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# Decentralized Aid and Democracy

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**Abstract**

The last three decades have seen an important surge of the non-governmental sector in the provision of foreign aid. Using NGOs to deliver aid can be a solution to bypass corrupt authorities, avoiding that aid resources are captured by local elites. However NGOs may also act as surrogates for governmental provision of public goods. This implies that citizens make their own governments less accountable. In democratic countries, this can reduce electoral support for provision of public services by the state and harm the poor that don't directly benefit from the NGOs' projects. We develop a theoretical model of vote over public finances to analytically characterise the effect of decentralised aid on welfare. We find that non-governmental aid can harm the poor, weaken governance and aggravate inequalities by crowding-out governmental expenditures. These inefficiencies occur even in a flawless institutional context. We also find that the crowding-out effect can be mitigated if NGOs target countries with low income inequalities or by focusing on humanitarian-oriented missions.

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# 1 Introduction

The involvement of the non-governmental sector in foreign aid delivery has substantially expanded in the last thirty years. Official Development Aid channelled through NGOs was raised from a negligible amount in the early 80's to over USD 4 bil. by the mid-2000's (Agg, 2006). Moreover, donations made by private contributors to NGOs often constitute the largest part of their budget. It is estimated that during the period 2006-2010, 17% of all aid donations (official and public) on average were destined to NGOs or similar decentralized aid agencies (GHA, 2012).

Notwithstanding these significant numbers, surprisingly few studies on aid efficiency categorize its effects by type of provider. This is problematic because there are serious reasons to believe that official and decentralised aid are systematically different. Indeed, while official aid works through the state, one of the deliberate aims of NGO aid is to circumvent governmental agencies. The impact of aid may vary significantly depending on the method of delivery, and failure to differentiate between these methods may therefore lead to misguided policy advice.

The reason why the literature on NGOs' efficiency is scant is that cross-country data on NGO activities is scarce, dispersed and of debatable quality. The few existing studies build databases on meagre informational resources. A notable example is provided by Koch et al. (2009) who have built the most comprehensive (to our knowledge) cross-section database on NGOs. They find that, when NGOs decide upon the geographic location of their projects, they often follow official aid. Therefore, countries receiving more development assistance also host more NGOs projects. The correlation resulting from this complementarity implies that the regression coefficients estimating the efficiency of official aid on growth, inequalities or governance chronically suffer from omitted-variable biases.

To disentangle the effects of aid by type of donor and to allow for interactions between decentralized aid and state policies in the recipient countries, we need the guidance of theory in the form of an applied theoretical model. There are three main messages coming out of the vast literature on development aid that need to be taken into account while setting the assumptions at the heart of the our model.

First, recent studies enable us to better understand the behaviour of NGOs and other aid agencies (Easterly, 2002; Fruttero and Gauri, 2005; Koch, 2007; Brass, 2012; Mansuri and Rao, 2012). These organizations seem to be generally confronted to a pragmatic versus humanitarian tradeoff, an opposition between motivation and realism. In other words, NGOs have to compromise between helping those that need it most, in the most adverse and risky situations, versus helping many in safer, easier cases. Empirical evidence shows that NGOs can favour either approach in different world locations. Therefore, we allow for variation in the type of project, whether humanitarian or pragmatic.

Second, many authors have emphasized that projects affect agents other than the direct beneficiaries. Some of these externalities have been widely studied by researchers from political sciences and sociology. Quite a few of them maintain that NGOs have indirectly harmed the poor by crowding-out state-provided public services (see e.g. Arellano-López and Petras, 1994; Petras, 1997; Lorgen, 1998; Mercer, 2002). They claim that, during the structural reforms of the eighties, NGOs have eroded governmental accountability by providing substitutes for public services. This loss of accountability has allegedly resulted in less social inclusion, weakened governance and reduced fairness. This literature states that, by diverting donations and militants from civic movements and trade unions, NGOs have mollified social protest and promoted an 'anti-statist ideology'. While economists are generally sceptical toward this rhetoric, the following statement by Collier and Dollar (2004) is worth citing:

> "By detaching the wellbeing of the population from the actions of the government, [...] NGOs can undermine democratic accountability. [If] the government is democratic, then offsetting the direct benefits of the project are unquantifiable externalities as accountability is undermined".

Third, these adverse effects appear in the cross-country literature on aid. At the aggregate level, there is evidence that aid increases inequalities and hinders governance. Concerning inequality, although Chong et al. (2009) find weak evidence that aid reduces income disparities, Layton and Fuller (2008), Bjørnskov (2010), and Herzer and Nunnenkamp (2012) find robust evidence that it actually increases them. In particular, Bjørnskov finds that aid worsens inequalities but only in democratic countries, assumed to have better institutions than non-democracies. In relation to governance, Collier and Dollar (2004) claim that aid has a negligible impact on governance quality[1]. However, by objectively measuring the share of industries depending on good governance (industries depending on numerous transactions), Rajan and Subramanian (2007) find that the negative effect of aid on institutionality is important. In the same vein, Djankov et al. (2008) find that foreign aid

[1]This argument is used to promote the *country selectivity* approach to aid against the *aid conditionality* approach: the idea is that, since institutions are not affected by aid, aid flows should be targeted to selected 'good' countries with good institutions instead of being conditioned to force changes in 'bad' countries (Mosley et al., 2004).

has a negative impact on the Polity IV measures of democracy (that include representativeness of citizens) and on the number of official checks required before a policy is implemented. For these authors, 'aid is a bigger curse than oil': the negative effects of aid on these indicators are far greater than those of natural resource windfalls.

Summing up, while projects implemented by NGOs seem to be successful at the local level, they might cause externalities that erode governmental accountability at the aggregate level. Citizens would rely less on the state for provision of public services and favour a reduction of government size. This contraction might translate into less redistribution and narrowed political representation of poor citizens[2]. This paper aims at synthesizing the aforementioned concepts into a single mechanism.

How can NGOs undermine equity and governance? Our model provides micro-foundations suggesting a possible mechanism that does not rely on institutional failures. Such failures, like corruption, elite capture or uncommitted politicians, are typically blamed for hampering aid efficiency (Burnside and Dollar, 2000; Svensson, 2000; Chong et al., 2009; McGillivray et al., 2006). We show that, in a democracy where citizens vote over public finances, decentralized aid can be inefficient even under assumptions of sound institutionality. By sound institutionality, we mean that politicians fully commit to enforce their promises, they do not embezzle resources, there are no public deficits and there is no tax evasion. Although these assumptions can be regarded as naive, we choose to make them with a view to showing that sound institutionality is not enough to guarantee aid efficiency. These simplifying assumptions also allow us to isolate the effect of NGO projects on governmental expenditures. Additional distortions would, in general, work toward reinforcing our results.

The mechanism by which NGOs crowd-out the government is as follows: when services provided by an NGO are substitutable to governmental services, any voter benefiting from the project would favor a low taxation/low expenditure policy platform during the next elections. This happens because, while NGO projects are financed by foreign donors, governmental services

[2]If, in turn, reduced governance and equality have adverse effects on growth, this mechanism could be at the heart of what has been called the Micro-Macro Paradox by Mosley (1986). The paradox states that despite project successes at the local level, aid has no effect on growth at the aggregate level. The existence of this paradox has been sometimes substantiated (Mosley, 1986; Rajan and Subramanian, 2008; Doucouliagos and Paldam, 2009) and some other times invalidated (Burnside and Dollar, 2000; McGillivray et al., 2006; Arndt et al., 2010; Mekasha and Tarp, 2011). It should be noted that because we derive a partial equilibrium model, we do not look at effects of lower governance and inequalities on growth.

require taxation. Therefore, any beneficiary of an NGO project would find optimal to update her optimal taxation level downwards given that NGO provides her a similar service for free. By skewing the distribution of political preferences toward smaller government, such behaviour has the effect of pulling the median voter away from poor non-beneficiaries of the NGO's project. As a result, the preferences of the poor non-beneficiaries become more distant from the policy preferred by the ex-post median voter, hindering income redistribution and their political representation. We find that this effect is larger in unequal or polarized societies, and it is mitigated in more homogeneous societies.

We also describe how characteristics of the NGO's project, confronted to the pragmatic/humanitarian tradeoff, affect the crowding-out effect. We find that humanitarian NGOs, by targeting few, poorer agents, limit the extent of governmental contraction. This happens, in particular, because a limited number of agents update their electoral preferences. By targeting much larger numbers, confronted with fewer needs, the crowding-out effect can be very large, especially if the ex-ante median voter benefits from the project. The paper makes the case that humanitarian projects are thus desirable not only because they help the poorest, but also because they limit the extent of the externality inflicted on other poor people. This kind of project is particularly appropriate in societies plagued by serious income inequalities or polarization.

The paper unfolds as follows. Section 2 sets up the model, the equilibrium of which is characterized in Section 3. Section 4 studies the welfare implications of the new equilibrium at the individual and aggregate levels. Section 5 concludes.

# 2 Set-up of the Model

Agents in this model are citizens and an NGO. Citizens decide upon a simple majority vote on the taxation level aimed at financing a public good. The NGO can also provide a local public good but it is not accountable to all citizens.

## 2.1 Citizens' choices over Public Finances

We depart from the Downsian framework (Downs, 1957). Suppose an electorate composed of $N$ agents indexed $i \in N$. Each agent's exogenous income is $y_i \in \mathbf{R}_+$. $N$ is assumed to be sufficiently large such that we can draw a continuous distribution over an interval normalised to one. Denote its cumulative distribution function (CDF) $F_Y(y)$ and let $\int_Y y_i dF(y) = \bar{y}$ be the average income. We assume that the government can provide an amount $G$ of public goods (PG) according to a simple budget constraint $G = \tau\bar{y}$ where $\tau$ is a flat tax rate over income. We assume that since this PG is financed by all of the electorate, every tax-payer is entitled to access to it.

Under this setting citizens vote upon a level $G$ of PG to be provided by the government. Suppose a citizen indexed $i$ has the following quasi-linear preferences[3]

$$U_i(c_i, G) = c_i + H(G)$$

where $c_i$ is her own private consumption in the numéraire, which is a tradable good, and where function $H(G)$ is increasing and concave in $G$. This utility function assumes that these two goods are substitutable, so that attention is focused on Public Goods for which a tradable (imperfect) substitute exists.

The saturated budget constraint of any agent is $c_i = (1-\tau)y_i$. This, combined to the government's budget constraint and the assumption of proportional taxation, allows us to write the agent's maximization problem as follows

$$\operatorname*{Max}_{G} \left(1 - \frac{G}{\bar{y}}\right) y_i + H(G). \tag{1}$$

The bliss point $G_i^*$ for any agent $i$ is

$$G_i^* = H_G^{-1}\left(\frac{y_i}{\bar{y}}\right). \tag{2}$$

It follows that since $H_G^{-1}(\cdot)$ is monotonically decreasing on $y_i$, the preferred level of public good decreases as income increases. This result is standard: when voting for a tax rate, agents are expressing how much are they willing to contribute to a *common pot* financing the PG. Since the tax is proportional, poor agents are willing to contribute a bigger share of their income provided this makes richer households pay more taxes and enlarge the overall contribution[4].

[3]The use of the quasilinear utility function implies that after a certain threshold there is no income effect on the PG, that is the number of public goods demanded should not go to infinity as income does. Another effect is that the quantity of the PG has no effect on the price of traded good (the numéraire), which considerably simplifies the setting. We follow an important share of the literature on public goods which assumes this specification, see e.g. Diamond (1973), Sandmo (1980), Mas-Colell et al. (1995, p.360), Persson and Tabellini (2002, pp. 48, 70, 98, 119).

[4]It is easy to verify that the preferred level of PG decreases with income in any other usual specification of the utility function, even when the goods are perfect complements. Moreover, if taxation is progressive, (or if the poor work largely in the informal sector, and therefore do not pay taxes, which is equivalent to progressive taxation), this negative

Following Persson and Tabellini (2002, p.21-23), given that (1) is *single peaked* and has the *single-crossing property* (see Appendix A) the median voter theorem (Black, 1948) can be applied.

**Proposition 2.1** *Given the properties of equation (1) and by application of the median voter theorem the outcome of the election corresponds to the preferred policy of the agent with median income* $y_m$ *defined by* $F_Y(y_m) \equiv 1/2$. *The resulting implementation in terms of PG is*

$$G_m = H_G^{-1}\left(\frac{y_m}{\bar{y}}\right). \tag{3}$$

**Proof** Recall that $G_m$ is the bliss point of the median voter. For any candidate campaigning for a platform different from $G_m$, it is a dominant strategy for her opponent to campaign for $G_m$ to get the majority. It is therefore never profitable to deviate from proposing $G_m$ for any candidate[5]. ■

It should be noticed that this equilibrium does not necessarily result in a social optimum, unless the distribution of income in society is such that the median voter is also the average voter (when the distribution is symmetrical around the mean). To see this, consider the Benthamite social welfare function, that is, the simple aggregation of utilities of all individuals

$$W(G) = \int_{y_i \in Y} \left(\left(1 - \frac{G}{\bar{y}}\right)y + H(G)\right) dF(y) = \bar{y} + H(G) - G. \tag{4}$$

This expression is maximized when the electoral outcome is $G^* = H_G^{-1}(1)$, defining the platform that maximizes social welfare. By equation (2) and the median voter theorem, we will have $G_m = H_G^{-1}(1)$ if and only if $y_m = \bar{y}$, that is when the median voter has also the average income. This social optimum has interesting properties. We know that the mean of a distribution is the point that minimizes the sum of the distances between each observation and the mean itself. Mathematically that is

$$\bar{y} = \arg\min_{y_0} \int_{y_i \in Y} |y_i - y_0| dy_i$$

relationship is stronger, given that for poorer agents an increase of the tax would be less than proportional than the increase in PG.

[5] We implicitly assume here that politicians' motivations are driven by an *ego rent* obtained when elected and that they don't have political considerations of their own, unlike the model proposed e.g. by Besley and Coate (1997). In the same line of thought this implicit assumption also suggests that politicians fully commit to their announced policy platform, which is also in contradiction with Alesina and Tabellini (1988). This simplifying (and naive) assumption is taken to clearly identify the implications of our mechanism in the standard model.

The social optimum implies that, holding the income distribution constant, each individual position is as close as possible to the implemented policy. From a purely utilitarian perspective consensus is maximised, and the Pareto-dominant policy is implemented. When the policy implemented deviates from the mean bliss point, we interpret this as degradation of representativity and therefore of governance.

To simplify the subsequent analysis, we map income levels into a single-dimensional distribution of political preferences. Let us call $G_1$ the policy preferred by the agent(s) with lowest income in the distribution, denoted $y_1 = \min\{y_i \in Y\}$, this is

$$G_1 \equiv H_G^{-1}\left(\frac{y_1}{\bar{y}}\right).$$

Let $\theta \equiv G_i/G_1$ be the *type* of the agent, such that any agent with the same preferred policy belongs to the same type. The domain of types $\theta$ is the set

$$\Theta \equiv \{\theta : 0 \leq \theta \leq 1, \theta \in \mathbf{R}_+\}. \tag{5}$$

In this unit interval, types are ranked from low to high requirements in terms of needs: the higher the type, the needier an agent is. This rescaling into types has the advantage of expressing needs over the unit domain which will be useful in the following subsection. Given these properties for $\theta$, it is possible to map the income distribution into domain $\Theta$.

**Lemma 2.2** *Given the continuity, differentiability and monotonicity of equation (2) relative to income, and by the change of variables theorem (see e.g. Kaplan, 1984, pp. 238-245), it is possible to map the distribution of incomes $y$ into a distribution density function $f(\theta)$ of types $\theta \in \Theta$.*

Proof is given in Appendix B.

Lemma 3.2 implies that the distribution of types $F_\Theta(\theta)$ exists if $F_Y(y)$ exists. The support of this distribution is $\Theta$ , where $\lim_{\theta\to 0} F_\Theta(\theta) = 0$ and $F_\Theta(1) = 1$. We define also the median type by $\theta_m$ where $F_\Theta(\theta_m) = 1/2$. It follows that for politicians the dominant strategy is to campaign for the policy preferred by median type $\theta_m$. The level of public good that will be provided is therefore $G_m = \theta_m G_1$.

Nonetheless, any $\theta$ lower than $\theta_m$ considers that there is over-provision of the PG and would like that the fiscal burden was reduced. Conversely, for higher types, the state is considered as under-providing public services. The next section studies how NGOs intend to tackle the issue of unmet needs.

## 2.2 Modelling NGOs

We look for an empirical foundation justifying the manner in which NGOs are modelled. Two recent studies, one by Fruttero and Gauri (2005) in Bangladesh and another by Brass (2012) in Kenya, highlight which are the factors determining NGOs' location choices. Much of the observed behaviour is similar to that of official aid bureaucracies described by Easterly (2007). In a principal-agent set-up, agencies are accountable to donors plagued by imperfect information, making agencies adopt several strategies to get funded. To secure funding two types of strategic location choices are observed. First, agencies choose to cluster together around specific geographical regions. Because effort is not perfectly monitored by donors, NGOs might regroup in order to free-ride on other NGOs' efforts to cater to a 'common pool of beneficiaries'. Donors might only observe the aggregated results and be unable to disentangle which result is attributable to which agency. The second location decision depends upon human needs. Whilst it is expected that aid targets areas with higher needs, this kind of mission could also be riskier. NGOs might choose to locate in less poverty-stricken or peaceful areas, maximizing the probability that a project is successful. In these areas, it is also easier to reach more beneficiaries, and headcounts are a cheap way of signalling effort to principals. Nonetheless, other NGOs might instead target agents confronted with hardship, implying a higher risk of mission failure. This might be done for purely humanitarian reasons or for strategic reasons to signal effort and zeal to donors.

Evidence for both pragmatic motivations and humanitarian motivations are found in this burgeoning literature. Therefore in our model we allow for agencies to vary on the degree of motivation and pragmatism.

We introduce an NGO which is able to provide a local public good (LPG) to a fraction of the population. Let this decentralized aid agency be an organisation whose funding is external to the recipient country's budget. Although its activities are legal, this agency does not use the structure of the central administration to channel aid. An agency will be characterized by its autonomous capacity to act.

Suppose that the NGO's program reaches a fraction $\Delta \leqslant 1$ of the population. This fraction is a continuum of individuals along the $\theta$-type dimension where $\theta_h$ is the highest type amongst beneficiaries of the project and $\theta_l$ the lowest. This implies $\Delta = F(\theta_h) - F(\theta_l)$. We can therefore define the set of beneficiaries as

$$\Theta_b \equiv \{\theta : \theta_l < \theta \leq \theta_h\} \tag{6}$$

This assumes continuity of the targeted section of the population.[6] In order to cater to this continuous array of types $\Theta_b$, the agency has to choose an *ideal* type $\theta_t$ it targets such that $\theta_t \in \Theta_b$, that is it chooses the typical level of need that will be attended. All agents belonging to $\Theta_b$ benefit thus from a LPG considered as ideal for $\theta_t$ in addition to the public good $G$ provided by the state. The LPG provided by the NGO is then $g = \theta_t G_1$, the bliss point of the targeted type. It follows that any agent's utility level becomes $U_i(c, G + gb)$ where $b$ is an indicator variable equal to one if the agent is a recipient of the program.

We set the utility function of the agency to be

$$U^A(\Delta, \theta_t) = \Delta\theta_t^{\beta/1-\beta} \qquad where \qquad 0 < \beta < 1. \tag{7}$$

The utility level of the agency increases in the number of beneficiaries and the extent to which it is able to target higher types, that is, the neediest. Since the agency's targeting is made in the bounded set $\Theta$, we allow for increasing marginal utility of the humanitarian tasks. When $\beta$ tends toward one the power of $\theta_t$ in the utility function tends toward infinity. This implies that the whole priority is put on helping the neediest, at the expense of coverage. Conversely, if parameter $\beta$ tends toward zero, the agency prioritizes only the number of beneficiaries. We sketch a simple, unidimensional distinction amongst different types of decentralized aid agencies:

**Definition** Depending on parameter $\beta$ the Decentralized Aid Agency can be either:

1. *Coverage Prioritizing* (CP) when $\beta$ tends toward zero. If $\beta$ equals zero the agency is a pure maximizer of coverage.

2. *Benthamite Utilitarian* (BU) when $\beta = 1/2$. All agents are weighted equally and the agency maximizes aggregated utility.

3. *Needs Prioritizing* (NP) when $\beta$ tends toward one. If $\beta$ equals one, the agency is Rawlsian, in the sense that it only targets the worse-off individual.

The program is assumed to be financed by the agency's own limited funds, which are allocated exogenously by donors (principals) from the North. The budget constraint is assumed to be $B \geq c_g g + c_\Delta \Delta$ where $B$ is its available

[6]Although it could be argued that the agency provides instead parcelled programs to different ranges of types, or equivalently that several agencies are providing a multitude of programs, we focus on the case of a unique continuum of beneficiaries. The aforementioned fact that NGOs often cluster implies that this simplification is not too far from reality.

budget and parameters $c_g$ and $c_\Delta$ are costs of producing $g$ and of providing coverage to $\Delta$ beneficiaries, respectively[7]. These costs depend on technologies, characteristics of the mission and local conditions to which the agency is confronted to. Other logistical costs (office supplies, wages, travel expenditures...) are assumed away from $B$ which thus consist of the net resources devoted to the program.

The fact that the cost of provision increases in the number of targeted beneficiaries is straightforward. The idea that the cost of provision increases with the targeted type is somewhat debatable. We assume that operations targeting hard situations are costlier because they require more efforts, they are riskier and they involve higher accessibility costs.

The utility maximisation problem of the agency is then

$$\begin{aligned} &\underset{\theta_t,\Delta}{\text{Max}} \quad \Delta\theta_t^{\beta/1-\beta} \\ &\text{s.t} \qquad B \geq c_g\theta_t G_1 + c_\Delta\Delta. \end{aligned} \tag{8}$$

The solution to this utility maximization problem is given by

$$g^* = \theta_t{}^* G_1 = \beta\frac{B}{c_g} \quad \textit{and} \quad \Delta^* = (1-\beta)\frac{B}{c_\Delta}$$

.

Denote by $\Delta_C = B/c_\Delta$ the maximum number of beneficiaries that a particular agency can cover. Similarly let $G_1\theta_C = B/c_g$ be the highest feasible amount of LPG. We should therefore take this 'maximum capacity' vector $(\theta_C, \Delta_C)$ as parameters reflecting technical and financial endowments of the agency, dependent on exogenous characteristics $\{B, c_g, c_\Delta\}$.

The solution of the agency is summarized by a vector $\mathbf{p}$ such that

$$\mathbf{p} = \begin{bmatrix} \theta_t^* \\ \Delta^* \end{bmatrix} = \begin{bmatrix} \beta & 0 \\ 0 & 1-\beta \end{bmatrix} \begin{bmatrix} \theta_C \\ \Delta_C \end{bmatrix} \tag{9}$$

Let us call $\mathbf{p}$ the *project vector*. This simple system characterizes two dimensions of the agency's optimal solution. First, newly defined parameters $\theta_C$ and $\Delta_C$ in the 'maximum capacity' vector define the material and technical capacities characterizing which degree of need can the agency satisfy and for how many people. Secondly, parameter $\beta$ defines the prioritization criteria in the matrix pre-multiplying the maximum capacity vector. This

[7]For simplicity reasons, linearity of the budget constraint is assumed. Assuming more complex cost structures does not change the main results in an informative way.

prioritization criteria originates in the internal decision process of the organization, on its ethical values, strategic choices and features inherent to its mission.

Before moving into the next section, we need to make an additional technical assumption such that $\Theta_b \subseteq \Theta$.

**Assumption 2.3** *For any given program vector* $\boldsymbol{p}$ *we assume there is an allocation rule such that:*

$$\begin{array}{rcl} F(\theta_l) & = & F(\theta_t)(1-\Delta) \\ F(\theta_h) & = & F(\theta_t)(1-\Delta)+\Delta \end{array} \tag{10}$$

This assumption allows computational simplicity and ensures that the agency does not target types that don't exist. Nonetheless, any other allocation rule such that $\Theta_b \subseteq \Theta$ would provide results similar to the ones presented here.

Given the agency's optimal solution, we now set out to explore the project's impacts on electoral outcomes.

# 3 Characterization of the Equilibrium

The timing of this model is simple: an NGO implements a program, beneficiaries update their electoral preferences and the outcome of subsequent elections defines the equilibrium. We provide analytical and graphical tools to characterize its properties.

## 3.1 General Solution

Suppose that prior to elections program $\mathbf{p} = (\theta_t, \Delta)$ is implemented. Recipients will benefit from the LPG and will update their preferred governmental policy platform $G_i$. From equation (1) their maximization problem becomes

$$\begin{array}{l} \underset{G}{\text{Max}} \ \left(1-\dfrac{G}{\bar{y}}\right) y + H(G+gb) \\ \\ \text{where } b=1 \text{ if } \theta \in \Theta_b \end{array} \tag{11}$$

The solution to this maximization problem, which is analogous to the benchmark case, is $G_i = H_G^{-1}(y_i/\bar{y}) - gb$ with $g = \theta_t G_1$. Expressed in ex-ante terms of types $\theta$, the updated type of the agents is defined by

$$\tilde{\theta} \equiv \min\{0, \theta - \theta_t b\}.$$

The mass of voters with political preferences distributed over the segment $\Theta_b$ shifts to the left (directionally) by a distance $\theta_t$. Figure 1 depicts how the distribution of types shifts following the introduction of an NGO project.

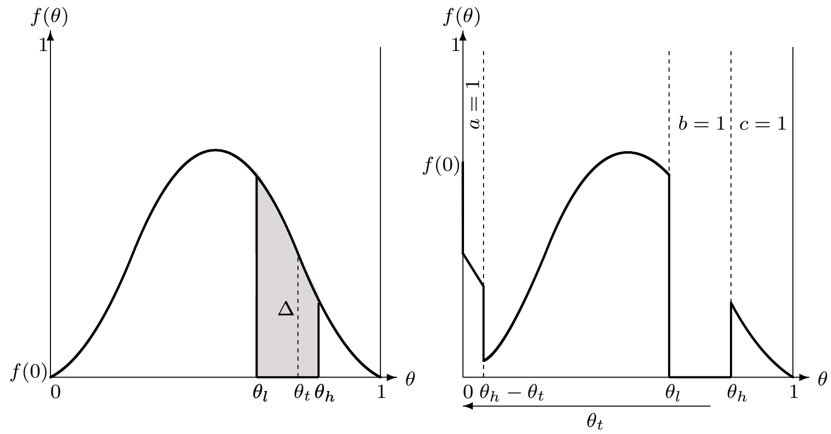



Figure 1: *Ex-ante* and *ex-post* density distributions.

Let us define three sub-domains $\Theta_k$ where $k = \{a, b, c\}$ and $k$ designs a binary variable such that

$$k = 1 \text{ if } \theta \in \Theta_k.$$

It is associated to the following subdomains

$$\begin{array}{l} \Theta_a \equiv \{\theta : \theta \leq \theta_h - \theta_t\} \\ \Theta_b \equiv \{\theta : \theta_l < \theta \leq \theta_h\} \\ \Theta_c \equiv \{\theta : \theta > \theta_h\} \end{array} \tag{12}$$

These are respectively: the set that includes all beneficiaries ex-post, the set of all beneficiaries ex-ante, and all those who are of a type higher than any beneficiary.

We will denote $J(\theta)$ the ex-post cumulative distribution function (CDF), which can be expressed in terms of $F(\theta)$. Figure 2 depicts function $J(\theta)$ for a given project $\mathbf{p}$ in a $1 \times 1$ box and compares it to function $F(\theta)$ from which it is derived.

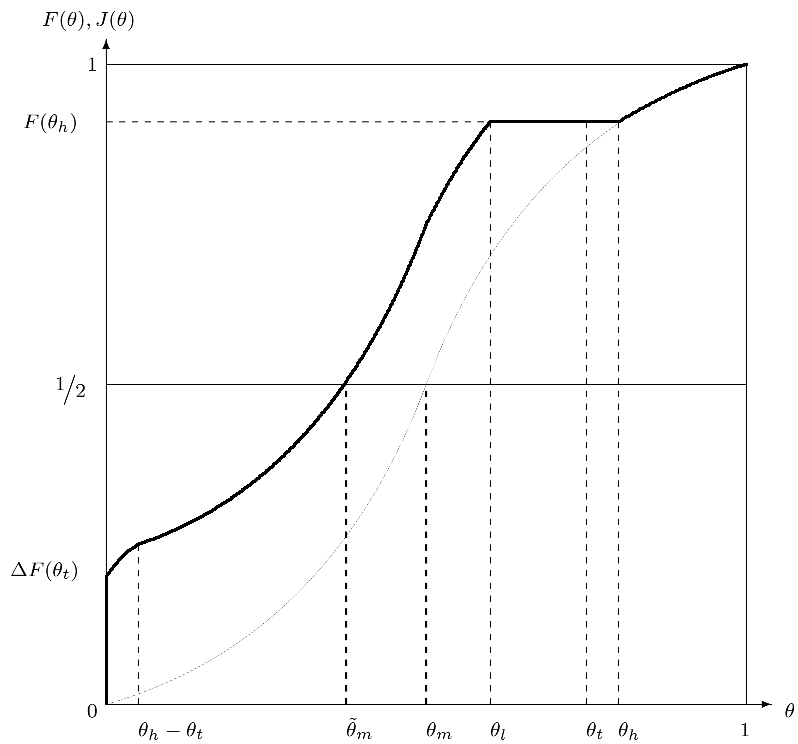



Figure 2: Ex-ante (thin line) and ex-post (thick line) distributions.

**Theorem 3.1** *Given a distribution of types $F(\theta)$, a project with characteristics $\boldsymbol{p} = (\theta_t, \Delta)$, the allocation rule given by assumption 3.3, the definition of indicator variables $k$ and the median voter theorem, the ex-post median voter $\tilde{\theta}_m$ is defined by*

$$J(\tilde{\theta}_m) = 1/2$$

*where $J(\theta)$ is the ex-post CDF. It is a continuous piecewise function such that*

$$J(\theta) = \begin{bmatrix} a \\ 1-a-b \\ b \\ c \end{bmatrix}' \begin{bmatrix} F(\theta) + F(\theta_t + \theta) - F(\theta_t)(1-\Delta) \\ F(\theta) + \Delta \\ F(\theta_t)(1-\Delta) + \Delta \\ -\Delta \end{bmatrix}. \tag{13}$$

*This function is continuously non-decreasing and greater or equal than $F(\theta)$. The proof of this theorem is given in Appendix C.*

Three important corollaries stem from Theorem 4.1.

**Corollary 3.2** ***Reduction of government spending.***
*All portions of the ex-post CDF (detailed in Appendix C) are such that $J(\theta) \geq F(\theta)$ for all $\theta$. This inequality is strict if $\Delta > 0$ for all $\theta < \theta_h$. Under this conditions we have*

$$\begin{aligned} J(\theta_m) \geq F(\theta_m) \quad \textit{and} \quad & F(\theta_m) = J(\tilde{\theta}_m) = 1/2 \\ \Rightarrow \quad & J(\theta_m) \geq J(\tilde{\theta}_m) \\ \Leftrightarrow \quad & \theta_m \geq \tilde{\theta}_m. \end{aligned}$$

*It follows that, if $\theta_m < \theta_h$, the outcome of elections always shifts in such a way as to reduce government expenditures. Denote this shift*

$$s \equiv \theta_m - \tilde{\theta}_m \textit{ where } 0 \leq s \leq \theta^m. \tag{14}$$

Simply put, beneficiaries whose ex-ante type laid to the right of the median type shift to its left. A new median-voter emerges that can gather more support for a reduced expenditure platform. Notice that if before the vote the beneficiaries already laid to the left of the ex-ante median voter (if $\theta_h < \theta_m$) there is no change. This happens because even if ex-post they prefer even lower taxation, there is no additional electors to the left of the median voter, keeping the median unmoved.

**Corollary 3.3** ***Full Disruption/Status Quo regimes*** *Notice that if $\theta = 0$, then $J(0) = \Delta F(\theta_t)$. Therefore, if $\Delta F(\theta_t) \geq 1/2$ we have $s = \theta_m$: the outcome of the election is a complete disruption of the PG. Conversely, for any $\theta \geq \theta_h$, $J(\theta) = F(\theta)$. If $F(\theta_h) \leq 1/2$ there is no shift in electoral outcomes ($s = 0$). This is the Status Quo situation.*

We have that for both $\theta_t$ and $\Delta$ high enough, the provision of the PG by the state will be discontinued. On the contrary, for low levels of these variables, the program has a small or no impact on electoral outcomes.

**Corollary 3.4** ***Negative and positive externalities.*** *Let us focus on the subset of non-beneficiaries when $s > 0$. Any ex-ante type $\theta > \theta_h$ is made unambiguously worse-off by the project. Indeed, for these agents the ex-ante PG was already considered under-provided by the state. Further reductions in governmental expenditures only makes them worse-off. Conversely, any ex-ante type $\theta \leq \tilde{\theta}_m$ is made unambiguously better-off by the crowding-out effect.*

Let us now analyse in detail how the size of the shift in political outcomes is affected by the characteristics of **p** and the distribution of types. Let us focus on solutions that lie outside of the Status Quo and Full Disruption cases. From equations (9) and (13) we can rewrite $J(\tilde{\theta}_m) = J(\theta_m - s) = 1/2$ as

$$\begin{bmatrix} a \\ 1-a-b \\ b \\ c \end{bmatrix}' \begin{bmatrix} F(\theta_m - s) + F(\theta_t + \theta_m - s) - F(\theta_t)(1-\Delta) \\ F(\theta_m - s) + \Delta \\ F(\theta_t)(1-\Delta) + \Delta \\ -\Delta \end{bmatrix} = 1/2. \tag{15}$$

Denote **b** the vector of indicator variables pre-multiplying vector **F**, which contains the different segments of the function such that **b'F** $= 1/2$. From this it is possible to analyse the impact of **p** on $s(\mathbf{p})$ trough comparative statics. By the implicit function theorem this yields the following gradient:

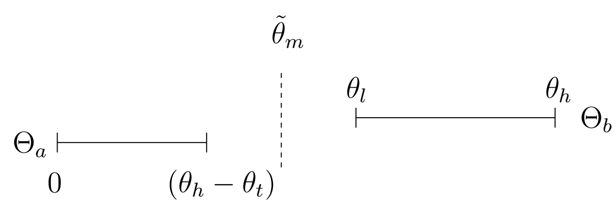
$$\nabla s(\theta_t, \Delta) = -\left[\frac{\partial \mathbf{b'F}}{\partial s}\right]^{-1} \begin{bmatrix} \partial \mathbf{b'F}/\partial \theta_t \\ \partial \mathbf{b'F}/\partial \Delta \end{bmatrix} \tag{16}$$

The explicit form of this gradient is provided in Appendix D. Intuitive explanations of comparative statics are summarized in what follows. To facilitate the analysis we define three Regimes (additional to the status quo and full disruption ones).

**Needs Prioritization Regime**

If $a = b = 0$ the gradient is

$$\nabla s(\theta_t, \Delta) = \begin{bmatrix} 0 \\ > 0 \end{bmatrix}$$

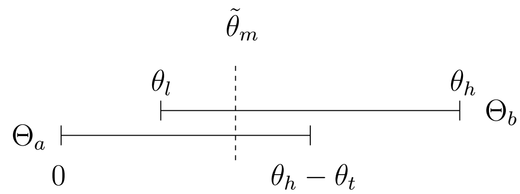



Here $\theta_h - \theta_t < \tilde{\theta}_m < \theta_l$: the ex-post median voter is not a beneficiary. All that matters to her is the number of recipients $\Delta$ who have changed types, this is, who have been transferred from $\Theta_b$ to $\Theta_a$ and are thus willing to vote for her preferred policy, irrespective of the the level of LPG provided by the project.

**Coverage Prioritizing Regime**

If $a = b = 1$ we have

$$\nabla s(\theta_t, \Delta) = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$$

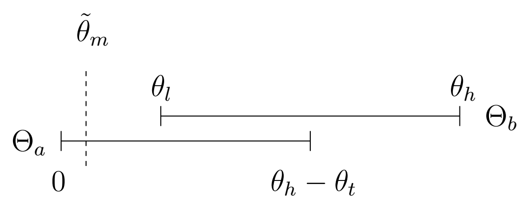



This is the domain where $\theta_l < \tilde{\theta}_m < \theta_h - \theta_t$ and therefore $\Theta_b \cap \Theta_a \neq \emptyset$. The ex-post median voter is a beneficiary of the program, therefore the level of LPG provided has an impact on her electoral preferences. When increasing $\Delta$, a higher-type agent moves from $\sup \Theta_b$ to $\sup \Theta_a$ which remains to the right of the ex-post median voter, implying no effect of additional beneficiaries (the converse is true for $\inf \Theta_b$).

**Utilitarian Regime**

If $a \neq b = 0$ we have

$$\nabla s(\theta_t, \Delta) = \begin{bmatrix} > 0 \\ > 0 \end{bmatrix}$$




Finally, when $\tilde{\theta}_m < \min\{\theta_h - \theta_t, \theta_l\}$ the ex-post median voter is among ex-post beneficiaries. Her preferences change with the LPG received. Additionally, an increase in the number of beneficiaries transfers agents from $\inf \Theta_b$ to $\inf \Theta_a$, from the right to the left of the ex-post median voter. Hence both the number of beneficiaries and the level of the LPG have an impact on the size of the shift.

Having characterized how the size of the shift changes with the different values of vector $\mathbf{p}$, we turn now to exploring the effects of dispersion and skewness in the following proposition. It should be noticed that because we want to keep the most general version of distribution $F(\theta)$ we cannot proceed by standard comparative statics, and therefore proceed to pairwise comparisons of any pair of distribution functions.

**Proposition 3.5** ***Effects of dispersion and skewness***

*Taking* $\boldsymbol{p}$ *given, the shift* $s$ *in electoral outcomes has the following characteristics:*

1. *If* $F(\theta)$ *is S-shaped (the distribution is unimodal) then* $s$ *increases with dispersion of types.*

2. *If* $F(\theta)$ *is inverse-S-shaped (the distribution is bimodal) then* $s$ *decreases with dispersion of types.*

3. *The size of the shift* $s$ *increases with positive skewness (when rich become the majority).*

**Proof** Take two functions denoted $F(\theta)$ and $\hat{F}(\theta)$ such that

$$\begin{array}{lcl} F(\theta) < \hat{F}(\theta) & \text{if} & 0 < \theta < \vartheta \\ F(\theta) > \hat{F}(\theta) & \text{if} & \vartheta < \theta < 1 \\ F(0) = \hat{F}(0), & F(1) = \hat{F}(1), & F(\vartheta) = \hat{F}(\vartheta) \end{array}$$

Where $\vartheta$ is some value where these two functions intercept. Let $\hat{J}(\theta)$ be the ex-post CDF derived from $\hat{F}(\theta)$. By equation (15) we have

$$J(\theta) \leq \hat{J}(\theta) \text{ for all } \theta \leq \vartheta$$

Let $\hat{s}$ be the shift associated to $\hat{F}(\theta)$ such that $\hat{J}(\theta_m - \hat{s}) = 1/2$. We have:

$$\begin{array}{lll} & J(\theta_m - s) = \hat{J}(\theta_m - \hat{s}) & \text{by equation (15)} \\ \Rightarrow & J(\theta_m - s) \geq J(\theta_m - \hat{s}) & \text{if } \theta_m - \hat{s} \leq \vartheta \\ \Leftrightarrow & s \leq \hat{s} & \text{since } J(\cdot) \text{ non-decreasing} \end{array}$$

The crossing point $\vartheta$ will allow us to understand the impact of the second and third moments of the distribution.

1. Suppose $\vartheta = \theta_m$ and both $F(\theta)$ and $\hat{F}(\theta)$ are S-shaped. Then $\hat{F}(\theta)$ is more dispersed than $F(\theta)$. Since $\hat{F}(\theta)$ is associated with a larger shift, more variance leads to a larger crowding-out effect.

2. Suppose $\vartheta = \theta_m$ and both $F(\theta)$ and $\hat{F}(\theta)$ are inverse-S-shaped. Then less variance is leads to a bigger shift.

3. Suppose $\vartheta = 1$. Then $\hat{F}(\theta)$ is more positively skewed than $F(\theta)$. Therefore positive skewness leads to a bigger shift. ■

Interpretations from proposition 4.5 are relatively straightforward but important in what relates to policy. First, suppose that the distribution is unimodal and the mode is close to $1/2$. Then the middle-class is numerous relative to the lower-income and the upper-income classes. If dispersion increases, members of the middle-class decrease, reducing the relative number of those willing to vote for the ex-ante median voter's preferred platform. The forces pulling against a reduction of governmental expenditures are lower.

If the distribution is bimodal, society is 'polarized' and has a slender middle-income group. Lower variance implies more concentration around both poor and wealthy. Therefore a decrease in variance increases polarization, reducing further the weight of the middle-class. Like in the previous case, a decrease in numbers of the middle class is synonymous with a larger shift in political outcomes after the introduction of the project.

Finally, if the distribution is positively skewed (the rich are the majority), the poor minority has an insufficient weight to prevent a large crowding-out of the PG. Conversely, if poor are the majority, the shift would be less important.

The conclusion is that polarization is a factor responsible for important political shifts when decentralised aid programmes are introduced. This is in line with the literature claiming that income inequality produces political instability, for instance Alesina and Perotti (1996). It follows that if this crowding-out is considered undesirable, the agency would prefer to cater to homogeneous populations where there is a majority of poor or middle-income agents.

This proposition has important repercussions on the aid selectivity debate. If aid projects are willing to mitigate the crowding-out effect, aid should target countries with poor homogeneous majorities. By contrast, targeting unequal or polarized societies can bring the undesirable repercussion of aggravating already tense situations. We will see, in the next section, that negative effects of the project can be mitigated depending on the choice of the NGO's prioritization criterion $\beta$. This mitigation can prevent the exclusion of polarized counties from aid.

We investigate in what follows the interaction between the agency's project and political outcomes by proposing a graphical representation of political outcomes depending on the characteristics of the agency's project.

## 3.2 A Graphical Representation of Electoral Outcomes

Let us study how any combination $(\theta_t, \Delta)$ changes the size of $s$. In order to do this, take a $1 \times 1$ box where $\theta_t$ is represented in the X-axis and $\Delta$ is represented in the Y-axis.

Consider the case of complete disruption of centrally provided PG, which occurs if $s = \theta_m$. This happens when $\Delta F(\theta_t) \geq 1/2$. Then any project of coordinates $(\theta_t, \Delta)$ belongs to the Full Disruption regime if it lies above the hyperbola

$$\Delta : [\theta_m; 1] \to [1/2; 1], \qquad \Delta(\theta_t | s = \theta_m) = \frac{1}{2F(\theta_t)}. \tag{17}$$

Similarly, political outcomes are not modified when $s = 0$, which implies $F(\theta_h) \leq 1/2$. Inverting axes, we can trace a function

$$\theta_t : [0; 1/2] \to [0; \theta_m], \qquad \theta^t(\Delta | s = 0) = F^{-1}\left(\frac{1/2 - \Delta}{1 - \Delta}\right). \tag{18}$$

Any vector $(\theta_t, \Delta)$ below this hyperbola has no impact on electoral outcomes. Finally, we have to distinguish the regimes where the public good provision is reduced but does not disappear. The change in behaviour of function $J(\tilde{\theta}_m) = 1/2$ depends on the binary variables $\{a, b\}$. [8] By Theorem 4.1 we have:

If $a = b = 0$ (Needs Prioritizing regime), the function changes behaviour at $\theta_h - \theta_t$, defining the following the cut-off line:

$$F(\theta_h - \theta_t) + \Delta = 1/2,$$

which is continuously increasing in $\theta_t$ and yields $\Delta = 1/2$ when $\theta_t = 1$.

If $a = b = 1$ (Coverage Prioritizing regime), the function changes behaviour at $\theta_l$, defining the following the cut-off line:

$$F(\theta_t + \theta_l) = 1/2,$$

which is also increasing in $\theta_t$ and yields $\theta = \theta_m$ when $\Delta = 1$. For full proof of the two previous statements, refer to Appendix E.

The interception between these too cut-off lines occurs when $\theta_h - \theta_t = \theta_l$. Using any cut-off line, it is easy to see that this yields $F(\theta_h) = 1/2$, which is the cut-off line of the Status Quo case. Therefore all three lines intercept at this point.

Finally, regime $a = 1 \neq b$ is the set in the box that remains undefined: it is the Utilitarian Regime. These regimes are depicted in figure 3.

[8] Variable $c$ is excluded and valued zero since we know that it corresponds to the full disruption case.

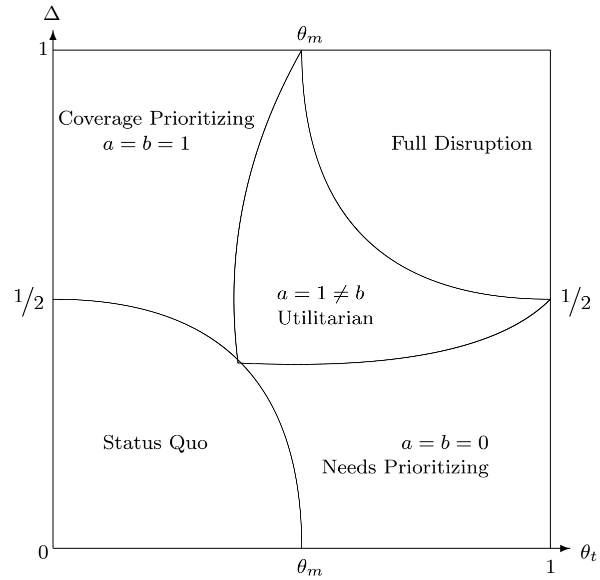



Figure 3: Graphical representation of the different regimes.

It is easy to see that the preference profile of the ex-ante median voter, $\theta_m$, and hence the skewness of $F(\theta)$, crucially determine how much of the above box is covered by each regime. The likelihood that a program will lead to a shift in political outcomes increases with positive skewness ($\theta_m$ tends to zero), and is reduced in societies where the poor form the majority, in line with proposition 3.5.

Having described the possible regimes, we can now represent the impact of the project on electoral outcomes. First let us define as 'iso-electoral outcome curves' level sets such that

$$L_{\tilde{\theta}_m}(h) = \{(\theta_t, \Delta) \mid h(\theta_t, \Delta) = \tilde{\theta}_m\}, \qquad \text{where} \;\; J(\tilde{\theta}_m) = 1/2.$$

Given gradient (16), an iso-electoral outcome map can be easily traced in the above box. Figure 4 depicts this mapping. The grey thin lines represent the iso-electoral outcome levels. Notice how the direction of the gradient changes depending on the regime. For a given budget constraint, and high or low values of the prioritization criterion, $\beta$, the effect on the size of the shift is small, while it is big for intermediate values of $\beta$. A Needs Prioritizing agency (following the definitions given in section 3.3) will target fewer, worse-off agents, so that the number of electors shifting electoral preferences is small. Conversely, a Coverage Prioritizing agency will target a larger set of beneficiaries, providing a low levels of the PG. Even if many voters benefit from it, their preferences shift will be small. It is the Benthamite Utilitarian agency that creates the biggest shift: balanced compromise between the level of LPG provided and number of beneficiaries makes several agents ask for an important tax reduction.

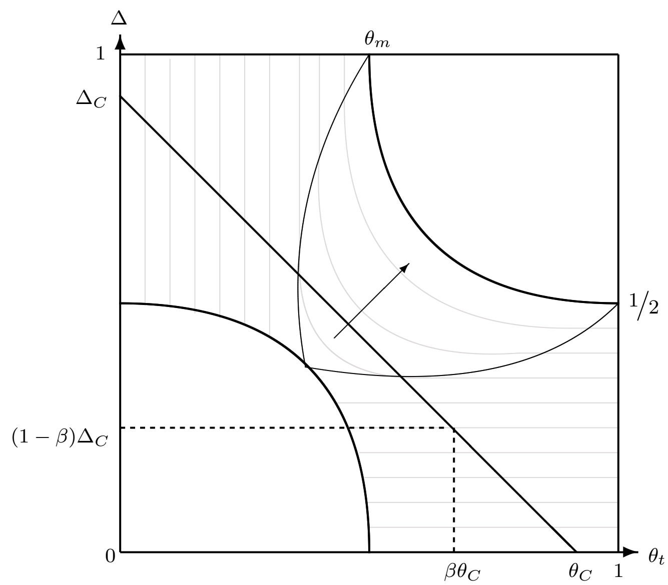



Figure 4: Iso-electoral outcome curves and optimal choice of the agency.

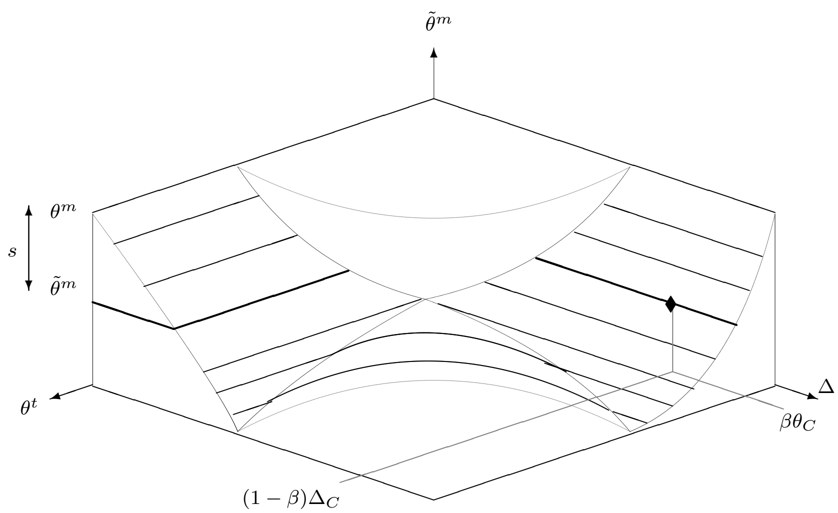



Figure 5: Three dimensional representation the size of the shift.

To be able represent the size of the shift, we need to add a third dimension to this typology representing the ex-post median voter. In Figure 5 the thick iso-electoral outcome curve allows us to explicitly represent $s$ for a given project $(\theta_t, \Delta)$. These graphical tools will be useful in the next section, where equity and welfare implications are discussed.

# 4 Welfare Implications

In this section we explore how the change in political outcomes affects welfare both at the individual and at the aggregate levels. This distinction is necessary to understand the effect in terms of fairness and in terms of efficiency.

## 4.1 Welfare implications at the Individual Level

Recall that $G_i = \theta_i G_1$ is the preferred policy platform for individual with income $y_i$ and that the LPG provided by the agency is $g = \theta_t G_1$. Denote $G_m$ and $\tilde{G}_m$ preferred level of PG by the ex-ante and ex-pot median voter respectively. We can establish that the project has been beneficial for agent $i$ if:

$$U_i(y_i, \tilde{G}_m, gb) - U_i(y_i, G_m) > 0,$$

that is, if the utility obtained with both the (diminished) centrally-provided PG and the NGO project exceeds the utility obtained in the case of non-intervention by the NGO.

By the maximization problem described in (11) this can be rewritten as

$$\left(1 - \frac{\tilde{G}_m}{\bar{y}}\right) y_i + H(\tilde{G}_m + gb) - \left(1 - \frac{G_m}{\bar{y}}\right) y_i - H(G_m)$$

$$sG_1 \frac{y_i}{\bar{y}} + H(G_m - sG_1 + gb) - H(G_m) \geq 0$$

Due to the concavity of $H(\cdot)$, working with this equation entails some technical difficulties. To simplify our task, let us take the first-order Taylor series expansion of $H(G_m - sG_1 + gb)$ around $G_m$. This yields

$$sG_1 \frac{y_i}{\bar{y}} + H(G_m) + H_G(G_m)(gb - sG_1) + R_1(G_m + gb - sG_1) - H(G_m) \geq 0$$

where $R_1(G_m + gb - sG_1)$ is the remainder of the Taylor expansion. For the purposes at hand, this expression provides little insights and only affects the results marginally. We will therefore neglect it, but the readers must bear in mind that our results are an approximation. This being said, by the optimal choice of the ex-ante median voter in equation (3), we find that the project is beneficial for agent $i$ if

$$sy_i + y_m(\theta_t b - s) \geq 0 \text{ where } b = 1 \text{ if } \theta_i \in \Theta_b. \tag{19}$$

The first term is related to the advantages of a reduced tax burden. The second term evaluates the effect of change in PG and LPG provision for beneficiaries and non-beneficiaries. To go forward with the analysis, we need to state the following lemma:

**Lemma 4.1** *For any shift $s$ and program $\theta_t$ we have*
*$\theta_t \geq s$: the reduction of the centrally provided PG is never larger than the LPG received. In particular, under the coverage prioritizing regime, $\theta_t = s$.*

This is proven in Appendix F.

**Proposition 4.2** *Effect of the policy at the individual level: Given Lemma 6.1, Figure 4 and equation (19),*

1. *since $\theta_t >$ geqs any beneficiary is better-off with the project than without it.*
2. *Non-beneficiaries who are poorer (richer) than the ex-ante median voter are unambiguously worse-off (better-off) as a result of the project. The poorer (richer) an agent, the stronger the impact of the shift.*
3. *In the Coverage-prioritizing Regime, since $\theta_t = s$, beneficiaries do not derive any advantage other than fiscal from the project.*
4. *The Needs-prioritizing Regime limits the size of the shift, implying that humanitarian missions contain the externality.*

Let us briefly discuss implications of proposition 6.1. Notice first that is in the interest of rich agents to allow and encourage decentralised aid projects, even when they do not benefit directly from them. Conversely, it is the poorer non-beneficiaries that would be most sanctioned by the externality caused by this programs. The extent of the externality can nevertheless be limited. The first possibility is to provide low-quality, coverage-maximizing programmes. Yet, because the size of the shift is identical to the level of the LPG, the beneficiaries' level of aggregate public good remains unchanged. Therefore they only withdraw a fiscal benefit from it. The other way in which the extent of the externality can be contained is by focusing on humanitarian tasks: while addressing harder, riskier situations, such approach does help agents in terms of public goods, and limits the harm done to non-beneficiaries.

The question remains as to whether in terms of aggregate welfare it is worthwhile that some agents endure this externality. This is the question that we address below.

## 4.2 Welfare Implications at the Aggregate Level

Social Welfare Analysis requires that we compare the impact of the project compared to the situation in which the same budget is allocated to the government via official development aid. Let us first explore the impact of aid in form of direct budget support. Suppose that, instead of implementing a decentralized project, the agency donates its budget $B$ to the government. The government's fiscal balance becomes then $G = \tau\bar{y} + B$. For any voter $i$, the new optimization programme is

$$\underset{G}{\mathrm{Max}} \left(1 - \frac{G - B}{\bar{y}}\right) y_i + H(G)$$

The bliss point for agent $i$ is $G_i^* = H_G^{-1}\left({}^{y_i}/_{\bar{y}}\right) = G_m$, which is identical to the ex-ante choice (equation (3)) and yields therefore the same electoral outcome. The only perceptible difference is a reduction in taxes paid per individual. In terms of social welfare, aggregate utility becomes

$$W(G_m) = \int_Y \left(\left(1 - \frac{G_m - B}{\bar{y}}\right)y + H(G_m)\right) dF(y) = \bar{y} + H(G_m) - G_m + B \tag{20}$$

In this context, budget support is equivalent as a lump-sum transfer that has no political repercussions. This extreme level of aid fungibility is unrealistic but specifies the context where decentralized aid should be the most desirable (Collier and Dollar, 2004). In other words, if budget support policies dominate decentralized aid in this context, they should perform even better with lower levels of aid fungibility.

Let us turn now to the decentralized aid programme. A programme with characteristics $\Delta, \theta$ yields the following social welfare function:

$$W(G_m) = \int_y \left(\left(1 - \frac{\tilde{G}_m}{\bar{y}}\right) y + H(\tilde{G}_m + gb)\right) dF(y)$$

As in the previous subsection, due to the concavity of $H(\cdot)$ we take the Taylor series approximation around $G_m$ (see equation (19)). This yields

$$W(\tilde{G}_m) = \int_y \left( \left(1 - \frac{G_m - sG_1}{\bar{y}}\right) y_i + H(G_m) + H_G(G_m)(gb - sG_1) \right) dF(y)$$

$$= \bar{y} - G_m + sG_1 + H(G_m) + \left( \int_\Delta (g - sG_1) dF(y) + \int_{1-\Delta} (-sG_1) dF(y) \right) H_G(G_m)$$

$$= \bar{y} - G_m + sG_1 + H(G_m) + (\Delta g - sG_1) \frac{y_m}{\bar{y}} \tag{21}$$

By substracting (20) from (21) we can establish which kind of aid formula is preferable. Decentralized aid should be preferred if

$$(\Delta g - sG_1) \frac{y_m}{\bar{y}} + sG_1 - B > 0 \tag{22}$$

For decentralized aid to be unambiguously preferred to direct budget support it is required that $\Delta g \geq sG_1 \geq B$. In words, the size of the shift has to be small enough so that the benefits (beneficiaries times LPG provided) of the project are larger than the reduction of PG provision. Simultaneously, the extent of the tax reduction has to be larger than the budget used by the agency. In any case, if $B \geq \Delta g$ the project is never desirable simply because the agency uses too much resources. Notice that the project might be beneficial in terms of welfare if only one of the inequalities holds: either the project brings benefits in itself ($\Delta g > sG_1$) or it brings benefits in the form of tax reduction ($sG_1 > B$).

Supposing that inequality (22) holds, it is possible to find a set of optimal prioritization criterion $\beta$ for the agency. Knowing that the shift $s$ varies with $\beta$, denote its first derivative $s'(\beta)$. Using the optimal solution of the agency in (9), the first order condition for optimality is

$$\left( (1 - 2\beta^*) \Delta_c \theta_c - s'(\beta) \right) \frac{y_m}{\bar{y}} + s'(\beta) = 0,$$

which leads to

$$\beta^* = \frac{1 + \frac{s'(\beta^*)}{\Delta_c \theta_c} \left(1 - \frac{\bar{y}}{y_m}\right)}{2} \tag{23}$$

where

$$\begin{array}{ll} s'(\beta^*) < 0 & \text{if } \beta^* \gg 1/2, \\ s'(\beta^*) > 0 & \text{if } \beta^* \ll 1/2, \\ \bar{y}/y_m > 1 & \text{if poor are the majority.} \end{array} \tag{24}$$

We can thus state the following proposition

**Proposition 4.3** *By condition (23) there are different types of local optima according to the regimes described in Figure 3 and in ex-ante conditions. Provided condition (22) holds, these are:*

1. *In the Benthamite Utilitarian regime , the optimal prioritization is criterion is $\beta^* = 1/2$. This maximizes welfare but also the extent of the externality. It is the only maximum if income distribution is symmetrical(if $y_m = \bar{y}$).*

2. *If rich are the majority there exists a local optimum $\beta^* \ll 1/2$ in the Coverage-prioritizing regime.*

3. *If poor are the majority there exists a local optimum $\beta^* \gg 1/2$ in the Needs-prioritizing regime.*

When $\beta^* \approx 1/2$ we have by Figure 4 that $s'(\beta) = 0$, so that the shift is maximized. We therefore have a local optimum that maximizes aggregate welfare but also the externality. This creates an opposition between efficiency and fairness. Interestingly, this opposition emerges under assumptions of democratic vote and full commitment by politicians. In the context of democracy and good institutions', if aid maximizes welfare which in turn promotes growth, we meet the arguments of Burnside and Dollar (2000), Collier and Dollar (2004) and McGillivray et al. (2006). But we also find that inequalities are increased, as stated by Layton and Fuller (2008), Herzer and Nunnenkamp (2012), and Bjørnskov (2010). Finally, if we consider that the distance from the average bliss point to the median bliss point increases, there is a reduction on agents representation in implemented policies, in particular for the poor, which is easily interpretable as a degradation of governance in line with Rajan and Subramanian (2007) and Djankov et al. (2008).

Combine now propositions 3.5 and 4.3. The first proposition describes how the shape of the income distribution affects the size of the shift. We have seen that if a population is homogeneous and/or has a large poor majority, the size of the shift is small. There is no much harm done in implementing a utilitarian policy; projects aiming at this type of countries can more efficiently direct their efforts at maximizing aggregate utility. Conversely, in polarized or very unequal societies targeting the slender middle class can potentially lead to a state of political turmoil. Notice that in equation (24) when poor are the majority in a polarized society, the Needs Prioritization can hold a local social optimum with $\beta^* \ll 1/2$. This choice reduces the extent of the externality, help those in need and is socially optimal (locally): humanitarian missions can be a particularly useful instrument in unequal societies.

Hence there exists a compromise between efficiency and fairness in humanitarian-oriented aid. The model provides theoretical foundations for pro-poor projects in developing countries that go beyond ethical foundations: they can simultaneously represent an efficient outcome (locally) and limit the extent of the externality inflicted on poor agents.

# 5 Conclusion

This paper has developed a Downsian model of public finances interacted with the provision of public services by an NGO. We assume that NGO projects are substitutable to governmental provision of public goods. Under a very general setting we find that decentralized aid would lead to a reduction of state-provided public goods. The reason is that aid makes beneficiaries willing to support lower-taxation platforms during elections. This crowding-out translates into an externality for non-recipients of aid, implying that poor non-recipients are made worse-off. We find that this crowding-out effect is smaller in homogeneous societies with large poor majorities compared its effect in unequal or polarized societies. We model NGOs as confronted to a trade-off between prioritizing need or coverage. Depending on its optimal choices, we characterize a variety of outcomes affecting individual and aggregate welfare. We find that agencies balancing coverage and needs (thus maximizing aggregate utility) have the highest impact both in creating welfare and generating an important externality. Coverage-prioritizing agencies might improve welfare, but only through the alleviation of the tax burden, while the project itself does not hold much interest for beneficiaries. Finally, Needs-prioritizing agencies, which cater to the poorest despite the additional risks and costs involved, can improve welfare and limit the extent of the inequalities created, providing a good compromise between efficiency and fairness. Combining the effects of income distribution and type of project, the paper concludes that pragmatism should be addressed to homogeneous societies with large poor majorities and that a stronger humanitarian accent should be put on unequal or polarized societies.

The model rests on deliberately simplifying assumptions to show that, even without institutional failures at the government level, decentralized aid can harm the poor. It sheds light on the problem of lack of coordination between NGOs and government. The externality problem can be easily overcome if NGOs provide services that do not exceed what the government *should* provide, but this requires substantial coordination between agencies and government. The main limits of the paper are two-fold. First, it is too optimistic on the institutional side. These naive assumptions are made to isolate the effect described in this paper from other institutional failures. Secondly, it uses a partial equilibrium setting. In general equilibrium, NGOs might develop human capital and/or increase productivity, improving overall market conditions. Conversely, agents might react to the externality through revolt and protest, harming economic performance and political stability. These considerations should be taken into account for further developments of the model.

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# Appendix

**Appendix A: Conditions Allowing for the Use of the Median Voter Theorem**

Following Persson and Tabellini (2000, p.21-23), given that (1) is a convex function and the bliss point $G_i^*$ is a maximum, preferences of any agent are *single peaked*. Likewise, if $G > G'$ and $y_i' < y_i$ it is easy to verify that $U(G'; y_i) \geq U(G; y_i) \Rightarrow U(G; y_i') \geq U(G'; y_i')$, and therefore ((1)) satisfies the *single-crossing property*. It follows that the Median Voter Theorem (Black, 1948) can be applied. Usual assumptions on *direct democracy, sincere voting* and *open agenda* hold.

**Appendix B: Proof of Lemma 3.2**

**Proof** Take a distribution of incomes $F_Y(y)$. If there are $N$ agents with income $y$ there are $N$ agents of type $\theta$. A marginal change in income categories $dy$ increases cumulated density by $dF_Y(y)$. It is the exact same number of agents taken into account by a variation $d\theta$ corresponding to $dy$. Thus we have $dF_Y(y) = dF_\Theta(\theta)$ following a change $dy$. Multiplying the left hand side by $dy/dy$ and the right hand side by $d\theta/d\theta$ we get

$$dy f_Y(y) = d\theta f_\Theta(\theta)$$

Since $\theta(y)$ is differentiable we can rewrite

$$f_\Theta(\theta(y)) = \frac{1}{\theta_y(y)} f_Y(y)$$

This expression reveals that given the properties of the income-dependent type function it is possible to draw a distribution of types for any given distribution of incomes.

**Appendix C: Proof of Theorem 4.1**

Function (13) can be constructed piecewise as follows:

1. Piece 1 is defined over $\Theta_a$ therefore $a = 1$ and $b = c = 0$. It includes non-recipients and ex-post recipients

$$J(\theta|\theta \in \Theta_a) = \int_0^\theta f(\vartheta)d\vartheta + \int_{\theta_l-\theta_t}^{\theta} f(\theta_t+\vartheta)d\vartheta = F(\theta)+F(\theta_t+\theta)-F(\theta_l)$$

2. Piece 2 depends on whether $\theta_h - \theta_t < \theta_l$ or not. If $\theta_h - \theta_t < \theta_l$ then $a = b = c = 0$, therefore:

$$J(\theta \mid \theta \in ]\theta_h - \theta_t; \theta_l]) = F(\theta_h - \theta_t) + F(\theta_h) - F(\theta_l) + \int_{\theta_h - \theta_t}^{\theta} f(\vartheta)d\vartheta = F(\theta) + \Delta$$

   If $\theta_h - \theta_t > \theta_l$ then $a = b = 1$ and $c = 0$, therefore:

$$J(\theta|\theta \in ]\theta_l; \theta_h - \theta_t]) = F(\theta_t + \theta_l) + \int_{\theta_l}^{\theta} f(\theta_t + \vartheta)d\vartheta = F(\theta_t + \theta)$$

3. Piece 3 is defined over $\Theta_b \setminus \Theta_a$ (thus $a = c = 0$ and $b = 1$) which is empty ex-post. We get

$$J(\theta|\theta \in \{\Theta_b \setminus \Theta_a\}) = F(\theta_h)$$

4. Piece 4 is defined over $\Theta_c$ (therefore $c = 1$ and $a = b = 0$) such that

$$J(\theta|\theta \in \Theta_c) = F(\theta_h) + \int_{\theta_h}^{\theta} f(\vartheta)d\vartheta = F(\theta)$$

Equation (13) synthesises these four pieces under a single expression through the subset-defined system of binary variables.

**Appendix D: explicit form of equation (16)**
Equation (16) can be rewritten as

$$\nabla s(\theta_t, \Delta) = \begin{bmatrix} \dfrac{af(\theta_t + \tilde{\theta}_m) + (b-a)f(\theta_t)(1-\Delta)}{af(\theta_t + \tilde{\theta}_m) + (1-b)f(\tilde{\theta}_m)} \\ \\ \dfrac{1 - a + (a-b)F(\theta_t)}{af(\theta_t + \tilde{\theta}_m) + (1-b)f(\tilde{\theta}_m)} \end{bmatrix}.$$

Remark that if $a = 1$ and $b = 0$ the sign of the numerator of the first element of the gradient seems ambiguous. However we can prove that

$$f(\theta_t + \tilde{\theta}_m) - f(\theta_t)(1-\Delta) > 0$$

Let us define the following function

$$K \equiv f(\theta_t + \tilde{\theta}_m) - f(\theta_t)(1-\Delta)$$

Since we are in the regime $a = 1$ and $b = 0$ we have $\tilde{\theta}_m \leq \min\{\theta_l, \theta_h - \theta_t\} \Rightarrow \theta_t + \tilde{\theta}_m \leq \theta_h$. By assumption (10) if $\Delta = 0 \Rightarrow K = 0$, $\forall\theta$. Therefore if $K$ strictly increases in $\Delta$ (if $\partial K/\partial\Delta > 0$) then $K > 0$.

Suppose that the distribution function is twice continuously differentiable. Assume also that there is a single value $\theta_e \neq \{0, 1\}$ defining a turning point of the distribution such that $f'(\theta_e) = 0$. Finally, if $f'(x) > 0$ for all $x < \theta_e$ and $f'(x) < 0$ for all $x > \theta_e$ the distribution is unimodal. It is bimodal if $f'(x) < 0$ for all $x < \theta_e$ and $f'(x) > 0$ for all $\forall x > \theta_e$.

1. If $\{\theta_t + \tilde{\theta}_m \leq \theta_e\} \cap \{f(\theta) \text{ unimodal}\} \Rightarrow \{f(\theta_t + \tilde{\theta}_m) > f(\theta_t)\} \Rightarrow K > 0$
2. If $\{\theta_t + \tilde{\theta}_m > \theta_e\} \cap \{f(\theta) \text{ unimodal}\} \Rightarrow \{f'(\theta_t + \tilde{\theta}_m) < 0\}$.

   $$\frac{\partial K}{\partial \Delta} = f'(\theta_t + \tilde{\theta}_m)\frac{\partial \tilde{\theta}_m}{\partial \Delta} + f(\theta_t) > 0 \Rightarrow K > 0$$

   Since $\partial\tilde{\theta}_m/\partial\Delta = \partial(\theta_m - s)/\partial\Delta = -\partial s/\partial\Delta < 0$ by (16).
3. If $\{\theta_t + \tilde{\theta}_m \leq \theta_e\} \cap \{f(\theta) \text{ bimodal}\} \Rightarrow \{f'(\theta_t + \tilde{\theta}_m) < 0\}$. Like in the previous point it follows that $K > 0$.

   This includes the case where $\theta_t + \tilde{\theta}_m = \theta_e \Rightarrow f(\theta_e) - f(\theta_t)(1 - \Delta) > 0$.
4. If $\{\theta_t + \tilde{\theta}_m > \theta_e\} \cap \{f(\theta) \text{ bimodal}\} \Rightarrow \{f(\theta_e) < f(\theta_t + \tilde{\theta}_m)\}$ therefore

   $$f(\theta_t + \tilde{\theta}_m) - f(\theta_t)(1 - \Delta) > f(\theta_e) - f(\theta_t)(1 - \Delta) > 0 \Rightarrow K > 0$$

**Appendix E: behaviour of the cut-off lines**

By assumption 2.3 we have $\partial\theta_h/\partial\theta_t > 0$, $\partial\theta_l/\partial\theta_t > 0$ and $\partial\theta_l/\partial\Delta < 0$. remark that the cut-off line between the NP and UB regimes is such that $F(\theta_h - \theta_t) + \Delta = F(\theta_m - s) + \Delta \Leftrightarrow \theta_h = \theta_m - s + \theta_t$. By appendix D this implies that

$$\frac{\partial\theta_h}{\partial\theta_t} = \frac{f(\theta_t)(1 - \Delta)}{f(\theta_h)} < 1$$

Properties of

$$F(\theta_h - \theta_t) + \Delta = 1/2$$

By the implicit function theorem and allocation rule (10) the important characteristics are:

$$\partial\Delta/\partial\theta_t = f(\theta_h - \theta_t)\left(1 - \frac{\partial\theta_h}{\partial\theta_t}\right) > 0$$

$$\theta_t = 0 \quad \Leftrightarrow \quad F(\theta_h) = \Delta \quad \Leftrightarrow \quad \Delta = 1/4$$

$$\theta_t = 1 \quad \Leftrightarrow \quad \theta_h = \theta_t \quad \Leftrightarrow \quad \Delta = 1/2$$

Properties of :

$$F(\theta_t + \theta_l) = {}^1\!/_2$$

Are the following:

$$\partial\Delta/\partial\theta_t = -\frac{f(\theta_t+\theta_l)(1+\partial\theta_l/\partial\theta_t)}{f(\theta_t+\theta_l)(\partial\theta_l/\partial\Delta)} > 0$$

$$\Delta = 0 \quad \Leftrightarrow \quad \theta_t = \theta_l \quad \Leftrightarrow \quad \theta_t = {}^{\theta_m}\!/_2$$

$$\Delta = 1 \quad \Leftrightarrow \quad \theta_l = 0 \quad \Leftrightarrow \quad \theta_t = \theta_m$$

**Appendix F: proof of lemma 4.1** Consider the three following regimes:

1. Coverage prioritizing regime: the shift is defined by $F(\theta_t + \theta_m - s) = F(\theta_m) \Leftrightarrow \theta_t = s$.

2. Benthamite utilitarian regime: in figure 3 it lays to the right of the previous regime. Notice that in appendix D it is shown that $0 < \partial s/\partial\theta_t < 1$. Therefore as $\theta_t$ increases departing from the coverage prioritization scenario, $s$ increases less than proportionally. Therefore $\theta_t > s$

3. Needs prioritizing regime: by the previous case we know that at the cut-off line between the Needs and Utilitarian regimes $\theta_t > s$. Any displacement downwards implies a reduction in $s$ since at the needs regime $\partial s/\partial\Delta > 0$. Therefore at any point below the cut-off line $\theta_t > s$.