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Mandatory Disclosure of Managerial Contracts in Nonprofit Organizations*

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Abstract

Nonprofit organizations have been recently mandated to disclose the details of their executives' compensation packages. Contract information is now accessible not only to current and prospective donors, but also to rival nonprofit organizations competing for donations in the fundraising market. Our aim is to investigate the impact of publicly available contract information on fundraising competition of nonprofit organizations. We argue that, although such provision makes contract information available to multiple stakeholders and increases the transparency of the nonprofit sector, it also induces nonprofits to use managerial incentive contracts strategically. In particular, we find that the observability of incentive contracts relaxes existing fundraising competition. This is beneficial in terms of nonprofits' outputs, in particular when these organizations are trapped in a situation of excessive fundraising activities. However, we show that publicly available contract information distorts nonprofits' choice of projects, thus potentially inducing socially inefficient project clustering.

Keywords: *Nonprofit Organizations, Mandatory Contract Disclosure, Fundraising Competition, Strategic Incentive Contracts, Project Clustering, Project Specialization.*

JEL codes: L31, D64, F35, L13

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1 Introduction

Since the 1970s, the nonprofit sector has recorded a continuous growth worldwide, both in terms of number of units as well as of received donations. The *National Center for Charitable Statistics* (2016) reports for the U.S. 1,41 million of nonprofit organizations in 2013, with a 2.8 percent increase from 2003. For 2017, *Giving USA* (2018) indicates donations of \$410.02 billion, with a 5.2 percent increase from 2016. In Europe, yearly philanthropic contributions were estimated at about 87.5 billion Euro (ERNOP, 2017). Most of the received donations have been collected by large organizations. McCleary and Barro (2008) notice that from 1941 onward, nonprofit revenues have been collected mainly by a restricted pool of organizations. Similarly, Atkinson et al. (2012) confirm that over the last decades, 50% of all donations in the UK have reached only the four largest nonprofits of the country. Hence, it is fair to conclude that the market for fundraising can be characterized as a tight oligopoly.

In fact, in recent years competition for funds in the market for donations has become increasingly intense. Looking at data collected by *Kiva* micro-lending platform, Ly and Mason (2012) observe how competition has substantially increased the time that is needed by nonprofits to collect funds. Although the detrimental effect of fundraising competition is well-known among those who work for these organizations (see, for instance, Edwards and Hulme 1996, Ebrahim 2003, Murdie and Davis 2012), the few attempts to regulate and coordinate fundraising activities among nonprofits have, so far, encountered some difficulties (Prakash and Gugerty 2010, Aldashev, Marini, Verdier 2014, Similon 2015).

In this paper, we argue that publicly available information about managerial compensation contracts has a crucial influence on fundraising competition. Executive compensation in large nonprofits is comparable to their peers in the for-profit sector. In fact, a survey conducted on 286 U.S. charities reported a substantial increase in the bonuses paid by large nonprofits to top executives (*The Chronicle of Philanthropy*, 2006).¹ Since 2008, the U.S. regulation concerning the disclosure of executive payment in nonprofits has changed. Prior to 2008, nonprofits were not required to separately report incentive compensation (Balsam and Harris 2018). This has been modified since then, and nonprofits and charities now have to disclose the details of their executive compensation policies on Form 990 Schedule J. Such disclosure requirements of detailed compensation data of top management officials, e.g. the CEO or Executive Director, are mandated to increase transparency and inform donors and the public about a nonprofit's pay practice. Empirical evidence documents that transparency of funds and high bonus payments has an impact on donor behavior and profitability of a nonprofit. Balsam

¹More specifically, the average bonus paid to top executives increased from \$69,477 in 2005 to \$142,700 in 2006. Although the *Association of Fundraising Professionals* - as part of its professional code of ethics - prohibits members from tying their compensation directly to fundraising performance, these practices are nonetheless very common and contribution-based incentive plans actually proliferate in fundraising and related fields.

and Harris (2018) find that bonuses are common in nonprofits², that (future) donations and grants are negatively associated with bonus payments, but (future) profitability is positively related. Bonus pay is also positively related to competition the nonprofit faces. Likewise, Balsam and Harris (2014) show that donors reduce their payments as a response to the disclosure of high executive compensation. Following the recommendations of regulators and watchdog organizations, nonprofits have started to disclose IRS Form 990 on their corporate website. Blouin, Lee, Erickson (2018) find that such voluntary web disclosure is strongly correlated to donations (see also van der Heijden 2013) and the authors recommend it to well-performing nonprofits to document their comparative advantage with regard to competing nonprofits.

Clearly, the disclosed information about managerial compensation contracts is accessible not only to current and prospective donors, but also to other charities and nonprofits which compete for donations in the highly competitive fundraising market. Empirical evidence from the for-profit sector demonstrates that a strong correlation exists between the structure of managerial pay and the characteristics of the competitive market environment of the firm. For example, Bloomfield (2018) uses the introduction of enhanced requirements for public firms to disclose more details of executive pay – the Compensation Discussions and Analysis section of the proxy statement – to show that firms are using incentive pay strategically as a weapon against rival firms. These firms add revenue-based incentive components to their CEO compensation package to induce more aggressive behavior in the market if such a commitment to aggressive behavior is beneficial. Vrettos (2013) provides empirical evidence for the airline industry which shows that the use of relative performance measures in an executive’s compensation contract is associated with the type of strategic competition the firm faces. Kedia (2006) studies features of incentive contracts for 656 firms over the period 1984-1991 and finds that CEO performance incentives are associated with the type of product market competition (strategic substitutes or strategic complements). The evidence provided in these studies is in line with the literature on “strategic incentive contracts” (e.g. Fershtman and Judd 1987, and Kopel and Pezzino 2018 for a survey) which demonstrates that a firm that competes against rivals in a quantity-setting oligopoly market can increase its profit by introducing sales revenue into the managerial compensation contract. Intuitively, the sales component induces the manager to make more aggressive quantity decision to increase the focal firms market share while the competing firms’ optimal reaction is to curtail their own quantities and market shares. If product market competition is in prices, then to induce the manager to avoid aggressive price undercutting, the firm puts a negative weight on the sales component, i.e. punishes its manager for additional sales. In effect, firms use managerial compensation contracts to coordinate their behavior and to keep market prices close to the monopoly level.

²See also Baber, Daniel, and Roberts (2002) who find that charities reward executives for increasing resources allocated to the charitable objective.

It was recently observed that "*barring a few exceptions, the economics literature on nonprofits has placed little focus on the motivation of those who manage or work in those organizations*" (Ghatak, 2020, p.323). We want to add to this observation that this literature has so far neglected the effects of publicly disclosed managerial compensation contracts on the behavior and performance of nonprofits competing in the market for donations. Despite the evidence from the for-profit sector, a comparably high intensity of competition in the nonprofit sector, and similar remuneration policies in large nonprofits, the (empirical and analytical) literature has focused primarily on donor behavior but has not studied the impact of mandated disclosure of managerial contract information on rivalry behavior.

To initiate a discussion about the competitive effects of managerial contract information, we investigate how the mandatory disclosure of the details of nonprofits' executive compensation policies affects the outcomes in the market for fundraising activities. In particular, we address the following research questions. It has been shown that fundraising can be excessive (Rose-Ackerman, 1982; Aldashev, Marini and Verdier 2014, Thornton 2006). Does mandated public disclosure of managerial contract information enhance or diminish this trend? Can disclosure achieve fundraising coordination (Aldashev, Marini and Verdier, 2014) since nonprofits use the public information of managerial contracts to signal less aggressive fundraising efforts to rival nonprofits by inducing managers to spend more time on the projects? The market for fundraising charities is competitive (e.g. Krasteva and Yildirim 2016). How does the intensity of competition (e.g. measured by the similarity of nonprofit projects) interact with the managers' compensation contracts? Do founders or charity owners (or their boards) make their managers take a more or a less aggressive stance against rival nonprofits? We further know from empirical and anecdotal evidence that nonprofits tend to cluster, i.e. choose the same or similar projects for their activities and that these choices are excessive compared to the social optimum (Aldashev, Marini and Verdier 2020, Heyes and Martin 2015). If compensation information is made public, can we expect more or less clustering? If mandatory disclosure of nonprofit's managerial contract information increases competition in the fundraising market, we might expect less clustering since nonprofits would then try to escape competition by specializing in niche projects.

Our main findings are as follows. Under intense fundraising competition and highly targeted fundraising activities, mandatory disclosure of information about CEOs' compensation contracts is beneficial for nonprofits since these contracts can be used strategically *to curtail the excessive fundraising competition*. In turn, nonprofits' project outputs are higher and this has, taken in isolation, a positive impact on social welfare. However, we also highlight that mandated contract disclosure is ultimately *harmful in terms of social welfare* since under endogenous selection of projects, it distorts the nonprofits' choice of projects, leading to a more pronounced and socially inefficient project clustering.³ Furthermore, under

³Aldashev, Marini and Verdier (2020) have recently proposed alternative explanations to the observed inefficient clustering of nongovernmental organizations.

high fundraising spillovers, the interplay between intensity of fundraising competition and fundraising technology can reverse the positive effect of contract disclosure on nonprofits' outputs. The main intuition underlying our findings is that when contracts are disclosed they are used strategically by nonprofits as a *coordination device* to reduce costly fundraising activities. The lower amount of fundraising effort can be beneficial for output under very efficient (i.e. highly targeted) fundraising technology and closely related projects that would otherwise cause cut-throat competition among nonprofits. However, curtailing fundraising competition has, in turn, distortionary welfare-reducing effects on nonprofits' choice of projects. We also demonstrate that the mechanics of the above results is rather general and to a certain extent independent of the specific linear setting that we adopt. We also illustrate the influence of fundraising spillovers on nonprofits' performance and we briefly discuss an extension to more than two nonprofits.

There are a few recent contributions that are closely related to our paper. Paskalev and Yildirim (2017) raise the question why charities outsource fundraising despite the fact that commissions paid to professional solicitors frequently exceed half of the solicited donations. One explanation is that strategically and observably delegating the task of fundraising to a professional solicitor changes the donor's behavior through increasing warm-glow giving. Harris, Neely and Saxton (2019) find that charities with higher transparency and with better performance to report accrue higher future contributions. While these contributions point to a positive effect of disclosing private information, the economics and accounting literature on for-profit firms also points out that disclosed private information can be used by rival firms to the disadvantage of the disclosing party. The issue of disclosure of private information under oligopolistic competition has been studied extensively in this literature, but has not been addressed up to now in the literature of charities and nonprofits. Heyes and Oestreich (2017) model the interplay between an Environmental Protection Agency and an NGO and show that, as in a strategic delegation game, a donor may prefer to donate to an NGO with very different preferences from her own. In a related paper, Aldashev, Jaimovich and Verdier (2020) study the effect of transparency policies on the use of funds in nonprofits. They show that, on the one hand, more transparency encourages nonprofits to devote more resources to curbing rent-seeking inside organizations, which has also a positive impact on donors. On the other hand, because of the higher costs of monitoring, these policies can induce some nonprofits to abandon their missions, thus reducing their diversity, to the detriment of the donors.

Our paper is organized as follows. In Section 2, we present the model. In Section 3, we start with a benchmark scenario of no disclosure requirement where nonprofits keep the details of their managerial contracts secret. We then illustrate the consequences of mandated disclosure for nonprofits' fundraising and output equilibrium levels. In Section 4, we introduce the endogenous choice of projects by nonprofits and show how mandatory contract disclosure provides an incentive towards excessive project clustering of nonprofits, which is detrimental for welfare. Section 5 considers the influence of

fundraising spillovers, argues that the main mechanism identified for our simple linear model also holds in more general settings, and briefly discusses the extension to competition between more than two nonprofits. Section 6 concludes.

2 Model Setup

2.1 Nonprofit Organizations

Our model is based on Aldashev et al. (2014). We start with two nonprofits ($i = 1, 2$) that compete for funds in the market for donations.⁴ Each nonprofit is led by a warm-glow social entrepreneur who aims at maximizing the output of her philanthropic project,

$$Q_i = Q_i(F_i, \tau_i), \tag{1}$$

where $Q_i : F_i \times \tau_i \rightarrow \mathcal{R}_+$ expresses the output of each organization as a function of the collected funds F_i and the amount of time τ_i devoted to the project. Funds come from voluntary donations and, thus, depend positively upon the time spent on fundraising activities. Let $D_i(y_i, y_j)$ indicate the amount of donations raised by organization i through its fundraising effort y_i if the rival nonprofit $j \neq i$ selects effort y_j . If there is a *non-distribution constraint* in place for nonprofits, all received donations will entirely go to the nonprofit project and, hence⁵

$$F_i(y_i, y_j) = D_i(y_i, y_j). \tag{2}$$

Moreover, if each social entrepreneur allocates entirely its total amount of time T_i either to fundraising y_i or to working for the project, we have

$$\tau_i(y_i) = T_i - y_i. \tag{3}$$

Without loss of generality, let $T_i = 1$. Furthermore, to keep the model as simple as possible, let the output function (1) be of a simple Cobb-Douglas form. Then, from (1)-(3), we can simply write⁶

$$Q_i(y_i, y_j) = D_i(y_i, y_j) \cdot (1 - y_i). \tag{4}$$

⁴We show in Section 5 that the main results in our paper can be extended to a more general setting including $n > 2$ nonprofits.

⁵For simplicity, we abstract from overhead costs, although their inclusion would not change any of the results of our paper.

⁶As shown in Section 5, our results extend to a more general output function.

2.2 Donors

The demand side of the market is as follows. Assume a *continuum* of atomistic donors $h \in I$ of unitary mass endowed with a warm-glow utility that is increasing in a *numeraire* good x and in the total donations made to the two nonprofits. Formally,

$$U = U(x, d), \quad (5)$$

where $d = (d_1, d_2)$ and the budget constraint of each donor is

$$x + d_1 + d_2 \leq m,$$

where m denotes the available income. In order to model a direct channel through which nonprofits by their fundraising efforts can affect donors' willingness-to-give to different projects, let the utility function in (5) be linear-quadratic and of the form (see Singh and Vives 1984 and similarly Aldashev et al. 2014)

$$U(x, d) = x + \sum_{i=1}^2 \omega_i(y_i, y_j) d_i - \frac{1}{2} \sum_{i=1}^2 d_i^2 - b \sum_{j \neq i} d_i d_j \quad (6)$$

where $b \in [0, 1)$ measures the substitutability between the projects of the two nonprofits. If $b = 0$, projects are independent and for increasing b , projects are increasingly similar. Each donor's willingness-to-give $\omega_i(y_i, y_j)$ is affected by the fundraising efforts exerted by a nonprofit as⁷

$$\omega_i(y_i, y_j) = w + y_i. \quad (7)$$

Here w denotes a *baseline willingness-to-give* to nonprofit i where we assume that $1 < w < 2$ to rule out zero donations (which occurs for $w \leq 1$) and no fundraising efforts by nonprofits (which occurs for $w \geq 2$).

The first-order conditions for the constrained utility maximization problem of every representative donor with regard to donations d , yields the total amount of donations directly received by every nonprofit $i = 1, 2$ as

$$D_i(y_i, y_j) = \int_{h \in I} (d_i) \, dh \equiv \frac{w-1}{1+b} + \frac{1}{1-b^2} y_i - \frac{b}{1-b^2} y_j, \quad (8)$$

and its output as

$$Q_i(y_i, y_j) = D_i(y_i, y_j) (1 - y_i) \equiv \left(\frac{w-1}{1+b} + \frac{1}{1-b^2} y_i - \frac{b}{1-b^2} y_j \right) \cdot (1 - y_i). \quad (9)$$

⁷We write the willingness-to-give as a function of *both* nonprofits' fundraising efforts to indicate that under the assumption of fundraising spillovers σ , we have $\omega_i(y_i, y_j) = w + y_i + \sigma y_j$ with $\sigma \in [0, 1]$. For simplicity, in this section we abstract from spillovers ($\sigma = 0$) and relegate the discussion of its influence to Section 5.

It can be noticed that a higher fundraising effort exerts a *negative* effect on the rival's output and that this negative effect increases with the intensity of competition between projects (expressed by a higher b),

$$\frac{\partial Q_i}{\partial y_j} = -\frac{b}{1-b^2}(1-y_i).$$

In addition, since

$$\frac{\partial^2 Q_i}{\partial y_i \partial y_j} = \frac{b}{1-b^2} > 0$$

for $b \in [0, 1)$, the nonprofits' fundraising efforts are *strategic complements*. Hence, if a nonprofit increases its fundraising effort, there is an incentive for the rival to boost its fundraising effort in response in order to avoid being surpassed in the competition for donations. This basic mechanism is somehow at the heart of the model results: disclosure turns out to be output-enhancing and nonprofits use *mandatory contract disclosure* as a *coordination device* in order to curtail the existing and harmful fundraising competition.⁸

2.3 Managers' Contracts in Nonprofit Organizations

When a nonprofit determines its fundraising activity y_i (and, implicitly, the time τ_i spent for the project), the aim is to maximize project output Q_i . However, at the noncooperative equilibrium the negative effects of fundraising cannot be internalized. Mandatory disclosure of executives' compensation contracts provides an opportunity for the nonprofits to use such contracts strategically. Assuming here a standard linear contract⁹, the nonprofit compensates its manager on the basis of output Q_i and collected donations D_i .¹⁰ Hence, following the strategic incentives approach for for-profit firms pioneered by, e.g., Fershtman and Judd (1987), nonprofit manager i 's compensation is equal to

$$U_i^m = A_i + B_i[\delta_i Q_i + (1 - \delta_i) D_i], \tag{10}$$

where the fixed wage is denoted by A_i and $B_i \geq 0$ is the weight which is put on the manager's variable compensation component, $\delta_i Q_i + (1 - \delta_i) D_i$. The incentive parameter δ_i is chosen by each nonprofit to maximize output while A_i and B_i are chosen to fulfill the manager's reservation constraint $U_i \geq \underline{U}$ (the reservation utility \underline{U} is obtained if the manager accepts a job outside the organization). For simplicity (but w.l.o.g.), we set $\underline{U} = 0$. Note that if $\delta_i = 1$, the manager is induced by the contract to maximize the nonprofit's output whereas for $\delta_i = 0$ the manager maximizes donations. Consequently, the manager's

⁸In case of high fundraising spillovers, mandatory contract disclosure can cause NPOs to spend *too little* effort on fundraising which causes a reduction of output in equilibrium. See Section 5 for more details.

⁹The use of linear contract is standard in the literature and in corporate practice. Linear contracts are easy to administer and easy to understand. They avoid "gaming effects" and provide uniform incentives to managers.

¹⁰The rationale for using observable and verifiable indicators is that it may be difficult to base compensation schemes on fundraising effort. However, it is easy to show that the model results remain the same if the contract is based on output and fundraising effort.

incentive for performance stems uniquely from δ_i . A manager accepts the contract if the participation constraint is fulfilled and selects the fundraising effort to maximize compensation U_i^m .

The timing of the game is as follows. At the first stage, nonprofits 1 and 2 simultaneously and non-cooperatively choose a value for δ_1 and δ_2 that maximizes their project outputs Q_1 and Q_2 . If contract disclosure is mandated and information about compensation contracts is publicly observable, these choices will be revealed to the rival firm before the second stage. At the second stage, each manager decides the level of fundraising effort y_i (and, thus, the time spent for the project) to maximize compensation U_i^m given the chosen value of δ_i . Finally, the donors provide funds in favor of the projects proposed by the two nonprofits and the output of each nonprofit is produced.

3 The Effect of Executive Contract Disclosure

The main economic effect of mandating disclosure of contract information can be analyzed by contrasting two alternative scenarios. In the benchmark scenario of pre-2008, disclosure is not mandated and contract information is kept private. We label this scenario by N (for no disclosure). In contrast, if disclosure of managerial contracts is mandated for all firms, contract information is publicly available and nonprofits use contracts strategically. In this case, each nonprofit induces its manager to deviate from output maximization to influence the behavior of the other nonprofit organization. We label this as case D (for disclosure by all nonprofits).

3.1 The Benchmark of No Contract Disclosure

If contract disclosure is not mandated and nonprofits keep contract information secret, then there is no reason for a nonprofit to manipulate its manager's contract in order to influence rival behavior (as this manipulation is not observable by the rival). Katz (1991) argues that an unobservable incentive contract has no strategic effects when residual claimant contracts are feasible, the parties are risk-neutral and have the same disutility of effort, and are symmetrically informed at the time of contracting. In case of agent moral hazard, residual claimancy solves the issue. It is easy to see that these conditions are fulfilled in our setting, so that unobservable manager contracts in nonprofit competition lose their strategic value. In the same vein, Bagwell (1995) studies how much commitment value is lost if the first move of a rival is only imperfectly observed. He shows that a first-mover advantage is eliminated if there is even a *slight amount* of uncertainty about the first mover's decision. Again, full and perfect observability is key for commitment to work. The consequence for our setting is that nonprofits will set $\delta_i = 1$ since a distortion from output maximization is only valuable if it changes the behavior of the rival nonprofit. As a result, managers will just select their fundraising efforts to maximize the nonprofit's

output therefore yielding an equilibrium effort for both nonprofits equal to

$$y^N = 1 - \frac{w(1-b)}{2-b} \quad (11)$$

with project output

$$Q^N = \frac{w^2(1-b)}{(1+b)(2-b)^2}. \quad (12)$$

Note that $\partial y^N / \partial b > 0$ and $\partial Q^N / \partial b < 0$. Hence, when the two nonprofit projects are closer substitutes (higher b), the equilibrium fundraising effort rises whereas output suffers a reduction since time spent on fundraising is lost for working on the project.

3.2 Mandatory Contract Disclosure

When the managers' contracts are publicly disclosed, the nonprofits have an interest to strategically manipulate their executives' contracts anticipating that each of the rival managers will set the fundraising effort to maximize the personal payoff U_i^m . This yields the following best-reply function of a manager working for nonprofit $i = 1, 2$

$$y_i(y_j) = R_i^D(y_j) = \frac{1}{2\delta_i} + \frac{(1-b)(1-w) + by_j}{2}. \quad (13)$$

The best-reply (13) depends on b and on the baseline donors' willingness to give toward the project w . Its intercept is decreasing in δ_i and it is independent of δ_j . Solving the managers' first order conditions yields the fundraising effort levels of nonprofit $i = 1, 2$,

$$y_i = \frac{\delta_i(b + \delta_j(2 - b - b^2)(1 - w)) + 2\delta_j}{\delta_1\delta_2(4 - b^2)}.$$

Plugging these expressions into nonprofit outputs (9) and solving the first order conditions for (δ_i, δ_j) yields, for every $i = 1, 2$,

$$\delta_i^D = 1 + \frac{(1-b)b^2w}{4 - b(b+2) - b^2w(1-b)}. \quad (14)$$

Since the second term on the RHS of (14) is always nonnegative, it follows that $\delta_i^D > 1$ regardless of the values of $b \in [0, 1)$ and $w > 0$. Therefore, in equilibrium each nonprofit offers its manager a contract with a *positive incentive weight* on output but a *negative incentive weight* on donations. In other words, managers are punished for spending time on fundraising. Note that if projects are independent ($b = 0$), managers are induced to maximize output, i.e. $\delta_i^D = 1$. Consequently, if the managers' contracts cannot be used as a device to influence the behavior of the rival nonprofit since the rival nonprofit acts in a different market segment, there is no reason to distort a manager's incentive away from output maximization.

Given the equilibrium bonus rate (14), the fundraising effort and output of every nonprofit are obtained as,

$$y^D = y^N - \frac{(1-b)b^2w}{8(1-b)+b^3} \quad (15)$$

$$Q^D = Q^N + \frac{b^3w^2(1-b)(4-3b)}{(b+1)(8(1-b)+b^3)^2}. \quad (16)$$

Since the second terms on the RHS of both (15) and (16) are nonnegative, we can easily conclude that $y^{DD} < y^{NN}$ and $Q^{DD} > Q^{NN}$. Thus, each nonprofit manipulates the manager's contract strategically to reduce fundraising activity and this results in an increase in project outputs. Each nonprofit provides its manager with a *positive bonus* δ_i^D for each unit of project output and a *negative punishment*, $1 - \delta_i^D = -[(1-b)b^2w] / [4 - b(b+2) - b^2w(1-b)]$, for each unit of collected donations.

A straightforward comparative statics shows that $\partial y^D / \partial b > 0$, i.e. the fundraising effort chosen by an executive is higher the closer the nonprofits' projects. For $b = 0$, we have $y^N = y^D$. The difference $y^N - y^D$ between the fundraising efforts increases in the "closeness" b of the nonprofits' projects until it reaches a maximum at $b \approx 0.816$ and then decreases and converges towards zero if b gets closer to 1. The resulting equilibrium outputs decrease for increasing proximity of the proposed projects expressed by b . The maximum output advantage measured by $Q^D - Q^N$ occurs for $b \approx 0.866$, i.e. when the projects are perceived as rather close substitutes by the donors.¹¹

Thus, a first conclusion that can be drawn here is that, when disclosure of managerial contract information is mandated, nonprofits use observable managerial incentive contracts strategically as a *coordination device*. As a result, fundraising activity is moderated and yields an increase in individual and total project output. The advantage is particularly pronounced when projects are sufficiently close substitutes (b sufficiently high, but not too high). Hence, coordination is particularly beneficial for output when fundraising competition is *particularly intense* and fundraising activity excessively high. Therefore, under high competition in the donation market, nonprofits can benefit from the strategic use of executives' contracts that are mandated to be publicly revealed to rivals.¹²

We summarize our major findings in the next proposition.

Proposition 1 *Absent fundraising spillovers, the mandatory disclosure of executive contracts exerts a beneficial effect on nonprofits by moderating their fundraising effort and increasing their project output*

¹¹In Section 5, it is shown that when the fundraising spillovers are sufficiently high, the positive effect of mandatory disclosure on output can be overturned, so that $Q^D < Q^N$. The *rationale* underlying this result is that when spillovers are high and fundraising campaigns produce an informative and "awakening" effect on donors, they give rise to a positive externality for the whole donation market. The free-riding of rival firms on the fundraising effort of a nonprofit leads to curtailed efforts of the whole nonprofit industry.

¹²This result continues to hold under sufficiently low fundraising spillovers; see Section 5. In contrast, when spillovers are large, contract disclosure and the strategic use of managers' contracts can be detrimental for nonprofits' outputs.

compared to the benchmark case where contract information is kept private. Hence, we have $y^D < y^N$ and $Q^D > Q^N$.

These results are illustrated graphically below. Notice that in Figure 1, contract disclosure has the effect to move both nonprofits' upward-sloping best-replies (13) inwards (i.e. R_1^N to R_1^D and R_2^N to R_2^D), causing the fundraising equilibrium efforts of both nonprofits to decrease (compare points D and N). Since fundraising activities exert a negative externality on nonprofits' outputs and, hence, higher outputs are represented by iso-output contours which are closer to the origin, the output reached in D is higher for both nonprofits than in N .

[Insert Figure 1 about here]

In the Appendix, we demonstrate that the increase in output generated by the mandated disclosure of executives' contracts is beneficial in terms of social welfare. Hence, our findings in this section demonstrate that if the nonprofits compete for funds for the same project, then mandating contract disclosure of managerial compensation can in fact reduce fundraising competition, lead to higher output, and in turn lead to an increase in welfare.

4 Choice of Projects

We have illustrated the effects of mandating contract disclosure if firms compete for funds *for similar and given types of the project*. However, nonprofits commonly can choose the type of project they want to pursue. We now continue our analysis from above by exploring the effect of contract disclosure if the choice of project type made by every nonprofit is endogenized. As in Aldashev, Marini and Verdier (2020), we can simply assume that nonprofits have to decide between two types of projects $k = A, B$. These types are meant to capture the differentiation of nonprofit projects along various dimensions, either in terms of the sector of intervention (i.e. education/poverty alleviation), geographic (i.e. projects in the same/different countries or regions within a country), or in the technology used (relying more/less on local inputs and staff). We want to analyze if the requirement of contract disclosure induces the nonprofits to a more or less efficient choice of project types.

To make the analysis as simple as possible, let us assume that if both nonprofits select the same type of project, namely AA or BB , the donors perceive giving to the two nonprofits' projects as *imperfect substitutes* and the parameter b , which captures the degree of substitutability of giving to the two nonprofits, takes a value $b \in (0, 1)$. Contrarily, if each nonprofit selects a project of a different type (i.e. AB or BA), the donors perceive them as *independent* and the two nonprofits operate as if they

were each in a monopolistic donation market (with $b = 0$). This assumption is intentionally extreme, but assuming intermediate levels of b when nonprofits select different project types would not alter the substance of our analysis. In addition, let us assume that every project type $k = A, B$ has a different baseline willingness-to-give w_k , where, as assumed in the previous sections, $1 < w_k < 2$.

In our extended game, the sequence of decisions is as follows. At stage 1, each nonprofit (simultaneously and non-cooperatively) chooses its type of project, A or B to maximize output. The remaining stages are like in the previous section. At stage 2, nonprofits design the managers' contracts strategically under mandatory contract disclosure. At stage 3, managers determine their fundraising effort levels to maximize their compensation. Finally, donors make their donations, nonprofits collect them and the selected projects are carried out.¹³

4.1 Choice of Projects Under the Benchmark of No Disclosure

Consider stage 1, in which every nonprofit decides on the type of projects, A or B . Each nonprofit compares the output obtained when the two nonprofits choose the same type of project (*project clustering* AA or BB) with the output obtained when the two nonprofits choose different project types (*project specialization* AB or BA). Under project clustering, the projects are perceived as imperfect substitutes and the output is as in (12),

$$Q_{kk}^N = \frac{w_k^2(1-b)}{(1+b)(2-b)^2}, \quad (17)$$

where $k = A$ or B . Under project specialization in which nonprofit 1 selects project type A and nonprofit 2 selects project type B (or vice versa), the projects are perceived as distinct and with $b = 0$ we get

$$Q_{kl}^N = \frac{w_k^2}{4} \quad (18)$$

where $k, l = A$ or B and $k \neq l$. Note that since in the latter case the two nonprofits are engaged in different project types, they act like monopolists on these projects. The nonprofits' choice of project types at stage 1 can be represented by the following normal form game:

1/2	A	B
A	Q_{AA}^N, Q_{AA}^N	Q_{AB}^N, Q_{BA}^N
B	Q_{BA}^N, Q_{AB}^N	Q_{BB}^N, Q_{BB}^N

Nonprofits' Choice of Project Types

¹³We purposely assume that the choice of project types always remains in the hands of nonprofits and is never delegated to managers. This is in line with what is usually observed in practice, where the decisions concerning their core mission remain appanage of the owners.

To determine the best-response of each nonprofit, consider without loss of generality nonprofit 1. Suppose its rival nonprofit 2 has chosen the project of type A . In this case, by (17)-(18), nonprofit 1's choice of project type reduces to the comparison

$$\frac{2(1-b)}{\underbrace{(2-b)(1-b^2)^{\frac{1}{2}}}_{X^N(b)}} w_A \gtrless w_B.$$

Similarly, suppose nonprofit 2 has chosen the project of type B . Then, nonprofit 1 compares

$$\frac{2(1-b)}{\underbrace{(2-b)(1-b^2)^{\frac{1}{2}}}_{X^N(b)}} w_B \gtrless w_A. \quad (19)$$

Consequently, for the benchmark case of no disclosure of contract information we have the following choices of project types in equilibrium (see also Aldashev, Marini, Verdier, 2017).

Proposition 2 *Let $X^N(b) = 2(1-b)/((2-b)(1-b^2)^{\frac{1}{2}})$. Then, we have the following result.*

(i) *AA is the unique Nash equilibrium in the choice of project types if*

$$X^N(b)w_A > w_B \quad (20)$$

(ii) *BB is the unique Nash equilibrium if*

$$X^N(b)w_B > w_A \quad (21)$$

(iii) *AB and BA are Nash equilibria in pure strategies in the choice of project types if¹⁴*

$$X^N(b)w_A \leq w_B \quad \text{and} \quad X^N(b)w_B \leq w_A.$$

[Insert Figure 2 about here]

Figure 2 illustrates the basic mechanism underlying the results of Proposition 2 where the lines $X^N(b)w_A = w_B$ and $X^N(b)w_B = w_A$ are denoted by (AA^N) and (BB^N) respectively. When the donors' willingness-to-give to the two different project types, w_A and w_B , are *extremely polarized*, either in favor of project type A or project type B , the two nonprofits prefer to cluster their projects (either in AA or in BB respectively). Clustering raises the level of fundraising activity, regardless of the intensity of the competitive pressure b . In contrast, when the donors' willingness-to-give to the two project types are *not too different* (which occurs in the region around the 45° line), the two nonprofits will be inclined to select different project types in equilibrium to escape the intensity of fundraising competition, the more so the higher is the level of b .

¹⁴Case (iii) includes also a mixed-strategy equilibrium.

4.2 Choice of Project Types under Mandatory Contract Disclosure

Our analysis on mandatory contract disclosure and the associated strategic use of managerial compensation contracts raises the question if contract disclosure provides an *incentive* or a *disincentive* for nonprofits to cluster in the same project type. Using a standard backward induction procedure, we assume that when both nonprofits decide on the type of project ($k = A, B$) they anticipate that they can use their executive's contract (10) strategically and in turn can affect the intensity of fundraising activity.

Hence, under project clustering, analogously to the case of (14), the nonprofits choose

$$\delta_{kk}^D = 1 + \frac{(1-b)b^2w_k}{4-b(2-b)-b^2w_k(1-b)}, \quad (22)$$

for $k = A, B$. Thus, following (15) the fundraising effort of every nonprofit will be

$$y_{kk}^D = 1 - \frac{2w_k(1-b)}{4-b(b+2)},$$

with corresponding output (see (16))

$$Q_{kk}^D = \frac{2(2-b^2)(1-b)w_k^2}{(b+1)(4-b(b+2))^2}. \quad (23)$$

Under project specialization (AB or BA), the nonprofits work on completely different project types and $b = 0$. Obviously, as each nonprofit does not face a rival, it does not make any sense to strategically distort a manager's incentive away from output maximization. Therefore, $\delta_{kl}^D = 1$ for $k, l = A, B$ and $k \neq l$, as can be directly deduced from (22). Therefore, the fundraising effort exerted in equilibrium by every nonprofit is

$$y_{kl}^D = 1 - \frac{w_k}{2}, \quad (24)$$

and the associated outputs are

$$Q_{kl}^D = \frac{w_k^2}{4}. \quad (25)$$

To determine the (subgame-perfect) Nash equilibrium choice of project types of every nonprofit, consider again nonprofit 1. Suppose its rival has selected a type- A project. In this case, re-arranging expressions (23)-(25), nonprofit 1's choice at the type selection stage reduces to the comparison

$$\underbrace{\frac{2^{\frac{3}{2}}(2-b^2)^{\frac{1}{2}}(1-b^2)^{\frac{1}{2}}}{(b+1)[4-b(b+2)]}}_{X^D(b)} w_A \gtrless w_B.$$

A similar result with the roles of w_A and w_B swapped can be obtained for a type- B project. Our next Proposition summarizes the equilibrium choice of project types.

Proposition 3 Define $X^D(b) = 2^{\frac{3}{2}}(2 - b^2)^{\frac{1}{2}}(1 - b^2)^{\frac{1}{2}} / ((b + 1)(4 - b(b + 2)))$. Then, under mandatory contract disclosure, we have the following results.

(i) *AA is the unique Nash equilibrium choice of project types if*

$$X^D(b)w_A > w_B. \tag{26}$$

(ii) *BB is the unique Nash equilibrium choice of project types if*

$$X^D(b)w_B > w_A. \tag{27}$$

(iii) *AB and BA are Nash equilibrium choices of project types in pure strategies if*

$$X^D(b)w_A \leq w_B \quad \text{and} \quad X^D(b)w_B \leq w_A.$$

Note that $X^D(b) > X^N(b)$ for any value of $b \in (0, 1)$. As a consequence, the *specialization area* in the admissible region $(w_A, w_B) \in (1, 2) \times (1, 2)$ shrinks compared to the case of no contract disclosure, whereas the *project clustering area* widens. This is depicted in Figure 3, where the dashed lines labeled (AA^D) and (BB^D) represent the boundaries between the regions of project specialization and project clustering under mandatory contract disclosure. The dashed lines are closer to the 45°-line than the bold lines (AA^N) and (BB^N) obtained for the benchmark case of no disclosure, indicating that the area of project specialization shrinks. A simple comparison of the results of Proposition 2 and 3 leads to our next Proposition.

Proposition 4 *Project clustering (AA or BB) is more likely to occur under contract disclosure (D) than under no disclosure (N), thus implying that project specialization (AB or BA) is less likely to occur under contract disclosure than under no disclosure.*

The proof of this Proposition follows directly from checking that $X^D(b) - X^N(b) \geq 0$ for any $b \in [0, 1)$, with the equality holding only for $b = 0$.

[Insert Figure 3 about here]

Intuitively, the finding illustrated by Figure 3 simply reflects the influence of mandatory disclosure of compensation contracts that are used strategically to alter the decisions of the rival nonprofit on the choice of project types. As we have shown in the previous section, the disclosure of contract relaxes

the negative impact of fundraising competition. Consequently, *ceteris paribus*, it makes the trade-off between project specialization and project clustering more favorable to *project clustering*. In the figure, this effect is captured as an inward move of the lines AA and BB (from the bold lines AA^N and BB^N under no disclosure to the dashed lines AA^D and BB^D under disclosure), therefore restricting the region of project specialization.

In the next section, we study how this distortion on the choice of projects caused by the contract disclosure influences social welfare. As has already been shown in Aldashev, Marini and Verdier (2017 and 2020), in comparison to the welfare-maximizing choice of projects made by a social planner, the choice of projects made by nonprofits at the Nash equilibrium is, not surprisingly, *suboptimal*. More precisely, it is characterized by *excessive clustering* if compared to the welfare-maximizing choice of project types. This raises the question if mandated contract disclosure worsens or improves the situation.

4.3 Welfare Analysis

The notion of social welfare adopted here is the sum of donors' and nonprofits' outputs:

$$SW = \int_{h \in I} U_i \, dh + Q_1(y_1, y_2) + Q_2(y_1, y_2),$$

where the utility of donors is taken at their initial levels, i.e. before the fundraising efforts of nonprofits have altered the donors' willingness-to-give.¹⁵ In our analysis we have to consider three alternative scenarios which refer to the three possible choices of project types made by the nonprofits at stage 1: (i) *Project specialization* (AB or BA); (ii) *Project clustering in A* (AA); or (iii) *Project clustering in B* (BB).

Consider first case (i) of *project specialization* and suppose that, without loss of generality, nonprofit 1's project is of type A and nonprofit 2's project is of type B .¹⁶ The social welfare is, in this case,

$$SW^{AB} = \left[m + (w_A - 1)D_1(y_1) + (w_B - 1)D_2(y_2) - \frac{1}{2}(D_1(y_1))^2 - \frac{1}{2}(D_2(y_2))^2 \right] + [D_1(y_1)(1 - y_1) + D_2(y_2)(1 - y_2)].$$

where D_1, D_2 are the donations collected by the two nonprofits. Thus, using the fact that under *project specialization*

$$D_1^{AB}(y_1) = w_A - 1 + y_1 \quad \text{and} \quad D_2^{AB}(y_2) = w_B - 1 + y_2,$$

we obtain the following first-order condition for the welfare-maximizing fundraising effort of, e.g., nonprofit 1:

$$\frac{\partial SW^{AB}}{\partial y_1} = -y_1 + (1 - y_1) - (w_A - 1 + y_1) = 0.$$

¹⁵It can be shown that evaluating the donors' utility *ex post* (i.e. taking into account the effect of fundraising on the equilibrium willingness-to-give) would reinforce the conclusions reached here.

¹⁶Recall that in this case $b = 0$, so that the interaction terms in the donors' utility function vanish.

The resulting socially optimal level of fundraising is

$$y_1^{AB^\circ} = \frac{2 - w_A}{3}.$$

Similarly, for project B operated by nonprofit 2 we get

$$y_2^{AB^\circ} = \frac{2 - w_B}{3}.$$

The corresponding optimal value of social welfare under project specialization scenario (AB) (and also (BA)) is

$$SW_{AB}^\circ = m + \frac{2(w_A^2 + w_B^2) - 2(w_A + w_B) + 1}{3}. \quad (28)$$

It is easy to see that in the noncooperative equilibrium where nonprofits choose their fundraising efforts to maximize their outputs, there is *too much fundraising* as compared to the *social optimum choice of fundraising*. For example, the corresponding first-order condition for nonprofit 1 at the noncooperative equilibrium yields $y_1 = (2 - w_A)/2 > y_1^{AB^\circ}$.

Consider next the two cases (*ii*) and (*iii*) of project clustering where both nonprofits either choose project type A or project type B (AA or BB). Denoting $y = (y_1, y_2)$, social welfare is

$$SW_{kk} = \left[m + (w_k - 1)D_1(y) + (w_k - 1)D_2(y) - \frac{1}{2}(D_1(y))^2 - \frac{1}{2}(D_2(y))^2 - bD_1(y)D_2(y) \right] + [D_1(y)(1 - y_1) + D_2(y)(1 - y_2)].$$

Thus, using the fact that under project clustering

$$D_1^{kk}(y) = \frac{(w_k - 1)(1 - b) + y_1 - by_2}{1 - b^2} \quad \text{and} \quad D_2^{kk}(y) = \frac{(w_k - 1)(1 - b) + y_2 - by_1}{1 - b^2},$$

the optimal values of fundraising are

$$y_1^{kk^\circ} = y_2^{kk^\circ} = \frac{2 - w_k}{3}.$$

and the maximum social welfare under clustering is, therefore

$$SW_{kk}^\circ = m + \frac{(1 - 2w_k)^2}{3(b + 1)}. \quad (29)$$

We can now compare the social welfare in cases (*i*)-(*iii*). Since $\partial SW_{kk}^\circ / \partial w_k > 0$ for $2 > w_k > 1$, we have

$$SW_{AA}^\circ \gtrless SW_{BB}^\circ \Leftrightarrow w_A \gtrless w_B.$$

Also, for $b = 0$ we have:

$$\begin{aligned} SW_{AA}^\circ &> SW_{AB}^\circ \Leftrightarrow w_A > w_B, \\ SW_{BB}^\circ &> SW_{AB}^\circ \Leftrightarrow w_B > w_A. \end{aligned}$$

Therefore, when competition between nonprofits is absent and both nonprofits operate in monopolistic niches ($b = 0$), clustering is always socially efficient and the optimal non-clustering area reduces to the 45°-line where $w_B = w_A$. In addition, when projects are *clustered*, the welfare decreases with b , i.e. $\partial SW_{kk}^\circ / \partial b = -(1 - 2w_k)^2 / 3(b + 1)^2 < 0$.

Moreover, using (28) and (29), it is straightforward to see that, in general, at the optimal fundraising choice,

$$SW_{AA}^\circ > SW_{BA}^\circ \tag{30}$$

for

$$a(b) + X^\circ(b) w_A > w_B \tag{31}$$

and, similarly,

$$SW_{BB}^\circ > SW_{AB}^\circ \tag{32}$$

for

$$a(b) + X^\circ(b) w_B > w_A, \tag{33}$$

where

$$a(b) \equiv \frac{1 + b - \sqrt{1 - b^2}}{2(1 + b)} \text{ and } X^\circ(b) \equiv \frac{\sqrt{1 - b^2}}{1 + b}.$$

Notice that for $b = 0$, the intercept $a(b)$ becomes equal to zero and the slope $X^\circ(b) = 1$. Thus, for this extreme case, clustering in AA (BB) is socially optimal for $w_A > w_B$ ($w_B > w_A$). As the intensity of competition b increases, the intercept $a(b)$ rises from 0 to 0.5, while the slope $X^\circ(b)$ decreases from 1 to 0. Consequently, the two lines (AA) and (BB) separating the clustering and the specialization areas under social welfare maximization rotate outwards. The area of project specialization broadens, whereas the two zones favorable to clustering in project A or project B, shrink. Notice also that for $b \geq 0.8$ the socially advantageous clustering area disappears completely.¹⁷

Figure 4 depicts the areas of clustering under *no contract disclosure* (marked by AA^N and BB^N), *contract disclosure* (marked by AA^D and BB^D), and under *social welfare maximization* (marked by

¹⁷This can be seen by solving the equation

$$\min w_B = 1 = \frac{1 + b - \sqrt{1 - b^2}}{2(1 + b)} + \frac{\sqrt{1 - b^2}}{1 + b} \cdot \max w_A$$

for b which yields $b = 4/5$.

AA° and BB°). The dashed-dotted lines AA° and BB° represent the lines separating the clustering and specialization area in the latter case.

[Insert here Figure 4]

Most importantly, if we compare the areas of the social optimum with the choice made by the nonprofits at the Nash equilibrium under no contract disclosure, we can first observe that for any level of $b \in (0, 1)$ and for all admissible values of the willingness-to-give for the two projects (i.e. for $w_k \in (1, 2)$), we have

$$X^N(b)w_A > a(b) + X^\circ(b)w_A.$$

Therefore, as illustrated by Figure 4, the nonprofits have an inefficiently high tendency to cluster at any level of fundraising competition, the more so the higher the intensity of competition. Even more importantly for our analysis is the influence of mandatory disclosure of managerial compensation contracts on the nonprofits' selection of project types. As we already know that $X^D(b) > X^N(b)$ for any value of $b \in (0, 1)$, it immediately follows that for all $w_k \in (1, 2)$ and $b \in (0, 1)$, we have

$$a(b) + X^\circ(b) < X^N(b) < X^D(b). \quad (34)$$

This implies that the *excessive clustering behavior* is exacerbated by mandating the disclosure of managerial compensation contracts (see Proposition 4). The inefficient choice of project types in the form of excessive clustering is occurring for a wider range of scenarios if the regulator mandates disclosure of managerial contract information. The *rationale* of this result is that, when fundraising activities are assigned to a manager, this relaxes the existing fundraising competition and gives a higher incentive, *ceteris paribus*, toward project clustering, whenever clustering offers nonprofits a larger provisions of funds from donations in comparison to project specialization.

Our finding is summarized in the next proposition.

Proposition 5 *If nonprofits choose the type of projects non-cooperatively, then in terms of social welfare mandatory disclosure of managerial compensation contracts causes a higher inefficiency than if disclosure is not mandatory. Mandatory disclosure distorts the nonprofits' choice of project types and induces a higher tendency towards clustering of projects.*

5 Model Extensions

5.1 The Influence of Fundraising Spillovers

We now return to our original setting where each nonprofit engages in a given project and these projects are considered as imperfect substitutes by the donors. Let us assume now that every donor's willingness

to give to each nonprofit project $i = 1, 2$ is, differently from (7), not only affected by the fundraising effort y_i of nonprofit i , but also by the fundraising effort y_j exerted by the rival nonprofit, as

$$\omega_i(y_i, y_j) = w + y_i + \sigma y_j. \quad (35)$$

Here w denotes again the baseline willingness-to-give (for simplicity assumed equal for both projects) and $\sigma \in [0, 1]$ represents *fundraising spillovers* that capture how much a nonprofit's fundraising activity increases the donors' willingness-to-give to the rival project $j \neq i$. A high spillover rate σ indicates that the fundraising technology is not very sophisticated and donors are only imperfectly targeted by nonprofit organizations through their fundraising activity. The opposite occurs for σ close to 0.

Solving the constrained utility maximization problem of every representative donor yields the donation received by every nonprofit $i, j = 1, 2$ with $j \neq i$ as

$$D_i(y_i, y_j) = \left(\frac{w-1}{1+b} + \frac{1-b\sigma}{1-b^2} y_i + \frac{\sigma-b}{1-b^2} y_j \right),$$

with the associated output

$$Q_i(y_i, y_j) = \left(\frac{w-1}{1+b} + \frac{1-b\sigma}{1-b^2} y_i + \frac{\sigma-b}{1-b^2} y_j \right) (1 - y_i).$$

Note that with spillovers the sign of effect of a rival's fundraising activity on the output of a nonprofit depends on the intensity of competition in relation to the spillover rate σ ,

$$\frac{\partial Q_i}{\partial y_j} = \frac{\sigma - b}{1 - b^2} (1 - y_i).$$

In contrast to the situation without spillovers, this influence can be *positive* if spillovers are high, i.e. $\sigma > b$. In other words, every nonprofit's fundraising effort exerts a positive (negative) externality on its rival when the level of the spillover is sufficiently high (sufficiently low). At the same time, since

$$\frac{\partial^2 Q_i}{\partial y_i \partial y_j} = \frac{b - \sigma}{(1 - b)(b + 1)},$$

and $b \in (0, 1)$, nonprofits' fundraising efforts are *strategic substitutes* if $\sigma > b$ and are, conversely, *strategic complements* if $\sigma < b$. This can be explained by saying that when the fundraising spillovers are *very intense*, an increase of the rival's fundraising activity causes a reduction of the fundraising of a nonprofit, with the purpose to save in costly fundraising activity. When, in contrast, the fundraising spillovers are not very intense, we are back to the previously studied situation where an increase in the rival's fundraising effort triggers a more intense effort in response. Below we analyze the influence of spillovers on the nonprofits' choice of fundraising efforts and resulting outputs under no disclosure and under mandatory disclosure. For simplicity (but w.l.o.g.), we set the baseline willingness-to-give $w = 1$ for the remainder of this subsection.

5.1.1 No Contract Disclosure

In this case, again, since managerial compensation contracts are kept secret, nonprofits' entrepreneurs have no reason to strategically manipulate the managers' choices. The optimal bonus rates are $\delta_i = 1$ for $i = 1, 2$ and the the managers are induced to exert fundraising effort in order to maximize the nonprofits' outputs. This yields

$$y^N = \frac{1 - b\sigma}{2 - b + \sigma(1 - 2b)},$$

with project outputs equal to

$$Q^N = \frac{(1 + \sigma)^2(1 - b)(1 - b\sigma)}{(1 + b)(2 - b + \sigma(1 - 2b))^2}.$$

Obviously, these expressions reduce to (11) and (12) respectively if $\sigma = 0$ and $w = 1$. Note that $\partial y^N / \partial \sigma < 0$ as expected. Free-riding leads to less individual efforts as a nonprofit benefits from the fundraising effort of the rival nonprofit. The impact of σ on output is ambiguous, since $\partial Q^N / \partial \sigma < 0$ only when b is sufficiently large, whereas $\partial Q^N / \partial \sigma > 0$ occurs otherwise.

5.1.2 Mandatory Contract Disclosure

Alternatively, when contract information is publicly disclosed, both nonprofits' entrepreneurs use the executives' contracts strategically to influence the choices of output. More precisely, each nonprofit uses the contract to induce the fundraising effort a Stackelberg leader would choose. The managers choose the efforts to maximize their payoffs. This yields the following best-reply function for each nonprofits' managers $i = 1, 2$

$$y_i(y_j) = \frac{1}{2\delta_i} + \frac{(b - \sigma)}{2(1 - b\sigma)}y_j. \quad (36)$$

It can be noticed that the slopes of the best-replies are determined by the difference between b and σ . Again, the intercept is decreasing in δ_i and independent of δ_j .

The equilibrium value of the bonus rate is obtained as

$$\delta_i^* = 1 + \frac{(1 - b)(b - \sigma)^2(1 + \sigma)}{(2 - b + \sigma(1 - 2b))(2 - b^2 - \sigma(2b + \sigma(1 - 2b^2)))}, \quad (37)$$

which coincides with (22) for $\sigma = 0$ and $w = 1$. Notice that since the second term on the RHS is always nonnegative, we have $\delta_i^* \geq 1$ for all values of b and σ . Therefore, each nonprofit provides its manager with a positive incentive in terms of output and a negative incentive for donations. Given the

equilibrium incentive rate (37), the equilibrium fundraising activities and the outputs are obtained as

$$y^D = y^N - \frac{(1-b)(b-\sigma)^2(1+\sigma)}{(2-b+\sigma(1-2b))B},$$

$$Q^D = Q^N + \frac{(1-b)(b-\sigma)^3(1+\sigma)^2(1-b\sigma)(4-3b+\sigma(3-4b))}{(1+b)(2-b+\sigma(1-2b))^2B^2},$$

where $B = 4 + (2 - \sigma)\sigma - b^2(1 - 2\sigma - 4\sigma^2) - 2b(1 + \sigma(3 + \sigma)) > 0$. Since the second term on the RHS of the first line is nonnegative, we can conclude that $y^D < y^N$ independently of b and σ . Thus, the nonprofit strategically manipulates the compensation contract of its manager to reduce fundraising activity and to increase its project output. A straightforward comparative statics analysis shows that, in equilibrium, spillovers reduce the fundraising effort, since $\partial y^D / \partial \sigma < 0$. Together, these two ingredients provide an incentive for the manager to reduce the nonprofit fundraising effort (compared to the case without contract disclosure). This raises the question if the resulting equilibrium output levels increase or decrease with respect to the situation without contract disclosure. The answer depends on the difference between the spillover rate σ and the proximity of projects for donors, i.e. b . For $b - \sigma > 0$, it turns out that $Q^D \geq Q^N$. If, in contrast, spillovers are sufficiently high ($\sigma > b$), we have $Q^D < Q^N$. Consequently, when fundraising efforts are not proprietary to projects and spillovers are large, mandatory contract disclosure is harmful to nonprofits' outputs. We summarize this result in the following proposition.

Proposition 6 *If spillovers are sufficiently small compared to the intensity of competition, i.e. $\sigma < b$, contract disclosure is beneficial for nonprofits' outputs, i.e., $Q^D > Q^N$. If, conversely, spillovers are large, i.e. $\sigma > b$, then $Q^D < Q^N$, and contract disclosure is detrimental to nonprofits' outputs.*

The result of this Proposition is illustrated in Figure 5. When fundraising spillovers are sufficiently high, i.e. for $\sigma > b$, the nonprofits' best-replies are now negatively sloped and the fundraising efforts exert positive externalities (and not negative externalities as before) on the rival's output. High spillovers also change the shape of the iso-output contours which are now convex in the fundraising space of the two nonprofits. Thus, under mandatory contract disclosure, nonprofits reduce their fundraising efforts as in a situation without spillovers. However, in contrast to the low-spillovers case, for high spillovers the two nonprofits also reduce their outputs (compare points D and N).

[Insert here Figure 5]

5.2 General Mechanism in a Setting with n Nonprofits

Qualitatively, under certain conditions our finding that mandatory disclosure of managerial compensation contracts works as a coordination device for reducing fundraising efforts carries over to a more general setting with n nonprofits. These conditions can be derived as follows. Denote the output of nonprofit i by $Q_i(y_1, y_2, \dots, y_n)$. Donations are denoted by $D_i(y_1, y_2, \dots, y_n)$. Now assume that the compensation contracts for the nonprofits' managers are based on output Q_i and donations D_i , so that managers maximize their compensation

$$U_i^m = A_i + B_i[\delta_i Q_i + (1 - \delta_i)D_i]. \quad (38)$$

All firms are mandated to disclose the details of the contracts with their managers. From the first order condition of manager i , i.e. $\frac{\partial U_i^m}{\partial y_i} = 0$, we obtain

$$\delta_i \frac{\partial Q_i}{\partial y_i} + (1 - \delta_i) \frac{\partial D_i}{\partial y_i} = 0.$$

Hence, in equilibrium

$$\frac{\partial Q_i}{\partial y_i} = -\frac{(1 - \delta_i)}{\delta_i} \frac{\partial D_i}{\partial y_i}. \quad (39)$$

Solving this system of n first order conditions would yield the chosen equilibrium fundraising efforts $y_i^*(\delta_1, \delta_2, \dots, \delta_n)$. Substituting all fundraising effort $y_i^*(\delta_1, \delta_2, \dots, \delta_n)$ into the nonprofit i 's output yields $Q_i(y_1^*(\delta), y_2^*(\delta), \dots, y_n^*(\delta))$ where $\delta = (\delta_1, \delta_2, \dots, \delta_n)$. At the first stage, every nonprofit $i = 1, 2, \dots, n$ then chooses δ_i to solve

$$\max_{\delta_i} Q_i(y_1^*(\delta), y_2^*(\delta), \dots, y_n^*(\delta)).$$

Using (39), this leads to the first order conditions

$$\frac{dQ_i}{d\delta_i} = \frac{\partial Q_i}{\partial y_i} \frac{\partial y_i^*}{\partial \delta_i} + \sum_{j \neq i} \frac{\partial Q_i}{\partial y_j} \frac{\partial y_j^*}{\partial \delta_i} = -\frac{(1 - \delta_i)}{\delta_i} \frac{\partial D_i}{\partial y_i} \frac{\partial y_i^*}{\partial \delta_i} + \sum_{j \neq i} \frac{\partial Q_i}{\partial y_j} \frac{\partial y_j^*}{\partial \delta_i}.$$

Evaluating the RHS at $\delta_i = 1$ (which coincides with the case where the nonprofit induces the manager to just maximize output), we realize that the first term drops out. Hence, the sign of $\frac{dQ_i}{d\delta_i}$ evaluated at $\delta_i = 1$ depends on $\sum_{j \neq i} \frac{\partial Q_i}{\partial y_j} \frac{\partial y_j^*}{\partial \delta_i}$. Consequently, if we have simultaneously

$$(i) \frac{\partial Q_i}{\partial y_j} < 0 \text{ and } \frac{\partial y_j^*}{\partial \delta_i} < 0, \text{ or } (ii) \frac{\partial Q_i}{\partial y_j} > 0 \text{ and } \frac{\partial y_j^*}{\partial \delta_i} > 0,$$

then the sum in the second term above is positive. Since this would imply that the derivative at $\delta_i = 1$ is positive, the bonus rate in equilibrium $\delta_i > 1$. In other words, our main result carries over to a general setting with n nonprofits if there are positive externalities of fundraising and fundraising efforts

are strategic substitutes or if there are fundraising negative externalities and fundraising efforts are strategic complements. Under these conditions we always obtain that the bonus rate $\delta_i > 1$.

In order to illustrate some of the arguments above, we consider a *general linear setting* with n firms and spillovers. In this case, following the procedure we have described in the two-nonprofits case, donations can be derived as (see, similarly, Aldashev et al. 2014)

$$D_i = \frac{w-1}{1+b(n-1)} + \frac{1+b(n-2)-b\sigma(n-1)}{(1-b)(1+b(n-1))} y_i - \frac{\sigma-b}{(1-b)(1+b(n-1))} \cdot \sum_{j \neq i} y_j.$$

In line with our model with two nonprofits, output is given by $Q_i(y_1, y_2, \dots, y_n) = D_i(y_1, y_2, \dots, y_n)(1 - y_i)$. We have

$$\frac{\partial Q_i}{\partial y_j} = \frac{\sigma-b}{(1-b)(1+b(n-1))} (1 - y_i).$$

Consequently, it follows that

$$\frac{\partial Q_i}{\partial y_j} = \begin{cases} > 0 & \text{if } \sigma > b \\ < 0 & \text{if } \sigma < b \end{cases}.$$

Therefore, we know that fundraising effort y_j yields positive externalities on the output of nonprofit i if spillovers are large (relative to the intensity of competition) and yields negative externalities otherwise. Concerning the condition under which fundraising efforts are strategic substitutes or strategic complements, we solve the manager's first order conditions (39) to obtain $y_j^*(\boldsymbol{\delta})$ as

$$y_j^* = -\frac{\alpha}{2\beta + \gamma(n-1)} + \frac{\beta(2\beta + \gamma(n-2))}{(2\beta - \gamma)(2\beta + \gamma(n-1))} \frac{1}{\delta_j} - \frac{\beta\gamma}{(2\beta - \gamma)(2\beta + \gamma(n-1))} \cdot \sum_{l \neq j} \frac{1}{\delta_l},$$

where $\alpha = (w-1)/(1+b(n-1))$, $\beta = (1+b(n-2)-b\sigma(n-1))/(1-b)(1+b(n-1))$ and $\gamma = (\sigma-b)/(1-b)(1+b(n-1))$.

It can now be checked that

$$\frac{\partial y_j^*}{\partial \delta_i} = \frac{\beta\gamma}{(2\beta - \gamma)(2\beta + \gamma(n-1))} \frac{1}{\delta_i^2}.$$

Substituting the expressions for α, β and γ , into the right hand side leads to the conclusion that

$$\frac{\partial y_j^*}{\partial \delta_i} = \begin{cases} > 0 & \text{if } \sigma > b \\ < 0 & \text{if } \sigma < b \end{cases}.$$

Taken together, this provides the following insight for the general linear case with n nonprofits and spillovers. If spillovers are sufficiently large compared to the intensity of competition, then fundraising effort y_j yields positive externalities on the output of nonprofit i and *simultaneously* fundraising efforts are strategic substitutes. If spillovers are sufficiently small compared to the intensity of competition, then fundraising effort y_j yields negative externalities on the output of nonprofit i and *simultaneously*

fundraising efforts are strategic complements. Hence, if disclosure of managerial compensation contracts is mandated, then nonprofits set $\delta_i > 1$ and use these contracts as a *coordination device* to collectively reduce their fundraising efforts. Our finding for the case with two nonprofits carries over to fundraising competition with n nonprofits.

6 Concluding Remarks

The aim of this paper is to investigate the impact of mandatory disclosure of managerial contract information on the behavior of nonprofit organizations competing to raise funds for their projects. We find that, although such provision is implemented to increase the transparency of the nonprofit sector, it also induces nonprofits to use their managers' incentive contracts strategically in order to relax existing fundraising competition. Under highly targeted fundraising technologies and projects which are perceived as close substitutes this is beneficial to nonprofits' outputs. However, we also find that mandatory disclosure distorts nonprofits' choice of project types, inducing excessive and socially inefficient project clustering. We further point out that our findings which are obtained in a specific setting seem to be rather general and extend to any number of firms and to the presence of fundraising spillovers among competing organizations.

More work needs to be done to fully understand the influence of managerial compensation contracts on competition between nonprofit organizations. The provisional findings presented in this paper hopefully serve as a starting point and lead to empirical studies which investigate the impact of mandatory disclosure regulations and other targeted policies on nonprofits' fundraising competition and the choice of projects. In this vein, Bloomfield's (2018) work for the for-profit sector might provide ideas on the design of such an empirical study.

7 Appendix

Mandating disclosure of compensation contracts enhances social welfare In this appendix, we consider the case where nonprofits compete for funds for the same project and we show that mandatory disclosure of managerial contract information has a positive effect on social welfare.

Social welfare is given by

$$SW = m + (w - y_1) D_1(y) + (w - y_2) D_2(y) - \frac{1}{2} (D_1(y))^2 - \frac{1}{2} (D_2(y))^2 - b D_1(y) D_2(y)$$

where $y = (y_1, y_2)$. Using the fact that in a symmetric equilibrium with $y_1^* = y_2^* = y^*$ we have

$$D_1(y^*, y^*) = D_2(y^*, y^*) = \frac{w + y^* - 1}{1 + b},$$

social welfare becomes

$$SW = m + 2D_i(y^*, y^*)(w - y_i^*) - (1 + b)(D_i(y^*, y^*))^2$$

which simplifies to

$$SW = m + \frac{(w + y^* - 1)(w - 3y^* + 1)}{b + 1}.$$

Since

$$\begin{aligned} y_1^N &= y_2^N = 1 - \frac{w(1-b)}{2-b} \text{ and} \\ y_i^D &= y_i^N - \frac{(1-b)b^2w}{8(1-b) + b^3}, \end{aligned}$$

we easily obtain that

$$SW^N = m + \frac{w(2b - 4 + w(5 - 4b))}{(2 - b)^2(b + 1)}$$

and

$$SW^D = m + \frac{w(2 - b^2)(2(b^2 + 2b - 4) + w(10 - b(b + 8)))}{(b + 1)(b^2 + 2b - 4)^2}.$$

The difference

$$SW^D - SW^N = \frac{(b^2w(1-b))(16(1-b) + 4w(5b-2) - wb^2(b+9) + 2b^3)}{(b+1)(b-2)^2(2b+b^2-4)^2}$$

has the same sign as

$$A(b, w) = (16(1-b) + 4w(5b-2) - wb^2(b+9) + 2b^3),$$

which is easily seen to be positive for the allowed range of parameters $w \in (1, 2)$ and $b \in (0, 1)$. Consequently, mandatory disclosure of managerial contract information is welfare-enhancing if nonprofits compete in trying to raise funds for the same project.

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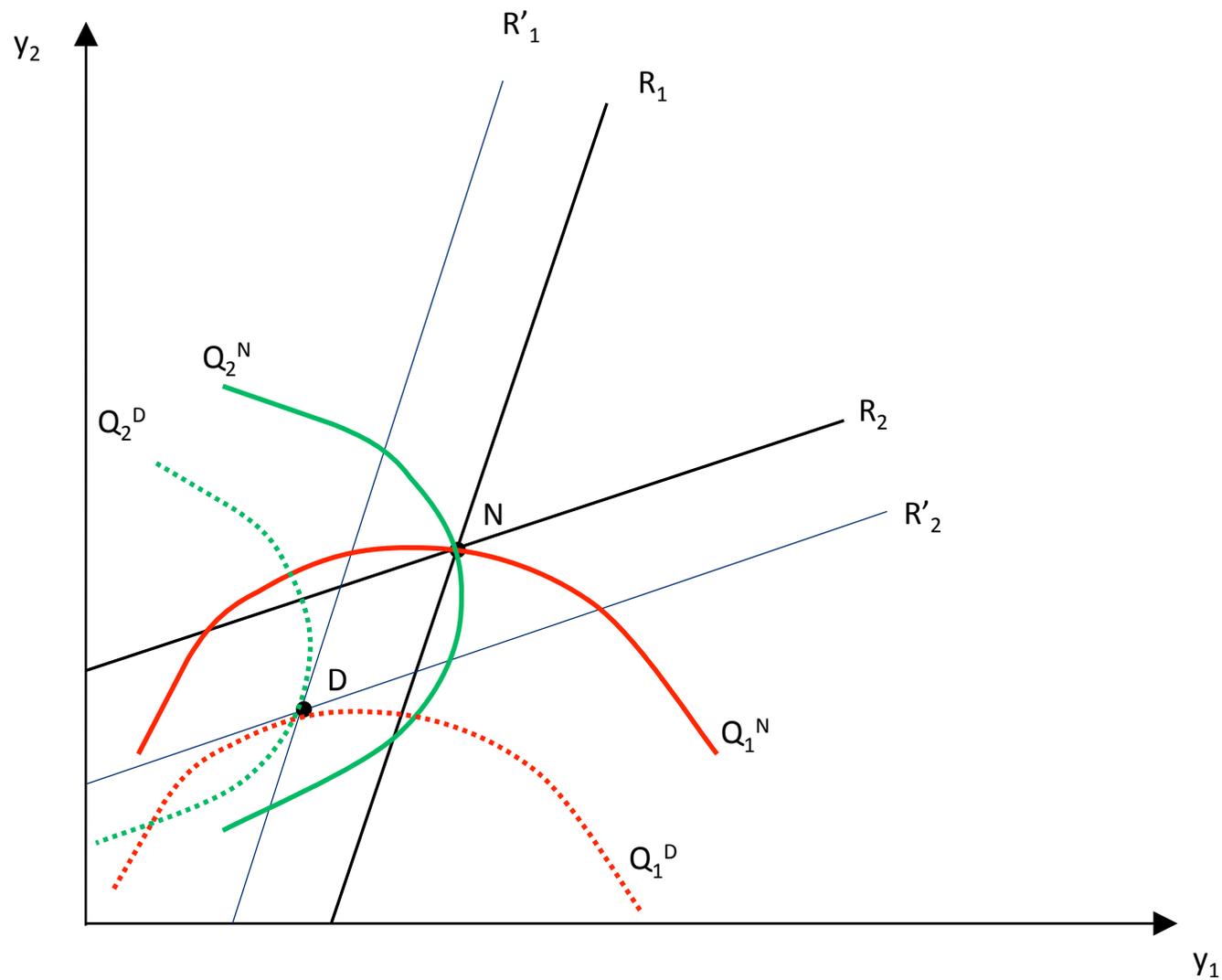


Figure 1: The nonprofits' best replies without mandated disclosure (R_1 and R_2) and with mandated disclosure (R'_1 and R'_2) of managerial compensation contracts. Fundraising efforts are strategic complements and yield negative externalities. Equilibrium fundraising efforts are given by the intersection points N and D . Red = nonprofit 1's iso-output contours; Green = nonprofit 2's iso-output contours.

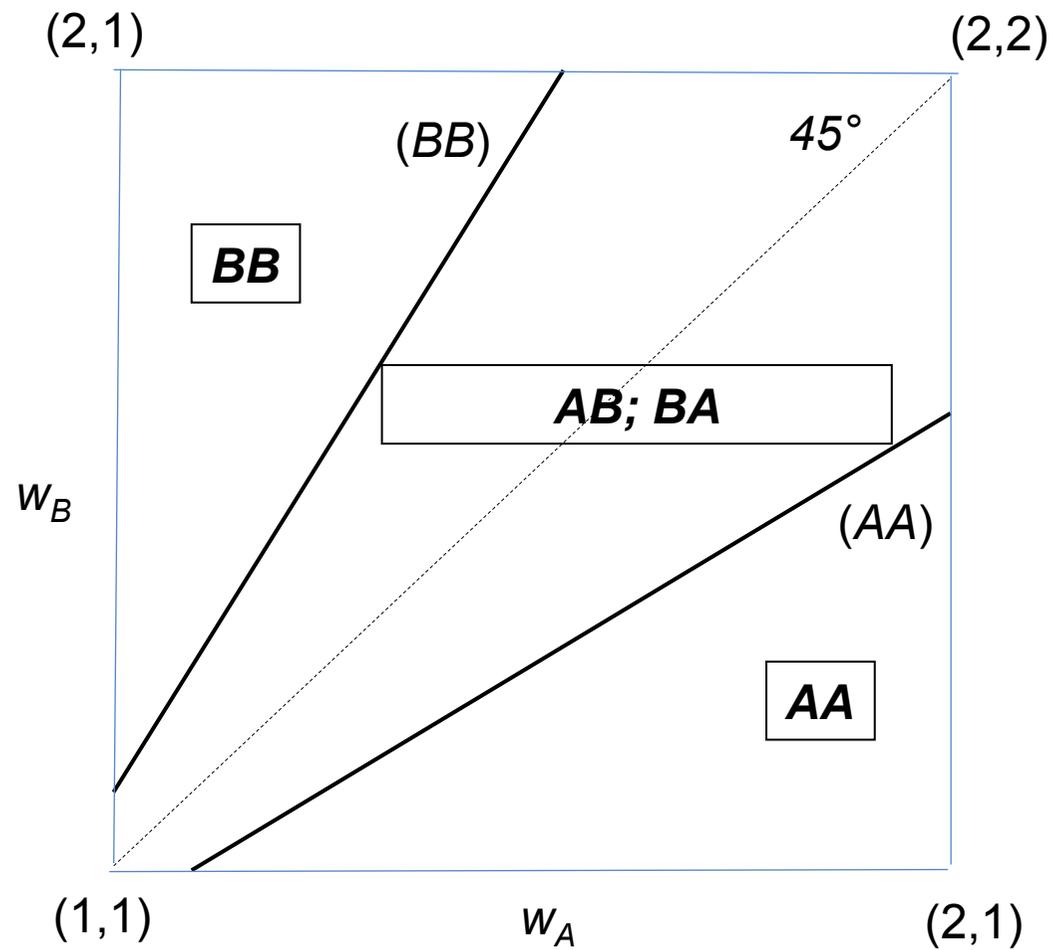


Figure 2: Equilibrium choice of project types under no disclosure. Project clustering (AA or BB) occurs for polarized values of donors' willingness-to-give, project specialization (AB or BA) for similar values.

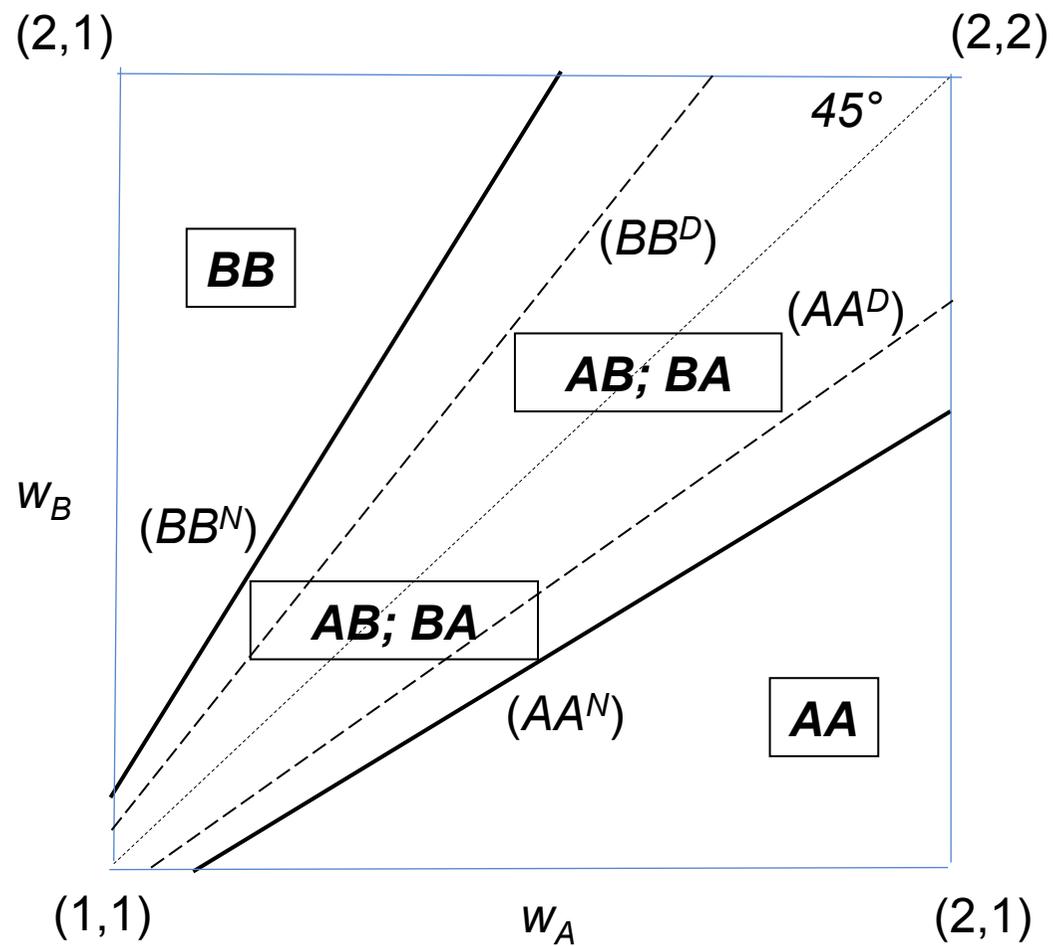


Figure 3: Project clustering and project specialization without disclosure (N) and with mandatory contract disclosure (D).

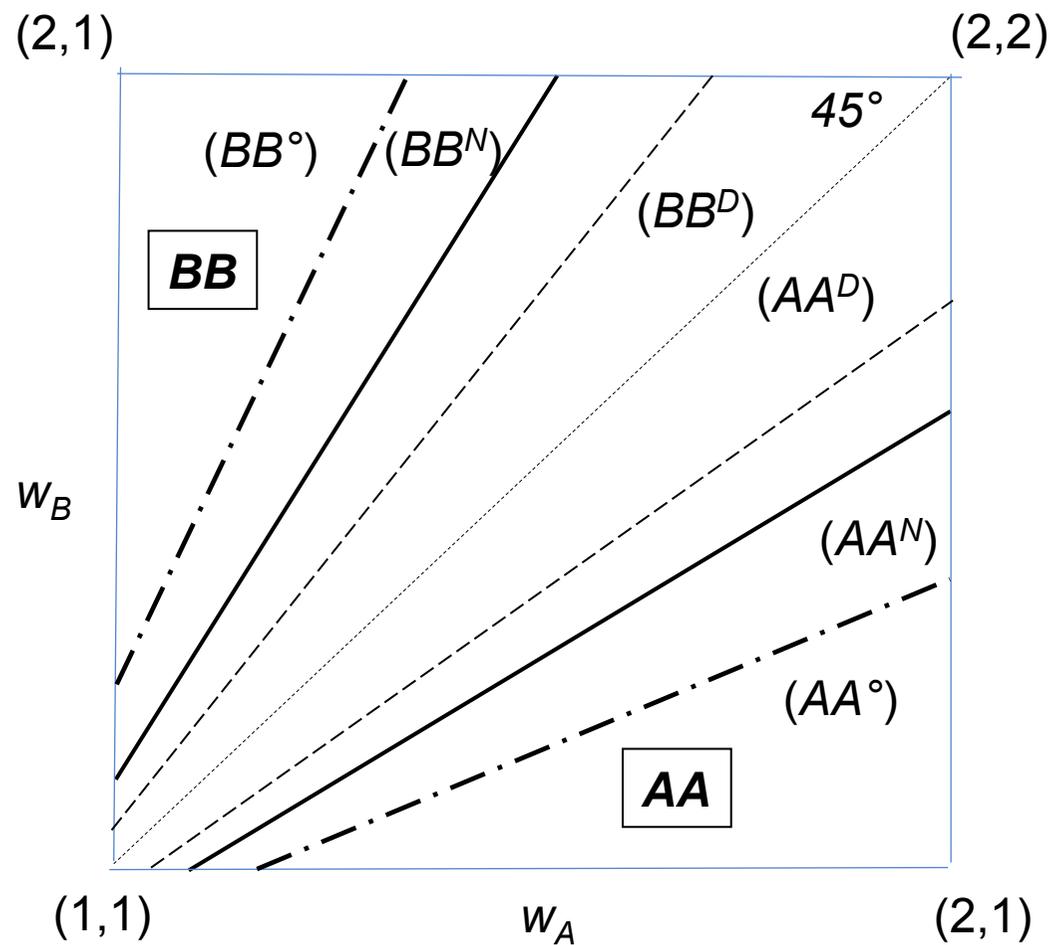


Figure 4: Socially optimal versus decentralized choice of project types: without contract disclosure (N) and with mandatory contract disclosure (D), inefficient project clustering occurs compared to the socially optimal choice of project types (superscript $^\circ$). The region where project clustering is socially optimal is smaller than under decentralized choice of project types.

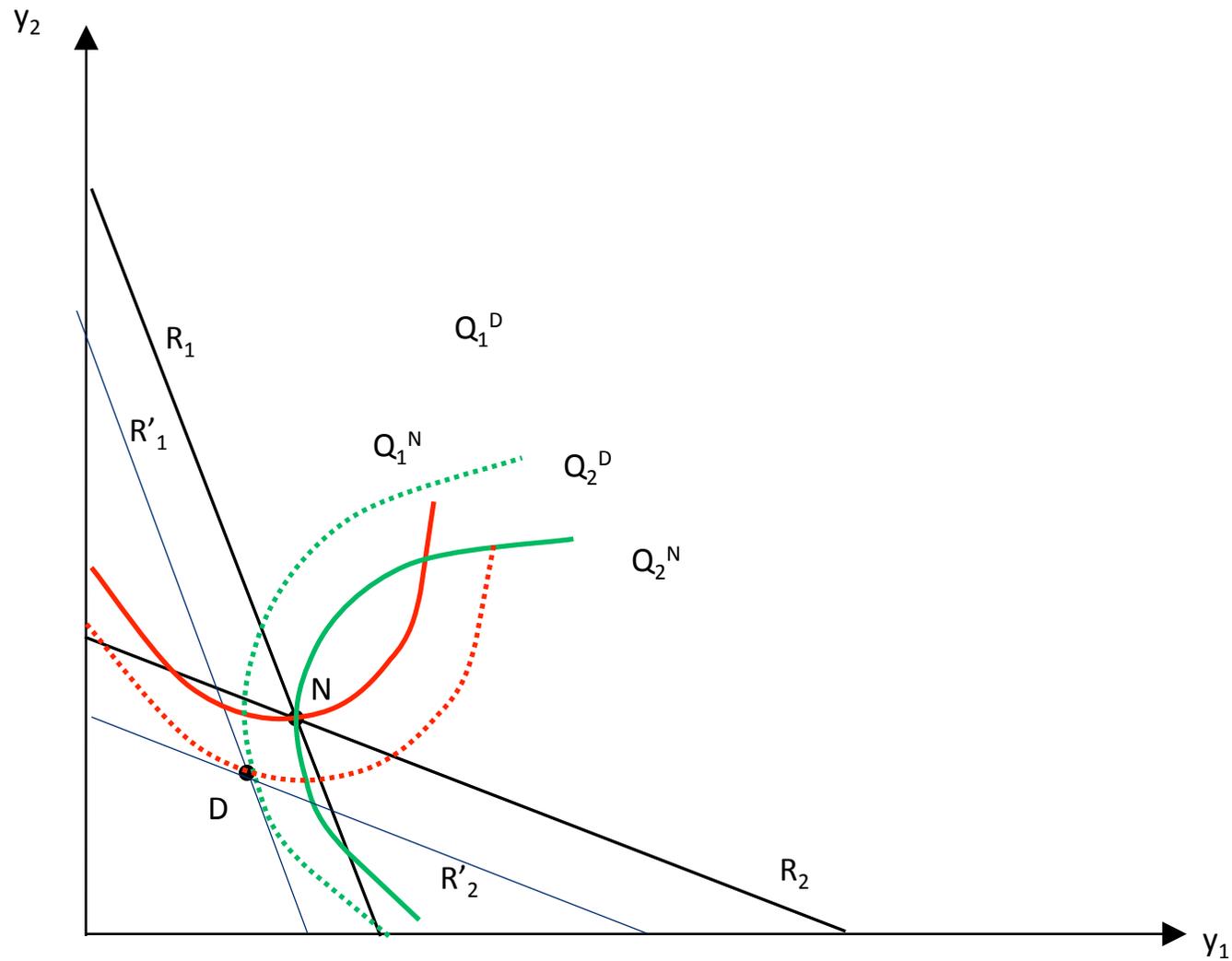


Figure 5: Nonprofits' best replies with high fundraising spillovers ($\sigma > b$). Fundraising efforts are strategic substitutes and yield positive externalities. Red = NGO 1's iso-output contours; Green = NGO 2's iso-output contours.