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Samaritan Bundles: Clustering in NGO Projects*

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Abstract

We build a model with non-governmental organizations competing through fundraising for donations and choosing issues to focus their projects on. Donors have latent willingness-to-give that differs across issues, but need to be "awakened" to give. Raising funds focusing on the same issue creates positive spillovers across NGOs. Each NGO chooses whether to compete in the same market (clustering) with spillovers, or to face weaker competition under issue specialization. The resulting equilibrium configuration crucially depends on the donors' baseline willingness-to-give and the cost of fundraising. We also develop variants of the model with donors' asymmetric (issue-dependent) willingness-to-give, settings where NGOs can coordinate their fundraising activities and/or issue choices, the inter-temporal choices of NGOs, 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.

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"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-govermental organizations (NGOs) have become key actors in development assistance over the last decades (Robinson and Riddell, 1995; Riddell, 2007; Werker and Ahmed, 2008). Currently, they represent a major channel through which aid projects are implemented in developing countries, in several main sectors of public good provision (health, education, poverty relief, environment, human rights, gender equality, etc.).[1] To finance their projects, NGOs rely on a mix of sources, the main ones being public funds (typically in the form of grants) and private voluntary donations.[2]

The development NGO sector has two key features. The first is the non-spontaneous nature of private donations: NGOs have to engage in (often large-scale) fundraising campaigns to mobilize private donations from a multitude of donors which have a rather limited awareness about the causes at which the NGO projects are aimed. The second is the diversity: as entry into the NGO sector is relatively easy, the sector became a plethora of organizations working towards numerous causes and in a multitude of different ways. Hence, the provision of public goods through NGOs based on voluntary donations faces the following fundamental problem: there are multiple deserving causes or issues, but donors are often unaware about them. The NGOs thus act as intermediaries, and have to play a double role. On the one hand, they collect donations and produce the good or deliver the service to the beneficiaries, and on the other hand, they raise the awareness of potential donors about the various causes. Economists have studied extensively the first dimension (Besley and Ghatak, 2003, and François and Vlassopoulos, 2008, are excellent reviews of this literature). The second dimension remains relatively understudied, despite being a very interesting and important economic phenomenon, as it implies costly investments and is potentially subject to key externalities across NGOs. For instance, the awareness-raising effort of

[1] Aldashev and Navarra (2018) describe major facts concerning the development NGO sector.

[2] Although public grants are an imporant source, often private donations represent the main source of NGO revenues. For instance, as reported by McCleary (2009, Figure 1.7), private donations accounted for almost 80 per cent of U.S. NGOs' revenues in the late 2000s.

one NGO working towards a given cause might increase the donations to other NGOs working towards the same cause. The following questions for economic analysis arise: which causes get addressed in donation "markets" and which ones do not? What determines such allocations: why some causes get neglected and certain others often command disproportionate attention?

The existing empirical literature, albeit limited, documents several interesting patterns. Researchers find that on many occasions NGOs allocate their resources in a collectively distorted fashion. 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 highly "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 usually have the same religion, share common colonial history, etc.).

How does this phenomenon of NGO clustering look like, in the aggregate and over time? Despite the relative scarcity of data on NGOs, we can identify certain patterns by relying on the best existing sources. The AidData (aiddata.org) initiative systematizes the data on virtually all the development aid projects with at least some involvement of public funds from the OECD countries. By relying on their core dataset and restricting our attention to projects where NGOs are the project implementation channel, we obtain a dataset covering the period from 1993 to 2013 (the latest year for which systematized project data are available) and containing over 250 000 aid projects.

Table 1 decomposes this data, by year of project implementation and by broad aid sector. Looking at Panel A, we observe a strong increase in the number of NGO projects over the two decades. Focusing on the cross-sector distribution of projects (Panel B), we notice that the largest category (almost one-fifth of all NGO projects) falls into the category "Government and civil society" (this category includes government aid projects with NGO involvement; thus, it is not surprising that many projects with public aid fall into this group). However, beyond this category, we observe quite an uneven distribution of NGO projects across sectors. For instance, health, education, and agriculture/rural development each account for more than 10 per cent of projects, whereas, for instance, environment-related NGO projects account for barely 3.81 per cent of the total.

[Table 1 about here]

Next, let's look at the geographic distribution of projects. Koch (2009) presented the distribution of NGO aid for 61 largest organizations in 2005, in per capita terms, across the world (see Figure 1). One can clearly see that this distribution is highly unbalanced: six developing 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]

Relying on AidData 2.0 dataset, we can also see a similar pattern, which is surprisingly stable over time. Table 2 presents the "top-10" beneficiary countries of NGO aid projects, by 5-year period. One can easily see that certain countries (such as, for instance, Ethiopia, Nicaragua, and India) always appear among the top-10 beneficiaries. However, there is also some interesting dynamics, if one looks across time. For example, Botswana was particularly "attractive" for NGOs during the 1993-2002 decade, but then disappeared from the top-10 list. On the other hand, Bolivia appeared in this list only in the 2003-2013 decade.

[Table 2 about here]

Similar patterns of NGO aid clustering occur also at the sub-national level. Fruttero and Gauri (2005) document that NGOs in Bangladesh (especially those focusing on microfinance) tend to cluster geographically within the country. Barr and Fafchamps (2006) find evidence for strong geographic clustering of NGOs within 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.[3]

[Figure 2 about here]

Clustering occurs not only in geographic terms, but also in the type of projects. 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): often, during large humanitarian crises, too many NGOs rush to carry out emergency activities whereas too few take care of the crucial post-emergency reconstruction work. On the contrary,

[3]Koch (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.

during certain other crises (especially when the attention of the international community is turned to other events), extremely few NGOs act sufficiently early, which aggravates the crisis, and a large number of NGOs start acting with considerable delay.

We see a similar picture when analyzing the AidData 2.0 dataset. Table 3 presents the decomposition of NGO projects in three large sectors, by sub-sector (using the Country Reporting System purpose code). Within the "Emergency response, reconstruction, and disaster prevention" sector, the lion's share (almost two-third of projects) is taken up by material relief assistance and services. On the other hand, the reconstruction projects (which, arguably, are also extremely important) account for a mere 6.73 per cent of the total. Within the health sector, one out every five projects has to do with HIV/AIDS, while malaria- and tuberculosis-related projects jointly fail to reach even 5 per cent of projects. Finally, within the environment-related projects, more than 38 per cent of projects are devoted to biodiversity; on the other hand, site preservation projects account only for 2.86 per cent of the total.

[Table 3 about here]

These findings confirm the numerous ethnographic accounts of NGO practitioners and investigative journalists that decry such patterns inside 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)

Why does such clustering of NGO projects occurs so often? This paper builds a simple model that provides an analytical framework to address this and above questions. In our model, two NGOs strategically choose issues to focus their projects on and then compete through fundraising for donations, to finance their projects. Donors have latent willingness-to-give that differs across issues, but need to be "awakened" to give. Raising funds focusing on the same issue creates positive spillovers across NGOs. The main trade-off that an NGO faces when choosing whether to compete in the same market as its rival (i.e. clustering) is to benefit from awareness-raising

spillovers, or to forgo spillovers and face weaker competition under issue specialization. The resulting equilibrium configuration crucially depends on the donors' baseline willingness-to-give and the cost of fundraising. Next, we explore the extensions of the baseline model allowing for donors to have asymmetric (issue-dependent) willingness-to-give, settings where NGOs can coordinate their fundraising activities and/or issue choices, and settings with inter-temporal choices of NGOs, and we illustrate the mechanisms of the model with several case studies.

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. Fruttero and Gauri (2005) are 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. (2018) 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 issues to focus on, which can encompass a rich set of choices that NGOs competing for donations undertake in real-life contexts.

2 Model

2.1 Basic Setup

Actors. Consider a simple economy with two non-governmental organizations (henceforth NGOs) denoted by $k \in \{1, 2\}$ which undertake projects related to two charitable or development issues $i \in \{A, B\}$: for instance, education and health, or poverty in two locations or regions of the world. We assume that each NGO is run by an impurely altruistic (*à la* Andreoni, 1989) social entrepreneur who enjoys a *warm-glow* utility increasing in the output of her organization. This implies that an NGO aims at maximizing the output of its project. We allow each NGO to undertake only one project, and each project targets only one issue. For simplicity, we assume

that the beneficiaries of these projects do not take any additional action; however, their well-being is affected by the size (measured by the output) of the projects. Therefore, NGOs act as intermediaries between donors and project beneficiaries.

The economy has a *continuum* of atomistic donors of mass one. Each donor has one (indivisible) unit of resource. Donors receive a warm-glow benefit (again, as in Andreoni, 1989) from giving to the two NGO projects. Each donor is characterized by three parameters (x, θ_A, θ_B). The first, $x \in [0,1]$, parametrizes the distance of each donor from NGO 1, and reflects the trust in (or ideological preference for) that specific NGO. Similarly, $(1-x)$ measures the location (trust, ideology) of each donor with respect to NGO 2. The other two parameters, θ_i, describe the degree of (un)awareness of each donor towards issue $i \in \{A, B\}$, which simply reflects the hurdle to overcome to make him/her "activated", i.e. willing to give to issue i.

More specifically, to give to an issue, a donor has to become sensibilized through the fundraising efforts of NGOs. Once "activated", a donor cares about the way each NGO works in addressing this issue. This is captured by the above parameter x (trust or ideological position with respect to each NGO). Donors with low values of x are ideologically close to NGO 1, or tend to like more how NGO 1 works, as compared to the approach of NGO 2, whereas donors with values of x closer to 1 see more favourably NGO 2's approach. For example, some environmentally-motivated donors prefer the militant approach of the *Greenpeace*, whereas certain other donors, although equally environmentally-aware, prefer the more pacific approach of the *World Wildlife Fund* (WWF).

Let the triple (x, θ_A, θ_B) be distributed i.d.d. uniformly on $[0,1]^3$ and let $\overline{U}$ denote each donor's baseline utility from giving her unit of resource to a project towards either issue. For the time being, we consider this baseline utility to be the same across issues; later, we will generalize the analysis to the case where such baseline utility is issue-specific.

Let y_{ik} denote the fundraising effort of NGO k targeting issue i, and Y_i the total fundraising effort spent on issue i. We assume that the donor with parameters (x, θ_A, θ_B) becomes aware on issue $i \in \{A, B\}$ if the NGOs' total voice Y_i is loud enough, i. e. if, for the donor, $\theta_i \leq Y_i$. Once "awakened", the donor decides to which issue, among those she is aware of, and to which NGO to give. We assume that if she decides to give to NGO $k \in \{1,2\}$ on issue $i \in \{A, B\}$, her utility is

$$\begin{aligned} U_{i1}(x) &= \overline{U} - t \cdot x \text{ if } k = 1, \text{ i.e. if she donates to NGO 1,} \\ U_{i2}(x) &= \overline{U} - t \cdot (1-x) \text{ if } k = 2, \text{ i.e. if she donates to NGO 2.} \end{aligned}$$

Here, t captures how costly it is for a donor to be further away from the NGO, reflecting the degree of donors' ideological attachement towards one or the other NGO. This parameter reflects the importance that donors attach to every NGO's specific approach. Higher values of t stand for markets where donors are strongly ideologically attached to NGOs' approaches and identities, whereas lower values of t describe the cases where donors care relatively little about the means

(projects) used to attack the ends (issues). In our analysis, we will consider the two cases: the one in which the donation market is fully *covered* ($\overline{U} \geq \frac{t}{2}$), namely all donors are willing to donate to at least one cause, and the *uncovered* case ($\overline{U} < \frac{t}{2}$), when some of the donors simply prefer not to give.

Technology. An NGO project converts funds (net of fundraising expenditures) into output. The output of an NGO k targeting issue i is

$$Q_{ik} = F_{ik} - \phi \frac{y_{ik}^2}{2},$$

where F_{ik} is the amount of funds raised by NGO k, and the second term denotes fundraising the effort (quadratic) cost borne by the NGO to raise donors' awareness on issue i with the parameter $\phi > 0$ parametrizing the technology of fundraising.

Timing. The game has two stages. At stage 1, each NGO (simultaneously and noncooperatively) chooses the issue on which to carry out its project. At stage 2, the NGOs (simultaneously and noncooperatively) set their fundraising efforts y_{ik}. Some donors are "awakened" (become activated) and decide the project(s) to donate to. NGOs collect donations, cover fundraising costs, and produce. The equilibrium concept we adopt is a two-stage subgame perfect Nash equilibrium (in issue choice and fundraising effort).

2.2 Issue Choice

Importantly, at the first stage NGOs decide simultaneously whether (1) to *cluster*, i.e. choosing the same issue, or (2) to *specialize* in two different issues. For each case, we need to specify the output levels of NGO projects.

Case 1: Clustering

Let both NGOs decide to carry out their projects on issue A. Then, their fundraising effort (*voice*) is spent only on issue A and, hence, $Y_A = y_1 + y_2$. Donors are only made aware of issue A and the total amount of donations given toward that issue, exploiting the uniform i.i.d. distribution of θ_A on $[0, 1]$, equals

$$F_A = \Pr(\theta_A \leq y_1 + y_2) = y_1 + y_2.$$

An *activated* donor with spatial parameter x chooses to give to NGO 1 rather than to NGO 2 if and only if[4]

$$\overline{U} - t \cdot x \geq \overline{U} - t \cdot (1 - x) \quad \text{and} \quad \overline{U} - t \cdot x \geq 0.$$

Clearly, the following two sub-cases may occur:

[4]Without loss of generality, in what follows we assume that, when activated in both issues, the donor located at $x = 1/2$ prefers to donate to NGO 1.

(1a) *The donation market is covered* $\left(\overline{U} \geq \frac{t}{2}\right)$. In this case, all activated donors with $x \leq \frac{1}{2}$ give to NGO 1, while those with $x > \frac{1}{2}$ give to NGO 2. The output of each NGO is then

$$Q_k^{AA}(y_1, y_2) = \frac{y_1 + y_2}{2} - \phi\frac{y_k^2}{2}. \tag{1}$$

Similarly, if both NGO choose to focus their projects on issue B, the output of each NGO is simply

$$Q_k^{BB}(y_1, y_2) = \frac{y_1 + y_2}{2} - \phi\frac{y_k^2}{2}. \tag{2}$$

(1b) *The donation market is uncovered* $\left(\overline{U} < \frac{t}{2}\right)$. In this case, all activated donors with $x \in \left[0, \frac{\overline{U}}{t}\right]$ give to NGO 1, whereas the activated donors with $x \in \left[1 - \frac{\overline{U}}{t}, 1\right]$ give to NGO 2. The non-activated donors, and all the activated ones with ideological preferences "located" furthest from both NGOs, i.e. those with $x \in \left(\frac{\overline{U}}{t}, 1 - \frac{\overline{U}}{t}\right)$, do not give. The output of each NGO's project is

$$Q_k^{AA}(y_1, y_2) = Q_k^{BB}(y_1, y_2) = (y_1 + y_2) \cdot \frac{\overline{U}}{t} - \phi\frac{y_k^2}{2}. \tag{3}$$

The output levels in these two sub-cases, (1)-(3), can be written compactly as

$$Q_k^{AA}(y_1, y_2) = Q_k^{BB}(y_1, y_2) = (y_1 + y_2) \cdot \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right) - \phi\frac{y_k^2}{2}. \tag{4}$$

Case 2: Specialization

Suppose now that the two NGOs choose their projects focusing on two distinct issues $i, j \in \{A, B\}$, with $i \neq j$. Let, for instance, NGO 1's project focus on issue A, and NGO 2's project - on issue B. Then, using the uniform i.i.d. distribution of θ_i on $[0, 1]$, the mass of activated donors giving towards issue $i \in \{A, B\}$ (and the total donation towards that issue) becomes

$$F_A = \Pr(\theta_A \leq y_1) = y_1 \quad \text{and} \quad F_B = \Pr(\theta_B \leq y_2) = y_2.$$

Note that each donor is activated towards issue A with probability $y_1(1 - y_2)$, towards issue B - with probability $y_2(1 - y_1)$, towards both issues - with probability $y_1 y_2$, and remains unaware with the residual probability $(1 - y_1)(1 - y_2)$.

A donor activated on only one issue will give to the NGO working on that issue if and only if $x \in \left[0, \min\left(\frac{\overline{U}}{t}, 1\right)\right]$ (for NGO 1), and if $x \in \left[\max\left(0, 1 - \frac{\overline{U}}{t}\right), 1\right]$ (for NGO 2). In case a donor is activated on both issues, we assume that her basic warm-glow willingness to give to either issue still equals $\overline{U}$, and that she will give to NGO 1 (rather than to NGO 2) if and only if

$$\begin{aligned} \overline{U} - t \cdot x &\geq \overline{U} - t \cdot (1 - x), \text{ and} \\ \overline{U} - t \cdot x &\geq 0. \end{aligned}$$

As above, there are two sub-cases depending on whether the donation market is covered for single-issue activated donors and two-issue activated donors.

(2a) *The donation market is covered for all issues.* The output levels are then

$$Q_1^{AB}(y_1, y_2) = y_1(1 - y_2) + y_1 y_2 \tfrac{1}{2} - \phi \tfrac{y_1^2}{2},$$

$$Q_2^{AB}(y_1, y_2) = y_2(1 - y_1) + y_1 y_2 \tfrac{1}{2} - \phi \tfrac{y_2^2}{2}.$$

The expressions are analogous if NGO 1 chooses issue B and NGO 2 - issue A.

(2b) *Uncovered markets.* Here, we have to distinguish between two cases. In the first case, the market is uncovered regardless of the number of issues for which donors are activated (i.e. on one issue or on both issues). In the second case, the market is covered for donors which are activated on one issue but is uncovered for donors which are activated on both issues, or, on the contrary, is covered for donors which are activated on both issues but is uncovered for donors which are activated on only one issue. However, note that the market is covered for one issue-activated donors but uncovered for two issues-activated donors only when the two conditions $\overline{U} \geq t$ and $\overline{U} < \frac{t}{2}$ hold simultaneously, which is obviously impossible. Hence, we have to consider only the following two cases:

($2b_1$) *Uncovered market both for one- and two-issues activated donors.* The conditions for this case are $\frac{\overline{U}}{t} < 1$ and $\frac{\overline{U}}{t} < \frac{1}{2}$, with the latter condition being the tighter one. In this case, the output levels are

$$\begin{aligned} Q_1^{AB}(y_1, y_2) &= y_1(1 - y_2)\tfrac{\overline{U}}{t} + y_1 y_2 \tfrac{\overline{U}}{t} - \phi \tfrac{y_1^2}{2}, \\ Q_2^{AB}(y_1, y_2) &= y_2(1 - y_1)\tfrac{\overline{U}}{t} + y_1 y_2 \tfrac{\overline{U}}{t} - \phi \tfrac{y_2^2}{2}. \end{aligned}$$

($2b_2$) *Uncovered market for one issue-activated donors and covered market for two issues-activated donors.* The condition for this case is $\frac{t}{2} \leq \overline{U} < t$. In this case, the output levels are

$$\begin{aligned} Q_1^{AB}(y_1, y_2) &= y_1(1 - y_2)\tfrac{\overline{U}}{t} + y_1 y_2 \tfrac{1}{2} - \phi \tfrac{y_1^2}{2}, \\ Q_2^{AB}(y_1, y_2) &= y_2(1 - y_1)\tfrac{\overline{U}}{t} + y_1 y_2 \tfrac{1}{2} - \phi \tfrac{y_2^2}{2}. \end{aligned}$$

We can summarize the output levels under these various cases ($2a$, $2b_1$ and $2b_2$) with the following compact form:

$$Q_1^{AB}(y_1, y_2) = y_1(1-y_2)\min\left(\frac{\overline{U}}{t}, 1\right) + y_1 y_2 \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right) - \phi\frac{y_1^2}{2}, \quad (5)$$

$$Q_2^{AB}(y_1, y_2) = y_2(1-y_1)\min\left(\frac{\overline{U}}{t}, 1\right) + y_1 y_2 \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right) - \phi\frac{y_2^2}{2}. \quad (6)$$

Hereafter, we assume that $\phi \in \left(\frac{1}{2}, \infty\right)$, which guarantees that that the probabilities of donors' awareness on issue $i \in \{A, B\}$, resulting from the fundraising efforts of NGOs, $y_i \in [0, 1]$, are well-defined.

3 Equilibrium Analysis

3.1 Equilibrium Fundraising Efforts

We can now characterize the Nash equilibrium levels of fundraising in the two cases (NGOs cluster, and, alternatively, NGOs specialize in issues).

Case 1: Clustering

The analysis of NGO behavior under clustering on issue A or B is symmetric, hence rather easy to solve. The strict concavity of NGOs' output functions (4) in their own fundraising efforts guarantees a unique Nash equilibrium fundraising effort equal to:

$$y_1^c = y_2^c = y^c = \frac{1}{\phi} \cdot \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right), \quad (7)$$

where superscript c stands for *clustering*. Note that in this case, when the market is partially covered ($\frac{\overline{U}}{t} < \frac{1}{2}$), every NGO's fundraising effort is lower than under fully covered market ($\frac{\overline{U}}{t} \geq \frac{1}{2}$), when the incentive to conduct fundraising activities becomes stronger.

Case 2: Specialization

Consider now the case in which NGOs decide to specialize, with NGO 1 choosing project A and NGO 2 choosing project B. Given the output functions (5) and (6), NGOs' first-order conditions write as:

$$(1-y_2)\min\left(\frac{\overline{U}}{t}, 1\right) + y_2 \cdot \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right) = \phi y_1, \quad (8)$$

$$(1-y_1)\min\left(\frac{\overline{U}}{t}, 1\right) + y_1 \cdot \min\left(\frac{\overline{U}}{t}, 1\right) = \phi y_2, \quad (9)$$

yielding a unique *non-clustering* (nc) symmetric effort for both NGOs:

$$y_1^{nc} = y_2^{nc} = y^{nc} = \frac{\min\left(\frac{\overline{U}}{t}, 1\right)}{\phi + \min\left(\frac{\overline{U}}{t}, 1\right) - \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)}. \quad (10)$$

From (10), we see that when the market is uncovered ($\frac{\overline{U}}{t} < \frac{1}{2}$), clustering or specializing does not make a difference for the fundraising by the two NGOs, since their donation markets are fully

separated, and they act as monopolists in their own markets. However, only in this peculiar case the Nash equilibrium fundraising efforts coincide under project clustering and specialization. When the donors' market is either covered fully or only for donors activated in both issues ($\frac{1}{2} < \frac{\overline{U}}{t} \leq 1$), clustering leads to a reduction on NGOs' fundraising activities. We summarize this result in the next proposition.

Proposition 1 *(i) Each NGO's equilibrium fundraising effort y^c under clustering is:*

$$y_1^c = y_2^c = y^c = \frac{1}{\phi} \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right);$$

(ii) each NGO's equilibrium fundraising effort y^{nc} under specialization is:

$$y_1^{nc} = y_2^{nc} = y^{nc} = \frac{\min\left(\frac{\overline{U}}{t}, 1\right)}{\phi + \min\left(\frac{\overline{U}}{t}, 1\right) - \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)}; \tag{11}$$

(iii) for any value $\frac{\overline{U}}{t} > 0$ and $\phi > \frac{1}{2}$,

$$y^{nc} \geq y^c.$$

Proof. *See the Appendix.*

Importantly, Part (iii) of the proposition indicates that, except for fully uncovered donation markets, competition in fundraising is more intense under specialization than under clustering. In particular, under specialization, each NGO is a monopoly on its own project and therefore has a potential donation market of size $\min\left(\overline{U}/t, 1\right)$ which is larger than under clustering with a potential donation market of size $\min\left(\overline{U}/t, 1/2\right)$. This induces each NGO to undertake more fundrasing in view of inducing donors' awareness. While fundraising efforts are strategic substitutes under specialization (see the first-order conditions in (8)-(9)), this does not, however, prevent the Nash equilibrium fundraising efforts to be larger than under clustering. Consequently, as a way to mitigate this competition effect, this feature enhances the NGOs' relative incentives to cluster (rather than to specialize).

3.2 Equilibrium Issue Choice

Substituting (7) into (4) and (10) into (5)-(6), we obtain the equilibrium NGO output levels, respectively, in two cases of clustering and specialization:

$$Q_k^{AA}(y_1^c, y_2^c) = Q_k^{BB}(y_1^c, y_2^c) = Q^c = \frac{3}{2\phi}\left[\min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)\right]^2 \quad \text{for } k = 1, 2, \tag{12}$$

and

$$Q_1^{AB}(y_1^{nc}, y_2^{nc}) = Q_2^{BA}(y_1^{nc}, y_2^{nc}) = Q^{nc} = \frac{\phi}{2} \frac{\left[\min\left(\frac{\overline{U}}{t}, 1\right)\right]^2}{\left[\phi + \min\left(\frac{\overline{U}}{t}, 1\right) - \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)\right]^2}. \tag{13}$$

From the above, we can characterize the first-stage equilibrium issue configurations:

Proposition 2 *The following equilibrium in issue choice occurs for NGOs:*

(1) For $0 < \frac{\overline{U}}{t} < \frac{\sqrt{3}}{2}$, *issue clustering occurs, with NGOs selecting the same issue, either A or B;*

(2a) For $\frac{\sqrt{3}}{2} < \frac{\overline{U}}{t} < 1$, *issue clustering occurs under* $\phi < \phi_1\left(\frac{\overline{U}}{t}\right)$ *and issue specialization occurs under* $\phi > \phi_1\left(\frac{\overline{U}}{t}\right)$, *where*

$$\phi_1\left(\frac{\overline{U}}{t}\right) = \frac{\frac{\sqrt{3}}{2}\left(\frac{\overline{U}}{t} - \frac{1}{2}\right)}{\left(\frac{\overline{U}}{t} - \frac{\sqrt{3}}{2}\right)};$$

(2b) For $\frac{\overline{U}}{t} \geq 1$, *issue clustering occurs under* $\phi < \phi_1(1)$ *and issue specialization occurs under* $\phi > \phi_1(1)$.

Proof. *See the Appendix.*

The equilibrium choice of issues by NGOs reflects the tension between different forces. The two NGOs interact strategically at three different levels: (i) in project choice, (ii) in activating the donors by fundraising, and (iii) in competing for activated donors (again by fundraising). Under project clustering, NGOs focus on the same issue. Given that donors are activated through the strength of the common voice by the NGOs on this unique issue, fundraising generates a positive informational spillover between the two NGOs at the activation level. We call this the *positive activation effect.* On the other hand, clustering potentially reduces the market share of each NGO on the market of these activated donors, which can be denoted as the *direct donation competition effect.*

Under specialization, NGOs compete for donors' attention, given that now individuals have to be awakened to different issues. Thus, there arises a *negative activation effect* between NGOs. However, once donors are activated, the competition for their donations is softened, as some donors are aware about only one issue, on which the NGO targeting that issue enjoys a monopoly power. Consequently, specialization reduces the *direct donation competition effect.*

At issue choice stage, NGOs anticipate the fundraising competition to gain donors' awareness that will occur in the donation market. As highlighted in Proposition 1, clustering induces lower equilibrium fundraising efforts than those under specialization ($y^{nc} \geq y^c$). Thus, by choosing to cluster, NGOs strategically soften the fundraising competition. We call this *tacit fundrasing-coordination effect.*

The *positive activation effect* and the *tacit fundrasing-coordination effect* both favor the emergence of clustering, while the *direct donation competition effect* favors specialization. Proposition 2 provides the conditions under which the first two effects jointly outweigh the latter effect and thus fundamentally determine NGOs' clustering or specialization.

Figure 3 depicts the equilibrium configuration of issue choices. If donors' baseline willigness to give is low (or their ideological attachment to specitic NGOs is high) and, therefore, the prospective donation market is uncovered, NGOs prefer to cluster on a single issue to economize on fundrasing costs, regardless of their level. On the figure, this occurs in the area $\overline{U}/t < 1/2$ (in this area, even under clustering, there are some potential donors that do not give) and for $\overline{U}/t < \sqrt{3}/2$ (where two-issue activated donors may be unwilling to donate to the NGO serving alone the given issue). When the donors' willigness to give is higher, NGOs have an incentive to specialize, and this incentive is stronger when the cost of fundrasing is lower. This explains the negative slope of the threshold $\phi_1(\overline{U}/t)$: under a larger size of the donation market (higher $\overline{U}/t$) NGOs are just indifferent between clustering and specialization for a lower level of fundrasing costs. Finally, for $\overline{U}/t = 1$, all potential donors are willing to give and, therefore, the threshold fundrasing cost which makes NGOs indifferent between clustering and specializing becomes independent of the donors' willigness to pay $\overline{U}$. Overall, the figure highlights the main trade-off faced by NGOs when deciding on the issue: lower fundrasing costs and smaller potential donation market increase the likelihood that NGOs cluster into a single issue to exploit the positive activation effect and the tacit coordination effect. Similarly, when the donors' willigness to give expands and fundraising costs increase, specialization becomes a more convenient option for NGOs, because of the direct donation competition effect described above.

[Figure 3 about here]

This main result of our stylized model explains the apparent puzzle of why NGOs tend to often be clustered around a particular cause instead of specializing in diverse causes (and this, despite their complaints about fundraising competition). The key intuition is that in donation markets, the market size is itself endogenous to the awareness-raising fundraising actions by NGOs, and such actions - being imperfectly targetable by NGOs - generate positive market-size spillovers from clustering. Hence, unless competition harms NGOs sufficiently severely (which occurs if the unit costs of fundraising are relatively high *and* the donation market is covered), it still makes more sense for an NGO to cluster with its rival rather than specialize (and thus forgo the benefits of positive spillovers).

3.3 Case 1: Ethiopian famine of 1984

A key example of the behavioral change of NGOs in the context where our model seems to apply comes from the 1984 Ethiopian famine case. It was a complex political situation in which the combination of the drought and political problems created a severe 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 spectaculars 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 last statement seems to suggest that the initial equilibrium was that of specialization: World Vision and the ACC conducted their fundraising campaigns in different

moments of the year, to avoid the direct donation competition effect. However, as the famine became suddenly mediatized, the cost of fundraising ϕ fell, and hence the equilibrium issue choice configuration became that of clustering, with both World Vision and the ACC conducting the fundraising campaigns at the same moment of the year.

3.4 Case 2: 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 blocade 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 crises; 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 desciption of the behavioral change of Oxfam, one of the largest international NGOs, is illustrative of the key prediction of our model. In fact, again, as in the first case, this last statement indicates that the initial equilibrium implied issue specialization: Oxfam specialized in operating outside the field, while the ICRC was operational in the field; this way, the two NGOs avoided the direct donation competition effect. However, as the cost of fundraising ϕ fell because of the sudden increase in the attention of international public, the equilibrium issue choice configuration became that of clustering, with both Oxfam and the ICRC being operational in the field. The anaysis by Sogge and Zadek (1996) suggests that this kind of sudden rise of media attention regularly turns the equilibria of the game into clustering:

"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).

4 Joint Fundraising and Issue Choices

Given the trade-offs driven by competition between NGOs highlighted in the above section, it is natural to wonder which outcomes would arise if NGOs can coordinate their actions. In particular, what would happen if (i) the NGOs jointly decide both the level of their fundraising efforts and the issues (*full coordination*); (ii) they coordinate their actions at only one of the two stages, being unable to coordinate their choices of the other stage? So far, we have assumed away the possibility that NGOs design voluntary coordination agreements. This might be excessively 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).

Hereafter we assume that when NGOs can coordinate, they have a common objective function, i.e. maximizing the sum of the outputs of their projects.[5]

4.1 Horizontal coordination (in fundraising)

As a first case, suppose that NGOs are able to construct coordination agreements, so as to jointly choose their levels of fundraising, but their choice of issues remains decentralized (non-coordinated). This assumption applies well to settings where NGOs create umbrella fundraising

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

organizations, but do not consider coordinating on the choice of issues feasible or desirable. What kind of issue configuration will emerge in equilibrium? And how does it differ from the fully non-coordinated case?

It is straighforward to see that when the two NGOs coordinate on their fundraising efforts, the problem of the two NGOs becomes to maximize the total output. If the two NGOs were operating towards the same issue (AA or BB), this would imply selecting a pair of fundraising effort levels to maximize

$$\mathcal{Q}^{CF} = 2Q_k^{AA} = 2Q_k^{BB} = 2(y_1 + y_2)\min\left(\tfrac{\overline{U}}{t}, \tfrac{1}{2}\right) - \frac{\phi}{2}\left(y_1^2 + y_2^2\right),$$

and the optimal fundraising effort levels obtained by solving the system of first-order conditions:

$$2\min\left(\tfrac{\overline{U}}{t}, \tfrac{1}{2}\right) - \phi y_k = 0 \text{ for } k \in \{1, 2\}$$

are simply given by

$$y_1^{CF} = y_2^{CF} = y^{CF} = \frac{2\min\left(\tfrac{\overline{U}}{t}, \tfrac{1}{2}\right)}{\phi},$$

where CF denotes *coordination in fundraising*. Clearly $y^{CF} > y^c$, as NGOs now internalize the positive activation effect that each of them generates on the other. The coordinated output of each NGO's project under clustering would, therefore, be

$$Q_1^{CF} = Q_2^{CF} = Q^{CF} = \frac{2\left[\min\left(\tfrac{\overline{U}}{t}, \tfrac{1}{2}\right)\right]^2}{\phi}.$$

Conversely, under *issue specialization* (AB or BA), a coordinated fundraising agreement would aim at maximizing

$$\begin{aligned}\mathcal{Q}^S \;=\; & Q_1^{AB} + Q_2^{AB} = y_1(1 - y_2)\min\left(\tfrac{\overline{U}}{t}, 1\right) + y_2(1 - y_1)\min\left(\tfrac{\overline{U}}{t}, \tfrac{1}{2}\right) + \\ & + 2y_1y_2 \cdot \min\left(\tfrac{\overline{U}}{t}, \tfrac{1}{2}\right) - \frac{\phi}{2}\left(y_1^2 + y_2^2\right).\end{aligned}$$

For every $k, h \in \{1, 2\}$ and $h \neq k$ the optimal coordinated fundraising efforts obtained from the system of first-order conditions for a maximum

$$(1 - y_h)\min\left(\tfrac{\overline{U}}{t}, 1\right) - y_h\min\left(\tfrac{\overline{U}}{t}, 1\right) + 2y_h\min\left(\tfrac{\overline{U}}{t}, \tfrac{1}{2}\right) = \phi y_k,$$

are

$$y_1^{SF} = y_2^{SF} = y^{SF} = \frac{\min\left(\tfrac{\overline{U}}{t}, 1\right)}{\phi + 2\left[\min\left(\tfrac{\overline{U}}{t}, 1\right) - \min\left(\tfrac{\overline{U}}{t}, \tfrac{1}{2}\right)\right]},$$

where SF denotes *coordination in fundraising under specialization*, with NGO projects' output levels obtained as

$$Q_1^{SF} = Q_2^{SF} = Q^{SF} = \frac{\left[\min\left(\frac{\overline{U}}{t}, 1\right)\right]^2}{2\left\{\phi + 2\left[\min\left(\frac{\overline{U}}{t}, 1\right) - \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)\right]\right\}}.$$

From the above expressions, two features are worth mentioning. First, given that output levels are the same across NGOs in the clustering and in the specialization situations, full coordination on both fundraising and issue choice will generate the same equilibrium pattern as fundraising coordination with uncoordinated issue choice.[6] Second, it emerges that under fundraising coordination and uncoordinated issue choice, clustering (AA or BB) would occur if and only if $Q^{CF} \geq Q^{SF}$, namely for

$$\frac{2\left[\min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)\right]^2}{\phi} \geq \frac{\left[\min\left(\frac{\overline{U}}{t}, 1\right)\right]^2}{2\left\{\phi + 2\left[\min\left(\frac{\overline{U}}{t}, 1\right) - \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)\right]\right\}}. \tag{14}$$

It is easy to show that this condition is always satisfied for all values of $\overline{U}/t$ and $\phi > 1/2$, as stated in the next proposition.

Proposition 3 *For all values of $\overline{U}/t$, NGOs always choose issue clustering when they coordinate on their fundraising efforts but not their issue choices. This also the case when NGOs fully coordinate both on fundraising and issue choice.*

Proof. *See the Appendix.*

As stated above, coordination only in fundraising or a full-coordination agreement (both in fundraising and issue choice) yield a much stronger incentive to cluster for NGOs than when they act in uncoordinated fashion (see Proposition 2). Contrarily, as we discuss below, when NGOs cannot coordinate in fundraising activities but can coordinate instead in their issue choice, this clustering effect is mitigated, and NGOs select the issue to cover in their project (A or B) exactly as when playing in an uncoordinated fashion in all decision stages.

4.2 Joint Decisions on Issues with Uncoordinated Fundraising Choices

We briefly consider here the configuration occurring when NGOs choose their fundraising efforts in a decentralized way but jointly decide the issues to focus on. Given the symmetry between NGOs, it is immediate to see that in this case, the outcome will replicate the equilibrium outcome of Proposition 2. Indeed, from (7) and (10) it follows that under issue clustering (respectively, issue specialization) the equilibrium fundraising effort levels are, respectively y^c and y^{nc}, while substitution provides individual output levels Q^c and Q^{nc}, as from (12). Hence, we obtain

[6] Indeed under full coordination, the NGOs choose between the clustering and specialization regime depending on $2Q^{CF} \gtrless 2Q^{SF}$, while under fundraising coordination only, the choice between clustering and specialization depends on $Q^{CF} \gtrless Q^{SF}$ for each NGO. This provides the same equilibrium regime choice.

Proposition 4 *For all values of $\overline{U}/t$, the equilibrium issue choice when NGOs coordinate on projects but choose independently their fundraising efforts replicates the equilibrium issue choice of the full decentralized equilibrium.*

Proof. *Follows from the proof of Proposition 2 in Appendix.*

From the above analysis, it emerges that issue clustering is much more likely to occur when NGOs coordinate only their fundraising activities than when they can only coordinate on their choices of issues (and not their fundraising efforts); in the latter case the outcome is the same as under under no coordination. The main reason is that issue clustering potentially yields an output advantage at the fundraising stage, that NGOs can exploit only when they are allowed to coordinate their fundraising activity. As a result, leaving the fundrasing coordination activities to the spontaneous agreement of NGOs only, may be potentially counterproductive for their incentive to cluster. Third-party, independent agencies, could be better suited to coordinate the excessive fundrasing competition of NGOs.

5 Asymmetric Willingness-to-give to Issues

In this section we relax the simplifying assumption made so far that donors have the same willigness to donate to different issues. Consider three types of donors: a mass one of donors that, if awakened, value the two projects with the same warm-glow utility, namely $U_A = U_B = \overline{U}$; a mass x_A who only care about issue A (i.e., for these donors $U_A = \overline{U}$ and $U_B = 0$); a mass x_B who only care about issue B (i.e., for which $U_A = 0$ and $U_B = \overline{U}$). Then, if both NGOs $k = 1, 2$ cluster on issue A, the individual project's ouput level is:

$$Q_k^{AA} = (y_1 + y_2) \cdot \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)(1 + x_A) - \phi\frac{(y_k)^2}{2}.$$

The expression is similar to (1), except that now a mass of $1 + x_A$ donors may be potentially interested in giving to issue A. Similarly, when both NGOs cluster on issue B, their output levels are given by:

$$Q_k^{BB} = (y_1 + y_2) \cdot \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)(1 + x_B) - \phi\frac{(y_k)^2}{2}.$$

Finally, under issue specialization, with NGO k on issue A and NGO h on issue B for $k, h \in \{1, 2\}$ and $h \neq k$, NGOs' output levels write as

$$Q_k^{AB} = y_k(1 - y_h)\min\left(\frac{\overline{U}}{t}, 1\right) + y_k x_A \min\left(\frac{\overline{U}}{t}, 1\right) + y_k y_h \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right) - \phi\frac{(y_k)^2}{2}, \tag{15}$$

$$Q_h^{AB} = y_h(1 - y_k)\min\left(\frac{\overline{U}}{t}, 1\right) + y_h x_B \min\left(\frac{\overline{U}}{t}, 1\right) + y_k y_h \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right) - \phi\frac{(y_h)^2}{2}. \tag{16}$$

As before, NGO k working on issue A can obtain donors who value both issues but are only activated on issue A (corresponding to the term $y_k(1-y_h)\min\left(\frac{\overline{U}}{t},1\right)$), donors who only care about issue A and are activated by NGO k (corresponding to the term $y_k x_A \min\left(\frac{\overline{U}}{t},1\right)$) and, finally, those who care about both issues and are also activated by both NGOs (corresponding to the term $y_k y_h \min\left(\frac{\overline{U}}{t},\frac{1}{2}\right)$).

The Nash equilibrium fundraising efforts and the corresponding equilibrium payoffs obtained by every NGO $k=1,2$ from clustering on issue A (respectively, issue B) can be easily computed as:

$$y_k^{AA}=\frac{\min\left(\frac{\overline{U}}{t},\frac{1}{2}\right)(1+x_A)}{\phi},\quad Q_k^{AA}=\frac{3\left[\min\left(\frac{\overline{U}}{t},\frac{1}{2}\right)(1+x_A)\right]^2}{2\phi}$$

and

$$y_k^{BB}=\frac{\min\left(\frac{\overline{U}}{t},\frac{1}{2}\right)(1+x_B)}{\phi},\quad Q_k^{BB}=\frac{3\left[\min\left(\frac{\overline{U}}{t},\frac{1}{2}\right)(1+x_B)\right]^2}{2\phi}.$$

Moreover, for the case of issue specialization, the first-order conditions of the optimal fundraising efforts of the two NGOs choosing, respectively, issues A and B, are given by:

$$\begin{aligned}(1-y_h)\min\left(\tfrac{\overline{U}}{t},1\right)+x_A\min\left(\tfrac{\overline{U}}{t},1\right)+y_h\min\left(\tfrac{\overline{U}}{t},\tfrac{1}{2}\right) &= \phi y_k,\\ (1-y_k)\min\left(\tfrac{\overline{U}}{t},1\right)+x_B\min\left(\tfrac{\overline{U}}{t},1\right)+y_k\min\left(\tfrac{\overline{U}}{t},\tfrac{1}{2}\right) &= \phi y_h.\end{aligned}\tag{17}$$

By denoting $\alpha=\alpha\left(\frac{\overline{U}}{t}\right)=\min\left(\frac{\overline{U}}{t},1\right)-\min\left(\frac{\overline{U}}{t},\frac{1}{2}\right)$, and solving the first-order conditions (17), the two NGOs' Nash equilibrium fundraising efforts are pinned down as:

$$y_k^{AB}=\left[\frac{\phi(1+x_A)-\alpha(1+x_B)}{\phi^2-\alpha^2}\right]\min\left(\frac{\overline{U}}{t},1\right),\tag{18}$$

$$y_h^{AB}=\left[\frac{\phi(1+x_B)-\alpha(1+x_A)}{\phi^2-\alpha^2}\right]\min\left(\frac{\overline{U}}{t},1\right).\tag{19a}$$

Note that because $\alpha\leq 1/2$, it follows that $\phi^2-\alpha^2>0$, for levels of ϕ that satisfy our assumption $\phi\in(1/2,\infty)$. One can clearly see from (18)-(19a) that the equilibrium fundraising effort of an NGO choosing issue A is increasing in $(1+x_A)$ (i.e. the size of the potential donation market associated to that issue), while it decreases with $(1+x_B)$ (i.e. the size of the potential donation market associated to the issue B). This is because fundraising efforts of NGOs are strategic substitutes under issue specialization.

Substituting (18)-(19a) into (15)-(16), we obtain the respective equilibrium payoffs of the two NGOs:

$$Q_k^{AB} = \frac{\phi}{2}\left[\frac{\phi(1+x_A)-\alpha(1+x_B)}{\phi^2-\alpha^2}\right]^2\left[\min\left(\tfrac{\overline{U}}{t},1\right)\right]^2,$$
$$Q_h^{AB} = \frac{\phi}{2}\left[\frac{\phi(1+x_B)-\alpha(1+x_A)}{\phi^2-\alpha^2}\right]^2\left[\min\left(\tfrac{\overline{U}}{t},1\right)\right]^2.$$

For notational convenience, let's introduce the following value:

$$H\left(\tfrac{\overline{U}}{t},\phi\right) = \frac{\phi^2\min\left(\frac{\overline{U}}{t},1\right)}{\sqrt{3}\left(\phi^2-\alpha^2\right)\min\left(\frac{\overline{U}}{t},\frac{1}{2}\right)+\phi\alpha\min\left(\frac{\overline{U}}{t},1\right)} \quad \text{for } \tfrac{\overline{U}}{t}\in(0,\infty).$$

Let us also remind that

$$\phi_1(\tfrac{\overline{U}}{t}) = \frac{\frac{\sqrt{3}}{2}\left(\frac{\overline{U}}{t}-\frac{1}{2}\right)}{\frac{\overline{U}}{t}-\frac{\sqrt{3}}{2}} \quad \text{for } \tfrac{\overline{U}}{t}\in\left(\tfrac{\sqrt{3}}{2},1\right].$$

In addition, let us define the following regions of the parameters' space $\left(\frac{\overline{U}}{t},\phi\right)\in\mathbb{R}_+\times\left(\frac{1}{2},\infty\right)$:

$$C = \left\{\left(\tfrac{\overline{U}}{t},\phi\right)\in\mathbb{R}_+\times\left(\tfrac{1}{2},\infty\right) \mid \tfrac{\overline{U}}{t}\leq\tfrac{\sqrt{3}}{2}\text{; or } \tfrac{\sqrt{3}}{2}<\tfrac{\overline{U}}{t}<1 \text{ and } \phi<\phi_1(\tfrac{\overline{U}}{t})\text{; or } \tfrac{\overline{U}}{t}\geq 1 \text{ and } \phi<\phi_1(1)\right\},$$
$$S = \left\{\left(\tfrac{\overline{U}}{t},\phi\right)\in\mathbb{R}_+\times\left(\tfrac{1}{2},\infty\right) \mid \tfrac{\sqrt{3}}{2}<\tfrac{\overline{U}}{t}<1 \text{ and } \phi>\phi_1(\tfrac{\overline{U}}{t})\text{; or } \tfrac{\overline{U}}{t}\geq 1 \text{ and } \phi>\phi_1(1)\right\}.$$

These correspond to the parameter sets for which, under equal willigness-to-give by donors, clustering (C) or specialization (S) occur (as in Proposition 2 and Figure 3). The following proposition characterizes the NGOs' equilibrium issue choices when donors have asymmetric warm-glow willingnesses to give.

Proposition 5 *(a) Within the equilibrium clustering region obtained in Proposition 2, if donors have asymmetric willingness-to-give, NGOs decide to cluster their projects either on issue A or on issue B depending on the magnitude of the relative potential market sizes $Z = (1+x_A)/(1+x_B)$; (b) Conversely, within the equilibrium specialization region of Proposition 2, NGOs cluster their projects on issue A (on issue B) if the relative potential market size is sufficiently large (biased towards issue A issue B) and specialize if the relative potential market sizes are sufficiently similar.*

Proof. *See the Appendix*

The different issue-choice regimes are depicted in Figures 4 and 5. When the parameters $(\overline{U}/t,\phi)$ belong to region C, we have $H<1$ as indicated in Figure 4. As we know from Proposition 2, this is occurring for relatively low fundraising costs and low willingness to give of donors.

Independently from the relative potential donation market size $Z = (1+x_A)/(1+x_B)$, clustering is *always* the equilibrium choice. However the issue on which NGOs cluster crucially depends on that relative potential donation market size. Clearly, if the relative market size of project A is large enough (namely for $Z > H$), NGOs cluster on project A, while conversely, if the relative market size of project A is small enough (namely for $Z < 1/H$), there is equilibrium clustering on project B. When Z takes intermediate values, (namely for $H < Z < 1/H$), i.e. when the relative market sizes are sufficiently similar to each other, then clustering on either project A or B is an equilibrium outcome.

When conversely, the parameters $(\overline{U}/t, \phi)$ belong to region S and, therefore, $H > 1$, Figure 5 indicates that there is now the possibility of equilibrium specialization in issues for the relative market size Z taking intermediate values (namely for $1/H < Z < H$) whereas one obtains clustering when the relative market sizes are sufficiently asymmetric (NGOs cluster on issue A for $Z > H$, and on issue B for $Z < 1/H$).

The intuition follows the benchmark model, with the additional considerations arising from the effect of the relative potential donation market size for the two issues. When the warm-glow utility of giving is relatively low (namely for $\overline{U}/t \leq \sqrt{3}/2$), the donation market is not covered and issue clustering allows benefiting from the awareness spillovers without inducing much competition on the donation market *ex post*. This is the preferred equilibrium option for NGOs, regardless of the intensity of competition on the donation market (as parametrized by the cost parameter ϕ). The relative market size Z only determines the issue on which the equilibrium clustering takes place.[7] When the willigness to give increases and the donation market of the awakened donors becomes covered, the choice of issue clustering may now depend upon the intensity of the fundraising competition. When ϕ is relatively small (namely for $\phi < \phi_1(\overline{U}/t)$) the issue clustering is the only emerging equilibrium, as clustering on the same issue is a strategy to reduce fundraising competition and to exploit to some degree the tacit coordination among NGOs on that front. On the other hand, when fundraising competition is not too strong (namely for $\phi > \phi_1(\overline{U}/t)$), then the logic of the relative potential market size Z matters for NGOs' equilibrium choice of issues. When the potential market size is strongly biased towards one issue (namely for $Z > H$ or $Z < 1/H$), then again NGOs will cluster on the issue that has the highest potential donation market. However, when Z takes intermediate values (namely for $1/H < Z < H$), and the fundraising competition is not too strong (occurring here for $\phi > \phi_1(\overline{U}/t)$), then there is scope for issue specialization. In this case, being the only NGO on a covered (or almost covered) issue more than offsets the tacit-coordination and positive awareness spillover effects associated with issue clustering.

[Figures 4 and 5 about here]

[7] Note that when Z takes intermediate values, two different pure-strategy issue clustering equlibria (i.e. clustering either on A or on B) arise.

5.1 Case 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).

Our asymmetric potential market model provides one explanation for the above pattern. Denote the helping Sierra Leone amputees as issue A, and other problems as issue B. Initially, the Sierra Leone was a forgotten crisis; hence, in the framework of our model, the NGOs conducted their projects on other issues (BB). When the media attention caught on, this led to two shifts: on the one hand, the effectiveness of fundraising increases substantially (i.e. the cost of fundraising ϕ fell); and, on the other hand, the potential of the market for the amputees issue increased (x_A and thus Z went up). We are thus likely to be in the case depicted by Figure 4, and moreover,

the equilibrium shifts from BB to AA. This explain why such a large number of NGOs jointly jumped in to conduct projects on Sierra Leone amputees.

6 Inter-temporal Issue Choice

In this section, we develop an application of our baseline model to the problem of endogenous timing of projects and fundraising campaigns by NGOs, focused on explaining some of the key patterns discussed in the introduction section. Consider a setting with a large-scale humanitarian crisis. The choice between two "issues" by NGOs in this context can be interpreted as the choice between (i) intervening early/immediately (emergency care projects) or (ii) intervene later (e.g. reconstruction projects). Our main aim in this section is to analyze the conditions under which NGOs decide to cluster temporally, i.e. both NGOs rush to do emergency care, or both wait to intervene later. The citations in the introduction seems to suggest that one of the key reasons for early inter-temporal clustering and the lack of NGOs conducting post-emergency reconstruction is that this latter type of projects, while being fundamentally important, is much less attractive from the perspective of fundraising. We now try to formalize this argument.

Let us assume that there exist two periods, and that the NGOs have two projects which can be implemented *sequentially*: project A gets implemented in period 1 while project B is implemented in period 2. The structure of the game is now somewhat different from the baseline model. Specifically, as before, the fixed pool of donors is characterized by a propensity to give $\overline{U}$ and by an ideological location $x \in [0,1]$ with respect to the two NGOs. However, donors may be activated sequentially by one or the other NGO. The timing is as follows:

- Stage 1: NGOs decide simultaneoulsy whether to activate donors in period 1 (conducting project A) or in period 2 (conducting project B);
- Stage 2: NGOs decide on their fundraising efforts. This is done simultaneously, if the NGO have chosen to activate donors in the same period, or sequentially, if they have chosen to activate them in different periods. Furthermore, we assume that both NGOs discount the payoffs from delaying project implementation from period 1 to period 2 by the factor $\delta \in (0,1)$.

When both NGOs activate donors in period 1 or in period 2, the stage-2 game is a simultaneous-move one, and thus NGOs compete for funds as in the benchmark model under clustering. Hence,

their output functions are, therefore:

$$Q_k^{11} = (y_1^{11} + y_2^{11}) \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right) - \phi\frac{(y_k^{11})^2}{2},$$
$$Q_k^{22} = (y_1^{22} + y_2^{22}) \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right) - \phi\frac{(y_k^{22})^2}{2},$$

which gives the following equilibrium fundraising efforts and output levels:

$$y^{11} = y^{22} = y^{tc} = \frac{1}{\phi}\min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right),$$

$$Q^{11} = Q^{22} = Q^{tc} = \frac{3}{2\phi}\left[\min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)\right]^2. \tag{20}$$

Here *tc* stands for *time clustering*. If, conversely, one NGO chooses to conduct its project in (and thus raises funds) in period 1 while its rival does so in period 2, then the first-period NGO obtains an output level equal to

$$Q_1^{12} = y_1^{12}\min\left(\frac{\overline{U}}{t}, 1\right) - \phi\frac{(y_1^{12})^2}{2},$$

while the output level of the second NGO's project equals

$$Q_2^{12} = y_2^{12}\left(1 - y_1^{12}\right)\min\left(\frac{\overline{U}}{t}, 1\right) + y_2^{12}y_1^{12}\min\left[1 - \min\left(\frac{\overline{U}}{t}, 1\right), \frac{\overline{U}}{t}\right] - \phi\frac{(y_2^{12})^2}{2}.$$

The importance of the temporal dimension of this game comes from the fact that the NGO acting in the first period obtains donations from the donors activated by its own campaign (i.e. the donors with the "deafness" level θ_A below y_1^{12}; hence, given the uniform distribution, the fraction y_1^{12} of the donors). Among these donors, some are then ready to give to this particular NGO (i.e. those with an "ideological" position x below $\min\left(\overline{U}/t, 1\right)$). The second NGO which conducts its campaign with a delay, gets access to donors who were not activated by NGO 1 (equal to the share $(1 - y_1^{12})$), who get activated by NGO 2's campaign (i.e. the fraction y_2^{12} of those), and who are ready to give to NGO 2 (i.e. donors with an "ideological" position x below $\min\left(\overline{U}/t, 1\right)$). In addition, NGO 2 gets donations from donors already activated by NGO 1 (a fraction y_1^{12}), who are also activated by NGO 2 (a fraction y_2^{12} of those), and who did not give to NGO 1, and prefer to give to the NGO 2 (i.e. those with an "ideological" position $1 - x$ smaller than $\left[1 - \min\left(\overline{U}/t, 1\right), \overline{U}/t\right]$).

Given this, the optimal fundraising effort and output level of NGO 1's project are, respectively,

$$y_1^{12} = \frac{1}{\phi}\min\left(\frac{\overline{U}}{t}, 1\right) \quad \text{and} \quad Q_1^{12} = \frac{1}{2\phi}\left[\min\left(\frac{\overline{U}}{t}, 1\right)\right]^2,$$

whereas the optimal fundraising effort of NGO 2 is

$$y_2^{12} = \min\left(\frac{\overline{U}}{t}, 1\right) \frac{1 - \frac{1}{\phi}\left\{\min\left(\frac{\overline{U}}{t}, 1\right) - \min\left[1 - \min\left(\frac{\overline{U}}{t}, 1\right), \frac{\overline{U}}{t}\right]\right\}}{\phi},$$

which generates the equilibrium output level

$$Q_2^{12} = \left[\min\left(\frac{\overline{U}}{t}, 1\right)\right]^2 \frac{\left[1 - \frac{1}{\phi}\left\{\min\left(\frac{\overline{U}}{t}, 1\right) - \min\left[1 - \min\left(\frac{\overline{U}}{t}, 1\right), \frac{\overline{U}}{t}\right]\right\}\right]^2}{2\phi}. \tag{21}$$

6.1 Equilibrium Choice of Issues over Time

The above analysis indicates that clustering in period 1 ("rush" to conduct projects early) occurs at the equilibrium when

$$Q^{11} > \delta \cdot Q_2^{12}. \tag{22}$$

Using (20) and (21), we can write the condition for clustering (22) as

$$\frac{3}{2\phi}\left[\min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)\right]^2 > \delta\left[\min\left(\frac{\overline{U}}{t}, 1\right)\right]^2 \frac{\left[1 - \frac{1}{\phi}\left\{\min\left(\frac{\overline{U}}{t}, 1\right) - \min\left[1 - \min\left(\frac{\overline{U}}{t}, 1\right), \frac{\overline{U}}{t}\right]\right\}\right]^2}{2\phi},$$

or, more compactly, as

$$\sqrt{\frac{3}{\delta}}\left\{\min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)\right\} > \Omega\left(\frac{\overline{U}}{t}\right), \tag{23}$$

where, for convenience, we denote

$$\Omega\left(\frac{\overline{U}}{t}\right) = \min\left(\frac{\overline{U}}{t}, 1\right)\left[1 - \frac{1}{\phi}\left\{\min\left(\frac{\overline{U}}{t}, 1\right) - \min\left[1 - \min\left(\frac{\overline{U}}{t}, 1\right), \frac{\overline{U}}{t}\right]\right\}\right].$$

Similarly, clustering on period 2 (both NGOs strategically delaying to act) occurs in equilibrium when

$$\delta \cdot Q^{22} > Q_1^{12},$$

which, using (20) and (21), yields

$$\delta \cdot \frac{3}{2\phi}\left[\min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)\right]^2 > \frac{1}{2\phi}\min\left[\left(\frac{\overline{U}}{t}, 1\right)\right]^2,$$

which can be simply rewritten as the condition

$$\sqrt{3\delta}\left[\min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)\right] > \min\left(\frac{\overline{U}}{t}, 1\right). \tag{24}$$

Finally, intertemporal specialization (non-clustering) by NGOs (i.e. one NGO conducts the emergency care project, whereas the second engages in post-reconstruction projects) is the equilibrium outcome when

$$Q^{11} < \delta \cdot Q_2^{12} \text{ and } \delta \cdot Q^{22} < Q_1^{12},$$

which, using (20) and (21), yields

$$\begin{aligned} \sqrt{\tfrac{3}{\delta}}\left[\min\left(\tfrac{\overline{U}}{t},\tfrac{1}{2}\right)\right] &< \Omega\left(\tfrac{\overline{U}}{t}\right), \\ \sqrt{3\delta}\left[\min\left(\tfrac{\overline{U}}{t},\tfrac{1}{2}\right)\right] &< \min\left(\tfrac{\overline{U}}{t},1\right). \end{aligned} \tag{25}$$

Next, let $\widehat{x}(\phi) \in [1/2, 1]$ be the solution of the following equation:

$$2x\left[1 - \tfrac{1}{\phi}(2x-1)\right] = \sqrt{\tfrac{3}{\delta}},$$

and define the following three regions Γ_i for $i = 0, 1, 2$, in the parameter space $(\overline{U}/t, \phi) \in [0, \infty] \times [1, +\infty)$ as

$$\Gamma_0 \equiv \left\{ \left(\tfrac{\overline{U}}{t}, \phi\right) \mid \tfrac{\overline{U}}{t} \leq \frac{1}{2};\ \tfrac{\overline{U}}{t} \in \left[\tfrac{1}{2}, \tfrac{\sqrt{3\delta}}{2}\right] \text{ and } \tfrac{\overline{U}}{t} \leq \widehat{x}(\phi) \right\},$$

$$\Gamma_1 \equiv \left\{ \left(\tfrac{\overline{U}}{t}, \phi\right) \mid \tfrac{\overline{U}}{t} \in \left[\tfrac{\sqrt{3\delta}}{2}, 1\right] \text{ and } \tfrac{\overline{U}}{t} \leq \widehat{x}(\phi);\ \tfrac{\overline{U}}{t} \geq 1 \text{ and } \phi \leq \widetilde{\phi} = \tfrac{2}{\left(2-\sqrt{\frac{3}{\delta}}\right)} \right\},$$

$$\Gamma_2 \equiv \left\{ \left(\tfrac{\overline{U}}{t}, \phi\right) \mid \left(\tfrac{\overline{U}}{t}, \phi\right) \in \left[\tfrac{1}{2}, 1\right] \text{ with } \tfrac{\overline{U}}{t} \geq \widehat{x}(\phi);\ \tfrac{\overline{U}}{t} \geq 1 \text{ and } \phi \geq \widetilde{\phi} = \tfrac{2}{\left(2-\sqrt{\frac{3}{\delta}}\right)} \right\}.$$

We can now characterize the equilibrium intertemporal choice of projects in the following proposition:

Proposition 6 *Suppose the cost of fundraising is sufficiently high ($\phi > 1$). Then, (i) if the NGOs are highly impatient (ie. $\delta < \frac{1}{3}$), for any level of willingness-to-give ($\overline{U}/t \geq 0$), the unique (subgame perfect Nash) equilibrium is such that NGOs rush to emergency (cluster in period 1); (ii) if the NGOs' patience is in some intermediate range (ie. $\delta \in [1/3, 3/4]$) and the donors' willingness-to-give is sufficiently low (ie. $\overline{U}/t \leq \sqrt{3\delta}/2$), rush to emergency (clustering in period 1) and strategic delay (clustering in period 2) are both equilibrium outcomes; if, instead, the donors' willingness-to-give is sufficiently high (ie. $\overline{U}/t > \sqrt{3\delta}/2$), the unique equilibrium is such that NGOs rush to emergency (cluster in period 1); (iii) finally, if NGOs are sufficiently patient (ie. $\delta > 3/4$), then clustering in period 1 and in period 2 are both the equilibria of the timing game when $(\overline{U}/t, \phi) \in \Gamma_0$; clustering in period 1 is the unique equilibrium for $(\overline{U}/t, \phi) \in \Gamma_1$; and inter-temporal specialization is the unique equilibrium for $(\overline{U}/t, \phi) \in \Gamma_2$.*

Figures from 6 to 8 illustrate this proposition. When the NGOs are rather impatient (their discount factor δ is low, i.e. $\delta < 1/3$, case (i) of the proposition, and Figure 6), the cost of waiting to engage in reconstruction projects in the second period is too high in terms of NGO payoffs. Hence, NGOs cluster their donation campaigns and production in the first period. In other words, both NGOs engage only in emergency care projects, and no one takes care of post-emergency reconstruction.

When the NGOs' patience is at the intermediate level (the discount factor takes intermediate values, i.e. $\delta \in [1/3, 3/4]$, or case (ii), and Figure 7), NGOs face a coordination problem concerning the period in which to cluster their activities. The benefit of conducting their activities in the same period comes from the fact that NGOs exert a positive externality on each other, in terms of raising donors' awareness. The cost is obviously that they have to compete for donations in the same period. When donors' propensity to give is relatively low (i.e. $\overline{U}/t < \sqrt{3\delta}/2$), the market on the ideological space is uncovered; hence, the competition for donors in the same period is weak. Consequently, the positive awareness spillover makes coordinating on the same period preferable, even if this may involve some delay. Thus, both coordinating on emergency-care projects and on post-reconstruction projects are equilibria. On the other hand, when donors' propensity to give is relatively high ($\overline{U}/t > \sqrt{3\delta}/2$), the same-period donation market is covered; therefore, the disadvantage of competiting by raising funds in the same period (paired with the cost of delay) outweighs the benefit of positive awareness spillover from acting (jointly) in the second period. In this case, the only equilibrium is to clustering in the first period, i.e. NGOs conduct only emergency-type projects.

When the NGOs are sufficiently patient (the discount factor is even larger, $\delta > 3/4$; case (iii), and Figure 8), the possibility of inter-temporal specialization finally arises. This occurs when both the willingness-to-give and the cost of fundraising $\left(\overline{U}/t, \phi\right)$ are sufficiently high (i.e. the parameter values fall inside region Γ_2). The intuition is as follows. For each NGO, waiting to conduct post-emergency reconstruction projects in the second period, while the rival NGO rushes in the first period and conducts an emergency project, implies a trade-off. On the one hand, the NGO would be a monopolist on the market for all donors activated in the second period. On the other hand, those donors are only the residual donors: they were not activated by the rival NGO in period 1, or were activated by in period 1 but did not choose to contribute to the emergency project of the rival, for ideological preference reasons. In addition, there is also the cost of waiting described by the discount factor $\delta < 1$. How this trade-off gets resolved depends on the key parameter values. When the cost of fundraising ϕ is relatively large, the fundraising effort of the rival NGO is likely to be rather low, and relatively little awareness is raised. Therefore, being the second mover (and accessing only the residual donors) is not too costly. Furthermore, the positive awareness externality created under operating in the same period as the rival NGO is also relatively small. Both of these reasons move the trade-off in favor of inter-temporal specialization.

Similarly, a relatively large willingness-to-give of donors (high $\overline{U}/t$) reduces the attractiveness for NGOs to act in the same period. Firstly, operating on the same period implies that the market for awakened donors is covered and therefore the competition on the ideological dimension between NGOs is rather intense. Secondly, by switching to a different period than its rival, an NGO can ensure a monopoly position on a residual demand of awakened donors, all of which have

a relatively high propensity to give to whoever activates them. Both of these forces induce the NGOs to specialize inter-temporally. As a result of these effects, in region Γ_2, the specialization equilibrium is the only prevailing (subgame perfect Nash) equilibrium.

[Figures 6, 7, and 8 about here]

6.2 Case 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 to 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 dynamic issue choice, the above citations suggest that the donors' willlingness to give was quite high, while the technological cost of raising funds was relatively low. Hence, *even for relatively patient NGOs* (e.g. those with long history and established reputation), the incentives to cluster in period 1 were high (area Γ_1 on Figure 8). Obviously for less patient ones, the high willingness to give was alone a sufficient driving force for clustering in emergency-type projects.

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 needs: "There are also neighboring countries that are touched by the same problem, sometimes even more that 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).

7 Conclusion

Reflecting over the deep problems of the internatonal 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 a simple economic framework for analyzing this and related problems. 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.

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.

8 Appendix

Proposition 1. *(i) Each NGO's equilibrium fundraising effort y^c under clustering is:*

$$y_1^c = y_2^c = y^c = \frac{1}{\phi}\min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right);$$

(ii) each NGO's equilibrium fundraising effort y^{nc} under specialization is:

$$y_1^{nc} = y_2^{nc} = y^{nc} = \frac{\min\left(\frac{\overline{U}}{t}, 1\right)}{\phi + \min\left(\frac{\overline{U}}{t}, 1\right) - \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)};$$

(iii) for any value $\frac{\overline{U}}{t} > 0$ and $\phi > \frac{1}{2}$,

$$y^{nc} \geq y^c.$$

Proof of Proposition 1. (i) and (ii) just follow from the maximization of NGOs' output functions under clustering and specialization, i.e. expressions (4) and (5)-(6), respectively. For (iii), consider first the case with $\overline{U}/t < 1/2$. By (7) and (10),

$$y^{nc} = \frac{\frac{\overline{U}}{t}}{\phi + \frac{\overline{U}}{t} - \frac{\overline{U}}{t}} = \frac{\overline{U}}{t\phi} = y^c = \frac{\overline{U}}{t\phi},$$

and in this case Nash-equlibrium level of NGO fundraising effort under clustering coincides with that under specialization. When $\overline{U}/t > 1/2$, by (7) and (10) we have that

$$y^{nc} = \frac{\frac{\overline{U}}{t}}{\phi + \frac{\overline{U}}{t} - \frac{1}{2}} \text{ and } y^c = \frac{1}{2\phi},$$

from which it follows that $y^{nc} > y^c$ for any $\phi \in (1/2, \infty)$. **QED.**

Proposition 2. *The following equilibrium in issue choice occurs for NGOs:*
(1) For $0 < \frac{\overline{U}}{t} < \frac{\sqrt{3}}{2}$, *issue clustering occurs, with NGOs selecting the same issue, either A or B;*
(2a) For $\frac{\sqrt{3}}{2} < \frac{\overline{U}}{t} < 1$, issue clustering occurs under $\phi < \phi_1\left(\frac{\overline{U}}{t}\right)$ and issue specialization occurs under $\phi > \phi_1\left(\frac{\overline{U}}{t}\right)$, where

$$\phi_1\left(\frac{\overline{U}}{t}\right) = \frac{\frac{\sqrt{3}}{2}\left(\frac{\overline{U}}{t} - \frac{1}{2}\right)}{\left(\frac{\overline{U}}{t} - \frac{\sqrt{3}}{2}\right)};$$

(2b) For $\frac{\overline{U}}{t} \geq 1$, issue clustering occurs under $\phi < \phi_1(1)$ and issue specialization occurs under $\phi > \phi_1(1)$.

Proof of Proposition 2. (1) Consider, first, the case with $\overline{U}/t < 1/2$. From (12) and (13) we obtain, for every NGO $k = 1, 2$, that

$$\begin{aligned} Q_k^{AA}(y_1^c, y_2^c) &= Q_k^{BB}(y_1^c, y_2^c) = \frac{3}{2\phi}\left(\frac{\overline{U}}{t}\right)^2, \\ Q_k^{AB}(y_1^{nc}, y_2^{nc}) &= Q_k^{BA}(y_1^{nc}, y_2^{nc}) = \frac{1}{2\phi}\left(\frac{\overline{U}}{t}\right)^2. \end{aligned}$$

Specialization (AB) at the first stage is part of a subgame perfect Nash equilibrium if and only if, for every $k = 1, 2$,

$$Q_k^{AB}(y_1^{nc}, y_2^{nc}) > Q_k^{BB}(y_1^c, y_2^c),$$

and, analogously,

$$Q_k^{BA}(y_1^{nc}, y_2^{nc}) > Q_k^{AA}(y_1^c, y_2^c),$$

both holding for

$$\frac{1}{2\phi}\left(\frac{\overline{U}}{t}\right)^2 > \frac{3}{2\phi}\left(\frac{\overline{U}}{t}\right)^2,$$

or

$$\phi > \sqrt{3}\phi$$

which never occurs since $\sqrt{3} > 1$ and $\phi > 0$. Hence, for this range of parameters, clustering (AA) or (BB) is the unique equilibrium.

Let now $1/2 \leq \overline{U}/t < 1$, and within this range we have *covered* market for one issue-activated donors under clustering and *uncovered* market for one-issue activated donors under specialization (and *covered* market for two-issues activated donors). Thus, from (12) and (13) follow that

$$\begin{aligned} Q_k^{AA}(y_1^c, y_2^c) &= Q_k^{BB}(y_1^c, y_2^c) = \frac{3}{8\phi}, \\ Q_k^{AB}(y_1^{nc}, y_2^{nc}) &= Q_k^{BA}(y_1^{nc}, y_2^{nc}) = \frac{\phi}{2}\frac{\left(\frac{\overline{U}}{t}\right)^2}{\left(\frac{\overline{U}}{t} - \frac{1}{2} + \phi\right)^2}. \end{aligned}$$

Hence, specialization (AB) at the first stage is part of a subgame perfect Nash equilibrium if and only if, for every $k = 1, 2$,

$$Q_k^{AB}(y_1^{nc}, y_2^{nc}) > Q_k^{BB}(y_1^c, y_2^c)$$

and, analogously,

$$Q_k^{BA}(y_1^{nc}, y_2^{nc}) > Q_k^{AA}(y_1^c, y_2^c)$$

that holds for

$$\phi\left(\frac{\overline{U}}{t}\right) > \frac{\sqrt{3}}{2}\left(\frac{\overline{U}}{t} - \frac{1}{2} + \phi\right),$$

or

$$\phi\left(\frac{\overline{U}}{t}-\frac{\sqrt{3}}{2}\right)>\frac{\sqrt{3}}{2}\left(\frac{\overline{U}}{t}-\frac{1}{2}\right),$$

which is never satisfied for $1/2 \leq \overline{U}/t \leq \sqrt{3}/2$. Therefore, also in this case we obtain clustering as unique equilibrium outcome. These two cases prove part (1) of Proposition 2.

(2a) When $1 > \overline{U}/t > \sqrt{3}/2$, it is easy to check that *specialization* occurs if and only if

$$\phi > \frac{\frac{\sqrt{3}}{2}\left(\frac{\overline{U}}{t}-\frac{1}{2}\right)}{\left(\frac{\overline{U}}{t}-\frac{\sqrt{3}}{2}\right)} \equiv \phi_1\left(\frac{\overline{U}}{t}\right)$$

whereas *clustering* if and only if $\phi < \phi_1\left(\frac{\overline{U}}{t}\right)$. This proves part (2a) of Proposition 2.

(2b) For $\overline{U}/t \geq 1$, we have *covered* market for all configurations of projects and from (12) and (13) we obtain

$$Q_k^{AA}(y_1^c, y_2^c) = Q_k^{BB}(y_1^c, y_2^c) = \frac{3}{8\phi},$$

and

$$Q_k^{AB}(y_1^{nc}, y_2^{nc}) = Q_k^{BA}(y_1^{nc}, y_2^{nc}) = \frac{\phi}{2}\frac{1}{(\phi+1/2)^2}.$$

Hence, specialization (AB) at the first stage is part of a subgame perfect Nash equilibrium if and only if $Q_1^{AB} > Q_1^{BB}$ and $Q_2^{BA} > Q_2^{AA}$ occurring for

$$2\phi > \sqrt{3}\,(\phi + 1/2)$$

or

$$\phi > \frac{\sqrt{3}}{2}\frac{1}{2-\sqrt{3}} = \phi_1(1).$$

Thus, we can have clustering (specialization) if and only if $\phi < \phi_1(1)$ $(\phi > \phi_1(1))$. This concludes the proof. **QED.**

Proposition 3. *For all values of $\overline{U}/t$, NGOs always choose clustering under (horizontal) fundrasing coordination.*

Proof of Proposition 3. As above, we need to consider the different ranges of parameters. Let first $\overline{U}/t \leq 1/2$, from which (14) rewrites as

$$\frac{4}{\phi} \geq \frac{1}{\phi},$$

which is always satisfied and, as a result, clustering always occurs when NGOs jointly decide their fundraising efforts. (b) Secondly, let $1/2 < \overline{U}/t \leq 1$, from which (14) rewrites as

$$\frac{1}{\phi} \geq \frac{\left(\frac{\overline{U}}{t}\right)^2}{\left[\phi + 2\left(\frac{\overline{U}}{t}-\frac{1}{2}\right)\right]},$$

or

$$\phi \geq 0 > \frac{2\left(\frac{1}{2} - \frac{\overline{U}}{t}\right)}{1 - \left(\frac{\overline{U}}{t}\right)^2}$$

which always holds. Thus, even in this case, clustering follows.
Finally, for $\frac{\overline{U}}{t} > 1$, (14) rewrites as

$$\frac{1}{\phi} \geq \frac{1}{\phi + 1}$$

which is always satisfied, and, once again, clustering is the only equilibrium outcome when NGOs jointly coordinate their fundraising efforts, whereas establishing their issues independently. **QED.**

Proposition 5. *(a) Within the equilibrium clustering region obtained in Proposition 2, if donors have asymmetric willingness-to-give, NGOs decide to cluster their projects either on issue A or on issue B depending on the magnitude of the relative potential market sizes* $Z = (1 + x_A) / (1 + x_B)$*; (b) Conversely, within the equilibrium specialization region of Proposition 2, NGOs cluster their projects on issue A (on issue B) if the relative potential market size is sufficiently large (biased towards issue A issue B) and specialize if the relative potential market sizes are sufficiently similar.*

Proof of proposition 5. As usual, the condition for the first stage (subgame perfect Nash) equilibrium clustering on project A write as

$$Q_k^{AA} > Q_k^{BA}$$

for both NGOs, that in the case of donors with different willingnesses to give equals to

$$\frac{3\left[\min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)(1 + x_A)\right]^2}{2\phi} > \frac{\phi}{2}\left[\frac{\phi(1 + x_B) - \alpha(1 + x_A)}{\phi^2 - \alpha^2}\right]^2 \left[\min\left(\frac{\overline{U}}{t}, 1\right)\right]^2,$$

(where $\alpha = \min\left(\frac{\overline{U}}{t}, 1\right) - \min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)$), which can be rewritten as

$$Z(x_A, x_B) \equiv \frac{1 + x_A}{1 + x_B} > \frac{\phi^2 \min\left(\frac{\overline{U}}{t}, 1\right)}{\sqrt{3}\left(\phi^2 - \alpha^2\right)\min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right) + \phi\alpha \min\left(\frac{\overline{U}}{t}, 1\right)} \equiv H(\tfrac{\overline{U}}{t}, \phi). \tag{26}$$

In the expression above, $Z(x_A, x_B)$ represents the *relative market size of issue A and B as due to the donors' preferences,* while $H(\frac{\overline{U}}{t}, \phi)$ is a threshold function which will be used both in the following proof and in Figures 5 and 6, and that depends both on donors' willingness to give and fundraising technology.
Similarly, the condition for equilibrium clustering on project B writes as

$$Q_k^{BB} > Q_k^{AB}$$

for both NGOs $k = 1, 2$, namely

$$\frac{3\left[\min\left(\frac{\overline{U}}{t}, \frac{1}{2}\right)(1+x_B)\right]^2}{2\phi} > \frac{\phi}{2}\left[\frac{\phi(1+x_A)-\alpha(1+x_B)}{\phi^2-\alpha^2}\right]^2\left[\min\left(\frac{\overline{U}}{t}, 1\right)\right]^2,$$

which can be rewritten as:

$$Z(x_A, x_B) < H^{-1}(\tfrac{\overline{U}}{t}, \phi). \tag{27}$$

Therefore, the conditions for clustering on projects A (resp. B) reduce to

$$\begin{aligned} &\text{clustering on projects } A: && Z > H, \\ &\text{clustering on projects } B: && Z < \frac{1}{H}. \end{aligned}$$

By the fact that

$$H < 1 \Leftrightarrow \phi^2 \min\left(\tfrac{\overline{U}}{t}, 1\right) < \sqrt{3}\left(\phi^2-\alpha^2\right)\min\left(\tfrac{\overline{U}}{t}, 1\right) + \phi\alpha\min\left(\tfrac{\overline{U}}{t}, 1\right),$$

for $\frac{\overline{U}}{t} < \frac{1}{2}$, $\alpha = 0$ and $H < 1$, this corresponds to $\phi^2 < \sqrt{3}\phi^2$, which always holds,
for $\frac{1}{2} < \frac{\overline{U}}{t} < 1$, $\alpha = \frac{\overline{U}}{t} - \frac{1}{2}$ and $H < 1$, this corresponds to

$$\phi^2\tfrac{\overline{U}}{t} < \tfrac{\sqrt{3}}{2}\left(\phi^2 - \left(\tfrac{\overline{U}}{t} - \tfrac{1}{2}\right)^2\right) + \phi\left(\tfrac{\overline{U}}{t} - \tfrac{1}{2}\right)\tfrac{\overline{U}}{t},$$

which, after some manipulations, yields

$$\left[\phi - \left(\tfrac{\overline{U}}{t} - \tfrac{1}{2}\right)\right]\phi\tfrac{\overline{U}}{t} < \tfrac{\sqrt{3}}{2}\left(\phi - \left(\tfrac{\overline{U}}{t} - \tfrac{1}{2}\right)\right)\left(\phi + \left(\tfrac{\overline{U}}{t} - \tfrac{1}{2}\right)\right),$$

and, then,

$$\begin{aligned} \frac{\overline{U}}{t} &< \frac{\frac{\sqrt{3}}{2}\left(\phi - \frac{1}{2}\right)}{\phi - \frac{\sqrt{3}}{2}}, \\ \left(\phi - \tfrac{\sqrt{3}}{2}\right)\frac{\overline{U}}{t} &< \tfrac{\sqrt{3}}{2}\left(\phi - \tfrac{1}{2}\right), \\ \phi &< \phi_1(\tfrac{\overline{U}}{t}) \equiv \frac{\frac{\sqrt{3}}{2}\left(\frac{\overline{U}}{t} - \frac{1}{2}\right)}{\frac{\overline{U}}{t} - \frac{\sqrt{3}}{2}}, \end{aligned}$$

for $\frac{\overline{U}}{t} > 1$, $\alpha = \frac{1}{2}$ and $H < 1$, this corresponds to

$$\phi^2 < \tfrac{\sqrt{3}}{2}\left(\phi^2 - \tfrac{1}{4}\right) + \frac{\phi}{2}, \text{ or } \left(2-\sqrt{3}\right)\phi^2 - \phi + \tfrac{\sqrt{3}}{4} < 0,$$

possessing the following two roots:

$$\phi_- = \frac{1}{2} \text{ and } \phi_+ = \frac{\sqrt{3}}{4 - 2\sqrt{3}} = \phi_1(1) > 0,$$

from which it follows that $\left(2 - \sqrt{3}\right)\phi^2 - \phi + \frac{\sqrt{3}}{4} < 0$ and $H < 1$ for $\phi \in \left(\phi_-, \phi_+\right)$, and $\left(2 - \sqrt{3}\right)\phi^2 - \phi + \frac{\sqrt{3}}{4} > 0$ and $H > 1$ for $\phi > \phi_+$. Therefore, two cases are possible:

(a) $H < 1$ (and therefore $H < \frac{1}{H}$). This can be further decomposed in *three subcases*:

(a_1) $Z > \frac{1}{H} > H$: one has $Q_k^{AA} > Q_k^{BA}$ and $Q_k^{BB} < Q_k^{AB}$, and it is a dominant strategy for a NGO k to choose project A. The Nash equilibrium structure of project choices is, therefore, clustering on project A.

(a_2) $\frac{1}{H} > Z > H$: one has $Q_k^{AA} > Q_k^{BA}$ and $Q_k^{BB} > Q_k^{AB}$ and it is a best response for each NGO k to choose the same project as the other NGO. There are two pure strategy Nash equilibrium structure of project choices: clustering on project A and clustering on project B;

(a_3) $\frac{1}{H} > H > Z$: one has $Q_k^{AA} < Q_k^{BA}$ and $Q_k^{BB} > Q_k^{AB}$ and it is a dominant strategy for an NGO k to choose project B. The Nash equilibrium structure of project choices is therefore clustering on project B.

(b) $H > 1$ (and therefore $H > \frac{1}{H}$). This can be similarly further decomposed in three subcases:

(b_1) $Z > H > \frac{1}{H}$: one has $Q_k^{AA} > Q_k^{BA}$ and $Q_k^{BB} < Q_k^{AB}$ and it is a dominant strategy for an NGO k to choose project A. The Nash equilibrium structure of project choices is, therefore, clustering on project A;

(b_2) $H > Z > \frac{1}{H}$: one has $Q_k^{AA} < Q_k^{BA}$ and $Q_k^{BB} < Q_k^{AB}$ and it is a best response for each NGO k to differentiate itself from the other NGO and to choose the project that the other NGO did not pick. There are, therefore, two symmetric pure strategy Nash equilibrium structure of project specialization in this case: one NGO specializing on project A and the other NGO specializing on project B;

(b_3) $H > \frac{1}{H} > Z$: one has $Q_k^{AA} < Q_k^{BA}$ and $Q_k^{BB} > Q_k^{AB}$ and it is a dominant strategy for an NGO k to choose project B. The Nash equilibrium structure of project choices is, therefore, clustering on project B. Summarizing the previous discussion:

(a) When the parameter space $\left(\frac{\overline{U}}{t}, \phi\right)$ corresponds to the clustering region (region C) with symmetric donors, i.e. when either $\frac{\overline{U}}{t} < \frac{\sqrt{3}}{2}$, $\frac{\sqrt{3}}{2} < \frac{\overline{U}}{t} < 1$ and $\phi < \phi_1(\frac{\overline{U}}{t})$ or $\frac{\overline{U}}{t} > 1$ and $\phi < \phi_+ = \phi_1(1)$, then $H < 1$ and under asymmetric donors there is always project clustering (on project A when $Z > H$ and on project B when $\frac{1}{H} > Z$).

(b) When the parameter space $\left(\frac{\overline{U}}{t}, \phi\right)$ corresponds to the specialization region (region S) with symmetric donors, i.e. when $\frac{\sqrt{3}}{2} < \frac{\overline{U}}{t} < 1$ and $\phi > \phi_1(\frac{\overline{U}}{t})$ and $\frac{\overline{U}}{t} > 1$ and $\phi > \phi_+ = \phi_1(1)$, then $H > 1$ and there is project clustering on project A when $Z > H$, project specialization (one NGO on A, the other on B) when $H > Z > \frac{1}{H}$ and project clustering on B when $\frac{1}{H} > Z$. **QED**.

Proposition 7. *Suppose the costs of fundraising are sufficiently high ($\phi > 1$). Then, (i) if NGO are highly impatient ($\delta < \frac{1}{3}$), for any level willingness-to-give ($\overline{U}/t \geq 0$), the unique (subgame perfect Nash) equilibrium is such that NGOs rush to emergency (cluster in period 1);* (ii) *if the NGOs' patience is at the intermediate level ($\delta \in [1/3, 3/4]$) and the donors' willingness-to-give is sufficiently low ($\overline{U}/t \leq \sqrt{3\delta}/2$), rush to emergency (clustering in period 1) and strategic delay (clustering in period 2) are both equilibrium outcomes; if, instead, the donors' willingness-to-give is sufficiently high ($\overline{U}/t > \sqrt{3\delta}/2$), the unique equilibrium is such that NGOs rush to emergency (cluster in period 1); (iii) finally, if NGOs are sufficiently patient ($\delta > 3/4$), then clustering in period 1 and in period 2 are both the equilibria of the timing game when $\left(\overline{U}/t, \phi\right) \in \Gamma_0$; clustering in period 1 is the unique equilibrium for $\left(\overline{U}/t, \phi\right) \in \Gamma_1$; inter-temporal specialization is the unique equilibrium for $\left(\overline{U}/t, \phi\right) \in \Gamma_2$.*

Proof of Proposition 7. First note that, having defined for convenience,

$$\Omega\left(\tfrac{\overline{U}}{t}\right) = \min\left(\tfrac{\overline{U}}{t}, 1\right)\left[1 - \frac{1}{\phi}\left\{\min\left(\tfrac{\overline{U}}{t}, 1\right) - \min\left[1 - \min\left(\tfrac{\overline{U}}{t}, 1\right), \tfrac{\overline{U}}{t}\right]\right\}\right],$$

this function takes the following values for $\frac{\overline{U}}{t} \in (0, \infty)$:

$$\Omega\left(\tfrac{\overline{U}}{t}\right) = \begin{cases} \frac{\overline{U}}{t} \text{ for } \frac{\overline{U}}{t} < \frac{1}{2}, \\ \frac{\overline{U}}{t} - \frac{1}{\phi}\frac{\overline{U}}{t}\left(2\frac{\overline{U}}{t} - 1\right) \text{ for } \frac{\overline{U}}{t} \in \left[\frac{1}{2}, 1\right) \text{ and} \\ 1 - \frac{1}{\phi} \text{ for } \frac{\overline{U}}{t} \geq 1. \end{cases}$$

(a) Consider first the case of $\frac{\overline{U}}{t} < \frac{1}{2}$.

Condition (23) holds and clustering on period 1 is an equilibrium when

$$\sqrt{\tfrac{3}{\delta}}\tfrac{\overline{U}}{t} > \tfrac{\overline{U}}{t},$$

which is always true (as $\delta < 1$).

Condition (24) holds and clustering on period 2 is always an equilibrium when

$$\sqrt{3\delta}\tfrac{\overline{U}}{t} > \tfrac{\overline{U}}{t},$$

which holds when $\sqrt{3\delta} > 1$ or $\delta > 1/3$.

From this it follows that for $\frac{\overline{U}}{t} < \frac{1}{2}$ clustering in period 1 is always an equilibrium, and clustering in period 2 is an equilibrium when $\delta > 1/3$. Given that (23) holds and, therefore, (25) does not hold, no clustering cannot be an equilibrium within that parameters' region.

(b) Consider now, in turn, the case with $\frac{1}{2} \leq \frac{\overline{U}}{t} < 1$.

(b_1) Condition (23) holds and clustering on period 1 is an equilibrium if

$$\sqrt{\tfrac{3}{\delta}} > 2\tfrac{\overline{U}}{t}\left[1 - \frac{1}{\phi}\left(2\tfrac{\overline{U}}{t} - 1\right)\right]. \tag{28}$$

To analyze the parameters' region for which (28) holds, consider the function

$$F(x,\phi) = 2x\left[1 - \tfrac{1}{\phi}(2x-1)\right].$$

$F(x,\phi)$ has a maximum at $x = \frac{\phi+1}{4}$, taking a value of $\frac{(\phi+1)^2}{4\phi}$, while $F\left(\frac{1}{2},\phi\right) = 1$ and $F(1,\phi) = 2^{\frac{\phi-1}{\phi}}$. Note also that $F(x,\phi)$ is increasing in ϕ for $x \geq \frac{1}{2}$ and $\frac{\phi+1}{4} \in \left(\frac{1}{2},1\right)$ if and only if $\phi \in (1,3)$. Now, for $\phi \in (1,3)$, we have $\frac{(\phi+1)^2}{4\phi} < \frac{(3+1)^2}{4.3} = \frac{4}{3} < \sqrt{\frac{3}{\delta}}$ (as $\delta < 1 < \frac{27}{16}$) and $F(x,\phi) < \sqrt{\frac{3}{\delta}}$ for all $x \in \left(\frac{1}{2},1\right)$. Consequently, (28) is always satisfied for all $\frac{\overline{U}}{t} \in \left(\frac{1}{2},1\right)$ and clustering on period 1 holds in equilibrium.

For $\phi \geq 3$, $F(x,\phi)$ is increasing on $\left[\frac{1}{2},1\right]$. Now notice that for $\delta \leq \frac{3}{4}$, $F(1,\phi) = 2^{\frac{\phi-1}{\phi}} \leq \sqrt{\frac{3}{\delta}}$ for all values of $\phi \geq 1$ while for $\delta > \frac{3}{4}$, $F(1,\phi) = 2^{\frac{\phi-1}{\phi}} < \sqrt{\frac{3}{\delta}}$ if and only if $\phi \leq \widetilde{\phi} = \frac{2}{\left(2-\sqrt{\frac{3}{\delta}}\right)}$, with $\widetilde{\phi} > 3$.

Hence for $\delta \leq \frac{3}{4}$ (28) is always satisfied for all $\frac{\overline{U}}{t} \in \left(\frac{1}{2},1\right)$ and all values of $\phi \geq 1$, and clustering on period 1 is an equilibrium. For $\delta > \frac{3}{4}$, (28) is satisfied if and only if $\frac{\overline{U}}{t} \in \left(\frac{1}{2},\widehat{x}(\phi)\right)$ with $\frac{1}{2} < \widehat{x}(\phi) < 1$ defined by the equation $F(\widehat{x},\phi) = \sqrt{\frac{3}{\delta}}$. Therefore for $\frac{\overline{U}}{t} \in \left(\frac{1}{2},\widehat{x}(\phi)\right)$, clustering on period 1 is an equilibrium.

Notice that $\widehat{x}(\phi)$ is decreasing in ϕ with $\widehat{x}\left(\widetilde{\phi}\right) = 1$ and $\lim_{\phi\to\infty}\widehat{x}(\phi) = \frac{1}{2}$.

(b_2) Condition (24) and clustering on period 2 is an equilibrium when

$$\sqrt{3\delta}\tfrac{1}{2} > \tfrac{\overline{U}}{t}.$$

Thus, as $\sqrt{3\delta} < 2$, we get clustering in period 2 when $\frac{\overline{U}}{t} \in \left(\frac{1}{2},\frac{\sqrt{3\delta}}{2}\right)$. Hence, for $\delta < \frac{1}{3}$, there is no clustering in period 2, and for $\delta \geq \frac{1}{3}$, there is clustering in period 2 if and only if $\frac{\overline{U}}{t} \in \left(\frac{1}{2},\frac{\sqrt{3\delta}}{2}\right)$.

(b_3) No clustering is an equilibrium when (25) holds. Given the previous discussion, this will be the case only when $\delta > \frac{3}{4}$, $\frac{\overline{U}}{t} \in \left(\frac{1}{2},1\right)$ and $\frac{\overline{U}}{t} \geq \widehat{x}(\phi)$.

(c) Finally consider the case in which $\frac{\overline{U}}{t} \geq 1$.

(c_1) Now, (23) holds and clustering in period 1 is an equilibrium when $\left(2-\sqrt{\frac{3}{\delta}}\right)\phi \leq 2$. When $\delta < \frac{3}{4}$, $\left(2-\sqrt{\frac{3}{\delta}}\right) < 0$, (23) always holds and, therefore, clustering in period 1 is the equilibrium choice of NGOs.

When $\delta \geq \frac{3}{4}$ (23) holds if and only if $\phi \leq \widetilde{\phi} = \frac{2}{\left(2-\sqrt{\frac{3}{\delta}}\right)}$. In such a case clustering in period 1 is an equilibrium.

(c_2) Condition (24) and clustering on period 2 is an equilibrium when

$$\tfrac{\sqrt{3\delta}}{2} > 1.$$

The above condition is never satisfied as $\sqrt{3\delta} < \sqrt{3} < 2$. Clustering on period 2 cannot be an equilibrium in that region.

(c_3) Project specialization is an equilibrium when (25) holds. Given the previous discussion, this will be the case only when $\delta \geq \frac{3}{4}$ and $\phi \geq \widetilde{\phi} = \frac{2}{\left(2-\sqrt{\frac{3}{\delta}}\right)}$.

Summarizing, as effect of (a), (b) and (c), we can conclude that:
(i) For $\delta < \frac{1}{3}$ and for all $\frac{\overline{U}}{t} \geq 0$, there is a unique (subgame perfect Nash) equilibrium of the endohgenous timing game with both NGOs clustering in period 1.
(ii) For $\delta \in \left[\frac{1}{3}, \frac{3}{4}\right]$,we have the following:
- For $\frac{\overline{U}}{t} \leq \frac{\sqrt{3\delta}}{2}$, clustering in period 1 and clustering in period 2 are both NGOs project choices equilibria.
- For $\frac{\overline{U}}{t} > \frac{\sqrt{3\delta}}{2}$ there is a unique equilibrium with both NGOs clustering in period 1.
(iii) Finally, for $\delta > \frac{3}{4}$, let us define the following regions Γ_i, for $i = 0, 1, 2$, in the space of parameters $\frac{\overline{U}}{t}$ and ϕ in $[0, \infty] \times [1, +\infty)$ as:

$$\Gamma_0 : \left\{ \left(\frac{\overline{U}}{t}, \phi\right) \mid \frac{\overline{U}}{t} \leq \frac{1}{2};\ \frac{\overline{U}}{t} \in \left[\frac{1}{2}, \frac{\sqrt{3\delta}}{2}\right] \text{ and } \frac{\overline{U}}{t} \leq \widehat{x}(\phi) \right\},$$

$$\Gamma_1 : \left\{ \left(\frac{\overline{U}}{t}, \phi\right) \mid \frac{\overline{U}}{t} \in \left[\frac{\sqrt{3\delta}}{2}, 1\right] \text{ and } \frac{\overline{U}}{t} \leq \widehat{x}(\phi);\ \frac{\overline{U}}{t} \geq 1 \text{ and } \phi \leq \widetilde{\phi} = \frac{2}{\left(2-\sqrt{\frac{3}{\delta}}\right)} \right\},$$

$$\Gamma_2 : \left\{ \left(\frac{\overline{U}}{t}, \phi\right) \mid \left(\frac{\overline{U}}{t}, \phi\right) \in \left[\frac{1}{2}, 1\right] \text{ with } \frac{\overline{U}}{t} \geq \widehat{x}(\phi);\ \frac{\overline{U}}{t} \geq 1 \text{ and } \phi \geq \widetilde{\phi} = \frac{2}{\left(2-\sqrt{\frac{3}{\delta}}\right)} \right\}.$$

Then, the following results follows (point (iii) of Proposition 7):
NGO Clustering on period 1 is a subgame perfect Nash equilibrium of the endogenous timing game for $\left(\frac{\overline{U}}{t}, \phi\right) \in \Gamma_0$; NGO clustering is period 2 is is a subgame perfect Nash equilibrium of the endogenous timing game for $\left(\frac{\overline{U}}{t}, \phi\right) \in \Gamma_1$; No NGO clustering is is a subgame perfect Nash equilibrium of the endogenous timing game for $\left(\frac{\overline{U}}{t}, \phi\right) \in \Gamma_2$. **QED.**

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Table 1. Distribution of NGO aid projects, by year and sector

A. Distribution of NGO aid projects by year

Year of implementation of NGO aid project	Number of projects	Percent of total projects
1993	11	0.00
1994	209	0.08
1995	615	0.24
1996	773	0.31
1997	770	0.30
1998	876	0.35
1999	30	0.01
2000	26	0.01
2001	114	0.05
2002	913	0.36
2003	848	0.33
2004	7 859	3.10
2005	10 894	4.30
2006	12 769	5.04
2007	17 790	7.02
2008	24 918	9.84
2009	30 979	12.23
2010	36 413	14.38
2011	33 732	13.32
2012	42 175	16.65
2013	30 533	12.06
Total	***253 247***	***100.00***

Source : Authors' calculations using AidData Core Research Release, Version 3.1

B. Distribution of NGO aid projects by sector

Sector (type) of aid project	Number of projects	Percent of total projects
Government & civil society	49511	19.60
Agriculture, forestry, fishing & rural development	34920	13.83
Health	33411	13.23
Education	25462	10.08
Emergency response, reconstruction, and disaster prevention	23963	9.49
Social infrastructure & welfare	17514	6.94
General/unspecified	15779	6.25
Food aid, food security & commodity assistance	11507	4.56
Conflict prevention & peace	10086	3.99
Environment	9611	3.81
Water supply & sanitation	7679	3.04
Trasport, communications & energy	4349	1.72
Industry, mining & construction	3407	1.35
Banking, financial, business services & debt-related	2779	1.10
Trade & tourism	1775	0.70
Refugees in donor countries	790	0.31
Total	***252543***	***100.00***

Source : Authors' calculations using AidData Core Research Release, Version 3.1

Table 2. Top 10 beneficiary countries of NGO aid projects, by 5-year period

1993-1997

	Country	Number of projects	Percent of total projects
1	Nicaragua	84	4.13
2	India	77	3.79
3	Sri Lanka	75	3.69
4	Zimbabwe	67	3.30
5	Botswana	65	3.20
6	Guatemala	63	3.10
7	Uganda	62	3.05
8	Ethiopia	60	2.95
9	Bangladesh	59	2.90
10	Mozambique	59	2.90
	Total	*2 033*	*100.00*

1998-2002

	Country	Number of projects	Percent of total projects
1	Sri Lanka	68	5.06
2	Zimbabwe	61	4.54
3	Ethiopia	54	4.01
4	Nicaragua	50	3.72
5	Mozambique	42	3.12
6	Tanzania	42	3.12
7	Zambia	42	3.12
8	India	41	3.05
9	Kenya	38	2.83
10	Bangladesh	35	2.60
	Total	*1 345*	*100.00*

2003-2008

	Country	Number of projects	Percent of total projects
1	Ethiopia	1257	3.41
2	India	1257	3.41
3	Bolivia	1226	3.33
4	Kenya	1184	3.21
5	Uganda	1105	3.00
6	Nicaragua	974	2.64
7	Sudan	922	2.50
8	Brazil	911	2.47
9	Guatemala	909	2.47
10	Mozambique	908	2.46
	Total	*36 868*	*100.00*

2009-2013

	Country	Number of projects	Percent of total projects
1	Ethiopia	4583	3.10
2	India	4567	3.09
3	Peru	3802	2.57
4	Tanzania	3498	2.37
5	Uganda	3357	2.27
6	Bolivia	3313	2.24
7	Haiti	3047	2.06
8	Nicaragua	2878	1.95
9	Colombia	2824	1.91
10	Afghanistan	2775	1.88
	Total	*147 787*	*100.00*

Source : Authors' calculations using AidData Core Research Release, Version 3.1

Table 3. Distribution of NGO aid projects, by sub-sector, for selected sectors

A. Emergency response, reconstruction, and disaster prevention projects

Sub-sector (type) of aid project	Number of projects	Percent of total projects
Material relief assistance and services	15027	62.71
Emergency food aid	4010	16.73
Disaster prevention and preparedness	2236	9.33
Reconstruction relief and rehabilitation	1612	6.73
Relief co-ordination; protection and support services	1078	4.50
Total	*23963*	*100.00*

B. Health, population policies/programmes & reproductive health projects

Sub-sector (type) of aid project	Number of projects	Percent of total projects
STD control including HIV/AIDS	6872	20.57
Basic health care	4692	14.04
Reproductive health care	4400	13.17
Medical services	2521	7.55
Health policy and administrative management	2383	7.13
Basic health infrastructure	1987	5.95
Population policy and administrative management	1881	5.63
Family planning	1440	4.31
Health education	1372	4.11
Basic nutrition	1311	3.92
Infectious disease control	1311	3.92
Malaria control	940	2.81
Tuberculosis control	651	1.95
Health personnel development	598	1.79
Medical education/training	570	1.71
Medical research	300	0.90
Personnel development for population and reproductive health	182	0.54
Total	*33411*	*100.00*

C. Environment-related projects

Sub-sector (type) of aid project	Number of projects	Percent of total projects
Bio-diversity	2924	38.42
Environmental policy and administrative management	2792	36.68
Environmental education/training	862	11.33
Biosphere protection	584	7.67
Site preservation	218	2.86
Environmental research	155	2.04
Flood prevention/control	76	1.00
Total	*7611*	*100.00*

Source : Authors' calculations using AidData Core Research Release, Version 3.1

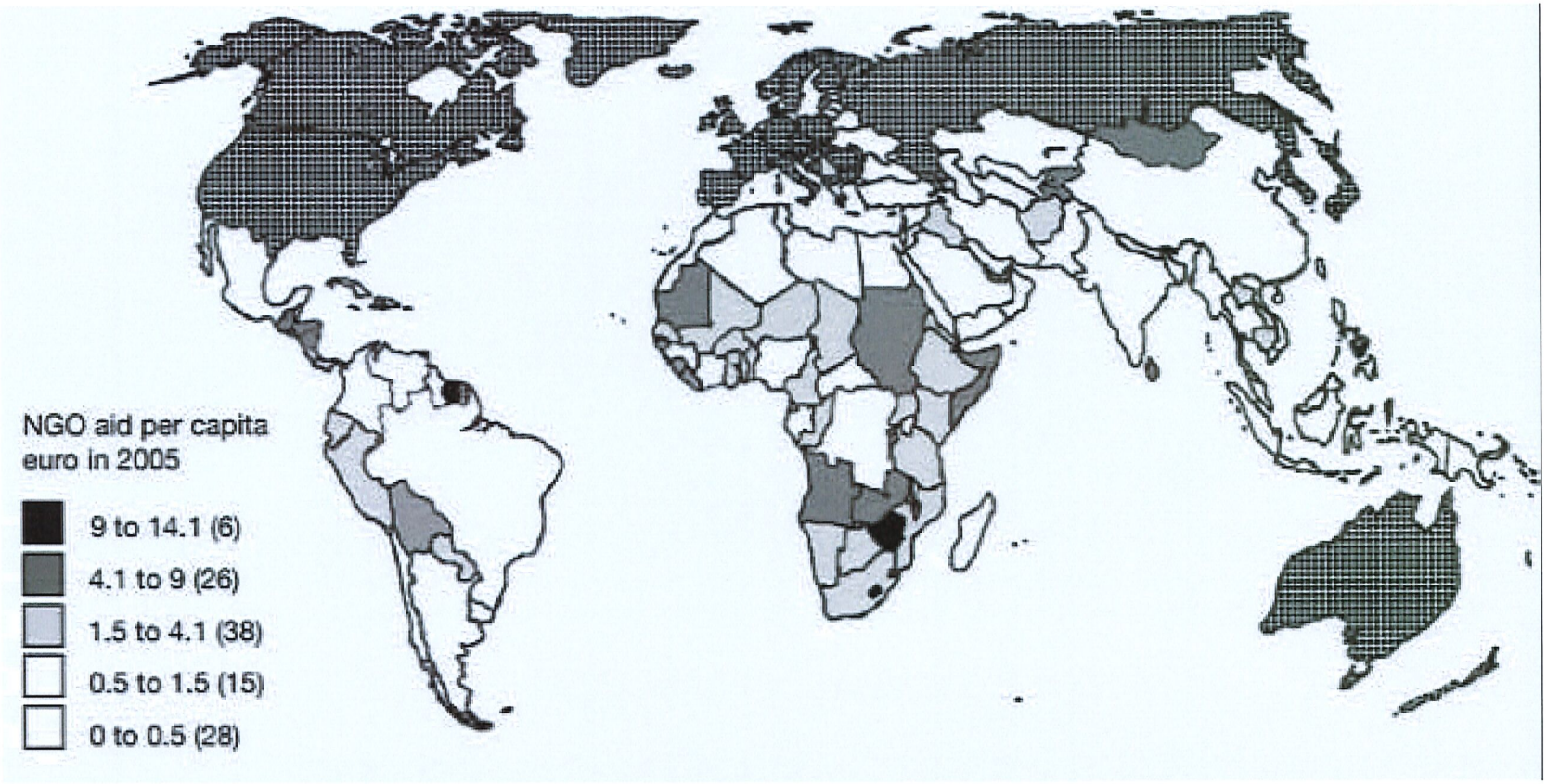

Fig. 1: Worldwide distribution of NGO aid in 2005

Source: Koch (2009), Figure 1.4

Notes: Hatched areas are non-recipient countries

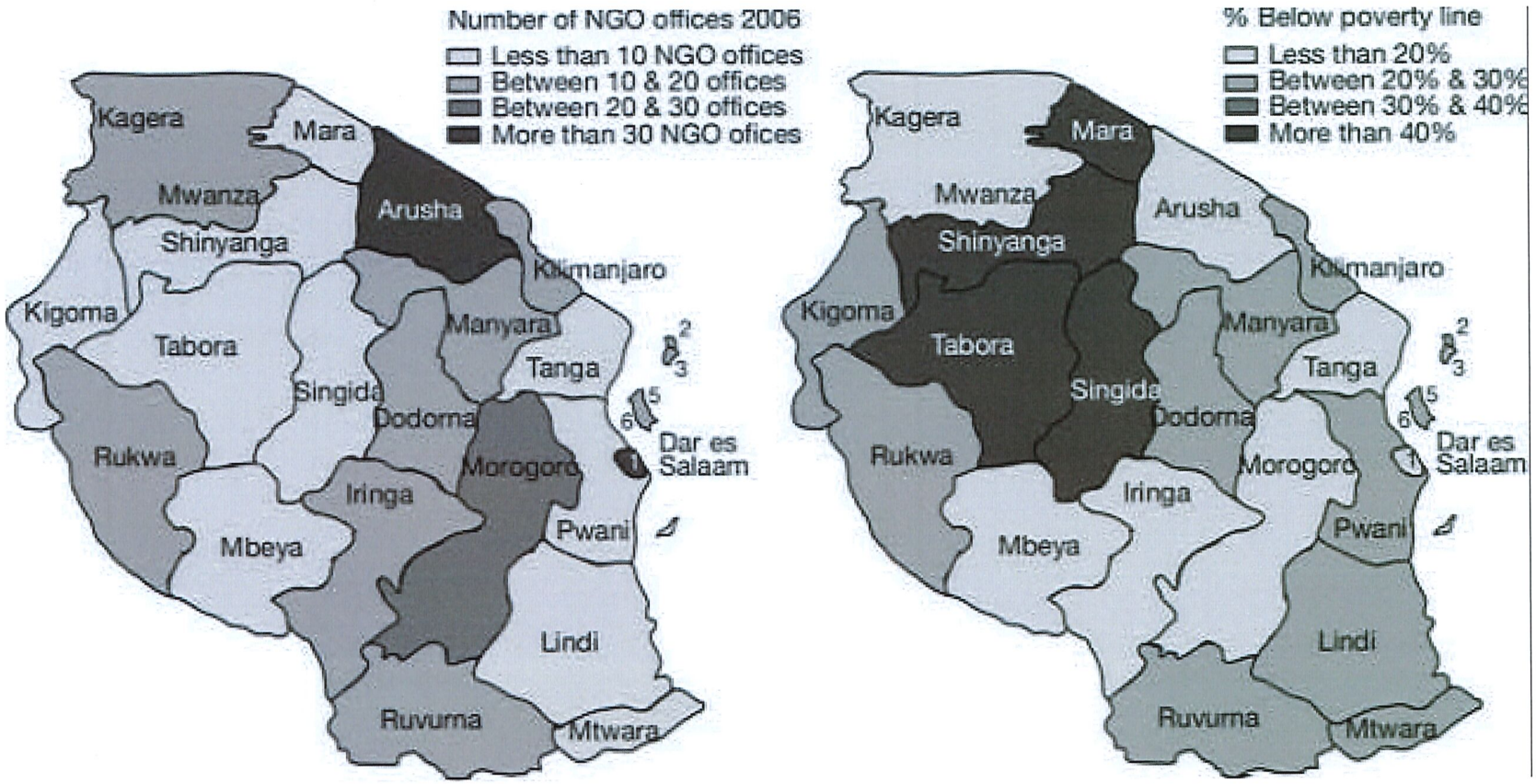

Fig. 2: Distribution of NGO offices and poverty rates in 2006, across Tanzanian regions

Source: Koch (2009), Figure A9.1

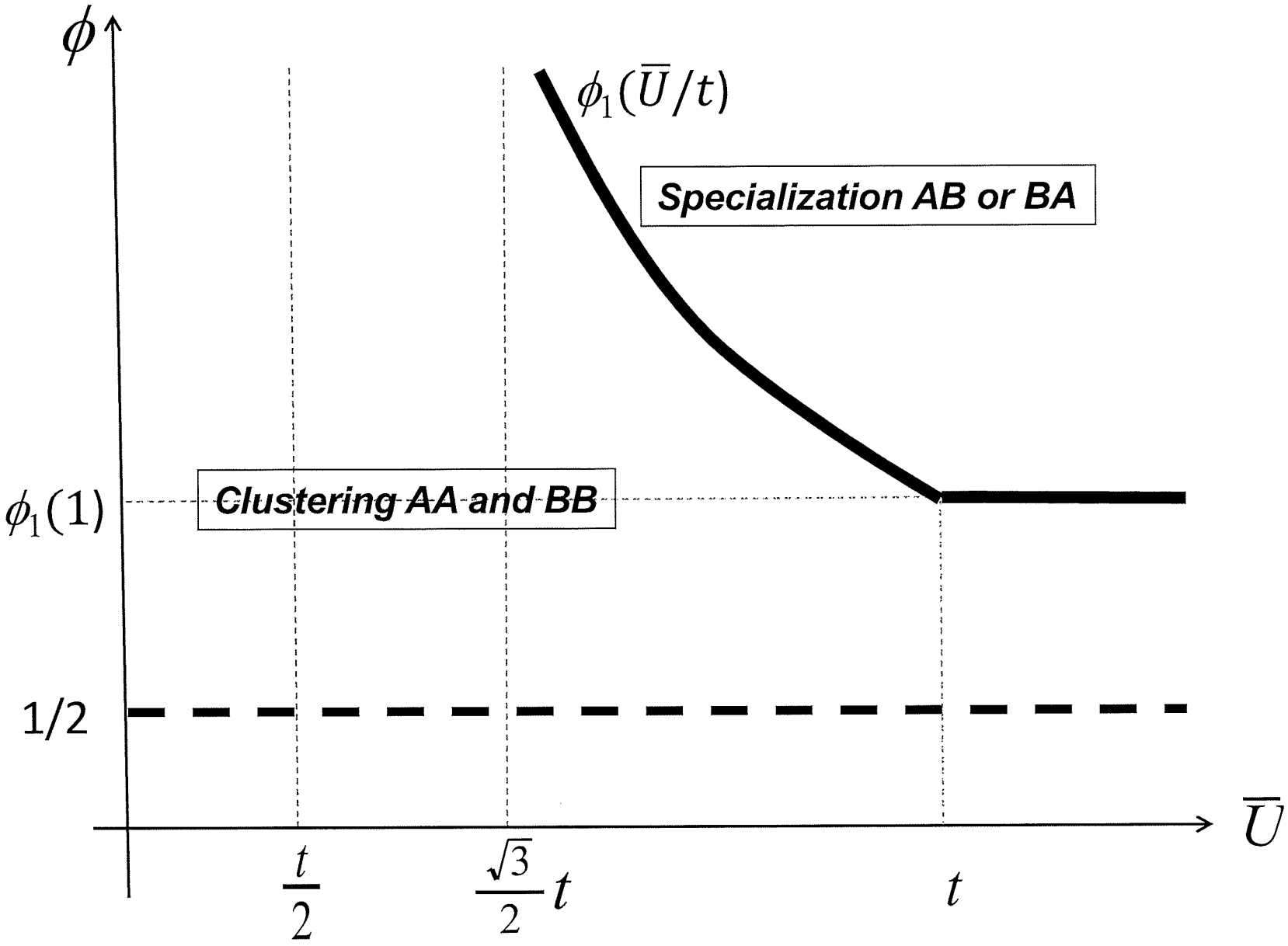

Fig. 3: Equilibrium Choice of Issues in the Baseline Model

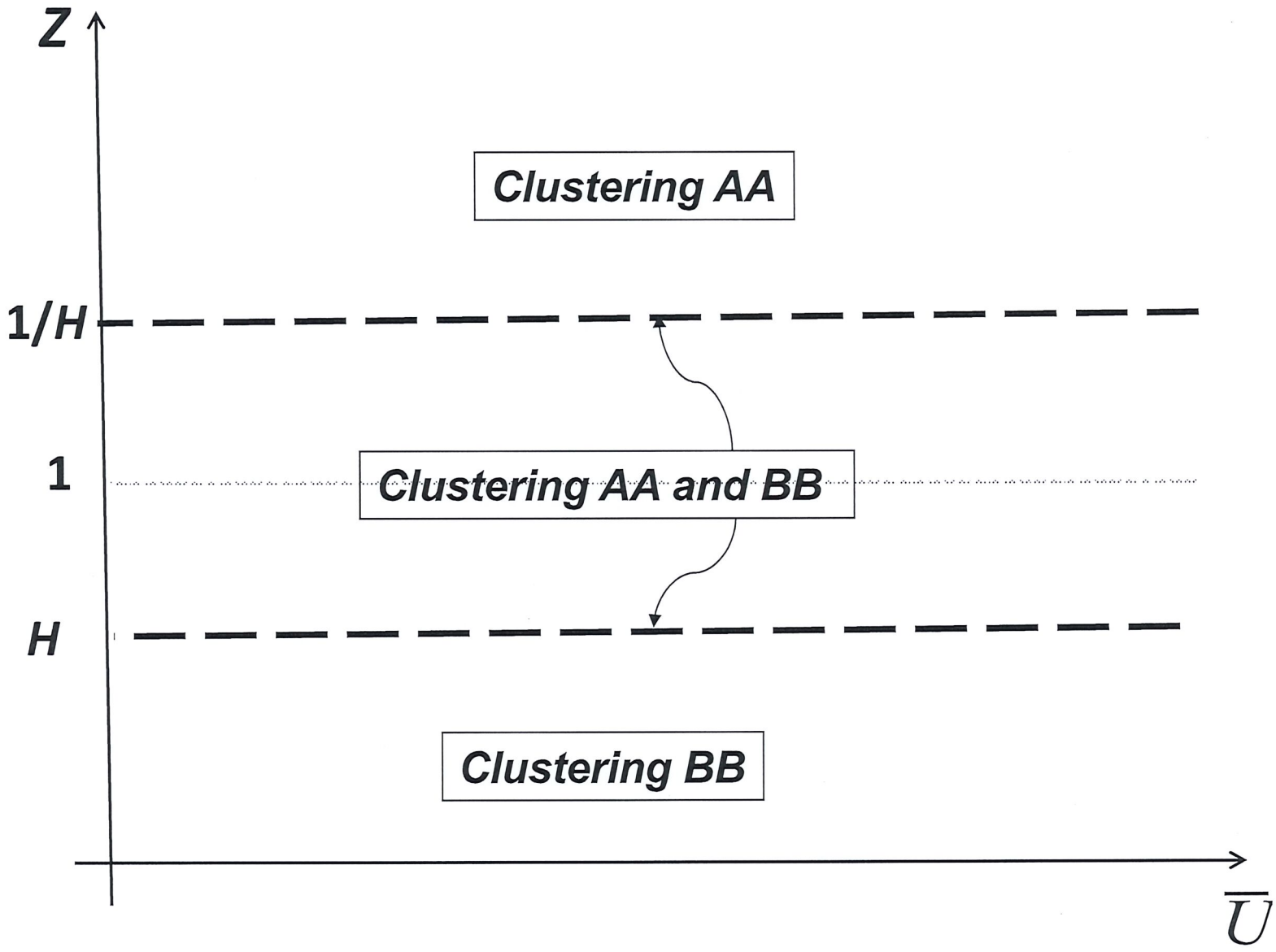

Fig. 4: Asymmetric Potential Markets (under H < 1)

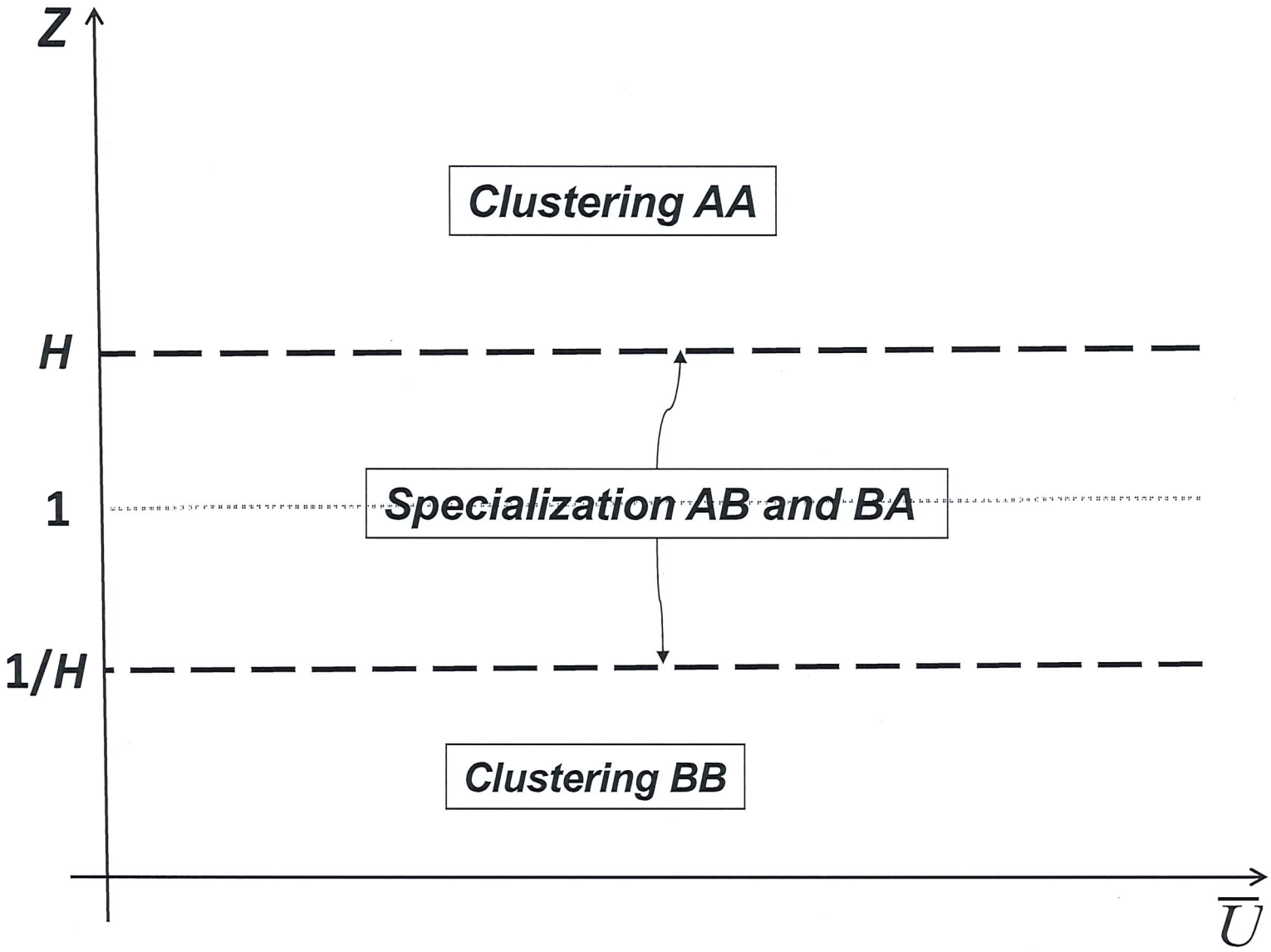

Fig. 5: Asymmetric Potential Markets: (under H > 1)

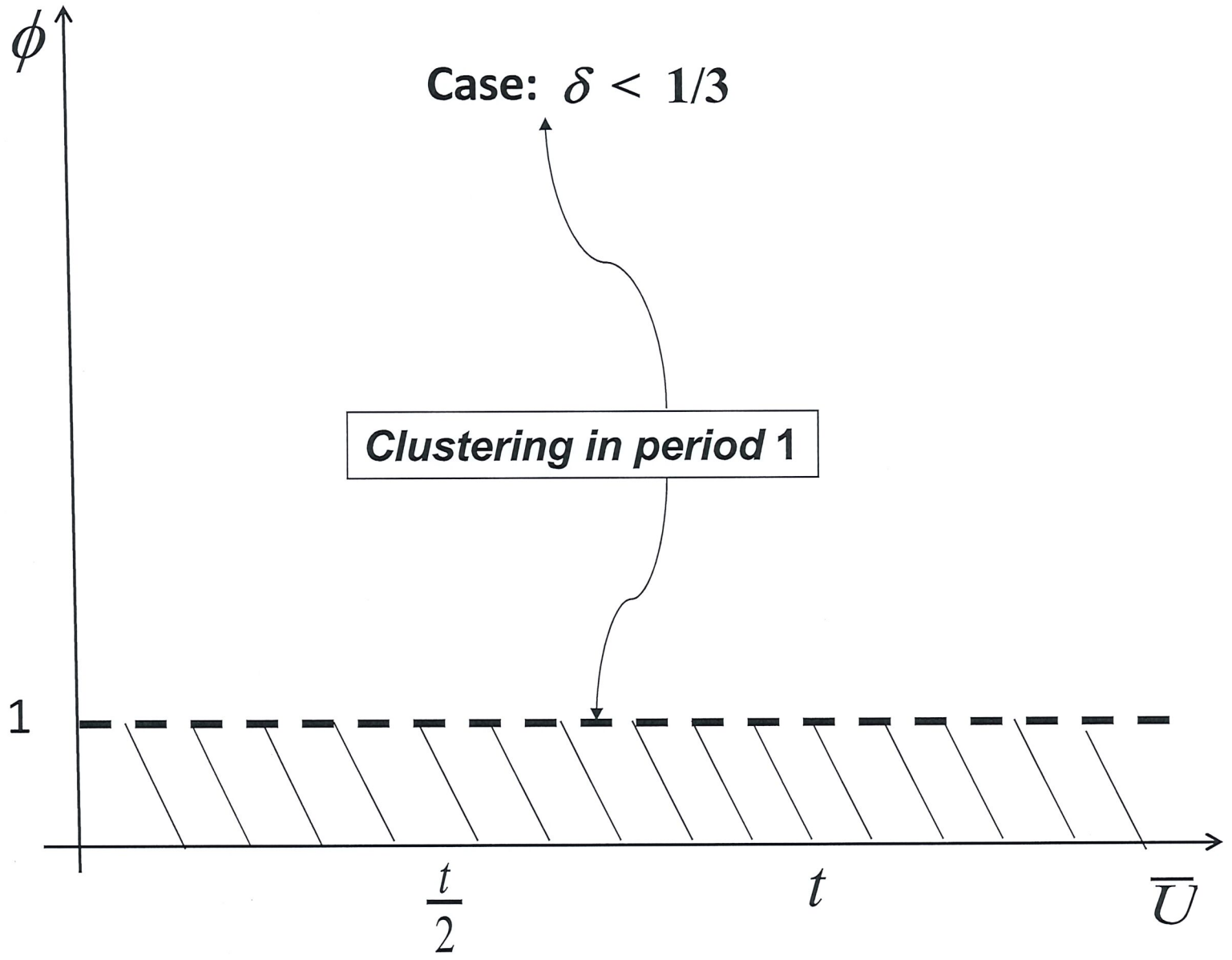

Fig. 6: Equilibrium Issue Choice with Endogenous Timing

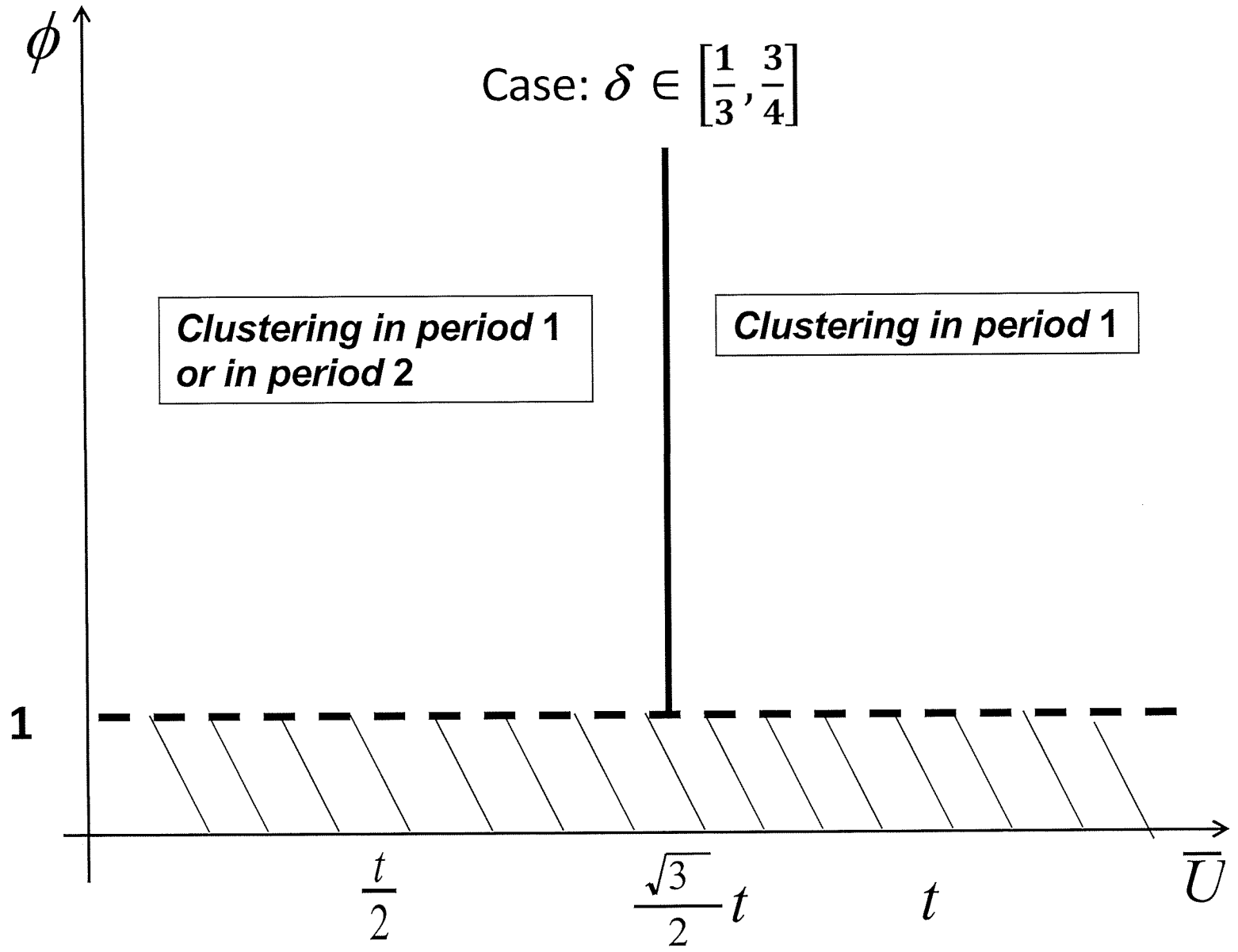

Fig. 7: Equilibrium Issue Choice with Endogenous Timing

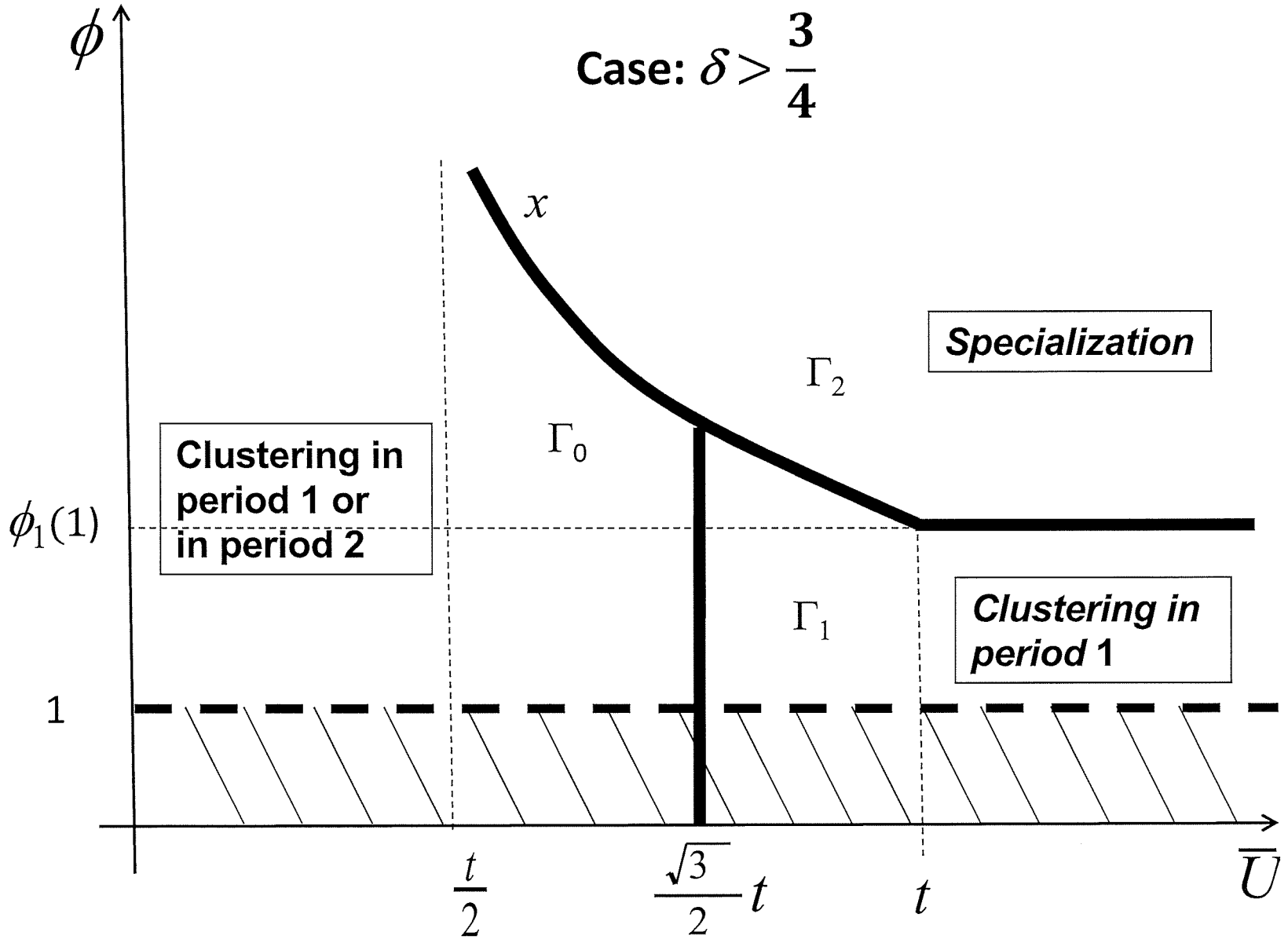

Fig. 8: Equilibrium Issue Choice with Endogenous Timing

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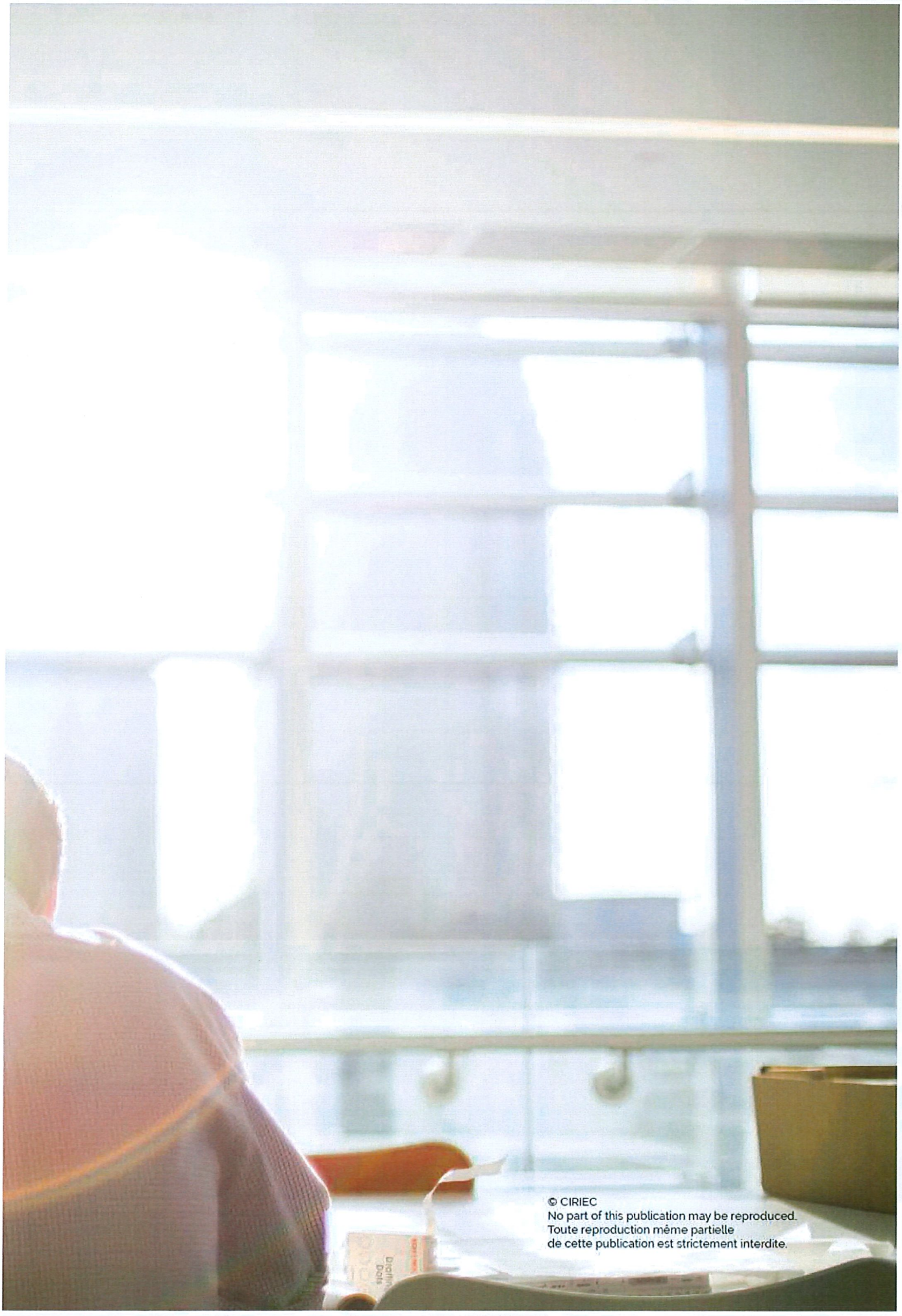

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