

Samaritan Bundles: Inefficient Clustering in NGO Projects*

Gani Aldashev[†] Marco Marini[‡] Thierry Verdier[§]

March 2017

Abstract

We build a model with non-governmental organizations competing through fundraising for donations and choosing their project types. Donors' willingness to give differs across project types. Each NGO chooses whether to compete in the larger donation market or to monopolize the smaller one. The resulting equilibrium configuration crucially depends on the asymmetry in potential donation market size and on donors' perceived substitutability or complementarity between giving to two different projects. We analyze the welfare properties of the decentralized equilibrium and characterize the conditions under which such equilibrium is inefficient. We also develop a variant of the model with inter-temporal choices of NGOs, analyze settings where NGOs can coordinate their fundraising activities and/or project type choices, extend the model to allow for spillovers between NGO fundraising activities, and illustrate the mechanisms of the model with several case studies.

Keywords: non-governmental organizations, fundraising, foreign aid, clustering.

JEL codes: L31, D64, F35, L13.

*We thank audiences at CIRIEC International Conference (Antwerp), SITE (Stockholm) and N.G.O. workshop (Frankfurt) for useful suggestions. Financial support from the Labex OSE, FNRS (FRFC grant 7106145 "Altruism and NGO performance"), and from CIRIEC International is gratefully acknowledged.

[†]Universite libre de Bruxelles (ULB), ECARES, and CRED, University of Namur. Mailing address: 50 Av Roosevelt, CP 114/04, 1050 Brussels, Belgium. Email: gani.aldashev@ulb.ac.be.

[‡]University of Rome La Sapienza and CREI. Mailing Address: Department of Social and Economic Sciences, Piazzale Aldo Moro, 5, 00185, Rome, Italy. Email: marco.marini@uniroma1.it.

[§]Corresponding author: PSE and Ecole des Ponts Paris-Tech, PUC-Rio, CEPR. Mailing address: PSE, 48 Boulevard Jourdan, 75014 Paris, France. Email: verdier@pse.ens.fr.

"The greatest tension for the thoughtful Northern NGO today lies in the attempt to balance fundraising messages for a public most easily moved by short-term disaster appeals, with recognition that longer-term development depends on the willingness of that same public to support difficult and costly structural change." (Smillie 1995: 137)

"The 'humanitarian Gresham's Law' is derived from the decoupling of aid agencies' hard and soft interests (their institutional interests versus their stated aims). It states: in a situation of unregulated private humanitarian activity, 'debased' humanitarianism will drive out the 'authentic version.'" (De Waal 1997: 138)

1 Introduction

Non-governmental organizations (NGOs) have become key actors in development assistance over the last decades. Currently, they represent a major channel through which aid projects are implemented in developing countries, in several large sectors of public good provision (health, education, poverty relief, environmental protection, human rights, gender equality, etc.).¹ In terms of their financing, NGOs rely on a mix of sources, including public funds. However, the key feature of NGOs is their active engagement in fundraising campaigns to mobilize voluntary donations from private citizens.

Despite the generalized optimism associated with NGO activities in developing countries (e.g. Robinson and Riddell, 1995; Nancy and Yontcheva, 2006), several researchers have documented that on many occasions these organizations allocate their resources and projects inefficiently. Koch et al. (2009) analyze the international allocation of NGO aid, using data on 61 large NGOs from various OECD countries, and find that NGOs mostly follow other NGOs in their choices of where to carry out their projects. In other words, NGO aid is "clustered". They also find that NGOs tend, in general, to select recipient countries with traits common to the headquarter countries of NGOs (for instance, headquarter and beneficiary countries have the same religion, share common colonial history, etc.).

Figure 1 shows the distribution of NGOs aid (for these 61 large organizations) in 2005, in per capita terms, across the world. One can clearly see that the this distribution is highly uneven: six countries received more than 9 euro per capita of NGO aid, whereas 28 countries received less than 0.5 euros per capita.

[Figure 1 about here]

Similar patterns of NGO aid clustering occur also at a sub-national level. Fruttero and Gauri (2005) document that NGOs in Bangladesh (especially those focusing on microfinance) tend to

¹Werker and Ahmed (2008) and Aldashev and Navarra (2014) survey salient facts concerning the development NGO sector.

cluster geographically within the country. Barr and Fafchamps (2006) find evidence for excessive geographic clustering of NGOs in Uganda, whereas Öhler (2013) documents such clustering of NGO projects in regions within Cambodia.

The left panel of Figure 2 illustrates the distribution of NGO office density across Tanzanian regions, whereas its right panel shows the poverty levels for these regions. Two regions (Arusha and Dar-es-Salaam) have more than 30 NGO offices; however, these regions have the lowest relative poverty rates within the country. On the other hand, the poorest areas of the country exhibit the lowest density of NGO offices.²

[Figure 2 about here]

Clustering occurs not only in geographic terms, but also in the type of projects. For instance, Smillie (1995: 136) describes that in the early 1980s, one of most successful type of projects in which numerous NGOs engaged was child sponsorship. Gauri and Galef (2005) document that in mid-2000s, most NGOs in Bangladesh were at least in part engaged in micro-credit services. Similar clustering patterns have been extensively documented in the inter-temporal dimension (e.g. Mattei, 2005). During certain humanitarian crises, too many NGOs rush to carry out emergency activities whereas too few take care of post-emergency reconstruction work. During some other crises (especially when the attention of the international community is turned to other events), contrarily, almost no NGOs act sufficiently early, which aggravates the crisis, and a large number of NGOs start acting late.

These findings confirm the numerous ethnographic accounts of NGO practitioners and investigative journalists that decry such inefficiencies in the international NGO sector (see Smillie, 1995; De Waal, 1997; Dichter, 2003; Mattei, 2005; Werly, 2005; Polman, 2010; among others). For instance, Smillie (1995) writes:

"The 'pornography of poverty' [is] the use of starving babies and other emotive imagery to coax, cajole, and bludgeon donations from a guilt-ridden Northern public... [The problem is] not that starving babies don't exist, but that such pictures, repeated year after year, create an image of horror and helplessness that far outweigh reality. This is generally recognized by most NGOs to be counter-productive in terms of creating understanding and awareness for longer-term development assistance." (p. 136)

On the other hand, there exist other contexts where NGOs seem to be able to coordinate on the types of projects which results in a relatively efficient division of tasks and responsibilities.

²Koch (2009: 184) shows that a very similar picture emerges when one looks at the location of projects (and not just offices) across a sub-set of regions for which data are available.

The coordinated or joint fundraising appeals in the United States, the Netherlands, the United Kingdom, Belgium, and other countries is perhaps the leading example (Smillie, 1995; Aldashev et al., 2014; Similon, 2015). Beyond fundraising, there are also multiple cases of NGO coordination "in the field" (see ICVA, 2015).

Why does inefficient clustering of NGO projects occur in some cases, while efficient coordination results in some others? What kind of interventions in aid policy design can help to alleviate this problem? In this paper, we build a simple model that provides an analytical framework to address these questions. In our model, there are two NGOs and two possible types of projects. We build on the idea that NGOs are motivated by "warm-glow" desire to carry out larger projects, but have to compete for donations, through time-costly fundraising activities. Before launching fundraising campaigns, the NGOs non-cooperatively choose the types of their projects. The two project types might differ in terms donors' willingness to give, one type representing the relatively larger donation market. If NGOs carry out the same type of projects (in the larger market), donors perceive the projects as substitutes, which intensifies the competition for donations. Thus, at the project type choice stage, each NGO faces a simple trade-off: entering the same (larger) market as the rival but facing tougher competition versus monopolizing the smaller market. The resulting equilibrium configuration crucially depends on the asymmetry in potential donation market size and on donors' perceived substitutability or complementarity between giving to the two projects. We then analyze the welfare properties of the decentralized equilibrium and characterize the conditions under which such equilibrium is inefficient. We also develop a variant of our basic model with inter-temporal choices of NGOs, study what happens when NGOs are able to coordinate their fundraising activities and/or project type choices, and extend the model to allow for spillovers between NGO fundraising activities. Finally, we provide four case studies that illustrate the main mechanisms of our model.

We contribute to the growing literature on the economics of NGOs. Besley and Ghatak (2001) present a general model of optimal ownership of public goods (government versus NGO), focusing on the key role of incompleteness of contracts in foreign aid and the non-excludable nature of project benefits. The above-mentioned paper by Fruttero and Gauri (2005) is the first to model the rational decision of geographic location of NGOs under alternative assumptions about their motivations. Aldashev and Verdier (2009, 2010) build models of horizontally-differentiated NGO competition on the markets for donations, while Aldashev et al. (2014) show the conditions under which NGOs are able to overcome the excessive competition and coordinate their fundraising activities in a stable fashion. Burger et al. (2015) focus on the optimal regulatory policies of NGOs under asymmetric information concerning the level of altruism of NGO founders. Heyes and Martin (2015) study the equilibrium breadth of NGO missions in a model where NGOs compete for donations through the choice of mission statements. Auriol and Brilon (2014) and Aldashev

et al. (2017) study the self-selection of motivated agents into the NGO sector. Scharf (2014) studies the relative efficiency of the equilibrium entry/selection of NGOs into the competitive market under alternative financing schemes, whereas Krasteva and Yildirim (2016) analyze how the adverse selection into NGO sector depends on the sector size and the donors' information costs about NGO quality. Our paper contributes to this literature by providing a simple but flexible model of NGO choice of activity type, which can encompass a rich set of choices that NGOs competing for donations undertake in real-life contexts.

2 Basic model

2.1 Setup

Donors. Consider an economy with a *continuum* of atomistic donors of unitary size. Donors consume a numeraire good and receive a warm-glow benefit (*à la* Andreoni, 1989) from giving to two projects carried out by two non-governmental organizations, denoted $i = 1, 2$. The beneficiaries of these projects are located in a developing country; for simplicity, we assume that they do not undertake any action.

Denoting the income of a donor with I , her budget constraint can be written as

$$C + \sum_{i=1}^2 d_i = I, \quad (1)$$

where C denotes the consumption of numeraire, $d = (d_i)_{i=1,2}$ is a vector of donations to the two projects.

Donors' preferences are described by a linear-quadratic utility function (Singh and Vives, 1984):

$$U(C, d) = C + \sum_{i=1}^2 \omega_i d_i - \frac{1}{2} \sum_{i=1}^2 d_i^2 - b d_i d_j. \quad (2)$$

The interpretation of the key parameters is as follows. ω_i stands for the "willingness to give" of the donor to the project i . The donor might be willing to give if, for instance, she is familiar with the cause and considers it as important. This could also include the emotional drive to give if the cause involves helping beneficiaries that the donor considers as particularly needy or close to her along some dimension (ethnicity, religion, race).³ Thus, ω_i depends positively on the awareness of the donor about the cause, its perceived importance for her, and the degree to which she identifies with the beneficiaries.

³Fong and Luttmer (2009) find, using the data from the U.S. survey following the Hurricane Katrina, that the donors who strongly identify with their own racial group give substantially more when victims are of the same race, as compared to the donors who do not feel very close to their own group.

The parameter $b \in (-1, 1)$ measures the degree of substitution (or complementarity) between donations to two NGOs, and captures the extent to which a donor considers the projects of two NGOs as (dis)similar to each other, i.e. the "loyalty" of the donor to the NGO 'brands'. This depends both on the characteristics of the donor and those of the NGOs. For instance, if the donor mostly cares about the social prestige or social norm associated with giving (and less about the identity of the NGO to which she donates), b would be close to 1. Contrarily, the donor that is strongly familiar with the different organizations and cares about their identity, would consider giving to the projects of the two NGOs as poor substitutes (thus b is close to zero). Moreover, if the origins or the operating methods of the two NGOs differ strongly, the donor plausibly considers them as highly distinct. This occurs, for instance, if the NGOs are born from different religious affiliations, or if they use highly divergent methods in advancing their causes (e.g. militant approach of Greenpeace versus the more conservative one of the World Wildlife Fund). Similarly, for $b < 0$, the donor perceives giving to the two NGOs as complementary and considers her giving to one NGO implying the rationale to give also to the other NGO.

Non-governmental organizations. We assume that each NGO is run by an impurely altruistic (again, as in Andreoni (1989)) social entrepreneur who receives a "warm-glow" utility increasing in the output of her NGO. This implies that the objective function of an NGO is to maximize the output of its project. The production technology of the project of NGO i has two inputs, funds F_i and time τ_i :⁴

$$Q_i(F_i, \tau_i) = F_i \cdot \tau_i. \quad (3)$$

Each social entrepreneur has an endowment of 1 unit of time. She divides this time between working on the project and conducting fundraising campaigns:

$$1 = \tau_i + y_i, \quad (4)$$

where y_i denotes the amount of time devoted to fundraising. The fundraising effort y_i spent by NGO i influences the weights ω_i of donors (and thus the amount given to the NGO's project):

$$\omega_i = \omega + y_i, \quad (5)$$

where ω denotes the baseline weight of giving (i.e. the weight that the donor attaches to giving to a project, in the absence of fundraising).

The NGOs are legally non-profit organizations: they are barred by law from distributing the unspent revenues (Hansmann, 1980; Weisbrod, 1988). Consequently, each social entrepreneur puts all the funds that she collects (net of the financial costs) into the project. Denoting, by $D_i = d_i(1)$,

⁴The fact that returns to scale are increasing does not affect the main results: the analysis remains the same with any Cobb-Douglas production function.

the donations collected by NGO i , the non-distribution constraint can be formally expressed as

$$D_i = f + cD_i + F_i,$$

where $0 \leq c < 1$ is the financial cost of collecting a unitary donation, $f > 0$ is the fixed cost of the project, and F_i is the amount invested into the project. The non-distribution constraint pins down the amount of funds that the NGO invests into its project:

$$F_i = (1 - c)D_i - f. \tag{6}$$

Project types. The project of NGO i can be of two types, which we denote with $k_i = A, B$. These types generally capture the differentiation of NGO projects along a certain dimension, which can be geographic (i.e. projects in same/different countries or regions with a country), temporal in fundraising (i.e. conducting campaigns in the same/different moments of the year), temporal in projects (emergency relief versus long-run reconstruction), technology used (relying more/little on local inputs and staff), etc.

Let k_1k_2 stand for the configuration (pair) of project types. If both NGOs select the same type, i.e. $k_1k_2 = AA$ or $k_1k_2 = BB$, donors perceive giving to the two NGOs' projects as substitutes (or complements); in that case the parameter b , expressing the degree of substitutability (or complementarity) of giving to the two NGOs, takes a positive (negative) value. Contrarily, if each NGO selects a project of a different type (i.e. $k_1k_2 = AB$ or $k_1k_2 = BA$), the donors perceive them as fully independent and the two NGOs operate as if they were each in a monopolistic donation market (and $b = 0$). Each project type $k_i = A, B$ is characterized by its own specific baseline "willingness-to-give" ω_k . We assume $1 \leq \omega_k \leq 2$, to rule out zero donations (which would result under $\omega_k < 1$) and no fundraising by NGOs (which would occur if $\omega_k > 2$).⁵

Timing. The sequence of actions is as follows. At stage 1, each NGO (simultaneously and non-cooperatively) chooses the type of its project. At stage 2, NGOs (simultaneously and non-cooperatively) set their fundraising efforts y_i and y_j . At stage 3, donors decide on their donations, NGOs collect the donations and produce.⁶

⁵These constraints on the willingness-to-give ω_k guarantee the existence of positive donations and positive fundraising levels at the symmetric fundraising equilibria, the ones occurring under the equilibrium choice of projects (see Section 2.2.3).

⁶In Section 4, we present a variant of the model in which we explicitly focus on the inter-temporal dimension and where NGOs can choose the type of the projects sequentially.

2.2 Equilibrium Analysis

2.2.1 Donations

Consider a given choice of project types and fundraising efforts by NGOs. Given these, by (1) and (2), a donor's constrained optimal donation choice satisfies the first-order condition

$$\underbrace{\omega_i - d_i - bd_j}_{\text{MB of giving to } i} = \underbrace{1}_{\text{MC of giving to } i} \quad \text{for } i = 1, 2 \text{ and } j \neq i.$$

The marginal benefit of giving to NGO i falls with d_i and diminishes or increases in d_j depending on the sign of b . Moreover, the marginal benefit of giving to i falls with d_j faster when donations to the two projects are closer substitutes (b approaching 1). For $b < 0$ the marginal benefit of giving to project i increases with d_j , meaning that the donor perceives a donation to the two projects as complementary.

From this first-order condition we obtain the individual donor's giving to NGO i :

$$d_i = \frac{\omega_i - (1 - b) - b\omega_j}{1 - b^2}. \quad (7)$$

Substituting (5) into (7), we obtain, for every $i = 1, 2$ and $j \neq i$, the donation function

$$d_i = \alpha + \beta y_i + \gamma y_j, \quad (8)$$

where

$$\alpha = \frac{\omega - 1}{1 + b} - \frac{f}{1 - c}, \quad \beta = \frac{1}{1 - b^2}, \quad \gamma = -\frac{b}{1 - b^2}. \quad (9)$$

Then, using (3), (6), and (8), the objective function of the NGO i can be expressed as a function of its fundraising effort and of the effort of its rival:

$$Q_i(y_i, y_j) = (1 - c)(\alpha + \beta y_i + \gamma y_j)(1 - y_i). \quad (10)$$

It is easy to notice that, according to (9) and (10),

$$\frac{\partial Q_i(y_i, y_{-i})}{\partial y_j} = \gamma(1 - c)(1 - y_i) \begin{cases} \leq 0 & \text{for } b \geq 0, \\ \geq 0 & \text{for } b < 0, \end{cases}$$

and

$$\frac{\partial^2 Q_i(y_i, y_{-i})}{\partial y_i \partial y_j} = -\gamma(1 - c) \begin{cases} \geq 0 & \text{for } b \geq 0, \\ \leq 0 & \text{for } b < 0. \end{cases} \quad (11)$$

Thus, when projects are considered as substitutes by donors ($b > 0$), the NGOs impose negative externalities on each other's output through fundraising, and their fundraising efforts are *strategic complements* (in other words, an increase in the rival's fundraising raises the incentives for an NGO to devote more time to fundraising). Contrarily, when donors view the projects as complementary ($b < 0$), the NGOs impose positive externalities on each other's output, and fundraising efforts are *strategic substitutes*: higher fundraising by the rival NGO increases the donations given to i and reduces its incentive to divert an additional unit of time from the project to the fundraising activity.

2.2.2 Fundraising

Each NGO sets its fundraising effort level to maximize its objective function

$$\max_{y_i} Q_i(y_i, y_{-i}) = \max_{y_i} (1 - c)(\alpha + \beta y_i + \gamma y_j)(1 - y_i). \quad (12)$$

The resulting first-order conditions for an interior maximum are, for $i = 1, 2$:

$$\frac{\partial Q_i(y_i, y_j)}{\partial y_i} = \underbrace{\beta(1 - c)(1 - y_i)}_{\text{marginal benefit of fundraising}} - \underbrace{(1 - c)(\alpha + \beta y_i + \gamma y_j)}_{\text{marginal cost of fundraising}} = 0, \quad (13)$$

implying that the NGO equates the marginal benefit of fundraising (in terms of project output) to its marginal (opportunity) cost. Intuitively, spending one incremental unit of time for fundraising raises additional $\beta(1 - c)$ amount of funds, which, given the time left for the project, maps into $\beta L(1 - c)(1 - y_i)$ more of project output. On the other hand, this incremental unit of time is taken away from working on the project, and this reduction in time of project work costs D_i units of output. A rational NGO entrepreneur allocates her time between the two activities so as to equate the two values.

Using symmetry, one easily obtains the following equilibrium fundraising effort level for $i = 1, 2$.⁷

$$y_i^* = 1 - \omega \left(\frac{1 - b}{2 - b} \right). \quad (14)$$

Equilibrium fundraising decreases with the initial awareness level of donors ω : more generous donations make funds less scarce in the production function of NGOs, which induces them to devote less time to fundraising.

Contrarily, equilibrium fundraising increases with the substitutability of the two NGOs for donors, b : more substitutable NGO projects make the competition for funds more intense, which, *ceteris paribus*, reduces the funds of each NGO. This makes funds in the production function more scarce, and thus increases the net marginal benefit of fundraising, inducing NGOs to devote more time to this activity. Finally, when projects are complements (for $b < 0$), a free-riding effect is in place: more effort in fundraising by the rival stimulates less effort by an NGO in equilibrium. As b tends to -1 , the positive externalities in fundraising become larger and the free-riding effect gets stronger, driving down the equilibrium fundraising.

The corresponding equilibrium payoff is

$$Q_i(y^*) = \frac{(1 - c)(1 - b)\omega^2}{(1 + b)(2 - b)^2}. \quad (15)$$

⁷Henceforth, for ease of exposition (and without loss of generality), we normalize f to zero (which simply scales down the value of α and does not play any relevant role for the results of the paper).

One easily sees that the equilibrium output decreases monotonically with b : the more resources are diverted away from the project towards fundraising, the less project output is produced in equilibrium.

2.2.3 Choice of projects

Consider now the first-stage choice on the type of projects $k_i = A, B$. Each NGO compares the payoff it obtains when the two projects "cluster", as in (15), that is, for $k_1k_2 = AA$ or $k_1k_2 = BB$,

$$Q_i(y^*) = \frac{(1-c)(1-b)\omega_{k_i}^2}{(1+b)(2-b)^2}, \quad (16)$$

to the one obtained under the monopoly markets, for $k_1k_2 = AB$ or $k_1k_2 = BA$,

$$Q_i(y^*) = \frac{(1-c)\omega_{k_i}^2}{4}. \quad (17)$$

Therefore, at stage 1, the NGOs play a simultaneous-move game in project type choice that can be represented in the following normal form:

To determine the best-response choices, consider NGO 1. Suppose its rival chooses the project of type A . In that case, by (16)-(17), NGO 1's choice of project type reduces to the comparison

$$\underbrace{\frac{1}{\sqrt{1-b^2}} \frac{2(1-b)}{2-b}}_{H(b)} \omega_A \geq \omega_B.$$

Similarly, suppose NGO 2 chooses type- B project. Then, the NGO 1 compares

$$\underbrace{\frac{1}{\sqrt{1-b^2}} \frac{2(1-b)}{2-b}}_{H(b)} \omega_B \geq \omega_A. \quad (18)$$

Given that the decision faced by NGO 2 is symmetric, this allows us to easily characterize equilibria in the choice of projects. Propositions 1 and 2 summarize this characterization.

Proposition 1 For $b \in [0, 1)$: (i) AA is the unique Nash equilibrium in the choice of projects if

$$\omega_B < H(b)\omega_A \quad (19)$$

(ii) BB is the unique Nash equilibrium if

$$\omega_A < H(b)\omega_B \quad (20)$$

(iii) AB and BA are Nash equilibria in pure strategies in the choice of projects if⁸

$$\omega_B \geq H(b)\omega_A \quad \text{and} \quad \omega_A \geq H(b)\omega_B.$$

⁸In addition, case (iii) has a third, mixed-strategy equilibrium.

Figure 3 describes the range of pure strategy Nash equilibria in the plane (ω_A, ω_B) for the case in which projects are perceived as substitutes. Line (AA) is given by the equation

$$\omega_B = H(b)\omega_A,$$

such that below this line the configuration AA arises as a Nash equilibrium in the choice of projects. Similarly, the line (BB) is described by

$$\omega_A = H(b)\omega_B,$$

such that above this line the configuration BB arises as a Nash equilibrium. When the two NGOs select the same project (AA or BB) and they are perceived as substitutes by donors ($b \in (0, 1)$) the slopes of the two lines are positive and always smaller than 1, since $H(b)$ tends to 1 for $b \rightarrow 0$ and tends to zero for $b \rightarrow 1$. Therefore, $H(b)\omega_A > \omega_B$ implies both $\omega_A > \omega_B$ and $\omega_A > H(b)\omega_B$ and this means that the condition (19) determines the uniqueness of project equilibrium (here AA). The same can be said for condition (20). In this case, given that the two lines start at the origin, they divide the (ω_A, ω_B) plane into three regions, as follows:

- Region I : $\{(\omega_A, \omega_B) \mid \omega_A H(b) > \omega_B\}$, where the configuration AA prevails as the unique pure-strategy Nash equilibrium;
- Region II : $\{(\omega_A, \omega_B) \mid \omega_A \geq H(b)\omega_B \text{ and } \omega_B \geq H(b)\omega_A\}$, where AB and BA are both pure-strategy Nash equilibria;
- Region III : $\{(\omega_A, \omega_B) \mid \omega_B H(b) > \omega_A\}$, where BB prevails as the unique pure-strategy Nash equilibrium.

[Figure 3 about here]

The intuition behind the result is as follows. For $b \in (0, 1)$ NGO projects are viewed as substitutes by donors. When deciding about the type of its project, each NGO compares the output it would obtain by being in a larger duopoly donation market (where it has to compete with its rival and face the business-stealing effect) to the one obtained in a monopoly in the alternative but smaller market. If the first market (say, A) is potentially much bigger than the second because of the difference in the pre-existing awareness level ω of donors, the market size effect dominates the competition effect (i.e. the condition (19) is satisfied). Then, both NGOs prefer to choose the type A , which results in the configuration AA being the unique Nash equilibrium. The same logic applies when the condition (20) is satisfied, and thus the configuration BB becomes the unique Nash equilibrium. Instead, when the donation markets are of relatively comparable size (i.e. the

values of ω_A and ω_B do not differ too much), being a monopolist even in a smaller market is more interesting than competing in the larger market. Then, the signs are reversed in both conditions, and each NGO prefers to be a monopolist rather than to compete in the (slightly) larger market. Thus, the NGOs end up playing an anti-coordination game, with the resulting Nash equilibria AB and BA .

Let us now consider in the next proposition the case in which the NGOs' projects are perceived as complements.

Proposition 2 *For $b \in (-1, 0)$, (i) AA is the unique Nash equilibrium in the choice of projects if*

$$\omega_A > H(b)\omega_B. \quad (21)$$

(ii) BB the unique Nash equilibrium in the choice of projects if

$$\omega_B > H(b)\omega_A. \quad (22)$$

(iii) AA and BB can be both Nash equilibria in the choice of projects if

$$\omega_B < H(b)\omega_A \quad \text{and} \quad \omega_A < H(b)\omega_B.$$

It is easy to see that when NGOs' projects are complements, $b \in (-1, 0)$, the slopes of the two lines are positive and greater than 1. Therefore, inequality $\omega_A H(b) > \omega_B$ holds also in a range for which $\omega_A < \omega_B$ (and similarly for $\omega_B H(b) > \omega_A$ when $\omega_A > \omega_B$). We can characterize three different regions:

- Region *I* : $\{(\omega_A, \omega_B) \mid \omega_A > \omega_B H(b)\}$, where the configuration AA prevails as the unique pure-strategy Nash equilibrium;
- Region *II* : $\{(\omega_A, \omega_B) \mid \omega_B < H(b)\omega_A \text{ and } \omega_A < H(b)\omega_B\}$, where AA and BB can both occur as pure-strategy Nash equilibria;
- Region *III* : $\{(\omega_A, \omega_B) \mid \omega_B > \omega_A H(b)\}$, where BB is the unique pure-strategy Nash equilibrium.

[Figure 4 about here]

The results of Proposition 2 mainly depend on the fact that in this case the two NGOs always prefer to compete in the same market than being a monopolist. This comes from the positive externalities that NGO fundraising activities generate on the donations collected by the rival. Moreover, in region *II* it can now occur that the NGOs are trapped in an "bad equilibrium", in which they have both chosen project *A* when the awareness level $\omega_B > \omega_A$ (i.e. the market *A* is potentially the smaller one) or, alternatively, project *B* when $\omega_B < \omega_A$.

Note that, according to Propositions 1 and 2, we observe non-clustering in projects only in region *II* under $b > 0$. This means that NGOs specializing in different project types is essentially driven by the fact that NGOs' projects are perceived as substitutes in terms of donors' awareness and that the NGOs' desire to avoid competing with each other for donations is sufficiently strong. Importantly, this "specialization in causes" disappears whenever some exogenous event makes one of the causes particularly salient in the eyes of donors (even if this may have little to do with the importance of the cause or the underlying need) and then clustering is likely to emerge.

We can now make a simple comparative statics analysis. Consider the case $b > 0$. A decrease in the substitutability of giving between two NGOs, b , rotates both lines towards the 45° line. Thus, clustering is more likely to occur when donors become more "loyal" to individual NGOs. This happens because the weakening competition between NGOs makes the potential size of the donation market a relatively more important consideration. At the limit, when $b \rightarrow 0$, the region *II* completely disappears: when NGOs effectively do not compete with each other for donations, they only care about entering the larger market, and we observe non-clustering outcome only in the knife-edge case of perfectly identical initial awareness of donors.

This comparative statics result provides an interesting testable implication. Consider two large international NGOs (one religious and one secular) that collect funds in two countries, for the same causes. Suppose the level of religiosity in one country is higher than in the other. Our above result implies that in the more religious country, donors have a stronger feeling of loyalty towards the religious NGO, and thus, the intensity of competition is weaker, than in the less religious country. Thus, we should more likely observe clustering by the two NGOs (in terms of their project choice) in the more religious country.

Consider now the case of complementary donations, $b < 0$. Our analysis suggests that when the perceived complementarity of giving to the two projects increases (b approaches -1), clustering remains always the unique outcome. In addition, however, the miscoordination of NGOs (i.e. being trapped in the potentially smaller donation market) becomes possible. Consider any point (on Figure 4) located below the 45° line but above the (BB) line. At such a point, donors' latent willingness-to-give to project *A* is higher than to project *B*. However, both NGOs choosing a project of type *B* is a Nash equilibrium: if NGO i believes that j would (for some reason) choose project type *B*, then i prefers to do the same rather than choosing *A*. This is because the

complementarity in the donations is sufficiently strong to outweigh the size-of-market incentive for i to choose project A .

3 Welfare

As discussed in the introduction, the critiques raised by NGO practitioners concerning the clustering behavior of NGOs underline the inefficiencies that emerge from the uncoordinated project choices by NGOs. However, what is the exact origin of these inefficiencies? Addressing this question and analyzing the claims concerning the inefficiency of decentralized choices of NGOs and donors needs an explicit specification of the social welfare function, which in this context with endogenous donors' preferences is non-trivial, as we explain below.

There are two main difficulties with a full welfare analysis. First, concerning the utility of donors, the presence of a warm-glow component poses a well-known conceptual problem. How should their welfare be evaluated, given that the actions of NGOs *de facto* modify their preferences? This problem is similar to the one arising in the welfare analysis of (non-informative) advertising. One solution to this problem was proposed by Dixit and Norman (1978). It consists in fixing the pre-advertising identity of the consumers, and using this benchmark to evaluate the post-advertising outcomes. We adopt this solution here. Specifically, we fix the pre-fundraising identity of the donors and evaluate the decentralized equilibrium outcomes against this benchmark:

$$W^D = U(C, d; \omega).$$

Second, how do we compare the utility of donors with the utility of the beneficiaries of NGOs' projects? As the latter play no active role in the model, we could assume that their welfare is appropriately represented by some aggregate index W^N combining the projects outputs of the NGO entrepreneurs $W^N = Z(Q_i(y_i, y_j); Q_j(y_j, y_i))$. A simple measure could for instance be the sum of these outputs $W^N = Q_i(y_i, y_j) + Q_j(y_j, y_i)$. Social welfare would then be written as $SW = W^N + \lambda W^D$ with λ reflecting implicitly the relative weight of the donors' welfare as compared to the NGOs beneficiaries' welfare.

Obviously how far the resulting decentralized equilibria characterized in the previous section differ from a welfare maximizing allocation, and whether there is a scope for policy interventions to improve social welfare is likely to depend on the value of λ (as well as on the aggregate index $Z(.,.)$ function of NGO outputs describing the recipients' welfare). In what follows we provide such a comparison for the simple utilitarian case where $\lambda = 1$ and $W^N = Q_i(y_i, y_j) + Q_j(y_j, y_i)$.

Given the symmetry of NGOs in terms of technology and endowments, to evaluate the implications of decentralized equilibria, it suffices to consider three cases: (i) no clustering, (ii) both

NGOs' projects are of type A ; (iii) both are of type B . The social welfare maximization then consists in comparing the maximum social welfare attainable in each of the three cases.

The potential inefficiencies occurring in the various decentralized equilibria are summarized by the next proposition, whose proof is relegated in the Appendix.

Proposition 3 (i) For $b \in [0, 1)$, there is a range of willingness-to-give (ω_A, ω_B) such that the decentralized selection of projects by NGOs is sub-optimal and characterized by excessive clustering.
(ii) For $b \in (-1, 0)$, there is a range of willingness-to-give (ω_A, ω_B) such that the decentralized selection of projects by NGOs are sub-optimal and characterized by miscoordination in the choice of project.

Proof. See the Appendix. ■

As proven in the Appendix, at the optimal fundraising choice,

$$SW_{AA}^\circ > SW_{BA}^\circ \quad (23)$$

for

$$\omega_B < \omega_A H^\circ(b) \quad (24)$$

and, similarly,

$$SW_{BB}^\circ > SW_{AB}^\circ \quad (25)$$

for

$$\omega_A < \omega_B H^\circ(b), \quad (26)$$

where

$$H^\circ(b) = \frac{1}{2} + \frac{\sqrt{(\omega_A - \omega_A^2)(16b^2 - 16) - 4b^2 + 4}}{4(b + 1)}.$$

Thus, comparing (24) and (26) with the Nash equilibrium NGOs project choice (expressions (19) and (20)) it emerges that

$$H^\circ(b) < H(b) \quad \text{for } b \in (0, 1) \quad (27)$$

and, conversely,

$$H^\circ(b) > H(b) \quad \text{for } b \in (0, -1). \quad (28)$$

Expression (27) says that when the NGOs' projects (AA) or (BB) are perceived as substitutes ($b > 0$) by the donors, the welfare-maximizing choice of projects would imply non-clustering for a broader range of ω_A and ω_B than at the decentralized equilibrium. Grey areas in Figure 5 depict the combination (ω_A, ω_B) of willingness-to-give to the two projects for which a decentralized choice of projects causes a social welfare loss due to an excessive clustering towards the project that guarantees more visibility and, thus, more donations.

[Figure 5 about here]

On the other hand, by (28) when the projects (under either AA or BB configurations) implemented by two NGOs are perceived as complements by the donors ($b < 0$), the first-best always requires clustering but with a coordination of both NGOs either in AA - when the donors' awareness favors project A over project B ($\omega_A > \omega_B$) - or in BB when the reverse holds ($\omega_B > \omega_A$). In this respect, a greater perception of complementarity by donors for the same projects operated by two competing NGOs (i.e. a level of b closer to -1), generates a higher risk to remain trapped in a coordination failure, with both NGOs clustering on the wrong type of project, and no possibility to escape without policy intervention or joint coordination. For $b \rightarrow -1$ region II grows larger and larger and this implies a higher chance of coordination failure for NGOs at the decentralized equilibria. Grey areas in Figure 6 indicate the "wrong clustering" areas due to miscoordination on the choice of projects under decentralized equilibria.

[Figure 6 about here]

4 Choice of projects as a timing game

Prominent contexts where the problem of NGO clustering often occurs are the episodes of large-scale humanitarian crises in developing countries. As described in the introduction, in such episodes, NGOs often engage in a humanitarian race, where most organizations rush into crisis areas to save lives, whereas extremely few NGOs choose to enter the area later on, to conduct the long-run reconstruction and post-emergency work. The main reason for such inter-temporal clustering is that this latter type of projects, while being fundamentally important, is much less attractive from the perspective of fundraising.

Why the inter-temporal clustering in humanitarian crises occurs so often? Are the main forces driving the clustering the same as in our basic model in Section 2, or is there something specific related to time that gives rise to additional forces? To answer these questions, in this section we develop an extension of our basic model for settings involving project choices as a timing game.

As an explanatory example, consider a poor developing country hit by a humanitarian crisis (e.g. a natural disaster). There are two periods, t and $t + 1$, that can be interpreted as time periods over which the crisis evolves. There are two NGOs ($i = 1, 2$) with humanitarian missions. In order to focus on the timing issue, let us assume that each of them can either implement its project in period t or in $t + 1$, but not in both. Implicitly, this assumes that there are either large fixed costs or capacity constraints that do not allow a NGO to operate in both periods.

The utility function of the donor takes into account the existence of two periods and now becomes

$$U(C, d^t, d^{t+1}) = C_t + \sum_{i=1}^2 \omega_i d_i^t - \frac{\sum_{i=1}^2 (d_i^t)^2}{2} - b d_1^t d_2^t + \\ + \delta \left[C_{t+1} + \sum_{i=1}^2 \omega_i d_i^{t+1} - \frac{\sum_{i=1}^2 (d_i^{t+1})^2}{2} - b d_1^{t+1} d_2^{t+1} - \rho (d_1^t + d_2^t) (d_1^{t+1} + d_2^{t+1}) \right],$$

where ω_i denotes the utility weight of donation to the project of NGO i , d_i^t the amount given to NGO i if its project is carried out in period t , and d_i^{t+1} the amount given to NGO i if its project is carried out in $t + 1$. Let also C_t and C_{t+1} denote the consumption of the *numéraire* in the two periods.

The utility function of the donor in this modified model contains the following key parameters. Similar to the basic model, b denotes the degree of substitutability or complementarity of giving to the projects of two NGOs, *if these projects are carried out in the same period*. The time-discounting factor $\delta \in (0, 1)$ captures the degree of patience of the donor, whereas ρ measures the degree of donor's "aid fatigue" (if $\rho > 0$) or donor's habit formation of giving (if $\rho < 0$). Intuitively, $\rho > 0$ when a donor that has given to an NGO in period t feels a lower marginal utility from giving in period $t + 1$: this has been documented in experiments, for instance, by Donkers et al. (2017). Similarly, $\rho < 0$ when a donor that has given to an NGO in period t feels a higher marginal utility from giving in period $t + 1$, which can occur, for instance, if the donor starts to become more familiar with the organizations to which she has given in the past.

The intertemporal budget constraint of the donor is

$$I \equiv I^t + \frac{I_{t+1}}{1+r} = C_t + \frac{C_{t+1}}{1+r} + \sum_{i=1}^2 d_i^t + \sum_{i=1}^2 \frac{d_i^{t+1}}{1+r},$$

where r denotes the real interest rate. For simplicity, assume that the subjective discount factor is equal to the objective (market) one, i.e. $\delta = \frac{1}{1+r}$. Then, the objective function of the donor simply becomes

$$U = I - \sum_{i=1}^2 d_i^t - \delta \sum_{i=1}^2 d_i^{t+1} + \sum_{i=1}^2 \omega_i d_i^t - \frac{\sum_{i=1}^2 (d_i^t)^2}{2} - b d_1^t d_2^t + \\ + \delta \left[\sum_{i=1}^2 \omega_i d_i^{t+1} - \frac{\sum_{i=1}^2 (d_i^{t+1})^2}{2} - b d_1^{t+1} d_2^{t+1} - \rho (d_1^t + d_2^t) (d_1^{t+1} + d_2^{t+1}) \right].$$

The sequence of actions is now modified as follows. At the beginning of period t , each NGO chooses (simultaneously and non-cooperatively) whether it will implement its project in t or in $t + 1$. The NGO(s) that has (have) decided to implement its (their) project in t then set its

(their) fundraising efforts at this time. Donors decide on their donations to this (these) NGOs, rationally anticipating the fundraising occurring in $t + 1$, if any. The collection of donations and the production of the project output occurs at this stage. Similarly in $t + 1$, the NGO(s) that has (have) decided to implement its (their) project in $t + 1$ set its (their) fundraising effort(s). Donors give to this (these) NGO(s) and then the implementation of project output(s) occurs.

Waiting is costly, as the humanitarian crisis deepens in the absence of action. Specifically, we assume that the NGOs' payoffs in period $t + 1$ is multiplied by a factor $\mu < 1$ if no project gets implemented in period t . Moreover, we assume that the baseline willingness to give ω is the same in both periods.⁹

Note that in case the two NGOs cluster temporally (i.e. both produce in t or both produce in $t + 1$), when choosing their fundraising efforts they play a simultaneous-move game. Instead, if they do not cluster (one NGO implements its project in t whereas the other implements in $t + 1$), they play a Stackelberg duopoly game in fundraising. Moreover, donors are rational and take this into account. As we will see, this has non-trivial consequences for the analysis, given that the preferences of donors are not time separable.

4.1 Naive NGOs

Suppose (for the moment) that NGOs are "naive" in their inter-temporal reasoning, i.e. when considering the non-clustering equilibria they act as if they played a sequential game without taking into account the strategic effects of being Stackelberg leader or follower. We consider this so as to explore which new results arise because of the inter-temporal nature of the game. Later, we will consider the fully-rational sequential decisions taken by NGOs and will see what additional results the sequential- versus simultaneous-game trade-offs will deliver. The game in project type choice becomes now representable as follows: where superscript n stands for "naive", indicated only in sequential strategy profiles t and $t + 1$, denoting the fact that projects are implemented in these periods.

Constructing the NGOs payoffs in the main diagonal of this matrix is easy. If both NGOs act in period t , no project is operational (and thus donors do not give) in period $t + 1$. Then, the game is very similar to the one analyzed in the basic model and

$$Q_{t,t} = \frac{L(1-c)\omega^2(1-b)}{(1+b)(2-b)^2}.$$

Similarly, if both NGOs operate in period $t + 1$, no donations are given in period t , and the

⁹Once the logic of the model is understood, it is easy to relax this assumption and see how the equilibria get affected if ω declines over time ($\omega_{t+1} < \omega_t$) or if it is increasing ($\omega_{t+1} > \omega_t$).

only difference with respect to the above case is that the payoffs of NGOs are reduced by μ :

$$Q_{t+1,t+1} = \mu \frac{L(1-c)\omega^2(1-b)}{(1+b)(2-b)^2}.$$

Things are slightly different in case of non-clustering. If one NGO operates in t while the other in $t+1$, a donor's utility function takes the form

$$U = I - d_1^t - \delta d_2^{t+1} + \omega_1 d_1^t - \frac{(d_1^t)^2}{2} + \delta \left[\omega_2 d_2^{t+1} - \frac{(d_2^{t+1})^2}{2} - \rho d_1^t d_2^{t+1} \right].$$

For "naive" NGOs, this simply implies playing a game in fundraising efforts in a market where donors' parameter of substitutability of giving to the two projects is $\rho\delta$ (instead of b). Then, it is straightforward to obtain the payoffs of the two NGOs as:

$$Q_{t+1,t}^n = Q_{t,t+1}^n = \frac{L(1-c)\omega^2(1-\rho\delta)}{(1+\rho\delta)(2-\rho\delta)^2}. \quad (29)$$

Notice that expression (29) monotonically decreases with $\rho\delta$. This implies that if $b > \rho\delta$ (see Figure 7), then the Nash equilibrium is necessarily asymmetric: either $(t+1, t)$ or $(t, t+1)$ will be played in the endogenous timing game. Intuitively, this is because the intensity of competition in same-period projects (as captured by the substitutability parameter b in donors' utility function) is higher than that of the inter-temporal competition (i.e. the competition between projects run in different periods). This inter-temporal competition is driven by donors' patience (δ) and by their "aid fatigue" (ρ). In other words, if a donor is relatively likely to give in period $t+1$ even after having given in period t (which is captured by ρ being relatively small) or the donor is relatively impatient (δ is relatively low), the NGOs understand that should they conduct their projects in two different periods, the donor would not consider giving to their project as close substitutes. Contrarily, operating in the same period intensifies the fundraising competition, which in turn harms the output levels of NGO projects. This comparison thus induces them to opt for competing in the different-period projects, and thus not to cluster temporally.

[Figure 7 about here]

If $b < \rho\delta$, then two possibilities emerge. If the output of NGOs deteriorates strongly enough across periods (in the absence of any projects in period t), i.e. if μ is sufficiently small, then the unique Nash equilibrium in the choice-of-timing game is (t, t) . This is because the intensity of same-period competition is smaller than that of inter-temporal competition, and the deterioration effect is so strong that playing t is still the best-response to the rival NGO's choice $t+1$. In other words, competing in different-period projects is still better than playing in the (much worse)

period $t + 1$. Then, playing t is the dominant strategy, which delivers the unique Nash equilibrium (t, t) .

Instead, if the deterioration is not too strong (μ is relatively close to 1), we obtain two Nash equilibria in pure strategies: (t, t) and $(t + 1, t + 1)$.

4.2 NGOs playing à la Stackelberg

When the NGOs take into account the strategic effect coming from their sequential fundraising, we can easily compute the Stackelberg fundraising effort for the NGO playing as leader: (s stands for "Stackelberg")

$$y_t^s = \frac{1}{2} \frac{4 - \omega(2 - \rho\delta) - \rho^2\delta^2(2 - \omega)}{2 - \rho^2\delta^2},$$

and that for the follower

$$y_{t+1}^s = \frac{1}{4} \frac{8 - \omega(4 - 2b) - \rho^2\delta^2(4 + \rho\delta\omega - 3\omega)}{2 - \rho^2\delta^2},$$

with associated project outputs, respectively given by

$$Q_{t,t+1}^s(y_t^s, y_{t+1}^s) = \frac{1}{8} \frac{L(1-c)\omega^2(1-\rho\delta)(2+\rho\delta)^2}{(1+\rho\delta)(2-\rho^2\delta^2)},$$

$$Q_{t+1,t}^s(y_t^s, y_{t+1}^s) = \frac{1}{16} \frac{L(1-c)\omega^2(1-\rho\delta)(\rho^2\delta^2 - 2\rho\delta - 4)^2}{(1+\rho\delta)(2-\rho^2\delta^2)^2}.$$

Now the equilibria of this game are characterized as follows:

Proposition 4 (i) For $b \in [0, 1)$, the endogenous equilibrium timing of projects decided by NGOs will be sequential (with either $(t, t + 1)$ or $(t + 1, t)$) for $b \geq \rho\delta > 0$ and simultaneous for $\rho\delta > b > 0$. (ii) For $b \in (-1, 0)$, the endogenous equilibrium timing of projects decided by NGOs will be simultaneous (with either urgency bias (t, t) or delayed interventions $(t + 1, t + 1)$) for $\rho\delta < b < 0$ and sequential for $0 > b > \rho\delta$.

What is the intuition for the above results? Consider first the case when projects are viewed by donors as substitutes ($b > 0$). Since by definition the Stackelberg leader gains at least as much as playing simultaneously, it must be true that $Q_{t,t+1}^s \geq Q_{t+1,t+1} = \mu Q_{t,t}$. Moreover, using the standard properties of the Stackelberg equilibrium, when fundraising activities are *strategic complements* and best-replies positively sloped in the fundraising space (which holds for $b > 0$), the follower always obtains a higher payoff than the leader and, hence, higher than under simultaneous play: $Q_{t+1,t}^s > Q_{t,t}$. Therefore, when $b = \rho\delta$, the NGOs would always prefer to

sequence their equilibrium choices of projects, ending in one of these two equilibria: $(t, t + 1)$ or $(t + 1, t)$. Therefore, a *simultaneous* equilibrium can only arise when $b < \rho\delta$. In Figure 8 this is represented by a shift downward of the (SS) line, dividing *simultaneous* from *sequential* NGOs project choice. Intuitively, when fundraising generates negative externalities (which is the case when $b > 0$), NGOs find it profitable to postpone fundraising and a sequential selection of projects arises even when the *inter-temporal* effect is relatively more intense than the *market competition* effect, occurring under project clustering.

Alternatively, when NGOs projects are complements ($b < 0$) and fundraising efforts are *strategic substitutes*, due to the strategic property of the Stackelberg equilibrium, playing simultaneously is in general more convenient than playing as a follower and, therefore, $Q_{t,t+1}^s \geq Q_{t,t} > Q_{t+1,t}^s$ for $b = \rho\delta$. In this case, an *urgency bias* (t, t) may occur even for $b > \rho\delta$, i. e. when the harming *market competition* of project clustering is stronger than the *inter-temporal* effect. In Figure 9, this strategic effect of the fundraising Stackelberg game is expressed by the (SS) line, now lying above the 45 degree line.

[Figures 8 and 9 about here]

Note that compared to the case of naive NGOs, "sophisticated" NGOs understand that playing sequentially induces a Stackelberg timing game. This opens up some additional strategic interactions not only in competition intensity of fundraising efforts, but also in terms of the strategic use of commitment to timing by the first NGO. This dimension therefore implies that, on top of the comparison between the intensity of competition in same-period projects (as captured by b) and the intensity of inter-temporal competition (as captured by $\rho\delta$), the equilibrium outcome of that game depends as well on the strategic nature of fundraising competition (strategic complementarity or substitutability as captured by $b \leq 0$).

To sum up, this modified model shows that when NGOs decide on carrying out their projects at an earlier or a later stage, the key determinant of the decentralized equilibrium lies in donors' preferences. Specifically, the crucial point is how donors view giving to different NGOs' projects (i.e. how substitutable they are) within the same period as compared to giving today or tomorrow (i.e. how substitutable is giving inter-temporally). The comparison of these two parameters determines the relative intensity of competition between NGOs for donations (competing in the same period versus competing inter-temporally), which in turn drives the temporal allocation of the projects.

5 Coordination

So far, we have assumed away the possibility that NGOs might want to overcome the inefficiencies by designing voluntary coordination agreements. This might be somewhat too pessimistic, as there

exist several real-life examples of successful coordination among NGOs. For instance, on multiple occasions, understanding the downsides of excessive fundraising competition, NGOs united their forces into umbrella organizations that conduct joint fundraising appeals. The most well-known example is, perhaps, the American United Way (see Brilliant 1990 for a detailed history), but such examples exist also in other countries, for instance, the Disaster Relief Agency created by Dutch NGOs in 1993, Disasters Emergency Committee (DEC) in Britain, and Belgian National Center for Development Cooperation (see Similon, 2015).

How does the analysis of our model change if one explicitly allows for NGO coordination? To answer this question, in this section we study the outcomes arising when the NGOs can coordinate their activities on fundraising efforts (at stage 2), project types (at stage 1), or both.

When NGOs coordinate, they need to have a their common objective function. We simply assume that they wish to maximize the sum of the outputs of their projects.¹⁰

5.1 Horizontal coordination (in fundraising) between NGOs

Suppose now NGOs are able to construct coordination agreements, so as to jointly choose their levels of fundraising effort, but their choice of project types remains decentralized (non-coordinated). Essentially, this assumption applies well to settings where NGOs create umbrella fundraising organizations, but do not consider coordinating on project types feasible or desirable. What kind of project configuration will emerge in equilibrium? And how does it differ from the fully non-coordinated case?

The problem of the two NGOs becomes now

$$\max_{y_1, y_2} Q_1 + Q_2.$$

The total output can then be written as

$$Q = Q_1 + Q_2 = (1 - c) [(\alpha + \beta y_1 + \gamma y_2)(1 - y_1) + (\alpha + \beta y_2 + \gamma y_1)(1 - y_2)]$$

and the first-order condition with respect to every i -th NGO fundraising effort y_i for $i = 1, 2$ and $j \neq i$ is

$$\frac{\partial Q}{\partial y_i} = \frac{1 - b}{1 - b^2}(1 - y_i) - \left(\frac{\omega - 1}{1 + b} + \frac{y_1 - by_j}{1 - b^2} \right) = 0.$$

The difference with respect to the first-order condition for the non-coordinated case is that now the marginal benefit of fundraising by a NGO is reduced (or increased) by b (the factor $1 - b$ instead of

¹⁰Alternatively we could have considered a more complicated index function of these projects outputs taking eventually into account some degree of complementarity between these output levels. While this would significantly complicate the analytics, the basic feature that coordination allow NGOs to internalize part of the competitive business stealing effect of fundraising will still be present in the analysis.

1), as the coordinated choice internalizes the business-stealing effect (or business-boosting effect) it imposes on the funds (and thus on output) of the second NGO.

Given the symmetry, we easily obtain the following solution in fundraising levels:

$$y_i^C = y_j^C = 1 - \frac{\omega_k}{2}. \quad (30)$$

Note that the level of fundraising it is smaller than in the non-coordinated case (14) for $b > 0$ (and bigger for $b < 0$) except in the limit case of $b = 0$, when the two coincide. Intuitively, the coordination agreement chooses the level of fundraising so as to fully internalize the business-stealing (or business-boosting) effect.

Using (30), it is easy to obtain the values of total output for various configurations of project types:

$$Q^{AA} = (1 - c) \frac{\omega_A^2}{2(1 + b)}, \quad Q^{BB} = (1 - c) \frac{\omega_B^2}{2(1 + b)}, \quad Q^{AB} = (1 - c) \left(\frac{\omega_A^2}{4} + \frac{\omega_B^2}{4} \right).$$

At the stage of project types, we assume that NGOs do not coordinate, and continue to choose their projects in a decentralized fashion. Again, suppose NGO 2 chooses project type A . The choice of NGO 1 is then driven by the comparison

$$\frac{\omega_A^2}{4(1 + b)} \geq \frac{\omega_B^2}{4},$$

which, analogously to the non-coordinated case, gives the (AA^C) line

$$\omega_B = \frac{1}{\sqrt{1 + b}} \omega_A.$$

Similarly, we obtain the (BB^C) line

$$\omega_A = \frac{1}{\sqrt{1 + b}} \omega_B.$$

Note that the slope of the (AA^C) line is smaller than 1 but is larger than that of the (AA) line.

Figure 10 compares the equilibrium configurations emerging with and without horizontal coordination for $b > 0$. The region II get smaller. This means that, if NGOs are able to credibly coordinate in terms of their fundraising efforts, we are more likely to observe clustering. Intuitively, as fundraising coordination weakens the business-stealing effect, the cost of entering the same market is now smaller, and the main concern becomes that about the market size. Similarly, for $b < 0$, we obtain that the slope of the (AA^C) line becomes steeper than that of the (AA) line, therefore increasing the possibility of inefficient clustering (see Figure 11).

5.2 Full coordination in fundraising and project choice

Now, let's allow the NGOs to coordinate both in terms of their fundraising *and* in the choice of project types. In that case, they will jointly choose the configuration AA iff $Q^{AA} > Q^{BB}$ and $Q^{AA} > Q^{AB}$. The first condition is satisfied below the 45° line, whereas the second is satisfied iff

$$\frac{\omega_A^2}{2(1+b)} > \frac{\omega_A^2}{4} + \frac{\omega_B^2}{4} \text{ or if } \omega_B < \omega_A \sqrt{\frac{1-b}{1+b}}.$$

This gives us the equation for the lines (AA^{FC}) and (BB^{FC})

$$\omega_B = \omega_A \sqrt{\frac{1-b}{1+b}} \text{ and } \omega_A = \omega_B \sqrt{\frac{1-b}{1+b}}.$$

Notice that the (AA^{FC}) line is always flatter than the (AA) line for $b > 0$ and steeper for $b < 0$

$$\sqrt{\frac{1-b}{1+b}} < \frac{1}{\sqrt{1-b^2}} \frac{2(1-b)}{2-b} \text{ as } 1 < \frac{2}{2-b}.$$

This means that if NGOs are able to coordinate at both stages, the area of clustering shrinks when NGOs outputs are perceived as substitutes by donors ($b > 0$) and, similarly, the area of "bad" clustering gets smaller when projects are perceived as complements ($b < 0$).

We illustrate these results for $b > 0$ in Figure 10. Consider point Z . Without any coordination or with coordination only in fundraising, at point Z we would observe the clustering configuration AA . Contrarily, if NGOs are able to coordinate also the choice of projects, they would jointly choose the configuration AB , and the NGO with project type A would compensate the NGO doing project of type B for not switching to type- A project.

[Figures 10 and 11 about here]

Similarly, in Figure 11 for $b < 0$, while a coordination in only fundraising can enlarge the area of potential coordination failure (region II), a full coordination in both fundraising and choice of projects would reduce it, with an obvious gain of efficiency. This point is briefly expressed in the next proposition.

Proposition 5 *While coordination between NGOs in fundraising only increases the possibility of inefficient clustering equilibria ($b > 0$) and miscordination on project choice ($b < 0$), full cooperation in both fundraising and project choice by NGOs exerts the opposite effect on their behaviour, reducing the chance of inefficient clustering (for $b > 0$) and miscordination on project choice ($b < 0$).*

Thus, we see that under *partial coordination* the results are radically different from those *under full coordination*. In other words, partial coordination (in fundraising, but not in project types) increases the scope of clustering (or bad clustering) while full coordination reduces it. Intuitively, under partial coordination competition in second stage gets weaker, and thus the Prisoner's Dilemma (coordination game, respectively) problem of NGOs in the first stage gets worse, and thus the parameter space in which clustering (bad clustering respectively) arises becomes larger. Instead, full coordination completely eliminates the Prisoner's Dilemma problem, allowing for binding side transfers between NGOs: even in the case of relatively strong asymmetry in the sizes of two donation markets, NGOs under full coordination can write an agreement to transfer value between them, and they only have to worry about maximizing the total output.

6 Fundraising spillovers

Our basic model assumes that fundraising activities by one NGO have only an indirect and negative impact on the funds collected by the other NGO, via the "business-stealing" effect. The existing empirical and experimental evidence shows, however, that fundraising activities often generate positive externalities. For instance, Van Diepen et al. (2009) find, using data on direct-mail fundraising by large Dutch charities, that an individual charity's donation solicitation by mail increases the total size of the donation market. Intuitively, being contacted by one charity working towards, for example, environmental issues, raises the awareness of the donor about those issues. She now cares more about environment, and thus her marginal warm-glow utility from giving to the other organization working on a similar project increases (compared to a scenario in which she was not contacted by the first organization). Thus, the fundraising activities of one organization have created positive spillovers for the donations collected by other organizations.¹¹

In this section, we develop an extension of our model that analyzes how our main results change when NGOs impose spillovers on each other through fundraising activities. For this, we assume that the willingness to give to NGO i of an individual donor now depends on fundraising by i and j in the following way:

$$\omega_i = \omega + y_i + \Delta y_j, \quad (31)$$

where $\Delta \in [0, 1]$ represents the spillover effect that a NGO fundraising effort exerts on the visibility of its rival. The donation function now becomes

$$d_i = \alpha + \beta y_i + \gamma y_j, \quad (32)$$

¹¹Using the U.S. data from PSID, Reinstein (2011) finds that such positive spillovers are present for small donors, whereas for larger ones, the negative "business-stealing" effect seems to dominate.

where

$$\alpha = \frac{\omega - 1}{1 + b}, \quad \beta = \frac{1 - b\Delta}{1 - b^2}, \quad \gamma = \frac{\Delta - b}{1 - b^2}. \quad (33)$$

The size of parameter Δ might depend on the nature of the cause towards which NGOs operate. For instance, if the issue is relatively new and unknown to donors (e.g. in case of a humanitarian emergency), a solicitation to give by and NGO typically involves providing extensive information about the cause or the problem to the donor. In such case, it is likely that the awareness-raising spillovers between NGO fundraising activities are large. Moreover, Δ depends on the dominant technology of soliciting donations. If the fundraising technology allows for precise targeting of potential donors on the basis of certain characteristics or behavior (as in case of online solicitations, when targeting is made through professional marketing firms on the basis of consumption patterns of potential donors), the spillovers are relatively small. Contrarily, if the technology does not allow for targeting, as for instance in case of direct mailing, the spillovers are likely to be high. From (33) it is easy to see that, for different values of b and Δ , the sign of γ can be either positive or negative and, therefore, fundraising exerts positive (negative) externalities for $\Delta > b$ ($\Delta < b$).

Concerning the project-type choice, similar to the basic model, we can assume that if both NGOs select the same type, i.e. $k_1k_2 = AA$ or $k_1k_2 = BB$, donors perceive giving to the two projects as substitutes (or complements). Contrarily, if each NGO selects a project of a different type (i.e. $k_1k_2 = AB$ or $k_1k_2 = BA$), the donors perceive them as distinct and the two NGOs operate as if they were in a monopolistic donation market, with $\gamma = 0$. This is equal to assume that the awareness spillovers in fundraising efforts are shaped by the project decision of the NGOs in this way: if $k_1k_2 = AA$ or $k_1k_2 = BB$, $\Delta_{AA} = \Delta_{BB} = \Delta$, while in the case of two distinct projects $\Delta_{AB} = \Delta_{BA} = 0$, meaning that there are no interactions between the fundraising activities carried out for the two projects. Finally, as before, we let each project $k_i = A, B$ be characterized by its own specific baseline "willingness-to-give" ω_k .¹²

Consequently, when deciding on $k_i = A, B$, each NGO compares the payoff it obtains when the two projects "cluster", as in (15), that is, for $k_1k_2 = AA$ or $k_1k_2 = BB$,

$$Q_i(y_i^*) = \frac{(1 - c)\beta(\alpha_{k_i} + \beta + \gamma)^2}{(2\beta + \gamma)^2}, \quad (34)$$

to the one obtained under the monopoly markets, for $k_1k_2 = AB$ or $k_1k_2 = BA$,

$$Q_i(y_i^*) = \frac{(1 - c)(\alpha_{k_i} + 1)^2}{4}. \quad (35)$$

Given (34) and (35) we can now easily characterize the equilibrium choices of the two NGOs when $\gamma > 0$.

¹²Again here $1 \leq \omega_k \leq 2$ is constrained to ensure the existence of interior equilibria for donors and NGOs.

Proposition 6 (i) AA is a Nash equilibrium in the choice of projects if and only if

$$\frac{\sqrt{\beta}(\alpha_A + \beta + \gamma)}{2\beta + \gamma} > \frac{\alpha_B + 1}{2}. \quad (36)$$

(ii) BB is a Nash equilibrium if and only if

$$\frac{\sqrt{\beta}(\alpha_B + \beta + \gamma)}{2\beta + \gamma} > \frac{\alpha_A + 1}{2}. \quad (37)$$

(iii) AB and BA are Nash equilibria in the choice of projects only if

$$\frac{\sqrt{\beta}(\alpha_A + \beta + \gamma)}{2\beta + \gamma} \leq \frac{\alpha_B + 1}{2} \quad \text{and} \quad \frac{\sqrt{\beta}(\alpha_B + \beta + \gamma)}{2\beta + \gamma} \leq \frac{\alpha_A + 1}{2}.$$

Proof. By straightforward manipulations of expressions (34)-(35). ■

The intuition is simple and similar to the one in the basic model, with some caveats. When deciding about the type of its project, each NGO compares the output it would obtain by being in a duopoly market for donations (which, however, would expand because of the positive awareness spillovers) to that obtained in a monopoly, but without the spillovers. When these spillovers are sufficiently strong (as compared to the benefit of being a monopolist), the condition (36) is satisfied. Then the former payoff dominates the latter, and both prefer to choose the type A (given that the other NGO chooses A), which results in the configuration AA being a Nash equilibrium. The same logic applies when the condition (37) is satisfied, and thus the configuration BB becomes a Nash equilibrium. Instead, when the spillovers are relatively small (as compared to the benefit of being a monopolist) the signs are reversed in both conditions, each NGO tries to become a monopolist; thus, the NGOs end up playing an anti-coordination game, with the resulting Nash equilibria AB and BA .

Figure 12 describes the range of Nash equilibria in the plane (ω_A, ω_B) . Line (AA) is given by the equation

$$\omega_B = \underbrace{\sqrt{\frac{1-b\Delta}{1-b^2}} \frac{2\Delta(1-b)}{2(1-b\Delta) + \Delta - b}}_{G(b,\Delta)} + \underbrace{\sqrt{\frac{1-b\Delta}{1-b^2}} \frac{2(1-b)}{2(1-b\Delta) + \Delta - b}}_{H(b,\Delta)} \omega_A,$$

such that below this line the configuration AA arises as a Nash equilibrium in the choice of projects.

Similarly, the line (BB) is described by

$$\omega_A = G(b, \Delta) + H(b, \Delta)\omega_B,$$

such that above this line the configuration BB arises as a Nash equilibrium. It is easy to verify that both the intercepts and the slopes of the two lines are positive, and that the slopes are smaller than 1. The two lines intersect at the point (E, E) , where

$$E = \frac{2\Delta(1-b)\sqrt{1-b\Delta}}{\sqrt{1-b\Delta} [2(1-b\Delta) + \Delta - b] - 2(1-b)\sqrt{1-b\Delta}}.$$

Consequently, these two lines divide the (ω_A, ω_B) plane into four regions, as follows:

- Region *I* : $\{(\omega_A, \omega_B) \mid \omega_A > G + H\omega_B \text{ and } \omega_B > G + H\omega_A\}$, where the configurations *AA* and *BB* prevail as the pure-strategy Nash equilibria;
- Region *II* : $\{(\omega_A, \omega_B) \mid \omega_A > G + H\omega_B \text{ and } \omega_B < G + H\omega_A\}$, where *AA* is the unique pure-strategy Nash equilibrium;
- Region *III* : $\{(\omega_A, \omega_B) \mid \omega_A < G + H\omega_B \text{ and } \omega_B > G + H\omega_A\}$, where *BB* is the unique pure-strategy Nash equilibrium;
- Region *IV* : $\{(\omega_A, \omega_B) \mid \omega_A \leq G + H\omega_B \text{ and } \omega_B \leq G + H\omega_A\}$, where *AB* and *BA* prevail as the pure-strategy Nash equilibria.

[Figure 12 about here]

In terms of comparative statics, it is easy to verify that the intercept (G) and the slope (H) of the two lines are increasing in Δ and decreasing in b . Consequently, as shown in Figure 13, the *AA* line shifts up and rotates counter-clockwise, whereas the *BB* line shifts to the right and rotates clockwise. This leads to the expansion of regions *I*, *II*, and *III*, and the shrinking of the region *IV*.

[Figure 13 about here]

Thus, when the awareness spillovers (under the choice of the same type of projects) become larger, the equilibrium clustering of the NGO projects becomes more prevalent. The same effect obtains when the donors perceive the projects of the same type as more substitutable.

Finally, when $\Delta < b$ (and $\gamma < 0$), the slope of the line (*AA*) defined by $H(b, \Delta)$ becomes greater than one (and which of (*BB*) smaller than one) and, therefore, something analogous to the analysis of Section 2 (for $b < 0$) occurs. Since the slope of the two lines switch, as shown in Figure 14, NGOs' miscoordination on project choices may now arise in two different regions, denoted I and IV, and characterized, in turn by very low and very high baseline levels of willingness to give to the two projects.

[Figure 14 about here]

7 Case studies

Our model delivers interesting testable predictions, for instance, concerning the effects of a change in donors' underlying willingness to give on NGOs' choice of project types, or the effect of donors' stronger "aid fatigue" on the inter-temporal clustering of NGO projects. Specifically, our model predicts that in a setting where donors consider giving to NGO projects of the same type as (imperfect) substitutes and NGOs initially conduct projects of different types, a large exogenous change in the relative willingness to give would induce both NGOs to choose to run projects of the same type (i.e. to cluster). It also predicts that in a setting where NGOs usually specialize inter-temporally (one NGO acts early, whereas the other carries out its project later on), an increase in donors' "aid fatigue" (i.e. a faster decline in willingness-to-give in the second period after having given in the first) would push NGOs to cluster temporally.

Conducting a rigorous empirical test of these predictions is currently beyond reach, because of data limitations. Such an exercise would require collecting data on NGOs' project type decisions, ideally in settings where there is a discontinuous exogenous change in donors' willingness to give to one of the project types of in donors' "aid fatigue". Moreover, one would need to observe NGO choices before and after the change. To the best of our knowledge, no data source containing such measures exists for the moment. Therefore, we limit ourselves to presenting four case studies that illustrate the main mechanisms of the model at work.

7.1 Biafra famine of 1968

The Biafra famine broke out in 1968 in the aftermath of the civil war between the Federal Military Government of Nigeria and the secessionist Eastern region's militants, mostly because of the blockade by the former. The international community initially showed little interest in the famine, and the international media covered it only marginally. As Alex de Waal (1997) writes:

"The famine first became news, almost wholly by accident, in June 1968, when the war was already decided in military terms... The press had [initially] shown little interest in the 'famine story'. In fact the first journalist to take famine pictures never got them published because his paper considered them of no news value..." (De Waal 1997: 73-74)

Only after some journalists took pictures of malnourished children in Biafran hospitals and diffused them in the U.K., the attention of the international public turned to the crisis; but this interest became massive:

"For relief agencies, the impact of the first African famine to become world news was electric... Immediately the press coverage began, Oxfam swung into action, breaking

ranks with the other members of the Disasters Emergency Committee (a club of leading British relief NGOs formed to co-ordinate television fund-raising for disasters) and the ICRC [International Committee of the Red Cross], with whom it had previously made an agreement not to act unilaterally. It became operational in the field for only the second time in its history” (De Waal 1997: 74-75)

The above description of the behavioral change of Oxfam, one of the largest international NGOs, is illustrative of one key prediction of our model. Consider *A*-type projects as being conducted in Biafra, while *B*-type projects conducted somewhere else. Initially, because of the lack of attention to the Biafra crisis, ω_A was much lower than ω_B , and thus the equilibrium played by NGOs was *BB*; in other words, Biafran crisis was a relatively neglected issue for NGO projects. The sudden increase in the donors’ interest in the Biafran crisis implied a large discontinuous increase in the latent willingness to give to the projects aimed at the emergency relief in Biafra (a sharp large rise in ω_A). In response, and as predicted by our model, Oxfam (and numerous other NGOs) changed its project type, breaking the market-sharing implicit agreement with other international charities, and - more importantly - choosing to engage in type of project it would normally avoid engaging in. The equilibrium play of NGOs became *AA*:

"The siege of Biafra of 1968-69, the Sahelian drought of 1974-5, and the Ethiopian famine of 1984-6 proved financial watersheds for a number of private agencies [i.e. NGOs] whose prior involvement in those parts of the world had been minimal or non-existent" (Sogge and Zadek 1996: 80).

Several observers, including Smillie (1995), argue that this kind of rush by international NGOs led to a highly inefficient outcome, in particular, because the sheer mass of aid and humanitarian relief allowed the local political powerholders to exploit it for their means, which prolonged the conflict: "The airlift and the broader relief efforts was... an act of unfortunate and profound folly. It prolonged the war by 18 months" (Smillie 1995: 104).

7.2 Ethiopian famine of 1984

Another key example of the behavioral change of NGOs in the context where our model seems to apply comes from the 1984 Ethiopian case. Similarly to Biafra, it was a complex political situation in which the combination of the drought and political problems created a famine. However, the political manipulation of the situation by the Ethiopian dictator induced the official donors to be wary of sending aid and, consequently, the private donors’ willingness to give was also muted. However, as images of starving children reached the press, this changed dramatically:

"Until early 1984, international donors were justifiably sceptical about the Ethiopian Government's appeals for relief. There was evidence of both diversion of food aid and the strategic abuse of relief to support counter-insurgency efforts in the south-east... In October 1984 the famine suddenly became international news... " (De Waal 1997: 121)

What led to this rapid change and the consequent massive inflows of aid? De Waal points out that it was a combination of the mediatization of the famine (during the Fall 1984) and the fact that such attention reached its maximum close to Christmas:

"It is interesting to chart the way in which the famine progressed from its niche as a news item and a campaign by relief agencies into an unprecedented international media event with political repercussions in leading Western democracies. BandAid played a key role in this: while not the first, it was the definitive media-charitable event. The timing was crucial: Christmas is the fund-raising season for relief agencies and a time of particular sensitivity in the public conscience" (De Waal 1997: 122).

Hancock (1989) also describes how this shock suddenly increased the attention of the donors to give to humanitarian causes, and, importantly, how this induced one of the largest NGOs, the World Vision, to enter into sharp competition for funds with the religious organizations during the Christmas time:

"On 21 December 1984, unable to resist the allure of Ethiopian famine pictures, *World Vision* ran an Australia-wide Christmas Special television show calling on the public in that country to give it funds. In so doing it broke an explicit understanding with the *Australian Council of Churches* that it would not run such television spectacles in competition with the ACC's traditional Christmas Bowl appeal. Such ruthless treatment of 'rivals' pays, however: the American charity is, today, the largest voluntary agency in Australia ..." (Hancock 1989: 17)

In terms of our model, this episode can be explained as follows. Donors consider giving to charities during the Christmas time as a special act, different from giving in other periods. Let A denote the Christmas-period donation market and B stand for the other-period donation market. Before the famine broke out, the *ACC* and the *World Vision* ran their fundraising campaigns in separate periods of the year, which can be interpreted as playing the configuration AB . The famine shock, reaching its maximum media attention right before Christmas, strongly increased the donors' willingness to give to this cause during the Christmas period. This suddenly made ω_A much larger than ω_B . Our model predicts that in this case, both NGOs should be running their campaigns during Christmas, which implies that the *World Vision* should break its "non-belligerence" coordination with the *ACC*. Moreover, by doing so, it should collect (much) more donations than under coordination, which is in line with the last sentence of the quotation above.

7.3 Sierra Leone at the end of the 1991-2002 civil war

Our third case concerns the clustering of international NGOs in Sierra Leone, towards the end of the 1991-2002 civil war. The numerous brutalities of the civil war led to a large number of amputees, many of which lived in camps built and organized by international agencies. In her book *The Crisis Caravan*, Linda Polman describes in detail one of such camps: Murray Town Camp, that hosted "226 amputees, some with a couple of close relatives, 560 people in total... In front of the gate was a small forest of notice boards... bearing the logos of aid organizations: Médecins sans Frontières, CAUSE Canada, World Hope International, UNICEF, [and more]..." (Polman 2010: 63).

Initially a "forgotten" crisis, Sierra Leone got the international media attention because of the amputees' camps. However, then this attention led to some unexpected dynamics. "Partly as a result of media attention, Sierra Leone became the beneficiary of the largest UN peace mission and - in terms of dollars per head of population - the largest humanitarian aid operation anywhere in the world at the time. Around three hundred INGOs rushed to the little country. Even organizations that were not there specifically to help amputees used photos of people in Murray Town Camp in their fund-raising campaigns. 'It's never been so easy to collect money as it is with the pictures of these poor devils,' said an INGO staff member in Freetown" (Polman 2010: 66)

The detailed description by Polman clearly indicates that while other types of projects were highly needed in Sierra Leone, the massive willingness-to-give by donors (moved by media images, especially those of children) to amputee projects implied that an inefficiently high number of NGO activities and projects concentrated on this type, whereas other kinds of activities were underfunded. This huge media attention and private aid inflows earmarked to this type of projects created deeply perverse incentives:

"One [international] NGO had already offered to build a whole new neighborhood for them at the edge of the city... [But] the amputees refused to leave... because in Murray Town Camp it was easy for foreign journalists, donors, and aid organizations to find them. Nor that such visitors could steer clear of the camp even if they wanted to. The amputees were the icons of Sierra Leone's civil war. Of all the war victims in West Africa, foreign aid workers tried hardest to be associated with them" (Polman 2010: 64)

7.4 The 2004 Indian Ocean tsunami

On December 26, 2004, a tsunami of unprecedented power, triggered by the Sumatra-Andaman undersea earthquake, hit the coastal areas of 14 countries in Asia and Africa (with Indonesia and Sri Lanka receiving the strongest impact). It was one of the deadliest natural disasters in recent history, killing close to 230 000 people and displacing over 1.75 million people. The scale of the

disaster, coinciding with it happening right after Christmas and fed by a large-scale international media coverage, led to a massive humanitarian response, both through public and private channels. The amount of private donations to international NGOs was huge: for example, Save the Children USA received over 6 million USD in just four days, whereas Catholic Relief Services collected over 1 million USD in three days. In total, U.S.-based charities raised about 1.6 billion USD for tsunami relief (Wallace and Wilhelm 2005), whereas total international response (both public and private) amounted to 17 billion USD (Jayasuriya and McCawley 2010).

This massive drive to give at the early stages of the disaster led an excessive focus on emergency projects, where too many NGOs engaged in projects early on but rather few wanted to carry out the post-crisis reconstruction and development projects. The report by the Joint Evaluation Report of the Tsunami Evaluation Coalition states:

" Exceptional international funding provided the opportunity for an exceptional international response. However, the pressure to spend money quickly and visibly worked against making the best use of local and national capacities... Many efforts and capacities of locals and nationals were marginalized by *an overwhelming flood of well-funded international agencies* (as well as hundreds of private individuals and organisations), which controlled immense resources" (Telford et al. 2006: 18-19).

Why the dynamics of NGO aid led to such an inefficiency? The then head of the French Red Cross, Jean-François Mattei notes that: "The particularity [of the tsunami donor appeals] resided in this unique combination of democratization of information technologies, the ability of witnesses to become vectors of immediately available images, the underlying violence of the phenomenon, and its tragic evolution" (Mattei 2005: 41). He then suggests that the inefficiency had to do with the fact that NGOs found it difficult to explain the donor public the complexity of the situation and the need to finance also the long-run projects, going beyond the emergency needs: "Few observers were aware of the complexity of this kind of engagement, that escapes the immediate perceptions of the expectations of the public. This implies a feeling of disconnection between the image that one has of the humanitarian [sector] and the reality found on the ground" (Mattei 2005: 12).

In the context of our model of section 4, the above citations suggest that NGOs considered the media-driven generosity of donors massive in the short-run, but likely to dry up over time. In other words, we are likely to be in the case with $b < \rho\delta$ (i.e. the within-period competition being less of a concern for NGOs, as compared to the donors' aid fatigue) and, moreover, given the emergency, μ was rather small (i.e. the situation deteriorated rather quickly). In such case, our model predicts that the equilibrium would be in the form of urgency bias (t, t) .

Interestingly, the tsunami case illustrates both the inter-temporal and spatial clustering problem, as the concentration of emergency projects in tsunami-hit areas went along with the relative

lack of attention to other areas of the world that were facing large need: "There are also neighboring countries that are touched by the same problem, sometimes even more than the country on which the projectors are focused. One has to look also in the shadows cast by the projector lights. The mobilization of public opinion can create terrible paradoxes: because of the emotions and emergency feelings, the concentrated flow of international aid can worsen the sentiment of neglect in the non-beneficiary areas. Thus, Darfour was erased by the tsunami, and then Niger by the Katrina hurricane..." (Werly 2005: 136).

8 Conclusion

Reflecting over the deep problems of the international NGO sector, Alex De Waal writes:

"Specific NGO successes mask strategic failures. NGOs tend to focus their efforts on areas in which they have specialist skills, on which can make for good publicity, such as feeding centres and orphanages. Crucial areas such as sanitation and public health are relatively neglected. The charitable market is unable to fill the full spectrum of relief needs" (De Waal 1997: 80).

This paper provided an economic analysis of this and related problems and to do so, it has developed a model with non-governmental organizations competing through fundraising for donations and choosing their project types, where donors' willingness to give might differ across project types. We find that the resulting equilibrium configuration crucially depends on the asymmetry in potential donation market size and on donors' perceived substitutability or complementarity between giving to two different projects. We have analyzed the welfare properties of the decentralized equilibrium and derived the conditions under which such equilibrium is sub-optimal, characterized by excessive clustering (i.e. NGOs choosing the same project type). Two main sources of inefficiency are (i) excessive fundraising competition as NGOs cluster when it is socially optimal to choose opposite project types (un-cluster), and (ii) mis-coordination on the "smaller" donation market. We also studied settings where NGOs can coordinate their fundraising and/or project type choices, developed an application to inter-temporal choices of NGOs, and extended the model to allow for spillovers between NGO fundraising activities.

Our analysis provides interesting implications for the decentralized competitive organization of the foreign aid industry. It highlights the importance of donors' perceptions about the causes as a major source of difficulty of optimal coordination and efficient division of tasks between development NGOs. This is particularly salient for NGOs operating during humanitarian crises, where a strong asymmetry in donors' awareness across different types of projects and the resulting

willingness-to-give aggravates this difficulty. The inefficient allocation of NGO efforts and donors' money creates a large scope for a welfare-improving government intervention.

There are two promising avenues for future work. The first consist of testing empirically the main predictions of our model, using either the information on the geographic clustering of NGO projects or the inter-temporal aspects developed in the timing-game version. Ideally, this requires having information on the baseline willingness-to-give or awareness of donors about the different causes, an exogenous (and asymmetric) variation in such willingness-to-give (for example, coming from a sudden natural shock or a large-scale outbreak of a disease), and measures of NGO project type choice before and after the shock. Given the relative scarcity of empirical work on the functioning of the development NGO sector, such analysis seems to have very high potential.

Secondly, in this paper we have not explored explicitly the effects of various policy instruments on the decentralized outcomes. Several instruments (tax deductions for donations, direct government grants to NGOs, registration fees, etc.) can affect both the behavior of donors as well as the incentives of NGOs to conduct fundraising and thus indirectly to choose the type of projects. A natural next step would be to extend the analysis of our model to studying the effects of such instruments, so as to help in formulating welfare-enhancing public policies.

9 Appendix: Proof of Proposition 3

Proposition 3. (i) For $b \in [0, 1)$, there is a range of willingness-to-give (ω_A, ω_B) such that the decentralized selection of projects by NGOs is sub-optimal and characterized by excessive clustering. (ii) For $b \in (-1, 0)$, there is a range of willingness-to-give (ω_A, ω_B) such that the decentralized selection of projects by NGOs are sub-optimal and characterized by miscoordination in the choice of project.

Proof. Consider the case with no clustering and suppose, without loss of generality, that NGO 1's project is of type A and NGO 2's project is of type B . The social welfare can be written as

$$SW^{AB} = \left[I + (\omega_A - 1)d_1(y_1) + (\omega_B - 1)d_2(y_2) - \frac{1}{2}(d_1(y_1))^2 - \frac{1}{2}(d_2(y_2))^2 \right] + (1 - c)[d_1(y_1)(1 - y_1) + d_2(y_2)(1 - y_2)].$$

Thus, using

$$d_1^{AB}(y_1) = \omega_A - 1 + y_1 \quad \text{and} \quad d_2^{AB}(y_2) = \omega_B - 1 + y_2,$$

we obtain the following first-order condition for the maximization of the social welfare function, for every NGO (e.g. for NGO 1):

$$\frac{\partial SW^{AB}}{\partial y_1} = \underbrace{-y_1}_{\text{Donors' net MB from fundraising}} + \underbrace{(1 - c)(1 - y_1)}_{\text{NGO 1's MB of fundraising}} - \underbrace{(1 - c)(\omega_A - 1 + y_1)}_{\text{NGO 1's MC of fundraising}} = 0.$$

We can compare it to the corresponding first-order condition for NGO 1 at the decentralized equilibrium:

$$\frac{\partial Q_1}{\partial y_1} = \underbrace{(1-c)(1-y_1)}_{\text{NGO 1's MB of fundraising}} - \underbrace{(1-c)(\omega_A - 1 + y_1)}_{\text{NGO 1's MC of fundraising}} = 0.$$

It is easy to observe that in the non-clustering equilibrium configuration, there is too much fundraising as compared to the social optimum. The resulting socially optimal level of fundraising is

$$y_1^{AB^\circ} = \frac{(1-c)(2-\omega_A)}{1+2(1-c)},$$

and, similarly, for project B operated by NGO 2

$$y_2^{AB^\circ} = \frac{(1-c)(2-\omega_B)}{1+2(1-c)}.$$

The corresponding optimal values of social welfare under non-clustering scenarios (AB) and (BA) are

$$SW_{AB}^\circ = I + \frac{1}{2} \frac{((\omega_A^2 + \omega_B^2)(2-c)^2 - 2(\omega_A + \omega_B)(2-c) + 2)}{(3-2c)}. \quad (38)$$

Conversely, when the two NGOs cluster either by choosing project A or project B ($k_1 = k_2 = k = A$ or $k_1 = k_2 = k = B$), social welfare maximization implies maximizing the following expression

$$SW_{kk} = \left[I + (\omega_k - 1)d_1(y) + (\omega_k - 1)d_2(y) - \frac{1}{2}(d_1(y))^2 - \frac{1}{2}(d_2(y))^2 - bd_1(y)d_2(y) \right] + (1-c)[d_1(y)(1-y_1) + d_2(y)(1-y_2)].$$

In this case the optimal values of fundraising are

$$y_1^{kk^\circ} = y_2^{kk^\circ} = \frac{(1-c)(2-\omega_k)}{1+2(1-c)}.$$

The maximum social welfare under clustering is, therefore

$$SW_{kk}^\circ = I + \frac{(\omega_k^2(4-4c+c^2) - \omega_k(4-2c) + 1)}{(3-2c)(b+1)}. \quad (39)$$

We can now compare the maxima in the three cases. Note first that

$$\frac{\partial SW_{kk}^\circ}{\partial \omega_k} > 0$$

and, therefore, the optimal welfare increases monotonically with the size of the donors' market ω_k . As a result,

$$SW_{AA}^\circ \gtrless SW_{BB}^\circ \Leftrightarrow \omega_A \gtrless \omega_B.$$

Also, for $b = 0$ and $k = A, B$:

$$SW_{kk}^{\circ} \begin{matrix} \geq \\ \leq \end{matrix} SW_{AB}^{\circ} \Leftrightarrow \omega_A \begin{matrix} \geq \\ \leq \end{matrix} \omega_B.$$

Therefore, when competition between NGOs is absent ($b = 0$), clustering is always socially efficient and the optimal non-clustering area reduces to the 45° line, where $\omega_B = \omega_A$, (exactly as the line $\omega_B = H(b) \omega_A$ for $b = 0$). In addition, when projects are clustered, the welfare decreases with b :

$$\frac{\partial SW_{kk}^{\circ}}{\partial b} = -\frac{(1 + c\omega_k - 2\omega_k)^2}{(3 - 2c)(b + 1)^2} < 0.$$

Moreover, using (38) and (39), and normalizing $c = 0$, it is straightforward to see that, in general, at the optimal fundraising choice,

$$SW_{AA}^{\circ} > SW_{BA}^{\circ} \tag{40}$$

for

$$\omega_B < \omega_A H^{\circ}(b) \tag{41}$$

and, similarly,

$$SW_{BB}^{\circ} > SW_{AB}^{\circ} \tag{42}$$

for

$$\omega_A < \omega_B H^{\circ}(b), \tag{43}$$

where

$$H^{\circ}(b) = \frac{1}{2} + \frac{\sqrt{(\omega_A - \omega_A^2)(16b^2 - 16) - 4b^2 + 4}}{4(b + 1)}.$$

Comparing (24) and (26) with (19) and (20), shows that, in general,

$$H^{\circ}(b) < H(b) \quad \text{for } b \in (0, 1) \tag{44}$$

and, conversely,

$$H^{\circ}(b) > H(b) \quad \text{for } b \in (0, -1), \tag{45}$$

implying the results of case (i) and (ii). The welfare comparisons for $c > 0$ are qualitatively similar and are omitted to economize on space. ■

References

- [1] Aldashev, G., M. Marini, and T. Verdier. 2014. Brothers in Alms? Coordination between Nonprofits on Markets for Donations. *Journal of Public Economics* **117**: 182-200.
- [2] Aldashev, G., and C. Navarra. 2014. Development NGOs: Basic Facts. Working paper 1409, CRED, University of Namur.

- [3] Aldashev, G., and T. Verdier. 2009. When NGOs Go Global: Competition on International Markets for Development Donations. *Journal of International Economics* **79**: 198-210.
- [4] Aldashev, G., and T. Verdier. 2010. Goodwill Bazaar: NGO Competition and Giving to Development. *Journal of Development Economics* **91**: 48-63.
- [5] Aldashev, G., E. Jaimovich, and T. Verdier. 2017. Small is Beautiful: Motivational Allocation in the Nonprofit Sector. *Journal of the European Economic Association*, forthcoming.
- [6] Andreoni, J. 1989. Giving with Impure Altruism: Applications to Charity and Ricardian Equivalence. *Journal of Political Economy* **97**: 1447-1458.
- [7] Auriol, E., and S. Brilon. 2014. Anti-social Behavior in Profit and Nonprofit Organizations. *Journal of Public Economics* **117**: 149-161.
- [8] Barr, A., and Fafchamps, M. 2006. A Client-Community Assessment of the NGO Sector in Uganda. *Journal of Development Studies* **42**: 611-639.
- [9] Besley, T., and M. Ghatak. 2001. Government versus Private Ownership of Public Goods. *Quarterly Journal of Economics* **116**: 1343-1372.
- [10] Brilliant, E. 1990. *The United Way: Dilemmas of Organized Charity*. New York: Columbia University Press.
- [11] Burger, R., Dasgupta, I. and Owens, T. 2015. A Model of Nongovernmental Organization Regulation with an Application to Uganda. *Economic Development and Cultural Change* **64**: 71-111.
- [12] De Waal, A. 1997. *Famine Crimes: Politics and the Disaster Relief Industry in Africa*. Bloomington, IN: Indiana University Press.
- [13] Dichter, T.W. 2003. *Despite Good Intentions: Why Development Assistance to the Third World Has Failed*. Amherst, MA: University of Massachusetts Press.
- [14] Dixit, A., V. Norman. 1978. Advertising and Welfare. *Bell Journal of Economics* **9**: 1-17.
- [15] Donkers, B., M. van Diepen, and P.H. Franses. 2017. Do charities get more when they ask more often? Evidence from a unique field experiment. *Journal of Behavioral and Experimental Economics*, forthcoming.
- [16] Fong, C., and E. Luttmer. 2009. What Determines Giving to Hurricane Katrina Victims? Experimental Evidence on Racial Group Loyalty. *American Economic Journal: Applied Economics* **1**: 64-87.

- [17] Fruttero, A., and Gauri, V. 2005. The Strategic Choices of NGOs: Location Decisions in Rural Bangladesh. *Journal of Development Studies* **41**: 759-787.
- [18] Gauri, V., and Galef, J. 2005. NGOs in Bangladesh: Activities, Resources, and Governance. *World Development* **33**: 2045-2065.
- [19] Hancock, G. 1989. *Lords of Poverty*. London, UK: Mandarin Press.
- [20] Hansmann, H. 1980. The Role of Nonprofit Enterprise. *Yale Law Journal* **89**: 835-901.
- [21] Heyes, A. and Martin, S. 2015. NGO mission design. *Journal of Economic Behavior & Organization* **119**: 197-210.
- [22] ICVA (International Council of Voluntary Agencies). 2015. NGO Perspectives on Humanitarian Response in Level 3 Crises. Available at: <https://icvanetwork.org>.
- [23] Koch, D.-J. 2009. *Aid from International NGOs: Blind Spots on The Aid Allocation Map*. London UK: Taylor & Francis.
- [24] Koch, D.-J., A. Dreher, P. Nunnenkamp, and R. Thiele. 2009. Keeping a Low Profile: What Determines the Allocation of Aid by Non-Governmental Organizations? *World Development* **37**: 902-918.
- [25] Krasteva, S. and Yildirim, H. 2016. Information, Competition, and the Quality of Charities. *Journal of Public Economics* **144**: 64-77.
- [26] Mattei, J.-F. 2005. *L'urgence humanitaire, et après? De l'urgence à l'action humanitaire durable*. Paris, Hachette.
- [27] Nancy, G. and Yontcheva, B. 2006. Does NGO Aid Go to the Poor? Empirical Evidence from Europe. IMF Working Paper No. 6-39.
- [28] Öhler, H. 2013. Do Aid Donors Coordinate Within Recipient Countries? Discussion Paper 0539, Department of Economics, University of Heidelberg.
- [29] Polman, L. 2010. *The Crisis Caravan: What's Wrong with Humanitarian Aid?* New York, NY: Picador.
- [30] Reinstein, D.A., 2011. Does One Charitable Contribution Come At the Expense of Another? *BE Journal of Economic Analysis & Policy* **11**.
- [31] Robinson, M. and Riddell, R.C. 1995. *Non-Governmental Organizations and Rural Poverty Alleviation*. Oxford, UK: Oxford University Press.

- [32] Scharf, K. 2014. Impure Prosocial Motivation in Charity Provision: Warm-Glow Charities and Implications for Public Funding. *Journal of Public Economics* **114**: 50-57.
- [33] Similon, A. 2015. Self-Regulation Systems for NPO Coordination: Strengths and Weaknesses of Label and Umbrella Mechanisms. *Annals of Public and Cooperative Economics* **86**: 89-104.
- [34] Singh, N., and X. Vives. 1984. Price and Quantity Competition in a Differentiated Duopoly. *RAND Journal of Economics* **15**: 546-554.
- [35] Sogge, D., and S. Zadek. 1996. 'Laws' of the Market? In: Sogge, D. (ed.), *Compassion and Calculation: The Business of Private Foreign Aid*. London, Pluto Press.
- [36] Smillie, I. 1995. *The Alms Bazaar: Altruism Under Fire - Non-Profit Organizations and International Development*. London, UK: IT Publications.
- [37] Van Diepen, M., B. Donkers, and P. Franses. 2009. Dynamic and Competitive Effects of Direct Mailings: A Charitable Giving Application. *Journal of Marketing Research* **46**: 120-133.
- [38] Weisbrod, B. 1988. *The Nonprofit Economy*. Cambridge, MA: Harvard University Press.
- [39] Werker, E. and Ahmed, F.Z., 2008. What Do Nongovernmental Organizations Do? *Journal of Economic Perspectives* **22**: 73-92.
- [40] Werly, R. 2005. *Tsunami, la vérité humanitaire*. Paris: Sarmant Les Edition du Jubilé.

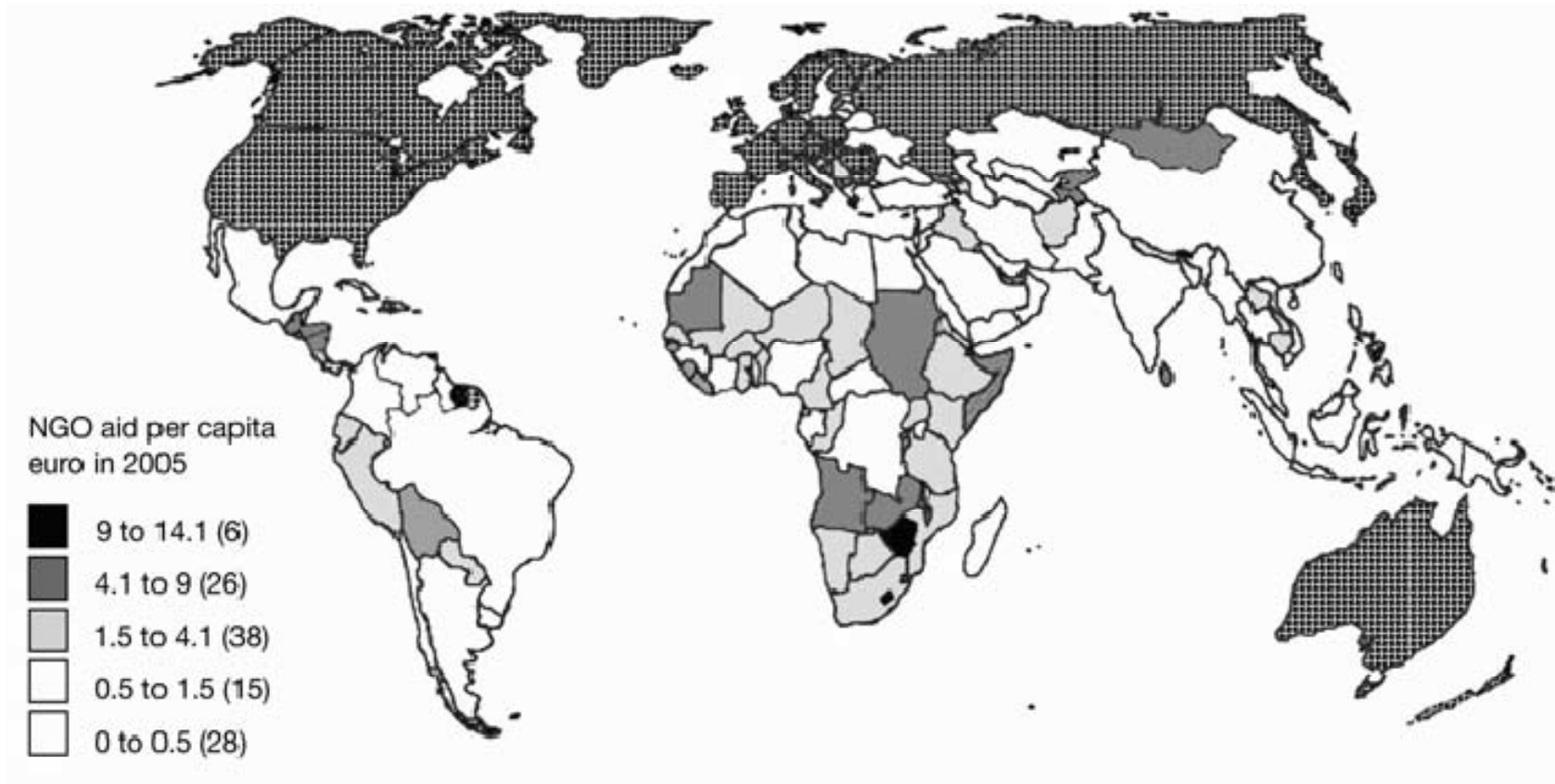


Fig. 1: Worldwide distribution of NGO aid in 2005

Source: Koch (2009), Figure 1.4

Notes: Hatched areas are non-recipient countries

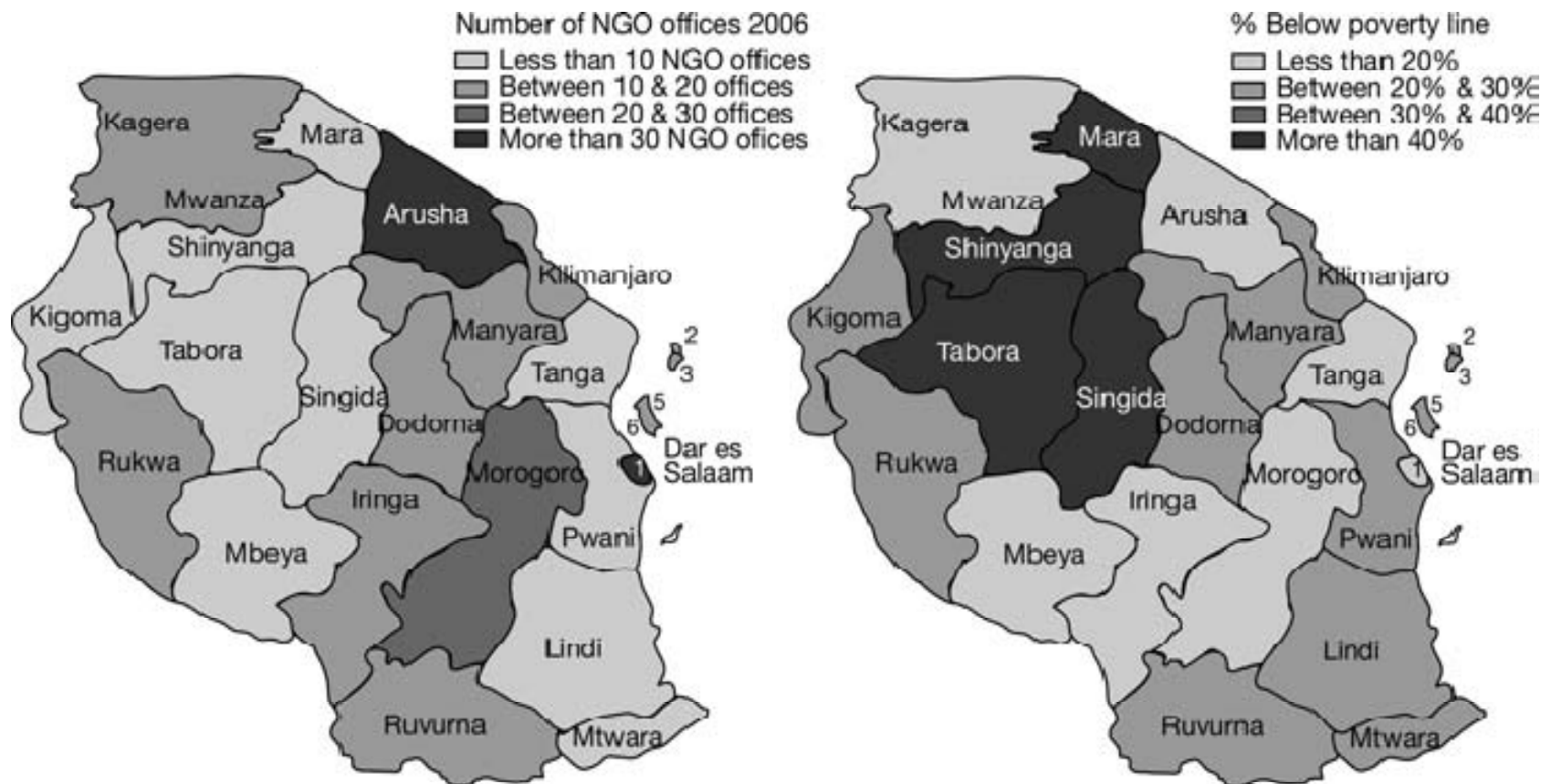


Fig. 2: Distribution of NGO offices and poverty rates in 2006, across Tanzanian regions

Source: Koch (2009), Figure A9.1

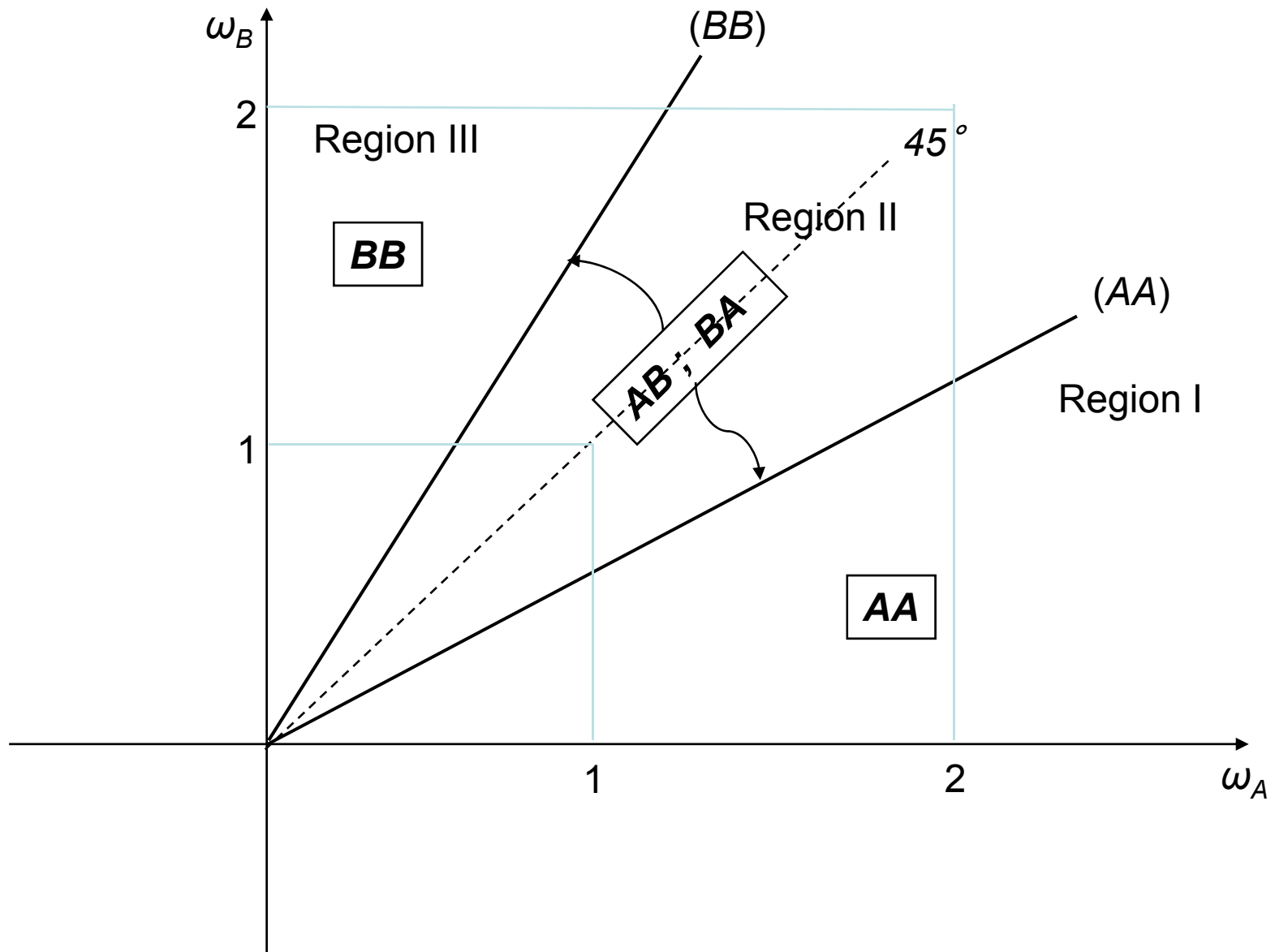


Fig. 3: Nash equilibria in the choice of projects for $b > 0$

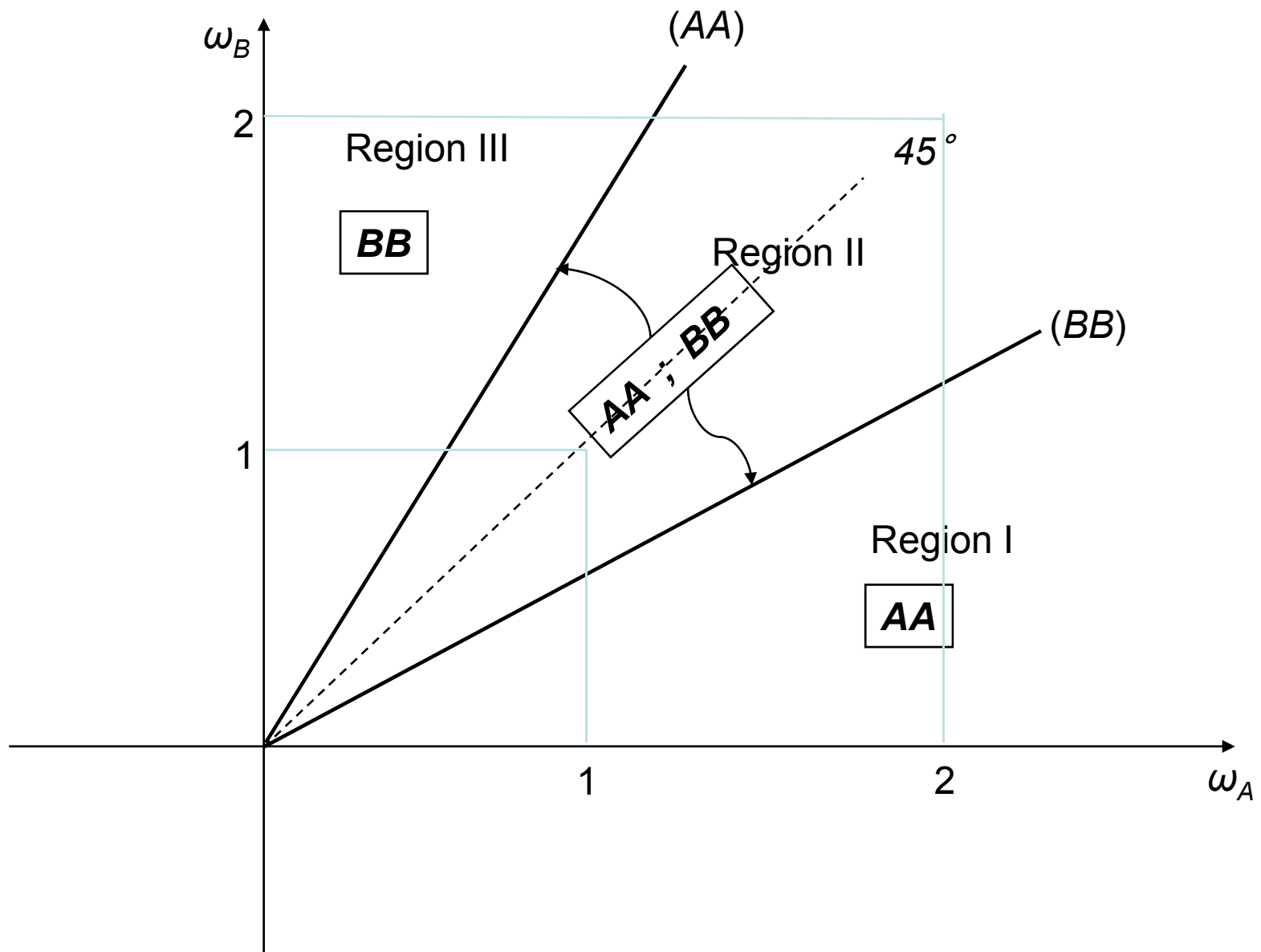


Fig. 4: Nash equilibria in the choice of projects for $b < 0$

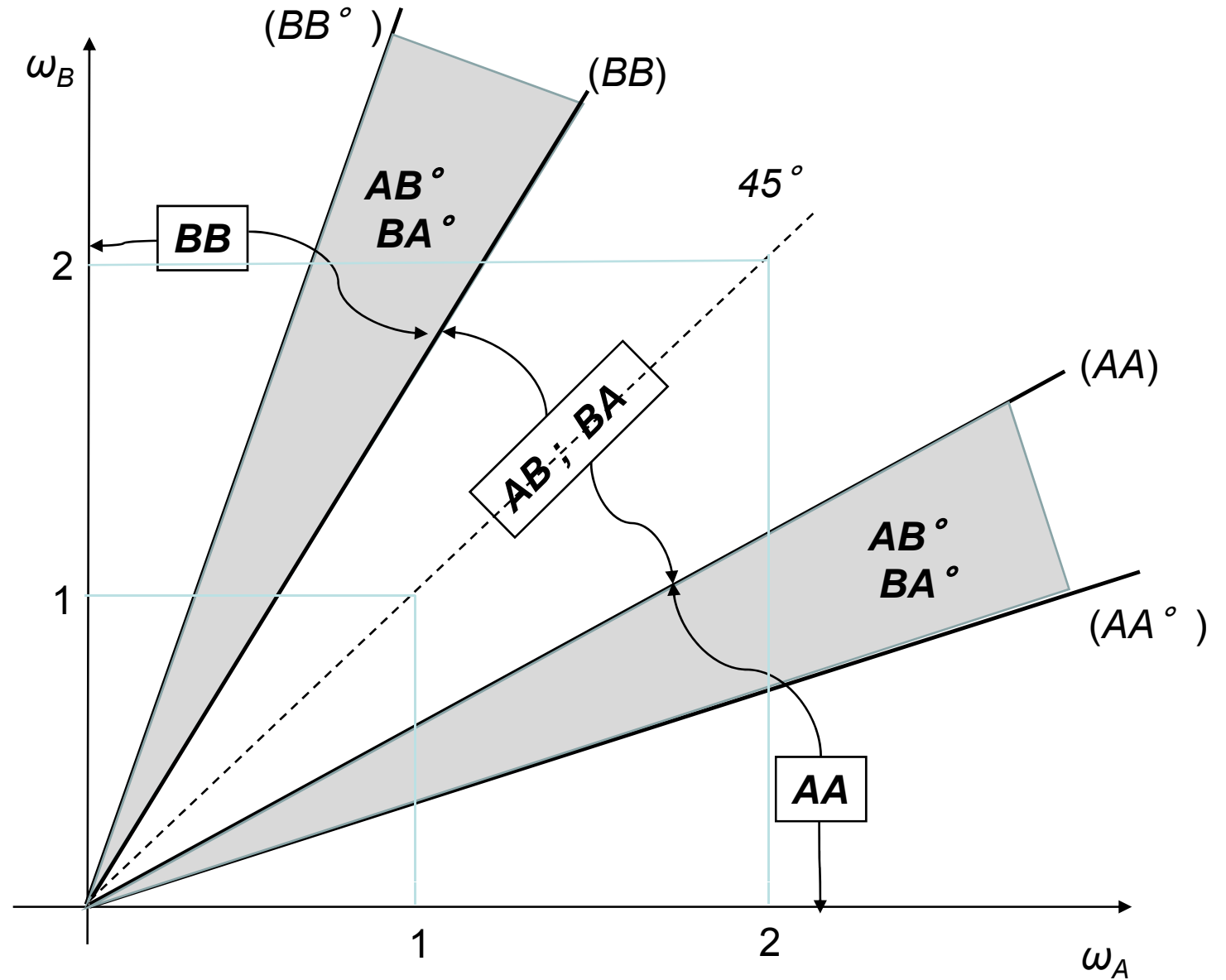


Fig. 5: Optimal vs. decentralized choice of projects: $b > 0$.
 Grey areas represent inefficient clustering

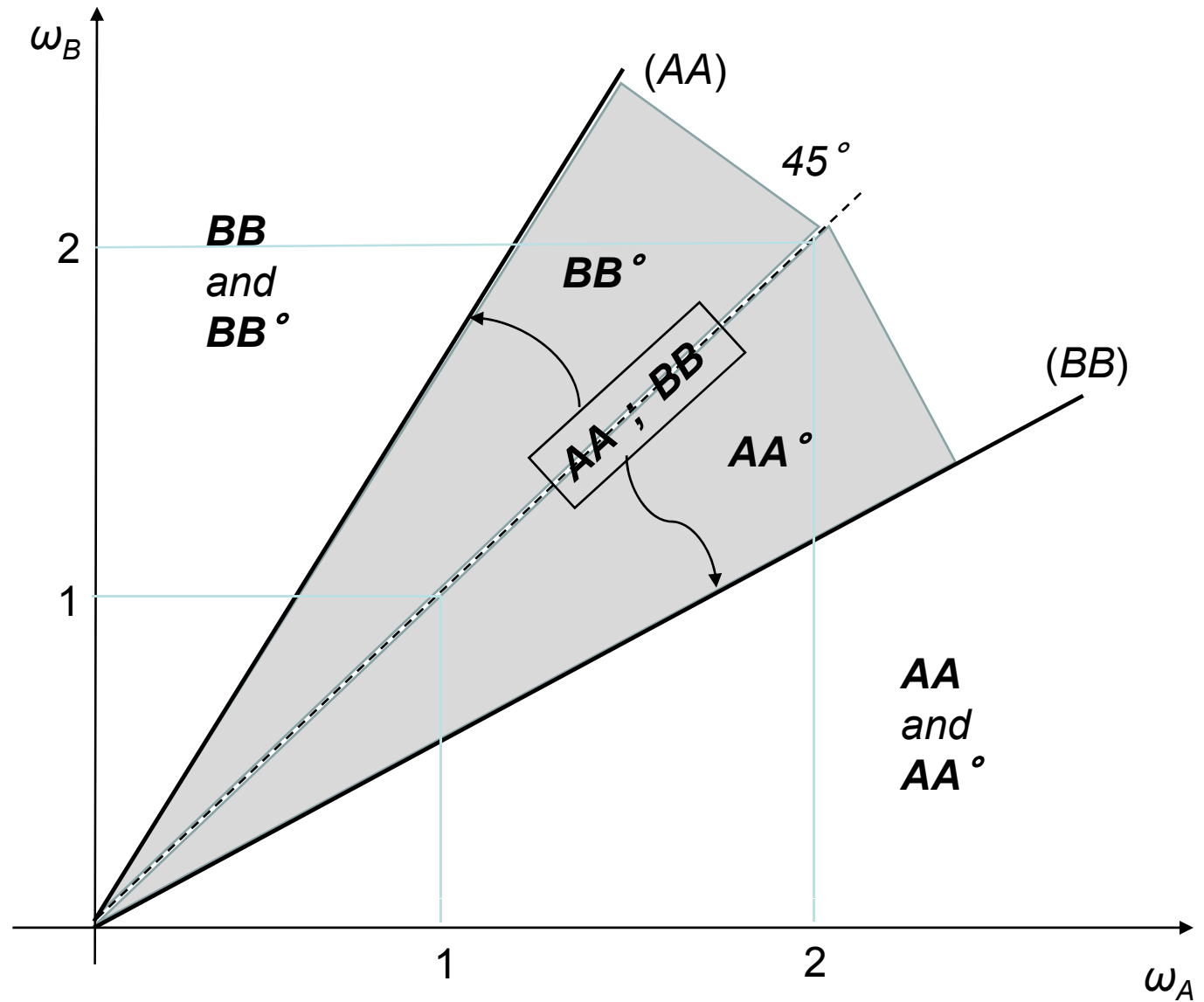


Fig. 6: Optimal vs. decentralized choice of projects: $b < 0$.
 Grey areas represent inefficient clustering

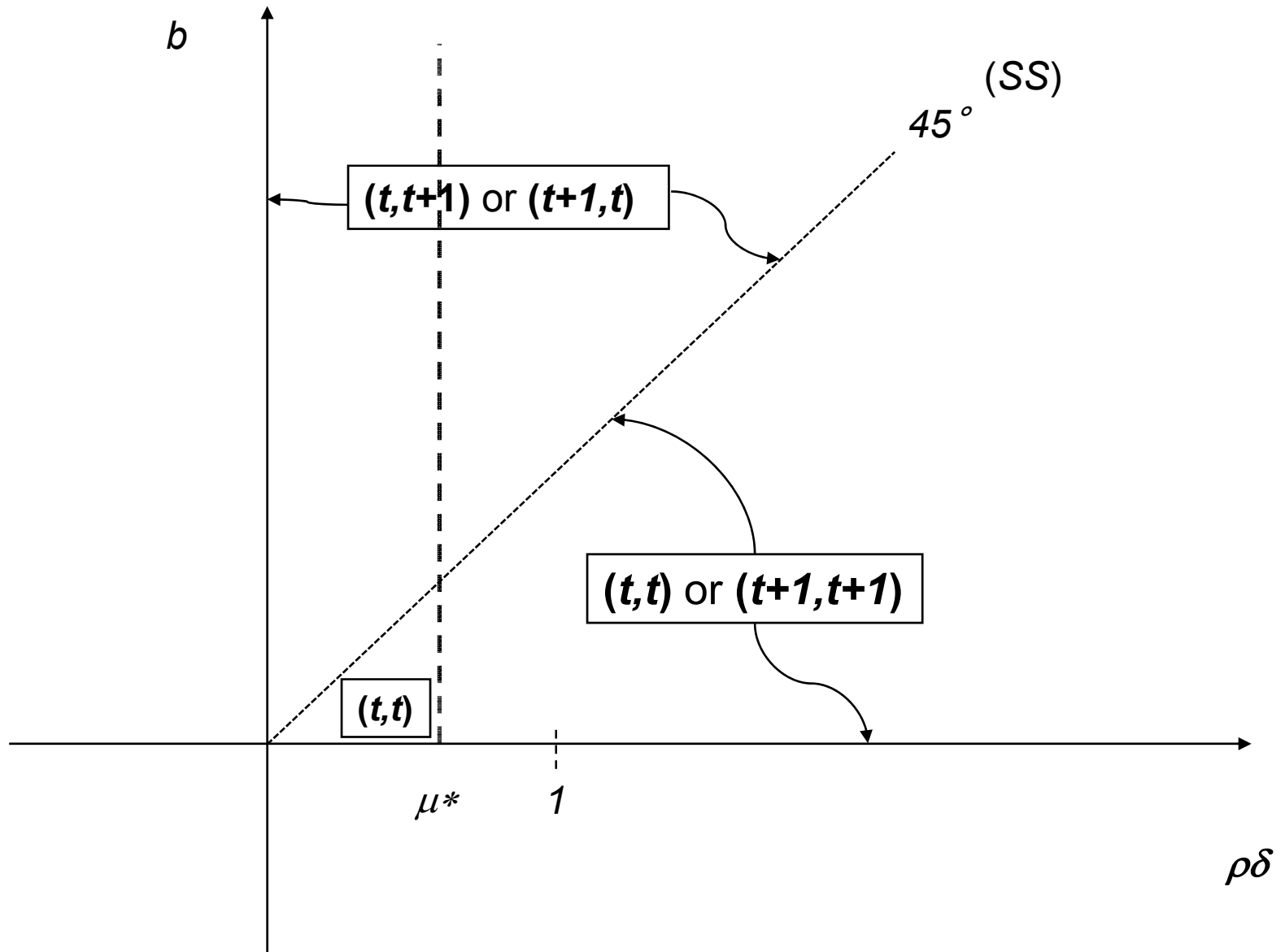


Fig. 7: Sequential vs. simultaneous equilibria in the choice of projects with «naive» behaviour

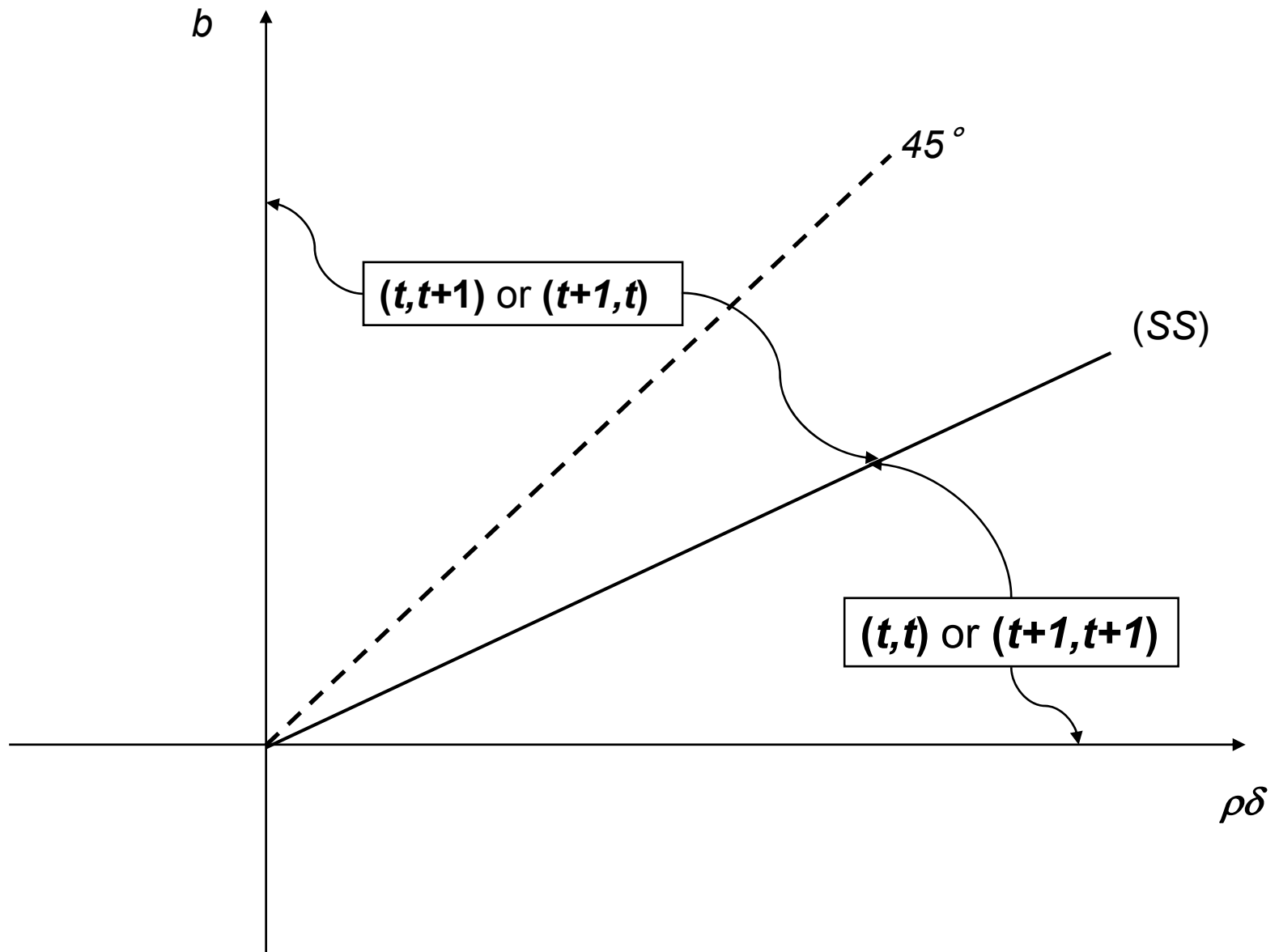


Fig. 8: Sequential vs. simultaneous equilibria in the choice of projects with $b > 0$ and Stackelberg behaviour.

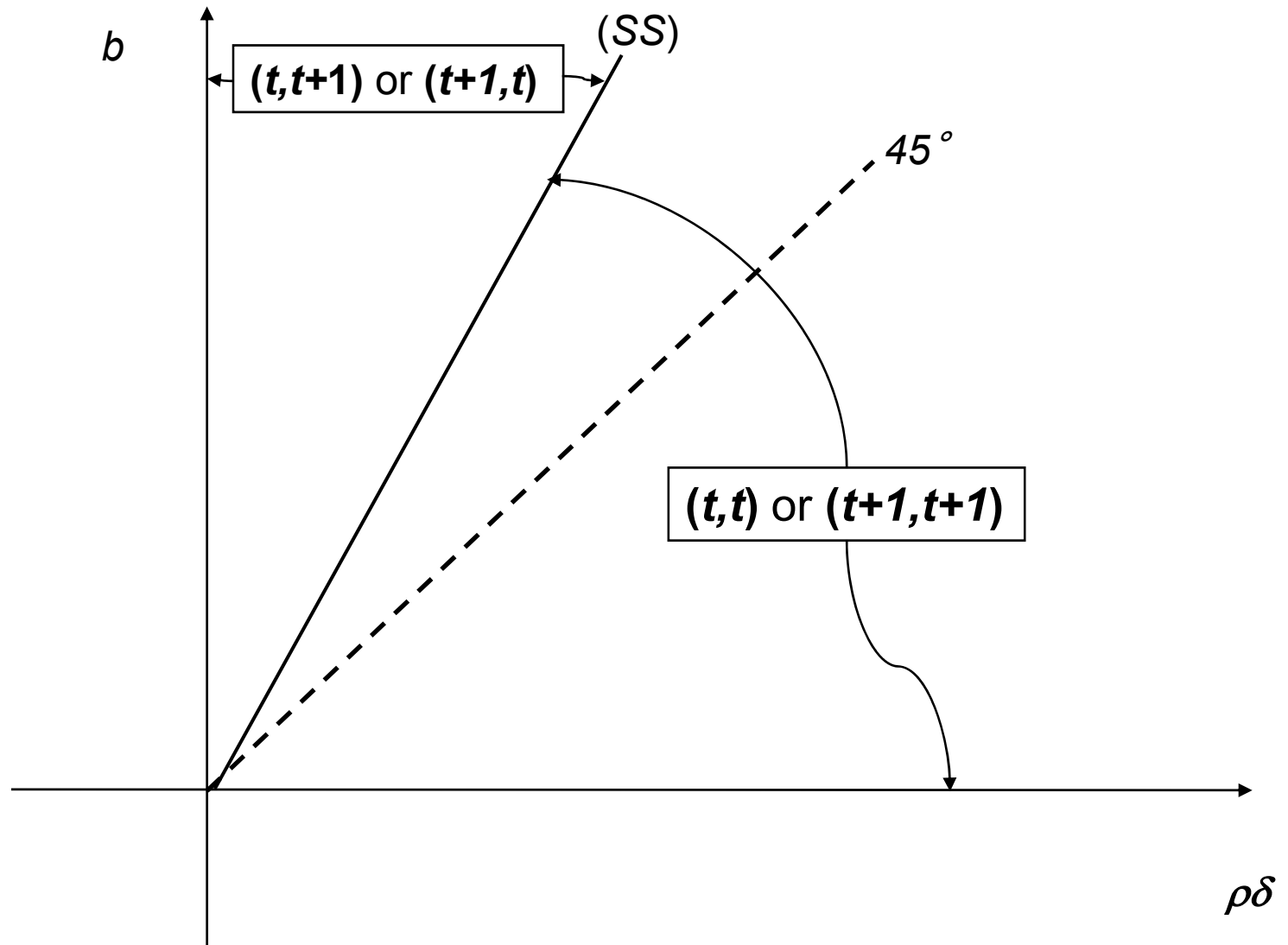


Fig. 9: Sequential vs. simultaneous equilibria in the choice of projects with $b < 0$ and Stackelberg behaviour

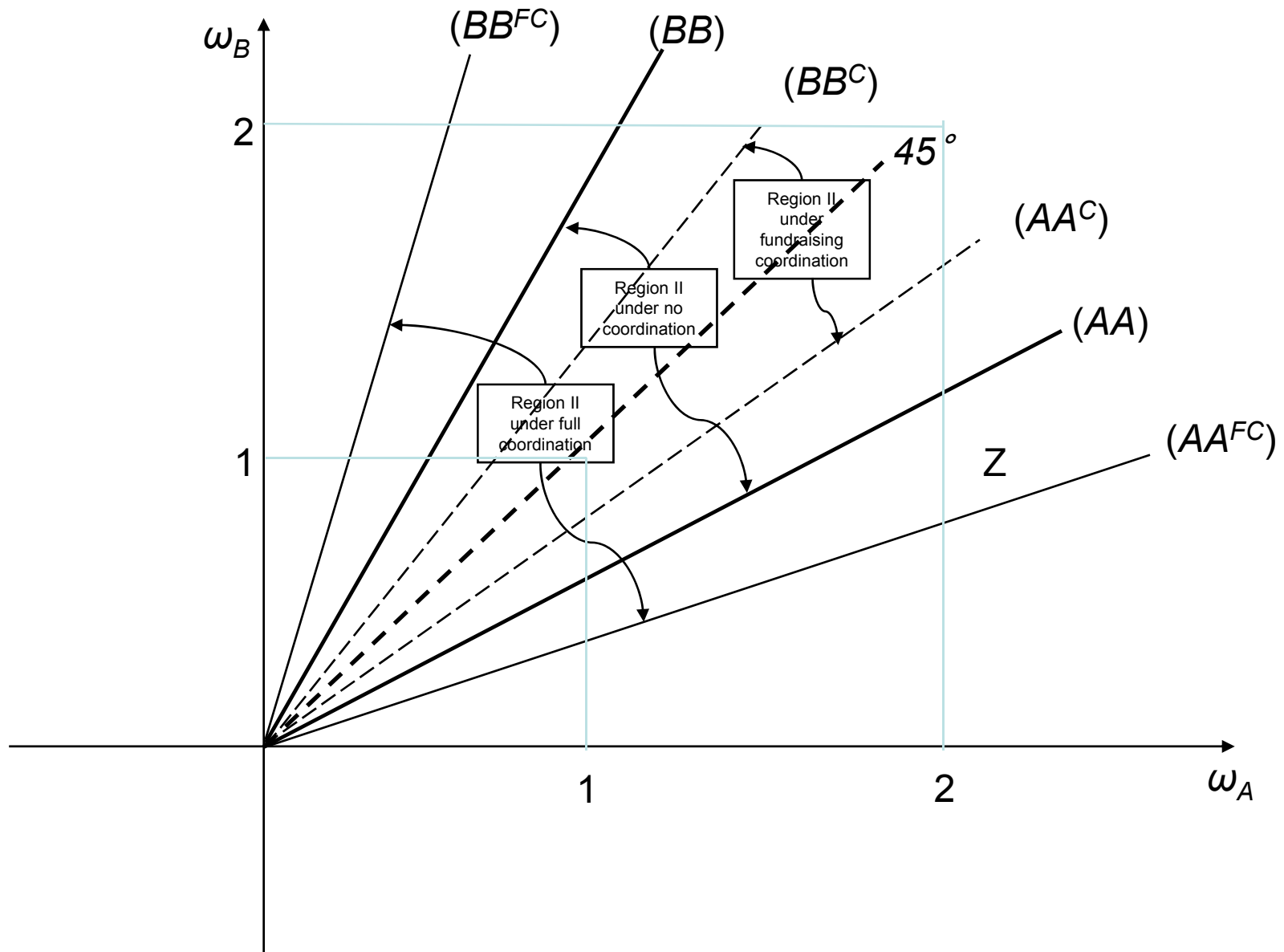


Fig. 10. Project choice with and without horizontal coordination: $b > 0$

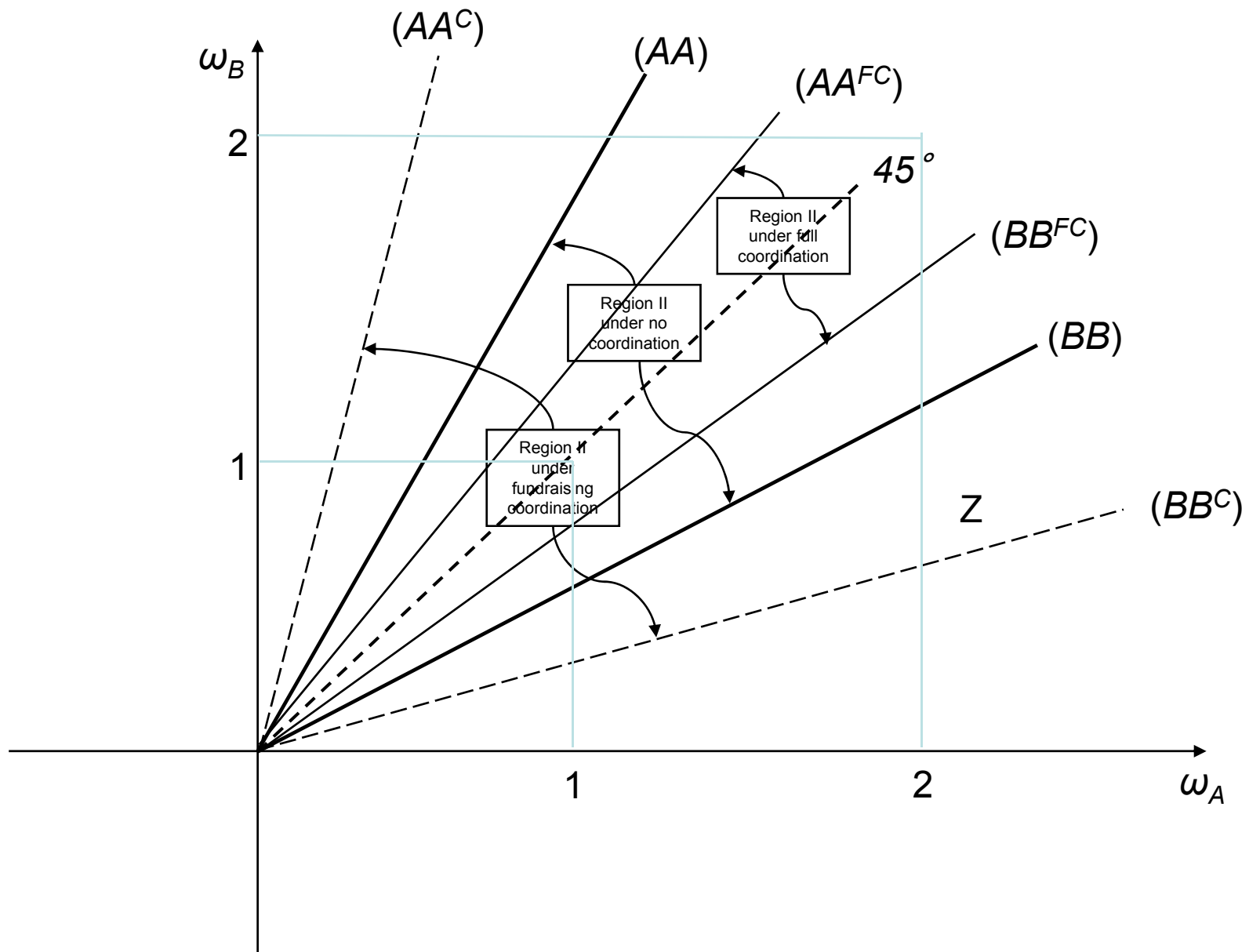


Fig. 11: Project choice with and without horizontal coordination: $b < 0$

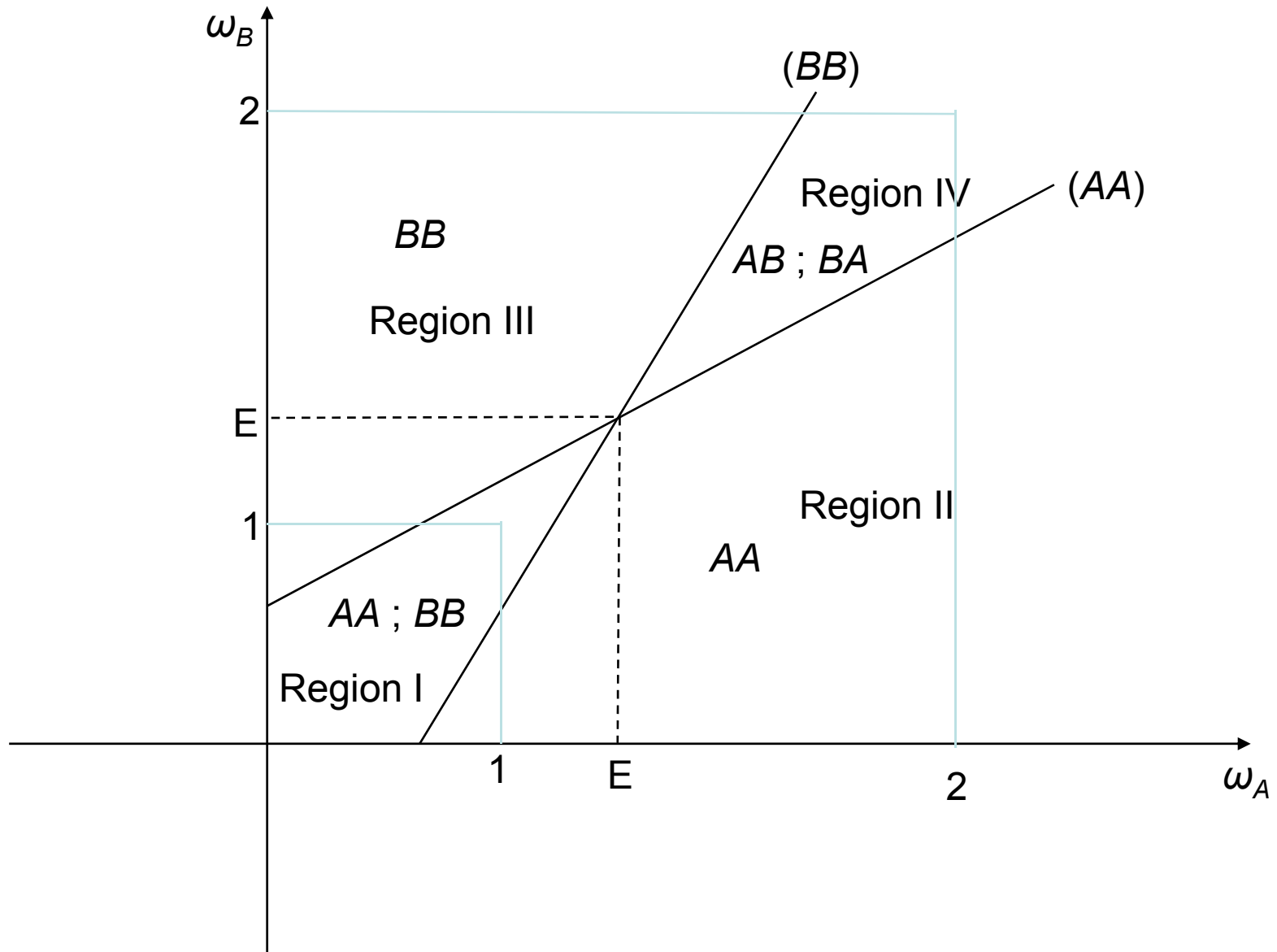


Fig. 12: Nash equilibria in project choice in the presence of spillovers ($\gamma > 0$)

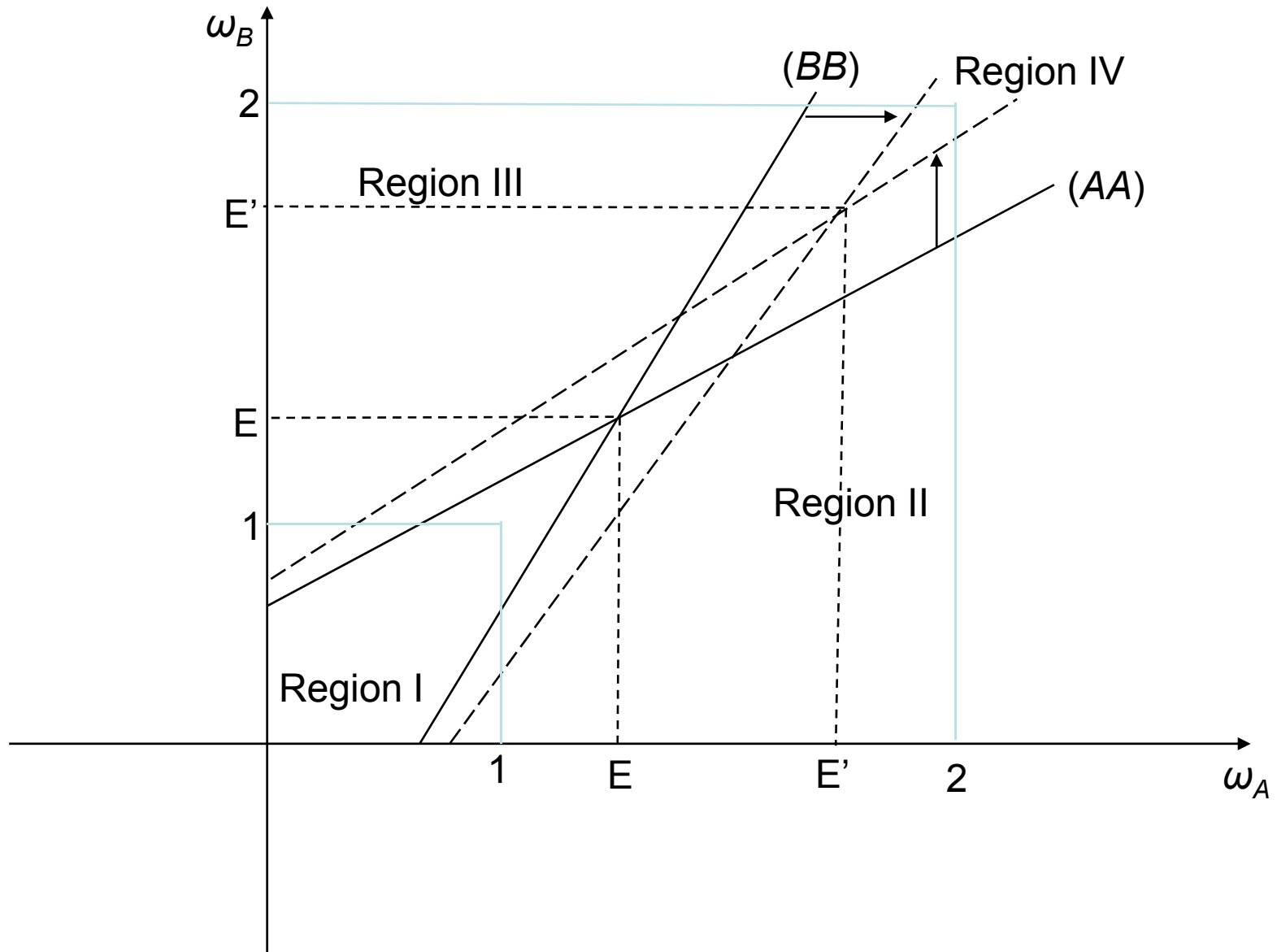


Fig. 13: The effect of an increase in Δ or a decrease in b

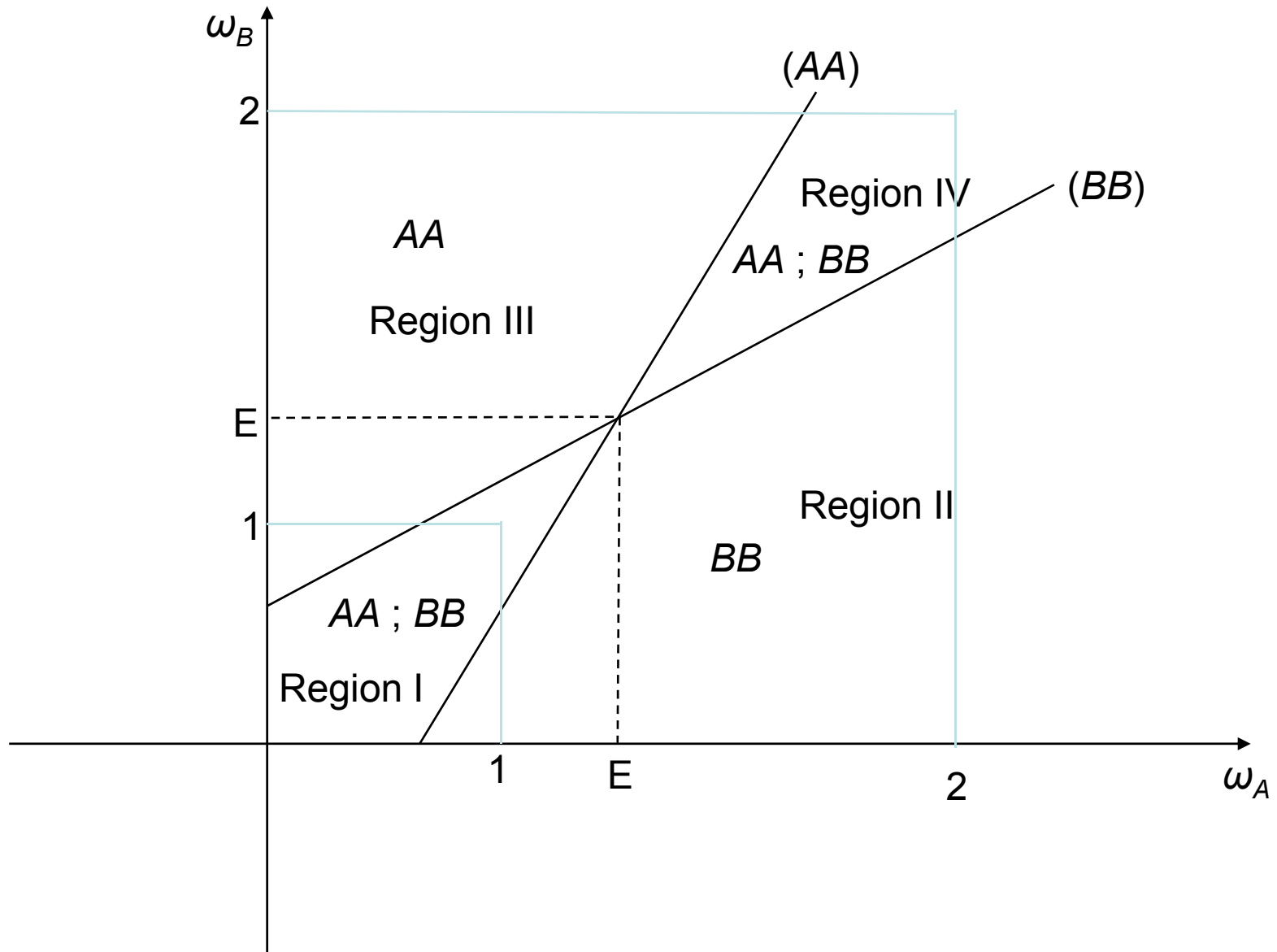


Fig. 14: Nash equilibria in project choice in the presence of spillovers (and $\gamma < 0$)