Governance in Decentralized Development Aid Programs

Jean-Philippe Platteau and Frédéric Gaspart[1]

Centre for Research on the Economics of Development (CRED)
Faculty of Economics
Rempart de la Vierge, 8 B-5000 Namur Belgium
Email address of the contact person: jean-philippe.platteau@fundp.ac.be
(Fax: 32-81-724840)

Abstract: Largely as a response to critiques of top-down development and of a growing awareness of the low effectiveness of aid absorption in poor countries, the international donor community has recently adopted with enthusiasm and determination a new approach to fight poverty, called the community-based development approach (CBD). Such an abrupt shift in aid strategies is questionable, not because the approach is wrong (the opposite is actually the case), but because massive injections of aid funds in CBD projects, the entry into the field of numerous agencies with little or no experience in participatory development, as well as the pressing need for quick and visible results, threaten to undermine its effectiveness in reducing poverty. The cause for worry comes from the 'elite capture' problem that risks deflecting a large portion of the resources devoted to CBD into the hands of powerful groups dominating target communities. On the basis of a game-theoretical model, the main aim of the paper is to discuss the use of sequential and conditional disbursement procedures as a way of surmounting such a problem, and to examine how the share of CBD aid reaching the poor is influenced by various elements of the aid environment, including the pressure of competition among donor agencies and the availability of aid funds. Multilateral reputation mechanisms and intra-community competition for leadership are also assessed as possible alternatives to sequential disbursement procedures.

Keywords: participatory development, conditional transfers, elite capture, aid effectiveness

June 2004

[1] Our gratitude goes to all those who made useful remarks and suggestions in the course of seminar presentations of this paper, in particular, to François Bourguignon, Louis Hotte, Marcel Fafchamps, Dirk Van de Gaer, and Jan Gunning.

1. Introduction

Of late, there has been growing concern about weak aid effectiveness and low absorption capacity of poor countries (Boone, 1996; Alesina and Dollar, 2000; Burnside and Dollar, 2000; Isham and Kaufmann, 2000; Easterly *et al.*, 2003; Collier and Dollar, 2004). This results both in low rates of aid disbursement[2], and in low effectiveness of aid actually disbursed. Regarding the latter consequence, Svensson (2000, 2003) and Kanbur (forthcoming) have argued that, when conditions are attached to an aid program (such as the requirement of reform efforts in structural adjustment programs), money tends to be disbursed irrespective of whether these conditions have been fulfilled or not. According to Svensson (2003), the bias towards disbursing committed funds to the ex ante designated recipient irrespective of its performance, is caused by a 'budget-pressure problem' arising from the high cost of not disbursing the money allocated. To some extent at least, such kind of problems, it may be pointed out, prevent low aid effectiveness from inducing still lower rates of aid disbursement.

The main contention of this paper is that the problem of weak aid effectiveness due to lax implementation of conditionality may also undermine programs of participatory or decentralized development. In particular, problems of corruption and opportunistic behavior do not disappear because aid is channelled through local levels. There is no reason to think that patronage is less present at those levels than at the top of the government's hierarchy. As a matter of fact, local leaders are typically enmeshed in patronage webs that go up the whole ladder linking the periphery to the center. Contrary to an idealized view accrediting everything that is local with 'naturally democratic' qualities (Watson, 2003: 299), communities or municipalities may actually be more vulnerable to capture by local elites, because local power groups can easily collude beyond the control of higher-level institutions and the attention of the media (Bardhan, 2002: 192-94; Leonard and Leonard, 2004: 62).

This is an important consideration at a time when most bilateral and multilateral aid organizations have started to include participatory elements in the design of their large-scale development assistance programs, or to channel substantial amounts of aid money through international or local Non-Governmental Organizations (Stiles, 2002; Brett, 2003). The move to put participation and empowerment of the poor squarely on the agenda is especially noticeable in the case of the World Bank which has made it one of the cornerstones of its Comprehensive Development Framework. This shift of approach is duly reflected in the World Development Report 2000/2001 ("Attacking Poverty") and in the massive increase in the amount lent by the Bank for community-based development (henceforth labeled CBD) from $325 million in 1996 to a conservatively estimated figure of $2 billion in 2003 (Mansuri and Rao, 2003).

Using the 'political economy' approach, economists have explored the trade-off between vulnerability of local organizations to the risk of elite capture, on the one hand, and their informational advantages (they are assumed to have a better knowledge of the prevailing local conditions and a better ability to enforce rules, monitor behaviour, and verify actions related to interventions), on the other hand. This is with a view to identifying important determinants of the relative desirability of decentralised versus centralised systems of service

---

[2] Over the 1990s, ODA commitments of the European Union exceeded gross disbursements by more than US$1.6 billion each year, peaking at US$2.2 billion in 1994 (Heller and Gupta, 2002: 137). In particular, in 1996-97, £4.5m of the budget of DFID (Department For International Development, UK) for Africa was unallocated. In 2000-01, that rose to £18m (*The Economist*, November 2nd-8th 2002, p. 39)!

provision and delivery (Bardhan and Mookherjee, 1999, 2000a, 2000b; Foster and Rosenzweig, 2002; Ravallion and Galasso, forthcoming). One critical determinant which these works have highlighted is the extent of elite capture at local level relative to that occurring at central level, which is itself dependent on the degree of relative inequality at local level.

Our paper will not pursue this line of inquiry but will instead focus on ways to improve CBD performances from a poverty alleviation perspective. Until the rural poor are sufficiently empowered to effectively participate in decision-making and claim their rightful dues, the elite capture problem is, indeed, bound to seriously undermine the capacity of CBD programs to attain their objective. Participatory approaches may even "reinforce the very structures of unequal privilege they seek to upset" (Ribot, 2000: 33). If no measures are taken to mitigate the elite capture problem, such approaches will fall far short of the high expectations placed on it by the international donor community, and cause a lot of disillusionment in the near future.

In fact, we do not know whether CBD is more or less cost-effective than conventional top-down approaches. Empirical evidence, as it emerges from several recent surveys, turns out to be unimpressive, therefore calling for great caution. And the conclusion does not change when we consider whatever (little) evidence is available about the experiences of NGOs, which have pioneered the participatory approach to development (Brett, 2004; Carroll 1992; Edwards and Hulme, 1996; White and Eicher 1999; Conning and Kevane, 2002; Bardhan, 2002; Mansuri and Rao, 2003; Platteau, 2004). It is true that, when different systems of channelling resources are being compared, we must keep in mind that they may not have achieved their maximum potential under the prevailing conditions. Even though this qualification holds true for both centralised and decentralised development programs, our attention will be limited to ways of enhancing the potential of the latter approach only.

Moreover, our emphasis is on CBD projects supported by foreign donor agencies and not on fiscal decentralisation programs whereby municipalities or local governments receive regular tax transfers from a central state. The problem of elite capture is especially difficult to solve in the case considered. Indeed, in so far as they are guided by the objective of self-sustainability, donors want their financial contributions to be of limited duration: aid flows are aimed at making rural communities eventually self-supporting. Reputation effects are thwarted in such a framework characterized by finitely repeated interactions between donor agencies and target communities, unlike what obtains under fiscal decentralization programs where the number of rounds played is theoretically endless.[3] In the absence of democratic control by the intended beneficiaries, some device or mechanism must be in existence to complement the policing role of aid agencies through aid conditionality. It is necessary that

[3] As we know from the Folk Theorem, however, this does not mean that such programs are invulnerable to the risk of elite capture. Commenting on the Indian experience with village-level democracy (*Panchayati Raj*), Ajay Mehta thus comments: "Despite significant allocation of resources and the creation of institutions for self-governance, these interventions have not succeeded in either empowering the poor or enhancing their well-being. If anything, they have strengthened the ability of more powerful and more affluent segments of society to control and co-opt the poor to serve their interests" (Mehta, 2000: 16). Even when they are sponsored by and belonging to the community of poor peasants, most of the elected representatives prove unable to make the village councils and the government bodies more responsive to the needs of the poor. Their election actually tends "to reduce the ties of horizontal solidarity among rural people and to reinforce vertical ties of dependency with powerful patrons and power brokers" (ibidem: 17-18). For other, similar, examples, see Platteau, 2004.

this mechanism confers on the poor some measure of bargaining strength without which they would be completely helpless vis-à-vis the local elite.

At equilibrium, opportunistic local leaders embezzle a positive amount of aid money. Yet, we are interested in knowing how the share of this money that ultimately reaches the grassroots is influenced by various factors, including the preferences of the donor agency, the effectiveness of the fraud detection technology, the fixed costs required to establish links with a target community, and characteristics of the aid environment, more specifically the degree of competition prevailing in the "aid market". The key result is that pushing CBD too far too quickly is self-defeating. In other words, by rushing to help the poor in the hope of achieving rapid results, donor agencies will end up reaching them less effectively. This is because donors' impatience drives them not only to skip the crucial steps of empowering the poor, but also to underutilize conditional transfer mechanisms. On the other hand, assuming that the conditions are favourable to an effective use of the conditionality mechanism, the hope may be entertained that the poor will gradually learn how to assert their rights and preferences, and how to make their elites accountable to them. If such learning effects are at play, resorting to the conditionality mechanism may become eventually unnecessary.

The outline of the paper is as follows. Section 2 starts by telling a rich story of CBD of which one of the authors (J.P. Platteau) has got first-hand knowledge through direct experience. The story allows us to gain profound insights into the nature of the problem of misappropriation by local elites of externally provided funds, and will serve as a major inspiration for the ensuing theoretical exercise. Thereafter, the theme is pursued by drawing attention to the pervasive presence of 'development brokers' who come into being encouraged by the lenient practices of many donor agencies. Partly building on these insights, Section 3 considers the possibility of a leader-disciplining mechanism using sequential and conditional disbursement of aid funds in the context of decentralized bilateral relationships of limited duration. Section 4 proceeds by proposing a sequential game-theoretical model depicting how such a mechanism operates when supply of aid funds is scarce and donor agencies behave as local monopolies. Comparative-static results are derived and interpreted in Section 5. Section 6 discusses the alternative case in which supply of CBD aid is abundant and monopolistic competition characterizes the "market for aid". It is argued that alleviating poverty is more difficult in this aid environment.

Taking stock of the inherent limitations of bilateral reputation mechanisms, Section 7 examines the feasibility of more sophisticated, multilateral mechanisms whereby information about malefactors is circulated and acted upon within the donor community. The potential role of the ultimate purveyors of aid funds, as distinct from aid operating agencies, is assessed in this new context. Section 8 briefly discusses the possibility for foreign donors to rely on competition between local leaders, rather than on fraud detection and sanction mechanisms, in order to better reach the poor. Finally, Section 9 summarizes the main findings of the paper.

2. Elite Capture at Local Level

A Case Study from West Africa

In the late years of the 20th century, a Western European development NGO (whose identity is not disclosed for the sake of discretion) established a relationship with a village association in a Sahelian country. This association, which is a federation of several peasant unions, had been initiated by a young and dynamic school teacher, the son of a local chief. The NGO decided to follow a gradual participatory approach consisting of strengthening the association institutionally before channeling financial resources to it. This decision was the

outcome of a carefully worked out diagnosis. It brought to light important weaknesses of the partner association that had to be corrected before genuine collaboration could take place: proclivity to view aid agencies as purveyors of money which can be tapped simultaneously, lack of analysis of local problems and of strategic vision for future action, loose and undemocratic character of the association (ill-defined objectives, ill-defined roles and responsibilities of the office bearers, absence of internal rules and reporting procedures, etc.).

After two years during which institutional support was provided in the form of guidance to improve the internal functioning of the partner association and to help define development priorities and the best means to achieve them, funds were made available for different types of investment. Within the limits of the budget set for each prioritized line of investment, the association could choose the project deemed most useful. A special committee was established to prepare rules regarding the use of the budget and enforce them. In this way, the group could hopefully appropriate the process of decision-making, preparation of project proposals and programming of the activities involved (all aspects traditionally undertaken by the foreign donor agencies). Continued support at different levels (technical, administrative, organizational, and methodological) was found necessary to help in the effective implementation of the different projects.

In spite of all these efforts to strengthen the partner association institutionally, things turned out badly. Thanks to the collaboration of two active members of the General Assembly (actually two animators) and the local accountant, the foreign NGO discovered serious financial and other malpractices committed by the main leader under the form of over-invoicing and falsifying of accounts. It reacted by calling on the local committee to sanction these manifest violations of the rules, yet at its great surprise no punishment was meted out and the general assembly even re-elected their leader in open defiance of its request. The two dissident animators were blamed for being driven by jealousy and envy, while the accountant was fired. Here is a clear illustration of the support that poor people are inclined to give to an elite member on the ground that they have benefited from his leadership efforts. That he appropriated to himself a disproportionate share of the benefits of the aid program is considered legitimate by most of them. They indeed think that without his efforts their own situation would not have improved at all. In particular, he created the village association which had to be formed in order to be eligible for external assistance.

In a context where the ability to establish contact and to deal with external sources of funding is concentrated in a small elite group, the bargaining strength of common people is inevitably limited, hence their ready acceptance of highly asymmetric patterns of distribution of programs' benefits. If the intervention of the elite results in an improvement of the predicament of the poor, however small is the improvement, the latter tend to be thankful to their leader(s): the new outcome represents a Pareto improvement over the previous situation and this is what matters after all. To put it in another way, appropriation of a large share of benefits by the elite is considered legitimate by commoners if they think that were it not for the elite's effort and initiative these benefits would simply not have occurred. In the above example, it is thus revealing that the ordinary members of the association defended their leader on the ground that "everybody around him benefited from the project and, if he benefited [much] more than the others, it is understandable because he is the leader and he made the whole project possible". They think it is highly unfair on the part of the foreign NGO to have withdrawn their support to the existing team and to have "humiliated their leader" by depriving him of all the logistical means (jeep, scooters, etc) previously put at his disposal.

As for the leader himself, he openly admitted (during a conciliatory meeting organized by the high commissioner of the province) to have used a significant portion of the money entrusted to him for his own personal benefit. Yet, he did not express any regret since it was

his perceived right to appropriate a large share of the funds. Did he not devote considerable energies to the setting up of the local organization and the mobilization of the local resources as required by the foreign NGO? By attempting to curb his power to allocate funds in the way he deemed fit, the latter exercised an intolerable measure of neo-colonialist pressure. This criticism was voiced in spite of the fact that the NGO paid him a comfortable salary to reward his organizing efforts. Things were left there and the local radio even echoed the leader's viewpoint. Of course, suing him before a court was not deemed to be a realistic option.

Stories like this could be easily multiplied[4]. What must be stressed is that the attitudes involved are typical of rural societies dominated by patron-client or chief-subject relationships, that is, hierarchical, asymmetric, and highly personalized relations in which the poor's deference and loyalty to the leader(s) is perceived as the best way of ensuring their day-to-day livelihood. In such a social setup, enrichment of the elite is not deemed reprehensible by the poor as long as they are allowed to derive some gains from the elite's actions (see Scott, 1976; Chabal and Daloz, 1999: 42). There is no disputing the power of the local 'strong men' and, when the poor sit in a village committee or association, it is essentially because they want to state their loyalty to them (Kumar and Corbridge, 2002).

Elite capture and Development Brokers

The problem of 'elite capture' is especially serious as donor agencies are enthusiastically rushing to adopt the participatory approach because they are eager to relieve poverty in the most disadvantaged countries and/or because they need rapid and visible results to persuade their constituencies or sponsors that the new strategy works well. Yet, if the required time is not spent to ensure that the poor acquire real bargaining strength and organizational skills, 'ownership' of the projects by the beneficiary groups is most likely to remain an elusive objective, such as has been observed in the case of the World Bank's Social Funds (Narayan and Ebbe, 1997; Tendler, 2000: 16-17)[5].

A perverse mechanism is set into motion when donor agencies skip the empowerment phase by asking intended beneficiaries to form groups or partner associations, and to 'elect' leaders to lead them. In effect, such a method establishes a power relationship that is open to abuse, since the donor agency has little or no communication with the community except through these leaders who are usually its most prominent members. As pointed out by Esman and Uphoff (1984: 249), "the shortcut of trying to mobilize rural people from outside through leaders, rather than taking the time to gain direct understanding and support from members, is

---

[4] For example, in the case of a failed community association for forest management in Palawan Island (Philippines), we learn that the local leader mishandled the community resource and eventually succeeded in embezzling an NGO-provided fund. It is striking that "no one had the nerve to defy" him, a fact blamed on "a lack of community capacity" (McDermott, 2001: 55).

[5] A recent evaluation report thus concludes that "building capacity and social capital at the community level are time- and human resource-intensive processes, making disbursements potentially slower and less predictable". Social funds, therefore, "may lose the strengths on which their reputation has been built" when their focus is gradually shifted from emergency response mechanisms to longer-term welfare and institutional development objectives (World Bank, 2002 : 48).

likely to be unproductive or even counterproductive, entrenching a privileged minority and discrediting the idea of group action for self-improvement"[6].

Confirming the prediction of Esman and Uphoff, several studies have concluded that the formation and training of village groups in community-based projects have the effect of encouraging the entry of wealthier and more educated people into leadership positions because of the attractiveness of outside funding (Gugerty and Kremer 1999, 2000; Rao and Ibanez 2001; Brett, 2003). Revealingly, a major problem confronted by the CBD drive attempted during the 1950s by the Ford Foundation and US foreign assistance programs, and which eventually led to its demise, lay in its inability to effectively counter the vested interests of local elites (Holdcroft 1984: 51). Being adept at representing their own interests as community concerns expressed in the light of project deliverables, local leaders often succeed in deluding the donors into thinking that their motivations are guided by the collective good (Mosse 2001; Harrison 2002; Ribot 1996, 2002; Eversole 2003). Their demands are replete with the sort of pleas and vocabulary that strongly appeal to the donors (including exaggerated statements about their poverty) and, in order to create the appearance of participation, they may go as far as spending resources to build community centres, hold rallies, and initiate showcase labor-intensive activities (Conning and Kevane 2002: 383; Kumar and Corbridge, 2002: 80).

Traditional or locally-based elites (elders, heads of lineage, and village chiefs) are not the only sort of leaders to benefit from CBD resources. Frequently, urban elites 'remember' their geographical origin and reactivate their rural roots when new funds become available which are channelled through rural groups or communities, or through local governments or municipalities. For example, in Cameroon, as soon as the decentralised program of forestry management was launched, a "localism fever" set in: members of the urban elite, consisting mainly of senior civil servants and politicians, began to join in local initiatives by getting co-opted or 'elected' in local committees or associations, or by featuring as resource persons for them. They then established "alliances with town-based companies, to whom they have promised their villages' forests" (Oyono, 2004: 102), giving rise to accusations of "re-centralisation".

The spawning of local (and foreign) NGOs is another recent phenomenon that must be understood in the light of the redirecting of foreign aid flows. Acting as 'development brokers', political entrepreneurs have been quick to understand that the creation of an NGO has become one of the best means of procuring funds from the international community (Meyer, 1995; Bebbington, 1997; Bierschenk, de Sardan, and Chauveau 2000)[7]. In the words of Chabal and Daloz (1999: 22-24): "a massive proliferation of NGOs … is less the outcome of the increasing political weight of civil society than the consequence of the very pragmatic realization that resources are now largely channelled through NGOs". As a consequence, "the

---

[6] In the light of this diagnosis, Cernea's contention that "NGOs insert themselves not as a third and different/independent actor, but as an emanation and representation of the community" (Cernea 1988: 10), appears almost surrealist.

[7] Thus, in the case of Benin, a West African country especially spoiled by the donors, local NGOs and associations, which are often "empty shells established with the sole purpose of capturing aid", have multiplied within a short period of time to number several thousands. Many others wait to receive the approval of the ministry of interior (Le Monde, 26 February 2001). In Mali, there were 1,467 NGOs registered locally in December 2001 (Coulibaly 2003: 24). In non-African countries, also, NGOs often constitute "an opportunistic response of downsized bureaucrats, with no real participation or local empowerment" and, inevitably, program officers themselves become involved in the creation of community institutions (Conning and Kevane 2002: 383-84).

political economy of foreign aid has not changed significantly" because "the use of NGO resources can today serve the strategic interests of the classical entrepreneurial Big Man just as well as access to state coffers did in the past…".

Of course, not all local leaders are opportunists ready to divert foreign aid from the intended beneficiaries. Several studies actually point to substantial variations in targeting effectiveness across villages (Ravallion 2000; Jalan and Ravallion, forthcoming). Interestingly, intra-village inequality is often found to be inversely related to this effectiveness (Galasso and Ravallion, forthcoming), confirming theoretical predictions (see supra) and suggesting that the local elite tend to appropriate a larger share of the transfers in communities that are highly unequal to begin with.

Hopefully, future evidence will settle the issue of whether cases of malevolent behavior outweigh cases where leaders are either unable (owing to sufficient empowerment of the grassroots) or unwilling (because they somehow share the ethical code of aid agencies) to cheat fellow villagers. Results are likely to vary from one area to another, depending on the power structure and class relations, the strength of social movements, levels of rural literacy, etc. Impressionistic but consistent evidence seems, however, to suggest that dedicated leaders are less numerous in countries of Sub-Saharan Africa than elsewhere. A tentative explanation for this difference is that African societies have not yet gone through protracted, nationwide struggles and movements of political or social emancipation. Such experiences help forge other-regarding values and norms of generalized reciprocity without which they are doomed to failure (Platteau, 2000: Chap. 7). By contrast, in many countries of Asia and Latin America, historically-rooted ideals of social commitment are alive that have been transmitted over generations thanks to the education system and civil society movements or associations.

3. A mechanism to discipline local leaders

Let us consider the following three-agent decision framework. At the top is a donor agency (labelled *A* below) which wants to disburse a given amount of funds with the purpose of alleviating poverty. At the bottom are the grassroots (labelled *G*) who are the intended beneficiaries of this aid effort. And between the two is a local leader (labelled *L*) who aims to organize the grassroots into a group or association for the sake of securing the funds on offer. As a matter of fact, the participatory character of the program makes it mandatory that beneficiaries are organized into a collective to be eligible for funds. In other words, the donor agency will not disburse funds unless it has received evidence that a cohesive group of beneficiaries exists through which these funds can be channelled. Yet, at the same time, it is ill-informed about what is happening at community level and this information gap is exploited by the local leader for own benefit. The latter can thus lie to the donor agency about the manner in which the funds have been disposed of, pretending that they have safely reached the grassroots while in fact he has largely appropriated them.

What is being played between the leader and the grassroots is a one-stage bargaining game. In dealing with *G, L* thus has a leadership role, meaning the right of the first move: to the *G* group which he has formed or helped to form, *L* makes a proposition about the way to share the funds offered by *A*. If *G* accepts the transfer proposed by *L,* they receive that amount. But if they disagree with *L*'s proposal, they create a situation in which both the leader and themselves have to forsake the money. Indeed, as explained above, it is in the nature of the game that *A* will not disburse the money unless an agreement has been struck between *L* and *G* to the effect that the former is empowered to represent the latter and act on their behalf. The prediction of economic theory in this so-called ultimatum game is that the agent with the first move will make a proposal whereby he keeps most of the funds for

himself, and the agent with the second move will accept such a deal for lack of a better alternative. In the setting of a one-period interaction framework, anticipating that the local leader will embezzle most of the funds, the donor agency should then refrain from disbursing money.

If in reality aid agencies do channel money through local intermediaries in the kind of circumstances just described, it is either because they do not have a good knowledge about the game that is being played or because, in spite of their pro-poor rhetoric, their main concern is not that the grassroots benefit from most of the external funds, but that such funds are effectively disbursed within a rigid time framework (the so-called 'fiscal year' concern or 'budget-pressure' problem). The first possibility, imperfect knowledge of the game, typically arises when aid agencies tend to underestimate the leverage of local leaders, or to overestimate his degree of altruism as a result of the leader's cunning ability to deceive them or of their own naivety. Although the second possibility is most often mentioned with respect to official aid agencies (Tarp, 2000; Svensson, 2003; Kanbur, forthcoming), its role ought not to be underestimated when considering private donor agencies such as NGOs, which depend on regular donations from the public and, therefore, need to show rapid and visible results to potential contributors[8].

Clearly, *L* must be disciplined through an appropriate mechanism, and this must involve the possibility of detecting embezzlements and punishing him in the event of a proven fraud. Punishment through externally-enforced legal sanctions and court action is ruled out because the judicial system is unreliable in most developing countries where poverty is widespread. Recourse to informal punishment –that is, a fully or partially self-enforcing punishment– is therefore necessary, and the most obvious mechanism involves repetition of the aid game. As we know from repeated game theory, the game must have an infinite or indeterminate duration for the socially desirable outcome (avoidance of complete embezzlement) to become a possible equilibrium (Kreps and Wilson, 1982; Kreps, 1990: 536-43; Friedman, 1990: 190-4).

Yet, because they aim at making beneficiaries eventually self-supporting, donors typically want their aid transfers to be of limited and definite duration. Granting funds for a finite but indeterminate period is obviously not a realistic option. It would, indeed, create perverse incentives to under-perform in order to lengthen the project's duration, thereby creating a 'dependency' syndrome. In keeping with our story told in Section 2, we consider a donor agency which decides to spread its aid transfers over several successive periods and to make later disbursements explicitly conditioned by proper use of the previous tranche of aid money. Theory teaches us that such a mechanism is of no avail, though. A rational *L* will embezzle the last tranche knowing that he cannot be punished at a later stage. Anticipating this, *A* will not disburse that last tranche, thus depriving itself of the possibility to use a credible threat to punish *L* during the previous period. As a result, *L* misappropriates the money of the previous tranche as well, and the strategic response of *A* is to cancel that tranche also. By backward induction, it is evident that even the first tranche will not be disbursed with the consequence that *G* will not get any financial support.

If *A* is committed to releasing a tranche whenever no fraud has been detected in the use of the previous tranche, the above outcome would not obtain, however. It can, indeed, be shown that under this condition *L* would not embezzle the whole money disbursed, except in

---

[8] Thus, in the case study presented in Section 2, the problem was actually complicated by the fact that there was a second foreign NGO competing with the one mentioned. Unlike the latter, however, this second NGO was eager to disburse the money quickly owing to budget pressure constraints (the need to show results to its contributors on the occasion of the next yearly fund-raising campaign).

the last round of the game. In other words, because *L* is keen to keep the probability of being detected within an acceptable range (assuming that this probability increases with the extent of the fraud) so as to remain entitled to the next tranches of money, a positive share of the aid flow will reach *G* at equilibrium. The problem with this solution is that the assumption of a committed *A* is not quite satisfactory. It implies that, in the event of no fraud detection, *A* will disburse the last tranche of money even though it knows quite well that it will be embezzled by *L*. In the following, we consider that *A* is ethically motivated, in the sense that it would endure an important moral cost if it were to hand over money to an intermediary who would misuse it with complete certainty. With such a preference function, *A* would not release the last tranche, which dooms the whole aid game to failure.

To avoid the deadlock of a large amount of embezzlement, we need not make the dubious assumption that *A* is committed. A conceptually more satisfactory escape route, probably more consonant with human behaviour, is actually available. The idea is that it is unrealistic to assume that *L* can freely vary the share of the aid fund accruing to *G,* depending on the period of the game (that is, to assume that he can bring down this share abruptly to zero in the last period). This is because the aid game is, in fact, linked to other games that are being simultaneously played in the community and that have an infinite or indeterminate duration[9]. Bearing in mind that the social setup is characterized by patron-client relationships, it is evident that the leader-patron cannot afford to ignore the future long-term consequences of a present action in other related games. More precisely, he must be aware that, if he suddenly reduces the share earmarked for *G,* the latter are not going to understand such a move and will therefore react negatively in other walks of the social village life, if only by showing less enthusiasm in their demonstrations of loyalty and even making a 'bad name' for *L*. Likewise, *L* may not, without long-term costs to himself, indulge in treacherous acts, such as breaking *ex post* his promise to hand over a certain share of the aid proceeds to *G*.

Thus, although *L* exercises a lot of power in deciding about the sharing of the aid funds, his power is nevertheless limited by the interdependence of many aspects of the village life. His image of a 'good patron' must be preserved if he is to enjoy the continuous support of his clients in other domains of community life, for example, in situations where his political career is at stake. In other words, the very logic of the patronage system commands that the patron abides by certain rules or norms which have the effect of constraining his actions and thereby grant a genuine bargaining power to his clients (see, e.g., Scott, 1985). Note that such rules and norms may involve the existence of a minimum share of external resources to be granted by *L* to *G*[10].

From the above assumption of interlinked games, two implications follow. First, the share of the aid fund accruing to *G* is constant over the successive rounds of the aid game (and, perhaps, may not fall below a minimum threshold). And, second, *L*'s promise regarding apportionment of this fund is enforceable. Note carefully that our assumption that *G* are empowered enough to enforce *L*'s promise (and to prevent him from abruptly lowering their share), but not enough to actively debate the sharing rule with him, is in line with the story told in Section 2. There, indeed, enforcement was not the real problem since villagers did not feel cheated by their predatory leader and actually voted for him again even after his

---

[9] For an analytical treatment of interlinked games in a village community setup, see Aoki, 2001: 47-50.

[10] We rule out the possibility that leaders are external agents who do not feel tied by local rules or norms, and are not engaged in the multiple network of linked games present at village or community level. As we have argued earlier, indeed, even when they have settled in urban areas, leaders are attached to a rural locale through kinship and other ties. If this were not the case, villagers would distrust them and refuse to 'elect' them in village organizations.

malpractices had been fully revealed and confessed[11]. If *G* were not empowered enough even in the first sense, they would be doomed to be seriously exploited by *L*, and there is not much that could be done in the short or medium term by an external agency to relieve their poverty. On the other hand, if they were empowered enough in both senses, our underlying model would become inadequate since the sharing rule would be determined as the outcome of a bargaining process between *L* and *G* (or a fair voting rule), and not by *L* only[12].

Two final remarks must be made in order to clarify the analytical structure underlying the informal leader-disciplining mechanism (LDM) proposed in this paper.

First, we have earlier assumed that *A* is ethically motivated and therefore unwilling to hand over money to *L* if it is convinced that the money will be seriously misused. Another implication of the same assumption is that *A* will not be ready to forgive *L* for a proven act of malfeasance, even if it involves a positive cost to itself. This is a fortunate implication precisely because a cost is likely to follow from the need to redirect aid funds withdrawn from a failing association or community. Without this moral component of *A*'s preference, the punishment threat would not be credible and, as a result, the mechanism of sequential aid disbursement would be useless[13].

Second, an important shortcoming of the LDM is that not only the local leader but also the intended beneficiaries are sanctioned in the event of fraud detection. For this reason, it is not in the interest of *G* to report malpractices to *A* at the end of a period lest they should lose any entitlement to the next tranches of money. To secure their assistance in fraud detection, could *A* propose *G* a deal whereby further tranches of aid money would be released provided that they remove a leader whom they will have denounced? Unfortunately, such a solution is vulnerable to two opposite kinds of risk. As the story told in Section 2 illustrates, *G* may choose to side with *L* and refuse to inform *A* against him because, in the logic of interlinked games, the long-term cost of severing links with *L* exceeds the short- or medium-term benefit of aid money. Note that the long-term cost includes the risk that the malevolent leader is replaced by a still worse figure. Conversely, community members, or some of them, may be tempted to seize the opportunity of *A*'s inspection procedure to settle private scores with *L*, or his family and clan, by bringing wrong or exaggerated accusations against him.

4. Modelling the LDM under conditions of monopolistic supply of CBD aid

---

[11] That is also why we did not follow the alternative modeling strategy consisting of depicting the interaction between *G* and *L* as a principal-agent relationship (with *G* as the principal and *L* as the agent). In such a framework, indeed, *G* would be unable to perfectly enforce what *L* does and would therefore be cheated by him.

[12] Assuming that the grassroots' share resulting from such a bargaining process is large enough, the LDM would be of no avail: indeed, disciplining the local leader with the help of an external device would not have the effect of raising the share of aid money accruing to the intended beneficiaries. To achieve its objective, the aid agency could rely on the bargaining strength of the latter. To be sure, some embezzlement would still occur, but the agency would not be able to do better by using a LDM.

[13] In his analysis, Svensson (2003) proposes a mechanism corresponding to a tournament game for a group of recipient countries in order to surmount the same problem (the recipient government anticipates that the donor organization will release funds regardless of its actual performance, because the latter is altruistic or constrained by the 'budget pressure' problem). Such a mechanism would be extremely difficult to implement in the kind of foreign aid game considered here, since donors are numerous and uncoordinated, and the sunk cost of setting up partnership relationships with local communities are quite high.

We begin by assuming that supply of aid funds is scarce relative to the numerous communities in poor countries that are eligible for CBD support. In the framework of our model, a donor agency, *A,* is posited to be in the position of a local monopolist vis-a-vis a given community of rural people, *G,* implying that the latter have no alternative source of external funding should the transaction with *A* fail. In Sections 6 and 7, we will consider alternative situations in which aid agencies compete for access to rural communities.

The objective of *A* is that as large a share as possible of a given amount of aid money earmarked for a particular community reaches the intended beneficiaries, *G*. As we shall show later, such an assumption is innocuous because making the number of target communities endogenous leads to a corner solution. In other words, all important results are unaffected by our assumption that the exogenously given aid budget is earmarked for a particular community rather than for a variable number of communities to be determined by the model itself. This being clarified, the presence of an opportunist local leader, *L,* through whom the funds must be channelled, compels *A* to strive to discipline *L*'s behaviour.

Towards that end, *A* uses a sequential conditional disbursement procedure. To keep things simple without any loss of substance, we assume a two-period framework in which the second tranche is released only if no fraud has been detected at the end of the first period. Two instruments are available to *A*. The first instrument is the decision regarding the inter-temporal allocation of the money between the two successive periods. The second instrument is the supervision effort devoted to fraud detection.

A is confronted by two different trade-offs corresponding to the two above instruments. The first trade-off can be stated as follows. On the one hand, *A* would like to spend as much as possible during the first period because it is impatient to see the results of its intervention, out of sheer altruism or because of more strategic considerations arising from the need to satisfy its ultimate fund purveyor. On the other hand, *A* wants to defer disbursement of aid money as much as possible till the second period, since late payments serve to discipline *L*, that is, to encourage him to use the first tranche according to *A'*s prescriptions (for the benefit of *G*). Note, incidentally, that the amount granted under the first tranche must be positive so as to ensure that *L*'s behaviour can be effectively put to test before making a decision about whether to disburse the second tranche. Let us now turn to the second trade-off. The higher the supervision effort chosen by *A* the more *L* is induced to convey funds to *G* yet, at the same time, since a greater supervision effort requires more money to be spent on fraud detection, the net amount of aid available for *G* is proportionately reduced.

What we have then is a classical principal-agent problem with *A* unable to observe *L*'s actions directly. *A* maximizes its objective function under the constraint of *L*'s optimizing behaviour. While deciding about the way to share aid money between *G* and himself, *L* considers as given the inter-temporal distribution of aid money between the two periods and the level of supervision effort exercised by *A*. To begin with, let us write the objective function of *L,* assuming for the sake of simplicity that he does not discount future incomes[14]:

$$\underset{\alpha}{Max}\, U^L(\alpha) = (1-\alpha)X_1 + (1-\alpha)X_2(1-\psi)\,, \qquad (1)$$

[14] The implication of a high discount rate of future incomes for *L* is straightforward. The less he feels concerned about future incomes the less attention he will pay to the conditionality mechanism with the result that he will largely embezzle the funds made available during the first period.

where X_1 and X_2 are the amounts of the first and second tranches of aid money, respectively; (1-α) is the share of the aid transfer appropriated by *L* and α is therefore the share accruing to *G*; ψ is the probability of detection of *L*'s embezzlement. In accordance with our discussion in Section 2, α is assumed to prevail throughout the two periods. The detection function can be simply defined as follows (note that it will be further justified at a later stage):

$$\psi = s(1-\alpha)^2, \tag{2}$$

where *s* a parameter measuring the effectiveness of fraud supervision. It corresponds to the level of the detection probability when *L* takes maximum risk by appropriating the entire amount of aid money (α=0). This implies that $s \leq 1$. Moreover, ψ=0 when *L* behaves in a perfectly honest manner (α=1). Underlying the above function is the realistic assumption that the probability of detecting dishonest behaviour increases at a rising rate with the extent of the embezzlement. For example, if facilities intended for use by *G* have not been constructed, detection of fraud is easier than if kickbacks have been received from a dealer in return for allowing him to overcharge and supply low-grade materials.

The problem of *L* then becomes:

$$\underset{\alpha}{Max}\, U^L(\alpha) = (1-\alpha)X_1 + (1-\alpha)X_2\left[1 - s(1-\alpha)^2\right] \tag{1'}$$

One could conceivably add a constraint $\alpha \geq \alpha^*$, where α^* stands for a social norm prescribing a minimum share of external resources to be accrued to *G*. Yet, we assume that the endogenously determined value of α exceeds α^*, so that the above constraint is not binding. If it were, the problem would be uninteresting since the existence of the LDM would not enable *G* to increase their share beyond what is guaranteed by the local custom.

Differentiating (1') with respect to α yields *L*'s reaction function:

$$-X_1 - X_2 + 3X_2 s(1-\alpha)^2 = 0 \Leftrightarrow (1-\alpha)^2 = \frac{X_1 + X_2}{3sX_2} \tag{3}$$

Using (2) and (3), we also find that:

$$\frac{X_2}{X_1 + X_2} = \frac{1}{3\psi} \tag{4}$$

In words, there is an inverse (proportional) relationship between the share of the net amount of the aid budget disbursed during the second period, on the one hand, and the probability of fraud detection, on the other hand.

From (4), it is evident that ψ cannot be nil at equilibrium. In point of fact, it must be the case that $\psi > 1/3$, since the ratio $X_2/(X_1 + X_2)$ must be smaller than one (X_1 may not be equal to zero, since fraud detection would be infeasible in the absence of a positive aid flow in the first period –see supra). It then follows from (2) that α must necessarily be smaller than one: *L* will never find it in his interest to channel the whole aid budget to *G*.

There are thus two ways to interpret the West African failure story reported in Section 2. Either the foreign NGO was acting candidly by disbursing money, in the sense that it was over-optimistic about the local leader's personal traits (a situation which would correspond to

an out-of-equilibrium outcome of the game); or, it just happens that it detected the leader's fraud, plausibly because its monitoring process was rather effective (a situation which can be rationalized as an equilibrium of the LDM game)[15].

Applying the implicit function theorem to find *L*'s response to a change in X_2, the level of detection effectiveness being assumed to be constant, we find:

$$\frac{d\alpha}{dX_2} = \frac{1-\alpha}{2X_2} = -\frac{d\alpha}{dX_1} > 0 \tag{5}$$

Here is the heart of the leader-disciplining mechanism: when *A* increases the amount of the aid transfer that is disbursed in the second period, *L* is induced to raise the share accruing to *G*. Increasing the amount of the first tranche has the opposite effect. Such is the interpretation to be given to relationship (4) above: when the relative importance of the second tranche is increased, the probability of fraud detection is lower at equilibrium (along *L*'s best response curve), because the leader is willing to reduce this risk by limiting the extent of his appropriation of the aid funds. Likewise, we derive *L*'s response to a change in s, the level of X_2 being assumed to be constant:

$$\frac{d\alpha}{ds} = \frac{X_1 + X_2}{6s^2 X_2 (1-\alpha)} > 0 \tag{6}$$

The direction of this effect is according to expectation: the more effective the detection procedure the higher the share of the aid fund that *L* conveys to *G*. We shall see below that the degree of effectiveness of the detection procedure can be somewhat manipulated by *A,* so that we will be able to write *L*'s reaction to a change in detection effectiveness as a reaction to a decision variable available to *A*.

We can now turn to *A*'s problem. Its utility function reflects its concern to help *G*, yet, for a reason that will become clear in Section 6, we refrain from calling it altruistic utility. It is written thus:

$$\begin{aligned} &\underset{X_2,Z}{Max}\, U^A(X_2,Z) = \alpha X_1 + \mu\alpha X_2(1-\psi) + \mu\alpha X_2 \psi \eta \\ &s.t. \quad the\, FOC\, of\, L, \\ &\qquad \psi = f(Z,k)(1-\alpha)^2, and \\ &\qquad X_1 + X_2 = X^* - Z, \end{aligned} \tag{7}$$

where X^* stands for the total aid fund (exogenously given) available for a given target community, Z is the amount of financial resources that *A* chooses to devote to fraud

[15] In this instance, both interpretations appear to be valid in so far as (1°) there were varying assessments about the extent of trust that could be placed in the local leader among the different persons in charge in the foreign NGO; and (2°) the monitoring of the project was relatively serious (the same staff person was involved in the designing and the following up of the project from the beginning and he was regularly sent to the field for the purpose of accompanying and monitoring the organizational process of, and the use of funds by, the local partner association).

detection, μ is the time rate of preference of *A*, and η is the cost for *A* of punishing *L* by withholding the second tranche of aid money.

It is assumed that the effectiveness of the fraud detection process increases with Z, but the impact of this financial effort on *s* and ψ declines as Z is increased. Fraud detection also improves when *A*'s organizational skills and experience in monitoring, measured by the parameter k, are more developed. Thus, one can think that more professional aid agencies have higher k than comparatively inexperienced ones. Formally, we have $s = f(Z,k)$, with $f(0,k)=0$, $f^1(Z,k)>0$, $f^{11}(Z,k)<0$, and $f^2(Z,k)>0$, where f^i designates the first derivative, and f^{ii} the second derivative, of the function f with respect to the ith argument. Finally, we assume the function $f(-)$ to be quasi-concave, which implies that :

$$\frac{d^2k}{dZ^2} = \frac{d(-f^1/f^2)}{dZ} \geq 0 \Rightarrow f^{12} \geq \frac{f^{11}f^2}{f^1}$$

Given the above assumptions, such a condition means that the sign of the cross derivative, f^{12}, can be either positive or negative. The detection function can therefore be written as: $\psi = f(Z,k)(1-\alpha)^2$. Also note that Z is a function of the desired level of supervision effectiveness, according to the reciprocal of the function $f(-)$: $Z = f^{-1}(s,k) = Z(s,k)$ *with* $Z^1(s,k)>0$ *and* $Z^{11}(s,k)>0$.

Turning now to μ and η, we assume that the values of both parameters are less than unity. The value of μ is smaller than one because *A* is concerned that *G*'s livelihood improves as rapidly as possible and the ultimate purveyors of funds, the taxpayers or the general public mobilized in fund-raising campaigns are eager to see the results of their financial effort (see supra). The value of η is smaller than one because any re-direction of CBD aid fund entails the transaction cost of making contact, and establishing partnership links, with a new community, which is a sunk cost. The most straightforward interpretation is to consider η as the proportion of X_2 that *A* is able to recycle costlessly (and of which intended beneficiaries will receive a share α).

Since $\eta<1$, punishing a community led by a dishonest *L* carries a cost for *A*. However, as explained in Section 3, adherence to moral values ensures that *A*'s punishment threat is credible. In other words, the utility loss incurred by *A* in the event of fund reallocation, $(1-\eta)X_2$, is outweighed by the cost of violating the ethical tenet according to which demonstrated fraud ought to be sanctioned.

Using (2) and (3), we can rewrite (7) as follows:

$$\underset{X_2,Z}{Max}\, U^A(X_2,Z) = \alpha(X^* - X_2 - Z) + \mu\alpha X_2 - \mu\alpha X_2\left(\frac{X^* - Z}{3X_2}\right)(1-\eta) \quad (8)$$

Or, equivalently,

$$\underset{X_2,Z}{Max}\, U^A(X_2,Z) = \alpha\left[(X^* - Z)\left(1 - \frac{\mu(1-\eta)}{3}\right) - X_2(1-\mu)\right] \quad (9)$$

Differentiating (9) with respect to X_2 and taking account of *L*'s reaction function through (5), the first FOC easily obtains as:

$$\frac{\partial U^A}{\partial X_2} = \frac{1-\alpha}{2X_2}\left[(X^*-Z)\left(1-\frac{\mu(1-\eta)}{3}\right) - X_2(1-\mu)\right] - \alpha(1-\mu) = 0\,, \qquad (10)$$

implying that: $\frac{1-\alpha}{1+\alpha}\left[1-\frac{\mu(1-\eta)}{3}\right]\left(\frac{X^*-Z}{X_2}\right) = 1-\mu$ (11)

This equilibrium condition has the standard form of an equality between a marginal cost and a marginal benefit. Indeed, while the term on the RHS measures the utility loss resulting from the postponement of the aid transfer as X_2 is increased (and X_1 decreased) by one unit, the term on the LHS represents the utility gain caused by the rise of the share of aid flows that reach the grassroots as a consequence of this marginal increase of X_2. From (11), it is straightforward to obtain an expression for the relative weight of the second tranche in the amount of the aid budget net of supervision expenditures:

$$\frac{X_2}{X^*-Z} = \frac{(1-\alpha)v}{(1+\alpha)(1-\mu)}, where \quad v = \left[1-\frac{\mu(1-\eta)}{3}\right] \qquad (12)$$

Let us proceed by considering the optimisation of U^A with respect to the second decision instrument available to the funding agency, Z. Before doing that, we must calculate $d\alpha / dZ$ from *L*'s reaction function. Equation (3) can now be written:

$$(1-\alpha)^2 = \frac{X^* - Z(s,k)}{3f(Z,k)X_2} \qquad (3')$$

From (3'), we easily get:

$$\frac{d\alpha}{dZ} = \frac{(1-\alpha)f^1(Z)}{2f(Z)} + \frac{1-\alpha}{2(X^*-Z)} = \frac{1-\alpha}{2(X^*-Z)}\left[1+\frac{f^1(Z)(X^*-Z)}{f(Z)}\right]$$
$$= \frac{1-\alpha}{2(X^*-Z)}\left(1-\varepsilon_{s,(X^*-Z)}\right) > 0 \qquad (13)$$

The sign of this derivative is as expected: an increase in the expenditures devoted by *A* to the monitoring of *L*, by raising the probability of detecting malpractices, drives the latter to reduce the extent of fraudulent appropriation of the aid funds (α grows). Moreover, the disciplining effect of an increase in monitoring expenditures is directly proportional to the elasticity of supervision effectiveness with respect to the total amount of the aid budget net of these expenditures. The term $(1-\varepsilon)$ is nothing else than the analogue of the mark-up coefficient in monopoly pricing. Note that, since ε is negative (as the amount devoted to helping the grassroots is reduced so that monitoring expenditures can be raised, the effectiveness of fraud detection is enhanced), this term is positive and greater than one.

Bearing (13) in mind, we can write the second FOC of *A*'s problem as follows:

$$\frac{\partial U^A}{\partial Z} = \left[\frac{(1-\alpha)f^1(Z,k)}{2f(Z,k)} + \frac{1-\alpha}{2(X^*-Z)}\right]\left[(X^*-Z)v - X_2(1-\mu)\right] - \alpha v = 0 \qquad (14)$$

Substituting the value of $X_2(1-\mu)$ as obtained from (12), we are able to derive an equilibrium condition expressed as a function of α and Z only:

$$\left[\frac{(1-\alpha)f^1(Z,k)}{2f(Z,k)}+\frac{1-\alpha}{2(X^*-Z)}\right](X^*-Z)\left(\frac{2\alpha}{1+\alpha}\right)=\alpha \qquad (15)$$

The RHS of (15) obviously corresponds to the marginal loss arising from the fact that the aid budget available for *G* has been reduced by one unit. As for the LHS, it measures the marginal benefit following from the more effective monitoring of *L* as a result of a one unit increase of the fraud detection expenditures. At equilibrium, the two must of course be equal.

Equation (15) can be rewritten:

$$\left(\frac{2\alpha}{1+\alpha}\right)v\left[\frac{(1-\alpha)f^1(Z,k)}{2f(Z,k)}(X^*-Z)-\alpha\right]=0 \qquad (16)$$

The first two terms are obviously non-negative. On the one hand, α must be positive as *A*'s utility would be nil if α were equal to zero. On the other hand, v may not have zero value since $\mu(1-\eta)\neq 3$. As a consequence, equation (16) finally reduces to:

$$\frac{f^1(Z,k)}{f(Z,k)}(X^*-Z)=\frac{2\alpha}{1-\alpha} \qquad (17)$$

Equilibrium condition (17) can be transformed so as to give rise to an interesting interpretation. Defining $\sigma_{s,Z}=(ds/dZ)(Z/s)$ as the elasticity of the effectiveness of fraud detection with respect to monitoring expenditures, and bearing in mind that $X_1+X_2=X^*-Z$, we get: $\frac{1}{2}\sigma_{s,Z}=\frac{\alpha Z}{(1-\alpha)(X_1+X_2)}$, which can also be written as:

$$2\sigma_{Z,s}=\frac{(1-\alpha)(X_1+X_2)}{\alpha Z} \qquad (18)$$

Clearly, the higher the value of the inverse elasticity (that is, the inverse of the elasticity of detection effectiveness, which measures the increase in *Z* required to achieve an additional unit of detection effectiveness) the larger, at equilibrium, the loss suffered by *G* on account of aid embezzlement (the numerator of the RHS) relative to the loss of aid budget caused by monitoring expenditures (the denominator). This is because, when monitoring expenditures are less effective, the equilibrium level of supervision effort is less important with the result that the loss caused by embezzlement is relatively large. Note, incidentally, that when the value of the inverse elasticity is exactly equal to ½, the two types of losses are identical at equilibrium. If it is equal to one, the former loss (caused by embezzlement) is twice as large as the latter (caused by budget reduction).

Turning to the FOC of *L* as given by (3'), we can write equivalently:

$$\frac{X_2}{X^*-Z}=\frac{1}{3f(Z,k)(1-\alpha)^2}, \qquad (3")$$

which, combined with (12), yields:

$$\frac{(1-\alpha)v}{(1+\alpha)(1-\mu)} = \frac{1}{3f(Z)(1-\alpha)^2}\text{, or}$$

$$f(Z) = \frac{(1+\alpha)(1-\mu)}{3(1-\alpha)^3\left[1-\frac{\mu(1-\eta)}{3}\right]} \tag{19}$$

Again, we have succeeded in eliminating X_2. After successive transformations, the FOC of *L* and the two FOCs of *A* have thus eventually come to form the system (3"), (17) and (19). It is noteworthy that none of these equilibrium conditions can be written as an explicit function, which compels us to study the endogenous variables simultaneously to derive equilibrium values and compute comparative-static derivatives. Fortunately, as we have just shown, whereas α, Z and X_2 are all present in (3"), only α and Z figure out as endogenous variables in (17) and (19). This feature enables us to solve the model by proceeding in two steps: first deriving the equilibrium values of α and Z using the system (17)-(19), and then finding out the equilibrium value of X_2 by resorting to (3").

Before solving the model and deriving comparative-static results, however, it is useful to construct a slight variant with the purpose of demonstrating that the chosen form of the detection function, $\psi = s(1-\alpha)^2$, is not arbitrary.

More precisely, we want to show that the explicit function $\psi = s(1-\alpha)^2$ can be endogenously derived as the optimal form of a more general function defined as $\psi = s(\theta-\alpha)^2$, where θ stands for a norm of sharing set by *A*. In other words, the donor agency has an additional decision variable, namely the proportion of the aid fund that it prescribes *L* to channel to *G*. In this variant of the original model, the FOC of the local leader becomes :

$$(\theta-\alpha)^2 = \frac{X^* - Z(s,k)}{3sX_2}$$

The problem of the donor agency is now written :

$$\underset{X_2,Z,\theta}{Max}\, U^A(X_2,Z,\theta) = \alpha X_1 + \mu\alpha X_2\left[1-s(\theta-\alpha)^2\right] + \eta\mu\alpha X_2\, s(\theta-\alpha)^2$$

$$s.t.\quad \theta \le 1,\ s = f(Z,k)\text{, the FOC of } L\text{, and } X_1 + X_2 = X^* - Z,$$

which is easily transformed into the form (8) obtained in the original model. Therefore, the FOCs with respect to X_2 and Z are strictly unchanged. Bearing in mind that $\partial\alpha/\partial\theta = 1$ –since we know from the FOC of *L* that $(\theta-\alpha)^2$ does not depend on θ–, the first derivative of U^A with respect to θ is simply given by :

$$\frac{\partial U^A}{\partial\theta} = X^* - X_2 - Z(s,k) + \mu X_2 - \frac{\mu(1-\eta)(X^* - Z(s,k))}{3}$$

When this expression is suitably decomposed, it becomes evident that it is unambiguously positive so that the equilibrium value of θ corresponds to the corner solution $\theta^{+}=1$:

$$\frac{\partial U^{A}}{\partial \theta}=\left(X_{1}-\frac{\mu X_{1}}{3}\right)+\left(\mu X_{2}-\frac{\mu X_{2}}{3}\right)+\frac{\mu\eta(X_{1}+X_{2})}{3}>0 \Rightarrow \theta^{+}=1$$

In other words, the norm of sharing that *L* is asked to follow by *A* is one requiring him to channel the whole aid fund to *G*. This implies that the form of the original detection function given by (2) was not arbitrary. The fact of the matter is that it does not pay *A* to show leniency vis-à-vis *L* because the latter would exploit this lenient attitude by increasing the extent of his fraud. As a result, the same probability of punishment would apply in equilibrium. Graphically, the setting of a sharing norm smaller than one would cause the detection function to shift downwards, meaning that, for a given value of α, the probability to detect fraud is lower (see equation (2)). This is not in the interest of *A*.

It is worth noticing that the expression for $\partial U^{A}/\partial\theta$ contains negative elements. This is because there are actually two forces running into opposite directions. On the one hand, *A* wants to set the sharing norm as close to one as possible so as to induce *L* to choose as high an α as possible (this is the disciplining effect). Yet, on the other hand, if the norm is too requiring, the probability of detection increases for a given α and with it the risk of having to recycle the aid budget, which is costly. As shown above, however, the former effect outweighs the latter. It is revealing that, when η is equal to one (the cost of recycling funds is nil), we have simply that $\partial U^{A}/\partial\theta = X_{1}+\mu X_{2}$, an expression from which all negative terms have vanished.

5. Results of the basic model

To obtain the desired comparative-static results in a problem where two equilibrium conditions –equations (17) and (19)– are simultaneous functions that cannot be solved explicitly, the easiest way to proceed is to use the graphical approach in the hope of avoiding the tedious calculations of total differentials and the application of Cramer's rule. We thus draw a four-quadrant graph with α measured rightwards and Z measured leftwards along a two-way horizontal axis (see Diagram 1 below). Bear in mind that the feasible space is bounded on the right as a result of the condition $\alpha<1$, and on the left as a result of $Z<X^{*}$. The relationship given by (19) with $f(Z,k)$ expressed as a function of α is represented in the northeast quadrant while the function $s=f(Z,k)$ is depicted in the northwest quadrant. As for the equilibrium condition (17), it is represented in the lower part of the diagram: the RHS of this condition, which is a function of α, is depicted in the southeast quadrant while the LHS, which is a function of Z, is drawn in the southwest quadrant.

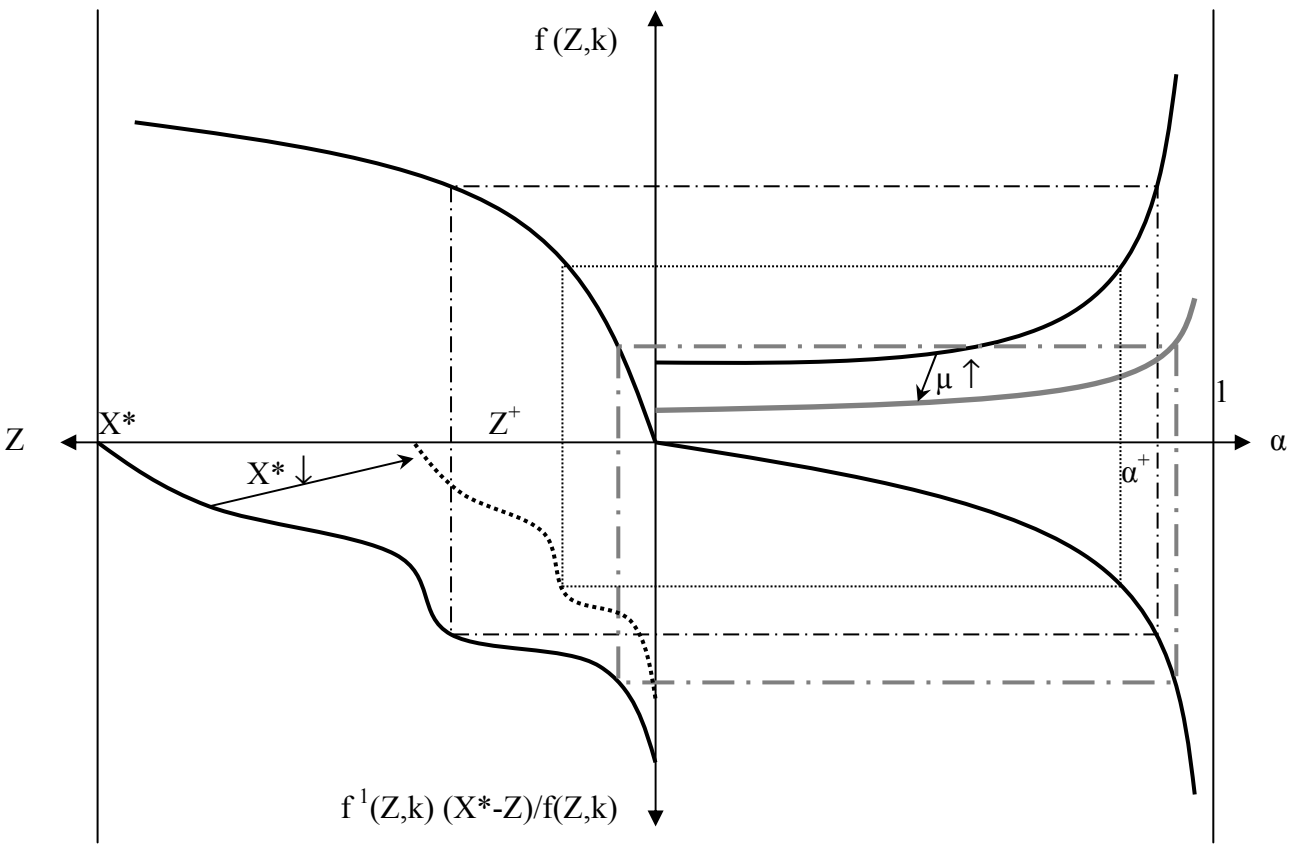

Diagram 1: The determination of equilibrium values and comparative-static effects in the LDM

It is easily shown that the relationship given by (19) in the northeast quadrant is positively sloped and convex in the domain [0,1] (see Appendix A). It bears recalling that $\alpha < 1$ by virtue of the FOC of *L* (see supra). On the other hand, we know by assumption that $f^1(Z,k) > 0$ and $f^{11}(Z,k) < 0$, hence the positively sloped but concave function represented in the northwest quadrant of the diagram. Next, it is the case that the first and second derivatives of the RHS of equilibrium condition (17) with respect to α are both positive, the latter because α is smaller than one (see Appendix A). The relationship drawn in the southeast quadrant has therefore a positive slope and a convex form. Finally, the function depicted in the southwest quadrant can be shown to have a negative slope (the first derivative is negative), yet the sign of its second derivative is indeterminate (see again Appendix A). Interestingly, this indeterminacy is not to be ascribed only to the unknown sign of the third derivative of the function $f(Z,k)$. As a matter of fact, even if we assume $f^{111}(Z,k)$ to be nil or very small, the indeterminacy persists.

The initial situation is represented by the black-coloured line drawn with dots and bars which links up all the equilibrium points corresponding to the four quadrants. We first consider the effect of an exogenous increase in μ. Such an increase translates itself into a downward shift of the curve located in the northeast quadrant of the diagram. Indeed, the sign of the first derivative of $f(Z)$ with respect to μ, as calculated from (19), is unambiguously

negative.[16] As a result of this shift, we obtain a new set of equilibrium values determined by the grey-coloured line drawn with dots and bars. It is evident that α and Z have moved in opposite directions: while α has gone up, Z has declined. Moreover, deriving the equilibrium value of X_2 from (3), it is easy to compute the total differential:

$$dX_2 = \frac{-3(1-\alpha)^2\left[f+(X^*-Z)f^1\right]}{9(1-\alpha)^4(f)^2}dZ + \frac{6(X^*-Z)(1-\alpha)f}{9(1-\alpha)^4(f)^2}d\alpha\,, \qquad (20)$$

which is a composite expression made of a negative term multiplied by dZ and a positive term multiplied by $d\alpha$. When dZ is negative and $d\alpha$ is positive, we can therefore conclude that dX_2 is always positive. In addition, it is apparent from (2) that ψ has diminished at the new equilibrium. It is also clear that, since Z decreases so that (X^*-Z) is larger, and since α increases, $\alpha(X_1+X_2)$ rises. More significantly, *A*'s utility rises as a result of an increase in μ. Indeed, using (9) and applying the envelop theorem, we get:

$$\frac{dU^A}{d\mu} = \alpha\left[X_2 - \frac{(X^*-Z)(1-\eta)}{3}\right] + \left[(X^*-Z)v - X_2(1-\mu)\right]\frac{d\alpha}{d\mu} \quad > 0 \qquad (21)$$

This derivative comprises two terms that turn out to be both positive. For one thing, the expression between brackets in the first term is positive in accordance with the FOC of *L*. As a matter of fact, (3) can be written $\psi X_2 = (X^*-Z)/3$, where $\psi < 1$ so that $X_2 > (X^*-Z)/3$. It follows that, a fortiori, $X_2 > (X^*-Z)(1-\eta)/3$. For another thing, the expression between brackets in the second term is also positive since $X^*-Z = X_1+X_2 > X_2$, and $v > 1-\mu$. Finally, we have shown above that $d\alpha/d\mu > 0$.

To sum up, we can write this first set of results as follows:

$$\frac{d\alpha}{d\mu} > 0; \frac{dZ}{d\mu} < 0; \frac{dX_2}{d\mu} > 0; \frac{d\left[\alpha(X_1+X_2)\right]}{d\mu} > 0; \frac{d\psi}{d\mu} < 0; \frac{dU^A}{d\mu} > 0 \qquad (22)$$

In words, when the aid agency is more patient, it spends less on monitoring but increases the amount of the transfer made in the second period: indeed, because the subjective cost of waiting is smaller, it is more ready to use the leader-disciplining mechanism and to postpone disbursement of aid funds. As a consequence, *L* is more effectively induced to behave during the initial period holding monitoring expenditures constant. In point of fact, at the new equilibrium the amount of these expenditures is being reduced. The net effect of these two contrary moves, –an increase in the second tranche accompanied by a decrease in the monitoring budget– is favourable to *G* since the share appropriated by *L* declines and the amount of aid money that will accrue to them if there is no detection of fraud by the aid agency is larger. Furthermore, the utility of the aid agency rises as a result of a more patient

[16] The value of this derivative is indeed:
$df(Z,k)/d\mu = \left[\frac{1+\alpha}{3(1-\alpha)^3}\right]\left[\frac{-1+(1-\eta)/3}{v^2}\right]$, which is negative since $\eta < 1$ and $\alpha < 1$.

attitude on its part. This is a more significant result than that related to the increase in $\alpha(X_1 + X_2)$, since *A*'s utility takes explicit account of the risk of fraud detection and the possible necessity to reallocate funds to another community. As for the probability of fraud detection, it actually decreases on two counts: the decline of the monitoring budget, on the one hand, and the smaller level of fund embezzlement by *L*, on the other hand.

The implication is serious and needs to be pondered over: showing more patience in disbursing money for the poor enables willing donors to reach them more effectively. Conversely, requiring quick results in the anti-poverty struggle is self-defeating in so far as its main effect is to enrich and consolidate local elites, much in the same way as windfall incomes from natural resources can be a curse because they give rise to greater rent-seeking activity (see, e.g., Tornell and Lane, 1998). At the limit, if *A* is very impatient, the share accruing to *G* will tend to a value as low as that obtained under a one-shot disbursement procedure.

The effect of an exogenous increase in η is strikingly similar to the effect yielded by an increase in μ. This is because the former change is also reflected in a downward shift of the curve located in the northeast quadrant of the graph.[17] In addition, the derivative of U^A with respect to η is again found to be positive :

$$\frac{\partial U^A}{\partial \eta} = \mu\alpha\left(\frac{X^* - Z}{3}\right) + \left[(X^* - Z)v - X_2(1-\mu)\right]\frac{d\alpha}{d\eta} \quad > 0 \qquad (23)$$

The terms between brackets whether in the first or the second term are positive while we know that $d\alpha / d\eta > 0$. Therefore, the above derivative is certain to have a positive value. The complete set of results is as follows :

$$\frac{d\alpha}{d\eta} > 0;\ \frac{dZ}{d\eta} < 0;\ \frac{dX_2}{d\eta} > 0;\ \frac{d[\alpha(X_1 + X_2)]}{d\eta} > 0;\ \frac{d\psi}{d\eta} < 0;\ \frac{dU^A}{d\eta} > 0 \qquad (24)$$

The lower the cost of recycling aid funds (or the higher the proportion of aid money earmarked for the second tranche of an initial project that can be costlessly redirected to another group or association in the event of detected fraud), the larger the amount of the second tranche, the higher the share accruing to *G*, the larger the amount of aid money accruing to them in the absence of fraud detection, and the higher the utility derived by *A*. Conversely, if *A* finds it more difficult to reallocate the funds intended for a particular project and is, therefore, less incited to defer disbursement and, consequently, *L* is in a better position to appropriate the aid money. In particular, interventions in low density areas are more vulnerable to such a risk since they tend to involve higher set-up costs associated with longer distances to be travelled, lower education levels in remote locations, etc.

Clearly, the logic underlying the effects of a rise in η is, *mutatis mutandis,* the same as that described above for an increase in μ. This is not surprising inasmuch as the effect of impatience on the part of *A* is identical to the effect of a high cost in the recycling of aid funds in the event of failure: in both cases, the cost of using the LDM is high and, as a consequence, *A* is prompted to disburse the available funds quickly.

---

[17] We indeed have that :
$\frac{df(Z,k)}{d\eta} = -\frac{\mu(1-\alpha)(1-\mu)}{9(1-\alpha)^3 v^2}$, which is negative since $\alpha < 1$ and $\mu < 1$.

Let us consider now the effect of an increase in X^*, the aid budget available for a given community. From (17), it is evident that such an increase causes the function $(f^1/f)(X^* - Z)$ to move upwards since f^1/f, the first derivative with respect to X^*, is positive. Conversely, and this is the case represented in Diagram 1, a decrease in X^* translates itself into a downward shift of the above function, which is tantamount to an upward shift of the curve drawn in the southwest quadrant. As can be observed from the graph (see the dotted line with a rectangular contour), the new equilibrium position is characterized by lower values for both α and Z. In this case, as is evident from (20), dX_2 cannot be signed. The same holds true for ψ and $\alpha(X_1 + X_2)$. Of course, since X^* expresses the budget constraint, we know for sure that *A*'s utility must decline if X^* diminishes, and vice-versa if X^* rises. What is less evident is how the utility of *A* per unit of money evolves when the aid budget available is being reduced. The answer is provided below :

$$\frac{d(U^A/X^*)}{dX^*} = \frac{(dU^A/dX^*)X^* - U^A}{(X^*)^2} = \frac{\left[\left(\frac{d\alpha}{dX^*}\right)\left(\frac{U^A}{\alpha}\right) + v\alpha\right]X^* - U^A}{(X^*)^2} \qquad (25)$$
$$= \frac{1}{(X^*)^2}\left[\lambda_{\alpha,X^*}U^A + \alpha v X^* - U^A\right] > 0$$

The elasticity of α with respect to X^*, denoted λ_{α,X^*}, is known to be positive and the same holds true of the sum of the last two terms in the expression between brackets. Indeed, the definition of U^A as given in (9) can be written: $U^A = \alpha v X^* - \alpha v Z - \alpha X_2(1-\mu)$ which is obviously smaller than $\alpha v X^*$, so that $\alpha v X^* - U^A$ is a positive quantity. Therefore, the derivative depicted in (25) has a positive sign.

The results concerning the comparative-static for X^* are summarized in (26) below:

$$\frac{d\alpha}{dX^*} > 0; \frac{dZ}{dX^*} > 0; \frac{dU^A}{dX^*} > 0; \frac{d(U^A/X^*)}{dX^*} > 0; \frac{\partial X_2}{\partial X^*}, \frac{\partial[\alpha(X_1+X_2)]}{\partial X^*}, \frac{\partial \psi}{\partial X^*} \ \textit{ambiguous} \qquad (26)$$

There is an instructive lesson to draw from the above set of results, namely that the well-being of *G* as assessed from *A*'s utility function (on an aggregate or per money unit basis) is enhanced when the budget allocated to a given community is greater. This is essentially because a larger budget allows *A* to increase its monitoring expenditures and, as a result, to check *L*'s behaviour more effectively. Dispersing aid on many communities is a bad strategy in so far as supervision of the use of funds is then bound to be loose, as exemplified by the experiences of those aid organizations that have chosen to spread their available funds thinly over a large number of projects or communities instead of concentrating these funds on a few of them.

Since $d(U_A/X^*)/dX^*$ in our model is positive at equilibrium, the aid agency is expected to limit its assistance to a single community. Such a result is actually confirmed by the extension of the model to the case where the number of target communities is endogenously determined (see Appendix B for a formal proof). Here, the aggregate budget in the hands of the agency is assumed to be fixed but the budget available for each community is decided by *A* since the number of communities to be helped is unknown.

The above extreme prediction is evidently a simplification that results from the overly naïve character of our assumption that *A*'s utility function depends on the aggregate amount of aid money reaching *G* conceived as an undefined aggregate mass. It does not depend on the number of poor, or the number of communities or locations, who have benefited from external support. Because the number of grassroots resident in a given community is necessarily limited, it is not realistic to expect an agency to be content with dealing with only one community as a matter of principle. Nevertheless, we would not learn much by rendering our model more realistic on this score, and it is better to keep the focus on the disciplining of local leaders by not unduly complicating its analytical structure.

The last comparative-static effect that we want to investigate concerns the parameter k that stands for the degree of experience and skill of the aid agency in monitoring local leaders' behaviour. Alternatively, k can be conceived as reflecting the type of project funded by *A,* since projects differ in terms of their monitorability by an external agency: projects aimed at supplying textbooks and other teaching materials, or at equipping village health centres, are easier to monitor than those involving less tangible benefits. The expected result is that a higher k ought to allow a larger share of aid funds to reach *G*, and perhaps to reduce the amount of expenditures devoted to fraud detection. It may therefore come as a surprise that these two effects cannot be shown to hold on the basis of Diagram 1, a consequence of the fact that the impact of k manifests itself through varied and complex channels. More precisely, we know by assumption that the curve $s = f(Z,k)$ depicted in the northwest quadrant shifts upwards as k rises. The curve drawn in the southwest quadrant is also affected by a change in k, yet unfortunately the direction of the impact cannot be determined. This is because, if we denote the LHS of (17) by ϕ, the first derivative of ϕ with respect to k cannot be signed. As a matter of fact,

$$\frac{d\phi}{dk} = \frac{(X^* - Z)(ff^{12} - f^1 f^2)}{(f)^2}, \quad where\ f = f(Z,k) \tag{27}$$

Bearing in mind that f, f^1, f^2, are positive while the sign of f^{12} is indeterminate, it is evident that the second term in the numerator cannot be signed. Thus ignoring the direction of the shift undergone by the curve represented in the southwest quadrant of the diagram, we are unable to say how α, Z, and therefore X_2 change following a rise in k. In order to identify the conditions under which the above effects could possibly be signed, the standard approach consists of differentiating the equilibrium conditions written as simultaneous implicit functions and then applying the Cramer rule so as to obtain the derivatives of the endogenous variables with respect to k.

The results are as follows (see Appendix C for proof). First, we find that:

$$\frac{d\alpha}{dk} > 0 \quad iff\ f^{12} > \frac{f^2 f^{11}}{f^1} - \frac{f^2}{(X^* - Z)} \tag{28}$$

The above condition is automatically fulfilled if the $f(-)$ curve is (strictly) quasi-concave. In this case, indeed, $f^{12} > f^{11} f^2 / f^1$, with the consequence that the above condition is met *a fortiori*. We can therefore conclude that $d\alpha / dk > 0$. This is the expected result: when *A* has more skills and experience in detecting fraud, say as a result of best practice dissemination, the share of the funds transferred eventually reaching *G* is higher.

From the above, it is possible to immediately derive another important result, namely that:

$$\frac{dU^A}{dk} = \frac{d\alpha}{dk}\left[(X^* - Z)v - X_2(1-\mu)\right] = \left(\frac{U^A}{\alpha}\right)\frac{d\alpha}{dk} > 0 \qquad (29)$$

Again, as expected, *G*'s well-being as can be assessed from *A*'s utility function is higher when *A* is better endowed with detection skills, or when the project chosen is easier to monitor.

Let us now look at the impact of a change in the fraud detection parameter on the equilibrium amount of monitoring expenditures. Application of the Cramer's rule yields the following condition:

$$\frac{dZ}{dk} \le 0 \Leftrightarrow \frac{f^{12}}{f^2} \le \left(\frac{2\alpha^2 + 5\alpha + 1}{(1-\alpha)(2+\alpha)}\right)\left(\frac{1}{X^* - Z}\right) = t > 0 \qquad (30)$$

Such a result is according to intuition: if *A* is comparatively effective in detecting fraud (for a given amount of monitoring expenditures, Z, it better detects fraud than other agencies), it will choose to spend less on monitoring at equilibrium, but only if its ability to improve fraud detection by increasing its monitoring expenditures at the margin (as measured by $f^{12} = d(ds/dZ)/dk$ is not too high in relation to its comparative advantage resulting from better detection skills ($f^2 = ds/dk$). Note that, if $f^{12} \le 0$, condition (30) would be automatically fulfilled. Yet, there exist some positive values of the cross derivative which are compatible with the above condition.

If (f^{12}/f^2) is thus sufficiently low to be smaller than the threshold value denoted by t, we are also assured, on the basis of (3"), that X_2 rises as a result of an increase in k. The same holds true of the share of the total aid transfer accruing to *G* in the event of no fraud detection, $\alpha(X_1 + X_2)$. On the other hand, the evolution of ψ cannot be determined since there are two effects calling for a decrease of ψ, −the higher value of α and the lower value of Z−, and one effect driving an increase, −the higher value of k. To sum up, the comparative-static regarding k yields the following effects:

$$\frac{d\alpha}{dk} > 0; \frac{dU^A}{dk} > 0; \frac{dZ}{dk} < 0, \frac{dX_2}{dk} > 0, \frac{d[\alpha(X_1 + X_2)]}{dk} > 0 \; if \; (f^{12}/f^2) < t; \frac{d\psi}{dk} \; ambiguous \qquad (31)$$

One instructive lesson from the above results is that a better endowment in skills and experience in fraud detection (or specialization in projects that are comparatively easy to monitor) causes *A* to prefer to defer disbursement of the aid money and simultaneously decrease monitoring expenditures, but only if its ability to improve detection by increasing such expenditures is not too high. If the latter turns out to be high, the monitoring budget will be raised and the amount of the second tranche might increase or decrease depending on the relative strengths of the factors impinging on (3"). Whatever happens, the good news is that the share accruing to *G* always rises and their well-being increases.

In terms of Diagram 1, the situation that is easiest to figure out is the one in which f^{12} has a rather high value. As is evident from (27), the curve shown in the southwest quadrant then shifts outwards $-\phi$ increases as a result of a rise in k. Moreover, f^{12} is assumed to be

high enough for the outward (downward) move of this curve to be more important than the outward (upward) move of the curve $s = f(Z)$ in the northwest quadrant. When this is the case, it appears that both α and Z have a larger value at the new equilibrium. By contrast, if f^{12} is low, the ϕ curve undergoes a small outward shift or even an inward shift, and α rises in parallel with a decrease in Z.

6. The LDM under monopolistic competition

So far, we have considered a situation where the supply of CBD aid is scarce relative to potential demand by poor communities. We now turn to the opposite case where such supply is abundant. If perfect competition prevails among donor agencies, and these agencies are selfish in the sense that they are concerned with relieving poverty but only to the extent that poverty reduction is achieved through their own effort, the share of CBD aid eventually reaching the poor will tend towards zero. This disastrous result obtains because all agencies try their best to lure communities so as to be able to spend their aid budget. Local leaders can then play on this acute competition to extract larger portions of aid funds.

Their bargaining strength will be tamed only if donor agencies are (genuinely) altruistic, that is, if their concern with poverty reduction is unconditional: their aim is to see poverty reduced and they do not mind if relief is brought by others' efforts rather than by their own. Their dedication to the objective of poverty reduction is so sincere that they are not ready to make compromises with dubious leaders in order to gain a foothold in a community. To put it in another way, with equal ability to reach the poor, an unambiguously altruistic agency leaves room to a rival agency whenever competition is liable to harm the interests of the intended beneficiaries of aid efforts.

The assumption of unambiguous altruism on the part of donor agencies is too strong, however. In the real word, many of them pay at least some significant attention to their own interests, because continuing employment of their staff depends on the CBD projects that they are able to win on the ground, or because of a 'flag effect' arising from prestige or other symbolic considerations (who funds a project matters as each agency wants to have its brand name advertised). This is bad news for the poor of the world.

Fortunately, it is probably not realistic to depict the "market for CBD aid" as perfectly competitive or subject to Bertrand competition. A more reasonable approach is to view donor agencies as producing differentiated, multi-attribute services. Monopolistic competition therefore appears as a more suitable framework to analyze the interactions between donor agencies and local leaders. To be short, we avoid the intricacies of writing a model suited to the new situation and content ourselves with highlighting the kinds of effects that must be expected when monopolistic competition rather than pure monopoly is contemplated. These effects are all converging to show that the poor are now more difficult to reach through decentralized aid programs.

First, since L enjoys access to alternative sources of CBD funds in case of fraud detection, an exit option must be introduced into L's payoff function. To the extent that exit options depend on the portions of funds appropriable by L in other projects, they should be treated as an endogenous variable, which would make the problem quite tricky to solve analytically. But the expected result is clear: the existence of exit options induces L to take more risk by indulging in greater misuse of aid money. Competition among donor agencies, albeit imperfect, has the effect of reducing G's bargaining strength.

Second, new interpretations can now be given to parameters μ and η of our base model. Thus, μ reflects the impatience of donor agencies, which is at least partly determined

by the competitive pressure of rival agencies: they are in a hurry to establish a partnership relationship with a local community lest the latter should be attracted by another offer. Competition, therefore, tends to make donor agencies more eager to obtain quick results. As for η, it measures the difficulty of relocating a CBD project, which is especially serious when communities are the object of much attention on the part of donors. Since re-allocation of aid funds is more costly, *L* becomes aware that *A* has a budget to spend that is more or less tied to the initially chosen community or location. A new room for maneuvering is thereby opened for *L*. In formal terms, compared to a situation of pure monopoly, monopolistic competition is reflected in lower values of μ and η, with the consequence that the equilibrium share accruing to *G* is smaller (see supra, Section 5).

It is thus evident that competition among donor agencies is harmful for the poor if it translates itself into an intense and selfish search for communities to support. Presumably, it has the additional effect of inducing these agencies to increase their supervision effort in order to counter the greater temptation of leaders to cheat. The net budget available for distribution is correspondingly reduced. The conclusion is that an increased aggregate supply of CBD funds is not an unmixed blessing. If it increases the number of communities that can be reached thanks to the multiplication of CBD aid operators and/or the expansion of their activities, it also causes the share appropriable by the poor to decline inasmuch as it results in more acute competition among such operators.

If all donor agencies are (genuinely) altruistic, the values of μ and, perhaps also η do not decrease compared to the situation of pure monopolies. But the detrimental effect arising from the availability of exit options still exists. In order to prevent that effect from occurring, a reputation mechanism should exist to link up the decisions of donor agencies. It is this issue that is addressed in the next section.

7. The role of multilateral reputation mechanisms

In the previous section, a bilateral reputation or sanction mechanism has been implicitly assumed to be at work. As a matter of fact, a local leader caught embezzling funds is punished only by the donor agency that he has flouted. The LDM is precisely aimed at deterring *L* from appropriating too large a share of CBD aid and shifting agencies in case his fraud is detected. (In the basic monopoly model, there were no alternative agencies to which a fraudulent leader could turn owing to the scarcity of aid funds). The problem is that this result is obtained at a high price: *L* must, indeed, be allowed by *A* to retain a possibly large share of the funds to be induced to stay with the same agency all throughout the project's life rather than using the exit option as a deliberate strategy. From the standpoint of the poor, a much more favourable situation would clearly be achieved if donor agencies could mutually inform each other about fraudulent behaviours in CBD projects and act upon that information to sanction fraudulent leaders. The existence of such a multilateral reputation and sanction mechanism, it may be noted, would make the recourse to a sequential and conditional disbursement procedure unnecessary. Unfortunately, mechanisms of that kind are fraught with so many practical difficulties that their feasibility can be seriously doubted.

Circulation of fraud-related information among aid agencies

Documented by Greif (1989, 1994) with respect to relationships between traders (see also Platteau 2000: Chap. 6; Aoki 2001: Chap. 4), the multilateral reputation mechanism can be applied to our problem in the following way. Operating within a repeated-game framework, an aid agency would adopt the strategy whereby its grants money to a local leader, but only provided that he is not known to have cheated another agency some time in the past. If money is thus disbursed and the benefiting leader is later found to have cheated the agency, the latter dutifully reports the fraud and communicates the name of the malevolent leader to the other members of the donor community. Before embezzling funds, a leader would thus be incited to think twice because by cheating today he would spoil his reputation for future interactions with the whole donor community. The multilateral reputation strategy can be shown to be an equilibrium strategy. That is, if a leader expects every donor agency to adopt such a strategy, his interest is to share the aid fund equitably among the intended project beneficiaries. Knowing that reaction, the interest of all aid agencies is to cling to the multilateral reputation strategy. Honest behaviour therefore gets established as a (Nash) equilibrium.

There are several problems with the multilateral reputation mechanism, however. The first one stems from the fact that the information conditions that must be fulfilled for it to work are extremely stringent: information must circulate perfectly between donor agencies. This is unlikely to be the case in reality, because they are in large numbers, scattered around the developed world, and very heterogeneous in terms of several key characteristics (size, ideology, methods, time horizon, etc.). These are hardly ideal conditions for a dense information network to exist.

Is the establishment of a private third party charged with centralizing information (as suggested, for example, in the Law Merchant system analyzed by Milgrom, North, and Weingast (1990) the solution to the problem caused by the costliness of generating and communicating information? Such a system can effectively work only if donors have an incentive to detect fraud and report fraudulent experiences to the third party, so that the black list of dubious intermediaries in its hand is exhaustive and regularly updated (otherwise, donors would not be induced to consult it). Yet, in so far as the detection and reporting of a fraud once it has occurred entails costs but brings no benefits to the individual agency which has been cheated, such an incentive does not exist. Unless, of course, aid agencies are unambiguously altruistic so that they do not feel concerned about whether poverty is reduced by themselves or by another aid agency.

To create the adequate incentive, the third party should be able to exercise pressure on the detected fraudulent leader to return the stolen money. A provision that unless an aid agency makes appropriate queries with the third party about the reliability of its current partner, it will not be entitled to use the system to obtain compensation would also make it in the interest of donors to query about past dealings of the partner-leader considered before disbursing money. As a result, so the theory goes, the threat against potential leaders would be effective and, if caught, a fraudulent leader would be prompted to comply with the third party by returning the money stolen (so that his name is removed from the black list). Milgrom, North and Weingast have nevertheless shown that honesty will be established as a (symmetric sequential) equilibrium under the above mechanism only if a number of conditions are met, in particular, the cost of information query, the cost of appeal to the third party, and the cost for the latter to recover the stolen money from fraudulent local leaders ought not to be too high. Unfortunately, these assumptions are likely to be violated in the case under concern, especially because the headquarters of aid agencies are located at great distances from one another, and

all kinds of information are costly to acquire, including evidence of fraud in the opaque context of alien cultural environments. The mechanism is therefore not self-enforcing.

A second, equally important problem lies in the fact that local leaders may not be actually concerned with preserving their reputation because their time horizon is short and they could be quite happy with running away with the money stolen from one single project[18]. In other words, the payoff from dishonest behaviour is so large compared to the payoff from honest behaviour that honesty cannot be induced at equilibrium.

Rating of aid agencies by ultimate fund purveyors

Up until now, one key actor has been missing from our discussion, namely the ultimate purveyors of funds from which aid agencies obtain their financial resources. These ultimate fund-providers create a further link in the game, giving rise to a new space of strategic relationships. As far as disciplining of local leaders is concerned, their contribution may be positive or negative depending on the way they interact with aid agencies.

Bad prospects arise if donor agencies expect the ultimate purveyors of aid funds to react adversely to news of embezzlement, for instance, through revocation of funds. In such circumstances, an aid organization has no incentive to report the acts of malfeasance detected in its projects. In the words of Alnoor Ebrahim (2003: 818), evaluations that reward successes while punishing failures "encourage NGOs to exaggerate successes, while discouraging them from revealing and closely scrutinizing their mistakes". What we have here is a genuine Prisoner's Dilemma: an aid agency refrains from disclosing cases of embezzlement because it entertains the hope that other agencies would candidly reveal their own bad experiences, or because it fears that, should it convey the information, others might not have done it and would then exploit the situation to their own advantage. That the above risk is real is evident from the atmosphere of secrecy that surrounds the activities of many donor organizations, including NGOs. This atmosphere of secrecy is obviously detrimental to the effective functioning of a multilateral reputation mechanism such as discussed above.

On the contrary, ultimate fund-purveyors can play a positive role if their understanding of the complexity of CBD processes is sophisticated enough to make them aware of the inevitability of failures. Honest aid agencies which openly admit of cases of cheating would then not be unfairly sanctioned to the benefit of more opportunistic ones. They could even be induced to reveal embezzlement cases if the disbursement and monitoring procedures used by donor agencies, as well as the duration of their CBD projects, were used by fund-providers as a yardstick upon which ratings of these agencies are based. In this perspective, self-reported cases of fraud detection could be considered as indirect evidence of the effectiveness of monitoring activities rather than as signs of failure. Not only are such characteristics rather easy to observe, but they also offer the advantage of not creating perverse incentives for the rated agencies.

The same cannot be said of other, more conventional criteria used to evaluate the work of aid agencies. Resorting to measures of outputs, such as improvements in the levels of living of the poor inside the communities chosen, is an ideal procedure but may be too costly to be feasible, especially in the case of NGOs with their typically diverse and long-term objectives (see Edwards and Hulme 1996; Ebrahim 2003). Moreover, such measures could introduce biases in the selection of communities by the rated agencies. As a matter of fact, the latter

[18] Note that donor agencies can limit that risk by avoiding to allocate sizeable budgets to a given project or community. Such a consideration runs counter to the (too radical) implication of our base model, according to which aid money is better concentrated in a single project or community.

would be induced to choose communities in which poverty can be more easily reduced, due to, say, easy accessibility and better integration with the market.

The need for a proper evaluation of aid agencies is all the more pressing as, side by side with serious agencies, there exist careless organizations that do not implement sequential disbursement mechanisms with a view to disciplining local leaders (reasons accounting for such behaviour have been mentioned earlier). Their presence further complicates the problem of 'elite capture' not only because it has the effect of increasing the exit options available to local intermediaries, but also because it makes the establishment of a multilateral reputation mechanism among all donor agencies impossible (they would not act upon it).

In fact, in the same way that "bad money chases good money", the operation of these opportunistic aid agencies risks driving 'good' agencies out of business or, else, it will force them to relax or altogether give up their gradual and conditional disbursement procedures. Indeed, if offered the choice, local leaders will normally prefer to work with 'bad' agencies. And if the latter are numerous enough, 'good' agencies will not be able to attract partner communities unless they soften their approach to aid disbursement. Here is a difficulty frequently encountered by serious NGOs: when attempting to establish a sound relationship with a prospective partner community, they may be undercut by rival agencies which offer aid on soft terms and all too readily to the coveted community.

A crucial difficulty remains. As a matter of fact, it is easier for central funding bureaucracies (such as the European Community or the Cooperation administrations of national governments) than for the scattered contributors to fund-raising campaigns organized by NGOs, to use the sort of evaluations envisaged above and to condition their financial support on the results of these evaluations[19]. The crux of the problem lies in the fact that many donors in the general public have a poor understanding of development issues, partly as a result of distortions carried through the media and the deceiving messages conveyed by aid agencies themselves. There generally prevails the simplistic idea that failures in development projects are necessarily the outcome of incompetence and mismanagement on the part of the aid agency concerned, all the more so if many other agencies claim repeated successes.

Development aid is seen by many as a simple transfer of equipment and know how to those in need. The important role of institutional arrangements, power relations, and organizational learning tends to be underestimated. Therefore, failing projects are seen as an anomaly. Such a lack of proper understanding of the complexity of community-based development processes is actually worrying in so far as leakages about even a few cases of failure may cause public opinion to easily swing from an attitude of general optimism to one of general pessimism and distrust in aid agencies. If that happens, all aid agencies will lose. To get out of this dangerous situation created by the versatility of public opinion, there is no other way than to educate the public about the real challenges and difficulties involved in CBD.

---

[19] It could be argued that, of late, there has been a tendency among some aid agencies to organize collectively with a view to ensuring better conduct in the profession (Edwards and Hulme, 1996). Problems with such endeavours ought not to be underestimated, however. As a matter of fact, codes of conduct are typically statements about general principles that are not easily translated into operational guidelines and enforceable standards. It is hard to deny that lack of satisfactory evaluative mechanisms is a serious drawback when it comes to NGO accountability, and that indicators of the quality of their work are very rare, especially if their main aim is the empowerment of the poor (Edwards and Hulme, 1996: 11). This situation often arises because it is easier to agree on general ideas than to converge on strict and externally verifiable rules. And if a satisfactory agreement is eventually reached, it is most likely adopted by only a restricted number of operating agencies.

Development education is clearly a public good. Aid agencies that free ride on this effort by claiming easy successes may undermine the work of the whole aid sector.

8. Relying on competition among local leaders?

Given the above-explained difficulties arising from the use of reputation mechanisms, whether bilateral or multilateral, can reliance on competition between local leaders provide a more satisfactory way of overcoming the elite capture problem? Understanding the interaction of competing local leaders (say, L_1 and L_2) actually requires a thorough modification of the model. The new game does not result from the simple addition of one intermediary stage, in which the additional leader would decide how much he would leave to the grassroots if he were appointed by them, plus a final stage where the grassroots would pick up one of the two leaders. In such a model, indeed, both leaders would have a zero payoff at any candidate equilibrium, making them indifferent between being appointed or not and depriving them of any incentive for assuming leadership.

A better insight is gained by the further addition of a move of nature before the leaders begin to play. Such a move is a draw of the leader's relative skill (say $m_2 = 1$ and m_1 is drawn in a distribution centered on 1), assuming that a leader's skill multiplies the effect of funds raised in *G*'s utility. The skill does not enter the leader's utility directly, but it exerts an indirect influence through the election process. In addition, we need to spell out what will happen in the case where the fraudulent behaviour of one leader (say, L_i) is being detected. The assumption here is that in such an event the other leader (L_j) takes over during period 2, which implies that he will be in charge of the amount X_2 allocated by *A* to the community. Moreover, L_j will be bound by his own promise, α_j, made to *G* before they chose to elect L_i in period 1.

In order to find the subgame-perfect equilibrium of this new game, it must first be noticed that no equilibrium can arise where the elected leader makes an offer, α, lower than what he would bid in the one-leader version of the model. In other words, the LDM is effective enough to prevent the appearance of subgames with very low bids. Formally, this condition can be expressed by writing that the elected leaders will act in such a way that $dU^L / d\alpha \leq 0$, which implies, bearing (2) and (3) in mind, that $f(Z,k)(1-\alpha)^2\left(\frac{X_2}{X_1+X_2}\right) \leq 1/3$. While in the one-leader version of the model this constraint holds with equality, competition between two leaders may actually compel them to offer a larger α than what obtains in the absence of competition.

Let us now consider the second step of the new game in which it is sufficient to look at *G*'s utility function. In any candidate equilibrium, it is the grassroots' best response to appoint leader L_1 if $\alpha_1 m_1 > \alpha_2 m_2$, where α_1 and α_2 stand for the shares conveyed to *G* by the first and by the second leader, respectively. In the opposite case, their interest is in electing L_2. And if $\alpha_1 m_1 = \alpha_2 m_2$, they are indifferent between the two leaders. The better skilled leader (the one with the higher level of m) anticipates that his competitor is willing to offer α as high as 1, since being elected is always at least as good as being rejected. Consequently, the more competent leader must consider a bid $\alpha_i^* = \alpha_j m_j / m_i = m_j / m_i$, by the usual argument of Bertrand competition.

To summarize, if α_i^* is strictly higher than the level of α that would be optimal under the LDM with no rival, then the only equilibria of the game are those in which the more competent leader offers α_i^* and gets elected. On the other hand, if α_i^* is smaller than the equilibrium level of α in the one-leader version of the model, then competition for leadership has no bite and the game is played as if L_i were the only playing leader. In the sequel, we discuss the first case, i.e., α_i^* is played in equilibrium.

In the first-stage of the game, *A* anticipates that α_i^* does not depend on the relative apportionment of funds between the two periods. It is not necessary to know the value of m_1 in order to make that deduction. If, *ex post*, the agency will come to know the identity of the more competent leader (since the latter will have been elected by *G*), it bears emphasis that, *ex ante,* it does not, and does not need to, have complete information on m_1. In the presence of leadership competition, therefore, the LDM may be dropped altogether. Since α_i^* is a constant from *A*'s viewpoint, the optimal response is to set $X_1 = X^*$ and to leave no further fund for the second period, no matter how patient the agency is (provided it is less than perfectly patient). It may be surprising, albeit ultimately intuitive, that the equilibrium does not depend on the parameters of the players' utility functions.

Such a clear-cut result implies that, as soon as two parties (individuals, or groups of candidates) compete, the LDM is ineffective, yet unnecessary anyway since the problem of 'elite capture' is greatly diminished. Nevertheless, it is evident from the above analysis that, as long as the competing parties are not equally proficient, some 'elite capture' will subsist in equilibrium, regardless of *A*'s willingness to effectively reach *G*. The wider the gap between the competences of the two leaders, the greater the misappropriation observed under the competitive equilibrium.

Moreover, and more importantly, whenever several competing leaders are present, there is a serious risk of collusion between them. If the candidates do effectively collude, the LDM becomes necessary again lest *G* should be strongly exploited. And if collusion is not feasible owing to the intense rivalry between the leaders, the negative externalities of a mechanism that fosters intra-elite competition rather than cooperation are to be counted as a possible shortcoming of that mechanism. The existence of such a dilemma –not-too-good relations between local leaders are necessary for the competitive mechanism to be effective, yet they are a liability threatening collective action at village or community level– may undermine the case for relying on intra-elite competition as a way to protect the poor's entitlement to external assistance. When the above dilemma does not exist, channeling aid through several local organizations or groupings which are potentially competing with each other may prove a more reliable or less costly solution to the elite capture problem than the LDM discussed in this paper.

9 Conclusion

When communities have well-established organizations where the poor are sufficiently empowered, the CBD approach is on safe grounds. The problem arises when local organizations do not exist or when they are dominated by strong elites driven by their peculiar interests. Unfortunately, this situation is more frequent than currently assumed by the proponents of CBD. Till the poor are sufficiently empowered to effectively participate in decision-making and claim their rightful dues, the elite capture problem must be somehow overcome if CBD is to prove more successful than the top-down approaches applied so far by

many donor agencies. One realistic manner of addressing that problem is for donor agencies to follow sequential and conditional disbursement procedures so as to substitute for the poor's lack of power in the target communities.

When the supply of CBD aid is rather scarce with the result that donor agencies find themselves in the position of local monopolies, such a solution may yield promising results in the sense that the share accruing to the poor at equilibrium will be sufficiently large. However, this will depend on various factors, including the effectiveness of fraud detection methods, the degree of impatience of donor agencies, and the transaction cost of relocating a CBD project when a local leader has been caught embezzling funds. The latter consideration points to a serious limitation of a conditional disbursement mechanism since populations located in remote areas, which tend to be the poorest, are then likely to be bypassed by aid agencies. Likewise, projects that are relatively easy to monitor will be favoured compared to other projects with the opposite characteristic. As for the influence of the agency's inter-temporal preferences, the implication is that rushing to help the poor is self-defeating.

When the supply of CBD aid is abundant, reaching the poor becomes more difficult because (monopolistic) competition between donor agencies causes the multiplication of exit options for fraudulent local leaders, increases the pressure to establish partnerships with communities quickly, and raises the cost of re-directing CBD funds. As a consequence, an increased supply of CBD aid is unlikely to be an unmixed blessing. On the one hand, it enlarges the number of communities that can be reached thanks to the multiplication of CBD aid operators and/or the expansion of their activities. Yet, on the other hand, it also causes the share appropriable by the poor to decline inasmuch as it results in more acute competition among such operators.

In the light of these findings, the present rush on CBD appears especially worrying, not because the approach is wrong (the opposite is actually the case), but because massive injections of aid funds in CBD projects, the entry into the field of numerous agencies with little or no experience in participatory development, as well as the pressing need for quick and visible results threaten to undermine its effectiveness for poverty alleviation. By disbursing significant amounts of money too rapidly, donor agencies enable local leaders to gain increasing legitimacy from interactions with the outside world rather than with their own people. Moreover, they contribute to create an unhealthy situation in which excessively high value is placed on the sort of skills needed to attract money from abroad, skills which tend to be heavily concentrated in the hands of a narrow educated elite. Outside money clearly corrupts the process of local institutional development if it allows indigenous leaders to eschew negotiation with members for support and material contributions, thereby preventing autonomous organization-building.

If donor agencies could coordinate their actions in favour of CBD by creating a sort of multilateral information network, or if the ultimate purveyors of aid funds could reward donor agencies that have succeeded in developing effective mechanisms for money disbursement and fraud detection, the problem of elite capture could, in theory, be somehow surmounted even in the context of plentiful supply of CBD funds and numerous operating agencies. Unfortunately, such solutions are fraught by many practical difficulties. Relying on intra-community competition for leadership provides another attractive alternative for an effective implementation of CBD. But, here too, the balance of advantages and shortcomings is far from clear.

If CBD is not to become another magic formula that will fail to live up to expectations, it is therefore essential that the approach is followed in an experimental and gradual fashion, and that its impact on poverty reduction is systematically assessed before more drastic steps are taken. Working through local communities rather than through central governments does not dispense external agencies from the need to use conditional transfer

mechanisms. However, operation of such mechanisms may be actually more difficult when funds are channelled through local communities, mainly because these communities are numerous, heterogeneous and highly scattered, and because the same can be said of operating aid agencies.

APPENDIX A : Derivation of the shapes of the curves drawn in Diagram 1

First, the relationship given by (20) in the northeast quadrant of the diagram is positively sloped and convex because :

$$d\left[\left(\frac{1-\mu}{3v}\right)\left(\frac{1+\alpha}{(1-\alpha)^3}\right)\right]/d\alpha=\left(\frac{1-\mu}{3v}\right)\left(\frac{2(2+\alpha)}{(1-\alpha)^4}\right)>0$$

and

$$d^2\left[\left(\frac{1-\mu}{3v}\right)\left(\frac{1+\alpha}{(1-\alpha)^3}\right)\right]/d\alpha^2=\left(\frac{1-\mu}{3v}\right)\left(\frac{6(3+\alpha)}{(1-\alpha)^5}\right)>0 \quad \text{since } 0<\alpha<1.$$

Second, the first and second derivatives of the RHS of (18) with respect to α are both positive as is evident from the expressions below :

$$d\left[\frac{2\alpha}{1-\alpha}\right]/d\alpha=\frac{2}{(1-\alpha)^2}>0 \text{ and } d^2\left[\frac{2\alpha}{1-\alpha}\right]/d\alpha^2=\frac{4}{(1-\alpha)^3}>0 \text{ since } 0<\alpha<1.$$

Third, the function depicted in the southwest quadrant of the diagram has a negative slope. Indeed, simplifying the notation by writing f for the function $f(Z,k)$, the first derivative is found to be :

$$d\left[\frac{f^1(X^*-Z)}{f}\right]/dZ=\frac{\left[f^{11}(X^*-Z)-f^1\right]f-[f^1]^2(X^*-Z)}{[f]^2}<0.$$

The negative sign obtains because of the assumptions made regarding the signs of $f^1(Z,k)$ and $f^{11}(Z,k)$ and because $X^*>Z$, lest the grassroots would not get any aid and the agency's utility should be zero. The second derivative is a much more complex thing that cannot be signed:

$$d^2\left[\frac{f^1(X^*-Z)}{f}\right]/dZ^2=$$

$$\frac{-1}{f^4}\left\{\begin{array}{l} f^2\left[f^1\left(f^{11}(X^*-Z)-f^1\right)+f\left(f^{111}(X^*-Z)-2f^{11}\right)-2f^1f^{11}(X^*-Z)+(f^1)^2\right] \\ -2ff^1\left[f^{11}(X^*-Z)-f^1f-(f^1)^2(X^*-Z)\right] \end{array}\right\}$$

APPENDIX B : A variant of the model with an endogenous number of communities or projects

In this variant of the model presented in the text, we assume that *A* has available to it a given amount of money, X^*, to be distributed among N different but identical projects or communities. The number N, or the amount of money allocated per community X^*/N, is a choice variable in the hands of *A*, together with Z and X_2.

Let us start with *L*'s problem, which is now written :

$$\begin{aligned} &\underset{\alpha}{Max}\, U^L(\alpha) = (1-\alpha)X_1 + (1-\alpha)X_2\left[1 - s(1-\alpha)^2\right] \\ &s.t. \quad X_1 + X_2 = (X^*/N) - Z, \ and \\ &\qquad s = f(Z,k) \end{aligned} \tag{1''}$$

The reaction function becomes :

$$(1-\alpha)^2 = \frac{(X^*/N) - Z(s,k)}{3sX_2} \tag{4'}$$

In the expressions obtained for $d\alpha/dX_2, d\alpha/dZ$, and $d\alpha/ds$, X^* must be simply replaced by X^*/N, which leaves the signs unchanged. On the other hand, we have :

$$\frac{d\alpha}{dN} = -\frac{-X^*/N^2}{-6f(Z,k)(1-\alpha)X_2} < 0$$

This means that *A* can discipline *L* not only by increasing X_2, but also by increasing the budget allocated for each community or project, which implies that the number of beneficiary communities is reduced.

The problem of *A* is now :

$$\begin{aligned} \underset{X_2,Z,N}{Max}\, U^A &= N\alpha\left[X_1 + \mu X_2\left(1 - f(Z,k)(1-\alpha)^2\right) + \mu\eta X_2 f(Z,k)(1-\alpha)^2\right] \\ &= N\alpha\left[\left(\frac{X^*}{N} - Z\right)v - X_2(1-\mu)\right] \\ s.t. \quad & N \geq 1 \ and\ the\ FOC\ of\ L \end{aligned}$$

The FOC with respect to N is :

$$\begin{aligned} \frac{dU^A}{dN} &= \alpha\left[\left(\frac{X^*}{N} - Z\right)v - X_2(1-\mu)\right] + N\frac{d\alpha}{dN}\left[\left(\frac{X^*}{N} - Z\right)v - X_2(1-\mu)\right] + N\alpha\left[\left(-\frac{X^*}{N^2}\right)v\right] \\ &= -\alpha Zv - \alpha X_2(1-\mu) + N\frac{d\alpha}{dN}\left[\left(\frac{X^*}{N} - Z\right)v - X_2(1-\mu)\right] < 0 \end{aligned}$$

This expression can be said to be unambiguously negative since all the three terms comprising it are smaller than zero. As a matter of fact, we know that v is positive, $\mu \leq 1$, $d\alpha / dN$ is negative (see supra), while the expression between brackets in the third term is positive. The latter holds true because $(X^* / N) - Z = X_1 + X_2$, $(X_1 + X_2)$ is greater than X_2, and v is greater than $(1-\mu)$. We therefore have a corner solution in which N is at its minimum value of one : unless otherwise constrained (see text), *A*'s interest is in assisting only one community. The other equilibrium conditions are unaffected.

APPENDIX C : Comparative-static regarding the effect of a change in *k*

For the sake of computing total differentials, let us rewrite the equilibrium conditions (18)-(20) as follows :

$$F(\alpha, Z, k) = (1-\alpha) f^1(Z,k)(X^* - Z) - 2\alpha f(Z,k) = 0 \qquad (18')$$

$$G(\alpha, Z, k) = 3 f(Z,k)(1-\alpha)^3 v - (1+\alpha)(1-\mu) = 0, \quad where\ v = \left[1 - \frac{\mu(1-\eta)}{3}\right] \qquad (20')$$

Assuming that k is the only exogenous variable that undergoes a change, and dividing the total differentials of these two equations by the variation of k, we obtain, in matrix notation :

$$\begin{bmatrix} -\dfrac{dF}{dk} \\ -\dfrac{dG}{dk} \end{bmatrix} = \begin{bmatrix} \dfrac{\partial F}{\partial \alpha} & \dfrac{\partial F}{\partial Z} \\ \dfrac{\partial G}{\partial \alpha} & \dfrac{\partial G}{\partial Z} \end{bmatrix} \begin{bmatrix} \dfrac{d\alpha}{dk} \\ \dfrac{dZ}{dk} \end{bmatrix} = J \begin{bmatrix} \dfrac{d\alpha}{dk} \\ \dfrac{dZ}{dk} \end{bmatrix}$$

Applying the Cramer's rule, we get expressions for $d\alpha / dk$ and dZ / dk. Starting with the former, we find :

$$\frac{d\alpha}{dk} = \frac{|J_1|}{|J|} = \frac{\begin{vmatrix} -\left[(1-\alpha)(X^* - Z) f^{12} - 2\alpha f^2\right] & (1-\alpha) f^{11}(X^* - Z) - (1-\alpha) f^1 - 2\alpha f^1 \\ -3 f^2 (1-\alpha)^3 v & 3 f^1 (1-\alpha)^3 v \end{vmatrix}}{\begin{vmatrix} -f^1(X^* - Z) - 2f & (1-\alpha) f^{11}(X^* - Z) - (1-\alpha) f^1 - 2\alpha f^1 \\ -9 f (1-\alpha)^2 v - (1-\mu) & 3 f^1 (1-\alpha)^3 v \end{vmatrix}},$$

Replacing $(1-\mu)$ by its value as given by (20') and simplifying, the Jacobian determinant can be rewritten thus :

$$|J| = \begin{vmatrix} -f^1(X^* - Z) - 2f & (1-\alpha)f^{11}(X^* - Z) - (1+\alpha)f^1 \\ -6f(1-\alpha)^2 v(2+\alpha/1+\alpha) & 3f^1(1-\alpha)^3 v \end{vmatrix}$$

$$3(1-\alpha)^3 v\left[-(f^1)^2(X^* - Z) - 2ff^1 + 2ff^{11}(X^* - Z)\left(\frac{2+\alpha}{1+\alpha}\right) - 2ff^1\left(\frac{2+\alpha}{1-\alpha}\right)\right] < 0$$

All the terms in the Jacobian determinant being negative in accordance with our assumptions regarding the function $f(Z,k)$, we can sign it in an unambiguous manner and look at the numerator of $d\alpha/dk$, denoted by J_1. After some algebraic manipulations, we get the following expression:

$$\begin{aligned} |J_1| &= 3(1-\alpha)^3 v\left[-(1-\alpha)f^1 f^{12}(X^* - Z) + 2\alpha f^1 f^2 + (1-\alpha)f^2 f^{11}(X^* - Z) - (1+\alpha)f^1 f^2\right] \\ &= 3(1-\alpha)^4 v\left[f^2 f^{11}(X^* - Z) - f^2 f^1 - f^{12} f^1 (X^* - Z)\right] \end{aligned}$$

It is evident that the sign of $|J_1|$ is going to depend on the value of the cross derivative f^{12}. More precisely, we have that :

$$|J_1| < 0 \; and \; \frac{d\alpha}{dk} = \frac{|J_1|}{|J|} > 0 \Rightarrow f^{12} > \frac{f^2 f^{11}}{f^1} - \frac{f^2}{(X^* - Z)}$$

Yet, we know that this condition is automatically fulfilled in accordance with our assumption that the $f(-)$ curve is quasi-concave. Bear in mind, indeed, that such an assumption implies that $f^{12} \geq f^2 f^{11}/f^1$, with the consequence that the above condition is met *a fortiori*. We can therefore conclude that $d\alpha/dk > 0$.

Let us now calculate the second comparative-static derivative :

$$\frac{dZ}{dk} = \frac{|J_2|}{|J|} = \frac{\begin{vmatrix} -f^1(X^* - Z) - 2f & -\left[(1-\alpha)(X^* - Z)f^{12} - 2\alpha f^2\right] \\ -6f(1-\alpha)^2 v(2+\alpha/1+\alpha) & -3f^2(1-\alpha)^3 v \end{vmatrix}}{\begin{vmatrix} -f^1(X^* - Z) - 2f & (1-\alpha)f^{11}(X^* - Z) - (1+\alpha)f^1 \\ -6f(1-\alpha)^2 v(2+\alpha/1+\alpha) & 3f^1(1-\alpha)^3 v \end{vmatrix}}$$

We know already that the Jacobian determinant is negative. The determinant of the numerator can be developed as follows :

$$|J_2| = 3v(1-\alpha)^3\left[f^1 f^2(X^* - Z) + 2ff^2 - 2ff^{12}\left(\frac{2+\alpha}{1+\alpha}\right)(X^* - Z) + 4ff^2\alpha\left(\frac{2+\alpha}{1+\alpha}\right)\left(\frac{1}{1-\alpha}\right)\right]$$

Using (18) to replace $f^1(X^* - Z)$ by $f(2\alpha/1-\alpha)$ in the first term in the expression between brackets, and then arranging the terms, we get :

$$|J_2| = f\left\{ f^2\left[\left(\frac{2\alpha}{1-\alpha}\right) + 2 + 4\alpha\left(\frac{2+\alpha}{1+\alpha}\right)\left(\frac{1}{1-\alpha}\right)\right] - 2f^{12}\left(\frac{2+\alpha}{1+\alpha}\right)(X^* - Z)\right\}$$

It is therefore evident, after some simple algebraic transformations, that :

$$|J_2| \geq 0 \; and \; \frac{dZ}{dk} = \frac{|J_2|}{|J|} \leq 0 \Leftrightarrow \frac{f^{12}}{f^2} \leq \left(\frac{2\alpha^2 + 5\alpha + 1}{(1-\alpha)(2+\alpha)}\right)\left(\frac{1}{X^* - Z}\right)$$

References

Alesina, A., and D. Dollar, 2000, "Who Gives Aid to Whom and Why?", *Journal of Economic Growth,* Vol. 5, N° 1, pp. 33-63.

Aoki, M., 2001, *Toward a Comparative Institutional Analysis,* Cambridge, Mssts & London : The MIT Press.

Bardhan, P., 2002, "Decentralization of Governance and Development", *Journal of Economic Perspectives,* Vol. 16, N° 4, pp. 185-205.

Bardhan, P., and D. Mookherjee. 1999. "Relative Capture of Local and Central Governments –An Essay in the Political Economy of Decentralization." Working Paper, Department of Economics, Boston University.

Bardhan, P., and D. Mookherjee, 2000a, "Capture and Governance at Local and National Levels", *American Economic Review,* Vol. 90, N° 2, pp. 135-139.

Bardhan, P., and D. Mookherjee, 2000b, "Corruption and Decentralization of Infrastructure Delivery in Developing Countries", Working Paper, University of California, Berkeley.

Bardhan, P., and D. Mookherjee, 2000c, "Decentralizing Anti-Poverty Program Delivery in Developing Countries", Working Paper, University of California, Berkeley.

Bebbington, A., 1997, "New States, new NGOs? Crises and Transitions among Rural Development NGOs in the Andean Region", *World Development,* Vol. 25, N° 11, pp. 1755-1765.

Bierschenk, T., J.P.O. de Sardan, and J.P. Chauveau (eds), 2000, *Courtiers en développement –Les villages africains en quête de projets,* Paris : Karthala.

Boone, P., 1996, "Politics and the Effectiveness of Foreign Aid", *European Economic Review,* Vol. 40, pp. 289-329.

Brett, A.J., 2003, "Participation and Accountability in Development Management", *Journal of Development Studies,* Vol. 40, N° 2, pp. 1-29.

Burnside, C., and Dollar, D., 2000, "Aid, Policies, and Growth", *American Economic Review,* Vol. 90, N° 4, pp. 847-868.

Carroll, T., 1992, "Intermediary NGOs: Supporting the Link in Grassroots Development", West Hartford: Kumarian Press.

Chabal, P., and J.P. Daloz, 1999, *Africa Works. Disorder as Political Instrument,* Oxford: James Currey.

Collier, P., and D. Dollar, 2004, "Development Effectiveness: What Have We Learnt?", *Economic Journal,* Vol. 114, N° 496, pp. F244-271.

Conning, J., and Kevane, M., 2002, "Community Based Targeting Mechanisms for Social Safety Nets A Critical Review", *World Development,* Vol. 30, N° 3, pp. 375-394.

Coulibaly, C., 2003, "Revue de l'état de mise en oeuvre des orientations de Praïa au Mali", Institut de Recherches en Sciences Humaines, Université Mande Bukari, Bamako, Mali (mimeo).

Easterly, W., R. Levine, and D. Roodman, 2004, "New Data, New Doubts: Revisiting Aid Policies and Growth", *American Economic Review* (forthcoming).

Ebrahim, A., 2003, "Accountability in Practice: Mechanisms for NGOs." *World Development* Vol. 31, N° 5, pp. 813-29.

Edwards, M., and D. Hulme (eds), 1996, *Non-Governmental Organisations –Performance and Accountability: Beyond the Magic Bullet,* London: Earthscan Publications Ltd.

Esman, M.J., and N.T. Uphoff, 1984, *Local Organizations: Intermediaries in Rural Development,* Ithaca, New York: Cornell University Press.

Eversole, R. 2003. "Managing the Pitfalls of Participatory Development: Some Insight from Australia." *World Development,* Vol. 31, N° 5: pp. 781-95.

Friedman, J.W., 1990, *Game Theory with Applications to Economics* , New York and Oxford: Oxford University Press (2d edition).

Galasso, E., and M. Ravallion, forthcoming, "Decentralized Targeting of an Anti-Poverty Program." *Journal of Public Economics*.

Greif, A., 1989, "Reputation and Coalitions in Medieval Trade: Evidence on the Maghribi Traders", *Journal of Economic History,* Vol. 49, N° 4, pp. 857-882.

Greif, A., 1994, "Cultural Beliefs and the Organization of Society: A Historical and Theoretical Reflection on Collectivist and Individualist Societies", *Journal of Political Economy,* Vol. 102, N° 5, pp. 912-950.

Gugerty, M. K., and M. Kremer, 1999, *The Impacts of Development Funding on Social Capital: The Kenya Local Community Action Project.* Washington, DC: The World Bank.

Gugerty, M. K., and M. Kremer, 2000, "Outside Funding of Community Organizations: Benefiting or Displacing the Poor?", Working Paper 7896, National Bureau of Economic Research, Cambridge, MA.

Harrison, E., 2002, "The Problem with the Locals: Partnership and Participation in Ethiopia." *Development and Change* 33 (4): 587-610.

Heller, P., and S. Gupta, 2002, "More Aid –Making It Work for the Poor", *World Economics,* Vol. 3, N° 4, pp. 131-146.

Holdcroft, L. E., 1984, "The Rise and Fall of Community Development, 1950-65: A Critical Assessment", in Eicher, Carl K., and John M. Staatz (eds.), *Agricultural Development in the Third World,* Baltimore: Johns Hopkins University Press, pp. 46-58.

Isham, J., and D. Kaufmann, 2000, "The Forgotten Rationale for Policy Reform: The Productivity of Investment Projects", *Quarterly Journal of Economics,* Vol. 114, N° 1, pp. 149-184.

Jalan, J., and M. Ravallion, forthcoming, "Estimating the Benefit Incidence of an Anti-Poverty Program by Propensity-Score Matching." *Journal of Business and Economic Statistics.*

Kanbur, R., forthcoming, "The Economics of International Aid", in Kolm, Serge-Christophe, and Jean Mercier-Ythier (eds.), *Handbook on The Economics of Giving, Reciprocity and Altruism*, Amsterdam & London: North-Holland and Elsevier.

Kreps, D.M., 1990, *A Course in Microeconomic Theory* , New York : Harvester Wheatsheaf.

Kreps, D.M., and R. Wilson, 1982, "Reputation and Imperfect Information", *Journal of Economic Theory* , Vol. 27, No. 2, pp. 253-279.

Kumar, S., and S. Corbridge, 2002, "Programmed to Fail? Development Projects and the Politics of Participation?", *Journal of Development Studies,* Vol. 39, N° 2, pp. 73-103.

Leonard, K.L., and Leonard, D.K., 2004, "The Political Economy of Improving Health Care for the Poor in Rural Africa: Institutional Solutions to the Principal-Agent Problem", *Journal of Development Studies,* Vol. 40, N° 4, pp. 50-77.

Mansuri, G., and V. Rao, 2003, "Evaluating Community Driven Development: A Review of the Evidence", Development Research Group, The World Bank, Washington, DC.

Mehta, A., 2000, "The Micro Politics of Participatory Projects: An Anatomy of Change in Two Villages", in Peters, P.E. (ed.), *Development Encounters –Sites of Participation and Knowledge,* Harvard, Cambridge, MA: Harvard University Press, pp. 15-28.

Meyer, C.A., 1995, "Opportunism and NGOs –Entrepreneurship and Green North-South Transfers", *World Development,* Vol. 23, N° 8, pp. 1277-1289.

Milgrom, P., D. North and B. Weingast, 1990, "The Role of Institutions in the Revival of Trade: The Law Merchant, Private Judges, and the Champagne Fairs", *Economics and Politics*, Vol. 2, pp. 1-23.

Mosse, David. 2001. "People Knowledge, Participation and Patronage: Operations and Representations in Rural Development." In Bill Cooke and Uma Kothari, eds., *Participation: The New Tyranny?* London & New York: Zed Books.

Narayan, D., and K. Ebbe, 1997, "Design of Social Funds –Participation, Demand Orientation, and Local Organizational Capacity", World Bank Discussion Paper N° 375, Washington, DC: The World Bank.

Oyono, R., 2004, "One Step Forward, Two Steps Back? Paradoxes of Natural Resources Management Decentralisation in Cameroon", *Journal of Modern African Studies,* Vol. 42, N° 1, pp. 91-111.

Platteau, J.P., 2004, "Community-Based Development in the Context of Within-Group Heterogeneity", in Pleskovic, B., and N. Stern (eds.), *Proceedings of the Annual Bank Conference on Development Economics, 2003,* Washington, DC: The World Bank.

Platteau, J.P., 2000, *Institutions, Social Norms, and Economic Development,* London: Harwood Academic Publishers.

Rahman, M.A., 1993, *People's Self-Development,* London: Zed Books and Dhaka: University Press Limited.

Rao, V., and A. M. Ibanez, 2001, "The Social Impact of Social Funds in Jamaica: A Mixed-Methods Analysis of Participation, Targeting and Collective Action in Community Driven Development." DECRG, Washington, DC : The World Bank.

Ravallion, M., 2000, "Monitoring Targeting Performance when Decentralized Allocations to the Poor are Unobserved." *World Bank Economic Review,* Vol. 14, N° 2, pp. 331-45..

Ribot, J., 1996, "Participation Without Representation: Chiefs, Councils and Forestry Law in the West African Sahel." *Cultural Survival Quarterly* (Fall): 40-4.

Ribot, J., 2000, "Decentralization, Participation, and Representation: Administrative Apartheid in Sahelian Forestry", in Peters, P.E. (ed.), *Development Encounters –Sites of Participation and Knowledge,* Harvard, Cambridge, MA: Harvard University Press, pp. 29-60.

Ribot, J., 2002, "Democratic Decentralization of Natural Resources –Institutionalizing Popular Participation." World Resources Institute, Washington, D.C.

Scott, J.C., 1976, *The Moral Economy of the Peasant –Rebellion and Subsistence in Southeast Asia,* New Haven & London: Yale University Press.

Scott, J.C., 1985, *Weapons of the Weak –Everyday Forms of Peasant Resistance,* New Haven & London: Yale University Press.

Stiles, K., 2002, "International Support for NGOs in Bangladesh: Some Unintended Consequences", *World Development,* Vol. 30, N° 5, pp. 835-846.

Svensson, J., 2000, "When is Foreign Aid Policy Credible? Aid Dependence and Conditionality", *Journal of Development Economics,* Vol. 61, N° 1, pp. 61-84.

Svensson, J., 2003, "Why Conditional Aid Does Not Work and What Can Be Done About It?", *Journal of Development Economics,* Vol. 70, N° , pp. 381-402.

Tarp, F. (ed.), 2000, *Foreign Aid and Development,* London & New York: Routledge.

Tendler, J., 1997, *Good Government in the Tropics,* Baltimore & London: The Johns Hopkins University Press.

Tornell, Aaron, and Philip R. Lane, 1998, "Are Windfalls a Curse? A Non-Representative Agent Model of the Current Account", *Journal of International Economics,* Vol. 44, Issue 1, pp. 83-112.

Watson, E.E., 2003, "Examining the Potential of Indigenous Institutions for Development: A Perspective from Borana, Ethiopia", *Development and Change,* Vol. 34, N° 2, pp. 287-309.

White, R. and C. Eicher, 1999, "NGOs and the African Farmer: A Skeptical Perspective." Staff Paper N° 99-01, Department of Agricultural Economics, MSU, East Lansing, Michigan.

World Bank, 2002, *Social Funds –Assessing Effectiveness,* World Bank Operations Evaluation Department (OED), Washington, DC.