < 1$ ($\varepsilon > 1$) as a increases – whether this deviation is negative or excessive redistribution.

What is the mechanism at work? Additional aid seems to work both ways in this economy. On the one hand, more aid increases the room for manoeuvre for clientelism by providing more

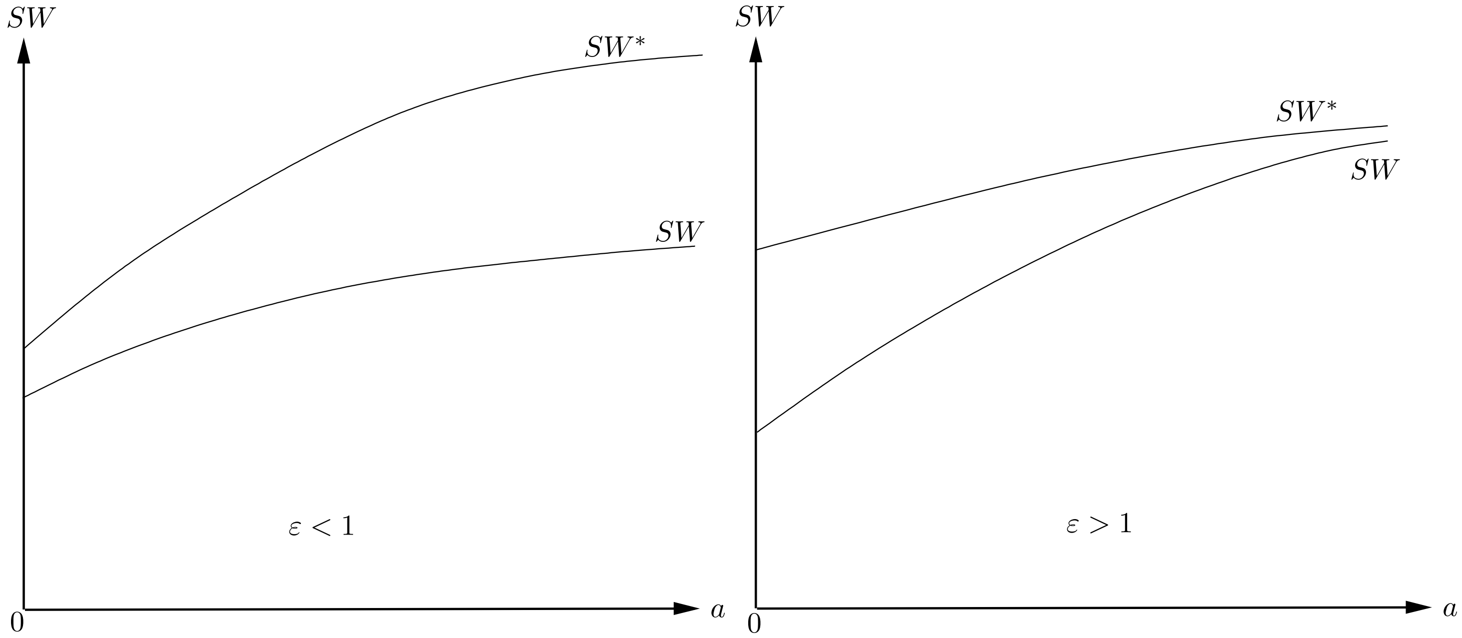

Figure 4.1: Behavior of SW as a increases

resources to be allocated tactically among voter groups in order to secure election. On the other hand, as this clientelistic strategy always favors certain groups of voters – namely the clients, who are the most responsive in terms of their vote to transfers –, those favored voters, having as a consequence a lower marginal utility than the non-client voters, will be less sensitive to an extra dollar than the latter. With a low elasticity of marginal utility ε, the difference of marginal utilities across client and non-client groups 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 to be allocated in a clientelistic fashion. The elasticity of marginal consumption fully determines which of the two effects dominates. Another way to state this is that a high ε implies that voters approach consumption satiety quickly – which makes them less responsive to a clientelistic distribution of transfers.

To provide a more precise illustration of this mechanism, we momentarily focus on the two-group case. The derivative of the difference in social welfare with respect to a writes:

$$\begin{aligned}\frac{d(SW^* - SW)}{da} &= n_1\left(\frac{dT^*}{da}u'(c^*) - \frac{dT_1}{da}u'(c_1)\right) + n_2\left(\frac{dT^*}{da}u'(c^*) - \frac{dT_2}{da}u'(c_2)\right)\\ &= n_1\frac{(1-\varepsilon)}{nR+a}(u(c^*) - u(c_1)) + n_2\frac{(1-\varepsilon)}{nR+a}(u(c^*) - u(c_2)).\end{aligned}$$

The two candidates, both adopting to the same degree a clientelistic behavior, favor the client group, namely the group with the highest density at the cut-point $f_j(0)$. Let us assume, without loss of generality, that the client group is group 2: $f_1(0) < f_2(0)$. This implies that the consumption obtained at the political equilibrium by members of group 2 (resp. 1) is larger (resp. lower) than the egalitarian consumption level: $c_2 > c_2^*$ and $c_1 < c_1^*$. This also implies, following Lemma 1, that $(dT_2/da) > (dT_2^*/da)$ and $(dT_1/da) < (dT_1^*/da)$. In other words, both politicians transfer a greater proportion of additional aid to the client group (and mechanically a lower proportion to the other group) than a utilitarian social planner would. What does this imply for welfare changes in both voter groups? Even though members of group 1 receive a smaller portion of aid, their marginal utility of consumption is greater under the clientelistic allocation than under the egalitarian one ($u'(c_1) > u'(c_1^*)$). Therefore, *their welfare may increase more under the clientelistic allocation than it would under the egalitarian one* ($(dT_1/da)u'(c_1) > (dT_1^*/da)u'(c_1^*)$). This is the case when the elasticity of marginal utility, ε, is greater than 1. This is intuitive: a high elasticity means that the marginal utilities are very different under the two allocations and thus that a marginal dollar has a much higher welfare impact in the clientelistic setting than in the utilitarian one. The utility of the non-client group members (who are the worse-off individuals) increases faster under the clientelistic allocation than under the utilitarian one, and the social welfare associated with the political equilibrium, becoming more egalitarian, is getting closer to the utilitarian optimum.

4.1.2. Asymmetric candidates

We now consider the possibility that the two candidates B and G differ in the weights α^B and α^G they place on social welfare. In this setting, we obtain *policy differentiation*,[13] with the candidates proposing different platforms at equilibrium.[14] Because B has a greater desire to be in office, his platform will be closer to the one that maximizes the election probability. Conversely, expected social welfare will be higher under G's platform. This simply reflects the fact that the benevolent politician places a higher weight on social welfare.

When looking at heterogenous politicians, the resolution of the model becomes considerably more involved. The candidates propose differentiated platforms and have different election probabilities. Moreover, a change in a affects the candidates' strategies differently. In particular,

[13] It is readily verified that the equilibrium conditions (4.4) cannot be satisfied for identical candidates' platforms.

[14] Policy differentiation when candidates have different policy preferences and maximize expected policy outcome is a well-known general result, first presented by Wittman (1983). See Roemer (2001) for a detailed discussion of this result.

a	$\alpha^G = 0.9$, $\alpha^B = 0.1$		$\alpha^G = 0.7$, $\alpha^B = 0.3$		$\alpha^G = 0.5$, $\alpha^B = 0.5$	
	P^B	ΔSW	P^B	ΔSW	P^B	ΔSW
0	0.5872	0.3001	0.5322	0.3038	0.5	0.3078
5	0.5957	0.3920	0.5383	0.3901	0.5	0.3924
10	0.6012	0.4687	0.5428	0.4614	0.5	0.4617
15	0.6052	0.5360	0.5463	0.5237	0.5	0.5219
20	0.6083	0.5968	0.5493	0.5797	0.5	0.5759

Table 4.1: Exogenous benefit of office, $\varepsilon = 1/2$.

a	$\alpha^G = 0.9$, $\alpha^B = 0.1$		$\alpha^G = 0.7$, $\alpha^B = 0.3$		$\alpha^G = 0.5$, $\alpha^B = 0.5$	
	P^B	ΔSW	P^B	ΔSW	P^B	ΔSW
0	0.5435	0.0743	0.5119	0.0820	0.5	0.0852
5	0.5435	0.0743	0.5119	0.0820	0.5	0.0852
10	0.5435	0.0743	0.5119	0.0820	0.5	0.0852
15	0.5435	0.0743	0.5119	0.0820	0.5	0.0852
20	0.5435	0.0743	0.5119	0.0820	0.5	0.0852

Table 4.2: Exogenous benefit of office, $\varepsilon = 1$.

it can be shown that Lemma 1 no longer holds in this framework, making it impossible to use the resolution techniques used so far. We thus rely on numerical simulations in the remainder of the paper, showing that the elasticity of the marginal utility of consumption continues to play a key role in this setting.

It should be noted that, with asymmetric candidates, expected social welfare, $ESW = P^B SW^B + P^G SW^G$, now differs from *ex post* welfare. The relevant welfare measure studied in the simulations is ESW, which accounts for the respective election probabilities.

In these simulations, we use uniform distribution functions: $f_j(.) = s_j$, $\phi(.) = h$. Voters belong to two groups, 1 and 2, with $n_1 = n_2 = 1$ and $s_1 = 1 < s_2 = 2$. We use $h = 1$, $Q = 2$ and $R_1 = R_2 = 4$ as our base simulation.

These simulations confirm the findings of the previous section: the distance between expected social welfare at the political equilibrium and optimal social welfare (denoted ΔSW in the tables) increases when ε is lower than 1 and decreases in the opposite case. The robustness of this result has been tested against variations of the above parameters.

It should be noted that with asymmetric candidates the election probability of these candidates now varies with aid. The impact of aid on expected social welfare can be broken down as

	$\alpha^G = 0.9$, $\alpha^B = 0.1$		$\alpha^G = 0.7$, $\alpha^B = 0.3$		$\alpha^G = 0.5$, $\alpha^B = 0.5$	
a	P^B	ΔSW	P^B	ΔSW	P^B	ΔSW
0	0.5076	0.0086	0.5017	0.0103	0.5	0.0109
5	0.5048	0.0052	0.5010	0.0063	0.5	0.0067
10	0.5035	0.0038	0.5008	0.0046	0.5	0.0048
15	0.5027	0.0029	0.5006	0.0036	0.5	0.0038
20	0.5022	0.0024	0.5005	0.0029	0.5	0.0031

Table 4.3: Exogenous benefit of office, $\varepsilon = 2$.

follows:

$$\begin{aligned} \frac{dESW}{da} &= P^B SW^B + P^G SW^G \\ &= P^B \frac{dSW^B}{da} + P^G \frac{dSW^G}{da} + \frac{dP^B}{da}(SW^B - SW^G). \end{aligned}$$

The first two terms represent the direct effect of aid on expected social welfare. The last term is an indirect effect that transits through the election probability. Note that this last term disappears when considering identical politicians.

In all the simulations that we have conducted, the election probability of the clientelistic politician increases with aid if and only if ε is lower than 1. Thus the last term in the above formula is positive if and only if ε is larger than 1. Therefore when the elasticity ε is large, the effect on the election probability tends to make expected social welfare closer to optimum social welfare than it would be in the absence of this effect. Conversely, when the elasticity is low (below unity), the fact that the election probability of the clientelistic candidate increases with aid drives expected social welfare even further away from the optimum. Put differently, the effect on the election probabilities tends to magnify the effect of aid on social welfare.

4.2. The impact of income

What is the influence of R, the exogenous income earned by voters? First, it is straightforward that all algebraic and numerical results in the paper hold for any value of R. Therefore, the impact of changing levels of aid as characterized above is independent of the level of income in the recipient country. Secondly, let us consider how the political equilibrium reacts to changes in R. Note that the budget constraint (4.2) can be rewritten as

$$\sum_{j=1}^{J} n_j c_j^K = nR + a,$$

	$\alpha^G = 0.9$, $\alpha^B = 0.1$		$\alpha^G = 0.7$, $\alpha^B = 0.3$		$\alpha^G = 0.5$, $\alpha^B = 0.5$	
a	P^B	ΔSW	P^B	ΔSW	P^B	ΔSW
0	0.5369	0.3104	0.5063	0.3358	0.5	0.3489
5	0.5373	0.4019	0.5066	0.4306	0.5	0.4463
10	0.5372	0.4777	0.5068	0.5088	0.5	0.5265
15	0.5370	0.5441	0.5069	0.5771	0.5	0.5965
20	0.5367	0.6039	0.5070	0.6386	0.5	0.6593

Table 5.1: Corruption, $\varepsilon = 1/2$.

	$\alpha^G = 0.9$, $\alpha^B = 0.1$		$\alpha^G = 0.7$, $\alpha^B = 0.3$		$\alpha^G = 0.5$, $\alpha^B = 0.5$	
a	P^B	ΔSW	P^B	ΔSW	P^B	ΔSW
0	0.4088	0.1638	0.4684	0.2301	0.5	0.2469
5	0.4308	0.1586	0.4762	0.2142	0.5	0.2279
10	0.4420	0.1551	0.4800	0.2054	0.5	0.2176
15	0.4490	0.1527	0.4823	0.1997	0.5	0.2109
20	0.4539	0.1508	0.4838	0.1956	0.5	0.2061

Table 5.2: Corruption, $\varepsilon = 1$.

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 of elected politicians misappropriating part of the public funds ($\xi = 1$), with Z^K the endogenous capture of politician K. There is now an additional first-order condition characterizing K's optimal strategy:

$$\frac{\partial U^K}{\partial Z^K} - \lambda^K = 0 \Leftrightarrow (1-\alpha)P^K u'(Z^K) - \lambda^K = 0. \tag{5.1}$$

We summarize the numerical results with endogenous office benefits in the following tables:

The numbers in Tables 5.4-5.6 indicate two main differences with the exogenous benefit case. First, the way the election probability varies with aid is completely different. The election

	$\alpha^G = 0.9,\ \alpha^B = 0.1$		$\alpha^G = 0.7,\ \alpha^B = 0.3$		$\alpha^G = 0.5,\ \alpha^B = 0.5$	
a	P^B	ΔSW	P^B	ΔSW	P^B	ΔSW
0	0.4410	0.0991	0.4798	0.1201	0.5	0.1247
5	0.4672	0.0599	0.4887	0.0704	0.5	0.0726
10	0.4773	0.0429	0.4921	0.0497	0.5	0.0512
15	0.4826	0.0333	0.4939	0.0384	0.5	0.0396
20	0.4859	0.0273	0.4951	0.0313	0.5	0.03221

Table 5.3: Corruption, $\varepsilon = 2$.

probability of B increases when $\varepsilon = 1$ and $\varepsilon = 2$ whereas it was respectively constant and decreasing in the numerical examples of the previous section. Furthermore, it is no longer monotonic: when $\varepsilon = 1/2$, the probability is increasing for low levels of aid and then decreases. Secondly, the difference between expected social welfare and optimal welfare is now decreasing with aid when $\varepsilon = 1$ whereas it is constant when the benefit of office is exogenous. However, the main message from the previous sections is confirmed by these simulations: the difference in welfare decreases with aid if and only if the elasticity of marginal utility is high enough, even though the threshold value for this elasticity is not unity anymore. The same deep influence of the elasticity of marginal utility is at work.

6. Conclusion

In this study, we have analyzed the effect of aid on the redistributive policy emerging from a voting model where candidates pursue a mixed strategy of clientelism and welfare-maximization.

The model suggests that aid works both ways: on the one hand, because it provides more resources to be distributed among voter groups in a clientelistic fashion, it tends to favor this kind of behavior; on the other hand, the political impact of this additional clientelistic allocation of private consumption is hindered by the fact that the favored voter groups (the clients) have a lower marginal utility than the non-client groups: they simply gain less extra private utility from a marginal transfer than the non-client groups. In our specification, 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 when the latter is politically determined. If clients approach satiety relatively slowly as consumption increases (a low elasticity of marginal utility), aid may well have a detrimental impact on the quality of policy, as clientelism becomes more powerful. This suggests yet another reason why aid has been ineffective 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 include conditionality, for example by making the volume of aid endogenous to policy. Secondly, the isoelastic utility function used in this paper, whilst 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 Lemma 1

We re-write the $J-1$ first-order conditions on c_j, given in (4.5):

$$u'(c_j)\left[f_j(0)\phi(0)(1-\alpha)Q+\frac{1}{2}\alpha\right]=u'(c_k)\left[f_k(0)\phi(0)(1-\alpha)Q+\frac{1}{2}\alpha\right] \text{ for all } j\neq k. \qquad \text{(A.1)}$$

These conditions, altogether with the budget constraint (4.2), form a system of J equations where the J unknowns are the c_j. We differentiate this system with respect to a:

$$\frac{dT_j}{da}u''(c_j)\left[f_j(0)\phi(0)(1-\alpha)Q+\frac{1}{2}\alpha\right]=\frac{dT_k}{da}u''(c_k)\left[f_k(0)\phi(0)(1-\alpha)Q+\frac{1}{2}\alpha\right] \text{ for all } j\neq k$$
$$\sum_{j=1}^{J} n_j\frac{dT_j^K}{da}=1.$$

Using (A.1) and the fact that $u(.)$ is isoelastic, it can be checked easily that

$$\frac{dT_j}{da}=\frac{c_j}{nR+a}\text{for all } j$$

satisfy these conditions.

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