Elite capture through information distortion: A theoretical essay

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ABSTRACT

We investigate donor–beneficiary relationships in participatory development programmes, where (i) communities are heterogeneous and dominated by the local elite, (ii) the elite strategically proposes a project to the donor, knowing that the latter has imperfect knowledge of the needs of the target population.
We analyse how changes in the donor's outside option or information about the needs of the target population affect elite capture. Our central, paradoxical result is that a more attractive outside option, or a higher quality of donor's information may end up encouraging the local elite to propose a project that better matches their own preference rather than the preference of the grassroots. Moreover, in the case where the noise in the donor's information follows a normal distribution, we find that a better outside option generally decreases elite capture but improved information about the needs of the target population is likely to increase elite capture.

1. Introduction

Of late, following great disappointment with conventional aid approaches based on a hierarchical relationship between donors and beneficiaries, there has been a growing emphasis within the international donor community on the importance of ownership of aid budgets and decisions by the receiving agent. Such a move has been reflected in the rapid emergence of decentralised or participatory development as a concept guiding aid strategies and efforts. Bilateral and multilateral agencies alike have thus given more importance to participation in the design of their development assistance programmes, and have channelled substantial amounts of aid money through local partner associations and municipalities or through Non-Governmental Organizations (NGOs). The World Bank, for example, has made the so-called Community-Driven Development (CDD) approach one of the cornerstones of its Comprehensive Development Framework, as reflected in the World Development Report 2000/2001 devoted to poverty alleviation. The share of Bank's projects with some degree of "civil society" involvement thus increased from 6% in the late 1980s to over 70% in 2006 (cited from Werker and Ahmed, 2008, p. 75).

It is a much boasted advantage of all decentralised aid programmes that the beneficiaries possess much more precise information than an external donor about what people want and how best they can achieve their objectives. In addition, their active participation in the aid process motivates them to exert effort and contribute their own resources to an aid project or programme.

A major problem nevertheless appears as soon as it is reckoned that populations are highly heterogeneous and that local elites – at the level of the village, the municipality, the regional or central government – are often guided by their selfish interest. Because they often succeed in monopolising the attention of the donor community thanks to their better education and greater exposure to the external world, they are typically in a position to speak on behalf of the poor who are the intended beneficiaries of aid programmes (Bierschenk et al., 2000; Esman and Uphoff, 1984; Kumar, 2002; Platteau, 2009). A recent and systematic study based on data related to the Tanzania's Social Action Fund has thus found that the pool of applications is neatly biassed in favour of wealthier and well politically connected households (Baird et al., 2011). Moreover, the authors show that this regressivity arises from variation in access to information, in civic engagement and in the ability to successfully navigate the application system rather than from the high costs or low perceived benefits of applying. In actuality, the poor often expect the village elite to manage aid projects and to make their own interests predominate as a sort of remuneration for their leadership role (Kumar, 2002; Platteau and Abraham, 2002; Platteau and Gaspart, 2003). Power asymmetry between the elite and the commoners is then bound to cause the preference of the former to prevail over the preference of the latter, thereby giving rise to a problem of elite capture in the presence of strong preference divergence between the two components of society.

This possibility has aroused much concern among social scientists during recent years. While abundant anecdotal evidence of preference distortion among beneficiary communities has been reported in a varied literature dominated by sociologists and anthropologists (Abraham and Platteau, 2004; Ban et al., 2010; Bierschenk et al., 2000; Blair, 2000; Chabal and Daloz, 1999; Conning and Kevane, 2002; de

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Haan et al., 2002; Eversole, 2003; Nygren, 2005), the issue of intra-community preference aggregation and its consequences on project choice have been recently explored by economists. The latter often represent the local decision mechanism as a form of representative democracy with (probabilistic) voting in which the poor, who have different preferences from the rich, have a relatively small weight (Bardhan and Mookherjee, 2000, 2005, 2006). From this framework, they have derived predictions that are subsequently put to empirical testing. One of the major results emerging from this literature is that the resource allocation process typically reflects the preferences of elite groups. In addition, more unequal communities do much worse, especially when there is a concentration of political, economic and social power in the hands of a few (Araujo et al., 2008; Bardhan et al., 2008; Besley et al., 2005; Galasso and Ravaillon, 2005; Labonne and Chase, 2009; Rao and Ibáñez, 2005; Rosenzweig and Foster, 2003). As pointed out by Mansuri and Rao (2012, Chap. 3), in their recent survey of the literature, elite capture also tends to be greater in communities which are remote from centres of power, have low literacy, are poor or have significant caste, race and gender disparities.

In such a context, a key question to ask is the following: what is the expected effect of a deliberate attempt by the donors themselves to tackle the problem of preference distortion in the context of heterogeneous communities? Although, ideally, the donors should let communities define their own priorities (since this prerogative should belong to them under a genuinely participatory approach), the possibility of elite capture through preference manipulation may, indeed, prompt the donors to take actions aimed at circumscribing it. For example, we know from a spate of recent evidence that better information of the ultimate beneficiaries regarding the nature of the benefits they can expect from an aid programme significantly reduces the risk of aid embezzlement by the elite (Banerjee et al., 2008; Bjorkman and Svensson, 2009; Olken, 2007; Reinikka and Svensson, 2005).

In this paper, we develop a principal–agent model to argue that this relationship may not hold in a situation where communities must apply for projects to receive aid funds, and the donor must select among proposed projects and communities to allocate scarce resources.

Specifically, we assume that the donor allocates some resources with a view to forming an idea about the preference of the poor and that the local elite, who have limited knowledge about the donor's information, has to propose a project on behalf of the community to receive development funding.

Given the alternative uses to which funds may be used, the donor has a degree of tolerance regarding the extent to which a proposed project (or programme) may differ from its own perception of what the poor want (or need). If the elite propose a project which falls outside of this tolerance interval, the donor rejects it altogether. If accepted, a project is implemented according to plan (enforcement problems are assumed away). Under the favourable assumption that the donor's perception is globally correct, the elite face a strategic choice which involves a trade-off between the probability of project acceptance by the donor and the extent to which the proposed project corresponds to their own interests rather than those of the community's poor. How the above trade-off is affected by the donor's outside option and the quality of the information he possesses about the poor's preferences is the major question that we explore.

One central, paradoxical result of our theoretical foray is that a higher quality of the signal received by the donor may end up encouraging the local elite to propose a project that better matches their own preference rather than the preference of the grassroots. A more attractive outside option for the donor, resulting, say, from reduced competition among donors for access to client communities, may also have the unexpected effect of encouraging elite capture.

The intuition behind these paradoxical results is that a change in the donor's tolerance affects not only the probability that a particular project recommended by the elite is accepted by the donor but also the sensitivity of this probability to changes in the project recommendation. These two effects can go in opposite directions. We show that improving the donor's outside option lowers its tolerance of project proposals that deviate from its own signal, while improving the quality of the donor's signal about the preferred project of the target population increases its tolerance (besides a direct effect on the probability of acceptance). Therefore, if the net effect of improving the donor's outside option is to decrease elite capture, then the net effect of improving the quality of the donor's signal is likely to increase elite capture; and vice versa. We provide numerical examples in which the error term in the donor's signal has a normal distribution. In this case, improving the donor's outside option generally reduces the level of elite capture but improving the quality of the donor's signal can *increase* elite capture.

Far from being a mere curiosity, our results may be actually obtained in other contexts exhibiting the same basic informational structure as that used in this paper (see Putterman, 1987; Putterman and Skillman, 1988). The policy implication is of utmost importance: making eligibility criteria stricter in decentralised development programmes, as seems natural when targeting is poor, may be ill-advised when a double uncertainty exists (the donor does not know the preferences of the poor precisely and the elite is uncertain about the signal received by the donor regarding those preferences).

Our assumption that the donor's information about the needs of the target group is imprecise is based on the idea that the needs expressed by the poor do not necessarily correspond to the way they are assessed by a benevolent rich. Furthermore, the needs of the poor tend to be highly location-specific, depending on the particular environment in which they live. Finally, the poor do not easily express dissenting preferences in the front of outsiders since outsiders are just passing while elite people are there to stay. It is important to bear in mind that, if the donor could easily gather reliable information regarding the poor's preferences (or needs), he would have no need for a participatory approach and could instead act as a central bureaucrat.

As for our abstracting away from enforcement problems, note that, in many instances, it is easier for a donor agency to check the proper execution of a project (especially so if it is embedded in visible infrastructures) than to identify the poor's preferences in the presence of severe power imbalances.[1] Testing our main prediction empirically presents the challenge that it is inherently difficult to assess to what extent a proposed development project genuinely addresses the needs of the poor in a community. Indeed, this difficulty is one of the primary motivations for aid decentralisation. Nevertheless, in Section 2, we present qualitative evidence from the literature to the effect that village communities do indeed misrepresent their needs to the donor in order to improve their chances of receiving aid funds.

The theoretical model can then be seen as an exercise to understand how this misrepresentation of needs, specifically by the community elite, is affected by the donor's outside option and access to independent information. In Section 3, we provide a short informal description of the context that is modelled, and we clarify and justify some key assumptions that guide our modelling effort. In Section 4, the model is laid out in detail and, in Section 5, the main analytical results are derived and discussed. In Section 6 we extend the model and we allow the donor to update its prior beliefs after receiving a project proposal from the elite. Section 7 concludes.

2. Evidence of preference distortion

Evidence of preference distortion is of two kinds. First, there is the indirect evidence emerging from the systematic empirical studies conducted by economists. In these studies, preference domination by

[1] If the project proposed by the elite is accepted by the donor, we are in the situation described by a village chief from Burkina Faso: "if I give you a hen free, you won't start examining the ass to determine whether it is fat or thin. You just accept it." (Guéneau and Lecomte, 1998, p. 100).

the elite is inferred from observed project choices given some a priori assumptions regarding the types of projects preferred by (meeting the needs of) the poor and those preferred by the elite groups (see the references given in Section 1). Second, we have the more anecdotal yet sometimes very insightful accounts provided by other social scientists. Two such accounts deserve to be especially emphasized here. The mechanism which they highlight, it must be noted, implicitly assumes that the village community acts as a homogeneous entity.

The first example is extracted from an anthropological study of participatory processes in Malawi (Tembo, 2003). Tembo's central point is that people and communities tend to profess the objectives, and adopt the style, methods, and language of the Non-Governmental Organizations (NGOs) so as to obtain access to their support. In his own words: "People's preoccupation was to align their requests with what an NGO was providing, in a sense of defending their position for assistance even when the critical problem was something else… in most cases, people were co-operative, in terms of giving appropriate answers to fieldworkers, in order to please them and have access to NGO assistance" (Tembo, 2003, p. 93–94, 125; in the same vein, see Chabal and Daloz, 1999; Laurent and Singleton, 1998; Mosse, 1997, 2001).

The underlying idea is that the donors' perception of what the poor need often differs from what the latter, or their representatives, think are their priorities, yet the poor are ready to strategically adjust their demand so as to get access to the aid fund available. For example, training is deemed critical by many NGOs for capacity-building and empowerment of the poor, but the poor (or their representatives) do not see it that way. Citing Tembo again, training was not viewed by the people as a form of assistance, but as "a facilitating activity attached to the process of receiving some kind of NGO assistance" (Tembo, 2003, p. 97). In fact, people saw training not only as a condition of access to assistance, but also as a source of direct advantages in the form of training allowances. Revealingly, one of the most contentious issues between fieldworkers and villagers concerns the form in which training allowances should be paid: while, on behalf of the NGOs, the former insist that they are paid in kind as gifts of food, the latter want to receive cash allowances so that they can use them in the way they deem fit (p. 64). More precisely:

> "…before the training commenced people demanded that they be provided with training allowances in cash and not food… When the NGO turned to the 'take it or leave it' approach, the people agreed and the training session was conducted, but with a lot of grumbling on the part of the community members. Fieldworkers were surprised and angry with the people, arguing that they were already beneficiaries of long-lasting assistance and should not demand payment for their access to the assistance" (Tembo, 2003, p.128).

Other sources of disagreement arise from NGO preference for participatory processes and for collective rather than individual enhancement. Activities involving participation, such as registration exercises and meetings, which for NGOs were meant for the empowerment of the people, were seen by them as serving the purpose of facilitating the inflow of external resources. As a result, when an NGO phased out assistance, the people often stopped their participation in the committees and organisations built at the initiative of the fund provider. Hence the observation that village organisations set up to secure external financial support "could disband as soon as NGO assistance was over" (Tembo, 2003, p. 146).[2] Partaking of the same logic of spurious participation is the fact that village organisations and committees set up for the purpose of capturing aid are specific to the intervention of a particular NGO. Thus, when a new NGO came to a community to provide assistance, people did not mention previous programmes and, therefore, new committees were formed to meet the demand of this new NGO. Change thus tends to be seen in project terms rather than in the context of the people's own construction of their livelihoods (Tembo, 2003, p. 122). This kind of observations have been confirmed by the more systematic studies reviewed by Mansuri and Rao (2012).

The second account comes from the state of Kerala, a southern Indian state which embarked upon an ambitious programme of decentralised development in 1996. There, some local governments (called panchayats) thought that a project would be more likely to be financed by the central government if it was identical to those previously implemented by the state or to the sort of projects presented as models by the State Planning Board, the office in charge of decentralisation (Harilal and Sanu George, 2000). In a study of two villages, (Nair, 2000) finds that "Almost all the individual beneficiary-oriented programmes (…) were mere repetition or replication of the standardized programmes which had already been implemented or initiated in the earlier Five-Year Plans.(…) It appears that neither the Grama Sabhas nor the Panchayat Committees had considered the relevance of particular programmes to the development of the panchayat nor exercised choice in the selection of programmes, probably due to lack of expertise, non-availability of time for deliberation or compulsion to fall for whatever acceptable programmes were readily available" (Nair, 2000, p. 16).

When queried about who played a key role in the choice and implementation of the projects, and why no innovative programme was included, half the respondents did not respond. But among those who responded, "the majority view is that the schemes were picked up from the Planning Board's shelf considering their easy approvability" (Nair, 2000, p. 18).

Compared to our analytical framework, the foregoing accounts present both a simplification and a complication. The simplification arises from the ignorance of social conflicts: as we have already pointed out, the village community or the municipality is treated as a homogeneous body whereas many studies, conducted by economists and other social scientists, stress the predominance of the elite's preferences over those of the grassroots. The complication is suggested by the first account which points to possible divergences between the donor and the poor regarding the latter's needs or priorities. In the following, we abstract from this possibility – in our setup, the donor wishes to get as close as possible to meeting the needs of the poor as they themselves define those needs – in order to focus attention on the conflict of interest between the local elite and the grassroots.

It may nevertheless be noted that the problem of the donor becomes rather trivial if he chooses to privilege its own approach to poverty alleviation, especially so if local communities are well informed about this approach. In the words of (Baird et al., 2011): "When central governments use quantified metrics of poverty to channel funds, then central government provision almost tautologically improves poverty targeting if these same metrics are used to analyse spending incidence" (p. 21).

3. Preliminary clarifications

3.1. Description of the context

We begin by providing an informal description of the context to be modelled. The formal setup is described in the next section. Since we are interested in the effect of preference divergence in decentralised development programmes, we focus our attention on heterogeneous communities. More precisely, we assume that a community is comprised of two groups, the target group which the donor agency wants to support through an aid flow, and the elite group. In fact, the term 'elite' need

[2] Villages from Mayo Kebbi in Chad derisively call "groupements-minute" (instant associations) these thousands of groups, committees, associations and the like which suddenly emerge when aid funds are available and quickly vanish from the scene when the opportunity has passed (Guéneau and Lecomte, 1998, p. 64).

not be interpreted in a restrictive sense. It may stand for the median voter, while the target group represents minority groups or marginal sections of the population, such as women, low-caste people, strangers and herders. In line with the objective of poverty reduction or emancipation of weak groups, the donor's utility function duly reflects the interests of the target group. Towards that end, the donor relies on a participatory process aimed at determining the nature of the needs of the target group. However, because the elite may interfere with the consultation mechanism, an information gap subsists and prevents the donor from assessing with certainty the genuine needs of this group. What the donor maximises, therefore, is the expected utility derived by the target group from the aid flow. The decision to be taken is simply to accept or refuse to finance a project submitted by the community (in fact, by the elite group). If the proposed project is refused, then the available funds can be considered for alternative projects, perhaps in a different community and probably involving a different elite group. These alternatives reflect the donor's outside option.

The elite influence the participatory process in a decisive manner, and choose the project to submit to the donor's approval with the purpose of maximising their own selfish utility. This involves a trade-off between two kinds of considerations: on the one hand, the elite would like a project that is as close as possible to their own preference; on the other hand, proposing a project that deviates from what the donor perceives as being most beneficial for the target group, lowers the likelihood that it will be approved by the donor.

In order to keep our focus on the issue of strategic manipulation of preferences, we abstract away from any problem arising at the level of enforcement of the project once approved. In other words, the elite has no possibility to embezzle the aid fund or to modify the nature or the destination of the project. It is easy to understand that if the project, once accepted, could not be enforced by the donor, the trade-off at the heart of the problem of elite capture through preference distortion would vanish, and the prediction derived from our analytical framework would be straightforward. As a matter of fact, if the donor is unable to monitor the use of the disbursed funds, the elite would propose the project that stands the best chance of being accepted by the donor and would actually implement their own preferred project.

3.2. Key assumptions

Some assumptions underlying our modelling effort and setup need further clarification and justification.

To begin with, we take decentralised aid as given in the sense that we do not explore the question as to why and when it is superior to centralised aid (on this aspect, see (Bardhan and Mookherjee, 2000)). What amount of information is available to the donor is only one factor determining the relative advantage of decentralised aid compared to centralised aid (ownership of aid, for example, has several beneficial effects that may not all be related to information). However, by positing that aid is decentralised (a common pattern of aid distribution nowadays), we implicitly and realistically assume that the donor's actual and potential knowledge about the preferences of local people or groups is limited.

Our second point concerns the dichotomous nature of the donor's decision. Since this is a key feature of our model, it is important to stress the kind of situation that we have in mind. The issue in which we are interested is the screening task which a donor organisation must perform when it is overwhelmed by a flurry of project proposals emanating from potential "partner" communities, municipalities, or other forms of local governments in poor countries.[3] Once a proposal is accepted, the donor organisation establishes a partnership relationship with the community or local government concerned. A negotiation may then start with a view to making more precise (i) the methods and the timing for the execution of the agreed-upon project (the project proposed by the partner and accepted by the donor); (ii) the process of disbursement of aid money; and (iii) the follow-up, monitoring, and evaluation of the project. All these operations are not modelled since we want to keep the focus on the partner selection issue.

Let us now turn to our third clarification. In the model, the elite choose which project to submit to the donor. Because the donor will either accept or reject the proposal, and since the project is implemented as planned if it is accepted, the elite's proposal determines the payoffs of both agents. This feature of the game makes it intrinsically different from "cheap talk" games (Crawford and Sobel, 1982) and the following literature where, by definition, the message has no implication for the future game except in the manner that it is interpreted by the players. If the recommendation appears too much biassed in a pro-elite direction, the donor will be compelled to reject it. By contrast, in a cheap-talk game, if the sender sends an implausible signal, then the receiver would simply ignore it.[4]

Four, even if they have information regarding the poor's preferences, donors are usually not able to fully assess the magnitude of the divergence between the poor's and the elite's preferences. Moreover, donors often do not have the means to assess the sincerity of a group that claims to represent the interest of the poor. To take this into account, we assume that the donor's perception of the needs of the poor and the elite's preference are independent. For example, if the donor thinks that the poor prefer a project A, this does not give him any information on whether the elite prefer project A or project B. And vice versa, the fact the elite prefers project A does not give the elite any information on the donor's perception of the poor's needs. Furthermore, we will show that if the donor does not have strong priors on the preferred project of the elite, the donor's beliefs about the needs of the poor would change little from Bayesian updating on the basis of the elite's recommendation. In this sense, what the elite do is not potentially informative for the donor. We assume that the donor does not engage in Bayesian updating in the first part of our analysis (Sections 4 and 5), but we investigate the implications of Bayesian updating in Section 6.

Five, in order not to add another source of uncertainty to our problem, the outside option of the donor is assumed to be known by the elite.

4. The model

4.1. Setup

Formally, we analyse a game consisting of two agents represented by the letters D (the donor agency) and E (the elite group).

The choice of a project is represented by the variable $\theta \in \mathbb{R}$ which measures some parameter of the project that affects the welfare of both the target population and the elite group. We let θ^r denote the preferred project of the elite group, and θ^t that of the target group. In addition, D receives a signal $\theta^s \in \mathbb{R}$ which is correlated with θ^t and unobserved by *E*. Specifically, we assume that θ^s and θ^t have a joint distribution described by the joint cumulative distribution function $F(\theta^s,\theta^t)$ and θ^r is distributed according to the function $G\theta^r$. The functions $F(\cdot)$ and $G(\cdot)$ are common knowledge; but E observes only the realisations of θ^r and θ^t and D observes only the realisation of θ^s.[5]

[3] It is not rare, as we could observe from our own involvement with NGOs, that aid organisations may receive tens of proposals in a week.

[4] The same point can be made regarding the so-called "biassed experts" problem, which is actually derived from the "cheap talk literature", as discussed by (Austen-Smith, 1994; Krishna and Morgan, 2001, 2004) among others. In this framework, too, the advice from an expert is an element of information that the receiver may well choose to ignore and that does not directly affect its payoffs.

[5] In a previous version of the paper we assumed that two projects were feasible, *A* and *B*, and that the elite had to choose a project mix, θ [0,1], which indicated the share of the aid fund allocated to project A. We reached qualitatively identical results under those assumptions. Following the suggestion of one referee we here assume that θ can take any values on the real line, which greatly simplifies the analysis.

The precise steps in the game are specified below.

1. Nature draws θ^r, θ^t and θ^s. We have θ^r and θ^t revealed to E and θ^s revealed to D.
2. E proposes a project, $\theta^r \in \mathbb{R}$ which is revealed to D.
3. D must choose to accept or decline the recommended project. The decision is represented by the variable $a \in \{y,n\}$.

If the recommended project is accepted (i.e. $a = y$), then D receives a payoff of $U^d(|\theta^r - \theta^t|)$, and E receives a payoff of $U^e(|\theta^r - \theta^e|)$. If the project is rejected, then D receives $\underline{U}^d$ and E receives $\underline{U}^e$.

Thus, if the recommended project is approved, then the utility of the donor depends on the 'distance' between the approved project and that preferred by the target group; similarly, the utility of the elite group depends on the 'distance' between the approved project and its own preferred project. The constants $\underline{U}^d$ and $\underline{U}^e$ represent the outside options of the donor and the elite group respectively.

We assume that the utility functions $U^d(.)$ and $U^e(.)$ have the following properties:

Assumption 1. $U^i(x)$ is continuous, differentiable and $\frac{dU^i(x)}{dx} < 0$ for $i = d, e$.

Assumption 2. $U^i(x)$ is twice differentiable and $\frac{d^2U^i(x)}{dx^2} < 0$ for $i = d, e$.

Assumption 1 simply means that both the donor and the elite prefer a project mix closer to their respective target points, θ^t and θ^e. Assumption 2 ensures that the donor dislikes uncertainty.

4.2. Case A: the elite observes the donor's signal

For illustrative purposes, we first solve for the equilibrium in the game in the case that θ^s is observed by E; i.e. the elite group has full knowledge of any information that the donor agency has about the preferred project of the target group.

At stage 3 of the game, the donor approves a project θ^r if and only if

$$E\left[U^d\left(\left|\theta^r - \theta^t\right|\right)|\theta^s\right] \geq \underline{U}^d. \tag{1}$$

We can use this condition to compute a set $\sigma(\theta^s)$ defined as

$$\sigma(\theta^s) = \left\{\theta \in (-\infty, +\infty) : E\left[U^d\left(\theta - \theta^t\right)|\theta^s\right] \geq \underline{U}^d\right\}. \tag{2}$$

The donor would accept the recommended project if and only if $\theta^r \in \sigma(\theta^s)$. Therefore, at stage 2 of the game, under the assumption that θ^s is observable to E, the elite group would recommend

$$\theta^r = \begin{cases} \theta^* \text{ if } U^e(\theta^* - \theta^e) \geq \underline{U}^e \\ \theta^e \text{otherwise} \end{cases} \tag{3}$$

where

$$\theta^* = arg \max_{\theta \in \sigma(\theta^s)} U^e(\theta - \theta^e). \tag{4}$$

It follows that, if $U^e(\theta^* - \theta^e) \geq \underline{U}^e$ and $\theta^e \notin \sigma(\theta^s)$, we have

$$E\left[U^d\left(\theta^r - \theta^t\right)\middle|\theta^s\right] = \underline{U}^d \tag{5}$$

i.e. the elite always recommends a project that is just acceptable to the donor agency, provided that the elite group prefers this project to its own outside option, and its own preferred project would be rejected by the agency.

Therefore, if the donor agency has no private information, then it can do no better than its own outside option unless, unusually, full elite capture (i.e. selection of a project $\theta^r = \theta^e$) is better than its outside option. This implies that, in general, if the donor agency opts to reveal its signal to the elite group, it cannot do better than its outside option. Doing so will merely lead the elite to capture all the potential surplus from its exchange with the donor.

Moreover, in the case where θ^r is given by Eq. (5), it is easy to verify that, as the donor's outside option improves, the approved project moves closer to that preferred by the target population. We will see that this relationship may be inverted when the elite does *not* observe the signal received by the donor.[6]

4.3. Case B: the elite does not observe the donor's signal

Next, we consider the more interesting case where the donor has private information about the preferred project of the target population. As before, the donor would approve a project proposal θ^r at stage 3 of the game if and only if $\theta^r \in \sigma(\theta^s)$, where $\sigma(\theta^s)$ is as defined in the previous section.

Without observing θ^s, the elite group does not know the set $\sigma(\theta^s)$. However, it can compute $Pr(\theta \in \sigma(\theta^s)|\theta^t)$ for each possible value of θ. Therefore, at stage 2 of the game, the elite group chooses θ^r to maximise its expected utility as follows

$$\theta^* = arg \max_{\theta \in (-\infty, +\infty)} V^e\left(\theta, \theta^e, \theta^t\right) \tag{6}$$

where

$$V^e\left(\theta, \theta^e, \theta^t\right) = Pr\left(\theta \in \sigma\left(\theta^s\right)\middle|\theta^t\right)U^e(|\theta - \theta^e|) + Pr\left(\theta \notin \sigma\left(\theta^s\right)\middle|\theta^t\right)\underline{U}^e. \tag{7}$$

The trade-off described above is evident from Eqs. (6) and (7): by recommending a project closer to θ^e, the elite will obviously improve its payoff from project approval. However, by choosing a project further from θ^t, it may lower the probability that the project is approved by the donor.

Note that the donor rejects a project proposal whenever its expected utility from accepting the project is below its outside option. Therefore, its expected utility from the game in Case B is at least as high as in Case A discussed above (unless implementing the project that best serves the interests of the elite group, i.e. $\theta^r = \theta^e$, is better than its outside option). Therefore, in general, it is not in the interest of the donor agency to reveal its signal to the elite group.

We would like to know how this trade-off is affected by the donor's outside option and the quality of its information about the preferred project of the target group. In particular, would the elite recommend a project that is closer to that of the target group when the donor has better information or more attractive alternatives to the proposal being considered? To answer these questions, we need to impose additional structure on the nature of information in the model. This we do in the following section.

4.3.1. Imposing a structure on the donor's signal

The idea underlying the donor's signal is that the agency is able to gather information about the needs of the target group, yet is never in a position to ascertain them in a completely reliable manner. For instance, he has a correct perception of what the poor need in general, but cannot assess accurately how the nature of such needs varies from one community to another. Such an assumption is warranted since it is precisely when the needs of the poor or marginal groups are community-specific that participatory or decentralised development programmes are justified.

[6] Another possibility is that the donor chooses whether to reveal his signal to the elite. In Section 5.2 we will discuss the case where the donor can reveal his signal and can, in addition, commit to implement only a project that corresponds to that signal. We will argue that under reasonable is actually very similar to that treated in Case B below.

For the subsequent analysis, we assume that, through its own research into the community, independent of the elite group, the donor agency obtains a signal

$$\theta^s = \theta^t + \varepsilon \tag{8}$$

where ε is a noise term with probability density function $f_{\varepsilon\varepsilon}(.)$ and cumulative distribution function $F_\varepsilon(.)$. We impose the following structure on ε.

Assumption 3. $\int x f_\varepsilon(x)dx = 0$,, $f_\varepsilon(.)$ is continuously differentiable, $f_\varepsilon(x) = f_\varepsilon(-x)$, and $f'_\varepsilon(|x|) < 0$ for each $x \in \mathbb{R}$.

In words, the error term in the donor's information has mean zero and its distribution is symmetric about the mean. Furthermore, smaller errors are more likely than larger errors. Given this signalling mechanism, we obtain $\theta^t = \theta^s - \varepsilon$. Therefore, given a signal θ^s and Assumption 3, the conditional distribution of θ^t is given by

$$f_t\left(\theta^t|\theta^s\right) = f_\varepsilon\left(\theta^s - \theta^t\right)$$

and $E(\theta^t|\theta^s) = \theta^s$. To ensure that there is at least one project proposal that the donor would accept we introduce an additional assumption as follows.

Assumption 4.

$$E\left[U^d\left(\theta^s - \theta^t\right)|\theta^s\right] > \underline{U}^d.$$

According to Assumption 4, the donor would prefer to pursue a project which corresponds to its signal over its outside option.

4.3.2. Relationship between information quality, the donor's outside option and the donor's tolerance

Given the structure imposed on the donor's signal in the preceding section, we can derive a number of useful characteristics of the donor's expected utility from a particular project proposal which are summarised in the following lemma.

Lemma 1. *Under Assumptions 1, 2 and 3, (i) the donor's expected utility from a project proposal θ^r is maximised at $\theta^r = \theta^s$, increasing in θ^r for $\theta^r < \theta^s$, and decreasing in θ^r for $\theta^r > \theta^s$. (ii) For each signal θ^s, there exists an interval $[\theta^s - k, \theta^s + k]$ such that the donor will accept the proposed project θ^r if and only if it lies within the interval. (iii) The parameter k is independent of θ^s.*

The parameter k introduced in Lemma 1 measures how far a project proposal may deviate from the donor's signal before the donor chooses to turn it down. Thus, it can be considered as a measure of the donor's "tolerance for elite capture".

We would like to know how the donor's tolerance is affected by the donor's outside option, and the quality of the donor's information about θ^t. We model a change in the quality of the donor's information as a change in the distribution of the error term. Specifically, if the random variable ε_1 is a mean-preserving spread of ε_2, then, we say that a change in the donor's information gathering process which replaces ε_1 with ε_2 in the error term in Eq. (8) constitutes an "improvement in the quality of the donor's signal".[7] We can establish the following results.

Lemma 2. *Under Assumptions 1, 2 and 3, the donor's tolerance of elite capture is (i) increasing in the quality of its signal, and (ii) decreasing in its outside option.*

[7] We adopt the definition of 'mean-preserving spread' provided by Machina and Pratt (1997): the pdf $g(\cdot)$ is a mean-preservin g spread of the pdf $f(\cdot)$ if $\exists x_1, x_2$ such that $g(x) \geq f(x)$ for $x \in (-\infty, x_1)$ and $x \in (x_2, +\infty)$, and $g(x) \leq f(x)$ for $x \in (x_1, x_2)$.

The intuition behind Lemma 2 is as follows. By assumption, the donor is averse to uncertainty about the distance between a recommended project and the preferred project of the target population. An improvement in the quality of the donor's signal reduces uncertainty about θ^t and reduces uncertainty about the distance of any recommended project from θ^t. Therefore, for any given project proposal, the donor's expected utility is higher when he has better information about θ^t. Therefore, he would tolerate greater deviation of a project proposal from its own signal when the quality of its signal is better. On the other hand, as the donor's outside option improves, he is less willing to tolerate any deviation of the proposed project from its own signal, as he can do better by turning it down.

4.3.3. The elite's optimal response

Given the structure imposed on the donor's information in Section 1, we can reconsider the strategic decision of the elite group at stage 2 of the game. As the preferred project for the target population, θ^t, is known to the elite and the donor's signal, θ^s, is correlated with θ^t, the elite group can use the former to form expectations about the latter. Using Eq. (8), we can show that, given θ^t and Assumption 3, we obtain $E(\theta^s|\theta^t) = \theta^t$ and the conditional distribution of θ^s is given by

$$f_{\varepsilon s}\left(\theta^s\middle|\theta^t\right) = f_{\varepsilon\varepsilon}\left(\left|\theta^s - \theta^t\right|\right).$$

Let $F_s(\cdot)$ be the cumulative distribution function corresponding to $f_{\varepsilon s}(\cdot)$. The optimal choice for the elite, as in the general case, is given by the solution to the maximisation problem in Eq. (6). Using Lemma 1, we can rewrite the probability of any proposed project being accepted by the donor as follows:

$$\begin{aligned} Pr(\theta \in \sigma(\theta^s)|\theta^t) &= Pr\left(\theta^s - k \leq \theta \leq \theta^s + k\middle|\theta^t\right) \\ &= Pr\left(\theta - k \leq \theta^s \leq \theta + k\middle|\theta^t\right) \\ &= F_s\left(\theta + k\middle|\theta^t\right) - F_s(\theta - k|\theta^t) \\ &= F_\varepsilon\left(\left|\theta + k - \theta^t\right|\right) - F_\varepsilon\left(\left|\theta - k - \theta^t\right|\right) \end{aligned} \tag{9}$$

For ease of exposition, and without loss of generality, we shift the utility of the elite group by a constant such that $\underline{U}^e = 0$. Then, using Eq. (9), we can rewrite Eq. (7) from Section 3 as follows:

$$V^e\left(\theta, \theta^e, \theta^t\right) = \left[F_\varepsilon\left(\left|\theta + k - \theta^t\right|\right) - F_\varepsilon\left(\left|\theta - k - \theta^t\right|\right)\right] U^e(|\theta - \theta^e|). \tag{10}$$

By varying θ, the elite can raise the probability that the recommended project is accepted by the donor, but this may involve moving further from the elite group's own preferred project. It should be clear that if the distance between its own preferred project and those likely to be provided by the donor is very large, then the elite may be better off pursuing its outside option (which is equivalent to recommending a project with zero probability of acceptance).

If not, we can show that the elite's optimal value of θ lies between θ^e and θ^t. The reason is as follows. Suppose $\theta^e < \theta^t$. Then, for any $\theta < \theta^e$, we have, under Assumption 1 and 3, that $U^e(|\theta - \theta^e|) < U^e(|\theta^e - \theta^e|)$ and $Pr(\theta \in \sigma(\theta^s)|\theta^t) < Pr(\theta^e \in \sigma(\theta^s)|\theta^t)$. So, the elite would do better by choosing θ^e than by choosing θ. For any $\theta > \theta^t$, we have, under Assumptions 1 and 3, that $U^e(|\theta - \theta^e|) < U^e(|\theta^t - \theta^e|)$ and $Pr(\theta \in \sigma(\theta^s)) < Pr(\theta^t \in \sigma(\theta^s))$. So the elite would do better off by choosing θ^t than by choosing θ. The same type of reasoning applies if $\theta^e > \theta^t$.

We can show that if the utility function of the elite is sufficiently concave, then the function $V^e(\theta, \theta^e, \theta^t)$ is also concave in θ between θ^e

and θ^t.[8] Then, if the maximisation problem has an interior solution, it is uniquely defined by the following first-order condition:

$$\left[f_\varepsilon\left(\left|\theta+k-\theta^t\right|\right)-f_\varepsilon\left(\left|\theta-k-\theta^t\right|\right)\right]U^e(|\theta-\theta^e|) + \left[F_\varepsilon\left(\left|\theta+k-\theta^t\right|\right)-F_\varepsilon\left(\left|\theta-k-\theta^t\right|\right)\right]\frac{\partial U^e}{\partial\theta} = 0 \quad (11)$$

or

$$\frac{\partial Pr\left(\theta\in\sigma(\theta^s)|\theta^t\right)}{\partial\theta}U^e(|\theta-\theta^e|)+Pr\left(\theta\in\sigma(\theta^s)\left|\theta^t\right.\right)\frac{\partial U^e}{\partial a}=0. \quad (12)$$

Eq. (11) completes our characterisation of the optimal strategy of the elite group. It contains the important insight that the choice of the agent – in this case, the elite group – depends not only on the probability $Pr(\theta\in\sigma(\theta^s)|\theta^t)$, but also on how this probability changes with θ. Consequently, the donor's outside option and quality of the donor's information affect the extent of elite capture not only because they determine the donor's tolerance, but also because they affect the *slope* of the probability curve, $\frac{\partial Pr(\theta\in\sigma(\theta^s)|\theta^t)}{\partial\theta}$. Using Eq. (12), we can further investigate how the elite's optimal project choice varies according to the 'gap' between the project preference of the elite and the poor.

Lemma 3. *Denote by $r(\theta,\delta)$ the best response of the elite when $\theta^t=\theta$ and $\theta^t-\theta^e=\delta$. Under Assumptions 1, 2 and 3, if the donor's strategy is to accept a project proposal θ^r if and only if $|\theta^r-\theta^s|\le k$ where $k>0$, then $r(\theta,\delta)=\theta+\lambda(\delta)$, where $\lambda(0)=0$, $\lambda'(\delta)<0$ and $\lambda(-\delta)=-\lambda(\delta)$.*

The term $\lambda(\delta)$ measures the extent to which the elite's optimal project choice deviates from the preferred project of the target population. Thus, it is a measure of elite capture. Lemma 3 establishes two natural but important characteristics about the behaviour of the elite. First, the extent of elite capture is increasing in the gap between the preferred project of the elite and the poor; and the only case where elite capture does not occur is when these preferences coincide perfectly. Second, the extent of elite capture is invariant to shifts in θ^e and θ^t, as long as the gap between the two is held constant.

Intuitively, it would seem that if the donor had a stronger outside option or better quality information about the preferences of the target population, then this would induce the elite to recommend a project closer to θ^t and thus lower elite capture. However, we shall see in the next section that this is not necessarily so.

5. Results

5.1. Comparative statics

We can deduce the effect of an improvement in the donor's outside option from the first-order condition in Eq. (11) or Eq. (12). According to Lemma 2, the donor's tolerance declines with $\underline{U}^d$. It follows that the probability that a project θ is accepted (denoted by the term $Pr(\theta\in\sigma(\theta^s)|\theta^t)$) also declines with $\underline{U}^d$. From Eq. (12), we can see that this lowers the elite's reward from recommending a project close to θ^e and therefore discourages elite capture.

But an increase in $\underline{U}^d$ also affects how the probability of project acceptance changes with θ (denoted by $\frac{\partial Pr(\theta\in\sigma(\theta^s)|\theta^t)}{\partial\theta}$). In particular, under Assumption 3, this slope becomes flatter, and thus lowers the 'marginal cost' (in the sense of a decrease in the probability of project acceptance) to the elite of recommending a project further from θ^t. This effect goes in the opposite direction of the one mentioned earlier. We can summarise these results in the form of the following proposition which are formally shown in Appendix B.

Proposition 1. *Under Assumptions 1, 2 and 3, if $|\theta^r-\theta^t|>k$, the effect of an increase in the donor's outside option on elite capture is composed of two opposing effects: (i) a decline in the probability of project acceptance, due to a decline in the donor's tolerance, which discourages elite capture, and (ii) an increase in the sensitivity of the likelihood of project acceptance to changes in the recommended project, which encourages elite capture.*

Which of the two effects described in Proposition 1 will dominate will depend on the distribution of the donor's signal. We explore this issue further in the next section.

Next, consider how an improvement in the quality of the donor's information would affect elite capture. According to Lemma 2, the donor becomes *more* tolerant as the quality of information improves. Therefore improving the quality of the donor's information also affects elite capture through the channels highlighted in Proposition 1, but the net effect should be in the *opposite* direction to that of improving the donor's outside option.

An improvement in the quality of the donor's signal not only affects the donor's tolerance – as noted above – but also the elite's conditional probability distribution of θ^s. Thus, it affects the probability that a specific project is approved and the sensitivity of the likelihood of project acceptance to changes in the recommended project. In general, these effects can go in opposite directions and therefore, once again, we have ambiguity in how improving the donor's signal affects elite capture. However, over some ranges of values of θ^r, these effects can go in the same direction and we are able to sign the net effect of improving the quality of the donor's signal on elite capture. The following proposition, formally proven in Appendix B, summarises the possible effects. We denote by $f(\cdot)$ and $g(\cdot)$, respectively, the distribution of the error term in the donor's signal before and after the change in the quality of the donor's information about the preferred project of the target population.

Proposition 2. *Under Assumptions 1, 2 and 3, the effect of an increase in the quality of the donor's information on elite capture is composed of three effects: (i) an increase in the probability of project acceptance, due to an increase in the donor's tolerance, which encourages elite capture, (ii) a change in the sensitivity of the likelihood of project acceptance to changes in the recommended project which, if $|\theta^r-\theta^t|>k$, discourages elite capture, and (iii) increased accuracy of the donor's signal and the elite's perception of it, which, if $[g(x)-f(x)]>0$ and $[g'(x)-f'(x)]<0$ for $x\in[\theta^r-k,\theta^r+k]$, encourages elite capture; and if $[g(x)-f(x)]<0$ and $[g'(x)-f'(x)]>0$ for $x\in[\theta^r-k,\theta^r+k]$, discourages elite capture.*

We know from Lemma 2 that improving the donor's outside option lowers its tolerance of project proposals that deviate from its own signal, while improving the quality of the donor's signal increases its tolerance. We can therefore expect that if the net effect of improving the donor's outside option is positive, then the net effect of improving the quality of the donor's signal is likely to be negative and vice versa (but note that the contrast is not perfect as changing the donor's quality of information also has the additional effect on the elite group's incentives, as described in Proposition 2(iii)). In the next section we provide numerical examples in which the error term in the donor's signal has a normal distribution. We show that in this case improving the donor's outside option generally reduces the level of elite capture but improving the quality of the donor's signal can increase elite capture.

[8] A sufficient condition for the function $V^e(\theta,\theta^e,\theta^t)$ to be concave is as follows.

$$\frac{\partial^2U^e(\theta-\theta^e)}{\partial\theta^2}<-\frac{\xi U^e\left(\left|\theta^t-\theta^e\right|\right)}{\left[F_\varepsilon(|\theta^e+k-\theta^t|)-F_\varepsilon(\le ft|\theta^e-k-\theta^t|)\right]}$$

for each $\theta\in S$, where

$$\xi=\max_{\theta\in S}\left\{f'_\varepsilon\left(\left|\theta+k-\theta^t\right|\right)-f'_\varepsilon\left(\left|\theta-k-\theta^t\right|\right)\right\}$$

and $S=[\theta^e,\theta^t]$ if $\theta^e<\theta^t$ and $S=[\theta^t,\theta^e]$ if $\theta^t<\theta^e$.

5.2. Discussion and illustration

The above results look counter-intuitive. The intuition suggests, indeed, that higher tolerance or laxity on the part of a donor agency should incite the elite to take advantage of it by making a project proposal closer to their own preference. This prediction is obviously correct when the elite know with certainty the information that the donor has acquired about the preference of the group targeted by the aid programme. This is the case in which the elite observe the donor's signal. The greater the tolerance of the donor regarding the extent to which the project proposal may deviate from its signal (that is, the donor's idea about what the targeted group prefers), the more the elite will choose to propose a project that departs from this signal.

However, as soon as one considers a situation in which the donor's signal is not precisely known by the elite (instead of being fixed, the domain of project acceptability is sliding along the rail of possible values of the project mix), so that the latter cannot know for sure whether their proposal will be accepted or rejected, the prediction may be invalidated. It remains true, of course, that greater tolerance of the donor means that a given project proposal is more likely to be accepted. Moreover, by proposing a project closer to their own preference the elite could be better off than before, increasing both the intrinsic utility derived from the project and the probability of its approval compared to the previous situation in which the donor was less tolerant. Yet, the important point to bear in mind is that greater tolerance of the donor manifests itself on both sides of the signal received, since the domain of project acceptance extends itself symmetrically to the right and to the left of the point corresponding to this signal. Since the probability of project acceptance is always higher in the area closer to the target group's preferred project, the effect of this extension is to create a larger potential for increasing the acceptance probability by moving closer to the target group's preferred project rather than moving in the opposite direction. Such a pro-poor move has the evident consequence of decreasing the elite's intrinsic utility derived from the project, but our result shows that the net effect may be favourable.

The argument can be easily illustrated with the help of Fig. 1. The graph shows the case in which $\theta^t = 0$ and θ^s, the signal received by the donor, follows a normal distribution with mean zero and a variance of four. Suppose that the elite's optimal recommendation is the project $\theta^s = 0.8$. The points *B* and *D* denote, respectively, the smallest and largest values of θ^s for which the donor would approve the recommendation θ^r. In this case, the donor's tolerance is the interval *BD*. The probability that the project is accepted is the surface *ABDC*.

Suppose that the donor's information improves, the variance of its signal drops down to one, and as a result its tolerance is now given by the interval *FH*. As a direct consequence, the probability that the project is accepted increases. It would become *IFHJ* if the density function did not change. This is part (i) of Proposition 2.

But with a lower variance, the density function changes. In the case that is illustrated, the probability of project acceptance further increases and becomes *EFHG*. This change corresponds to part (iii) of Proposition 2. As stated in the proposition, this effect could have had the opposite sign. To see how, imagine for instance that the starting point of our illustrative exercise is $\theta^r = 2$ instead of 0.8.

In addition, the sensitivity of the likelihood of project acceptance changes. In the initial situation, if the elite propose a project closer to θ^t, the marginal increase in the probability of project acceptance is given by *AB*–*CD*. After the improvement of the donor's information, this marginal benefit increases and becomes *EF*–*GH*. This is part (ii) of Proposition 2.

We now look at the effect of a decrease in the donor's outside option. In this case the density function does not change. The donor's tolerance increases and the probability of project acceptance increases from *ABDC* to *IFHJ*. This corresponds to part (i) of Proposition 1. The second effect is an increase in the sensitivity of the likelihood of project acceptance. Proposing a project closer to θ^t marginally raised the probability of project acceptance by *AB*–*CD*. Following the decrease in the donor's outside option, this marginal effect becomes *IF*–*JH*. This is part (ii) of Proposition 1.

We cannot say, in general, which of the countervailing effects identified in Propositions 1 and 2 would be greater. To propose a precise illustration of our argument with the help of numerical simulations, we now further specify the utility and density functions. As in Fig. 1, the noise in the donor's signal follows a normal distribution: $\varepsilon \sim N(0;\sigma^2)$. In line with Assumptions 1 and 2, we give the utility functions a quadratic form: $U^d = D - (\theta^r - \theta^t)^2$ and $U^e = E - (\theta^r - \theta^e)^2$. In this case, the tolerance parameter, *k*, is equal to $\sqrt{D - \underline{U}^d - \sigma^2}$ and the elite's optimal choice, θ^*, is unique given the values of σ^2, θ^t, θ^e, *D*, *E*, $\underline{U}^d$ and $\underline{U}^e$.

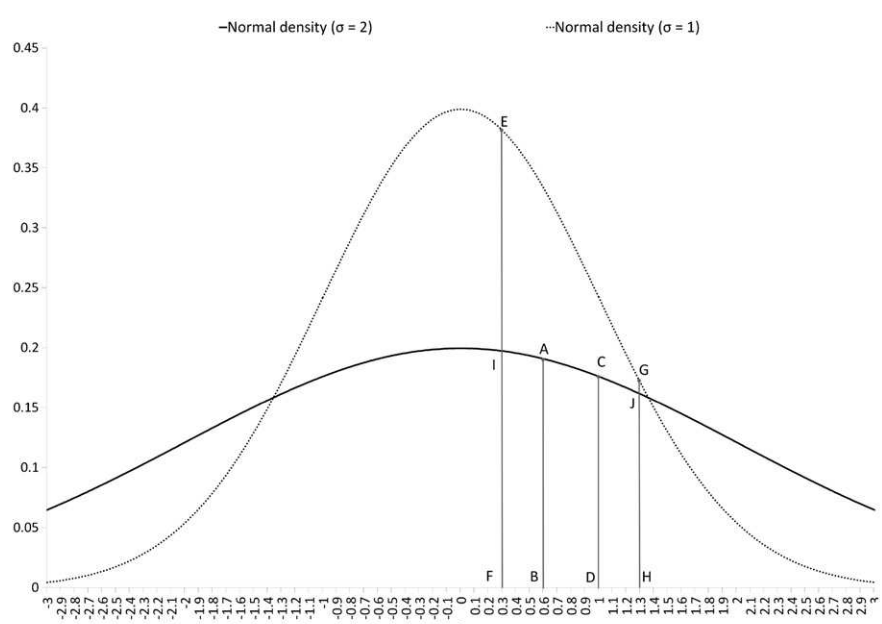

Fig. 1. How an increase in the donor's outside option and improved donor's information change the probability of project acceptance.

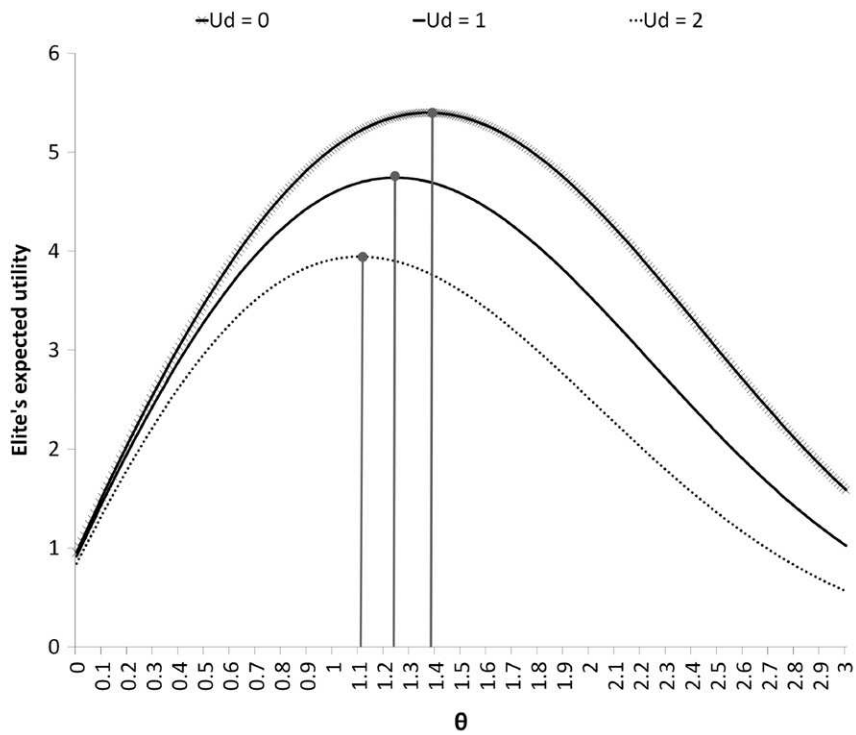

Fig. 2. Changes in the donor's outside option and the elite's expected utility.

Assume, for instance, that $\theta^t = 0$, $\theta^e = 3$, $D = 5$, $E = 10$, $\underline{U}^d = 0$ and $\underline{U}^e = 0$. Under these conditions, an increase in the donor's outside option, $\underline{U}^d$, will decrease elite capture. Thus, with $\sigma = 1$, the elite's optimal choice goes from 1.37 ($k = 2$) to 1.24 ($k = 1.73$) and to 1.11 ($k = 1.41$) when the donor's outside option increases from $\underline{U}^d = 0$ to $\underline{U}^d = 1$ and, then, to $\underline{U}^d = 2$. In short, in this example the paradox does not occur when the parametric change bears upon the donor's outside option. In fact, with the normal distribution function and quadratic utility functions, the first effect in Proposition 1 usually dominates the second effect. Note however that with other distribution functions, such as the uniform distribution function, we obtain the opposite result (Platteau and Somville, 2009). The three cases of our example are illustrated in Fig. 2.

On the other hand, the relationship between the quality of the donor's information and elite capture is non-monotonous, as expected from Proposition 2. Under the same parameter values, when $\sigma = 2$, then $k = 1$, the elite optimally choose $\theta^* \cong 1.57$. When the donor's information improves and $\sigma = 1$, then $k = 2$, and the elite optimally choose $\theta^* \cong 1.37$ closer to θ^t. If the donor's information further improves and $\sigma = 0.5$, then $k = 2.18$, the elite optimally choose $\theta^* \cong 1.53$ away from θ^t. Remarkably, when the donor obtains a very precise signal's about the poor's preference, the elite capture increases a lot. When $\sigma = 0.1$ for instance, the elite will optimally choose $\theta^* \cong 1.99$. The elite's expected utility in these four cases is drawn in Fig. 3.

In other words, it is evident that when the donor's information becomes more precise (the variance of the signal decreases) and its tolerance consequently increases as predicted by lemma (2), the elite first propose a project closer to the preferred project of the target group (the expected effect). When the quality of the signal further improves, however, the elite change tactics and propose a project that better matches their own preference (the unexpected effect). In the case of the normal distribution, it is clear that when the donor has a

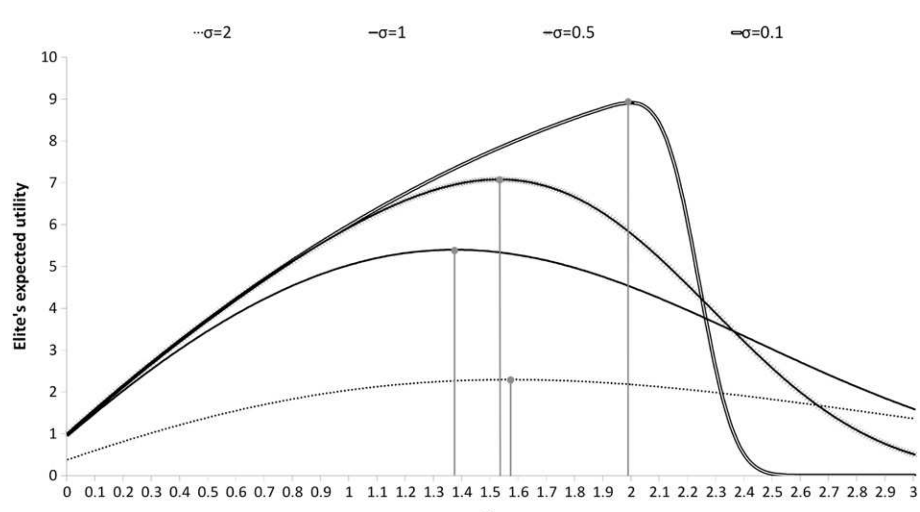

Fig. 3. Changes in the quality of the donor's information and the elite's expected utility.

very precise information, the elite capture becomes very high. Note that this non-monotonicity easily obtains with the normal distribution under other parametric assumptions.

We emphasized in the beginning of this section, that the tradeoff does not apply when the elite have perfect information about the donor's signal. This is the scenario that we solved in Section 4.2 and in which the elite always recommend a project that is just acceptable to the donor. Alternatively, imagine the situation in which the donor's signal is known to the elite, but the donor can commit to implement only a project that would correspond to his signal (or any other project of his choice). The roles of the players are interchanged: the donor suggests a project, based on his signal, and the elite accept that project or not. Our paradoxical results are then expected to arise again.

In this case, if the donor's signal is precise enough, and if the elite's outside option is very low, then the donor can find it optimal to commit to finance only a project that corresponds to his signal. Because their outside option is very low, the elite follow the donor and the project that corresponds to the signal is implemented.

However, as soon as the quality of the donor's signal deteriorates, or the elite's outside option improves, the elite risk rejecting the donor's offer. The donor and the elite are therefore in symmetric positions, compared to the game that we have solved. Now the donor faces a tradeoff between increasing the chances that the project is approved and suggesting a project closer to his signal. The same mechanisms that we described in details are at play and the paradoxical results apply.

6. Extension: updating the donor's beliefs following a project recommendation

In Sections 4 and 5, we assumed, for the sake of simplicity, that the donor does not update its beliefs regarding the preferred project of the target population after it obtains a project recommendation from the elite group. Since the project proposed by the elite is a function of θ^t and θ^e, as discussed in Section 3, there is information regarding θ^t implicit in a project proposal; and, therefore, it is possible to engage in Bayesian updating regarding θ^t using this information. Our simplifying assumption may be plausible given that such Bayesian updating would require the donor to have full knowledge about the elite group's strategy, and sophisticated use of this knowledge. Nevertheless, it is useful to verify whether the results from our preceding analysis still hold when we allow for Bayesian updating.

First, we investigate whether, when the elite group adopts the strategy represented by the function $r(\theta,\delta)$, and the donor's posterior beliefs about θ^t are consistent with $r(\theta,\delta)$, it is optimal for the donor to pursue the type of strategy described in the statement of Lemma 3.

According to Lemma 3, $r(\theta,\delta)$ is monotonic in δ. Therefore, for each θ^r and θ^t, we can find a unique value for θ^e such that $r(\theta^t, \theta^t-\theta^e)=\theta^r$. Let us denote this value of θ^e by $e(\theta^r,\theta^t)$. Let $f_{\varepsilon e}(.)$ represent the donor's beliefs about θ^e. For the donor's beliefs to be consistent with the elite strategy $r(\theta,\delta)$, we require

$$f_\varepsilon\left(\hat{\theta}^t\middle|\theta^s,\theta^r\right)=\frac{f_\varepsilon\left(\hat{\theta}^t|\theta^s\right)f_e\left(e\left(\theta^r,\hat{\theta}^t\right)\right)}{\int_{\theta^t} f_e(e(\theta^r,\theta^t)f_\varepsilon(\theta^t|\theta^s))d\theta^t}. \tag{13}$$

Eq. (13) can be interpreted as follows. After receiving the project recommendation θ^r, the donor adjusts its beliefs about the likelihood of $\hat{\theta}^t$ by the factor $f_e\left(e\left(\theta^r,\hat{\theta}^t\right)\right)$, assigning more weight to those θ^t values that, given θ^r, correspond to the more likely values of θ^e. Note that, if the donor believes that all θ^e values corresponding to θ^t values in some interval I are equally likely, then we obtain $f_e\left(e\left(\theta^r,\hat{\theta}^t\right)\right)=\int_{\theta^t\in\mathcal{I}} f_e(e(\theta^r,\theta^t))f_\varepsilon(\theta^t|\theta^s)d\theta^t$. Then, if the donor's prior probability that θ^t lies outside I is small, then $f_e\left(e\left(\theta^r,\hat{\theta}^t\right)\right)\approx\int_{\theta^t} f_e(e(\theta^r,\theta^t))f_\varepsilon(\theta^t|\theta^s)d\theta^t$, and it follows that $f_\varepsilon\left(\hat{\theta}^t|\theta^s,\theta^r\right)\approx f_\varepsilon\left(\hat{\theta}^t|\theta^s\right)$. Therefore, if the donor's prior beliefs about θ^e are 'weak', then its posterior beliefs about θ^t will be close to its prior beliefs about θ^t. If so, allowing the donor to update beliefs following a project recommendation would not substantially affect its behaviour.

More generally, the belief adjustments in Eq. (13) can lead to complex changes in posterior beliefs, such that the donor's optimal strategy need not take the form described in the statement of Lemma 3. However, the analysis is greatly simplified if the prior distribution of θ^e takes the form described in the following assumption.

Assumption 5. $\theta^e = \theta^t - \eta$ where η is a random variable with distribution $f_\eta(.)$, such that $\int x f_\eta(x)dx=0$ and $f_\eta(x)=f_\eta(-x)$.

Under Assumption 5, the donor's beliefs about θ^e are centred on its signal θ^s, and the extent to which it adjusts its beliefs about θ^t depends on how far the proposed project θ^r lies from θ^s. If θ^r is close to θ^s, this 'reinforces' the donor's signal in the sense that the posterior beliefs attach an even higher probability of θ^t being close to θ^s and θ^r than the prior beliefs, and the donor is likely to accept the project. But if θ^r is far from θ^s, the probability adjustment is likely to be negative and the donor is likely to refuse the project. In particular, we obtain the following characterisation of the donor's best response strategy.

Lemma 4. *Under Assumptions 1, 2, 3 and 5, if the elite group follows the strategy represented by the function $r(\theta,\delta)$ and the donor's posterior beliefs are given by Eq. (13), the donor's best response is to accept a project θ^r if and only if $|\theta^r-\theta^s|\le k$ for some $k>0$.*

Then, the following result follows directly from Lemmas 3 and 4.

Proposition 3. *Under Assumptions 1, 2, 3 and 5, there exists a Perfect Bayesian Equilibrium in which the elite group pursues the strategy represented by $r(\theta,\delta)$, the donor's posterior beliefs are given by Eq. (13) and the donor accepts a project θ^r if and only if $|\theta^r-\theta^s|\le k$ for some $k>0$.*

The strategies pursued by the elite and the donor in the Perfect Bayesian Equilibrium are qualitatively identical to those derived in Section 4 (although the donor's level of tolerance is not necessarily the same). In particular, following the reasoning of Lemma 2, we can show that an improvement in the donor's outside option would lower the donor's tolerance, and therefore affect the incentives of the elite group in two opposing ways, as described in Proposition 1.

For a given θ^r, an improvement in the quality of the donor's signal translates into a mean-preserving contracting of the conditional distribution $f_\varepsilon(\theta^t|\theta^s, \theta^r)$, and therefore higher expected utility for the donor. Thus, it increases the donor's tolerance as per the reasoning in Lemma 2. Therefore, the three distinct effects of improving the quality of the donor's signal described in Proposition 2 are also present when the donor engages in Bayesian updating.

7. Conclusion

Participatory development is highly vulnerable to the risk of elite capture. Among the two main forms of elite capture, embezzlement and information distortion, the latter has been best documented empirically and worked out theoretically. However, the influence of the elite is typically assumed to exert itself through the local collective decision-making process without the donor being able to constrain it. In this contribution, we have followed a different approach in which the donor pursues the explicit objective of poverty alleviation and has an imprecise idea of what the priorities of the poor look like. This idea can only be guessed by the elite. The donor also exhibits a certain degree of tolerance regarding the distance between its signal and the actual proposal made by the elite on behalf of the poor. The elite then faces a trade-off between two types of considerations: the probability of acceptance of their project proposal by the donor, on the one hand, and its degree of congruence with their own preference, on the other hand.

In this framework, a paradoxical result may obtain. An improvement in the quality of the donor's information about the poor's preference may induce the elite to propose a project that is farther away from the poor's preferred outcome. Similarly, an improvement in the donor's outside option that results, say, from reduced competition between donors for access to target communities, may end up encouraging elite capture.

The main channel through which changes in the quality of the donor's information and the donor's outside option affects the incentives for elite capture is the donor's level of tolerance of project recommendations that deviate from its own signal. We show that improving the donor's outside option, and improving the quality of the donor's information affects the donor's tolerance in opposite ways. This means that, for a given distribution function for the error in the donor's signal, if improving the donor's outside option leads to a decrease in elite capture, then improving the quality of the donor's signal is likely to *increase* elite capture and vice versa. This reasoning indicates that at least one of the paradoxical effects of changing the donor's decision parameters on the incentives for elite capture are likely to be common for any distribution function which satisfies our assumptions (Assumption 3).

We find that, in the case of a normal distribution, improving the donor's outside option generally leads to a decrease in elite capture but increasing the quality of the donor's information can lead to an *increase* in elite capture. These results indicate that, if errors in the donor's signal are normally distributed, then we should be more concerned about perverse incentives arising from improving the quality of the donor's information than from improving the donor's outside option.

It bears emphasis that this sort of paradoxical effect is not a mere curiosity arising in the context of donor–elite strategic relations. It has a much wider scope since it can be obtained in other principal–agent settings exhibiting characteristics similar to those mentioned above. Revealingly, Putterman (1987) and Putterman and Skillman (1988) have shown, in the context of sharecropping contracts, that different assumptions regarding the information available to a principal who monitors the work of a worker lead to different responses of labour effort to monitoring. In some cases, the worker will in fact exert less effort when the monitoring improves.

Since the paradox is now well understood on the theoretical plane, research effort should be devoted to gathering empirical evidence on whether and under what circumstances it arises. In particular, is mis-targeting of aid resources somewhat attributable to the sort of information distortion analysed in this paper.

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Appendix A

Proof of Lemma 1:

(i) Consider the expression

$$\int U_d\left(\left|\theta^r-\theta^t\right|\right)f_\varepsilon\left(\left|\theta^t-\theta^s\right|\right)d\theta^t = \int_{-\infty}^{\theta^r} U_d\left(\theta^r-\theta^t\right)f\left(\left|\theta^t-\theta^s\right|\right)d\theta^t + \int_{\theta^r}^{\infty} U_d\left(\theta^t-\theta^r\right)f_\varepsilon\left(\left|\theta^t-\theta^s\right|\right)d\theta^t. \quad (14)$$

Differentiating w.r.t. θ^r, we obtain

$$\int_{-\infty}^{\theta^r} U_d'\left(\theta^r-\theta^t\right)f_\varepsilon\left(\left|\theta^t-\theta^s\right|\right)d\theta^t - \int_{\theta^r}^{\infty} U_d'\left(\theta^t-\theta^r\right)f_\varepsilon\left(\left|\theta^t-\theta^s\right|\right)d\theta^t. \quad (15)$$

Thus, there are two counter-veiling effects of increasing θ^r. In the region that $\theta^t < \theta^r$, increasing θ^r increases the expected ‘distance’ between θ^r and θ^t; while, in the region that $\theta^t > \theta^r$, increasing θ^r decreases the expected ‘distance’ between θ^r and θ^t. At $\theta^r = \theta^s$, the expression in Eq. (15) becomes

$$\int_{-\infty}^{\theta^s} U_d'\left(\theta^s-\theta^t\right)f_\varepsilon\left(\theta^t-\theta^s\right)d\theta^t - \int_{\theta^s}^{\infty} U_d'\left(\theta^t-\theta^s\right)f_\varepsilon\left(\left|\theta^t-\theta^s\right|\right)d\theta^t. \quad (16)$$

Using the substitution $x = \theta^s - \theta^t$, we can show that the two integrals in Eq. (16) are exactly equal; i.e. the differential is equal to zero.

For $\theta^r < \theta^s$, the first integral is smaller in magnitude than the second integral. So, the differential is positive (recall that $U_d'(.) < 0$; therefore both integrals are negative). For $\theta^r < \theta^s$, the first integral is greater in magnitude than the second integral. So, the differential is negative. In summary, as we increase θ^r, the expected utility to the donor increases till we reach $\theta^r = \theta^s$. If we continue to increase θ^r beyond θ^s, then the expected utility decreases. So, the expected utility to the donor reaches its maximum value at $\theta^r = \theta^s$.

(ii) First, we want to show that

$$\int U_d\left(\left|\theta^t-\left(\theta^s+x\right)\right|\right)f_\varepsilon\left(\theta^t-\theta^s\right)d\theta^t = \int U_d\left(\left|\theta^t-\left(\theta^s-x\right)\right|\right)f_{epsilon}\left(\theta^t-\theta^s\right)d\theta^t. \quad (17)$$

Let $y = \theta^t - \theta^s$. Let $z = -y$. Then, the left-hand side can be written as

$$\int U_d(|y-x|)f_\varepsilon(|y|)dy = \int_{-\infty}^{x} U_d(x-y)f_\varepsilon(|y|)dy + \int_{x}^{\infty} U_d(y-x)f_\varepsilon(|y|)dy. \quad (18)$$

Similarly, the right-hand side above becomes

$$\begin{aligned}\int U_d(|y+x|)f_\varepsilon(|y|)dy &= \int_{-\infty}^{-x} U_d(-y-x)f_\varepsilon(|y|)dy + \int_{-x}^{\infty} U_d(y+x)f_\varepsilon(|y|)dy \\ &= -\int_{-\infty}^{x} U_d(z-x)f_\varepsilon(|z|)dz - \int_{x}^{\infty} U_d(-z+x)f_\varepsilon(|z|)dz \\ &= \int_{x-\infty}^{x} U_d(x-z)f_\varepsilon(|z|)dz + \int_{x}^{\infty} U_d(z-x)f_\varepsilon(|z|)dz.\end{aligned} \quad (19)$$

The expressions in Eqs. (4) and (1) are identical. Therefore, we have established Eq. (17). Then, using Eq. (17), we obtain the result that if there is some $k > 0$ such that the donor's expected utility from the project proposal $\theta^s - k$ is equal to its outside option, the same must be true for the project proposal $\theta^s + k$. Moreover, as the expected utility is increasing in θ^r for $\theta^r < \theta^s$ and decreasing in θ^r for $\theta^r > \theta^s$ (shown in part (i)), it follows that the expected utility from a proposal θ^r is equal to or above $\underline{U}^d$ if and only if $\theta^r \in [\theta^s - k, \theta^s + k]$.

(iii) Next, we wish to snow that the factor k, which is a measure of the donor's tolerance, is independent of θ^s. First, we write θ^r as $\theta^s + x$, where x may be positive or negative. We let $y = \theta^t - \theta^s$, $z = -y$. Then the expression (14) can be written as

$$\begin{aligned}\int_{-\infty}^{+\infty} U_d\left(\left|\theta^t-\left(\theta^s+x\right)\right|\right)f_\varepsilon\left(\left|\theta^t-\theta^s\right|\right)d\theta^t &= \int_{-\infty}^{+\infty} U_d(|y-x|)f_\varepsilon(|y|)dy \\ &= \int_{-\infty}^{+\infty} U_d(|z+x|)f_\varepsilon(|z|)dz.\end{aligned}$$

This last expression depends on the absolute value of x; i.e. how far is θ^r from θ^S. But it does not depend on the signal θ^s itself. Therefore, whether a particular proposal is acceptable to the donor or not depends on how far it is from the signal received by the donor, but the donor's tolerance is independent of the signal itself.

Proof of Lemma 2:(i) We define

$$\tilde{U}_d\left(\theta^t;\theta^r\right) = U_d\left(\left|\theta^r-\theta^t\right|\right)$$
$$V\left(\theta^t;\theta^r\right) = E\tilde{U}_d\left(\theta^t;\theta^r\right).$$

For $\theta^t<\theta^r$, we have $\tilde{U}_d(\theta^t;\theta^r) = U_d(\theta^r-\theta^t)$. Therefore, $\frac{\partial \tilde{U}_d}{\partial\theta^t} = -U_d'(.)$ and $\frac{\partial^2\tilde{U}_d}{\partial(\theta^t)^2} = U_d''(.)$. For $\theta^t>\theta^r$, we have $\tilde{U}_d(\theta^t;\theta^r) = U_d(\theta^t-\theta^r)$. Therefore, $\frac{\partial \tilde{U}_d}{\partial\theta^t} = U_d'(.)$ and $\frac{\partial^2\tilde{U}_d}{\partial(\theta^t)^2} = U_d''(.)$. Therefore, $\tilde{U}_d(.)$ is a concave function.

Suppose the donor has received a signal θ^s. When the signalling mechanism corresponds to the random variable $\theta^t+\varepsilon_1$, accepting a project proposal θ^r constitutes a lottery $\theta^s-\varepsilon_1$. When the signalling mechanism corresponds to the random variable $\theta^t+\varepsilon_2$, accepting the project constitutes a lottery $\theta^s-\varepsilon_2$. If the distribution of ε_1 is a mean-preserving spread of ε_2, then the lottery $\theta^s-\varepsilon_2$ second-order stochastically dominates $\theta^s-\varepsilon_1$ (Machina and Pratt, 1997; Rothschild and Stiglitz, 1970). Therefore, we obtain

$$V\left(\theta^s-\varepsilon_2;\theta^r\right)>V\left(\theta^s-\varepsilon_1;\theta^r\right).$$

It follows that k is lower when ε_1 is replaced by ε_2; i.e. when the donor's signal improves.

(ii) By construction,

$$\int U^d\left(\left|\theta^s+k\left(\underline{U}^d\right)-\theta^t\right|\right)f_t\left(\theta^t|\theta^s\right)d\theta^t \equiv \underline{U}^d.$$

We have shown, in the proof of Lemma 1, that, if $\theta^r>\theta^s$, then the expected utility of the donor is decreasing in θ^s. It follows that, if $k>0$, then the expected utility of the donor is decreasing in k. Therefore, $k\left(\underline{U}^d\right)$ is decreasing in $\underline{U}^d$.

Proof of Lemma 3: From the definition of $r(\theta,\delta)$ and Eq. (10), we obtain

$$\begin{aligned} r(\theta,\delta) &= \arg\max_{\theta^r} V^e\left(\theta^r,\theta-\delta,\theta\right) \\ &= \arg\max_{\theta^r}\left[F_\varepsilon\left(\theta^r+k-\theta\right)-F_\varepsilon\left(\theta^r-k-\theta\right)\right]U_e\left(\left|\theta^r-\theta+\delta\right|\right). \end{aligned} \tag{20}$$

From Eq. (20), we see that $V^e(\theta^r,\theta-\delta,\theta)=V^e(\theta^r+x,\theta+x-\delta,\theta+x)$ for all x. By definition, $V^e(r(\theta,\delta),\theta-\delta,\theta)\geq V^e(\theta^r,\theta-\delta,\theta)$ for all θ^r.

Therefore, $V^e(r(\theta,\delta)+x,\theta+x-\delta,\theta+x)\geq V^e(\theta^r,\theta-\delta,\theta)$ for all θ^r. Therefore, we have $r(\theta+x,\delta)=r(\theta,\delta)+x$. Therefore, $r(\theta,\delta)$ is increasing in θ.

Using Eq. (20), the marginal effect of increasing θ^r on the expected utility to the elite can be written as

$$\begin{aligned} &\left[f_\varepsilon\left(\left|\theta^r+k-\theta\right|\right)-f_\varepsilon\left(\left|\theta^r-k-\theta\right|\right)\right]U^e\left(\left|\theta^r-\theta+\delta\right|\right) \\ &+\left[F_\varepsilon\left(\left|\theta^r+k-\theta\right|\right)-F_\varepsilon\left(\left|\theta^r-k-\theta\right|\right)\right]\frac{\partial U^e\left(\left|\theta^r-\theta+\delta\right|\right)}{\partial\theta^r}. \end{aligned} \tag{21}$$

Consider, first, the case where $\theta^e<\theta^t$; i.e. $\delta>0$. If the maximisation problem has an interior solution then, at $\theta^r=r(\theta,\delta)$, we have $\theta^e<\theta^r<\theta^t$ and the expression in Eq. (11) is equal to zero; and, since $\frac{\partial U^e(|\theta^r-\theta+\delta|)}{\partial\theta^r}<0$, we have $[f_\varepsilon(|\theta^r+k-\theta|)-f_\varepsilon(|\theta^r-k-\theta|)]>0$. From Assumptions 1 and 2, $U^e(|\theta^r-\theta+\delta|)$ and $\frac{\partial U^e(|\theta^r-\theta+\delta|)}{\partial\theta^r}$ are decreasing in δ. Therefore, for $\delta'>\delta$, the marginal effect is less than zero at $\theta^r=r(\theta,\delta)$. Therefore, if $V^e(\theta^r,\theta-\delta,\theta)$ is concave in θ^r for $\theta^e<\theta^r<\theta^t$, then $r(\theta,\delta')<r(\theta,\delta)$. Therefore, $r(\theta,\delta)$ is decreasing in δ.

Next, consider the case where $\theta^e>\theta^t$; i.e. $\delta<0$. If the maximisation problem has an interior solution then, at $\theta^r=r(\theta,\delta)$, $\theta^t<\theta^r<\theta^e$ and the expression in Eq. (11) is equal to zero; and, since $\frac{\partial U^e(|\theta^r-\theta+\delta|)}{\partial\theta^r}>0$, we have $f_\varepsilon(|\theta^r+k-\theta|)-f_\varepsilon(|\theta^r-k-\theta|)<0$. From Assumptions 1 and 2, $U^e(|\theta^r-\theta+\delta|)$ is increasing in δ and $\frac{\partial U^e(|\theta^r-\theta+\delta|)}{\partial\theta^r}$ is decreasing in δ. Therefore, for $\delta'>\delta$, the marginal effect is smaller than zero at $\theta^r=r(\theta,\delta)$. Therefore, if $V^e(\theta^r,\theta-\delta,\theta)$ is concave in θ^r for $\theta^t<\theta^r<\theta^e$, then $r(\theta,\delta')<r(\theta,\delta)$. Therefore, $r(\theta,\delta)$ is decreasing in δ.

Note that

$$\begin{aligned} r(\theta,0) &= \arg\max_{\theta^r} V^e\left(\theta^r,\theta,\theta\right) \\ &= \arg\max_{\theta^r}\left[F_\varepsilon\left(\theta^r+k-\theta\right)-F_\varepsilon\left(\theta^r-k-\theta\right)\right]U_e\left(\left|\theta^r-\theta\right|\right). \end{aligned} \tag{22}$$

By Assumption 1, $U_e(|\theta^r-\theta|)$ reaches its maximum at $\theta^r=\theta$. And by Assumption 3, the expression $[F_\varepsilon(\theta^r+k-\theta)-F_\varepsilon(\theta^r-k-\theta)]$ reaches its maximum at $\theta^r=\theta$.[9]

Let $\lambda(\delta)=r(\theta,\delta)-r(\theta,0)$. Therefore, we obtain

$$\begin{aligned} r(\theta,\delta) &= r(\theta,0)+\lambda(\delta) \\ &= \theta+\lambda(\delta). \end{aligned}$$

Since $r(\theta,\delta)$ is decreasing in δ, as shown above, it must be that $\lambda'(\delta)<0$.

From the definition of $V^e(\theta^r,\theta^e,\theta^t)$, we obtain

$$V^e(\theta+x,\theta-\delta,\theta) = [F_\varepsilon(x+k)-F_\varepsilon(x-k)]U_e(|x+\delta|)$$
$$V^e(\theta-x,\theta+\delta,\theta) = [F_\varepsilon(-x+k)-F_\varepsilon(-x-k)]U_e(|-x-\delta|).$$

We can show that $[F_\varepsilon(-x+k)-F_\varepsilon(-x-k)]=[F_\varepsilon(x+k)-F_\varepsilon(x-k)]$.[10] Therefore, $V^e(\theta+x,\theta-\delta,\theta)=V^e(\theta-x,\theta+\delta,\theta)$. So, if

$$V^e\left(\theta+x^*,\theta-\delta,\theta\right)\geq V^e(\theta+x,\theta-\delta,\theta)\ \text{for all}\ x$$

it must be that

$$V^e\left(\theta-x^*,\theta+\delta,\theta\right)\geq V^e(\theta-x,\theta+\delta,\theta)\ \text{for all}\ x.$$

Therefore,

$$\begin{aligned} &r(\theta,\delta)-\theta = \theta-r(\theta,-\delta) \\ &\Rightarrow \lambda(\delta) = -\lambda(-\delta) \end{aligned}$$

Proof of Lemma 4: Using Assumption 5 and Eq. (8), we obtain

$$\theta^e = \theta^s-\varepsilon-\eta.$$

Denote by $f_{\eta\varepsilon}(.)$ the distribution of $\eta+\varepsilon$. Using Assumptions 3 and 5, we can show that $\int x f_{\eta\varepsilon}(x)dx=0$ and $f_{\eta\varepsilon}(x)=f_{\eta\varepsilon}(-x)$; i.e. the distribution has a mean of zero and is symmetric about

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[9] To see the second statement, note that $\frac{d}{d\theta^r}\left[F_\varepsilon\left(\theta^r+k-\theta\right)-F_\varepsilon\left(\theta^r-k-\theta\right)\right]=f_\varepsilon\left(\theta^r+k-\theta\right)-f_\varepsilon\left(\theta^r-k-\theta\right)-$ The expression $f_\varepsilon(\theta^r+k-\theta)-f_\varepsilon(\theta^r-k-\theta)>0$ for $\theta^r<\theta$ and $f_\varepsilon(\theta^r+k-\theta)-f_\varepsilon(\theta^r-k-\theta)<0$ for $\theta^r>0$. Therefore, $[F_\varepsilon(\theta^r+k-\theta)-F_\varepsilon(\theta^r-k-\theta)]$ reaches its maximum at $\theta^r=\theta$. Therefore, from Eq. (22), we obtain $r(\theta,0)=\theta$.

[10] To see this, note that
$$\begin{aligned} F_\varepsilon(-x+k)-F_\varepsilon(-x-k) &= \int_{-x-k}^{-x+k} f_\varepsilon\left(\theta^t\right)d\theta^t \\ &= -\int_{x+k}^{x-k} f_\varepsilon\left(\hat\theta^t\right)d\hat\theta^t \ \text{using the substitution}\ \hat\theta^t=-\theta^t \\ &= \int_{x-k}^{x+k} f_\varepsilon\left(\hat\theta^t\right)d\hat\theta^t \\ &= F_\varepsilon(x+k)-F_\varepsilon(x-k). \end{aligned}$$

the mean. Therefore, $f_e(\theta^e|\theta^s) = f_{\eta\varepsilon}(\theta^s - \theta^e)$. Then, we show that the posterior beliefs of the donor are 'symmetric' about θ^s in the sense that

$$f_t(\theta^s + x|\theta^s, \theta^s + y) = f_t(\theta^s - x|\theta^s, \theta^s - y) \tag{23}$$

for any x,y. The left-hand side of Eq. (23) can be written as

$$\begin{aligned} &\frac{f_\varepsilon(|x|)f_{\eta\varepsilon}(e(\theta^s + y, \theta^s + x) - \theta^s)}{\int_\theta f_{\eta\varepsilon}(e(\theta^s + y, \theta) - theta^s) f_\varepsilon(|\theta - \theta^s|)d\theta} \\ &= \frac{f_\varepsilon(|x|)f_{\eta\varepsilon}(|e(\theta^s + y, \theta^s + x) - \theta^s|)}{\int_{-\infty}^{+\infty} f_{\eta\varepsilon}(||e(\theta^s + y,\ eta^s + z) - \theta^s|) f_\varepsilon(|z|)dz} \end{aligned} \tag{24}$$

where we use the substitution $z = \theta - \theta^s$. Using Lemma 3, we can show that[11]

$$|e(\theta^s - y, \theta^s - x) - \theta^s| = |e(\theta^s - y, \theta^s - x) - \theta^s|.$$

Therefore, the expression in Eq. (24) can be written as

$$\begin{aligned} &\frac{f_\varepsilon(|x|)f_{\eta\varepsilon}(|e(\theta^s - y, \theta^s - x) - \theta^s|)}{\int_{-\infty}^{+\infty} f_{\eta\varepsilon}(|e(\theta^s - y, 0a^s - z) - \theta^s|) f_\varepsilon(|z|)dz} \\ &= \frac{f_\varepsilon(|x|)f_{\eta\varepsilon}(e(\theta^s - y, \theta^s - x) - \theta^s)}{\int_{-\infty}^{+\infty} f_{\eta\varepsilon}(|e(\theta^s - y,\ eta') - \theta^s|) f_\varepsilon(\theta' - \theta^s)d\theta'} \\ &= f_t(\theta^s - x|\theta^s, \theta^s - y) \end{aligned}$$

where we use the substitution $\theta' = \theta^s - z$. Thus, the donor's posterior beliefs are 'symmetric' about θ^s in the sense of Eq. (23). Then, we can show that

$$EU^d\left(\theta^s + y - \theta^t\right) = EU^d\left(\theta^s - y - \theta^t\right).$$

That is, the donor receives the same expected utility from the projects $\theta^s + y$ and $\theta^s - y$. Therefore, if the donor accepts the project recommendation for $\theta^r \in [\theta^s - k, \theta^s]$, then the donor also accepts it for $\theta^r \in [\theta^s, \theta^s + k]$.

Furthermore, we can show that, if $\varepsilon > 0$, for $\theta^r > \theta^s$ the distribution $\int_\infty^x f_\varepsilon(\theta^t|\theta^s, \theta^r)d\theta^t$ first-order stochastically dominates $\int_\infty^x f_\varepsilon(\theta^t|\theta^s, \theta^r + \varepsilon)d\theta^t$, and for $\theta^r < \theta^s$ the distribution $\int_{-\infty}^x f_\varepsilon(\theta^t|\theta^s, \theta^r)d\theta^t$ first-order stochastically dominates $\int_{-\infty}^x f_\varepsilon(\theta^t|\theta^s, \theta^r - \varepsilon)d\theta^t$. Then, using Lemma 1, we obtain the result that $\int U^d(|\theta^r - \theta^t|)f_\varepsilon(\theta^t|\theta^s, \theta^r)d\theta^t$ is increasing in θ^r for $\theta^r < \theta^s$ and decreasing in θ^r for $\theta^r > \theta^s$. Therefore, there exists an interval $[\theta^s - k, \theta^s + k]$ such that the donor accepts a project recommendation θ^r if and only if $\theta^r \in [\theta^s - k, \theta^s + k]$.

[11] To see this, note that, by construction,

$$e\left(\theta^r, \theta^t\right) = \theta^t - \lambda^{-1}\left(\theta^r - \theta^t\right).$$

Using Lemma 3, we have $\lambda(-\delta) = \lambda(\delta)$. Let $y = -\lambda(\delta)$. Then, we can show that $\lambda^{-1}(-y) = -\lambda^{-1}(y)$. Therefore,

$$\begin{aligned} &e(\theta^s + y, \theta^s + x) = \theta^s + x - \lambda^{-1}(y - x) \\ &\Rightarrow -e(\theta^s - y, \theta^s - x) - \theta^s = x + \lambda^{-1}(x - y). \end{aligned}$$

On the other hand,

$$\Rightarrow \theta^s - e(\theta^s - y, \theta^s - x) = x + \lambda^{-1}(x - y).$$

Therefore,

$$e(\theta^s + y, \theta^s + x) - \theta^s = \theta^s - e(\theta^s - y, \theta^s - x).$$

Appendix B

4. Proof of Proposition 1:

We assume that the elite's optimal choice problem has an interior solution. From the discussion in Section 3, the effect of a marginal increase in θ^r on the expected utility of the elite is given by the following expression:

$$\begin{aligned} &\left[f_{\varepsilon\varepsilon}\left(\theta^r + k - \theta^t\right) - f_{\varepsilon\varepsilon}\left(\theta^r - k - \theta^t\right)\right]U^e(\theta^r - \theta^e) \\ &+ \left[F_\varepsilon\left(\theta^r + k - \theta^t\right) - F_\varepsilon\left(\theta^r - k - \theta^t\right)\right]\frac{\partial U^e}{\partial \theta^r} \end{aligned}. \tag{25}$$

By Lemma 2, k is decreasing in $\underline{U}^d$. Therefore, to analyse how the elite's optimal project proposal changes with $\underline{U}^d$, it suffices to consider how the expression in Eq. (25) changes with k. Suppose, first, that $\theta^e < \theta^t$. Then, as argued in Section 3, we must have $\theta^e < \theta^r < \theta^t$. The probability of project acceptance, as represented by $[F_\varepsilon(|\theta^r + k - \theta^t|) - F_\varepsilon(|\theta^r - k - \theta^t|)]$, increases with k. From Eq. (25), we see that this raises the marginal *loss* in utility to the elite of deviating from θ^e. By Assumption 3, $f_{\varepsilon\varepsilon}(|\theta - \theta^t|)$ is increasing in θ for $\theta < \theta^t$. Therefore, if $\theta^r < \theta^t - k$, the expression $[f_{\varepsilon\varepsilon}(|\theta^r + k - \theta^t|) - f_{\varepsilon\varepsilon}(|\theta^r - k - \theta^t|)]$ is increasing in k. From Eq. (25), it is evident that this raises the *reward* to the elite (in the form of a higher probability of project acceptance) from choosing a higher value for θ^r (i.e. choosing θ^r closer to θ^t). Therefore, increasing $\underline{U}^d$ and decreasing k has two countervailing effects on the optimal choice of the elite. [If $\theta^r > \theta^t - k$, then the second effect is ambiguous].

If $\theta^e > \theta^t$, then, we must have $\theta^t < \theta^r < \theta^e$. The probability of project acceptance, as represented by $[F_\varepsilon(|\theta^r + k - \theta^t|) - F_\varepsilon(|\theta^r - k - \theta^t|)]$, increases with k. From Eq. (25), we see that this raises the marginal *gain* in utility to the elite of choosing a proposal closer to θ^e. By Assumption 3, $f_{\varepsilon\varepsilon}(|\theta - \theta^t|)$ is decreasing in θ for $\theta > \theta^t$. Therefore, if $\theta^r > \theta^t + k$, the expression $[f_{\varepsilon\varepsilon}(|\theta^r + k - \theta^t|) - f_{\varepsilon\varepsilon}(|\theta^r - k - \theta^t|)]$ is decreasing in k. From Eq. (25), it is evident that this lowers the *cost* to the elite (in the form of a lower probability of project acceptance) from choosing a higher value for θ^r (i.e. choosing θ^r further from θ^t). Therefore, once again, increasing $\underline{U}^d$ and decreasing k has two countervailing effects on the optimal choice of the elite. [If $\theta^r < \theta^t + k$, then the second effect is ambiguous.]

5. Proof of Proposition 2: Suppose that the donor's initial signalling mechanism corresponds to the random variable $\theta^t + \varepsilon_1$, and that this is replaced by the improved signal $\theta^t + \varepsilon_2$; and ε_1 is a mean-preserving spread of ε_2. Let us denote by $f_\varepsilon(.)$ and $g(.)$ the probability distribution functions, and by $F(.)$ and $G(.)$ the cumulative distribution functions, for ε_1 and ε_2 respectively.

(i) & (ii): According to Lemma 2, an improvement in the donor's signal from $\theta^t + \varepsilon_1$ to $\theta^t + \varepsilon_2$ leads to an increase in the donor's tolerance, as measured by k. The proof of Proposition 1 identifies two distinct effects of elite capture from a change in k. Therefore, an improvement in the donor's signal results in these same effects: (i) an increase in the probability that any proposed project is accepted, which encourages elite capture; and (ii) a change in the sensitivity of the probability of project acceptance to changes in the recommended project, which, if $|\theta^r - \theta^t| > k$, encourages elite capture.

(iii) Suppose $[g(x) - f(x)] > 0$ and $[g'(x) - f'(x)] < 0$ for $x \in [\theta^r - k, \theta^r + k]$, where θ^r denotes the elite's recommended project, and k the donor's tolerance, under the initial distribution $f_\varepsilon(.)$. Then,

$$\left[G\left(\left|\theta^r + k - \theta^t\right|\right) - G\left(\left|\theta^r - k - \theta^t\right|\right)\right] > \left[F\left(\left|\theta^r + k - \theta^t\right|\right) - F\left(\left|\theta^r - k - \theta^t\right|\right)\right]$$

and

$$\left[g\left(\left|\theta^r + k - \theta^t\right|\right) - g\left(\left|\theta^r - k - \theta^t\right|\right)\right] < \left[f\left(\left|\theta^r + k - \theta^t\right|\right) - f\left(\left|\theta^r - k - \theta^t\right|\right)\right].$$

Therefore, given θ^r and k, the left-hand side of Eq. (11) is negative under the new distribution $g(.)$. Then, if the elite's objective function $V(\theta,\theta^e,\theta^t)$ is concave, the optimal choice corresponding to the signalling mechanism $\theta^t + \varepsilon_2$ is closer to θ^e; i.e. the extent of elite capture is greater.

If $[g(x) - f(x)] < 0$ and $[g'(x) - f'(x)] > 0$ for $x \in [\theta^r - k, \theta^r + k]$, then

$$\left[G\left(\left|\theta^r + k - \theta^t\right|\right) - G\left(\left|\theta^r - k - \theta^t\right|\right)\right] < \left[F\left(\left|\theta^r + k - \theta^t\right|\right) - F\left(\left|\theta^r - k - \theta^t\right|\right)\right]$$

and

$$\left[g\left(\left|\theta^r + k - \theta^t\right|\right) - g\left(\left|\theta^r - k - \theta^t\right|\right)\right] > \left[f\left(\left|\theta^r + k - \theta^t\right|\right) - f\left(\left|\theta^r - k - \theta^t\right|\right)\right].$$

Therefore, given θ^r and k, the left-hand side of Eq. (11) is positive under the new distribution $g(.)$. Then, if the elite's objective function $V(\theta,\theta^e,\theta^t)$ is concave, the optimal choice corresponding to the signalling mechanism $\theta^t + \varepsilon_2$ is closer to θ^t; i.e. the extent of elite capture is smaller.

References

Abraham, A., Platteau, J.P., 2004. Participatory development: where culture creeps in. Cult. Public Action 210–233.

Araujo, M.C., Ferreira, F.H., Lanjouw, P., Özler, B., 2008. Local inequality and project choice: theory and evidence from Ecuador. J. Public Econ. 92, 1022–1046.

Austen-Smith, D., 1994. Strategic transmission of costly information. Econometrica 62, 955–963.

Baird, S., McIntosh, C., Özler, B., 2011. The regressive demands of demand-driven development. The World Bank, Policy Research Working Paper Series, p. 5883.

Ban, R., Gupta, M.D., Rao, V., 2010. The political economy of village sanitation in South India: capture or poor information? J. Dev. Stud. 46 (4), 685–700.

Banerjee, A., Banerji, R., Duflo, E., Glennerster, R., Khemani, S., 2008. Pitfalls of participatory programs: evidence from a randomized evaluation in education in India. CEPR. DP6781.

Bardhan, P., Mookherjee, D., 2000. Capture and governance at local and national levels. Am. Econ. Rev. 90, 135–139.

Bardhan, P., Mookherjee, D., 2005. Decentralizing antipoverty program delivery in developing countries. J. Public Econ. 89, 675–704. http://dx.doi.org/10.1016/j.jpubeco.2003.01.001 (cornell - ISPE Conference on Public Finance and Development).

Bardhan, P., Mookherjee, D., 2006. Decentralisation and accountability in infrastructure delivery in developing countries. Econ. J. 116, 101–127. http://dx.doi.org/10.1111/j.1468-0297.2006.01049.x.

Bardhan, P., Mitra, S., Mookherjee, D., Sarkar, A., 2008. Political Participation, Clientelism and Targeting of Local Government Programs: Analysis of Survey Results from Rural West Bengal, India. Discussion Paper, 171. Institute of Economic Development (IED), Department of economics, Boston University.

Besley, T., Pande, R., Rao, V., 2005. Participatory democracy in action: survey evidence from South India. J. Eur. Econ. Assoc. 3.

Bierschenk, T., Chauveau, J., De Sardan, J., 2000. Courtiers en développement: les villages africains en quête de projets. Karthala.

Bjorkman, M., Svensson, J., 2009. Power to the people: evidence from a randomized field experiment on community-based monitoring in Uganda. The Quarterly Journal of Economics 124 (2), 735–769.

Blair, H., 2000. Participation and accountability at the periphery: democratic local governance in six countries. World Dev. 28, 21–39. http://dx.doi.org/10.1016/S0305-750X(99)00109-6.

Chabal, P., Daloz, J., 1999. Africa Works: Disorder as Political Instrument. Indiana University Press.

Conning, J., Kevane, J., 2002. Community based targeting mechanisms for social safety nets. World Dev. 30 (3), 375–394.

Crawford, V.P., Sobel, J., 1982. Strategic information transmission. Econometrica 50, 1431–1451.

de Haan, A., Holland, J., Kanji, N., 2002. Social funds: an effective instrument to support local action for poverty reduction? J. Int. Dev. 14.

Esman, M., Uphoff, N., 1984. Local Organizations: Intermediaries in Rural Development. Cornell University Press.

Eversole, R., 2003. Managing the pitfalls of participatory development: some insight from Australia. World Dev. 31 (5), 781–795.

Galasso, E., Ravaillon, M., 2005. Decentralized targeting of an antipoverty program. J. Public Econ. 89, 705–727.

Guéneau, M., Lecomte, B., 1998. Sahel: les paysans dans les marigots de l'aide. Harmattan.

Harilal, K., Sanu George, M., 2000. Prioritisation in local-level planning: the Kerala experience. International Conference on Democratic Decentralisation, Thiruvananthapuram.

Krishna, V., Morgan, J., 2001. A model of expertise. Q. J. Econ. 116, 747–775.

Krishna, V., Morgan, J., 2004. The art of conversation: eliciting information from experts through multi-stage communication. J. Econ. Theory 117, 147–179.

Kumar, S., 2002. Does participation in common pool resource management help the poor? A social cost–benefit analysis of joint forest management in Jharkhand, India. World Dev. 30, 763–782. http://dx.doi.org/10.1016/S0305-750X(02)00004-9.

Labonne, J., Chase, R.S., 2009. Who is at the wheel when communities drive development? Evidence from the Philippines. World Dev. 37 (1), 219–231. http://dx.doi.org/10.1016/j.worlddev.2008.05.006.

Laurent, P., Singleton, M., 1998. Une association de développement en pays Mossi: le don comme ruse. Karthala Paris.

Machina, M., Pratt, J., 1997. Increasing risk: some direct constructions. J. Risk Uncertain. 14, 103–127. http://dx.doi.org/10.1023/A:1007719626543.

Mansuri, G., Rao, V., 2012. Localizing Development: Does Participation Work? World Bank Publications.

Mosse, D., 1997. The symbolic making of a common property resource: history, ecology and locality in a tank-irrigated landscape in South India. Dev. Chang. 28, 467–504.

Mosse, D., 2001. People knowledge, participation and patronage: operations and representations in rural development. In: Cooke, B., Kothari, U. (Eds.), Participation: The New Tyranny?. Zed Books, pp. 16–35.

Nair, G.N.D., 2000. People's planning in Kerala: a case study of two village Panchayats. Discussion Paper N.16. KRPLLD, Thiruvananthapuram.

Nygren, A., 2005. Community-based forest management within the context of institutional decentralization in Honduras. World Dev. 33, 639–655. http://dx.doi.org/10.1016/j.worlddev.2004.11.002.

Olken, B.A., 2007. Monitoring corruption: evidence from a field experiment in Indonesia. J. Polit. Econ. 115 (2), 200–249.

Platteau, J.P., 2009. Information distortion, elite capture, and task complexity in decentralised development. In: Ahmed, E., Brosio, G. (Eds.), Does decentralisation Enhance Service Delivery and Poverty Reduction?. Edward Elgar, Cheltenham, UK, and Nothampton, USA. chapter in E. Ahmed and G. Brosio, pp. 23–72 (Does decentralisation Enhance Service Delivery and Poverty Reduction?).

Platteau, J.P., Abraham, A., 2002. Participatory development in the presence of endogenous community imperfections. J. Dev. Stud. 39 (2), 104–136.

Platteau, J.P., Gaspart, F., 2003. The risk of resource misappropriation in community-based development projects. World Dev. 31 (10), 1687–1703. http://dx.doi.org/10.1016/S0305-750X(03)00138-4.

Platteau, J.P., Somville, V., 2009. Elite capture through information distortion: uniformly distributed signal. Working Papers 1104. Department of Economics, University of Namur.

Putterman, L., 1987. The incentive problem and the demise of team farming in China. J. Dev. Econ. 26, 103–127. http://dx.doi.org/10.1016/0304-3878(87)90054-X.

Putterman, L., Skillman, G., 1988. The incentive effects of monitoring under alternative compensation schemes. Int. J. Ind. Organ. 6, 109–119. http://dx.doi.org/10.1016/0167-7187(88)90009-4.

Rao, V., Ibáñez, A.M., 2005. The social impact of social funds in Jamaica: a "participatory econometric" analysis of targeting, collective action, and participation in community-driven development. J. Dev. Stud. 41 (5), 788–838. http://dx.doi.org/10.1080/00220380500145297.

Reinikka, R., Svensson, J., 2005. Fighting corruption to improve schooling: evidence from a newspaper campaign in Uganda. J. Eur. Econ. Assoc. 3, 259–267. http://dx.doi.org/10.1162/jeea.2005.3.2-3.259 (arXiv:http://www.mitpressjournals.org/doi/pdf/10.1162/jeea.2005.3.2-3.259).

Rosenzweig, M., Foster, A., 2003. Democratization, decentralization and the distribution of local public goods in a poor rural economy. BREAD Working Paper N° 10.

Rothschild, M., Stiglitz, J.E., 1970. Increasing risk: I. A definition. J. Econ. Theory 2, 225–243. http://dx.doi.org/10.1016/0022-0531(70)90038-4.

Tembo, F., 2003. Participation, Negotiation and Poverty, Encountering the Power of Images Designing Pro-Poor Development Programmes. Ashgate Pub Ltd.

Werker, E., Ahmed, F.Z., 2008. What do nongovernmental organizations do? J. Econ. Perspect. 22 (2), 73–92. http://dx.doi.org/10.1257/jep.22.2.73.