Let's call the whole thing off: NGOs, mission conflict and occupational choice

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Abstract

Why do donors and the recipients of aid and other donations disagree over how funds should be used? Despite ample evidence that mission conflict in the NGO sector is a widespread phenomenon – witness, for example, the 2011 Busan Declaration, which encourages international donors to solve the problem of mission conflict by allowing the recipient to choose the project's mission – the economics literature has not been able to explain why this conflict of mission preferences so frequently arises. Besley and Ghatak (2005) predict that principals and agents in the NGO sector should be assortatively matched with respect to mission preferences. We show that mission mismatch can arise in equilibrium by allowing for endogenous choice of donor and recipient roles, and for mission preferences that are correlated with income from the private sector. When mission mismatch occurs in equilibrium, we show that enforcing the Busan declaration decreases joint donor-recipient surplus when donors care sufficiently about their preferred mission. However, it is possible that the declaration could improve social welfare when additionally beneficiary payoffs are taken into account.

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1 Introduction

> Too often, donors' decisions are driven more by our own interests or policy preferences than by our partners' real needs

Hillary Clinton, Busan High-Level Forum November 2011

> 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 a recognition that long-term development depends on the willingness of that same public to support difficult and costly structural change. This is a tension between the 'appeal' of helplessness and antipathy towards empowerment, between concern for children and indifference towards parents, between the provision of food and the creation of jobs, between aid and trade, between charity, as some NGOs say quite clearly, and justice.

Smillie (1995)

If the above quotations are to be believed, there is a serious problem in the field of development assistance: there are substantive conflicts over how aid spending should be used, and donors seem to be inefficiently imposing their preferred way of doing things on recipient organisations. The 2011 Busan Declaration[1] – the successor of two previous international declarations on aid effectiveness in Paris and Accra – expresses a commitment to "give ownership of development policies to aid recipients, and to give in line with these priorities." However, it seems that implementation of these commitments has been incomplete. Leo (2013), for example, demonstrates that US development assistance is less aligned with the priorities of developing country residents than multilateral assistance provided through the African Development Bank and the Inter-American Development Bank. Hedger and Wathne (2010) note that, while donors pay lip service to the principles of alignment and ownership, it is implicitly understood by both donors and recipients that the objectives of the former should not be overridden. [2]

This paper has two main objectives. One is to ask whether the policy embodied in the Busan Declaration is a suitable instrument to deal with the mission mismatch problem outlined above. In order to reach a conclusion we need first to address a more fundamental question: why would there be such a conflict between donors and aid recipients in the first place? And relatedly, if donors and recipients do indeed have different preferences, is it necessarily inefficient for the donor to enforce his preferred mission?

The economics literature to date does not have a satisfactory explanation as to why such conflict over the goals or ethos of an aid project arises. Besley and Ghatak (2005) predict an assortative stable matching between principals and agents in a matching market where there are diverse social goals. Their result is based on the premise that, for any given goal – which we will refer to as a *mission*[3] – there exists the same number of principals and agents sharing the same mission preferences. If this symmetry assumption were to be relaxed, then principals and agents with different preferred missions would necessarily be matched with one another. Whilst Besley and Ghatak's symmetry assumption may seem intuitively appealing, we show in a model with endogenous choice of donor or NGO role, there is often a donor who cannot find an NGO which produces his preferred mission.

We show that if mission preferences are correlated with an individual's capacity to earn in the private sector, those who can earn a lot in the private sector will tend to do so, and seek to provide charitable goods (or aid) by making donations. Those who cannot earn much in the private sector will set up NGOs and make a contribution to charitable goods by providing their labour to turn financial contributions into goods valued by beneficiaries. Thus donors will tend to face a shortage of recipients (whom we call *NGO entrepreneurs*) who share their mission preferences and thus will be forced to deal with mission conflict in the course of their giving.

[1] According to the OECD (2014), "The Busan Partnership document does not take the form of a binding agreement or international treaty. It is not signed, and does not give rise to legal obligations. Rather, it is a statement of consensus that a wide range of governments and organisations have expressed their support for, offering a framework for continued dialogue and efforts to enhance the effectiveness of development co-operation."

[2] "A number of respondents to the latest ODI study note that while many national and sector strategies appear to be domestically 'owned', governments recognise that the policies they adopt must address donor expectations to some degree."

[3] A mission is an action choice (choice of project) or choice of ethos (such as a religious or secular approach), and can be represented formally as a choice of the 'variety' of the good that the NGO produces

To explain the forces that keeps such a mismatch equilibria in check, consider the following concrete example. Mother Teresa (as part of what became a global large-scale operation aimed at serving the poorest of the poor) ran hospices for the dying, starting with small scale operations in Calcutta. These facilities were run with a specific ethos, derived from Catholic theology[4]. She professed that suffering would bring people closer to Jesus, proclaiming that: "I think it is very beautiful for the poor to accept their lot, to share it with the passion of Christ. I think that the world is being much helped by the suffering of poor people." Despite being awarded the Nobel Peace prize in 1979 for her work to combat the poverty and distress, several critics suggested that Mother Teresa could have made better use of medical techniques and financial resources to keep dying people comfortable in their last days – indeed, that she deliberately favoured running her operations on meagre resources, thus keeping the poor in their place. (Shields, 1997; Greene, 2004; Hitchens, 2012; Larive *et al*, 2013)

Donors to Mother Teresa's mission did not have to accept this situation passively. Perhaps they did not have much power to change the Missionaries of Charity's practices, or they could not find an NGO sharing their preferred way of doing things. However, they could have chosen to contribute to the wellbeing of the poor and sick by setting up and running their own NGO, using more medical and scientific methods than the Mother Teresa's religious order. Why didn't they? This paper offers a credible response; because, for people like them, setting up and running a hospice charity would – even without taking a vow of poverty as Mother Teresa did – require a significant sacrifice of private consumption. To such people, giving to someone with somewhat different ideals (it is clear that many donors were still moved by the mercy and love her sisters showed to the dying) might seem a small price to pay to maintain a degree of comfort in day-to-day living.

In order to explain mission mismatch, there is a second piece of the puzzle to resolve. Why did Mother Teresa and the Missionaries of Charity – who could have incurred some costs in dealing with donors with different preferences – content themselves with their position caring for the poor directly and facing whatever costs this conflict incurred,[5] rather than earning in the private sector and contributing financially to the organisation? The fairly obvious answer is that the capacity of the sisters to earn in the private sector – and hence to offer donations – would be smaller and therefore of less impact than the large donations than that which the Missionaries of Charity was used to receive (the sisters regularly received donations for over \$50,000 (Sheilds, 1997)).

Given our result that mismatch equilibria can exist, what can we deduce about the usefulness of the Busan Declaration as a policy? First, looking at a fixed donor-entrepreneur pairing, we provide some calculations that would seem to support the notion that donors should let NGO entrepreneurs choose their own preferred mission. We show that, given that a donor has committed a fixed amount to distribute to an NGO, the donor (from the point of view of joint donor-entrepreneur surplus, or beneficiary utility) sometimes wastefully uses some of those funds to enforce his preferred mission. This inefficiency comes about because the charitable project is a public good for the donor and entrepreneur: the donor does not directly take into account the entrepreneur's payoff. This suggests that there could be a return to enforcing the Busan Declaration on a wider group of donors that those who already voluntarily adhere to it.

However, this conclusion does not always carry through (from the point of view of joint donor-entrepreneur surplus) when we allow donors to choose the amount that they give and allow all agents to choose whether or not to donate – otherwise put, when donors have the capacity to respond to this loss of mission influence by "calling the whole thing off". When donors care sufficiently about their preferred mission, enforcing the Busan Declaration when it is not voluntarily adhered to strictly reduces joint donor-NGO entrepreneur surplus. This happens for two reasons. Firstly, restricting the mission choice means that any agent who chooses to be a donor and expects to face mismatch gives less. Secondly there are effects on entry; for example, those who earn the least in the private sector may be encouraged to become NGO entrepreneurs now that they are guaranteed their preferred mission when they are matched

[4]N.B. These hospices were open to people of all confessions of faith and the dying were ministered to in accordance to their religious practices

[5]There is not much evidence that the Missionaries of Charity were beleaguered by donors seeking to overturn the things that were done. It seems in this case that the majority of costs of mismatch were borne by donors and that Mother Teresa's mission or vision was adopted in practice. However, a former sister, Susan Sheilds, recalls liaising with donors and thanking them for their gift, knowing full well that the money would only help the poor within the limits circumscribed by Mother Teresa's philosophy, and not in line with donor expectations (Sheilds, 1997)

with a donor of different preferences. If the total number of recipients or NGO entrepreneurs already exceeds the number of donors in equilibrium – as we will show is the case – then this movement away from earning in the private sector is bad for welfare, as it reduces the total amount of income available to donate to the goods produced by NGOs.

However, the welfare of donors and NGO entrepreneurs is not necessarily the right measure of global social welfare. There are beneficiaries of the NGO's activities who perhaps have neither the donor or NGO entrepreneur occupational choice available to them; to continue the Missionaries of Charity example given above, the poor and dying could clearly neither give to a hospice nor nurse within it. What can we say about the Busan Declaration's effect on their payoffs? First, we need to define what their payoffs look like. We consider the two following assumptions.

1. The beneficiaries are indifferent between missions; or
2. The beneficiaries care about the mission and share the mission preferences of the type who has the lowest earnings capacity in the private sector.

Unfortunately we can reach no definite conclusion on beneficiary welfare. Under the first assumption (beneficiaries indifferent between missions), implementing the Busan Declaration creates two effects. The first is, that for every donation made, a (weakly) higher share of each donation goes directly to the cause and less is "wasted" on mission influencing activities. The second is that each individual donation is (weakly) lower. We are unable to calculate an analytic solution which would resolve the trade-off. Under the second assumption (beneficiaries ahre mission preferences of low earnings capacity types), there is a third effect, which is that more donations go towards the beneficiaries' preferred mission. Again, we cannot resolve the trade-off. When donors care sufficiently about their preferred mission, f there is a rationale for making the Busan Declaration enforceable, it must come from beneficiary welfare and not from the welfare of participating donors and entrepreneurs.

The remainder of this paper is structured as follows. In Section 2.1, we review the policy literature relating to mission conflict, highlighting the wealth of evidence that this phenomenon is particularly pertinent in donor and recipient relationships. Then in Section 2.2, we analyse the related literature within economics, emphasising two main strands; the literature on mission conflict and the literature on occupational choice. In Section 3, we introduce the model, and then solve it by backward induction in Sections 3.1 to 3.4. In Section 3.5, we examine the policy of leaving mission choice to NGO entrepreneurs embodied in the Busan Declaration and examine whether the policy could do more good if it were enforced. Section 4 concludes.

2 Literature Review

2.1 Mission conflict in the NGO sector

The decade-old international efforts to agree upon broadly-supported principles of aid effectiveness, culminating in the Busan Declaration, reflect a recognition amongst that mission conflict between international aid donors and recipients is a widespread phenomenon. [6] The problem of mission mismatch, and the pressure donors may exert on aid recipients, is extensively documented by Smillie (1995). Discussing relationships between Northern government aid donors and Southern NGOs, Smillie notes that:

> There are very real and sometimes volatile tensions between governments and the voluntary sectors of the North and the South. On the one hand, more service delivery is expected of voluntary organizations as governmental expansion in health, education and job creation halts or retreats. Faced with static levels of private income, voluntary organizations are easily enticed by the financial blandishments of large benefactors. Governments, however, which are providing them with more and more support, do so on conditional terms... Advocacy and reform, long an integral part of the voluntary *raison d'être*, are unwanted or feared by governments, and means are sought, through legislation, contracting and spurious theorizing about 'voluntarism', to minimise, subvert or suppress it.

[6] The Busan Declaration is a voluntary compact that donors can sign, to illustrate, amongst other things, their commitment to allow NGO entrepreneurs to choose their preferred mission, and to provide financing to realise this mission. It does not take the form of a binding agreement or international treaty. It is not signed, and does not give rise to legal obligations. Rather, it is a statement of consensus that a wide range of governments and organisations have expressed their support for, offering a framework for continued dialogue and efforts to enhance the effectiveness of development cooperation.

Meyer (1995) documents some of the disparaging language used about NGOs who accept large grants that lead to some degree of mission compromise. Other NGOs who question the legitimacy of such organisations have been known to call them 'BINGOs' (big NGOs), 'DONGOs' (donor-organised NGOs), 'GONGOs' (government-organised NGOs), or even 'Yuppie NGOs'.

Pache and Santos (2010) show that competing views of how to run an organisation can be strong enough to tear it apart. In the 1980s, ten years after it was founded, Médecins Sans Frontières was divided over the appropriate role of the NGO vis-à-vis the state. On the one side, there were the so-called legitimists, who believed that the only legitimate actors in humanitarian crises were nation states, and argued that the NGO should therefore see itself as an adjunct to and assistor of state actions. On the other were those who believed that the organisation should have an independent approach, driven by a legitimacy over and above that enjoyed by some states, which implied that they should have an independent and fully-functional logistical machine for intervention into humanitarian crises. Ultimately the difference of opinion was resolved when a group of legitimists left and became Médecins du Monde.

Mission mismatch and mission influencing activities are not just a phenomenon found in the field of development assistance. Alexander (1996) studies the evolution of exhibitions at leading art galleries in the United States during a period when the main source of gallery funding shifted from individual philanthropists (from the 1920s to the 1970s) to corporate funders, private foundations, and public arts foundations such as the National Endowment for the Arts. She shows that, whereas funding by individual philanthropists often led to exhibitions containing art from an individual collector, corporations and public and private art foundations have tended to favour more popular and accessible formats that are more likely to attract a broad public (such as high-profile exhibitions focused on a single artist). However, Alexander also provides evidence that the changes brought about by this shift in funding sources has been mediated by museum curators – in our model, NGO entrepreneurs – who ensured that, whilst the format of exhibitions may have changed, their content – in terms of the artworks displayed – did not.

Oliver (1991), in a seminal contribution to the institutional logics and resource dependency literature, develops a typology of institutional responses to external pressures to adopt a particular approach (or mission). Internal actors can respond to such pressure with compliance, active defiance (dismissal, challenge and attack), and passive defiance (acquiescence, compromise, and buffering – that is, reducing the degree of external inspection and scrutiny). Whilst our theoretical framework is not rich enough to separately model these different potential organisational responses to external pressure, a central feature of our model is the related notion that it is costly for external agents – in our model, donors – to impose their preferred approach on an organisation, and that these costs are greater when internal actors have a stronger adherence to their own preferred approach (on this point, see also Greenwood and Hinings 1996).

2.2 Economic literature on mission-driven organisations

This paper brings together two literatures in the area of public organisation – the first concerned with the mission choice problem and the way in which disagreements over the mission play out within public organisations, and the second concerned with the problem of occupational choice within the charitable and non-profit sectors.

Our contribution to these literatures is twofold. We develop a model that addresses the problems of mission conflict and occupational choice within a unified framework, which few other contributions have attempted. Further, we provide a model in which donors can exert some limited influence over an NGO's mission (i.e., the mission is subject to moral hazard) – whereas earlier contributions tend to assume either that mission is contractible, or that the mission is neither observable nor contractible.

We start by considering the literature which addresses the mission choice problem. Rose-Ackerman (1982) and Aldashev and Verdier (2010) consider a model in which potential NGO entrepreneurs have differing mission preferences. Their choice is between entering and running their own preferred mission, and between staying out of the sector altogether. They find, depending on assumptions, that there is over- or under-entry of NGOs. However, in contrast to our model, the pool of potential NGO entrepreneurs is fixed and non of these potential entrants can become donors. Missions are chosen by NGOs and are not influenced by donors (though a lack of donor support may induce some NGOs to stay out of the market and hence their mission from arising).

The above-mentioned papers allow for donors' choices to influence NGO's entry decisions; other contributions allow for donors to influence the NGO's mission choice. In Rose-Ackerman (1987), NGOs choose their (perfectly observable) mission to maximise donations from a group of small (atomistic) donors with differing preferences. In equilibrium, the extent to which the NGO compromises on mission choice is dependent on the extent of unconditional support from a large donor (such as the government). Similarly Meyer (1995) considers a single NGO who must decide whether to accept an ideologically compromising grant, which may increase the NGO's visibility at the cost of its legitimacy with local people. In contrast to our contribution, in Meyer (1995) the mission is both observable and contractible.

Cassar (2013), again in a contractible mission setting, shows that, when a single donor chooses between NGOs, all of whom have different mission preferences from the donor, the donor can screen between those who are more or less willing to substitute between mission and money. Like us, Cassar finds that the donor may make the entrepreneur choose a mission which is not socially optimal in the sense of being too close to the donor's preferred mission. However, she does not provide the micro-foundations for mismatch that we outline in this contribution.

Besley and Ghatak (2005) study matching between principals and agents in a contractible mission setting and show that mismatch (which they define as a stably matched principal-agent pair in which the two parties have different mission preferences) only occurs when there is an asymmetry in the type space – that is to say that many principals have one preferred mission, whereas few agents share it. Why such a correlation between preferences and roles might arise is not clear. By contrast, in our model, with endogenous choice of donor/entrepreneur roles, we show that such an asymmetry can indeed arise as an equilibrium phenomenon if differences in private sector earnings opportunities are correlated with mission preferences.

Besley and Ghatak (2014) also study principal-agent matching in an environment in which, as well as effort moral hazard, there is, firstly, a mission choice problem, where the 'mission' corresponds to a choice between 'purpose' and 'profit', and, secondly, a choice of organisational form, between a non-profit organisation, a for-profit organisation, and a social enterprise. Like Besley and Ghatak (2005), this paper predicts assortative matching between principals and agents based on pro-social motivation, conditional on a balanced type space for the pro-social types. That is to say, mismatch is only residual phenomenon.

The intermediate scenario that we develop (between donors being able to directly prescribe the mission via the contracting process, and donors being completely unable to influence the mission) by making an alternative observability assumption was first suggested by Scharf (2010) – namely that the NGO's choice of mission is initially unobservable, but that an imperfect signal of the mission is observable and contractible. This setup gives rise to a *mission moral hazard* problem, in which the donor can structure her contributions to induce a particular mission by satisfying a mission incentive compatibility constraint.[7]

Next we consider the relationship between our paper and those that study occupational choice in public organisations. Auriol and Brilon (2014) consider the choice between the private and charitable sector amongst agents who may actively wish to subvert or overturn an NGO's mission – for example, paedophiles who seek to work for a children's charity. We do not go as far as considering NGO entrepreneurs who actively wish to sabotage the donor's mission – but NGO entrepreneurs do need, in our model as well as in that of Auriol and Brilon, to be incentivised to do the 'right' thing from the donor's point of view.

Aldashev et al. (2014) look at occupational choice in a framework which breaks the link between donors' desires to give and the outcomes of funding to NGOs. Donors may still receive warm glow utility from giving, even when the expected outcomes from giving are poor. Those who run non-profits are heterogeneous in their desire to use funds for the public good as opposed to for their own benefit. There exists a 'bad' equilibrium in which the non-profit sector is primarily run by those who enter to divert donations for their private usage. Our paper does not go as far as these authors in breaking the link

[7]Besley & Ghatak (2005) and Cassar (2013) analyse an *effort* moral hazard problem in a setting where principals and agents both care about the mission that the organisation adopts, and the mission is assumed to be observable and contractible. Their setup gives rise to an agency problem that is not dissimilar to our own modelling of a mission moral hazard problem. This is especially true in the case of Cassar (2013), who also allows for differential strength of feeling about the mission that the NGO adopts.

between the motivation for giving and the results achieved – indeed, all agents in our model rationally anticipate the way that their funds will be used to achieve a project with a particular mission, and this drives their occupational choice. Nevertheless, Aldashev et al. (2014) is one of the few papers that, like ours, examines the problem of occupational choice in a principal-agent model of charitable sector activity.

Bilodeau and Slivinski (1997) also consider both choice of mission and occupational choice, but with one constraint that we do not have here – the NGO entrepreneur always chooses his preferred mission. As compared with our own setting, mission is not only non-contractible, but donors have no means of influencing the entrepreneur's choice of mission. They show that, in general, NGOs will specialise and choose extreme missions, but they provide no definitive answers about who enters as a donor and who as an entrepreneur.

More broadly our paper also relates to the delegation literature. This literature (e.g. Prendergast 2007; 2008) – see also Vickers (1985) for a review of an earlier related literature – examines situations in which a principal might actively wish to hire an agent that does not share her own preferences, for example because of measurement problems, or because of the fact that citizens only challenge a bureaucrat's decisions when they incorrectly rule against them, not when they rule in their favour. We examine a different situation, in which participants in the model prefer, *ceteris paribus*, to be assortatively matched, but can nevertheless end up mismatched in equilibrium if there is a correlation between income-earnings capacity and preferences over the mission.

3 Model & Results

Agents in the set $\mathcal{A}$, of size $2N$, have preferences over a private good and over charitable goods. Charitable goods are produced by NGOs, using both the labour of NGO entrepreneurs and the financial contributions of donors.

The good produced by any given NGO can either be of type or mission R, or of mission S. A mission is an action choice (choice of project) or choice of ethos (such as a religious or secular approach).[8]

There are N agents of mission preference R in $\mathcal{A}$ who have preferences over the private good p and over charitable goods to which they contribute, giving b_1 to mission R and giving b_2 to mission S:

$$U_R(p, b_1, b_2) = p + \mu v(b_1) + \mu(1 - \Delta^R)v(b_2)$$

where $1 > \Delta^R > 0$, $\mu > 0$ and $v(b) = b^a$ for some $a \in (0, 1)$.[9]

Similarly there are N agents of mission preference S who have preferences:

$$U_S(p, b_1, b_2) = p + \mu(1 - \Delta^S)v(b_1) + \mu v(b_2)$$

where $1 > \Delta^S > 0$ and as above $\mu > 0$ and $v(b) = b^a$. We assume that an agent's mission preference $\in \{R, S\}$ is common knowledge.

We use the terms charity and NGO interchangeably to denote a donative non-profit in the sense used by Hansmann (1980) – that is to say, an organisation with a non-distribution constraint whose activities are funded by donations rather than by sales to the end recipients of the goods and services that the organisation provides.[10]

[8] In other contributions to the literature, a mission is represented as a blend of two different public goods – see Bilodeau and Slivinski (1997). Bilodeau and Slivinski (1997) also note that non-profit firms can attempt to differentiate themselves by offering public goods that have particular characteristics. For example, communities often include several nonprofit organizations that provide a variety of in-kind assistance to the indigent, shelters for battered spouses or runaway teenagers, or support alternative kinds of medical research. Private post-secondary educational institutions in the U.S. differ considerably in the nature of the education they provide, and are partly funded through private contributions. The towns of London, Ontario and Sherbrooke, Quebec are each home to a number of youth hockey leagues, each of them offering different programs and each soliciting private contributions to aid their operations.

[9] We choose $v(b) = b^a$ as we require that $v(0) = 0$, $v'(b) > 0$, $v''(b) < 0$ and $v^3(b) > 0$.

[10] We are aware that a "charity" has a specific legal definition in many jurisdictions, for example in relation to tax liability. However, the specific legal status of a charity is not relevant to our model – all that is important is that the organisation's activities are funded by donors rather than by the direct beneficiaries of the organisation's activity.

Agents $\in \mathcal{A}$ have two ways to influence the mission choice of an NGO. The first is to run the charity itself, i.e. to become an NGO entrepreneur. The set of NGO entrepreneurs is denoted by $\mathcal{E}$. The second is to give to the NGO, in which case the donor (the set of donors is denoted by $\mathcal{D}$) can choose to induce the NGO entrepreneur to undertake the donor's preferred mission, by playing a mission influence game we set out below. Thus each agent $a \in \mathcal{A}$ chooses to be a donor $a \in \mathcal{D}$ or an entrepreneur $a \in \mathcal{E}$. No agent can split their time between being a donor and being an NGO entrepreneur, i.e. $\mathcal{D} \cap \mathcal{E} = \emptyset$. Let $|\mathcal{D}| = N_D$ and $|\mathcal{E}| = N_E$.

Both the donors to the NGO, and the "NGO entrepreneur", value the output of the NGO. Thus the charitable good is a public good.[11]

Agents who choose to become donors earn m_j in the private sector, where $j \in \{R, S\}$ is the donor's mission preference. He endogenously chooses to give d_j to charity. Those who choose to be NGO entrepreneurs have no private sector earnings and are dependent on donors to provide income which can be used for private consumption.

We assume that $m_S \geq m_R$ – that is, S types earn at least as much as R types. If $m_S = m_R$, mission preferences are uncorrelated with private sector earning capacity. If $m_S > m_R$, mission preferences are correlated with private sector earnings. We will later demonstrate the influence of this correlation on mission mismatch.

We assume that, in the set $\mathcal{A}$, only the donor and the entrepreneur involved in giving/production value the output of the NGO. However, as well as donors and NGO entrepreneurs, there exists a set of beneficiaries $\mathcal{B}$, where $\mathcal{A} \cap \mathcal{B} = \emptyset$ who also value the output of all the NGO. These agents play a passive role in our model; they derive utility from the charitable goods in a way we will specify, but provide neither funds nor labour to assist in its production. The utility function of a beneficiary is:

$$U_B(b_1, b_2) = \mu v(b_1) + \mu(1 - \Delta^B)v(b_2)$$

If $\Delta^B = 0$ beneficiaries are indifferent to the mission. If $\Delta^B > 0$ then they prefer mission R. We will assume $\Delta^B \geq 0$. We take the position that beneficiaries are either neutral about the mission – or they prefer the mission R, that is to say $\Delta^B > 0$. Why R? Beneficiaries are presumably less advantaged than agents in $\mathcal{A}$, and when $m_S > m_R$ the worst off agents in $\mathcal{A}$ prefer mission R.

Donors decide up-front on an allocation of funds d_j to be allocated for charitable giving. Once this allocation has been decided upon, the funds cannot be used for private consumption. Such up front contributions are common in aid agencies and amongst wealthy donors, who will often commit funds to their foundation to demonstrate their capacity to give to potential recipient organisations, or to benefit from favourable tax treatment.

The funds of the donor, and the labour of the entrepreneur are both necessary for the production of the charitable good: no unmatched agent can produce alone. Thus we assume that NGO entrepreneurs have no funds of their own that they can use to fund their NGO's project.

Once agents in $\mathcal{A}$ have chosen to be a donor or an entrepreneur, donors and entrepreneurs are matched in a one-to-one stable matching.[12] A matching is a pairing between donors and entrepreneurs, in which every donor (entrepreneur) is either matched with an entrepreneur (donor), or goes unmatched. Recall that $\mathscr{D}$ is the set of donors, and $\mathscr{E}$ the set of entrepreneurs, endogenously determined at $t = 1$. At $t = 2$, If $f \in \mathscr{D}$ and $e \in \mathscr{E}$, a matching is a function

$$\eta : \mathscr{D} \cup \mathscr{E} \to \mathscr{D} \cup \mathscr{E}$$

such that:

[11] This is the case even though the good produced by the NGO could be private for the recipients of the charity – the fact that both entrepreneur and donor value the welfare of the homeless means that providing housing to the homeless is a public good

[12] In this paper we assume that a single donor is paired with a single NGO entrepreneur – that is, donors cannot donate to multiple charities, and entrepreneurs can only receive money from a single donor. This is a strong assumption – though there is substantial evidence that donors face capacity constraints, which prevent them from scaling up their activities even when new funding sources become available. Feeny and de Silva (2012) provide a typology of such constraints. These include physical and human capital constraints, policy and institutional constraints, macroeconomic constraints and social and cultural constraints. Both within and outside of development contexts, 'capacity building' is a commonly used term to indicate that NGOs may need investment in their management, strategy, human resource management and culture in order to be able to scale up their activities (including by accepting funds from multiple donors) and hence to achieve their maximum possible impact. The United Nations Development Program has a Capacity Development Group to support aid recipients to develop their leadership, institutions knowledge and accountability mechanisms (UNDP 2011).

1. $\eta(f) \in \{f\} \cup \mathscr{E}$
2. $\eta(e) \in \mathscr{D} \cup \{e\}$
3. $\eta(e) = f \iff \eta(f) = e$

If $\eta(k) = k$, then k is matched with herself (otherwise put, remains unmatched). The three conditions above thus say that f must be matched with herself or with an element of $\mathscr{E}$; e must be matched with himself or with an element of $\mathscr{D}$; and if e is matched with f, then f must be matched with e.

Following Roth & Sotomayor (1992) a matching is stable if there exists no donor and entrepreneur, who, whilst not matched with one another, could obtain higher payoffs if they were to be matched with each other (with at least one of these agents obtaining a strictly higher payoff). We assume that, if an agent is indifferent between two matchings, they choose the one that maximises the joint surplus produced by the match (i.e. they choose the match for which their partner receives higher utility).

The payoffs of the agents in a stable matching are determined as follows. Let $\Pi(j,i)$ and $\pi(j,i)$ be the utility of the donor and NGO entrepreneur respectively from the donations of donor of type j to an NGO entrepreneur of type i. These are defined by the mission contracting game that takes place between matched donors and entrepreneurs, set out below. Let z_{ji} be the equilibrium transfer of a donor of type j to an entrepreneur of type i. If a donor of mission preference j is matched with an entrepreneur of mission preference i, the donor receives $m_j - d_j + \Pi(j,i) - z_{ji}$ and the entrepreneur receives $\pi(j,i) + z_{ji}$.

Following Besley and Ghatak (2005; 2014), we assume that a person on the short side of the market gets the maximum amount of surplus from the match compatible with $z_{ji} > 0$ (that is to say, transfers can only be made from donors to entrepreneurs and not vice-versa). This pins down payoffs in a stable matching for all agents who are not unmatched for $N_D \neq N_E$. If $N_D = N_E$ we assume that a donor gets a share 1/2 of the surplus from the match, with the entrepreneur extracting the remaining surplus.

As for unmatched agents in $\mathcal{A}$, an unmatched NGO entrepreneur has a payoff of zero. An unmatched donor has a payoff of $m_j - d_j$ where m_j is his income and d_j is the amount of funding he has pre-committed to charity.

The donor's contribution to the NGO d_j can be split into two parts: project funding b_j and mission influencing activities w_j. If donors and entrepreneurs do not share the same mission preference, the donor cannot directly specify the mission to be chosen in a contract – because, although the donor eventually observes the mission chosen (in the long run) the donor cannot observe the mission realisation on the time scale of the contract (in the short run). He can only influence the mission chosen by the NGO entrepreneur by offering a payment which is conditional on a signal received in the short run that indicates which mission the agent has chosen. Thus, following Scharf (2010), there is *mission moral hazard.*

The entrepreneur chooses either mission R or mission S for the entire project – he cannot use some of the funding for mission R and some for mission S. Let the signal of the mission be denoted by $\sigma \in \{0,1\}$ and let $j \in \{R,S\}$ be the donor's preferred mission. Then the signal is high when the mission m is the donor's preferred mission with probability θ_1, and the signal is high when the mission chosen is the entrepreneur's mission with probability $\theta_0 < \theta_1$, i.e.:

$$\begin{aligned} Pr(\sigma = 1|m = j) &= \theta_1 \\ Pr(\sigma = 1|m \neq j) &= \theta_0 < \theta_1 \end{aligned}$$

We define a measure of signal strength Θ – the effectiveness with which the signal distinguishes between desirable and undesirable actions by the entrepreneur – as:[13]

$$\Theta = \frac{\theta_1 - \theta_0}{\theta_1}$$

Thus the expected mission-conditional payment received by the entrepreneur is $\theta_1 w_j$ if he chooses mission j and is $\theta_0 w_j$ otherwise. The budget constraint[14] of the donor must be respected:

$$\begin{array}{lrcl} \text{Entrepreneur chooses mission } j: & b_j + \theta_1 w_j & \leq & d_j \\ \text{Entrepreneur chooses mission } i \neq j: & b_j + \theta_0 w_j & \leq & d_j \end{array}$$

In summary, agents in $\mathcal{A}$ play a game with the following timing convention:

1. **Occupational Choice and donations decisions:** Agents in $\mathcal{A}$ make an irrevocable decision about whether to become a NGO entrepreneur, or a donor. Agents of preference type j that decide to be donors earn m_j in the private sector and set aside funds that can only be used for charitable giving, d_j. Agents that decide to be entrepreneurs earn nothing in the private sector.
2. **Stable Matching:** The set of donors $\mathcal{D}$ and NGO entrepreneurs $\mathcal{E}$ are matched in a stable matching (Roth and Sotomayor, 1992). A donor makes an unconditional transfer $z \geq 0$ to the entrepreneur with whom they are matched.
3. **Donor-entrepreneur interaction:**
   - i **Contracting:** When a donor is matched to an entrepreneur, the donor offers (b, w) to the NGO entrepreneur, where b is project size and w is a mission-conditional payment.
   - ii **Mission choice and production:** Given the offer of (b, w) the entrepreneur chooses the mission, receives project funding b, and produces.
   - iii **Signal-conditional payment:** Given the realisation of the signal, the donor pays out the relevant mission-conditional payment w.
   - iv **Donor experiences mission utility:** The donor observes the realisation of the mission and experiences the utility of having contributed to such a good.

We suppose that the discount factor is 1 and we seek a subgame perfect Nash equilibrium of the above game (noting, however, that strictly speaking the second stage does not correspond to a game solvable by Nash equilibrium, but to a stability concept). Otherwise put, we solve for a Nash equilibrium of the first (entry) stage above, where the payoffs are determined by the expected payoff of a stable matching.

The sections that follow are structured to solve the game set out above by backwards induction. In Section 3.1, we study the game that takes place at $t = 3$, once a donor and entrepreneur have been matched. Determining the payoffs from those steps allows us to determine the stable matchings at $t = 2$, which we undertake in Section 3.2. Finally, we determine the $t = 1$ entry decisions of all agents in $\mathcal{A}$, which yields us the SPNE, in Section 3.3.

3.1 Contracting in a fixed donor-entrepreneur pair

In this section, we study the interaction between a paired donor and entrepreneur that takes place at $t = 3$. We take d_j as fixed (recall this is determined at $t = 1$) – in Section 3.3 we solve for its value.

[13] We motivate our assumption regarding the observability of the entrepreneur's choice of mission by noting that there are many situations in which the full benefits of an NGO's activity are only observable in the long run. For example, in the short run a NGO entrepreneur can share data with a donor about how many people attend a clinic for an HIV test, but it takes longer to evaluate the effects of such an initiative on new HIV infections. The first may be an indicator of the second, but the second is what the donor really cares about. Alternatively, mentoring is a common approach to tackle delinquency amongst disaffected youth. In the short run, a donor to a mentoring programme may be able to observe how many mentor-mentee pairs have been formed and how often they have met, but it would take years to be able to compare the outcomes for mentees against comparable youths who were not mentored. Finally, an aid donor may want to promote trade and development, and may fund the construction of new roads in order to facilitate the exchange of goods. In the short run, the donor may be able to verify how many roads have been constructed. But to gauge the long term impact, the donor needs to know how well the roads are maintained, and what additional trade has taken place.

[14] We assume that the donor has access to actuarily fair insurance, and that when she offers the entrepreneur a contract involving a strictly positive conditional payment, she fully insures against the possibility of having to make this payment. Thus, the donor's budget constraint must be satisfied in expectation, but does not necessarily need to be satisfied *ex post*

3.1.1 Mismatched pair

Suppose that a donor, without loss of generality, of mission preference S, is matched with a donor of mission preference R. Suppose that the S donor wishes the R donor to choose mission S, offering a contract (b_S, w_S). Then, the *mission incentive compatibility constraint* of the entrepreneur must be respected:

$$\begin{array}{rcl} \mu(1-\Delta^R)v(b_S)+\theta_1 w_S & \geq & \mu v(b_S)+\theta_0 w_S \\ \theta_1 w_S & \geq & \frac{\mu\Delta^R}{\Theta}v(b_S) \end{array} \tag{1}$$

In the first line of the above, each side of the equation on the top line consists of the mission-dependent utility from the project of size b_S, plus the expected mission-conditional payment that the entrepreneur receives. The left hand side gives the payoff under mission S, the right hand side the payoff under mission R. The donor's budget constraint implies:

$$b_S+\theta_1 w_S \leq d_S$$

Combining this with the mission incentive compatibility constraint (1), we obtain that the maximum project size b_S compatible with mission S being chosen is implicitly defined by:

$$b_S+\frac{\mu\Delta^R}{\Theta}v(b_S)=d_S$$

We thus obtain that $b_S=g^{-1}(d_S)$ where $g(b)=b+\frac{\mu\Delta^R}{\Theta}v(b)$. Let the utility of a donor of type j matched with an entrepreneur of type i implementing mission m be $\Pi(j,i,m)$. Similarly let the utility of an entrepreneur of type i matched with an entrepreneur of type j when the mission m is chosen be $\pi(j,i,m)$. Given the donor's choice of b_S, the utility of the donor and the entrepreneur under mission S (denoted, respectively, by $\Pi(S,R,m=S)$ and $\pi(S,R,m=S)$), are given by:

$$\begin{array}{lcl} m_S-d_S+\Pi(S,R,m=S) & \equiv & m_S-d_S+\mu v(g^{-1}(d_S)) \\ \pi(S,R,m=S) & = & \left(\mu(1-\Delta^R)+\frac{\mu\Delta^R}{\Theta}\right)v(g^{-1}(d_S)) \end{array} \tag{2}$$

Alternatively, the donor can choose not to implement his preferred mission, and to allow the entrepreneur to implement his preferred mission. In this case, there is no mission-conditional payment, and the payoffs of the donor and entrepreneur respectively are:

$$\begin{array}{lcl} m_S-d_S+\Pi(S,R,m=R) & \equiv & m_S-d_S+\mu(1-\Delta^S)v(d_S) \\ \pi(S,R,m=R) & \equiv & \mu v(d_S) \end{array} \tag{3}$$

Now the donor chooses between enforcing mission S and choosing mission R. We denote the payoffs when the donor chooses the mission as follows at stage 3 (iv) as follows:

$$\begin{array}{lcl} \Pi(S,R) & = & \max_m \Pi(S,R,m) \\ \pi(S,R) & = & \pi(S,R,\arg\max_m \Pi(S,R,m)) \end{array}$$

Considering the donor's mission choice decision, we obtain the following Lemma.

Lemma 1 *Fix a donor's contribution to an NGO at $d=d_S$. Then the entrepreneur always prefers that the donor chooses mission R.*

The donor chooses mission S if and only if:

$$d_S \geq d_S^* \tag{4}$$

Mission S maximises joint donor-entrepreneur surplus if and only if:

$$d_S \geq d_S^{**} \tag{5}$$

with $d_S^{**} > d_S^*$ Thus, on the interval (d_S^*, d_S^{**}), the donor enforces mission S when mission R would maximise joint surplus.

Consider a beneficiary $\in \mathcal{B}$ who cares only about project size. Then the beneficiary strictly prefers that the donor allows the NGO entrepreneur to choose mission R.

Lemma (1) says that, over some range of d_S, the donor sometimes chooses a mission that is good for him but bad for joint donor-entrepreneur surplus. This effect arises because the donor does not take into account the effect the mission choice has on the entrepreneurs payoff – beyond, of course, the necessity of satisfying the entrepreneur's mission incentive compatibility constraint.

Lemma (1) provides partial support for the Busan Declaration's ideal of placing the mission decision in the hands of the NGO entrepreneur. When $d_S \in (d_S^*, d_S^{**})$, the donor does not choose the joint surplus maximising mission, and joint welfare would be higher if the NGO entrepreneur chose the mission.[15] If, instead, we consider uniquely the interest of the beneficiaries $\mathcal{B}$, then the entrepreneur should always choose the mission because they priortise the highest project size b and mission R. However, given that this lemma relies on an exogenous choice of d_S, we should be careful in its application. Later we will see that the conclusions of this lemma can be overturned for endogenous d_S and occupational choice.

3.1.2 Assortatively matched pair

Suppose that donor and entrepreneur share the same mission preference j. Then there is no need for a mission-conditional payment to enforce the donor's preferred mission. Hence the donor sets $b_j = d_j$ and the payoff of the donor ($\Pi(j,j)$) and entrepreneur ($\pi(j,j)$) respectively, at $t = 3(iv)$ are:

$$\begin{aligned} m_j - d_j + \Pi(j,j) &\equiv m_j - d_j + \mu v(d_j) \\ \pi(j,j) &= \mu v(d_j) \end{aligned}$$

3.2 Stable matching

In this section, we characterise the set of stable matchings at $t = 2$, given the entry decisions of agents in $\mathcal{A}$ at $t = 1$. That is to say, we take the set of donors $\mathcal{D}$ and entrepreneurs $\mathcal{E}$ as fixed. Then, in Section 3.3, we will explore which agents in $\mathcal{A}$ choose to be donors and which choose to be entrepreneurs, given that they anticipate that at $t = 2$ they will be matched in a stable matching.

Let N_D^R be the number of R agents who have chosen to be donors, and let N_E^R be the number of R agents who have chosen to be entrepreneurs, with $N_D^R + N_E^R = N$. Similarly, let N_D^S be the number of S agents who have chosen to be donors, and N_E^S to be the set of S agents who have been chosen to be entrepreneurs, with $N_D^S + N_E^S = N$.

Recall from section 3 that a matching is stable if there no two matched donor- entrepreneur pairs (f_1, e_1) and (f_2, e_2) such that $\eta(f_i) = e_i$ and $\eta(e_i) = f_i \; \forall i = 1, 2$ and both:

$$\begin{aligned} \Pi(m(f_1), (m(e_2)) - z(f_1, e_2) &\geq \Pi(m(f_1), (m(e_1)) - z(f_1, e_1) \\ \pi(m(f_1), (m(e_2)) + z(f_1, e_2) &\geq \pi(m(f_2), (m(e_2)) + z(f_2, e_2) \end{aligned} \tag{6}$$

where $z(f, e)$ being the transfer of donor f to entrepreneur e, with at least one inequality strict. If two such donor-entrepreneurs exist, then donor f_1 and entrepreneur e_2 would want to break their existing pairing to match with each other, so the matching would not be stable.

In the following Lemma, we characterise the possible payoffs of each type of agent in a stable matching. That is to say, we characterise the payoffs where each possible element of $\mathcal{D}$ is matched with each possible element $\mathcal{E}$. In a stable matching, which we characterise in a later proposition, only a subset of these possible matches will occur.

The concept of a stable matching at $t = 2$ will has different implications for payoffs depending on whether donors are on the short side of the market $N_D < N_E$ or the long side $N_D > N_E$, as transfers z are only possible from donors to entrepreneurs. If donors are on the long side of the market, then entrepreneurs will be able to extract all the surplus from a prospective donor match at the matching stage, by demanding a transfer z from a prospective donor match that is equal to the donor's payoff Π from the match. By contrast, when donors are on the short side of the market, the fact that entrepreneurs have no private sector earnings implies that donors cannot, at $t = 2$ extract the entire surplus from a donor-entrepreneur match in the same manner. The following Lemma summarises this basic situation.

Lemma 2 *The payoffs in a stable matching equilibrium can be characterised as follows:*

[15] Above d_S^{**}, however, the NGO entrepreneur would choose mission R when mission S should have been chosen.

- *Let $N_D > N_E$ (donors are on the long side of the market). Then $z(j,i)$ is such that a donor with mission preference j will always have payoff $m_j - d_j$ regardless of whom she is matched with. An entrepreneur of type i, matched with a donor of type j will have a payoff of $\pi(j,i) + \Pi(j,i)$.*
- *Let $N_D < N_E$ (donors are on the short side of the market). Then $z(j,i)$ is such that an unmatched entrepreneur receives a payoff of zero; an entrepreneur of type i matched with an donor of type j receives a payoff of $\pi(j,i)$; and a donor of type j matched with an entrepreneur of type i receives a payoff of $m_j - d_j + \Pi(j,i)$.*

We are now in a position to characterise the set of possible stable matchings that can arise for a given configuration of the occupational choice entry game:

Lemma 3 *A stable matching falls into one of the four following categories depending on $N_E^R, N_D^R, N_E^S, N_D^S$:*

1. ***More entrepreneurs than donors** $N_E \geq N_D$*
   (a) ***No mission mismatch; see Figure (1)** If $N_E^i \geq N_D^i$ $\forall i \in \{R,S\}$, then all donors are matched with an entrepreneur sharing their mission preference. Any remaining entrepreneurs go unmatched.*
   (b) ***Mission Mismatch; see Figure (2)** If there are not enough entrepreneurs for all donors of type i to be matched with entrepreneurs of type i (wlog assume $N_E^S < N_D^S$), then all S entrepreneurs are matched with S donors; all remaining S donors are matched with R entrepreneurs; and all R donors are matched with R entrepreneurs. Any remaining entrepreneurs, all of type R, go unmatched.*
2. ***More donors than entrepreneurs** $N_D \geq N_E$*
   (a) ***No mission mismatch; see Figure (3)** $N_D^i \geq N_E^i$, $\forall i \in \{R,S\}$ Then all entrepreneurs of type i are matched with donors of type i and any remaining donors go unmatched*
   (b) ***Mission Mismatch; see Figure (4)** Suppose wlog $N_D^S < N_E^S$. Then all S donors are matched with S entrepreneurs and the remaining S entrepreneurs are matched with R donors. All R entrepreneurs are matched with R donors and the remaining donors, all of type R, go unmatched.*

The intuition for Lemma (3) is straightforward. Consider first the case when $N_E > N_D$ and $N_E^i > N_D^i$ for both $i \in \{R,S\}$, as in case 1(a). Since each donor prefers being matched with an entrepreneur of his preferred mission to being matched with an entrepreneur of a different mission preference, and each entrepreneur prefers to be matched than to go unmatched, the only stable matching involves assortative matching. A similar argument can be made for $N_D > N_E$ and $N_D^i > N_E^i$ for both $i \in \{R,S\}$, ie, for case 2(a). Now consider a case where $N_E > N_D$ and suppose that that $N_D^S < N_E^S$, as in case 1(b). Then there are not enough S entrepreneurs to be matched with S donors. As S donors are better of being matched with an entrepreneur sharing their mission preferences, we can show that this means that all S entrepreneurs are matched with S donors – that is to say, no S donor is matched with an R entrepreneur whilst an S entrepreneur goes unmatched. This means that mismatch is a residual phenomenon – only after the supply of S entrepreneurs has been used up are S donors matched with R entrepreneurs. A similar argument can be made for $N_D > N_E$ with $N_D^S < N_E^S$, ie, for case 2(b).

3.3 Entry Equilibria

In this section, given what we know of stable matchings and their payoffs from Sections 3.1 and 3.2, we now solve for this first step of the game, when agents in $\mathcal{A}$ choose to be either donors or entrepreneurs, and in which those who decide to be donors choose how much to commit to charitable giving.

We begin by noting an important feature of the entry equilibrium where the number of donors endogenously exceeds the number of entrepreneurs.

Lemma 4 *The only equilibrium with $N_D > N_E$ involves $N_E^R = N_E^S = 0$ and $d_R = d_S = 0$. This equilibrium always exists.*

Figure 1: $N_E > N_D$ with no mission mismatch

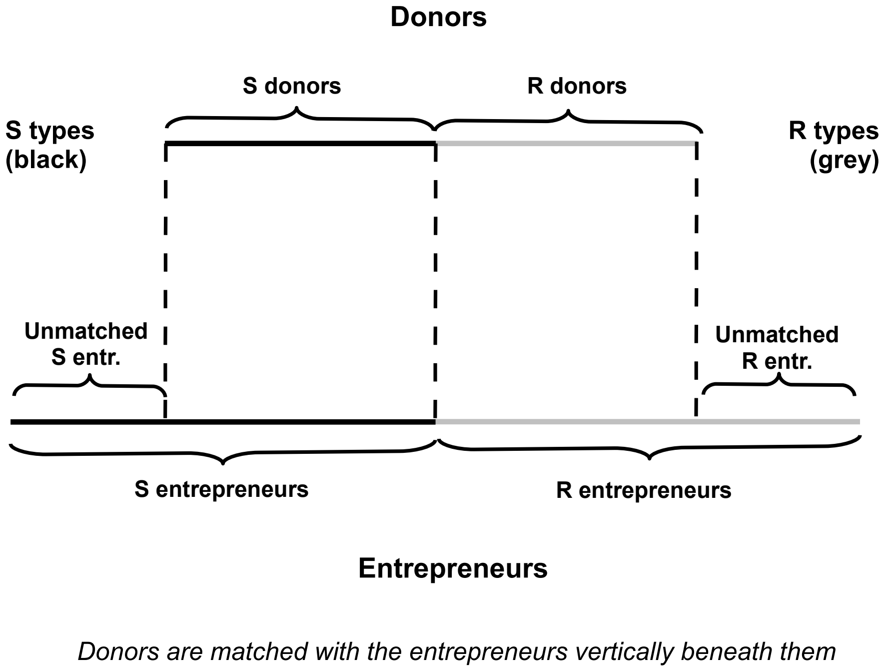


Figure 2: $N_E > N_D$ with mission mismatch

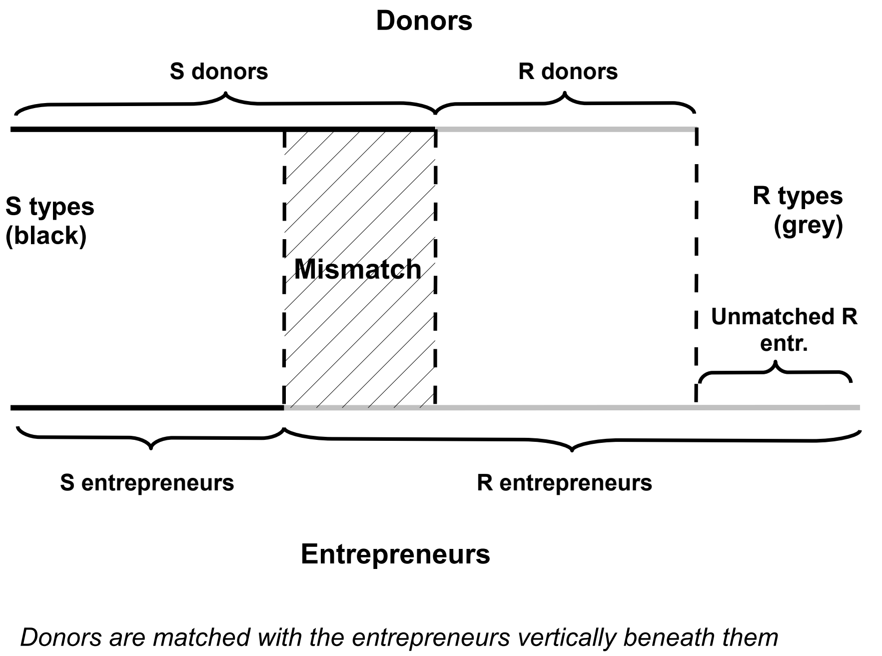
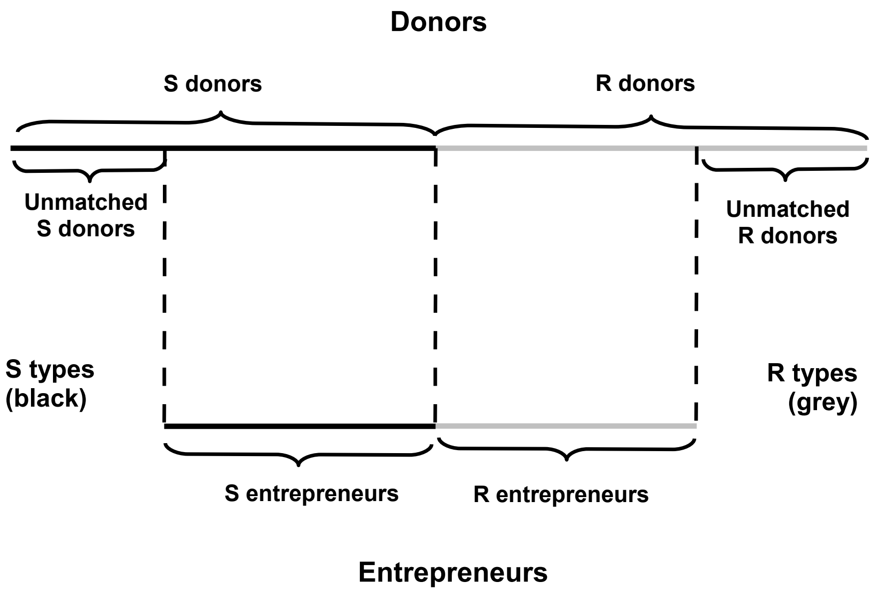
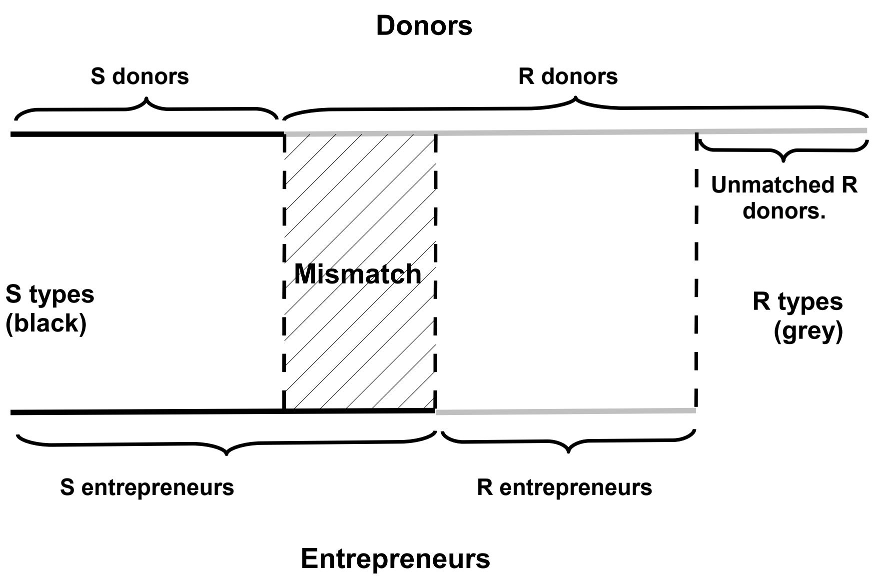


Figure 3: $N_D > N_E$ with no mission mismatch



Donors are matched with the entrepreneurs vertically beneath them

Figure 4: $N_D > N_E$ with mission mismatch



Donors are matched with the entrepreneurs vertically beneath them

Proof of Lemma (4). Suppose that $N_D > N_E$. Then the payoff of every donor of type j in a matching equilibrium is $m_j - d_j$. At $t = 1$, given this payoff in a stable matching equilibrium, the donor chooses how much to commit to giving to charity, that is to say, he chooses d_j to maximise $m_j - d_j$. Thus he chooses $d_j = 0$. Given this the payoff of any type that enters as an entrepreneur is 0. Thus all types enter as donors, with the payoff of type j being m_j. $\square$

The intuition behind Lemma (4) is simple. When donors are on the long side of the market they are pushed down to their utility they would have when they find no entrepreneur to give to. Thus in equilibrium they never experience any of the surplus from their gift, and given this, they should never commit any funds to charitable giving.[16]

Having characterised the set of equilibria with $N_D > N_E$, we turn our attention to entry equilibria with $N_E \geq N_D$. We first rule out entry equilibria which give rise to more entrepreneurs than donors, and in which there is assortative matching. Further, we show that when $N_E = N_D$ there is rarely an assortative matching equilibrium – that is to say only when s (the share of surplus obtained by a donor from a match when $N_E = N_D$) takes a special and rather artificial value. We have no particular reason to think that this value of s is likely to arise.

Lemma 5 *Suppose that $m_S > v'^{-1}(1/\mu)$; ie, donors have strictly positive private consumption. Then there is no entry equilibrium with $N_E \geq N_D$ characterised by assortative matching.*

The intuition for Lemma (5) is as follows. When donors and entrepreneurs are assortatively matched, the entrepreneur receives no mission-conditional payment. Thus an entrepreneur who is matched with a donor in equilibrium receives only utility from the production of the charitable good with his preferred mission, $\mu v(d_j)$ where d_j is the total donated by the donor for the production of a charitable gift. The donor also receives this utility, but also benefits from his leftover income as private consumption $m_j - d_j$. To show that all j types are strictly better off as donors – so there is no entry equilibrium with j types on both sides of the market –it suffices to show that private consumption is strictly positive, i.e. that $m_j > d_j = v'^{-1}(1/\mu)$.

Having set out the unique equilibrium with $N_D > N_E$, and having shown the very limited circumstances under which assortative matching equilibrium with $N_E \geq N_D$ can arise, we now turn to characterising the conditions under which a mismatch equilibrium with $N_E > N_D$ can arise.

Proposition 1 *Let $m_R = m_S = m$. Then there is no equilibrium with $N_E > N_D$ involving mismatch.*

When R types and S only differ in their mission preferences and in no other aspect that there is no force that could sustain the system in a state of mission mismatch. The proof for Proposition 1 works as follows. Suppose that such an equilibrium exists, and consider Figure (2). As S donors are not matched with S entrepreneurs with probability 1, they give less than R donors, who are matched with R entrepreneurs with probability 1. But then an R type would always better off as a donor, since he can earn $m_R - d_R + \mu v(d_R)$ as a donor, and less than $\mu v(d_R)$ as an entrepreneur. Hence there are no R entrepreneurs – a contradiction.

In the next proposition, we prove that such equilibria exist when, apart from differing mission preferences, types R and S differ in terms of income. We provide a set of sufficient conditions for a mission

[16] Lemma (4) seems to be dependent on our assumption that donors commit funds to be used only for charitable giving before the matching takes place. In fact, this is not the case. donation decisions after being matched with an entrepreneur. In this case, there is only an equilibrium with $N_D > N_E$ for a set of (m_i, m_j) of measure zero in $\mathcal{R}^2$ – specifically, the following would be necessary. Without loss of generality let k be the preferred mission of the entrepreneur who is always assortatively matched (see Lemma 3 to verify that there is alway such an entrepreneur).

$$m_k = 2\mu v(v'^{-1}(1/\mu)) - v'^{-1}(1/\mu) \tag{7}$$

The left hand side is the payoff of the donor, given that he can never do worse than to give nothing up front. The right hand side is $\mu v(v'^{-1}(1/\mu)) + z$ where z is the maximum transfer that the donor can make to the entrepreneur whilst guaranteeing himself a payoff of z. To have a k type on both sides of the market, equation (7) is necessary. But this corresponds to a particular value of m_k.

mismatch equilibrium to exist. Although we prove existence, we do not have uniqueness: for example, it is possible that there is an equilibrium in which donations are high, the degree of mismatch is low and the mission chosen by the S donor when mismatched is mission S – and that there also exists an equilibrium with lower donations, a higher degree of mismatch and where the mission chosen by the S donor when mismatched is either mission R or S.

Proposition 2 *Let the difference in private sector earnings abilities between $S$and R types, m_S and m_R respectively, be sufficiently different in the sense that they obey the conditions:*

$$m_S > v'^{-1}\left(\frac{1}{\mu}\right) > g^{-1}\left(v'^{-1}\left(\frac{1}{\mu(1-\Delta^S)}\right)\right) > m_R \tag{8}$$

Then there exists some l and $\hat{\Delta^S}$ such that for $m_S - v'^{-1}(1/\mu) < l$ and $\Delta^S \geq \hat{\Delta}^S$ there exists an entry equilibrium with mismatch, that is to say, the equilibrium involves a matching as in part 1(b) of Lemma 3, ie, as follows:

- *$N_D < N_E$ – entrepreneurs are on the long side of the market.*
- *Both S types and R types enter both sides of the market (i.e. become both donors and entrepreneurs) in a certain proportion.*
- *$N_D^S > N_E^S$ – there are more S donors than Sentrepreneurs, so that some S donors must be matched with R entrepreneurs.*

The condition $m_S - v'^{-1}(\frac{1}{\mu}) < l$ is not a necessary condition for the existence of a mismatch equilibrium, but it is necessary for an equilibrium with some S entrepreneurs to exist. If not, then S donors' private consumption is so large that all S types prefer to be donors. Neither is the assumption that $\Delta^S \geq \hat{\Delta^S}$ necessary for our result, though it comes in useful as a sufficient condition for existence.

What is crucial for existence of a mismatch equilibrium – given the result of Proposition 1 – is that income is correlated with preferences, ie $m_S > m_R$. In the Proof of Proposition 1, we note that the conditions $v'^{-1}(1/\mu) > m_S$ and $g^{-1}\left(v'^{-1}\left(\frac{1}{\mu(1-\Delta^S)}\right)\right) > m_R$ imply that $d_S > d_R$. In other words, it is inequality in donations which holds together this mismatch equilibrium. R entrepreneurs, who face the risk of being mismatched or unmatched, must be content with their lot and not be tempted to change their entry decision at $t = 1$ to become a donor. If they were to do this, they would get their preferred mission with probability 1. What makes it worthwhile for them to stay as entrepreneurs and tolerate the probability of mission mismatch? R entrepreneurs are actually better off matched with an S donor than they would be with an R donor in this equilibrium: they don't get their preferred mission but they do get a much larger donation than they would from someone who share their preferences and private sector income-earning opportunities. To take the example used in the introduction, Mother Teresa (an R entrepreneur) must have found the donations she receives from rich benefactors sufficiently appealing, even taking into account any cost she may have faced as a result of mission tensions,[17] to prevent her from wishing to earn money in the private sector and donate it to a cause sharing perfectly her values.

Secondly, S donors, who face the risk of being matched with an R entrepreneur, must not be tempted to change their entry decision and decide to obtain an S mission with probability one by being an S entrepreneur (who would always obtain their preferred mission). What prevents them doing this? S types who enter as entrepreneurs have to give up a payoff from private consumption of $m_S - d_S$ that they could get if they earned in the private sector. Going back to the Mother Teresa example, those who gave to her charity must have been content in their role of donors, and were not tempted to pack in their job in the private sector which allowed them both to contribute to Mother Teresa, and to have a comfortable style of life. Becoming a NGO entrepreneur would have allowed them to do things in line with their preferences – for example, using a more medicalised approach to end-of-life care – but would have involved a substantial sacrifice in terms of style of life.

[17] There is little evidence to suggest that donors with different preferences had much mission influence on her practices. In our model, this lack of donor influence over the mission in mission-mismatched donor-entrepreneur pairs is equivalent to donors allowing entrepreneurs to choose their preferred mission R.

3.4 The Busan Declaration

The Busan Declaration is a voluntary compact that donors can sign, to illustrate, amongst other things, their commitment to allow NGO entrepreneurs to choose their preferred mission, and to provide financing to realise this mission. It does not take the form of a binding agreement or international treaty. It is not signed, and does not give rise to legal obligations. Rather, it is a statement of consensus that a wide range of governments and organisations have expressed their support for, offering a framework for continued dialogue and efforts to enhance the effectiveness of development cooperation.[18]

As is the case for many international accords, one might imagine that the Busan Declaration have more effect if it were enforceable – that is to say, if donors were compelled to put the choice of the mission in the hands of NGO entrepreneurs. Given the result of Lemma (1) – which says that, fixing the donation d_S, the donor sometimes inefficiently enforces his preferred mission on the entrepreneur – it would seem that this declaration might sometimes achieve more when it is enforced. However, we cannot conclude this from Lemma (1) – we need to check this given donation levels and entry decisions are endogenous.

In this section, we examine the Busan Declaration in the full model set out in section 3, including endogenous donation decisions and entry choices – and find, under some circumstances – our earlier, tentative conclusion, is not justified. If the conditions of Proposition 2 hold – and particularly the assumption $\Delta^S \geq \hat{\Delta}^S$ (that S donors care more than a minimum amount for mission S over mission R), then the Busan Declaration should never be enforced – if we take the point of view of the welfare of agents in $\mathcal{A}$. Unfortunately, we cannot reach a conclusion if we also take into account the welfare of the set of beneficiaries $\mathcal{B}$.

Given that the model we have been studying has multiple equilibria, one might imagine that little can be said about the effects of the Busan Declaration on welfare. We are able to tackle this question for two reasons. One is that it turns out the welfare of the agents in $\mathcal{A}$ can be written in a very simple form that depends on donations only. This expression implies that the equilibrium with the highest donations from S types is the equilibrium giving rise to the highest possible welfare of agents in $\mathcal{A}$, regardless of the mission chosen when agents are mismatched (which is logical given than a higher degree of mission mismatch always leads to lower donations). The second reason is that one can show that, for $\Delta^S > \hat{\Delta}^S$, imposing mission R on S donors either creates a mismatch equilibrium with lower donations, or destroys the mismatch equilibrium and pushes the equilibrium to the inefficient, no donations equilibrium described in Lemma 4.

We now introduce the following notation. Let $\mathcal{M}(\mathcal{A})$ be the maximum possible welfare of the agents in $\mathcal{A}$, taken over all the possible equilibria of the entry game. Let $\mathcal{M}_B(\mathcal{A})$ be the maximum possible welfare of the agents in $\mathcal{A}$, taken over all the possible equilibria of the entry game when the Busan declaration is enforced.

Proposition 3 *Suppose that the conditions of proposition 2 hold. Then: $\mathcal{M}_B(\mathcal{A}) < \mathcal{M}(\mathcal{A})$ – the maximum possible welfare of agents in $\mathcal{A}$ falls with the implementation of Busan. Then the effects on the welfare of agents on $\mathcal{B}$ cannot be determined.*

To understand this proposition, note that the Busan Declaration has the following potential effects on agents in $\mathcal{A}$:

- The marginal return on giving is lowered, hence S donors give less.
- This reduces the payoffs of all S types, but donors by more since entrepreneurs never face mission mismatch. As a result the number of S donors goes down.
- The effect on R types is uncertain; there are fewer S donors who could be matched with R entrepreneurs. If an R type is an entrepreneur matched with an S donor, then the R type's payoff could be higher or lower than in the equilibrium giving rise to welfare $\mathcal{M}(\mathcal{A})$, depending on how the smaller project size weighs against the fact that R type will have his preferred mission. If overall these effects bring about an increase in an R entrepreneur's expected payoff, then the number of R donors will go down. Thus fewer R types create wealth m_R that can be used to fund R entrepreneurs. (Given that the equilibria involves $N_E > N_D$, we would like more R entrepreneurs to become

[18](OECD, 2011): http://www.oecd.org/development/effectiveness/49732200.pdf

donors who create income that can be transformed into charitable goods, and thus also reducing the number of unmatched R entrepreneurs).

The proposition shows that, under the assumptions in the previous proposition that allowed us to construct a mismatch equilibrium, the above effects combine so that the welfare of agents in $\mathcal{A}$ goes down when the Busan Declaration is enforced. We note that this result rests on $\Delta^S \geq \hat{\Delta}^S$. Although we cannot prove existence of a mismatch equilibrium when $\Delta^S < \hat{\Delta}^S$, we note that, intuitively, as $\Delta^S \rightarrow$ tends to 0, the cost of implementing the Busan Declaration to the S types goes to zero.

Likewise for agents in $\mathcal{B}$, supposing that they are neutral about the mission, i.e. $\Delta^B = 0$, we have the following effects.

- On the positive side, less of the funding committed is wasted on mission-influencing activities and more reaches the beneficiaries in the form of project funding.
- On the negative side, less funding is given by S donors and there are fewer of them than when donors had free choice over mission-influencing activities
- There may be more or less funding from R donors, depending on the effect that the Busan Declaration has from R types.

We are unable to resolve the combination of these effects on beneficiaries $\mathcal{B}$. Whilst we cannot be sure that their welfare goes down with the enforcement of Busan, we hardly have a compelling case to implement it.

4 Discussion and Conclusion

This paper has used the Busan Declaration as a springboard to asking a question of broad relevance to many contexts involving the donor funding of NGO activity – namely, should donors, as the Busan Declaration suggests, limit their activity to providing funding, and allow recipients to decide on the uses to which these funds are put? Or are there circumstances under which it is socially desirable for donors to seek to shape the type of mission that is undertaken by recipient organisations?

We answer these questions by embedding a model of donor-entrepreneur interactions in a matching market of occupational choice, in which agents decide whether to enter the private sector or the charitable sector, private sector entrants decide whether or not to give, and donors and entrepreneurs are paired endogenously in a stable matching equilibrium.

Using this model, we first answer a question implicitly posed by the economic literature on the mission choice problem: namely, why should we expect mission conflict to arise in the first place, when agents can match assortatively and entry into the donor and entrepreneur roles (or, in other models, to the manager and worker roles) is endogenous? We show that, even when occupational choice and donor-entrepreneur matchings are endogenous, mission conflict can arise in the charitable sector when mission preferences are correlated with income-earning ability in the private sector. In such a world, rich philanthropists may have difficulty finding NGO entrepreneurs who share their preferences, and NGO entrepreneurs may be willing to compromise on the mission in order to access the larger donation budgets that come from being paired with a rich philanthropist. These two factors combine to create a charitable sector with a systematic tendency towards donor-entrepreneur pairings that involve disagreement over the mission. In this way, we offer an insight into how rich philanthropists can exert a decisive influence over the charitable sector, but we also suggest that this influence may come at the cost of a charitable sector riven with mission conflict.

In this richer setting, we consider a possible policy response to the tendency of donors to inefficiently enforce their mission – direct enforcement of the Busan Declaration. We find that directly prescribing that charities must implement the entrepreneur's preferred mission risks reducing social welfare, because when richer donors care sufficiently about the mission, making them adopt NGO entrepreneurs' mission pushes them to donate less, and to strive to influence the mix of charitable goods provided by becoming NGO entrepreneurs themselves.

These nuanced conclusions allow for a reflection on the quotes provided at the start of this paper. Our model of the market for charitable donations suggests that Hillary Clinton was – in the limited sense which we describe in section 3.1 – right to criticise the tendency of donors to impose their own preferences on the organisations that they donate to – but it also suggests that the power of donors to choose whom they give to, and whether or not to give in the first place – their capacity to call the whole thing off, in the words of our title – limits the scope for policy to rectify the problem of inefficient donor enforcement of their own preferred mission. Secondly, the quotation from Smillie (1995) highlights the tensions between donors and recipients, and alleges that the question boils down to one of justice – justice, presumably for the beneficiary group. This is in line with our result that if the Busan Declaration can be justified for Δ^S over some threshold, it must be beneficiaries that tip the balance, since welfare of the group of donors and entrepreneurs must go down. However, we must be more tentative than Smillie, as we cannot prove that enforcing the Busan Declaration would in fact makes this group any better off.

5 Appendix: Proofs

Proof of Lemma 1

The limit d_S^* can be chosen by comparing (2) and (5). The S mission is better for the donor if and only if:

$$\begin{array}{rcl} v(g^{-1}(d_S)) & \geq & (1-\Delta^S)v(d_S) \\ \iff \quad g^{-1}(d_S) & \geq & (1-\Delta^S)^{1/a}d_S \end{array} \tag{9}$$

Note that g is increasing and concave:

$$\begin{array}{rcl} g(b) & = & b + \frac{\mu\Delta^R}{\Theta}v(b) \\ g'(b) & = & 1 + \frac{\mu\Delta^R}{\Theta}v''(b) \\ g''(b) & = & \frac{\mu\Delta^R}{\Theta}v''(b) \end{array} \tag{10}$$

Since $g^{-1}(d)$ is an increasing and convex function of d with slope that tends to 1 as d_S tends to infinity, there exists d_S^* such that the RHS = LHS of 9. For all $d_S \geq d_S^*$ the LHS> RHS and hence the S mission is preferred.

Now we compare joint donor-entrepreneur surplus. Surplus is higher under mission S if and only if:

$$\begin{array}{rcl} v(g^{-1}(d_S)) - (1-\Delta^S)v(d_S) & \geq & v(d_S) - \left((1-\Delta^R) + \frac{\Delta^R}{\Theta}\right)v(g^{-1}(b)) \\ \iff g^{-1}(d_S) & \geq & \left(\frac{2-\Delta^S}{2-\Delta^R+\frac{\Delta^R}{\Theta}}\right)^{1/a} d_S \end{array} \tag{11}$$

Since for all $\Delta^R, \Delta^S \in (0,1)$, $\frac{2-\Delta^S}{2-\Delta^R+\frac{\Delta^R}{\Theta}} > 1-\Delta^S$ the threshold d_S^{**} at which (11) is satisfied with equality is above d_S^*.

Similarly, we can obtain that the entrepreneur prefers the R mission when

$$v(d_S) \geq \left((1-\Delta^R) + \frac{\Delta^R}{\Theta}\right)v(g^{-1}(d_S)) \tag{12}$$

by comparing (2) and (5). Next we will show that (12) holds if

$$v'(d_S) \geq \frac{1-\Theta}{\mu} \tag{13}$$

By the concavity of v – specifically using the relationship between the slope of a chord and the derivative – we have that

$$v'(d_S) \leq \frac{v(d_S) - v(g^{-1}(d_S))}{d_S - g^{-1}(d_S)} = \frac{v(d_S) - v(g^{-1}(d_S))}{\frac{\mu\Delta^R}{\Theta}v(g^{-1}(d_S))} \tag{14}$$

Rearranging (12) we have:

$$\begin{array}{rcl} v(d_S) - v(g^{-1}(b)) & \geq & \Delta^R\frac{1-\Theta}{\Theta}v(g^{-1}(b)) \\ \frac{v(d_S)-v(g^{-1}(b))}{\frac{\mu\Delta^R}{\Theta}v(g^{-1}(d_S))} & \geq & \frac{1-\Theta}{\mu} \end{array} \tag{15}$$

This holds if (13) holds. But (13) always holds, because at $t=1$ the S donor is always matched with an S entrepreneur with probability $\rho < 1$. Thus $d_S < v'^{-1}(1/\mu)$ or $\mu v'(d_S) > 1$. Finally, the fact that $g^{-1}(d) < d$ yields the result that agents in $\mathcal{B}$ prefer mission R as it gives rise to the largest project size.□

Proof of Lemma 2 When entrepreneurs are on the long side of the market, the donors cannot drive down entrepreneurs' share of the surplus of the match to zero, since entrepreneurs cannot make transfers to donors. If donor and entrepreneur share the same mission preference i the entrepreneur receives $\mu v(d_i)$. If a donor of type j and entrepreneur of type $i \neq j$, either:

- If the donor chooses mission j, the entrepreneur, as well as receiving utility $\mu(1-\Delta_i)v(g^{-1}(d_i))$ from the charitable project, receives $\frac{\mu\Delta_i}{\Theta}v(g^{-1}(d_i))$ in expected mission-conditional payments
- Otherwise the entrepreneur receives payoff $\mu v(d_j)$

When donors are on the long side of the market, donors can make transfers to the entrepreneur. Hence the entrepreneur receives all the surplus from the match and the donor of type j receives only what he would receive when unmatched, ie $m_j - d_j$. □

The intuition behind this result is as follows. A donor has the ability to transfer any surplus he receives from the match to an entrepreneur. However, an entrepreneur cannot transfer surplus in the same way to a donor. An entrepreneur on the long side of the market matched with a donor may thus earn rents over the payoff he would receive if unmatched – ie, 0. □

Proof of Lemma 3

First we consider the case $N_E > N_D$. Note first that all donors are matched, since each match generates positive surplus. In order to show that the match is as stated in part 1(a) or part 1(b) of the proposition, it suffices to show that:

- No R donor is matched with an S entrepreneur, whilst an S donor is matched with an R entrepreneur
- No j donor is matched with an i entrepreneur whilst an j entrepreneur goes unmatched

To show the first item above, suppose that $d_S > d_R$. Then note that the payoff of an S donor matched with an R entrepreneur is strictly less than $m_S - d_S + \mu v(d_S)$ whereas if he were to be matched with an S entrepreneur he would have payoff equal to $m_S - d_S + \mu v(d_S)$. The payoff of the S entrepreneur matched with the R donor would be less than $\mu v(d_R)$, whereas if he were matched with an S donor he could have payoff equal to $\mu v(d_S)$. Thus both the S donor and S entrepreneur could be made strictly better off by matching with one another. A similar argument applies if $d_R > d_S$. To show the second item above, note that the j donor has a payoff of less than $m - d_j + \mu v(d_j)$ when matched with an i entrepreneur but can achieve payoff $m - d_j + \mu v(d_j)$ when matched with a j entrepreneur. Further, the j entrepreneur is strictly better off when matched than unmatched. This is sufficient to prove part 1 of the proposition.
To prove part 2, when $N_D > N_E$, it is sufficient to prove that:

- No R donor is matched with an S entrepreneur, whilst an S donor is matched with an R entrepreneur
- No i entrepreneur is matched with an $j \neq i$ donor whilst an i donor goes unmatched

To prove the first part of the above, note that whilst each donor of type j earns $m_j - d_j$ regardless of the matching, note that an S entrepreneur matched with an R donor gets at most $\pi(R, S) + \Pi(R, S)$, an S entrepreneur matched with an S donor gets $\pi(S, S) + \Pi(S, S)$. Since the total surplus when an S donor is matched with and S entrepreneur is higher than the total surplus when an S entrepreneur is matched with an R donor, and since the S donor is indifferent between being matched with the R and S entrepreneur, our assumption that when one party is indifferent he goes with the match which generates the largest overall surplus implies that an S entrepreneur cannot be matched with and R donor whilst an R entrepreneur is matched with an S donor. To prove the second part of the above, it suffices to notice that an i entrepreneur is strictly better off with an i donor than with a j donor, whilst the i donor is indifferent between being matched with an i entrepreneur or going unmatched. □

Proof of Lemma 5

Suppose first that there exists an assortative matching equilibrium with $N_E > N_D$, ie the matching is characterised by part 1 of Lemma 3 and Figure 1. Now we examine the entry decisions of type j in such an entry equilibrium. As every j donor is matched with a entrepreneur of the same mission preference, a donor of type j gives $\max(v'^{-1}(1/\mu), m_j)$. Suppose first that there exists an equilibrium with $N_E > N_D$. The utility of the donor is $m_j - \max(v'^{-1}(1/\mu), m_j) + \mu v(\max(v'^{-1}(1/\mu), m_j))$ and the utility of the entrepreneur is less than $\mu v(\max(v'^{-1}(1/\mu), m_j))$. The payoffs of the donor and entrepreneur of type j thus cannot be equal – so we cannot have j types on both side of the market, as all types would strictly prefer to be donors. This is a contradiction of our assumption of $N_E > N_D$.

Suppose now that there exists and equilibrium with $N_D = N_E$ and the donor gets a share 1/2 of the surplus from the match. Then the donor's payoff is $m_j - d_j + \mu v(d_j)$ (where d_j is the endogenous donation level, to be specified) and the entrepreneur's payoff is $\mu v(d_j)$. The donor maximises $m_j - d_j + \mu v(d_j)$, hence $d_j = v'^{-1}(1/\mu)$. Thus j types are willing to enter on both side of the market if and only if:

$$\begin{aligned} m_j - d_j + \mu v(d_j) &= \mu v(d_j) \\ \iff \quad m_j = d_j &= v'^{-1}(1/\mu) \end{aligned} \tag{16}$$

But we assumed that $m_S > v'^{-1}(1/\mu)$, a contradiction. $\square$

Proof of Proposition 1

Suppose that an equilibrium with mismatch exists; wlog that $N_D^S \geq N_E^S$, so that all S entrepreneurs are matched and all unmatched entrepreneurs are R types as in Figure 2. Note first that this implies that $d_R \geq d_S$, since all R donors are matched with R entrepreneurs and S donors face a probability of mismatch. That is to say that the R donor maximises $\mu v(d_R)+m_R-d_R$ so that $d_R = \min(m_R, v'^{-1}(1/\mu))$, whereas the S donor is mismatched with positive probability, so that he maximises

$$\left(\mu\frac{N_E^S}{N_D^S}v(d_S) + \left(1-\frac{N_E^S}{N_D^S}\right)\max(\mu v(g^{-1}(d_S)),(1-\Delta^S)\mu v(d_S)\right) + m - d_S$$

Hence $d_S < d_R$. Consider now the R type's decision to become a donor or an entrepreneur. An R donor has payoff $m - d_R + \mu v(d_R)$ as he is matched with certainty with an R entrepreneur. An R entrepreneur, however, is matched with an S donor with a certain probability, in which case his payoff is $\leq \mu v(d_S)$ and is unmatched with a certain probability. This implies that the R entrepreneur's payoff is less than $\mu v(d_R)$. But then an R type is strictly better off as a donor than as an entrepreneur. In this case, $N_D \geq N_E$ – a contradiction. $\square$

In order to prove proposition 2 we will need the following lemma.

Lemma 6 *Let $v(b) = b^a$ where $a \in (\frac{1}{2},1)$. Then*

$$\mu y(d) \equiv \mu v(d) - \mu v(g^{-1}(d)) \tag{17}$$

is an increasing and concave function of d.

Proof of Lemma 6

The first derivative of $y(d)$ can be written:

$$\frac{\partial y}{\partial d} = \frac{\partial b}{\partial d}\left(v'\left(b+\frac{\mu\Delta^R}{\Theta}v(b)\right)\left(1+\frac{\mu\Delta^R}{\Theta}v'(b)\right) - v'(b)\right) \tag{18}$$

where $b = g^{-1}(d)$. This is positive if and only if:

$$\left(1+\frac{\mu\Delta^R}{\Theta}v'(b)\right)\left(v'\left(b+\frac{\mu\Delta^R}{\Theta}v(b)\right) - v'(b)\right) + \frac{\mu\Delta^R}{\Theta}v'(b)^2 > 0 \tag{19}$$

Given that $v''(b) < 0$ and $v^3(b) > 0$ we have that:

$$v'(b) - v'\left(b+\frac{\mu\Delta^R}{\Theta}v(b)\right) \leq -v''(b)\frac{\mu\Delta^R}{\Theta}v(b) \tag{20}$$

Hence (19) holds if:

$$\left(1+\frac{\mu\Delta^R}{\Theta}v'(b)\right)v''(b)v(b) + v'(b)^2 > 0 \tag{21}$$

This is greater than $v''(b)v(b) + v'(b)^2$ which, given $v(b) = b^a$, is positive for $a > \frac{1}{2}$. So $a \in (\frac{1}{2},1)$ is a sufficient condition for $y(d)$ to be increasing. It remains to show that $y''(d) < 0$. Recall that $g(d)$ is increasing and concave in d, so that g^{-1} is increasing and convex. Note that

$$y''(d) = v''(d) - (g^{-1}(d))^2 v''(g^{-1}(d)) - g^{-1\prime\prime}(d)v'(g^{-1}(d)) \tag{22}$$

The first term is negative. It remains to show that $(g^{-1}(d))^2 v''(g^{-1}(d)) - g^{-1\prime\prime}(d)v'(g^{-1}(d)) < 0$. To show this, we note that:

$$\begin{array}{rcl} g^{-1\prime}(d) & = & \frac{1}{b+\alpha a b^{a-1}} \\ g^{-1\prime\prime}(d) & = & \frac{a(1-a)\alpha b^{a-2}}{(1+\alpha a b^{a-1})^3} \end{array} \tag{23}$$

Now note that

$$(g^{-1}(d))^2 v''(g^{-1}(d)) - g^{-1\prime\prime}(d)v'(g^{-1}(d)) = a g^{-1}(d)^{a-2}\Big(-(1-a)g^{-1\prime}(d)^2 + (g^{-1}(d))^{a-1}g^{-1\prime\prime}(d)\Big) \tag{24}$$

In iorder to verify the sign of the second derivative of y it suffices to show that the term in the large brackets on the RHS of the above is negative. Plugging in from (23) we find that:

$$-(1-a)(g^{-1\prime}(d))^2 + g^{-1}(d)^{a-1}g^{-1\prime\prime}(d) = -\frac{(1-a)}{(1+\alpha ab^{a-1})^3} \tag{25}$$

Hence $y''(d) < 0$ and $y(d)$ is an increasing and concave function of d. □

Proof of Proposition 2

The proof can be broken down into the following steps:

1. We show that $d_S > d_R$ and $d_R = m_R$ and show that these are necessary condition for a mismatch equilibrium to exist
2. We establish the simultaneous equations which define $\left(d_S, \frac{N_E^S}{N_D^S}\right)$ and show that $\Delta^S \geq \hat{\Delta}_S, \breve{\Delta^S})$ and $m_S - v'^{-1}(\frac{1}{\mu}) < n$ is sufficient to establish the existence of a mismatch equilibrium.
3. We calculate N_D^S and N_E^S as functions of d_S and fundamental parameters[19]
4. We consider the free-entry decision of the R agent and determine N_D^R and N_E^R as functions of d_S and fundamental parameters[20]
5. We use the expressions for the N_k^is, to check whether $N_E > N_D$.

First, to demonstrate step 1, note that we require that $m_R < v'^{-1}(1/\mu)$, and hence $d_R = m_R$. Otherwise we could not have R types on both sides of the market. To show this, suppose m_R exceeds this bound. Then d_R is chosen to maximise the R donor's expected utility from giving, which is $m - d_R + \mu v(d_R)$, since an R donor is matched with an R entrepreneur with probability 1. Then d_S is smaller that $d_R = v'^{-1}(1/\mu)$, since some S donors are matched with R entrepreneurs and so the return on giving is lower. But if $d_R > d_S$, we cannot have R types on both sides of the market, since R donors have payoff $m_R - d_R + \mu v(d_R)$, whereas R entrepreneurs have payoff $\frac{N_D^S - N_E^S}{N_E^R}\pi(S,R) + \frac{N_D^R}{N_E^R}\mu v(d_R)$ which, since $N_D^S - N_E^S + N_D^R < N_E^R$ and $\pi(S,R) < \mu v(d_S)$, is less than $\mu v(d_R)$. Thus, if $d_S < d_R$ there is no mismatch equilibrium.

We thus require that $d_S > d_R = m_R$. In order to check that this happens, we will need to establish that $v'^{-1}(1/\mu(1-\Delta^S)$ is a lower bound for d_S. If this is the case then we can apply the following reasoning: $d_S > v'^{-1}\left(\frac{1}{\mu(1-\Delta^S)}\right) > g^{-1}\left(v'^{-1}\left(\frac{1}{\mu(1-\Delta^S)}\right)\right)$. Finally our assumption that $g^{-1}\left(v'^{-1}\left(\frac{1}{\mu(1-\Delta^S)}\right)\right) > d_R$ ensures that $d_S > d_R$. We will prove that $d_S \geq v'^{-1}(1/\mu(1-\Delta^S))$ in Lemma 7.

Moving on to step 2, suppose now that a mission mismatch equilibrium exists, with $N_D^S > N_E^S$ and $N_E > N_D$. An equilibrium consists of entrant numbers $(N_D^S, N_E^S, N_D^R, N_E^R)$, donation levels (d_R, d_S) and a mission m chosen when an S donor is matched with an R entrepreneur.

We begin by considering the indifference condition of the S type which ensures that S types can be both donors and entrepreneurs:

$$\mu v(d_S) = m_S - d_S + \frac{N_E^S}{N_D^S}\mu v(d_S) + \left(1 - \frac{N_E^S}{N_D^S}\right)\Pi(S,R) \tag{26}$$

An S entrepreneur is matched with an S donor with probability 1, giving rise to a payoff of $m_S - d_S + \mu v(d_S)$ (LHS of (26)). An S donor is matched with probability 1, but with an S entrepreneur of probability $\frac{N_E^S}{N_D^S} < 1$. The rest of the time he is matched with an R donor, achieving payoff $m_S - d_S + \Pi(S,R)$. At $t = 1$ the donation of the S type is chosen to maximise the right hand side of (26), so that:

$$\frac{N_E^S}{N_D^S}\mu v'(d_S) + \left(1 - \frac{N_E^S}{N_D^S}\right)\frac{\partial}{\partial d_S}\Pi(S,R) = 1 \tag{27}$$

The fact that $\Pi(S,R) = \max(\mu(1-\Delta^S)v(d_S), \mu v(g^{-1}(d)))$ implies that $d_S < v'^{-1}(\frac{1}{\mu})$. Thus, given our assumption that $m_S \geq v'^{-1}(1/\mu)$, $m_S - d_S > 0$. Further we can rearrange (26) to obtain:

$$\frac{N_E^S}{N_D^S} = \frac{\mu v(d_S) - \Pi(S,R) - (m_S - d_S)}{\mu v(d_S) - \Pi(S,R)} \tag{28}$$

[19]It is not necessary to determine the N_k^i in terms of fundamental parameters to prove the existence of a mismatch equilibrium with $N_E > N_D$

[20]as above

Supposing (as we will prove below)that (27) and(28) admit a solution, the above ratio of S entrepreneurs to S donors, given that $m_S > d_S$, is strictly less than 1, as desired – there are more S donors than S entrepreneurs.

Now we show that (27) and (28)admit a solution. Recall that $\Pi(S,R) = \max(\mu(1-\Delta^S)v(d_S), \mu v(g^{-1}(d_S))$. Rather than work with the kinked function $\Pi(S,R)$, and its derivative (which is not defined at d_S^*) we work with two separate scenarios and then check that they are consistent with the donor's (endogenous) mission choice decision.

The first scenario is to look at the pair of equations that would be relevant if the donor were to choose to implement mission R:

$$\begin{aligned} \frac{N_E^S}{N_D^S} &= 1 - \frac{m_S - d_S}{\mu\Delta^S v(d_S)} \\ \left(\frac{N_E^S}{N_D^S}\mu + \left(1 - \frac{N_E^S}{N_D^S}\right)\mu(1-\Delta^S)\right)v'(d_S) &= 1 \end{aligned} \tag{29}$$

If we find an intersection point between the two curves above, it is necessary to check that it has $d_S \leq d_S^*$ for it to be consistent with the donor to choosing mission R. The second is to look at the pair:

$$\begin{aligned} \frac{N_E^S}{N_D^S} &= 1 - \frac{m_S - d_S}{\mu y(d_S)} \\ \frac{N_E^S}{N_D^S}\mu v'(d_S) + \left(1 - \frac{N_E^S}{N_D^S}\right)\mu g^{-1\prime}(d_S)v'(g^{-1}(d_S)) &= 1 \end{aligned} \tag{30}$$

If such an intersection point between the curves above exists, it is necessary to check that this corresponds to $d_S \geq d_S^*$ in order for the equilibrium to be consistent with the donor choosing mission S.

Note that the first line of (29) defines $\frac{N_E^S}{N_D^S}$ as a concave function of d_S, since the first and second derivatives are:

$$\begin{aligned} \frac{\partial}{\partial d_S}\frac{N_E^S}{N_D^S} &= \frac{1}{\mu v(d_S)\Delta^S} + \frac{v'(d_S)(m_S - d_S)}{\mu v(d)^2\Delta^S} > 0 \\ \frac{\partial^2}{\partial d_S^2}\frac{N_E^S}{N_D^S} &= -\frac{2v'(d_S)}{\mu v(d_S)\Delta^S} + \frac{v''(d_S)}{\mu v(d)\Delta^S} - \frac{(2v'(d_S))^2(m_S - d_S)}{\mu v(d_S)^3\Delta^S} < 0 \end{aligned} \tag{31}$$

Note that when $d_S = 0$, $\frac{N_E^S}{N_D^S} = -\infty$ and when $d_S = m_S$, $\frac{N_E^S}{N_D^S} = 1$. When instead 30 holds, we can use the concavity of $y(d_S) = v(d_S) - v(g^{-1}(d_S))$ to show (28) also corresponds to an increasing and concave function of d_S which passes through the points $(0, \infty)$ and $(m_S, 1)$. Note also that the two possible curves defined by the first lines of (29) and (30) intersect at d_S^*.

Now we treat the second lines of (29) and (30) and show that, in both cases, the curve is increasing and convex. Then differentiating the second line of (29) with respect to d_S we have that:

$$\begin{aligned} \frac{\partial}{\partial d_S}\frac{N_E^S}{N_D^S} &= -\frac{N_E^S}{N_D^S}\frac{v''(d_S)}{v'(d_S)} > 0 \\ \frac{\partial^2}{\partial d_S^2}\frac{N_E^S}{N_D^S} &= -\frac{\partial}{\partial d_S}\frac{N_E^S}{N_D^S}\frac{v''(d_S)}{v'(d_S)} - \frac{N_E^S}{N_D^S}\left(\frac{v''(d_S)^2}{v'(d_S)^2} - \frac{v^3(d_S)}{v'(d_S)}\right) > 0 \end{aligned} \tag{32}$$

This function passes through the points $\left(v'^{-1}\left(\frac{1}{\mu(1-\Delta^S}\right), 0\right)$ and $\left(v'^{-1}\left(\frac{1}{\mu}\right), 1\right)$ Similarly we can show that the second line of **??** corresponds to an increasing and convex function of d_S which passes through the points $\left(\tilde{d_S}, 0\right)$ and $\left(v'^{-1}\left(\frac{1}{\mu}\right), 1\right)$ where $\tilde{d_S}$ is defined by:

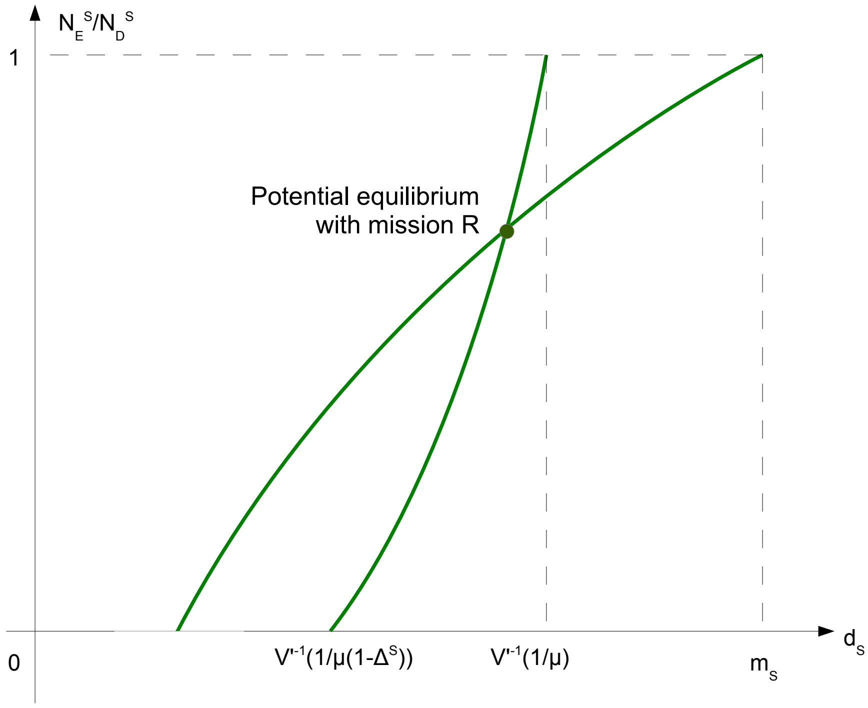
$$g^{-1\prime}(\tilde{d_S})v'(g^{-1}(\tilde{d_S})) = 1 \tag{33}$$

An increasing and convex function can intersect and increasing and concave function between zero and two times. However, in this particular case, we will show that we can make parameter restrictions that ensure that these functions intersect at least once.

Notice that when $m_S = v'^{-1}(1/\mu)$, the two curves (28) and (27) cross at $d_S = m_S$. Further, (28) lies above 27 for $d_S = m_S - \epsilon$ for ϵ positive and not too large, since the slope of (28) is strictly lower than the slope of (27) at $d_S = m_S$. This implies that there is an intersection point of the two curves (28) and (27) near to $d_S = m - S$ as long as $m_S - v'^{-1}(1/\mu) < l$ for some $l > 0$. We verify the relative sign of the derivatives first in the case where (28) and (27) are captured by (29), in which case the first derivatives of (28) and (27) are respectively:

$$\begin{aligned} \frac{\partial}{\partial d_S}\frac{N_E^S}{N_D^S}\Big|_{d_S = m_S} &= \frac{1}{\mu\Delta^S v(m_S)} \\ \frac{\partial}{\partial d_S}\frac{N_E^S}{N_D^S}\Big|_{d_S = v'^{-1}(1/\mu)} &= \frac{1-a}{a\mu\Delta^S v(v'^{-1}(1/\mu))} \end{aligned} \tag{34}$$

Figure 5: A potential equilibrium with mission S



Since $a \geq \frac{1}{2}$ the slope of the (28) is larger than the slope of (27) at $m_S = v'^{-1}(1/\mu)$. Now we verify the relative signs of the derivatives in the case (28) and (27) are captured by (30), in which case the first derivatives of (28) and (27) are respectively:

$$\begin{aligned} \frac{\partial}{\partial d_S}\frac{N_E^S}{N_D^S}\Big|_{d_S=m_S} &= \frac{1}{\mu y(m_S)} \\ \frac{\partial}{\partial d_S}\frac{N_E^S}{N_D^S}\Big|_{d_S=v'^{-1}(1/\mu)} &= \frac{-v''(v'^{-1}(1/\mu))}{y'(v'^{-1}(1/\mu))} \end{aligned} \tag{35}$$

However, we have not established whether these intersection points are coherant with the S donor enforcing an S or an R mission. We need to know whether the donation of the S donor is compatible with the mission we assume that they have chosen. Rather than calculate explicitly the donations level and check whether it is above or below d_S^*, we will place a restriction on Δ^S which we will show implies that there is at least one equilibrium (ie, an intersection of the curves in (29) with $d_S \leq d_S^*$, or an intersection of the curves in (30) with $d_S \geq d_S^*$). We define this restriction of Δ^S and note its useful properties in the following Lemma.

Lemma 7 *There exists a threshold $\hat{\Delta^S}$, such that, for all $\Delta \geq \hat{\Delta^S}$, the function*

$$\left(\frac{N_E^S}{N_D^S}\mu + \left(1 - \frac{N_E^S}{N_D^S}\right)\mu(1-\Delta^S)\right)v'(d_S) = 1 \tag{36}$$

lies to the left of the function

$$\frac{N_E^S}{N_D^S}\mu v'(d_S) + \left(1 - \frac{N_E^S}{N_D^S}\right)g^{-1\prime}(d_S)v'(g^{-1}(d_S)) = 1 \tag{37}$$

in $\left(d_S, \frac{N_E^S}{N_D^S}\right)$ space. In particular this implies $\tilde{d}_S > v'^{-1}(1/\mu(1-\Delta^S))$ and hence $d_S > v'^{-1}(1/\mu(1-\Delta^S))$.

$$\tag{38}$$

Proof of Lemma 7 As the two functions defined in the statement of the lemma are increasing and convex, it suffices to show:

Figure 6: Multiple (potential) equilibria with mission R

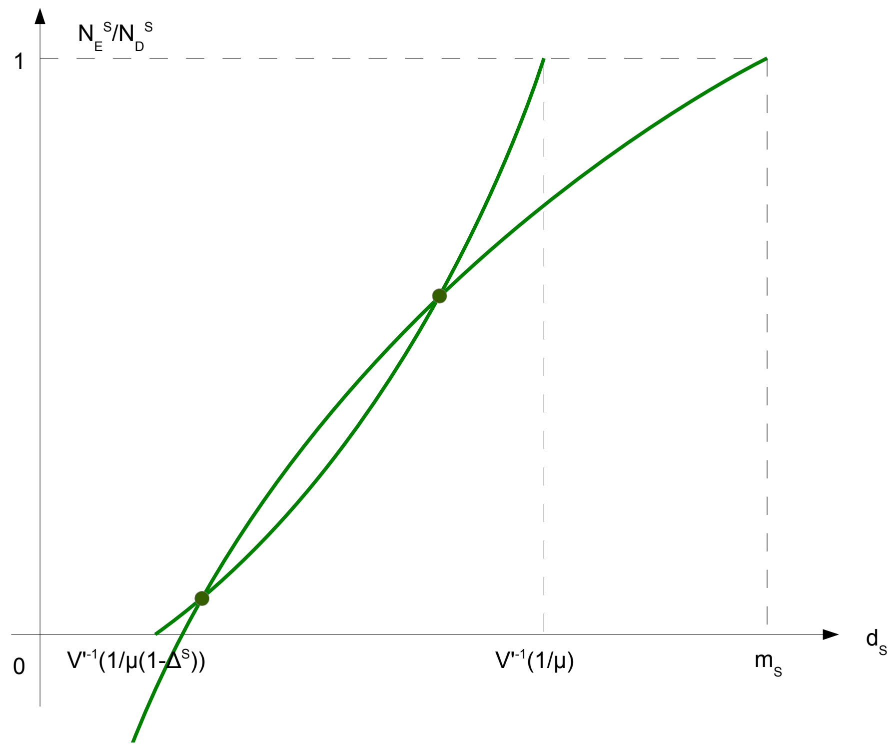


Figure 7: An equilibrium with mission R

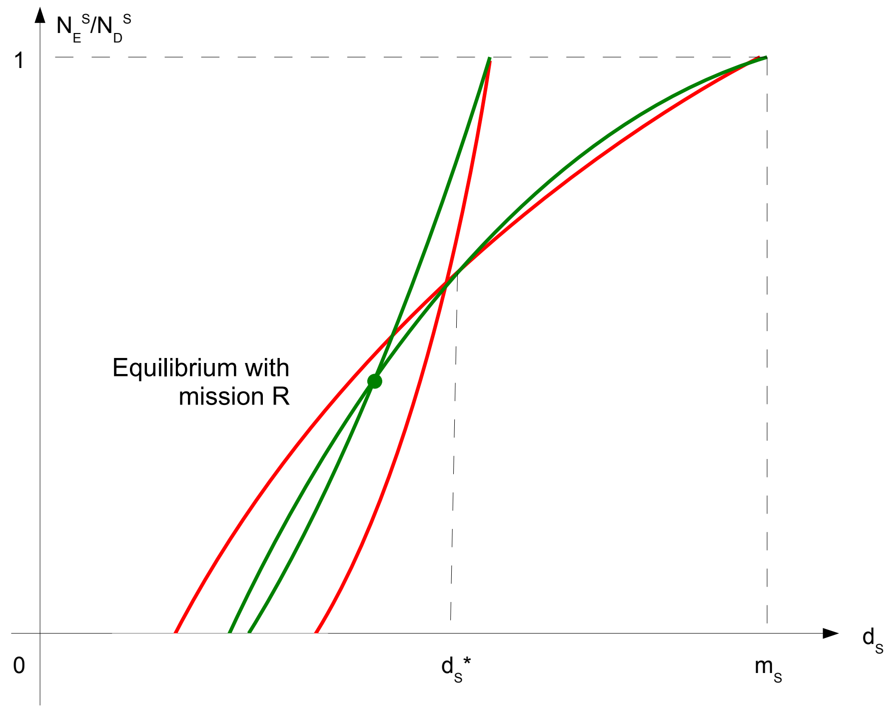


Figure 8: An equilibrium with mission R, an equilibrium with mission S

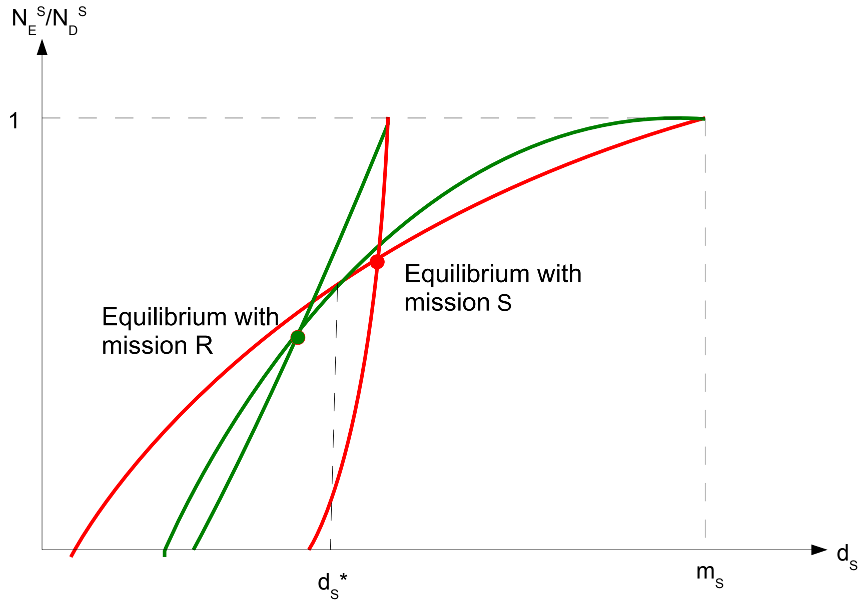
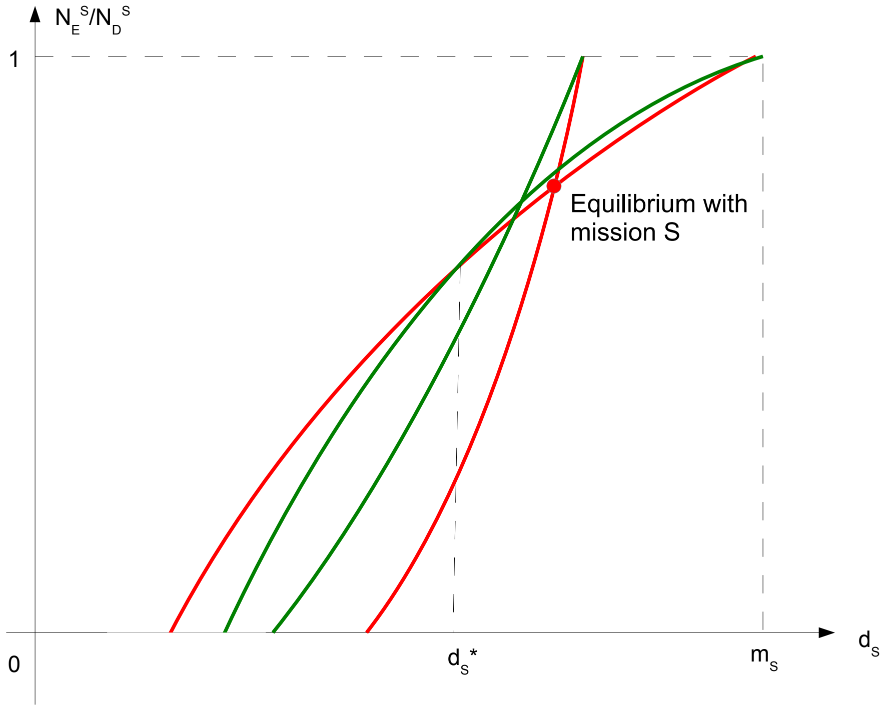


Figure 9: An equilibrium with mission S



1. $v'^{-1}(1/\mu(1-\Delta^S)) < \tilde{d_S}$ and

2. The slope of (36) at $d_S = v'^{-1}(1/\mu)$ is higher than the slope of (37) at the same d_S.

To demonstrate the first point, define $\tilde{b} = g^{-1}(v'^{-1}(\tilde{d_S})$. Then the definition of $\tilde{d_S}$ can be rewritten in terms of the definition of $\tilde{b}$, as:

$$\begin{array}{rcl} \frac{v'(\tilde{b})}{g'(\tilde{b})} & = & \frac{1}{\mu} \\ \iff \quad \frac{\mu a \tilde{b}^{-(1-a)}}{1+\frac{\Delta^R}{\Theta}\mu a \tilde{b}^{-(1-a)}} & = & 1 \\ \iff \quad \tilde{b} & = & (\mu a)^{\frac{1}{1-a}}\left(1-\frac{\Delta^R}{\Theta}\right)^{\frac{1}{1-a}} \end{array} \tag{39}$$

Since $v'^{-1}(1/\mu) = (\mu a)^{\frac{1}{1-a}}$ we have:

$$\begin{array}{rcl} v'^{-1}(1/\mu(1-\Delta^S) & < & \tilde{d_S} \\ \iff \quad (1-\Delta^S) & < & \left(\left(1-\frac{\Delta^R}{\Theta}\right)^{\frac{1}{1-a}} + \frac{\Delta^R}{\Theta a}\left(1-\frac{\Delta^R}{\Theta}\right)^{\frac{a}{1-a}}\right)^{1-a} \end{array} \tag{40}$$

hence we can define a threshold Δ_1^S, such that for $\Delta^S > \Delta_1^S$, we have $v'^{-1}(1/\mu(1-\Delta^S) < \tilde{d_S}$.

For the second half of the proof we use a similar method.

The slope of (36) at $d_S = v'^{-1}(1/\mu)$ is:

$$\left.\frac{\partial}{\partial d_S}\frac{N_E^S}{N_D^S}\right|_{d_S=v'^{-1}(1/\mu)} = \frac{-v''(v'^{-1}(1/\mu))}{(1-(1-\Delta^S))v'(v'^{-1}(1/\mu))} \tag{41}$$

and the slope of (37) at the same point is:

$$\left.\frac{\partial}{\partial d_S}\frac{N_E^S}{N_D^S}\right|_{d_S=v'^{-1}(1/\mu)} = \frac{-v''(v'^{-1}(1/\mu))}{v'(v'^{-1}(1/\mu)) - v'(g^{-1}(v'^{-1}(1/\mu)))g^{-1\prime}(v'^{-1}(1/\mu))} \tag{42}$$

Comparing and rearranging, we find that the slope of the (36) is higher if and only if:

$$v'(g^{-1}(v'^{-1}(1/\mu)))g^{-1\prime}(v'^{-1}(1/\mu)) > \frac{1-\Delta^S}{\mu} \tag{43}$$

By setting Δ^S sufficiently close to 1 we can ensure that this is satisfied, that is to say, there exists Δ_2^S such that for all $\Delta^S \geq \Delta_2^S$, the slope condition set out in the second of the two steps above above is satisfied. Finally, we set $\hat{\Delta^S} = \max(\Delta_1^S, \Delta_S^2)$ $\square$

Next we prove the existence of an candidate equilibrium with mission R corresponding to the intersection of the equations in (29), and a candidate equilibrium corresponding to the intersection of the equations in (30). We call these candidate equilibrium because it remains to show that the candidtate equilibrium level of d_S is consistent with the donor's choice of mission – ie, we need to know whether the donations are lower or higher than d_S^*.

First turning our attention to the intersection of the curves defined by (30), we note that the d_S at a point of intersection is defined by:

$$\frac{1-\mu(1-\Delta^S)v'(d_S)}{\mu\Delta^S v'(d_S)} + \frac{m_S - d_S}{\mu\Delta^S v(d_S)} = 1 \tag{44}$$

At $d_S = 0$ we have that the right hand (∞) side is greater than the left hand side. At $d_S = v'^{-1}(1/\mu)$ we have that the left hand side is smaller than 1 if and only if:

$$m_S - v'^{-1}(1/\mu) < (\mu - 1)v(v'^{-1}(1/\mu)) \tag{45}$$

which, supposing $\mu > 1$ defines another upper limit on $m_S - v'^{-1}(1/\mu)$

Assuming now that (45) holds, the left hand side of (44) is a continuous function of d_S that takes the value ∞ at $d_S = 0$ and is less than one at $d_S = v'^{-1}(1/\mu)$. By continuity, there must exist a value of $d_S \in (0, v'^{-1}(1/\mu))$ such that 44 holds with equality. That is to say, there is at least one candidate equilibrium with mission R. We will denote the candidate equilibrium with mission R, $\left(d_S, \frac{N_E^S}{N_D^S}\right)$ with the highest level of d_S by $\mathcal{C}_R$.

Now consider the curves defined by (30) we note that, at an intersection, we would have:

$$\frac{1-\mu(v\circ g^{-1})'(d_S)}{\mu v'(d_S)-\mu(v\circ g^{-1})'(d_S)}+\frac{m_S-d_S}{(d_S)-\mu(v\circ g^{-1})(d_S)}=1 \tag{46}$$

At $d_S=0$ we have that the right hand (∞) side is greater than the left hand side. At $d_S=v'^{-1}(1/\mu)$ we have that the left hand side is smaller than 1 if and only if:

$$m_S-v'^{-1}(1/\mu)<1-\mu(v\circ g)'(v'^{-1}(1/\mu)) \tag{47}$$

Then, if (47) holds, the left hand side of (46) is a continuous function of d_S that takes the value ∞ at $d_S=0$ and is less than one at $d_S=v'^{-1}(1/\mu)$. By continuity, there must exist a value of $d_S\in(0,v'^{-1}(1/\mu))$ such that 46 holds with equality. That is to say, there is at least one candidate equilibrium with mission S. We will denote the candidate equilibrium of mission S $\left(d_S, \frac{N_E^S}{N_D^S}\right)$ with the highest level of d_S by $\mathcal{C}_S$. Finally we set $l=\min\Big(1-\mu(v\circ g)'(v'^{-1}(1/\mu)),(\mu-1)v(v'^{-1}(1/\mu))\Big)$.

We are now in a position to deduce which of the potential equilibria defined above do in fact correspond to equilibria in which donations are coherant with mission choices. There are now three possibilities:

- Both $\mathcal{C}_R$ and $\mathcal{C}_S$ lie to the left of d_S^* – in this case, there is a mismatch equilibrium with mission R, see figure 7.
- $\mathcal{C}_R$ lies to the left of d_S^* and $\mathcal{C}_S$ to the right of d_S^* – then there are at least two mismatch equilibria, one with mission R enforced; the other with mission S, see figure 8.
- Both $\mathcal{C}_R$ and $\mathcal{C}_S$ lie to the right of d_S^* – there is at least one mismatch equilibrium with mission S, see figure 9.

Given that we have now shown that a solution $\left(d_S, \frac{N_E^S}{N_D^S}, m\right)$ to (27) and(28) exists it will be useful to write N_D^S and N_E^S in terms of d_S.

Using $N_D^S+N_E^S=N$ we obtain that:

$$\begin{array}{lcl} N_E^S & = & \frac{\mu v(d_S)-\Pi(S,R)-(m_S-d_S)}{2(\mu v(d_S)-\Pi(S,R))-(m_S-d_S)}N \\ N_D^S & = & \frac{\mu v(d_S)-\Pi(S,R)}{2(\mu v(d_S)-\Pi(S,R))-(m_S-d_S)}N \\ N_D^S-N_E^S & = & \frac{m_S-d_S}{(\mu v(d_S)-\Pi(S,R))-(m_S-d_S)}N \end{array} \tag{48}$$

Next we consider the indifference condition of the R type. The gift of an R donor is constrained to be m_R. An R donor is matched with probability 1 with an R entrepreneur, giving him utility $\mu v(m_R)$ with certainty. An R entrepreneur is matched with an S donor with probability $\frac{N_D^S-N_E^S}{N_E^R}$, is matched with an R donor with probability $\frac{N_D^R}{N_E^R}$ and is unmatched with probability $\frac{N_E-N_D}{N_E^R}$. Hence his indifference condition is given by:

$$\mu v(m_R)=\frac{N_D^S-N_E^S}{N_E^R}\pi(S,R)+\frac{N_D^R}{N_E^R}\mu v(m_R) \tag{49}$$

Rearranging we find that:

$$\begin{array}{lcl} N_E^R & = & \frac{(N_D^S-N_E^S)\pi(S,R)+N\mu v(m_R)}{2\mu v(m_R)} \\ N_D^R & = & \frac{N\mu v(m_R)-(N_D^S-N_E^S)\pi(S,R)}{2\mu v(m_R)} \\ N_E^R-N_D^R & = & \frac{(N_D^S-N_E^S)\pi(S,R)}{2\mu v(m_R)} \end{array} \tag{50}$$

We have already checked, by showing that $\frac{N_E^S}{N_D^S}<1$, that this equilibrium involves an excess of S donors. In order to show that it involves mismatch with $N_E>N_D$ it is sufficient to check that $N_E>N_D$, or, equivalently, $N_E^R-N_D^R>N_D^S-N_E^S$. (**??**) implies this is the case if and only if:

$$\pi(S,R)>\mu v(m_R) \tag{51}$$

This holds since $\pi(S,R) > \mu v(g^{-1}(d_S))$, and further since we have shown $d_S > v'^{-1}(1/\mu(1-\Delta^S))$, we can deduce from our assumption $g^{-1}(v'^{-1}(1/\mu(1-\Delta^S))) \geq m_R$ that $\pi(S,R) > \mu v(m_R)$ □

Proof of Proposition 3

First note that if the equilibrium with the highest welfare for agents in $\mathcal{A}$ involves mission R, then implementing the Busan declaration does not change the equilibrium with the highest welfare for agents in $\mathcal{A}$

Now suppose that in the equilibrium with the highest welfare for agents in $\mathcal{A}$ involves mission S, the S donors commit to giving d_S and the ratio of S entrepreneurs to S donors is $\frac{N_E^S}{N_D^S}$. Then the welfare of agents in $\mathcal{A}$ is:

$$N_E^S(2\mu v(d_S)+m_S-d_S)+(N_D^S-N_E^S)\left(\left(\mu+\mu(1-\Delta^R)+\frac{\Delta^R}{\Theta}\right)v(g^{-1}(d_S))+m_S-d_S\right)+2N_D^R\mu(v(m_R)) \tag{52}$$

The first term is the number of S donor -S entrepreneurs multiplied by the joint donor-entrepreneur surplus from such a match. The second term in the number of S donor - R entrepreneurs multiplied by the joint surplus from such a match. The third term is the number of R donor -R entrepreneur pairs multiplied by the surplus coming from such a match. Using that $2\mu v(d_R)N_D^R = N\mu v(m_R) - (N_D^S - N_E^S)\pi(S,R) + N\mu v(m_R)$ the welfare of agents in $\mathcal{A}$ becomes:

$$N_E^S(2\mu v(d_S)+m_S-d_S)+(N_D^S-N_S^E)\left(\mu v(g^{-1}(d_S))+m_S-d_S\right)+N\mu v(m_R) \tag{53}$$

Plugging in the expressions for N_E^S and $N_D^S - N_E^S$ from (48) we obtain that the welfare of agents in $\mathcal{A}$ is:

$$N(m_S-d_S)+N\mu v(d_S)+N\mu v(m_R) \tag{54}$$

Now suppose that the Busan declaration is enforced. Then there are two possibilities:

1. There is a mismatch equilibrium with mission R
2. There is no mismatch equilibrium and we are in the bad equilibrium $d_R = d_S = 0$

In the first of these two possibilities, supposing that the equilibrium level of donations is $\hat{d_S}$, and the number of S donors and entrepreneurs is $\hat{N}_D^S$ and $\hat{N}_E^S$ respectively, using a similar method to the above, the equilibrium gives rise to welfare for agents in $\mathcal{A}$ of:

$$\begin{aligned}
& \hat{N}_E^S(2\mu v(\hat{d_S})+m_S-\hat{d_S})+(\hat{N}_D^S-\hat{N}_E^S)\left((2-\Delta^S)\mu v(\hat{d_S})+m_S-\hat{d_S}\right)+2\hat{N}_D^R\mu(v(m_R)) \\
= \; & \hat{N}_E^S(2\mu v(\hat{d_S})+m_S-\hat{d_S})+(\hat{N}_D^S-\hat{N}_E^S)\left((1-\Delta^S)\mu v(\hat{d_S})+m_S-\hat{d_S}\right)+N\mu(v(m_R)) \\
= \; & N(m_S-\hat{d_S})+N\mu v(\hat{d_S})+N\mu v(m_R)
\end{aligned} \tag{55}$$

In order for equilibrium welfare to go down when the Busan declaration is enforced, it suffices that $\hat{d_S} < d_S$. After Busan is enforced the new equilibrium donations and N_k^Ss are defined by the intersection of 29. But as the first line of (29) is to the left of the first line of (30), and as the second line of (29) is to the left of the second line of (30), the intersection point of the two equations in (29) lies to the left of the intersection point of the two equations in (30), ie, $\hat{d_S} < d_S$.

In the second of these two possibilities, equilibrium welfare clearly goes down. □

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