Profit with Purpose? A Theory of Social Enterprise with Experimental Evidence*

Timothy Besley
LSE and CIFAR

Maitreesh Ghatak
LSE

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Abstract

Social enterprise tries to balance profit making with a wider mission, as well as providing effort incentives. In this paper, we explore this organizational form and its distinctiveness from for-profit and and non-profit activity. In social enterpises inducing managers to undertake the desired mission means that they should be made residual claimants on financial flows generated by a firm. The paper develops the implications of matching between founders and managers based on their preferences for the mission. The main trade-offs suggested by the theory are tested experimentally and these are used to calibrate a matching outcome. This makes precise the parameter range in which social enterprises will be observed.

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"The purpose of the corporation must be redefined as creating shared value, not just profit *per se*. This will drive the next wave of innovation and productivity growth in the global economy." Porter and Kramer (2011)

"Most business people are upright citizens; but that does not change the fact that business is conducted for private gain and not for the public benefit. The primary responsibility of management is to the owners of the business, not to some nebulous entity called the public interest—although enterprises often try, or at least pretend, to be acting in a public-spirited way because that is good for business. If we care about universal principles such as freedom, democracy, and the rule of law, we cannot leave them to the care of market forces; we must establish some other institutions to safeguard them." Soros (2000)

1 Introduction

While the pursuit of profit and private reward can generate wealth and benefits in the form of new goods and gains in economic efficiency, it is well-known that there are potential downsides to profit-seeking activities. An important private response to this has been to harness private initiatives to establish non-profit firms whose end is to serve the social good rather than private profit. And many sectors of the economy, especially health, education and the relief of poverty rely heavily on such organizations.

For-profit and non-profit production are characterized by having rigid missions. External shareholders can invest in for-profit firms knowing that the firm has a legal obligation to maximize profit. Donors to non-profits do so knowing that it is legally obliged to focus on its non-profit mission via the *ultra vires* principle. But such rigidity has a downside. From a social point of view, there may be times when profit-oriented activities make sense and others where pursuing other ends is desirable. Recognizing this, it makes sense to seek a middle ground with a more nuanced balance of profit and contributions to social ends. To achieve this is the goal of *social enterprise*.

This paper explores the logic of social enterprise in terms of balancing profit with purpose. The main contribution lies in developing a modeling framework which allows a comparison between social enterprise and other forms of business organization. The model which has five key features. First, profitability and social payoffs may sometimes diverge. Second, the enterprise requires managerial effort to improve efficiency as well as to decide whether to pursue profit or social purpose in

its key decisions.[1] Third, organizational choice determines whether there is a rigid mission as well as the allocation of any residual cash flow. Fourth, firms employ motivated "citizen-managers" who care about the mission. Fifth, organizations must compete for managerial talent.

The underlying ideas are then tested using a laboratory experiment which is designed to capture the main features of the approach. We then calibrate the parameters of the model to the data and explore when we might expect to see social enterprises emerging in a market place when non-profit and for-profit activity is also possible.

There is increasing interest in hybrid forms of activity which balance profits with a social mission. Martin and Osberg (2007) observe that there are many different firms which travel under the broad heading of social enterprise.[2] We focus on what Katz and Page (2010) call a "for-profit social enterprise" which they describe as follows:

> "In contrast to an ordinary commercial business, it expressly measures its success both in terms of its financial performance (e.g., pecuniary profits, shareholder value, return on investment, etc.) and its success in advancing a social mission or addressing social concerns." (page 86)

They contrast this form of social enterprise with a commercial non-profit, i.e. situations where charities to engage in business activities, so long as the profits are used for charitable purposes and not distributed to insiders as dividends.

A key issue in any for-profit social enterprise is how the trade-off between profits and the social mission is enforced, *the mission integrity problem.*[3] In practice, a variety of organization and contractual means are used to achieve this. The power of this has increased recently with law changes that allow the use of B-corporations where stated social goals are externally audited and form part of the mandate of the board.[4] But such legal solutions are often imperfect; Katz and Page (2010) underline the role of "mission-sympathetic parties" in how social enterprises operate. In our model, the key such party, apart from the founder, will be the citizen-manager who is appointed to uphold the mission and to achieve an optimal trade-off between mission and profit.

A well-known good example which illustrates the notion of social enterprise and some of the issues in this paper is *Ben and Jerry's,* an ice-cream brand which was

[1] This gives rise to a multi-tasking agency problem in the spirit of Holmstrom and Milgrom (1991) since we suppose that social payoffs, unlike profits, are not measurable.

[2] Terms like "public benefit corporations" (Shiller, 2012), "social enterprise" (Dees, 1998, Bornstein, 2004) or "social business" (Yunus, 2007) are part of the lexicon but all stand for somewhat different organizational forms.

[3] This is essentially what Katz and Page (2010) call the legacy problem.

[4] At the time of writing, 20 US states have passed laws recognizing benefit corporations as distinct legal entities. In the UK, the law was changed to allow the formation of Community Interest Companies which are similar in spirit to B-corporations.

established to pursue strong ethical norms alongside more commercial ends. For example, the ice-cream is manufactured in Vermont using hormone-free milk sourced from local farms. However, it was eventually sold to Unilever at the behest of shareholders, raising questions about how far it would continue to be run as a social enterprise.[5] In this case, the citizen-manager is the Unilever-appointed CEO, Justin Solheim, who promised when he was appointed to uphold "the history and the authenticity of the culture and values" of the firm. He would be a true citizen-manager in the terms of this paper to the extent that he internalizes the founders' preferences in the decisions that he takes.

The failure of profit maximization to align with the public interest is a classic problem of mispricing of inputs or outputs. We view social enterprises as trying to lean against this by employing decision makers who sometimes consciously ignore price signals. This ties the paper to the growing literature on motivation and incentives (see e.g. Akerlof and Kranton, 2005, Benabou and Tirole, 2006, Besley and Ghatak, 2005, Delfgauuw and Dur, 2010, and Francois, 2000). Our paper is particularly close in spirit to Prendergast (2007, 2008) who shows that for certain types of agency problems, there is a role for hiring motivated but biased bureaucrats.

Our lab experiment that is close in spirit to those conducted by Fehrler and Kosfeld (2012) and Tonin and Vlassopoulos (2012) which investigate how pro-social mission choice influences effort. The particular effort task that we employ comes from Gill and Prowse (2012) who use it to investigate incentives when there is disappointment aversion. Incentives and self-selection are explored in a lab setting by Dohmen and Falk (2011) who confirm the importance of selection into tasks when incentives vary. The idea that worker's sort into tasks is central to the approach pursued here.

The remainder of the paper is organized as follows. The next section lays out the theoretical framework where firms employ motivated managers to make decisions which affect profits and mission. In section three, we use the model to compare three organizational forms: two with rigid missions (for-profit and non-profit) and one with a flexible mission which call a social enterprise. We consider what happens when organizations compete for managers where the founders of firms employ managers to run their firms. Section four describes the lab experiment that we used to test some of the core ideas in the modeling framework and, in section five, we use this to look at alternative organizational forms and their merits using the experimental evidence as means of calibrating the model. In section six, we discuss the links between the current approach and more standard models of agency. Concluding comments are in section seven.

[5] See the discussion in Page and Katz (2012).

2 Theoretical Framework

We set out a stylized model to capture the key trade-offs which characterize our approach to social enterprise and its potential role in the economy.

The Firm The enterprise produces a good which it sells to customers and on which it can earn a profit (possibly zero). The good is valued by the consumer but also has a benefit which is external to the firm. It can be valued by the founder (the social entrepreneur), by workers involved in its production and citizens at large. We will keep the details of the interaction between the customer and firm in the background. We have three broad classes of firm-level decision making in mind.

First, there are some goods where the goal is to widen access; education, health care and legal services are important examples. Tobin (1970) referred to this as "specific egalitarianism". Firms must decide whether it should value access to certain goods in its pricing strategy. So it could hold down prices and ration access to deserving individuals. For example, a university might care that students from disadvantaged backgrounds are admitted or a hospital that values medical care being available to poor patients. Access to the good in question is the social component in these examples.

A second case is where there is externality associated with the good's production. For example, environmental externalities may arise requiring firms trade off cost efficiency against social costs. The social component here is the willingness of a firm to reduce its pollution even if profits are reduced.

A third case is where firms take decisions in markets where consumers face behavioral or informational issues. Although this has been popularized recently by the rise of behavioral economics, the idea is much older and is related to Musgrave (1959)'s concept of merit goods. In this case, the firm must weigh up the ethics of exploiting its information or the frailties of consumers against making a profit.

Our model is not specific to any one of these cases. What the examples have in common is the fact that the firm's decision making matters to the balance of social and private goals being pursued. And these are attached to production which has both profit flows and social costs/benefits as outcomes. Moreover, there is a public component to the payoff which is non-rival. This contrasts with the standard agency framework where rewards are pecuniary, and therefore, rivalrous.

Actions The manager takes two actions which we shall call effort $e \in [0,1]$, and mission $x \in \{0,1\}$.

Effort is modelled as a continuous choice with greater effort creating a first-order stochastic dominating shift in payoffs. Let $c(e)$ be the cost of effort. It is assumed to have the standard properties: it is strictly increasing and strictly convex. We also assume that $c'''(e) > 0$.[6] This ensures that the marginal cost eliciting effort is increasing.

[6]This stronger condition is needed for only Propositions 3 and 4 below and is satisfied for the

Let the parameter λ be a measure of the manager's competence in putting in effort and normalize $c(\underline{e}) = 0$. Define $\hat{e}(z)$ as:

$$\hat{e}(z\lambda) = \arg\max_{e\in[0,1]} \{ze - c(e)/\lambda\}. \tag{1}$$

We assume that the manager has some level of intrinsic motivation denoted by a parameter $A > 0$. Therefore, $z \geq A$.[7] Let

$$\phi(z,\lambda) = z\hat{e}(\lambda z) - c(\hat{e}(\lambda z))/\lambda = \frac{\lambda z\hat{e}(\lambda z) - c(\hat{e}(\lambda z))}{\lambda}. \tag{2}$$

The parameter z is the reward from high effort which is a combination of intrinsic motivation (A) and rewards from contributing to society or financial rewards.

Mission choice is a discrete (binary) decision and affects how far social payoffs are prioritized. The action has no utility cost. The choice $x = 1$ is the pro-social action, where profits are sacrificed for the social objective, and $x = 0$ is the commercial action which maximizes realized profits.

States There are two states. The effort choice determines which of two states $r \in \{L, H\}$ occurs where $r = H$ occurs with probability e and $r = L$ occurs with probability $(1 - e)$. The state r refers to the overall (pecuniary and non-pecuniary) surplus that the firm is able to generate. After the realization of r there is a further state $s \in \{h, l\}$ which is realized with $q \in (0, 1)$ being the probability of state h. This state affects the relative desirability of $x = 0$ and $x = 1$ in a way that we make precise below. The realization of state s is independent of the actions of the agent.

Payoffs The payoffs depend on the realized and the mission choice. These payoffs are the sum of two components. The first is profit, $\pi(x, s, r)$, where

$$\begin{aligned} \pi(x,s,L) &= \pi_L \text{ for all } x \in \{0,1\}, s \in \{h,l\} \\ &\quad \text{and} \\ \pi(0,s,H) &= \pi_H > \pi(1,s,H) = \pi_L \text{ for all } s \in \{h,l\}. \end{aligned}$$

This says that is $r = H$ makes it is feasible to generate a high profit but this depends on the choice of x. If $r = L$, then only the low profit results independent of the action choice. Let $\Delta \equiv \pi_H - \pi_L$.

The second component is a social payoff $\theta(x, s, r)$ where

$$\begin{aligned} \theta(x,s,L) &= \theta(0,l,H) = \theta(0,h,H) = 0 \\ &\quad \text{and} \\ \theta(1,h,H) &= \theta_h > \theta(1,l,H) = \theta_\ell > 0. \end{aligned}$$

constant elasticity case used in the empirical analysis given our estimate of the elasticity of effort with respect to rewards.

[7] Alternatively we could have assumed that it is costly for the agent to supply effort below some minimum standard level, e.g., $c(e) = (e - \underline{e})^2$ for $e \geq \underline{e}$.

When the state $r = L$, there is no scope for generating a high social payoff. When the state is $r = H$, this can be done but only when $s = h$, in which case choosing $x = 1$ yields θ_h. Let

$$\bar{\theta} = q\theta_h + (1 - q)\,\theta_\ell$$

denote the expected social payoff.

The following table summarizes the payoffs for all (x, s, r) combinations:

- With probability e, $r = H$ and then the decision of the agent is given by the following matrix:

	$x = 1$	$x = 0$
$s = h$	$\pi_L + \theta_h$	π_H
$s = \ell$	$\pi_L + \theta_\ell$	π_H

- With probability $1 - e$, $r = L$, upon which the decision of the agent is given by the following matrix:

	$x = 1$	$x = 0$
$s = h$	π_L	π_L
$s = \ell$	π_L	π_L.

Informational and Contracting Assumptions We assume that the states r and s, the manager's effort e, and the non-pecuniary social payoff θ_s $(s = h, l)$ are non-verifiable. Hence the use of contractual means to enforce a flexible trade-off between mission and profit is limited even though the mission choice (x) and profits $(\pi_i,\ i = H, L)$ are verifiable.[8] We restrict attention to organizational forms where either the manager is a full residual claimant or has a flat payoff.[9] Organizations will also differ in control rights over x.

We focus on three possible organizational forms: (i) (FP) a for-profit with a rigid mission of profit-maximization $(x = 0)$; (ii) (NP) a non-profit with a rigid pro-social mission $(x = 1)$[10] and (iii) (SE) a social enterprise where the citizen-manager has control rights over the mission so may choose whether to earn a profit or pursue a

[8] The model could easily be modified to have a partially informative public signal of the mission-related payoff. But selection of citizen-managers would still be relevant as long as this is imperfect.

[9] In principle, we could allow for more continuous forms of contracts that make the manager a partial residual-claimant. Our focus on three discrete organizational forms is driven by our experiment design. But clearly it could be relaxed in fiture work.

[10] Our model of non-profit organization follows the literature in emphasising how a non-distribution constraint ensures that the non-profit mission is not compromised for private gain (e.g., Hansmann, 1980, Easly and O'Hara, 1983, and Glaeser and Shleifer, 2001). Here, it ensures that the enterprise is never tempted to choose a highly profitable at the expense of the mission.

social purpose.[11] Thus, the social enterprise is a hybrid where there is scope for a flexible trade-off between the pro-social mission and profit.

In each case, managers are residual claimants on the firm's profit and receive a payment from (make a payment to) the organization's founder to run the firm which we denote by T. The sign of T is not known a priori. In a for-profit firm, we would typically expect the founder to license the product to a manager in exchange for a royalty payment so that $T < 0$. In a non-profit firm, it may be necessary for the manager to be paid to run the firm where $T > 0$ is a grant or the returns to an endowment which makes the firm viable. However, managers may also be willing to work below their "market" price if they are committed to the cause being pursued by the firm. In the limit, they could either work for free or donate to the organization. In all cases, the level of T will be determined endogenously by the need to attract managers to the run the firm in a competitive market setting.

Citizen-Managers We use the term citizen-manager to capture the idea of a manager who is a motivated agent in the sense of Besley and Ghatak (2005), i.e. may care directly about the social payoff.[12] This will play a key role in achieving mission integrity in a social enterprise. We assume that everyone is risk neutral and that there are no transferability constraints. There is a pool of potential managers who differ in two dimensions. Typical manager i places a weight γ_i^M on the social payoff where $\gamma_i^M \in \left[0, \overline{G}\right]$ where $\overline{G} > 0$. Manager i's competence level is denoted by $\lambda_i \in (0, \Lambda]$. Each manager has an outside option, u_i, which is determined endogenously in a competitive recruitment process. We will drop the subscript i when referring to an individual manager for the remaining of this section to simplify notation.

For the rest of the analysis we will focus on the following parameter range:

$$\theta_h > \triangle > \theta_\ell.$$

This implies that managers with $\gamma^M \in [\underline{\gamma}, \overline{\gamma}]$ where $\underline{\gamma} \equiv \frac{\triangle}{\theta_h} < 1$ and $\overline{\gamma} \equiv \frac{\triangle}{\theta_l} > 1$ make a state-contingent mission choice. For such managers, social payoffs are more important than profits when $r = H$ and $s = h$ and profits are more important than social payoffs when $r = H$ and $s = l$. Managers with γ^M outside this interval will make a none state-contingent mission-choice. With $\gamma^M \geq \overline{\gamma}$, they always choose $x = 1$ and with $\gamma^M \leq \underline{\gamma}$ they choose $x = 0$. Obviously, unmotivated managers fall into the latter camp and will always prefer to pursue profits.

[11] Logically we could allow a fourth possibility, namely, a non-profit where the manager has control rights over mission. But his mission choice in this case will be driven by non-pecuniary considerations only (by definition), and so that means the choice will be $x = 1$. This is assuming that the manager puts some value weight on the social payoff, however small. If he derives no value whatsoever, then he is indifferent between choosing $x = 0$ and $x = 1$ and in such cases, we assume he will choose the mission that the founder prefers.

[12] See also Francois (2000) and Delfgauuw and Dur (2007, 2010) for models which make use of selection arguments with motivated agents.

In general, the payoff of the manager is

$$U^M = \pi_L + \phi(z, \lambda) + T$$

and the choice of effort is given by $\hat{e}(z\lambda)$. The following records a useful fact that we use repeatedly below. The proof of this and subsequent results are in the Appendix.

Proposition 1 *The larger is the payoff of the manager conditional on success (z), the greater is his effort and the higher is his expected payoff.*

The proof follows directly from the properties of $\phi(z, \lambda)$ and $\hat{e}(z\lambda)$. It embodies the standard logic of residual claimancy in promoting effort incentives. That said, it is important to bear in mind that z could reflect non-pecuniary payoffs from pursuing a good cause.

Founders (Social Entrepreneurs) Organizations are established by founders who are motivated by a combination of profits and social payoffs. We think of founders as entrepreneurs who endow the firm with a constitution (an organizational form) which could specify a rigid mission and recruit managers to run the firm on their behalf. Even if she delegates running the organization, the founder retains rights over the idea or the brand that is created which allows her to choose the organizational form even if she no longer has any control over how the organization is run.

Below, we will consider the organizational form that the founder would prefer if she must delegate running the organization and faces competition for managers. The founder's expected payoff is

$$U^F = \gamma^F \hat{e}(\lambda z)\left[q x_h \theta_h + (1-q) x_\ell \theta_\ell\right] - T$$

where $x_s\,(s \in \{\ell, h\})$ is the action taken by the manager in state s. As we noted above, the payment T can be positive or negative.

The parameter $\gamma^F \geq 0$, denotes how much the founder cares about the social payoff relative to money. A founder who cares only about money has $\gamma^F = 0$ and, as γ^F increases, the manager cares increasingly about the social cause. Below, we will consider a world where there are many founders who differ in γ^F and compete to hire managers from the pool in matching market.[13]

3 Organizational Forms

This section elaborates the three organizational forms that we study throughout the paper. For the remainder of this theoretical section, we will consider only variation in motivation γ^M assuming that all potential managers are equally productive, i.e. have the same λ.

[13] In section 5, we discuss the more standard agency case where $\gamma^F < 0$.

For-Profit Enterprise (FP) A for-profit enterprise always sets $x = 0$, a commercial mission. In this case, γ^M is irrelevant since all rewards to managers are in the form of private consumption. We assume that the manager is made a residual claimant on profit. Hence, he will put in effort $\hat{e}(\lambda[A + \Delta])$ and his expected payoff will be $\pi_L + \phi(A + \Delta, \lambda) + T$.

Non-profit Enterprise (NP) In this case, we assume that the firm always pursues the social mission, i.e. $x = 1$. Managers will be motivated to put in effort only in so far as they value the social payoffs. Hence effort will be $\hat{e}\left(\lambda\left[A + \gamma^M\bar{\theta}\right]\right)$, i.e. effort now depends on how far the manager values the mission. His expected payoff will be $\pi_L + \phi\left(A + \gamma^M\bar{\theta}, \lambda\right) + T$.

Social Enterprise (SE) The mission of the organization is now delegated to the citizen-manager who has to weigh up the social payoff against private payoffs. In effect, he is in a multi-tasking environment, making both a productive effort and a mission decision. Unlike, a non-profit, the firm can choose to return a profit rather than pursuing a social goal and the manager is reward for that decision. And unlike a for-profit, she is able to forego profit and do what is good for society should she choose to do so.

The mission choice in social enterprise will be:

$$\begin{aligned}\hat{x}\left(\gamma^M; s\right) &= \arg\max_{x\in\{0,1\}}\left\{\gamma^M\theta_s x + [1-x]\Delta\right\} \text{ for } s \in \{h, l\} \\ &= \begin{cases} 1 & \text{if } \gamma^M \geq \frac{\Delta}{\theta_s} \\ 0 & \text{otherwise.} \end{cases}\end{aligned}$$

Let $v\left(\gamma^M\right) = \sum_{s\in\{h,l\}} q_s\left[\hat{x}\left(\gamma^M; s\right)\gamma^M\theta_s + (1 - \hat{x}\left(\gamma^M; s\right))\Delta\right]$where $q_h = q$ and $q_l = 1-q$ be the expected mission related payoffs when the state is H. Then effort will be $\hat{e}\left(\lambda\left[A + v\left(\gamma^M\right)\right]\right)$. The expected payoff of the manger is $\pi_L+\phi\left(A + v\left(\gamma^M\right), \lambda\right)+T$.

Comparison of Organizations from the Manager's Point of View From Proposition 1, we know that the higher the marginal payoff of the manager conditional upon success (z), the higher is his effort and his expected payoff. Therefore, we have:

Proposition 2 *For $\gamma^M \leq \underline{\gamma}$ the manager is indifferent between a social enterprise and a for profit, but strictly prefers each of them to a non-profit. For $\gamma^M \geq \overline{\gamma}$ the manager will be indifferent between a non-profit and a social enterprise but will strictly prefer these to a for-profit. For $\gamma^M \in \left(\underline{\gamma}, \overline{\gamma}\right)$, the manager strictly prefers a social enterprise to a for-profit or a non-profit.*

This suggests that the scope for social enterprise is most promising for citizen-managers who wish to tailor the mission to the realization of state s. However, which organizational form will be chosen depends on the preferences of the founder as well and on the competitive recruitment process.

Optimal Choice of Organizational Form We now consider which organizational form is optimal once we take the founder's valuation into account. The joint surplus of each organizational form factoring in both the founder's valuation of the social payoff and the citizen-manager's payoff is given by:

$$\begin{aligned} S^{FP}\left(\gamma^F,\gamma^M\right) &= \pi_L+\phi\left(A+\Delta,\lambda\right) \\ S^{NP}\left(\gamma^F,\gamma^M\right) &= \pi_L+\gamma^F\bar{\theta}\hat{e}\left(\lambda\left[A+\gamma^M\bar{\theta}\right]\right)+\phi\left(A+\gamma^M\bar{\theta},\lambda\right) \\ S^{SE}\left(\gamma^F,\gamma^M\right) &= \pi_L+\gamma^F\left(\sum_{s\in\{h,l\}}q_s\hat{x}\left(\gamma^M;s\right)\theta_s\right)\hat{e}\left(\lambda\left[A+v\left(\gamma^M\right)\right]\right)+\phi\left(A+v\left(\gamma^M\right),\lambda\right). \end{aligned}$$

To maximize joint surplus, the mission in state s should be governed by whether $\left(\gamma^M+\gamma^F\right)\theta_s \gtrless \Delta$. However, in each of our organizational forms, either a rigid mission is chosen (in a for-profit or a non-profit) or the choice is governed solely by manager's preferences (in a social enterprise). Thus selection of γ^M can affect the choices made in a social enterprise and the surplus that it generates. For now, we take the matching of founders and managers as given, relaxing this in the next section.

These payoffs can be used to define two critical levels of founder motivation which affect which organizational form is optimal. We define the parameter space relative to a non-profit being optimal. Thus, for $\gamma^M \leq \underline{\gamma}$, let us define $\Gamma_{FP}\left(\gamma^M\right)$ such that $S^{FP}\left(\Gamma,\gamma^M\right)=S^{NP}\left(\Gamma,\gamma^M\right)$, i.e. as the switch point above which a non-profit yields greater total surplus when the manager would always prefer to pursue a for-profit mission. And for $\gamma^M \in \left(\underline{\gamma},\overline{\gamma}\right)$, define $\Gamma_{SE}\left(\gamma^M\right)$ from $S^{SE}\left(\Gamma,\gamma^M\right)=S^{NP}\left(\Gamma,\gamma^M\right)$, as the switch point above which a non-profit yields higher total surplus when a manager in a social enterprise will choose a state-contingent mission.

Using these definitions, we have the following key result:

Proposition 3

1. *For low levels of manager motivation ($\gamma^M \in [0,\underline{\gamma}]$) there is a level of founder motivation $\Gamma_{FP}(\gamma^M)>0$ above which a non-profit dominates a for-profit which yields the same surplus as a social enterprise. Moreover, the function $\Gamma_{FP}(\gamma^M)$ is strictly decreasing, with $\Gamma_{FP}(0)>\frac{\Delta}{\bar{\theta}}$ and $\Gamma_{FP}(\underline{\gamma})>\Delta-\Delta\frac{\bar{\theta}}{\theta_h}$.*

2. *For middle levels of manager motivation ($\gamma^M \in \left(\underline{\gamma},\overline{\gamma}\right)$) there is a level of founder motivation $\Gamma_{SE}(\gamma^M)>0$ above which a non-profit dominates a social enterprise which dominates a for-profit . Moreover, $\Gamma_{SE}(\gamma^M)$ is strictly decreasing, with $\Gamma_{SE}(\underline{\gamma})>0=\Gamma_{SE}(\overline{\gamma})$.*

3. *For high levels of manager motivation ($\gamma^M \geq \overline{\gamma}$) a non-profit yields the same surplus as a social enterprise, and both of these organizational forms dominate a for-profit for all $\gamma^F \geq 0$.*

This partitions the parameter space depending on the level of founder and manager motivation matter. Manager motivation matters in a social enterprise because it affects which mission will be chosen while founder motivation matters because it affects how far the she cares about the social cause. When motivation is low, then either a non-profit or for-profit is optimal with the former yielding the highest payoff when the founder is sufficiently motivated. However, there is a complementarity between founder and manager motivation since a more motivated manager puts in greater effort and hence lessens the loss in efficiency in a non-profit. In the middle range of manager motivation, a social enterprise can be optimal as long as the manager will choose the right missions. When managers are highly motivated, then motivated founders are always attracted to choosing a non-profit form.[14]

Competition and Matching We now examine a market equilibrium where managers match with firms set up by founders who choose an organization form. We focus on the implications of stable matching, defined as allocations of founders and managers which are immune to a deviation in which *any* founder and manager can negotiate a choice of organizational form and a payment which makes both of them strictly better off. Were this not the case then we would expect re-matching to occur. This approach can be thought of as the outcome of a competitive labor market.

Let $\mathcal{A}_F = \{f_0, f_1, f_2\}$ denote the set of types of founders and $\mathcal{A}_M = \{m_0, m_1, m_2\}$ be the set of types of managers. Following Roth and Sotomayor (1989), the matching process can summarized by a one-to-one matching function $\mu : \mathcal{A}_F \cup \mathcal{A}_M \to \mathcal{A}_F \cup \mathcal{A}_M$ such that (i) $\mu(f_i) \in \mathcal{A}_M \cup \{f_i\}$ for all $f_i \in \mathcal{A}_F$ (ii) $\mu(m_j) \in \mathcal{A}_F \cup \{m_j\}$ for all $m_j \in \mathcal{A}_M$ and (iii) $\mu(f_i) = m_j$ if and only if $\mu(m_j) = f_i$ for all $(f_i, m_j) \in \mathcal{A}_F \times \mathcal{A}_M$. A founder (manager) is unmatched if $\mu(f_i) = f_i (\mu(m_j) = m_j)$. What this function does is to assign each founder (manager) to at most one manager (founder) and allows for the possibility that a founder (manager) remains unmatched, in which case he is described as "matched to himself".

The founder and the manager types determine how the cause is value and are denoted by $\gamma^F(f)$ and $\gamma^M(m)$ respectively. We assume that $\gamma^F(f_0) = \gamma^M(m_0) = 0$; $\gamma^M(m_2) > \bar{\gamma} > \gamma^M(m_1) > \underline{\gamma}$, and $\gamma^F(f_2) > \gamma^F(f_1) > 0$. This means that type m_2 agents are strongly motivated and will always choose the pro-social action, while m_1 agents would achieve mission integrity only if they worked in a social enterprise as described above. Type m_0 agents are completely neutral. The founders of type f_2 and f_1 are motivated, the former more than the latter, but type f_0 founders are neutral. We will abuse notation slightly and refer to $\gamma^F(f_\tau) = \gamma^F_\tau$ and $\gamma^M(m_\kappa) = \gamma^M_\kappa$ where τ,$\kappa \in \{0, 1, 2\}$, i.e. subscripts now refer to the type.

The number of founders and managers of each type is denoted by $N(f_\tau)$ and $n(m_\kappa)$ respectively. We study a population where $N(f_2) = n(m_2)$ and $N(f_1) =$

[14] Note the switch points between different forms of enterprise are not aligned with the point that mission preferences of founders and citizen-managers align since manager motivation also affects productive effort levels.

$n(m_1)$ but $N(f_0) > n(m_0)$. This puts social enterprises and non-profits under maximum competitive pressure from for-profit firms who will be seeking to recruit managers and will be willing to bid their wages up to the point where expected profits are zero. Associated with each possible match $(f_\tau, m_\kappa) \in \mathcal{A}_F \times \mathcal{A}_M$ is a choice of organization form $J(f,m) \in \{FP, NP, SE\}$ and a transfer $T(f_\tau, m_\kappa)$ when a founder of type f_τ matches with a manager of type m_κ.

As we saw in Proposition 3, for matched pairs (γ_1^F, γ_0^M) and (γ_2^F, γ_0^M) either a for-profit or a non-profit may be the best organizational form, depending on the value of $\Gamma(\gamma_0^M)$ relative to γ_1^F and γ_2^F. Similarly, for the pairs (γ_1^F, γ_1^M) and (γ_2^F, γ_1^M) either a social enterprise or a non-profit may be the optimal depending on the value of $\Gamma_{SE}(\gamma_1^M)$ relative to γ_1^F and γ_2^F.

However, the fact that there are some managers who would do what founders would like in a social enterprise is not sufficient to guarantee that social enterprises would survive as part of a stable matching model of market competition. Once firms have been founded, they need to be able to recruit managers against competition from other enterprises. We now give a condition under which there is a stable assortative matching where selfish managers and founders match together in for-profit firms, highly motivated founders and managers set up non-profit firms and those with middle levels of motivation set up social enterprises.

Stable matching will require one further condition which guarantees that a non-profit organization values a more motivated manager more than does a social enterprise. For this, we need to ensure that effort does not increase too much with manager motivation in the range $\gamma^M \in \left[\underline{\gamma}, \overline{\gamma}\right]$. A sufficient condition for this is given as part of the following result:

Proposition 4 *Suppose that the elasticity of effort at* $A + \underline{\gamma}\bar{\theta}$ *is less than* $\frac{\left(A+\underline{\gamma}\bar{\theta}\right)\theta_l}{\Delta q(\theta_h - \theta_l)}$, *then the unique stable matching equilibrium displays assortative matching, with (i)* $J(f_0, m_0) = FP$; *(ii)* $J(f_1, m_1) = SE$ *if* $\gamma_1^F < \Gamma_{SE}\left(\gamma_1^F\right)$ *and* NP *otherwise; and, (iii)* $J(f_2, m_2) = NP$.

This result articulates the case where we would expect social enterprises to emerge in matching market against competition from other organizational forms.[15] This

[15] Our assumption that $c'''(e) > 0$ implies that the marginal cost eliciting effort is increasing, which in turn implies that $\hat{e}(z)$ is increasing but concave in z (setting $\lambda = 1$), as shown in the proof of Proposition 3. Therefore, the elasticity of effort with respect to reward, namely, $\hat{\varepsilon}(z) \equiv \frac{z\hat{e}'(z)}{\hat{e}(z)}$, is strictly less than 1. For Proposition 4, we require that

$$\frac{\hat{e}'\left(A + \underline{\gamma}\bar{\theta}\right)}{\hat{e}\left(A + \underline{\gamma}\bar{\theta}\right)} < \frac{\theta_l}{\Delta q(\theta_h - \theta_l)},$$

which is equivalent to

$$\hat{\varepsilon}\left(A + \underline{\gamma}\bar{\theta}\right) < \frac{\left(A + \underline{\gamma}\bar{\theta}\right)\theta_l}{\Delta q(\theta_h - \theta_l)}.$$

A sufficient condition for this assumption to hold is $\frac{\left(A+\underline{\gamma}\bar{\theta}\right)\theta_l}{\Delta q(\theta_h - \theta_l)} > 1$ which is easy to verify in

will happen precisely when the flexible mission is valuable to both the founder and worker. Within the specified range, having a more motivated manager is good for the prospect of having a social enterprise since the effort committed by the manager will be higher.

Summary We have developed a model where social enterprises can play a role. They can recruit managers who are willing to pursue a trade-off between profits and social purpose. The level of productive effort also matters with more motivated managers also putting in greater effort. However, the need to achieve mission integrity puts a bound on the effort (and hence the level of efficiency) that can be achieved in a social enterprise. Depending on the levels of motivation and the matching process, it may be better for a motivated founder to set up a non-profit.

4 Quantitative Analysis

The results above suggest the theoretical possibility that social enterprise can serve a purpose. Our next step is to breath life into the theory in two steps. First, we present results from a laboratory experiment which is designed to test some of the core trade offs in the theory and to provide a basis for calibrating some key parameters. We can then use these calibrated values to compute the parameter ranges from Propositions 3 and 4 from these data.

4.1 The Experiment

The experiment is designed to replicate all of the key features of the decisions in theoretical model. By randomly assigning organizational choices to participants, we can cleanly test for the main trade-offs at the heart of the model between effort incentives and mission integrity. We can also use the results of the experiment to get a feeling for the empirical magnitudes involved.

The Experiment and Data The experiment was carried out in the LSE Behavioral Lab in May 2013 and drew in participants based on the Lab's mailing list. While students dominate the list, participation was not restricted.

The experiment was designed to capture the theoretical setting as closely as possible. Details of the experiment are in Appendix A. Here, we focus only on the main elements that are needed to understand the results. The participants came in groups of up to 20 and it took approximately one hour to complete the range of tasks outlined below. At the outset, participants were read a set of instructions describing the experiment which they also received on screen. They were aware before participating, that the experiment would allow them to earn money for themselves as well as donations to a good cause. The latter was the lab version of a social

applications including in the empirical application below.

payoff. The tasks were programmed in z-Tree – see Fischbacher (2007).[16] During the experiment, but prior to undertaking any of the specified tasks, participants were asked to select their preferred good cause from a list of nine possibilities.[17]

For the effort task, we follow Gill and Prowse (2012) who propose capturing effort by asking the participant to locate an on screen slider in the middle of a line. We used this task since we were persuaded that, in contrast to other tasks proposed in a range of experiments to capture the effect of incentives on effort, it provides a clean measure of effort.[18] In line with previous experiments, we find persistent heterogeneity in an individual's ability to perform the task which we interpret as ability.

As in the model above, effort led to a discrete outcome denoted by success (state H) or failure (state L). The baseline probability of a successful outcome was 52%. The participant was asked to position 48 sliders in the middle of a line during a two minute period. Each correctly positioned slider increased the probability of success by 1%. After the two minute round, success or failure was determined probabilistically in line with the model.

In the experiment, we set $\pi_L = 0$, i.e. there was no profit or donation to charity in state L (i.e. in the event of failure). In either a non-profit or a social enterprise, we captured the two states in the model conditional on state H being realized by an opportunity to give to a good cause, a process that is governed by a stochastic variable $\beta \in \{\beta_h, \beta_\ell\}$ with $\beta_h > 1 > \beta_\ell$ with

$$\theta_h = \beta_h \pi_H \text{ and } \theta_\ell = \beta_\ell \pi_H.$$

Hence the outcomes $\{h, \ell\}$ correspond to the states in the theory above. In a non-profit, proceeds were automatically given to the cause while in the case of a social enterprise, this was chosen by the participant to mimic the decision $x \in \{0, 1\}$. In state $s = h$, the participant in the experiment can forego private income to give a multiple of her what she has earned to a good cause, while in state $s = \ell$, he/she donates to the good cause of a less than one-for-one basis. The observable decision is whether an individual donates or keeps what they have earned, i.e., $x = 1$ and $x = 0$ respectively. In the experiment, we set $\beta_h = 2$, $\beta_\ell = 0.2$ and $q = 1/2$ so that $\bar{\beta} = \frac{\beta_h + \beta_\ell}{2} = 1.1$.

The experiment runs with 11 two minute effort rounds. In advance of each effort round, the participants were also told whether they were playing for $\pi_H = 2000$ or $\pi_H = 250$. These were point tallies for success or failure which would later be

[16] We are grateful for Sam Marden for his excellent programming work.

[17] The list was: Oxfam, Cancer Research UK, British Heart Foundation, Amnesty International, LSE Student Hardship Fund, Centrepoint (a London-based charity which helps young homeless), Mind (support for those with mental health problems), National Society for the Prevention of Cruelty to Children (NSPCC), Royal Society for the Protection of Cruelty to Animals (RSPCA), and World Wildlife Fund.

[18] See Gill and Prowse (2012) for discussion of the prior literature.

converted into money.[19]

The first round was a pure practice round in which the participants were not paid. After this round, they faced one of two possible scenarios. The first possibility was described to participants as an "earning" task which was intended to capture essence of a for-profit enterprise in which individuals got to keep the points that they earned. The two values of π_H (2000 or 250 points) were communicated to the participant prior to putting in effort. Each participant completed the earnings task three times consecutively.

The second possibility was described to participants as a "giving" task and was intended to capture effort in a non-profit. This also had different pre-announced values of π_H as above. It was also repeated three times with success in the effort task leading to an equally likely draw of $\beta_h = 2$ or $\beta_\ell = 0.2$ as described above. The order in which participants faced the giving task and the earning task was determined randomly.

The eighth through tenth round, was described to participants as completing a hybrid task. This captured the structure of the social enterprise model in theory above. Here, the participants performed an effort task after which, if successful, they were presented with either $\beta_h = 2$ or $\beta_\ell = 0.2$ but with a choice between giving their earnings to charity or keeping it for themselves. Once again, the value of π_H was chosen at random and communicated before effort was chosen. The experiment above does a good job at replicating the key features of the theoretical model under one key assumption, namely that the participants in the experiment perceive that the ability to help the good cause that they have selected is tied to the experiment. We expect variation in behavior according to the motivation of each participant. Specifically, we can think of each participant placing a weight γ_i on donations versus private rewards. For $\gamma_i > 5$, it will be privately optimal to donate in a social enterprise even if $\beta_s = 0.2$ while if $\gamma_i^M < 0.5$, it will never be privately optimal to donate. In the interval $\gamma_i^M \in [0.5, 5]$, individuals will choose to donate to their preferred good cause only if $s = h$. By observing their behavior when they face the incentives of a social enterprise, we will therefore be able to bound their individual γ_i^M.

Finally, in the eleventh round, the participants were allowed to choose a task. They were randomly assigned to making one of three binary choices between any of the three tasks: earnings, giving or hybrid. They then undertook the effort task associated with that choice. Note however that this does *not* replicate the matching outcome of the theory where wages are set endogenously. Moreover, it is possible that individuals pursued their own private gain in order to donate their proceeds to a good cause – a complication which is not in the theory as we assumed that the ability to pursue the good cause was not feasible outside the organization. To see whether this could be motivating individuals in our experiment, we allowed participants at the end of the experiment to donate their round 11 earnings to their preferred good

[19] We used two different levels of reward to give us a basis for estimating the elasticity of effort with respect to rewards.

cause regardless of what they had chosen. However, we did not inform them that this option would be available up front so as not to influence their self-selection decisions.

In addition to the experimental evidence, we also asked each participant to complete a short survey.[20] We collected data on age, occupation, religion, and nationality. Given the nature of the experiment and the context that interests us, we were also interested in trying to assess participants' degree of pro-social motivation. We asked them whether they had volunteered in the past year, whether they had voted, given to charity or were a member of a political party. We also followed Dal Bo, Finan and Rossi (2013) in asking two hypothetical questions. The first was the answer to a hypothetical dictator game experiment: "Suppose you were given £10 pounds to split between yourself and an anonymous other person. How much would you give the other person? (They would never know who you were)." The choice set offered to them as answers were values between 0 = £0 to 10 = £10 in £1 increments. The second was a hypothetical receiver game experiment where we asked: "Suppose an anonymous partner had been given £10 to split between you and them. They chose to give you £1. You can reject their offer, in which case you both get nothing, or accept their offer, in which case you get to keep the £1 (and they keep £9). What would you do?" The possible answers were 0 = *reject* or 1 = *accept*.

Finally, we used the questionnaire proposed in Perry (1996) to measure public service motivation. It asks a series of questions using six categories which contribute towards having an outlook on life which is indicative of greater public service orientation: attraction to policy making; commitment to the public interest; social justice; civic duty; compassion; and self-sacrifice. All of the individual questions which go into creating these judgements is based on a five point "Liker" scale measured from 1 = *strongly disagree* to 5 = *strongly agree*. From these six underlying categories, we also created an "aggregate" z-score for each participant.

At the end of the experiment, the participants were rewarded for the final round (the self-selection round) and for one of the earnings, giving and hybrid task rounds. Which round they were rewarded for was determined randomly, by a roll of the dice in the presence of the payment clerk.

Descriptive Evidence We begin be describing some basic features of the data and experimental findings. In Table 1, we look at how effort (as measured by the number of correctly positioned sliders) varies across the tasks. The practice round, not surprisingly, elicited much lower effort than the main task rounds. Looking at the raw data, effort is highest in the hybrid round and lowest in the giving round. This basic pattern obtains even when the effort in the self-selection round is not considered.

Table 2 looks at how effort varies by round (excluding the practice round). There

[20] Further details are in the data appendix.

is a pronounced "learning by doing" effect which seems to last around three rounds. Thereafter, effort seems roughly flat over rounds four through six. However, it picks up again in the final three (hybrid rounds). Since rounds four through six are roughly flat, it seems reasonable to attribute this to the impact of the organizational type on choice rather than being due to continued learning. This is view is further underlined by looking at the cumulative distribution of effort as shown in Figure 1.

Table 3 looks at the decision of whether to choose the pro-social action (donate to a good cause) or the privately optimal action (keep as earnings) in rounds six through nine of the experiment. We break this down by whether β_s is high (2) or low (0.2). Of the 468 cases where a mission choice decision was faced 236 were cases where β_s is low. There are a number of cases where individuals choose to keep the money as earnings whatever the value of β_s. However, there is evidence that individuals are more willing to take a pro-social action when the rewards of doing so are high. There are also individuals who pursue the pro-social action even when the charitable donation that they can make is lower than the private reward that they could earn. This provides evidence that there is indeed heterogeneity in motivation among the participants in the experiment in line with the theory.

Effort Choice and Incentives In the theory, we focused on heterogeneity in motivation rather than ability. However, it would be straightforward to allow λ to vary. So imagine that each participant is characterized by a pair $\left\{\lambda_i, \gamma_i^M\right\}$ reflecting their ability and motivation towards the good cause to which they can donate. Since we observe multiple effort observations for each participant, we can obtain an estimate of λ_i. And we can bounds the value of γ_i^M by observing the mission choice. We could also, in principle, allow for A to vary as it would be likely to in the population but trying to estimate this amount of parameter heterogeneity in our data is not very credible. Hence, below we calibrate the model to a core case where A is a common parameter.

The output from the experiment is 9 observations on effort per participant in the initial rounds where we assigned the organizational form and one observation one observation in the self-selection round. For the moment, we focus on the first nine rounds where for each of the k observations for individual i, let e_{ikJ} be an effort observation where $J \in \{NP, FP, SE\}$ is the organizational form.

Suppose that

$$c\left(e\right) = \frac{1}{1+1/\mu} e^{\left(1+\frac{1}{\mu}\right)}$$

i.e. a constant elasticity function. Then privately optimal effort is:

$$e_{ikJ} = \left(\lambda_i\right)^{\mu} \left(A + M_{ikJ}\right)^{\mu}$$

where M_{ijo} is a payoff associated with each organizational form. Hence:

$$\begin{aligned} M_{ikFP} &= \pi_{kH} \\ M_{ikNP} &= \gamma_i^M \bar{\beta} \pi_{kH} \\ M_{ikSE} &= \sum_{s \in \{\ell, h\}} \frac{\left[\gamma_i^M \beta_s \hat{x}\left(\gamma_i^M; J\right) + \left[1 - \gamma_i \beta_s\right] \mathcal{I}\left(\gamma_i^M \beta_s - 1\right)\right]}{2} \pi_{kH} \end{aligned}$$

where $\mathcal{I}\left(\gamma_i^M \beta_s - 1\right)$ is the indicator function. Recall that there are two possible values of rewards when the state is H with $\pi_{kH} \in \{250, 2000\}$.

Taking logs, we therefore have

$$\log\left(e_{ikFP}\right) = \mu \log\left(\lambda_i\right) + \mu \log\left(A + \pi_{kH}\right). \tag{3}$$

for effort under a for-profit. With a non-profit effort is:

$$\log\left(e_{ikNP}\right) = \mu \log\left(\lambda_i\right) + \mu \log\left(A + \gamma_i^M \bar{\beta} \pi_{kH}\right) \tag{4}$$

The term $\mu \log\left(\lambda_i\right)$ will be picked up empirically by including a participant fixed effect in all the specifications that we estimate.

Combining (3) and (4), we can run the following regression

$$\log\left(e_{ikJ}\right) = \alpha_i + \alpha_r + \delta_K + \phi_K D_{kH} + \varepsilon_{ikJ}.$$

where $J = \{NP, FP\}$ and D_{kH} is a dummy variable which is equal to one if $\pi_{kH} = 2000$ and zero otherwise. Round fixed effects are included to allow for the possibility of learning by doing.

We begin by focusing on the first six rounds where round and organizational form are both randomly assigned and hence can be fully separated from each other by including a full set of round dummy variables. The result in column (1) of Table 4 shows that effort is approximately 4% lower in the non-profit case, i.e. where all returns to effort are donated to the participant's selected good cause. In column (2) we add a dummy for whether the participant is playing for $\pi_{kH} = 2000$ or $\pi_{kH} = 250$ with a dummy variable equal to one in first case. Participant effort is 4% high when the stakes are higher. In column (3), we test whether the effect of having a high value of π_H is different in a non-profit situation where rewards are donated to a good cause. However, there is no significant difference between the two organizational forms in the data.

The pattern of round effects for the first six rounds suggest that learning by doing is exhausted by round 3 with the baseline effort being similar for each participant thereafter. An F test of the hypothesis that all dummies are the same after round 3 cannot be rejected with a p-value of 55%. When we control for learning by doing in this way as reported in column (4), then we find that the results are virtually identical to those in column (2) confirming that this more restrictive way of capturing learning by doing is not affecting the impact of organizational form and higher rewards on

effort. This finding is important since we only have observations in a social enterprise for round seven onwards.

According to the theory, effort in social enterprise is given by:

$$\log\left(e_{ikSE}\right) = \mu \log\left(\lambda_i\right) + \mu \log\left(A + \left(\sum_{s\in\{\ell,h\}} \frac{\left[\gamma_i^M \beta_s + \left[1-\gamma_i^M\beta_s\right]\mathcal{I}\left(\gamma_i^M\beta_s - 1\right)\right]}{2}\right)\pi_{kH}\right). \tag{5}$$

This is predicted to be higher in a social enterprise since there is now a flexible disposition of the resources.

In column (5) of Table 4, we maintain the hypothesis that all learning by doing is exhausted beyond the third round of the effort task to estimate the effect of a social enterprise in which the participant chooses the mission of the organization on effort choice. Here, we find a positive and significant effect of the social enterprise on effort with effort being around 5% higher.[21]

Mission Choice We now consider the decision over whether to give earnings to pursue a good cause in a social enterprise by looking at decisions to donate if the state is H. The theory suggests that this decision follows:

$$\hat{x}\left(\gamma_i^M;\beta\right) = \begin{cases} \textit{donate} & \text{if } \gamma_i^M \geq \frac{1}{\beta} \\ \textit{keep} & \text{otherwise.} \end{cases} \tag{6}$$

We model this empirically using a linear probability model where

$$x_{iks} = \rho x_i + \lambda \beta_{ik} + \eta_{ik}$$

where x_i are characteristics of the participant which may capture their pro-sociality, i.e. are proxies for γ_i^M and β_{ik} is determined randomly in the experiment for participant i after effort has been chosen.

Table 5 reports the results. At most a participant could face three rounds in which they were confronted with this choice but this happened in only 468 out of a maximum possible 621 cases. In fact only 202 of the 207 participants successfully reached the stage in the game where a "mission choice" was made.

The raw data can be used to calibrate the different ranges of γ_i^M in our data. In terms of raw percentages, we find that around 8% of the population choose to donate their earnings even if $\beta = \beta_\ell$. In terms of the model such individuals have $\gamma_i^M \geq 5$ and are strongly motivated types. Around 18% choose to donate their earnings if $\beta = \beta_h$. They have $\gamma \in \left[\frac{1}{2}, 5\right]$ and are moderately pro-social. The remaining 82% of the population have $\gamma_i^M < 1/2$ since they always choose to keep the money as earnings.

[21] When we run the regressions separately for each organizational form, then we only find a significant effect of high rewards in the for-profit case.

In column (1) of Table 5, we show that if $\beta_s = 2$, then there is a 10% increase in the chance that the participant chose to give the money as a charitable donation (chose the pro-social mission in the language of our theoretical model) compared to when $\beta_s = 0.2$.

Column (2) adds as a control whether not an individual has been a volunteer in the past year as a proxy for γ_i^M. If the answer is "yes", then he/she is 9.4% more likely to make the pro-social choice. In column (3), we add their answer to the dictator game question. Here, we find that a £1 increase in their willingness to give in the answer to that hypothetical dictator game is associated with a 1.7% increase in the probability of donating their earnings to a good cause. The results on the effect of high rewards and the high donation possibility are unchanged.

Also as a proxy for γ_i^M, column (4) adds their answer to the hypothetical receiver game. However, in this case the answer has no predictive power. Column (5) adds the six different dimensions based on the Perry (1996) scores on different dimensions of motivation. Among these, only the score which measures attraction to policy making and commitment to the public interest appear to predict a greater likelihood of giving to charity. However, when we aggregate the measures to form a Perry z-score as we report in column (6) this is significantly and positively correlated with donating to the good cause. A one standard deviation increase in the z-score (4.6) is associated with a 6% increase in the probability of giving to charity rather than taking the money as earnings. Finally, column (7) looks at the relationship with β when we include id fixed effects, i.e. identify the effect only by exploiting information on participants who faced the decision to donate in multiple rounds.

In all of the specifications in columns (1) through (7), the coefficient on realizing $s = h$, the social state in our theoretical framework, is around 10%. Thus changing the importance of social rewards versus private rewards does, in line with theory, have an impact on the behavior of some of our participants.

Our model assumes that income is linear in money so that the size of π_H does not affect whether or not to donate earnings to charity. However, if there were curvature in the utility function with a concave utility function $u(\pi_H)$, then the decision to donate would depend on income. Specifically:

$$\hat{x}\left(\gamma_i^M;\beta\right) = \begin{cases} \textit{donate} & \text{if } \gamma_i^M \geq \frac{\phi(\pi_H)}{\beta \pi_H} \\ \textit{keep} & \text{otherwise.} \end{cases} \tag{7}$$

In column (8) of Table 5, we test this linearity assumption by including the size of the π_H draw on the decision to donate. The result reported shows that having a high π_H makes it around 10% less likely that a participant in the experiment chooses to give their earnings to charity. Thus some non-concavity in payoffs seems to be implied by this.

Self-selection The experiment studied self-selection in the final round. Even though this does not give any direct insight into the matching model of competition,

it does provide a way of testing the predictions of Proposition 2 where the payoffs of managers depended on γ_i^M.

The experiment randomly assigned participants to three binary choices sets between each of the organizational forms. In Table 6, we look at the decision to pick a particular organizational form given the choice that the participant is confronted with. The basic specification that we look explains this decision to pick an organization as a function of competence in the effort task (as measured by looking at previous rounds of the experiment), the Perry z-score and whether rewards on offer are high or low. To measure competence, we use the participant fixed effects from the first six rounds.

The results are in columns (1) through (3) of Table 6. In column (1), we find that individuals who choose between a for-profit and a social enterprise are more likely to choose a social enterprise when rewards are highest and when they have a higher Perry Z-score suggesting that they are more pro-socially motivated. Competence in the effort task is not significantly correlated with choosing any kind of organization. Column (2) shows that there is no significant correlation between any of the characteristics of the organization or the individual when choosing between a non-profit and for-profit. In column (3), there is weak evidence that more pro-socially motivated individuals prefer to pick a non-profit over a for-profit as we would expect from the theoretical model.

In column (4), we look at effort in the self-selection round bearing in mind that we have now only one observation per participant. However, it is interesting to note that while competence as measured by effort in the first six rounds of the experiment strongly predicts effort in the self-selection round, there is now no correlation between the effort choice and the organizational form.[22] This finding makes sense as we should expect individuals to self-select on characteristics which explain their willingness to put in effort in an organization.

Finally, in column (5) of Table 6 we look at the decision by the participants who either chose a for-profit or social enterprise to give away their earnings in the self-selection round. There were 147 cases where this was a possibility. These comprise 71 cases where a participant had picked a for-profit and was successful and 76 cases where a participant had picked a social enterprise, had been successful and had decided to keep their earnings. Of these, 21% (31 people) decided to give away their earnings from the self-selection round. Competence and pro-social motivation as measured by the Perry z-score both strongly predict giving away earnings at this stage. And, paralleling the finding in column (8) of Table 5, there is some evidence that people are more willing to give away a lower level of earnings.

These results do suggest that motivation, γ_i^M, determines the payoffs of the participants in different organizational forms.

[22] Although, as a note of caution, it should be acknowledge that we cannot reject the hypothesis that the coefficient on non-profit is the same as in Table 4.

Summary Taken together, these results show that the core elements of the theory seem to appear in a lab setting. Effort responds to organizational choice and incentives. Moreover, mission choice varies with the importance of the good cause in the organizational setting which we use to capture our notion of a social enterprise. Our results are also show that people are heterogeneous in the main ways that the model envisages: their ability and their pro-social motivation. This is important when we think of effective organization requiring individuals to be sorted into organizations.

Our next step is to use the empirical findings to calibrate the payoffs and to use this to compute the hypothetical market equilibrium in the model. We can then explore how the motivation of the founder of an organization leads to different organizational forms emerging, but recognizing that organizations need to compete for workers in a labor market.

4.2 Calibration of a Matching Model

Although the experiment does not replicate a matching model, we can use what we learn from it to calibrate what we would expect to be the outcome when founders with different motivation levels compete by setting organizational forms and have to compete for managers to run them. Thus, we suppose that there is a large potential group of citizen-managers are available and we calibrate their types to the experimental evidence. We then ask what levels of founder motivation will lead to a social enterprise emerging as the outcome of matching process as described in Proposition 4.

Core Parameter Values To calculate these total surplus functions, we need to plug in values for the parameter vector $\left\{\lambda_i, \gamma_i^M, \mu, A, \beta_\ell, \beta_h, \pi_H, \underline{e}\right\}$. We have used the fact that in the experiment, $\pi_L = 0$ so that even with $A + z = 0$, $\hat{e} = \underline{e}$. We set $\underline{e} = 0.52$ as the lower bound on effort. Values of $\{\beta_h, \beta_h\}$ come right out of the experiment and we will calibrate the model for $\pi_H = 2000$. Estimates of λ_i are straightforward from the estimates of the participant fixed effects in the effort equation from Table 4. We use the estimates in the column (1) to obtain our estimate of participant ability.

To estimate γ_i^M we look at the mission choices as studied in Table 5. We will assign $\gamma_i^M = 5$ for individuals who always donate, $\gamma_i^M = 0$ for those who never donate and $\gamma_i^M = 1$ who only donate when $\beta = \beta_h$. Thus, we have three levels of pro-social motivation which we refer to as 'low', 'medium' and 'high'. Out of the 207 subjects in our experiment, we have 157 for whom we assign $\gamma_i^M = 0$, 33 for whom $\gamma_i^M = 1$ and 17 for whom we calibrate $\gamma_i^M = 5$.

The final two parameters that we need are intrinsic motivation A and the effort elasticity μ which we assume to be common across agents for the purposes of our calibration. There are a host of studies that suggest that a reasonable number for μ

is 0.2.[23] We can then estimate the the level of intrinsic motivation from

$$0.043 = 0.2[\log(A + 2000) - \log(A + 250)]$$

where 0.043 was the estimated coefficient in column 2 of Table 4. This gives an estimate of $A \approx 7000$. We will look at the sensitivity of the results to this below.

Consider a founder with preference γ^F who matches with a manager of type $\{\lambda_i, \gamma_i^M\}$. The set of potential managers are the 207 individuals who participated in our experiment. We can compute the total surplus that any match would generate.[24] We will use these to solve for the values of γ^F which make any particular match a stable outcome. The results in Propositions 3 and 4, show that we need to characterize is $\Gamma_{SE}(\gamma_i^M)$ and $\Gamma(\gamma_M)$. These functions are straightforward to compute and Appendix B gives the precise formula that we use.

Social Enterprise versus Non-Profits The theoretical analysis informs us that, for a social enterprise to emerge as an outcome, it suffices to focus on the participants in our experiment for whom we have calibrated that $\gamma_i^M = 1$. This was a total of 33 out of the 207 participants. For each of these potential manager, we also have an estimate of their ability λ_i.

The estimates of $\Gamma_{SE}(\gamma_i^M)$ are in Figure 2. They suggest that there is a role for social enterprise when $\gamma^F < 4.1$ but for values above this, a non-profit will be able to compete for workers from a social enterprise because it cares about having motivated workers. We find an upward sloping locus with the switch point towards social enterprise being higher for more productive workers.

Thus social enterprise does indeed occupy a niche between standard non-profit and for-profit but works when there is suitable matching between the managers and founders. Note that the founder of the social enterprise is considerably more motivated than the managers that they employ. But if the founder were more highly motivated still then he would prefer a non-profit.

This quantitative analysis also allows us to see what the percentage increase in total surplus possible by allowing social entrepreneurs to establish social enterprises rather non-profits assuming that they are matched with managers who have similar preferences. For this, we take the case where $\gamma^F = 1$ and $\gamma_i^M = 1$. Then the gain is measured as

$$\Delta = \frac{S^{SE}(1,1) - S^{NP}(1,1)}{S^{NP}(1,1)}.$$

Using our core calibration, we measure this benefit as between 8% and 12% over the range of ability that we have estimated for the 33 participants in the experiment for

[23] This elasticity is similar to those found in other exeperimental settings both in the lab and the field. As noted in Prendergast (2013) it is also consistent with the findings in the literature on taxation and labor supply.

[24] The exact formulae for these are given in Appendix B.

whom $\gamma_i^M = 1$. Thus, for this range of motivation, there do appear (based on this) to be reasonable gains.[25]

The calibration that we have used is specific and based on specific parameter values from the experimental data. We can assess straightforwardly the robustness of the results to varying some of the key parameters.

We begin by looking at the elasticity of effort with respect to rewards where the core results set $\mu = 0.2$. We now consider what happens when we halve this to $\mu = 0.1$ and double it to $\mu = 0.4$. Since we calibrate the level of intrinsic motivation based on this, we also have to adjust this to be consistent with the coefficient in column (2) of Table 4. Hence the values that we set are:

$$\begin{array}{ll} \mu = 0.1 & A = 3000 \\ \mu = 0.2 & A = 7000 \\ \mu = 0.4 & A = 15000 \end{array}$$

Figure 3 looks at the margin between a non-profit and social enterprise when $\gamma^M = 1$. Now we find that the differences are quite modest suggesting that . However, increasing the effort elasticity to $\mu = 0.4$ does expand the range under which a social enterprise is optimal quite a bit.

We now look at what happens when we vary β_ℓ. We consider lowering β_ℓ to 0.1 and increasing it to 0.4. Figure 4 shows the choice between a non-profit and social enterprise. The critical value of γ^M now seems quite sensitive to having a higher value of β_ℓ with a lower value of β_ℓ significantly increasing the range over which a social enterprise is better than a non-profit.

Finally, we look at variations in the value of γ^M. We pick $\gamma^M = 0.5$ (with the correct mission choice still chosen when the manager is indifferent) and $\gamma^M = 1.5$. The results of doing this are displayed in Figure 5. The effect of this on the choice of a social enterprise versus a non-profit are quite modest.

For-Profit versus Non-Profit We now look at the case where managers are not motivated, i.e. $\gamma^M = 0$. This is interesting because it is the standard case of selfish agents considered in agency models and almost all models of organization design. It is not interesting, however, for studying social enterprise in our setting since for-profit organization and social enterprise achieve the same outcomes. But there is still a question of whether a non-profit is viable when it has to compete for managers against for-profit firms. The wages that it will have to pay will depend on λ; it will be harder to compete for workers who are more productive as they are more desirable for profit firms.

For this case, we compute the function $\Gamma(0)$, which we defined above as the critical value of γ^F such that a non-profit is preferred to a for-profit for all γ^F above

[25] We also computed the gains for a social enterprise over a for-profit enterprise. These are much large with an average gain in total surplus of 70%, ranging from around 60% to 100% across the 33 participants.

this threshold. Using our calibration to the experimental data, we get the upward sloping locus in Figure 6 characterizing the critical γ^F values. This gives the critical value of γ^F above which a non-profit firm is willing to bid more for a worker than a for-profit firm. The value of γ^F is below one. This finding suggests that even a modest interest in the good cause will be sufficient to establish a non-profit in the setting that we studied in the lab.

Figure 7 considers sensitivity to choosing $\mu = 0.1$ or $\mu = 0.4$, re-calibrating the level of intrinsic motivation as above. Observe now that the high elasticity case now requires a negative value of γ^F to make having a for-profit optimal. This is because, we need to assume quite a high level of intrinsic motivation to be consistent with the results in Table 4. Note that the effect of having a lower effort elasticity is not particularly great.

5 The Case for For-Profit Enterprise

The focus of the analysis so far has been on cases where forgoing profit can generate unambiguous social gains, i.e. $\gamma^F \geq 0$ and $\bar{\beta} > 1$. But, if these conditions did not hold, then the case for for-profit enterprise (as a rigid mission) is stronger.

Suppose first that $\gamma^F < 0$. Then there is a conflict of interest between the founder and motivated managers which is similar to standard agency models of the firm where managerial discretion leads to private rent-seeking.[26] Founding a for-profit firm now makes sense as a means of restricting this by creating a rigid mission to pursue profit maximization. Thus we have:

Proposition 5 *For any $\gamma^M > 0$ a for-profit will dominate a non-profit or a social enterprise if $\gamma^F < 0$ and is sufficiently large.*

This result highlights a key difference between the framework of this paper and standard models of organization. The study of social enterprises and non-profits makes sense in cases where there is a common cause that founders and managers wish to pursue.

Making use of the observation in Proposition 5, it should be clear that if $\gamma^F = -5$ in our core calibration, then there is never a case for either a non-profit or social enterprise. This is because even with managers who are strongly committed towards choosing $x = 1$, produce a corresponding "loss" in utility for the founder. However, with $\gamma^F = -1$, there could be a case for a non-profit or social enterprise if they employ a manager for whom $\gamma^M = 5$. This is because the benefits to the manager of the good cause exceed the loss to the founder.

Having $\bar{\beta} < 1$, is in many ways similar to having $\gamma^F < 0$ since the value of the cause favored by motivated managers is less on average than forgone profits. Founding a non-profit again restricts the manager's discretion to pursue a private surplus-reducing agenda.

[26] See, for example, Tirole (2006).

A more subtle possibility arises by considering what happens if the social cause can also be pursued through government action. This bears on the argument articulated by George Soros in the quote at the beginning of the paper which echoes Milton Friedman's well-known critique of corporate social responsibility (see Friedman (1970)). Both argue that government should take responsibility for regulating public goods and bads, leaving firms to focus on profit maximization. If the government were choosing its preferred level of public goods, then it would optimally reduce its contribution to good causes in response to private contributions. The result would be complete crowd-out making private contributions irrelevant. To all intents and purposes, this is like having $\beta_s = 0$. In this case, in line with Friedman and Soros, only for-profit enterprise would be chosen. Hence the case for a non-profit or social enterprise as developed here is (implicitly) premised on government intervention being either rigid or absent in the enterprise's sphere of operation.

We have offered a specific take on the role of social enterprise where there is a trade-off between mission and profits. However, pro-social ends could actually enhance profitability. In Bagnoli and Watts (2003), Besley and Ghatak (2007), and Kotchen (2006), socially responsible consumers drive this possibility while in Baron (2001, 2009) the mechanism is private politics, i.e. social activists. In such cases, a for-profit mission need not clash with pro-social behavior.

6 Concluding Comments

This paper has explored the value of social enterprise in theory and by calibrating the model to experimental data. A social enterprise is neither bound to maximize profits nor to pursue a purely social mandate – it combines profit with purpose. However, since the good cause is unpriced, it works only when there are citizen-managers in the world to achieve he right balance between mission and profits. Hence, we have explored the selection argument behind social enterprise where managers are motivated agents.

We have identified two features of the world which naturally limit the domain of social enterprise. First, there has to be a trade-off between profits and purpose which cannot be contracted over directly, therefore requiring selection of citizen-managers to deliver this outcome. Second, managers and founders have to be able to match on their mission preferences to achieve a mutually preferred to that in an organization that always pursues either profit or a good cause. Provided that these two conditions hold, there is a role for social enterprise of the kind that we have identified where managerial selection achieves mission integrity. The empirical example developed here suggests a gain of around 10% in total surplus from founding a social enterprise rather than a non-profit.

Our approach has also emphasized that any model of social enterprise must survive in a competitive environment where for-profit and non-profit enterprises can also be set up. Non-profits provide competition to the extent that highly motivated

founders are willing to use their personal wealth to fund an organization which always pursues a social mission and can bid away motivated agents. For-profits can earn a higher financial surplus and hence bid for managers more aggressively.

The paper has blended a mix of theory and experimental evidence. The latter has allowed us to calibrate our model and to explore the trade-off between effort and mission integrity empirically. The core elements of the model are found to have empirical counterparts in the lab setting. And this is helpful in taking lessons of the analysis beyond theoretical possibilities and into real world debates. However, the usual issue of external validity of experimental findings remains. In future work, it would be interesting to study the interplay of mission integrity and effort incentives in field settings and using observational data.

Although not normally classified as "social enterprises", the ideas in this paper can be used to think about the ownership and management of sports franchises and media outlets. These are both cases where there is a wider constituency, fans in the case of sports and citizens/politicians in the case of the media, who care about how the enterprise is run. In both cases, owners own such enterprises because they too care about success in non-profit terms. In sports, club like structures were traditionally a means of attenuating the profit motive and in media some kind of trust based ownership is no uncommon. It would be interesting to use the ideas here to explore in more detail how ownership and control structures affect performance.

In a wider sense, the paper contributes to debates about the right organizational structures for a market economy.[27] Protest movements around the world have used the recent financial crisis to galvanize discontent about some aspects of market driven societies. Such sentiments have been seized upon by to denounce economic reasoning, particular in spheres were social goals matter. This disillusionment has yet to find expression in an alternative model and founding social enterprise sounds appealing in that context. Attempts to promote benefit corporations in law is a growing response to this. However, before pushing the idea further, it is essential to understand the theory and practice better. By doing so, albeit in a specific setting, this paper highlights both the potential and limitations of these ideas. But much remains to be done to create a complete understanding.

[27] See Besley (2013) for discussion in the context of the critique of markets by Sandel (2012).

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Appendix

A Proofs

Proof of Proposition 1: Using earlier notation, if z is the manager's expected payoff (pecuniary and non-pecuniary) conditional on success, then the choice of effort by the manager is given by $\hat{e}(\lambda z)$ and the expected payoff of the manager by $\pi_L + \phi(z,\lambda) - T = \pi_L + \frac{\lambda z \hat{e}(\lambda z) - c(\hat{e}(\lambda z))}{\lambda} - T$. For higher values of z, the value of $\hat{e}(\lambda z)$ is higher from the first-order condition, and by the envelope theorem, the change in $\phi(z,\lambda)$ is given by $\hat{e}(\lambda z)$. ■

Proof of Proposition 2: There are three ranges of γ^M to consider. For $\gamma^M \leq \underline{\gamma}$, the manager will always choose $x = 0$ under a social enterprise, and therefore, be indifferent between a social enterprise and a for profit. But a non-profit is strictly dominated. For $\gamma^M \geq \overline{\gamma}$, the manager will always choose $x = 1$ in a social enterprise. Therefore he will be indifferent between a non-profit and a social enterprise but a for-profit will be strictly dominated. Finally, for $\gamma^M \in \left(\underline{\gamma}, \overline{\gamma}\right)$, the manager will choose $x = 1$ when $s = h$ and $x = 0$ when $s = l$ in a social enterprise. In this case, $v(\gamma^M) = q\gamma^M\theta_h + (1-q)\Delta > \max\{\Delta, \gamma^M\bar{\theta}\}$. Therefore, the social enterprise is preferable to the manager to a for-profit or a non-profit. ■

Proof of Proposition 3: $S^{FP}\left(\Gamma, \gamma^M\right) = S^{NP}\left(\Gamma, \gamma^M\right)$ is equivalent to the value of $\gamma^F = \Gamma_{FP}$ that solves $\phi(A+\Delta,\lambda) = \gamma^F\bar{\theta}\hat{e}\left(\lambda\left[A+\gamma^M\bar{\theta}\right]\right) + \phi\left(A+\gamma^M\bar{\theta},\lambda\right)$.This is equivalent to

$$\begin{aligned} & \lambda(A+\Delta)\hat{e}((A+\Delta)\lambda) - c(\hat{e}((A+\Delta)\lambda)) \\ = \; & \lambda\left(\gamma^F\bar{\theta} + A + \gamma^M\bar{\theta}\right)\hat{e}\left(\lambda\left(A+\gamma^M\bar{\theta}\right)\right) - c\left(\hat{e}((A+\gamma^M\bar{\theta})\lambda)\right). \end{aligned}$$

To minimize notation we set $\lambda = 1$ in the subsequent analysis so that we have:

$$(A+\Delta)\hat{e}(A+\Delta) - c(\hat{e}(A+\Delta)) = \left(A+\gamma^F\bar{\theta}+\gamma^M\bar{\theta}\right)\hat{e}\left(A+\gamma^M\bar{\theta}\right) - c\left(\hat{e}(A+\gamma^M\bar{\theta})\right). \tag{8}$$

It is straightforward to verify that $\Gamma'\left(\gamma^M\right) < 0$: totally differentiating (8), we get

$$\frac{d\gamma^F}{d\gamma^M} = -1 - \bar{\theta}\gamma^F\frac{\hat{e}'\left(A+\gamma^M\bar{\theta}\right)}{\hat{e}\left(A+\gamma^M\bar{\theta}\right)} < 0.$$

For $\gamma^M = 0$, the right-hand side of (8) is lower than the left-hand side at $\gamma^F\bar{\theta} = \Delta$, and therefore, $\Gamma(0) > \frac{\Delta}{\bar{\theta}}$, which lies between $\underline{\gamma}$ and $\overline{\gamma}$. At $\gamma^M = \underline{\gamma}$, $\gamma^M\bar{\theta} = \Delta\frac{\bar{\theta}}{\theta_h} < \Delta$ and therefore, at $\gamma^F\bar{\theta} + \gamma^M\bar{\theta} = \Delta$, the left hand side is larger. Therefore, the two sides can be equal only if γ^F exceeds some minimum threshold, given by $\Gamma(\underline{\gamma}) > \left(\Delta - \Delta\frac{\bar{\theta}}{\theta_h}\right)\frac{1}{\bar{\theta}}$.

Also, as $\Gamma'\left(\gamma^M\right) < 0$, and $\Gamma(0) > \Gamma(\underline{\gamma}) > 0$, $\Gamma(\gamma^M) > 0$ for all $\gamma^M \in [0, \underline{\gamma}]$. Therefore, we find that in the parameter range $\gamma^M \leq \underline{\gamma}$, both FP and NP can

dominate depending on parameter values. In particular, for any given level of manager motivation γ^M, there is a level of founder motivation $\Gamma(\gamma^M)$ such that for $\gamma^F \geq \Gamma(\gamma^M)$ NP dominates FP. $\Gamma(\gamma^M)$ is strictly negatively sloped, with $\Gamma(0) > \frac{\Delta}{\bar{\theta}}$ and $\Gamma(\underline{\gamma}) > \left(1 - \frac{\bar{\theta}}{\theta_h}\right)\frac{\Delta}{\bar{\theta}}$. Notice that $\frac{\Delta}{\bar{\theta}} > \left(1 - \frac{\bar{\theta}}{\theta_h}\right)\frac{\Delta}{\bar{\theta}}$.

Now we turn to the parameter range $\gamma^M \in \left(\underline{\gamma}, \overline{\gamma}\right)$. For this parameter range,

$$v\left(\gamma^M\right) = q\gamma^M\theta_h + (1-q)\,\Delta\ .$$

Also, $v\left(\gamma^M\right) > \max\left\{\gamma^M\bar{\theta}, \Delta\right\}$ for $(\underline{\gamma}, \overline{\gamma})$. At $\gamma^M = \underline{\gamma}$, $v\left(\gamma^M\right) = \Delta > \gamma^M\bar{\theta}$ and at $\gamma^M = \overline{\gamma}$, $v\left(\gamma^M\right) = \gamma^M\bar{\theta} > \Delta$. Once again setting $\lambda = 1$, $S^{SE}\left(\Gamma, \gamma^M\right) = S^{NP}\left(\Gamma, \gamma^M\right)$ is equivalent to $\gamma^F = \Gamma_{SE}$ solving:

$$\gamma^F q\theta_h \hat{e}\left(A + v\left(\gamma^M\right)\right) + \phi\left(A + v\left(\gamma^M\right)\right) = \gamma^F\bar{\theta}\hat{e}\left(A + \gamma^M\bar{\theta}\right) + \phi\left(A + \gamma^M\bar{\theta}\right)$$

or,

$$\begin{aligned} & \left(A + v\left(\gamma^M\right) + \gamma^F q\theta_h\right)\hat{e}\left(A + v\left(\gamma^M\right)\right) - c\left(\hat{e}(A + v\left(\gamma^M\right))\right) \\ = \ & \left(A + \gamma^F\bar{\theta} + \gamma^M\bar{\theta}\right)\hat{e}\left(A + \gamma^M\bar{\theta}\right) - c\left(\hat{e}(A + \gamma^M\bar{\theta})\right). \end{aligned} \tag{9}$$

Observe that $\gamma^F q\theta_h < \gamma^F\bar{\theta}$, i.e., the non-pecuniary payoff received by the founder is always lower under a SE than a NP, since the SE chooses a commercial action when $s = l$. However, the effort under a SE is higher than that of a NP, as $v\left(\gamma^M\right) \geq \gamma^M\bar{\theta}$ with the strict equality holding only for $\gamma^M = \overline{\gamma}$. This is the key trade off between a SE and a NP.

For $\gamma^M = \underline{\gamma}$, $v\left(\gamma^M\right) = \Delta > \gamma^M\bar{\theta}$. Therefore, a SE strictly dominates a FP. Therefore, the critical level of γ^F such that a NP dominates a SE, has to be higher than the one for a FP, namely, $\Gamma(\underline{\gamma})$. In particular, consider the threshold

$$\left(\gamma^F + \underline{\gamma}\right)\theta_l = \Delta$$

(which is consistent with $\underline{\gamma}\theta_l < \Delta$). For this value, $\gamma^F\bar{\theta} + \underline{\gamma}\bar{\theta} = \left(\gamma^F + \underline{\gamma}\right)q\theta_h + (1-q)\,\Delta$ and the total payoff conditional on success is the same under a NP and a SE, but the effort level is higher under a SE. Therefore, $\Gamma_{SE}(\underline{\gamma}) > \overline{\gamma} - \underline{\gamma} > \left(\Delta - \Delta\frac{\bar{\theta}}{\theta_h}\right)\frac{1}{\bar{\theta}} > 0$. For $\gamma^M = \overline{\gamma}$, $v\left(\gamma^M\right) = \gamma^M\bar{\theta}$. Therefore, the effort level is the same under a SE and a NP, and therefore, for any $\gamma^F > 0$, a NP must dominate. At $\gamma^F = 0$ they yield the same surplus.

Observe that

$$\Gamma'_{SE}\left(\gamma^M\right) = -1$$
$$-\frac{\phi\left(A + v\left(\gamma^M\right)\right) - \phi\left(A + \gamma^M\bar{\theta}\right)}{\left[\bar{\theta}\hat{e}(A + \gamma^M\bar{\theta}) - q\theta_h\hat{e}\left(A + v\left(\gamma^M\right)\right)\right]^2} \cdot \frac{\partial\left[\bar{\theta}\hat{e}\left(A + \gamma^M\bar{\theta}\right) - q\theta_h\hat{e}\left(A + v\left(\gamma^M\right)\right)\right]}{\partial\gamma^M}$$

using the envelope theorem. As $v\left(\gamma^M\right) > \gamma^M\bar{\theta}$ for $\gamma^M \in [\underline{\gamma}, \overline{\gamma}]$, by Proposition 1, $\phi\left(A + v\left(\gamma^M\right)\right) > \phi\left(A + \gamma^M\bar{\theta}\right)$. Also,

$$\frac{\partial\left[\bar{\theta}\hat{e}\left(A+\gamma^{M}\bar{\theta}\right)-q\theta_{h}\hat{e}(A+v\left(\gamma^{M}\right))\right]}{\partial\gamma^{M}}=\left(\bar{\theta}\right)^{2}\hat{e}'\left(A+\gamma^{M}\bar{\theta}\right)-\left(q\theta_{h}\right)^{2}\hat{e}'\left(A+v\left(\gamma^{M}\right)\right).$$

So $\Gamma'_{SE}\left(\gamma^{M}\right)<0$ for $\gamma^{M}\in[\underline{\gamma},\overline{\gamma}]$ if $\hat{e}'\left(z\right)>\hat{e}'\left(z^{*}\right)$ whenever $z^{*}>z$, that is, $\hat{e}\left(z\right)$ is concave. To see when this is true, observe that

$$\hat{e}'\left(z\right)=\frac{1}{c''\left(\hat{e}\left(z\right)\right)}.$$

Hence it will hold whenever $c'''\left(e\right)>0$. Therefore, $\Gamma'_{SE}\left(\gamma^{M}\right)<0$. As $\Gamma_{SE}(\underline{\gamma})>0=\Gamma_{SE}(\overline{\gamma})$ this shows that $\Gamma_{SE}\left(\gamma^{M}\right)>0$ for all $\gamma^{M}\in[\underline{\gamma},\overline{\gamma})$. ■

Proof of Proposition 4: Our assumptions on the fraction of each type implies that all the surplus will accrue to managers. Both $S^{NP}\left(\gamma^{F},\gamma^{M}\right)$ and $S^{SE}\left(\gamma^{F},\gamma^{M}\right)$ have a positive cross-partial derivative with respect to γ^{M} and γ^{F}. Also, $S^{FP}\left(\gamma^{F},\gamma^{M}\right)$ is independent of γ^{F} and γ^{M} and therefore, is weakly supermodular. However, the maximum of these supermodular functions is not necessarily supermodular. We proceed to prove positive assortative matching using the following steps:
Step 1: Consider a function $f(\gamma^{F},\gamma^{M})$ that is increasing in both arguments. Suppose it is strictly supermodular, i.e.,

$$f(\gamma_{a}^{F},\gamma_{a}^{M})+f(\gamma_{b}^{F},\gamma_{b}^{M})>f\left(\gamma_{a}^{F},\gamma_{b}^{M}\right)+f(\gamma_{b}^{F},\gamma_{a}^{M}\}$$

whenever $\gamma_{a}^{F}>\gamma_{b}^{F}$ and $\gamma_{a}^{M}>\gamma_{b}^{M}$. Define a function $g(\gamma^{F},\gamma^{M})=\max\{f(\gamma^{F},\gamma^{M}),C\}$ where C is a constant. We show that $g(\gamma^{F},\gamma^{M})$ is weakly supermodular and strictly so for $C<\max\{f(\gamma_{a}^{F},\gamma_{b}^{M}),f(\gamma_{b}^{F},\gamma_{a}^{M})\}$. As $f(\gamma^{F},\gamma^{M})$ is increasing in both arguments, the result is trivially true if $C>f(\gamma_{a}^{F},\gamma_{a}^{M})$ or $C<f(\gamma_{b}^{F},\gamma_{b}^{M})$. Therefore, consider the case where

$$C\in\left[f\left(\gamma_{b}^{F},\gamma_{b}^{M}\right),f(\gamma_{a}^{F},\gamma_{a}^{M})\right].$$

Then

$$g\left(\gamma_{a}^{F},\gamma_{a}^{M}\right)+g\left(\gamma_{b}^{F},\gamma_{b}^{M}\right)=f(\gamma_{a}^{F},\gamma_{a}^{M})+C.$$

As

$$f(\gamma_{a}^{F},\gamma_{a}^{M})\geq\ \max\{f(\gamma_{a}^{F},\gamma_{b}^{M}),f(\gamma_{b}^{F},\gamma_{a}^{M}),C\}$$

and

$$f(\gamma_{a}^{F},\gamma_{a}^{M})+C\geq f\left(\gamma_{a}^{F},\gamma_{a}^{M}\right)+f\left(\gamma_{b}^{F},\gamma_{b}^{M}\right)>f(\gamma_{a}^{F},\gamma_{b}^{M})+f(\gamma_{b}^{F},\gamma_{a}^{M})$$

the result follows. Suppose $C<\max\{f(\gamma_{a}^{F},\gamma_{b}^{M}),f(\gamma_{b}^{F},\gamma_{a}^{M})\}$. Then we show that $g(\gamma^{F},\gamma^{M})$ is strictly supermodular. There are three cases to consider: (i) $f(\gamma_{a}^{F},\gamma_{b}^{M})>C>f(\gamma_{b}^{F},\gamma_{a}^{M})$. Then $g\left(\gamma_{a}^{F},\gamma_{b}^{M}\right)+g\left(\gamma_{b}^{F},\gamma_{a}^{M}\right)=f\left(\gamma_{a}^{F},\gamma_{b}^{M}\right)+C<f\left(\gamma_{a}^{F},\gamma_{a}^{M}\right)+C=g\left(\gamma_{a}^{F},\gamma_{a}^{M}\right)+g\left(\gamma_{b}^{F},\gamma_{b}^{M}\right)$; (ii) $f(\gamma_{b}^{F},\gamma_{a}^{M})>C>f(\gamma_{a}^{F},\gamma_{b}^{M})$ for which the proof is

similar to (i); (iii) $\min\left\{f(\gamma_b^F,\gamma_a^M),f(\gamma_a^F,\gamma_b^M)\right\}>C$ then $g\left(\gamma_a^F,\gamma_b^M\right)+g\left(\gamma_b^F,\gamma_a^M\right)=f\left(\gamma_a^F,\gamma_b^M\right)+f\left(\gamma_b^F,\gamma_a^M\right)<f\left(\gamma_a^F,\gamma_a^M\right)+f\left(\gamma_b^F,\gamma_b^M\right)<g\left(\gamma_a^F,\gamma_a^M\right)+C=g\left(\gamma_a^F,\gamma_a^M\right)+g\left(\gamma_b^F,\gamma_b^M\right)$. A direct corollary of Step 1 is, that $\max\{S^{SE},S^{FP}\}$ and $\max\{S^{NP},S^{FP}\}$ are weakly supermodular, and strictly so for particular cases (which arise later in the proof).

Step 2: Consider the pair (γ_a^F,γ_a^M) and (γ_b^F,γ_b^M). Suppose $\gamma_a^F>\gamma_b^F$ and $\gamma_a^M>\gamma_b^M$. Then $S^{NP}(\gamma_a^F,\gamma_a^M)-S^{NP}(\gamma_a^F,\gamma_b^M)>S^{SE}(\gamma_a^F,\gamma_a^M)-S^{SE}(\gamma_a^F,\gamma_b^M)$ where $\gamma_a^M,\gamma_b^M\in(\underline{\gamma},\overline{\gamma})$. From the proof of Proposition 3, $\frac{\partial^2\left(S^{NP}-S^{SE}\right)}{\partial\gamma^F\partial\gamma^M}>0$. Therefore, $\frac{\partial\left(S^{NP}-S^{SE}\right)}{\partial\gamma^M}>\left.\frac{\partial\left(S^{NP}-S^{SE}\right)}{\partial\gamma^M}\right|_{\gamma^F=0}=\bar{\theta}\hat{e}(A+\gamma^M\bar{\theta})-q\theta_h\hat{e}\left(A+v\left(\gamma^M\right)\right)=(1-q)\,\theta_l\hat{e}(A+\gamma^M\bar{\theta})-q\theta_h\left[\hat{e}\left(A+v\left(\gamma^M\right)\right)-\hat{e}(A+\gamma^M\bar{\theta})\right]$. We want to show this is positive. From the proof of Proposition 3, $\hat{e}\,(z)$ is increasing and concave. Therefore $\hat{e}\left(A+v\left(\gamma^M\right)\right)-\hat{e}(A+\gamma^M\bar{\theta})<\left[v\left(\gamma^M\right)-\gamma^M\bar{\theta}\right]\hat{e}'(A+\gamma^M\bar{\theta})=(1-q)\left(\Delta-\theta_l\gamma^M\right)\hat{e}'(A+\gamma^M\bar{\theta})$. For our proof, it is sufficient to show that $q\theta_h\left(\Delta-\theta_l\gamma^M\right)\hat{e}'(A+\gamma^M\bar{\theta})<\theta_l\hat{e}(A+\gamma^M\bar{\theta})$ for all $\gamma^M\in(\underline{\gamma},\overline{\gamma})$. The left-hand side is decreasing in γ^M while the right-hand side is increasing and so it is sufficient to show that $q\theta_h\left(\Delta-\theta_l\underline{\gamma}\right)\hat{e}'(A+\underline{\gamma}\bar{\theta})<\theta_l\hat{e}(A+\underline{\gamma}\bar{\theta})$ which follows from assumption in the statement of the proposition (namely, $\hat{\varepsilon}\left(A+\underline{\gamma}\bar{\theta}\right)<\frac{\left(A+\underline{\gamma}\bar{\theta}\right)\theta_l}{\Delta q(\theta_h-\theta_l)}$) given that that $\underline{\gamma}=\frac{\Delta}{\theta_h}$. A similar proof holds to establish the inequality $S^{NP}(\gamma_a^F,\gamma_a^M)-S^{NP}(\gamma_b^F,\gamma_a^M)>S^{SE}(\gamma_a^F,\gamma_a^M)-S^{SE}(\gamma_b^F,\gamma_a^M)$. So far in the proof of Step 2 we considered only $\gamma^M\in(\underline{\gamma},\overline{\gamma})$. We can extend this argument to the case where $\gamma_b^M<\underline{\gamma}$ while $\gamma_a^M\in(\underline{\gamma},\overline{\gamma})$ and this would be needed in the proof of case 1 below. This is done by noting that $S^{SE}(\gamma_a^F,\gamma_b^M)=S^{SE}(\gamma_a^F,\underline{\gamma})$ while $S^{NP}(\gamma_a^F,\gamma_B^M)<S^{NP}(\gamma_a^F,\underline{\gamma})$. Therefore, $S^{NP}(\gamma_a^F,\gamma_a^M)-S^{NP}(\gamma_a^F,\gamma_b^M)>S^{NP}(\gamma_a^F,\gamma_a^M)-S^{NP}(\gamma_a^F,\underline{\gamma})>S^{SE}(\gamma_a^F,\gamma_a^M)-S^{SE}(\gamma_a^F,\underline{\gamma})=S^{SE}(\gamma_a^F,\gamma_a^M)-S^{SE}(\gamma_a^F,\gamma_b^M)$.

We now proceed to prove that the unique matching equilibrium involves positive assortative matching, i.e., a type f_τ founder ($\tau=0,1,2$) matches with a type m_κ ($\kappa=0,1,2$) manager where $\tau=\kappa$ and some type f_0 founders remain unmatched. Suppose not, and if possible let there be at least one non-assortative match. Since type m_0 managers are scarce relative to type f_0 founders, therefore, we cannot have a non-assortative match such that a type m_0 manager is unmatched. There can be three possible types of non-assortative matches:

Case 1: A type m_0 manager can be matched to a type f_2 (or f_1) founder, and a type m_2 (or m_1) manager to a type f_0 principal. If there is a non-assortative match (f_0,m_2) would be a NP and (f_2,m_0) would be a NP or FP. As $\max\{S^{NP},S^{FP}\}$ is strictly supermodular, the non-assortative match is not stable. If they are re-matched assortatively, i.e, (f_0,m_0) and (f_2,m_2), these would be a FP and a NP respectively. Next consider a possible non-assortative match (f_0,m_1) and (f_1,m_0). We know (f_0,m_1) would be a SE, but (f_1,m_0) could be a FP or a NP and (f_1,m_1) could be a NP or a SE. These generates four possible cases, of which (f_1,m_0) being a FP and (f_1,m_1) being a SE is easy to deal with by the supermodularity of $\max\{S^{SE},S^{FP}\}$

(by Step 1). Let us consider the case where (f_1, m_0) and (f_1, m_1) are both NPs. Then we want to show:

$$S^{NP}(\gamma_1^F, \gamma_1^M) - S^{NP}(\gamma_1^F, \gamma_0^M) > S^{SE}(\gamma_0^F, \gamma_1^M) - S^{FP}(\gamma_0^F, \gamma_0^M).$$

Notice that $S^{FP}(\gamma_0^F, \gamma_0^M) = S^{SE}(\gamma_0^F, \gamma_0^M)$. The result follows as

$$S^{NP}(\gamma_1^F, \gamma_1^M) - S^{NP}(\gamma_1^F, \gamma_0^M) > S^{SE}(\gamma_1^F, \gamma_1^M) - S^{SE}(\gamma_1^F, \gamma_0^M)$$

by Step 2 above, and

$$S^{SE}(\gamma_1^F, \gamma_1^M) - S^{SE}(\gamma_1^F, \gamma_0^M) > S^{SE}(\gamma_0^F, \gamma_1^M) - S^{SE}(\gamma_0^F, \gamma_0^M)$$

by the supermodularity of S^{SE}. Next consider the case where (f_1, m_0) is a NP and (f_1, m_1) is a SE. Then we want to show

$$S^{SE}(\gamma_1^F, \gamma_1^M) - S^{NP}(\gamma_1^F, \gamma_0^M) > S^{SE}(\gamma_0^F, \gamma_1^M) - S^{FP}(\gamma_0^F, \gamma_0^M).$$

This is true as

$$S^{NP}(\gamma_1^F, \gamma_1^M) - S^{NP}(\gamma_1^F, \gamma_0^M) > S^{SE}(\gamma_0^F, \gamma_1^M) - S^{SE}(\gamma_0^F, \gamma_0^M)$$

by the argument above, and

$$S^{SE}(\gamma_1^F, \gamma_1^M) - S^{NP}(\gamma_1^F, \gamma_0^M) > S^{NP}(\gamma_1^F, \gamma_1^M) - S^{NP}(\gamma_1^F, \gamma_0^M)$$

in this instance. The final sub-case is where (f_1, m_0) is a FP and (f_1, m_1) is a NP. Then we want to show

$$S^{NP}(\gamma_1^F, \gamma_1^M) - S^{FP}(\gamma_1^F, \gamma_0^M) > S^{SE}(\gamma_0^F, \gamma_1^M) - S^{FP}(\gamma_0^F, \gamma_0^M).$$

This follows from $S^{NP}(\gamma_1^F, \gamma_1^M) > S^{SE}(\gamma_1^F, \gamma_1^M)$ and given that $S^{SE}(\gamma_0^F, \gamma_1^M) > S^{NP}(\gamma_0^F, \gamma_1^M)$, the supermodularity of $\max\{S^{SE}, S^{FP}\}$.

Case 2: A type m_1 manager can be matched to a type f_2 founder, and a type m_2 manager to a type f_1 founder. We know that (f_2, m_2) and (f_1, m_2) would be a NP, but (f_2, m_1) could be a NP or a SE and (f_1, m_1) could be a NP or a SE. Obviously, if (f_1, m_1) is a NP then (f_2, m_1) would be a NP as well. Obviously, if all four organizational forms are NP, then assortative matching follows from the supermodularity of S^{NP}. Therefore, let us consider the two interesting cases, where we want to show, respectively:

$$S^{NP}(\gamma_2^F, \gamma_2^M) - S^{NP}(\gamma_1^F, \gamma_2^M) > S^{SE}(\gamma_2^F, \gamma_1^M) - S^{SE}(\gamma_1^F, \gamma_1^M)$$

and

$$S^{NP}(\gamma_2^F, \gamma_2^M) - S^{NP}(\gamma_2^F, \gamma_1^M) > S^{NP}(\gamma_1^F, \gamma_2^M) - S^{SE}(\gamma_1^F, \gamma_1^M).$$

The first one follows from the fact that S^{NP} is supermodular, i.e.,

$$S^{NP}(\gamma_2^F, \gamma_2^M) - S^{NP}(\gamma_1^F, \gamma_2^M) > S^{NP}(\gamma_2^F, \gamma_1^M) - S^{NP}(\gamma_1^F, \gamma_1^M)$$

and Step 2:

$$S^{NP}(\gamma_2^F, \gamma_1^M) - S^{NP}(\gamma_1^F, \gamma_1^M) > S^{SE}(\gamma_2^F, \gamma_1^M) - S^{SE}(\gamma_1^F, \gamma_1^M).$$

The second inequality follows from the fact that S^{NP} is supermodular, i.e.,

$$S^{NP}(\gamma_2^F, \gamma_2^M) - S^{NP}(\gamma_2^F, \gamma_1^M)x > S^{NP}(\gamma_1^F, \gamma_2^M) - S^{NP}(\gamma_1^F, \gamma_1^M)$$

and $S^{NP}(\gamma_1^F, \gamma_1^M) < S^{SE}(\gamma_1^F, \gamma_1^M)$.

Case 3: A type m_0 manager is matched with a founder of type f_1 (or f_2), a type m_1 (or m_2) manager is matched to a type f_2 (or f_1) founder, and a type m_2 (or m_1) manager is matched to a type f_0 founder. We can repeat the types of arguments used above to show that a non-assortative match of the above kind is not stable. ■

Proof of Proposition 5: Suppose $\gamma^M \bar{\theta} = \Delta$ so that the effort level under a non-profit is the same as in a for-profit. Clearly, overall surplus in a NP is lower, since the marginal social payoff from success is lower as $\gamma^F < 0$. In contrast, if $\gamma^F = 0$, then a non-profit and a for-profit will yield the same total surplus. Extending the argument, for any value of $\gamma^M > 0$, there exists a $\gamma^F < 0$ such that a for-profit dominates a non-profit. Similarly, for $\gamma^M = \underline{\gamma}$, $v\left(\gamma^M\right) = \Delta$ and so for $\gamma^F = 0$, a for-profit and a social enterprise yield the same surplus, which is higher than that of a non-profit. But if $\gamma^F < 0$, a FP will dominate both. Therefore, for any $\gamma^M \in [\underline{\gamma}, \overline{\gamma}]$ such that a social enterprise dominates a non-profit and a for-profit for $\gamma^F \geq 0$, there exists a $\gamma^F < 0$ such that a for-profit will yield the highest surplus. ■

B Calibration Formulae

The formulae for total surplus in the constant elasticity case are:

$$\begin{aligned}
S^{FP}\left(\gamma_i^M, \lambda\right) &= \underline{e}\pi_H + \frac{1}{1+\mu}\left[(\lambda_i)^{\mu}\left(A + \pi_H\right)^{1+\mu}\right], \\
S^{NP}\left(\gamma^F, \gamma_i^M, \lambda\right) &= \underline{e}\left[\gamma_i^M + \gamma^F\right]\bar{\beta}\pi_H + \frac{1}{1+\mu}\left[(\lambda_i)^{\mu}\left(A + \gamma_i^M\bar{\beta}\pi_H\right)^{1+\mu}\right] \\
&\quad + \gamma^F\bar{\beta}\,(\lambda_i)^{\mu}\left(A + \gamma_i^M\bar{\beta}\pi_H\right)^{\mu}\pi_H, \\
&\quad \text{and} \\
S^{SE}\left(\gamma^F, \gamma_i^M, \lambda\right) &= \underline{e}\left[\sigma\left(\gamma_i^M\right) + \Sigma\left(\gamma_i^M, \gamma^F\right)\right] + \frac{1}{1+\mu}\left[(\lambda_i)^{\mu}\left(A + \sigma\left(\gamma_i^M\right)\right)^{1+\mu}\right] \\
&\quad + \Sigma\left(\gamma_i^M, \gamma^F\right)(\lambda_i)^{\mu}\left(A + \sigma\left(\gamma_i^M\right)\right)^{\mu}
\end{aligned}$$

where:

$$\begin{aligned}\sigma\left(\gamma^M\right) &= \sum_{s\in\{\ell,h\}} \frac{\hat{x}\left(\gamma^M;s\right)\gamma^M\beta_s + \left[1-\hat{x}\left(\gamma^M;s\right)\right]}{2}\pi_H \\ &\text{and} \\ \Sigma\left(\gamma^M,\gamma^F\right) &= \sum_{s\in\{\ell,h\}} \frac{\hat{x}\left(\gamma^M;s\right)\gamma^F\beta_s}{2}\,\pi_H.\end{aligned}$$

Then we can compute $\Gamma_{FP}\left(\gamma^M\right)$ as follows:

$$\Gamma_{FP}\left(\gamma_i^M\right) = \frac{\underline{e}\left[1-\gamma_i^M\bar{\beta}\pi_H\right] + \frac{1}{1+\mu}\left[(\lambda_i)^\mu\left[-\left(A+\pi_H\right)^{1+\mu} - \left(A+\gamma_i^M\bar{\beta}\pi_H\right)^{1+\mu}\right]\right]}{\left[\underline{e} + (\lambda_i)^\mu\,\bar{\beta}\left(A+\gamma_i^M\bar{\beta}\pi_H\right)^\mu\right]\bar{\beta}\pi_H}$$

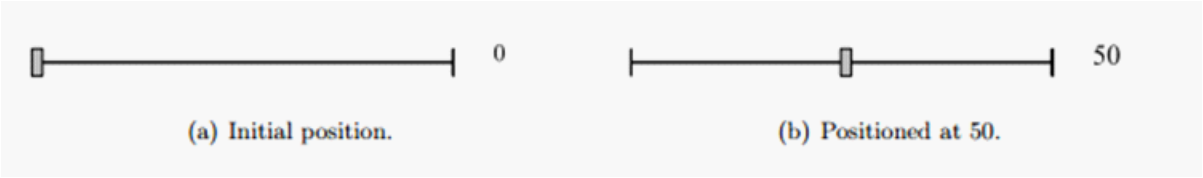
and $\Gamma_{SE}\left(\gamma^M\right)$ as follows:

$$\Gamma_{SE}\left(\gamma_i^M\right) = \frac{\underline{e}\left[\gamma_i^M\bar{\beta}\pi_H - \sigma\left(\gamma_i^M\right)\right] + \frac{1}{1+\mu}\left[(\lambda_i)^\mu\left[\left(A+\gamma_i^M\bar{\beta}\pi_H\right)^{1+\mu} - \left(A+\sigma\left(\gamma_i^M\right)\right)^{1+\mu}\right]\right]}{\underline{e}\left[\frac{\hat{x}(\gamma^M;s)\beta_s}{2} - \bar{\beta}\right] + (\lambda_i)^\mu\left[\frac{\hat{x}(\gamma^M;s)\beta_s}{2}\left(A+\sigma\left(\gamma_i^M\right)\right)^\mu - \bar{\beta}\left(A+\gamma_i^M\bar{\beta}\pi_H\right)^\mu\right]\pi_H}$$

which be computed straightforward given values of the parameters as specified.

C Experiment Details

Stage 1 Stage 1 is several iterations of the 'real effort' task from Gill and Prowse (2012). In this task participants are faced with a computer screen of 48 'sliders' (see diagram below) and have two minutes in order to change the position of as many as possible from initial position (a) into the correct central position (b).



(a) Initial position. (b) Positioned at 50.

The number of sliders correctly positioned is the effort outcome. Higher effort will result in a higher probability of 'success' and hence higher payoffs. Before each iteration of the task, we gave the payments associated with success and failure. If successful, the participants are told how much they have earned. Round 1 allowed the participant to practice positioning the sliders without any payoffs attached. During subsequent rounds, there were confronted with three possibilities:

1. (non-profit) success triggers a donation to charity which could be either high or low (greater than less what they have earned) with equal probability. We described this as the "giving task".

2. (for-profit) their success gives them an amount that will be banked until the end of the game . We described this as the "earnings task".

3. (social enterprise) participants will choose between banking the money for themselves or making a charitable contribution (we will randomly make that contribution high or low with equal probability attached to each outcome). We described this as the "hybrid task".

In rounds 1-7, they were confronted with either 1 or 2, each for three rounds with the order being randomly assigned. Rounds 8-10 were always option 3.

The round order for the tasks is as follows:

1. Participants told the number of points available if successful

   (a) In the earnings task this is a number of points for the participant

   (b) In the giving task this is two possible donations to charity, both are equally likely but they only learn which they playing for after they have been successful.

   (c) In the hybrid task this is the opportunity to choose between a number of points for themselves and one of two possible donations to charity. Both are equally likely, but they only learn which they playing for after they have been successful.

2. Play the slider game.

3. Determine whether participant has been successful based on the number of correctly-positioned sliders.

4. If successful, a reward is earned:

   (a) In the earning task this is the number of points as stipulated in (1a).

   (b) In the giving task this is a donation to charity depending on one of the two numbers of points as stipulated in (1b)

   (c) In the hybrid task there is a choice between the number of points or the two possible donations specified in (1c).

5. Unsuccessful participants earned nothing and could make no donation to charity.

Stage 2 Participants were asked to complete an additional iteration of the effort task from stage 1, with one modification: they will now be allowed to choose one of the organizations from Stage 1 to play again. This will allow us to see whether more socially motivated individuals do in fact select into social enterprises and non-profits rather than for-profits.

Stage 3 Questionnaire:

1. Personal Characteristics

   (a) Age : 1="18-21"; 2="22-24"'; 3="25-29"'; 4="30-39"'; 5="40+"';

   (b) gender : 0= "Male" 1= "Female"

   (c) occupation : 0="Undergraduate Student"; 1="Postgraduate Student"; 2="Other Student"; 3="University Employee"; 4="Otherwise Employed"; 5="Unemployed, Retired or Otherwise Neither Working or Studying"

   (d) nationality 0="British"; 1="other European"; 2="Middle Eastern"; 3="other African"; 4="Central Asian"; 5="South Asian"; 6="East Asian"; 7="Pacific"; 8="North American"; 9="South or Central American"; 10="Other";

   (e) religion 0="Atheist/Agnostic"; 1="Christian"; 2="Muslim"; 3="Hindu"; 4="Jewish"; 5="Buddhist"; 6="Sikh"; 7="Other";

2. Volunteering

   (a) "Have you done any volunteer or charity work in the last year?" 1="Yes"; 0="No"

   (b) "Have you donated to charity in the last month?" 1="Yes"; 0="No"

(c) "Do you belong to a political party?" 1="Yes"; 0="No"

(d) "Did you vote in the last election you were eligible to vote in?" 1="Yes"; 0="No";

3. Hypothetical Games

   (a) Dictator Game: "Suppose you were given £10 pounds to split between yourself and an anonymous other person. How much would you give the other person? (They would never know who you were)." Choice set was values between 0=£0 to 10=£10 in £1 increments

   (b) Receiver Game: "Suppose an anonymous partner had been given £10 to split between you and them. They chose to give you £1. You can reject their offer, in which case you both get nothing, or accept their offer, in which case you get to keep the £1 (and they keep £9). What would you do?", 0="Reject"; 1="Accept";

4. Public Service Motivation: Answer to following questions on the Perry (1996) scale, measured from, 1="Strongly Disagree"; 5="Strongly Agree" (Reversed means that scale is reversed);

   (a) Attraction to Policy Making (5 items)

      i. PSM 11 Politics is a dirty word. (Reversed)
      ii. PSM 15 I respect public officials who can turn a good idea into law.
      iii. PSM 22 Ethical behavior of public officials is as important as competence.
      iv. PSM 27 The give and take of public policy making doesn't appeal to me. (Reversed)
      v. PSM 31 I don't care much for politicians. (Reversed)

   (b) Commitment to the Public Interest (7 items)

      i. PSM 7 People may talk about the public interest, but they are really concerned only about their self-interest.(Reversed)
      ii. PSM 16 It is hard for me to get intensely interested in what is going on in my community. (Reversed)
      iii. PSM 23 I unselfishly contribute to my community.
      iv. PSM 30 Meaningful public service is very important to me.
      v. PSM 34 I would prefer seeing public officials do what is best for the whole community even if it harmed my interests.
      vi. PSM 37 An official's obligation to the public should always come before loyalty to superiors.
      vii. PSM 39 I consider public service my civic duty.

(c) Social Justice (5 items)

i. PSM 18 I believe that there are many public causes worth championing.

ii. PSM 20 I do not believe that government can do much to make society fairer. (Reversed)

iii. PSM 32 If any group does not share in the prosperity of our society, then we are all worse off.

iv. PSM 33 I am willing to use every ounce of my energy to make the world a more just place.

v. PSM 38 I am not afraid to go to bat for the rights of others even if it means I will be ridiculed.

(d) Civic Duty (7 items)

i. PSM 14 When public officials take an oath of office, I believe they accept obligations not expected of other citizens.

ii. PSM 21 I am willing to go great lengths to fulfill my obligations to my country.

iii. PSM 25 Public service is one of the highest forms of citizenship.

iv. PSM 28 I believe everyone has a moral commitment to civic affairs no matter how busy they are.

v. PSM 29 I have an obligation to look after those less well off.

vi. PSM 35 To me, the phrase "duty, honor, and country" stirs deeply felt emotions.

vii. PSM 36 It is my responsibility to help solve problems arising from interdependencies among people.

(e) Compassion (8 items)

i. PSM 2 I am rarely moved by the plight of the underprivileged. (Reversed)

ii. PSM 3 Most social programs are too vital to do without.

iii. PSM 4 It is difficult for me to contain my feelings when I see people in distress.

iv. PSM 8 To me, patriotism includes seeing to the welfare of others.

v. PSM 10 I seldom think about the welfare of people whom I don't know personally. (Reversed)

vi. PSM 13 I am often reminded by daily events about how dependent we are on one another.

vii. PSM 24 I have little compassion for people in need who are unwilling to take the first step to help themselves. (Reversed)

viii. PSM 40 There are few public programs that I wholeheartedly support. (Reversed)

(f) Self-Sacrifice (8 items)

i. PSM 1 Making a difference in society means more to me than personal achievements.

ii. PSM 5 I believe in putting duty before self.

iii. PSM 6 Doing well financially is definitely more important to me than doing good deeds. (Reversed)

iv. PSM 9 Much of what I do is for a cause bigger than myself.

v. PSM 12 Serving citizens would give me a good feeling even if no one paid me for it.

vi. PSM 17 I feel people should give back to society more than they get from it.

vii. PSM 19 I am one of those rare people who would risk personal loss to help someone else.

viii. PSM 26 I am prepared to make enormous sacrifices for the good of society.

Stage 4 The participants were paid any money that they have banked at stage 1 or 2. A dice was rolled by the participant to determine which round they would be rewarded for. Before receiving the payment, each participant was asked whether they wished to receive their banked earnings in the final round as a cash payment or to donate it to charity. To avoid stigma effects, the participants were assured that nobody among the participants would know what choice they made. All participants received an identical brown envelope containing either money or a thank you note and confirming the size of their total charitable donation. There experiment comprised eleven rounds in which the effort task involved placing up to 48 sliders in the middle of a line.

Table 1: Effort Levels by Task

Round Type	All Rounds	Excluding Self-Selection and Practice Rounds
Practice	11.80 (6.46)	-
For Profit	22.21 (7.91)	21.58 (7.74)
Non-Profit	21.07 (7.79)	20.96 (7.74)
Social Enterprise	24.98 (7.94)	24.58 (7.80)
Total	21.82 (8.53)	22.37 (7.92)

Notes: The table gives the number of correctly positioned sliders in each two minute task for each kind of task. (Standard deviation in parentheses.)

Table 2: Effort, Choices and Payoffs by Round

Round Number	Effort	Keep as Earnings (percentage)	Average Payoff (π_H)
Round 1	18.60 (7.43)	-	1103.87 (877.03)
Round 2	19.48 (7.41)	-	1112.32 (877.03)
Round 3	21.62 (7.25)	-	1086.96 (876.29)
Round 4	22.78 (7.86)	-	1171.50 (875.88)
Round 5	22.37 (7.56)	-	1086.96 (876.29)
Round 6	22.77 (7.93)	-	1036.23 (872.60)
Round 7	23.86 (7.72)	87.20 (33.54)	1154.59 (876.62)
Round 8	24.40 (7.77)	85.28 (35.54)	1095.41 (876.62)
Round 9	25.48 (7.88)	86.58 (34.21)	1247.59 (868.47)
Self-selection	26.88 (8.10)	90.48 (29.53)	1264.49 (865.90)

Notes: There are 207 observations per round. (Standard Deviation in parentheses.)

Table 3: Mission Choice

	Low β round (β = 0.2)	High β round (β = 2)
Keep as Earnings	212	192
Donate to Good Cause	20	44
Total	232	236

Notes: Data are from rounds six through nine where the participants could choose either to donate or keep their earnings. There were 207 participants but only 202 were successful with a total of 468 facing the mission choice decision out a maximum of 621 such cases.

Table 4: Effort

Variable	(1)	(2)	(3)	(4)	(5)
Non-Profit Round	-0.039*** (0.014)	-0.039*** (0.014)	-0.033 (0.021)	-0.039*** (0.014)	-0.038*** (0.015)
High π_H	-	0.043*** (0.017)	0.052** (0.021)	0.046*** (0.017)	0.017 (0.014)
High π_H x Non-profit Round	-	-	-0.011 (0.031)	-	-
Social Enterprise Round	-	-	-	-	0.057*** (0.016)
High π_H x Social Enterprise Round	-	-	-	-	-
ID Fixed Effects	Yes	Yes	Yes	Yes	Yes
Full Set of Round Fixed Effects	Yes	Yes	Yes	No	No
Restricted Round Effects	No	No	No	Yes	Yes
Rounds	Giving and Earning	Giving and Earning	Giving and Earning	Giving and Earning	All Non-Self-Selection Rounds
R^2	0.99	0.99	0.99	0.99	0.99
Observations	1242	1242	1242	1242	1863

Notes: The data are for 207 participants over six effort rounds in columns (1) through (4) and nine effort rounds in columns (5) and (6). The dependent variable is the log of effort. Robust standard errors in parentheses: *** significant at 1%, ** significant at 5%. The restricted round effects include four dummy variables: for the first round, second round, third round and all subsequent rounds.

Table 5: Choosing to Donate in a Social Enterprise

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High β round (β = 2)	0.100*** (0.035)	0.090** (0.035)	0.094*** (0.035)	0.010*** (0.035)	0.089*** (0.034)	0.092*** (0.035)	0.129** (0.574)	0.121** (0.06)
Volunteer	-	0.086** (0.034)	-	-	-	-	-	-
Dictator	-	-	0.018** (0.007)	-	-	-	-	-
Receiver	-	-	-	-0.015 (0.056)	-	-	-	-
Attraction to Policy Making	-	-	-	-	0.054* (0.028)	-	-	-
Commitment to the Public Interest	-	-	-	-	0.089** (0.040)	-	-	-
Social Justice	-	-	-	-	-0.028 (0.038)	-	-	-
Civic Duty	-	-	-	-	-0.019 (0.036)	-	-	-
Compassion	-	-	-	-	0.040 (0.035)	-	-	-
Self-Sacrifice	-	-	-	-	-0.015 (0.040)	-	-	-
Perry Z-Score	-	-	-	-		0.012*** (0.004)	-	-
High π_H	-	-	-	-	-	-	-	-0.137*** (0.045)
ID Fixed Effects	No	No	No	No	No	No	Yes	Yes
R^2	0.02	0.04	0.04	0.02	0.06	0.05	0.53	0.55

Notes: The dependent variable is choosing to give the proceeds to charity in a social enterprise. Standard Errors (clustered on id) in parentheses: *** significant at 1%, ** significant at 5%, * significant at 10%. The number of observations in each regression is 468 with 202 distinct participants.

Table 6: Self-Selection

Variable	(1) Social Enterprise	(2) Social Enterprise	(3) Non-profit	(4) Log(effort)	(5) Giveaway
Competence	0.132 (0.082)	0.063 (0.113)	0.070 (0.054)	0.937*** (0.060)	0.124** (0.068)
Perry Z-score	0.035*** (0.011)	-0.012 (0.009)	0.015* (0.007)	-0.005 (0.003)	0.0239*** (0.008)
High π_H	0.0257** (0.124)	0.018 (0.079)	-0.018 (0.067)	-0.010 (0.032)	-0.116* (0.067)
$\beta = \beta_H = 2$					0.0594 (0.966)
Non-profit	-	-	-	-0.043 (0.046)	-
Social Enterprise	-	-	-	-0.016 (0.033)	0.0607 (0.0744)
Choice	For-profit or social enterprise	Non-profit or social enterprise	Non-profit or for-profit	-	-
R^2	0.19	0.04	0.09	0.83	0.11
Observations	64	83	60	207	147

Notes: Robust standard errors in parentheses: *** significant at 1%, ** significant at 5%, * significant at 10%.

Figure 1: Cumulative Distribution of Effort by Round

(first six rounds)

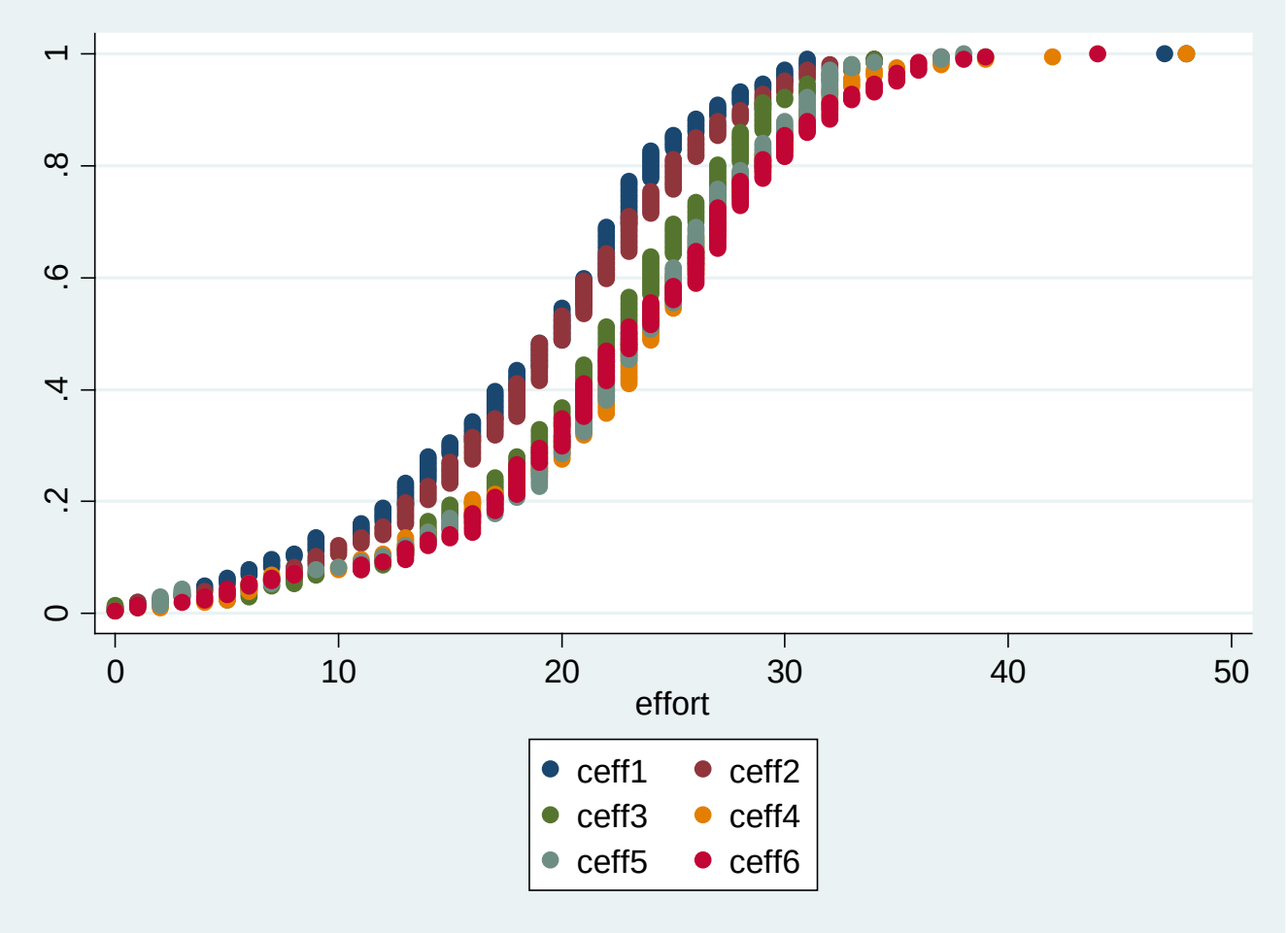


Figure 2: Non-profit versus Social Enterprise (γ=1)

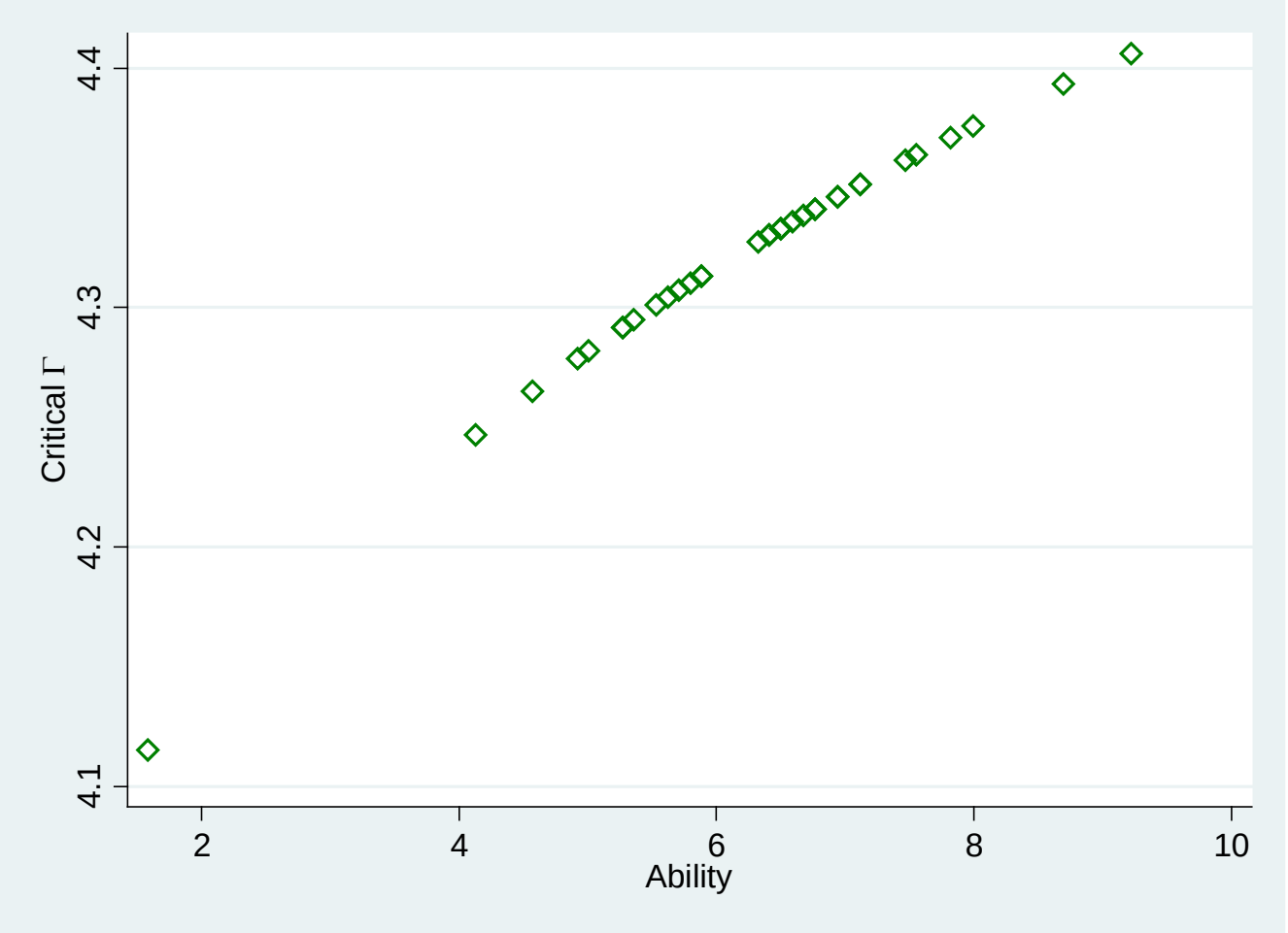


Figure 3: For-profit versus Non-Profit: Varying μ

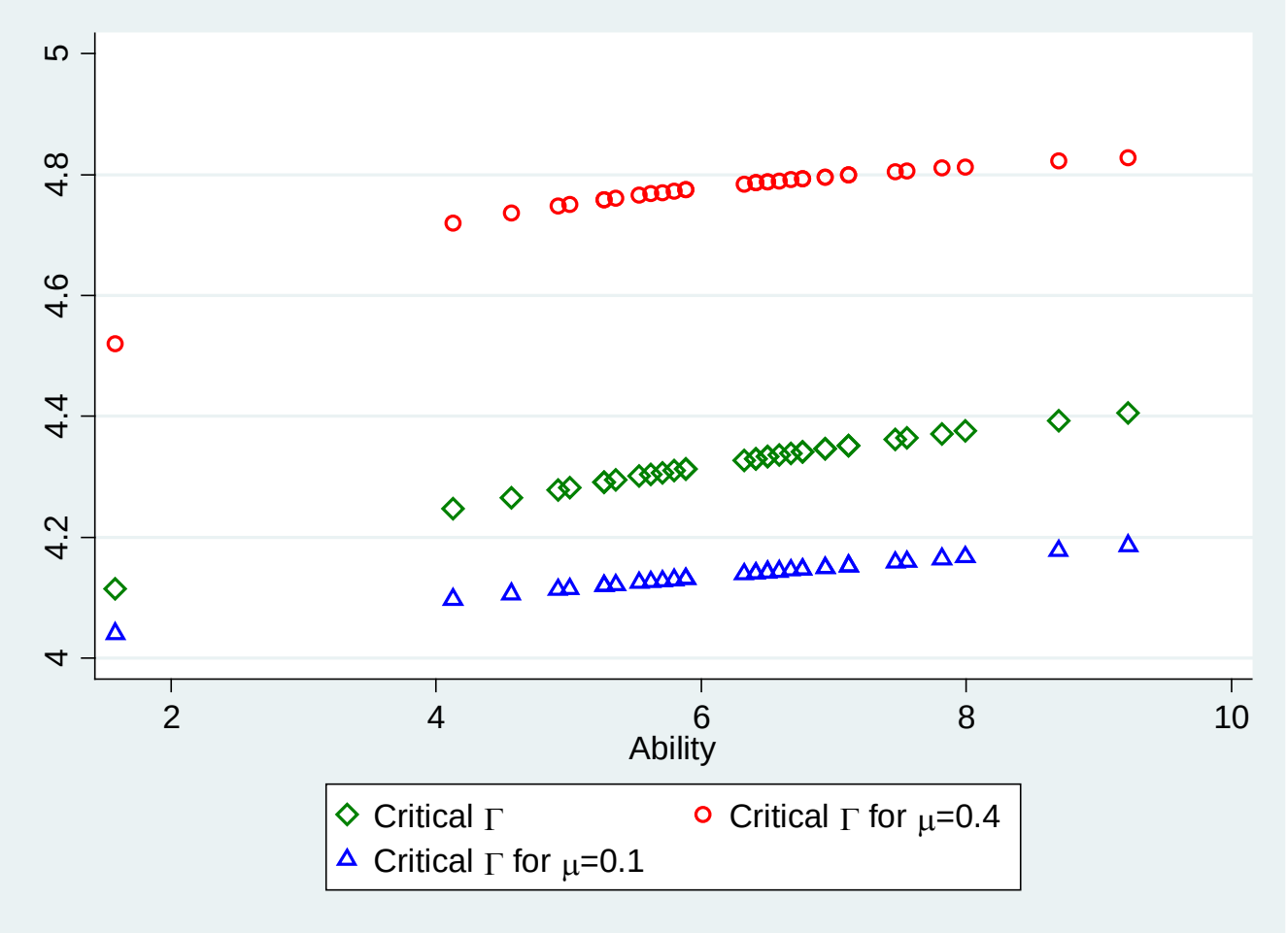


Figure 4: Non-profit versus Social Enterprise: Varying β_L

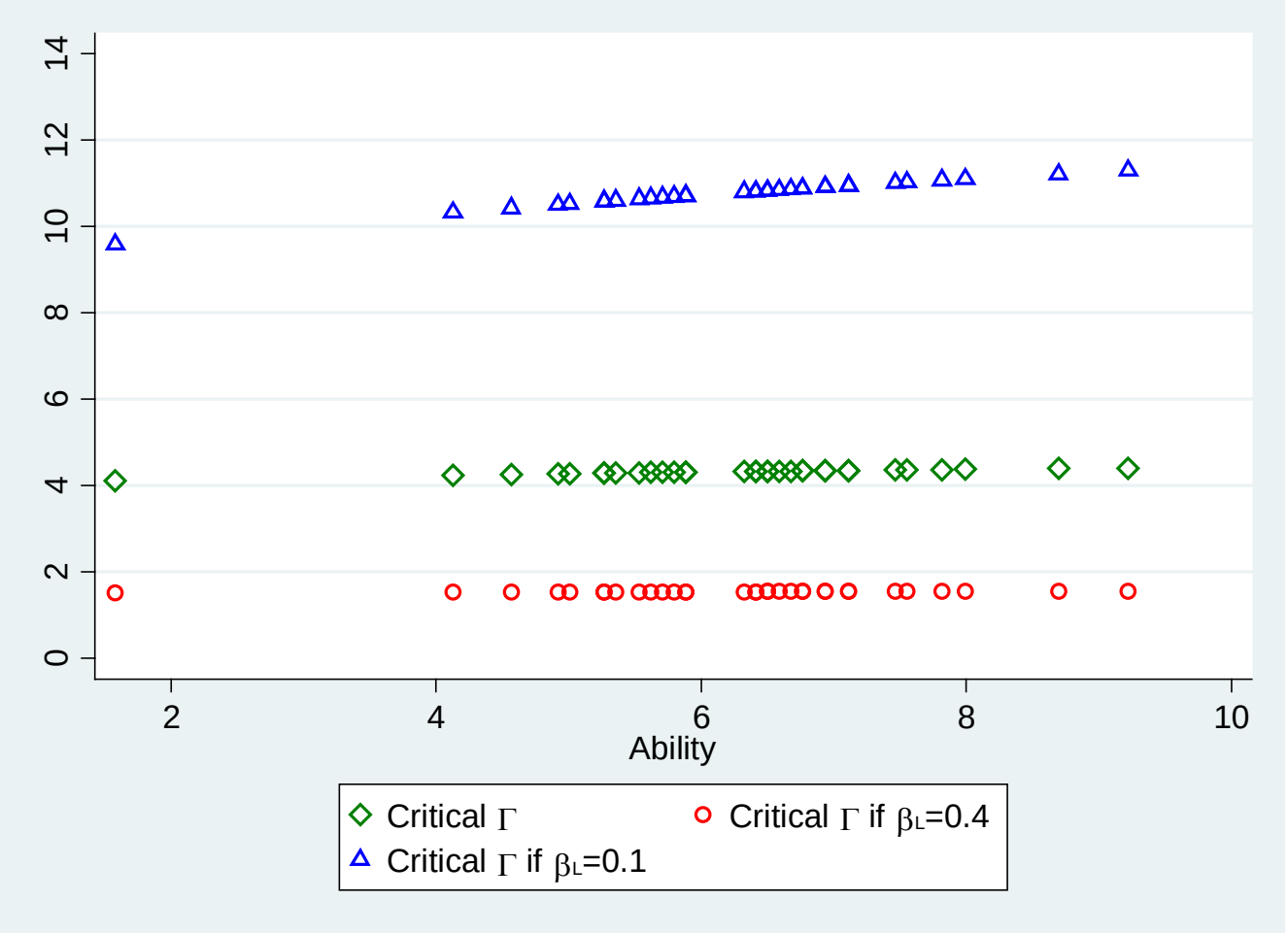


Figure 5: Non-profit versus Social Enterprise: Varying γ

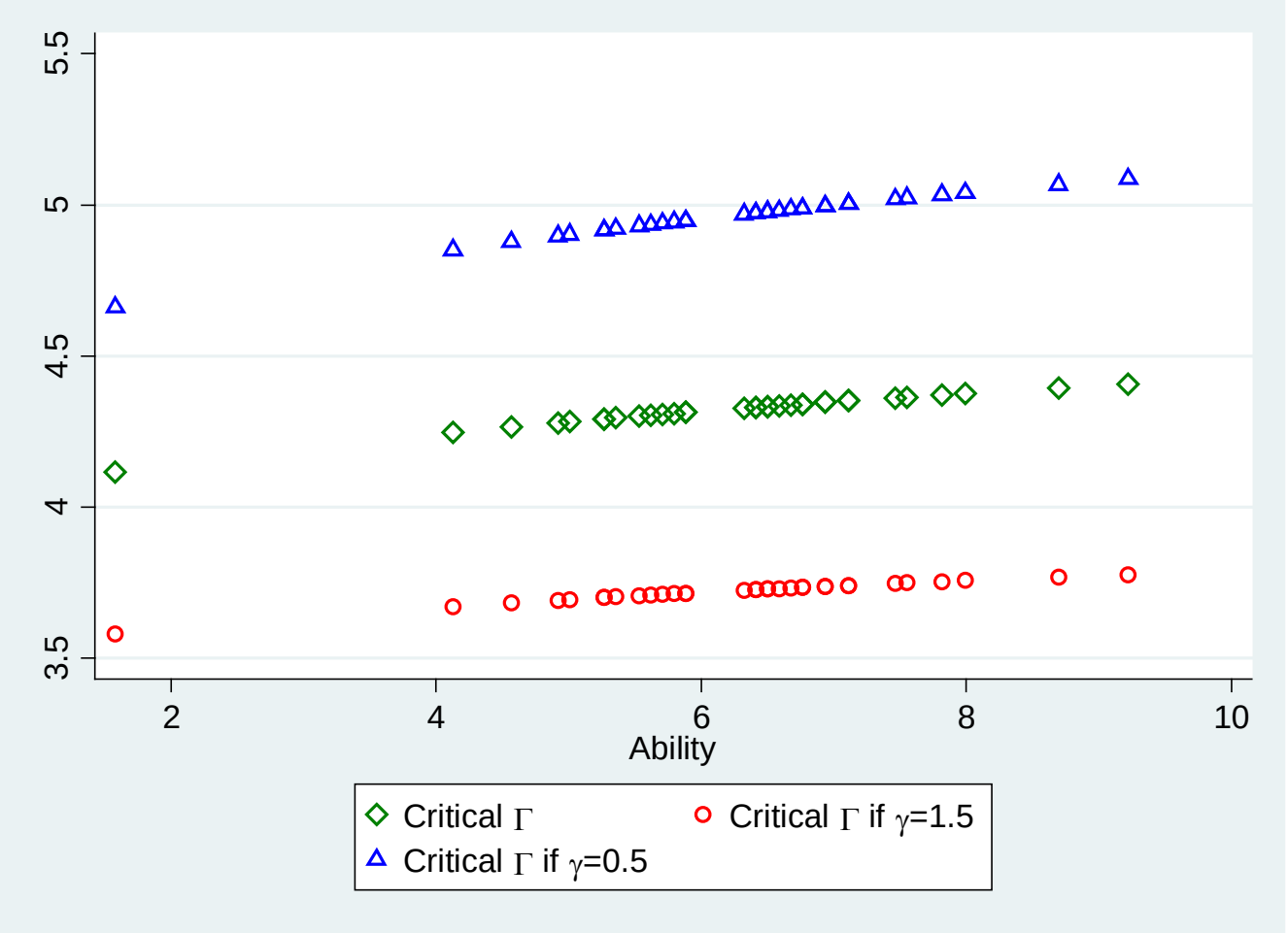


Figure 6: For-profit versus Non-Profit (γ=0)

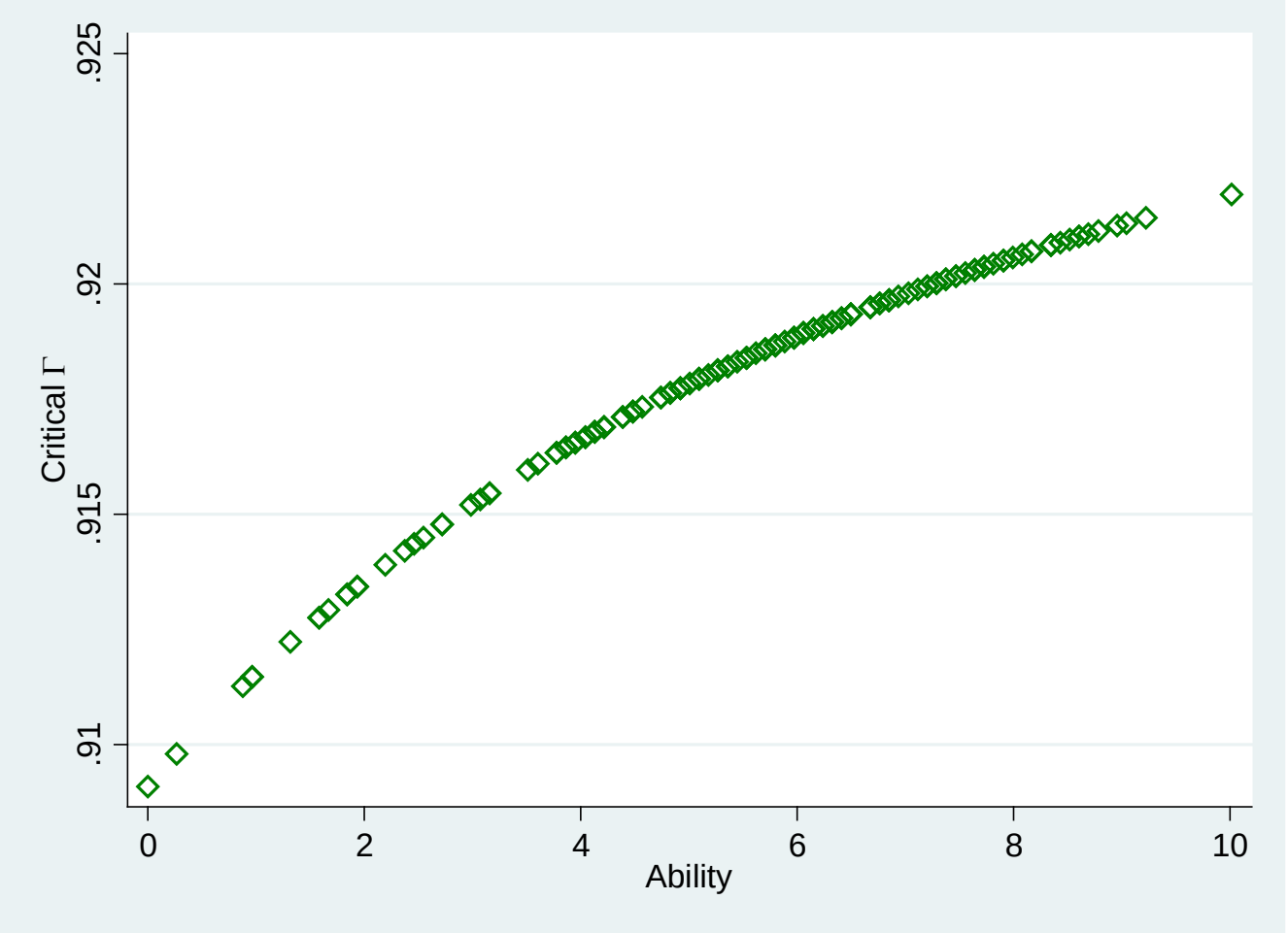


Figure 7: Non-profit versus Non-Profit: Varying μ