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Profit with Purpose? A Theory of Social Enterprise†

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When social benefits cannot be measured, an organization that selects managers based on pro-social motivation can be used to balance profits with a social purpose. This paper develops a model of social enterprise based on selection of citizen-managers to run firms with flexible missions. We analyze organizational choice between social enterprise, for-profits, and nonprofits. The paper also develops the implications of matching between founders and managers based on their preferences for the mission. (*JEL* D21, L21, L31)

Two kinds of private organizations dominate the marketplace: for-profits and nonprofits. Nonprofit organizations are rigid due to the nondistribution constraint. However, this helps to secure social benefits as it reduces managerial rent-seeking (see Hansmann 1980 and Glaeser and Shleifer 2001 among others). Their operation can be further enhanced by selecting employees who are committed to the cause as observed, for example, by Weisbrod (1988) and Besley and Ghatak (2005).

Standard for-profit firms also have a rigid mission: to maximize the profit of their owners. This may be reinforced by selecting managers who care solely about money—the usual *homo economicus* assumption. These managers are rewarded with bonuses based on profitability to encourage effort. The focus on profit can, however, lead to a social cost when profitable actions do not reflect social values. Everything from environmental pollution to poor treatment of workers is blamed on placing the pursuit of profit above all else.

Recognizing these issues, there is much recent interest in more flexible organizational forms which combine "profit with purpose," securing the right trade-off between pro-social behavior and efficiency. These hybrid forms of organization are often referred to as "social enterprises." Even though, as Martin and Osberg (2007) acknowledge, there are many different types of firms which travel under this banner, the mantra of social enterprise is to balance making profits with a social mission (Katz and Page 2010).[1] This eschews the rigidity of either nonprofit or for-profit enterprises.

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[1] Terms like "public benefit corporations" (Shiller 2012), "social enterprise" (Dees 2001, Bornstein 2004) or "social business" (Yunus 2007) are part of the lexicon but all stand for somewhat different organizational forms.

To be effective, social enterprises have to solve the problem of achieving the right trade-off between the dual objectives of profit and purpose. We call this the *mission integrity problem*. In the absence of contractual solutions, this creates a role for what Katz and Page (2010) call "mission-sympathetic parties," who are appointed to achieve an optimal trade-off between mission and profit. Selection on motivation can then be used to achieve mission integrity.

This paper explores the ideas by developing a model of social enterprise where firms are run by mission-sympathetic managers—we call them citizen-managers—who balance profit with purpose. The model has four key features. First, profitability and social payoffs sometimes diverge; however, only profit can be measured or contracted upon. Second, the enterprise requires a manager to put in effort to improve overall efficiency, as well as to decide whether to pursue profit or social purpose in its key decisions depending on the situation (the mission integrity problem). Third, organizational design determines whether there is a rigid mission or the trade-off between profit and mission is left to the discretion of the manager, and the allocation of any residual cash flow. Fourth, firms or "founders" employ managers who care about the mission and who are selected from a competitive labor market.

We focus on three organizational forms: for-profits, nonprofits, and social enterprises. With a for-profit or social enterprise, the manager is a full residual claimant on profits, whereas with a nonprofit the manager's wage is flat. For-profits and nonprofits curb the autonomy of managers by stipulating a rigid mission. In a social enterprise, the manager has discretion over the balance of profits and purpose. We allow founders and managers to differ in terms of their motivation, and derive conditions under which an organizational form is optimal.

If managers are sufficiently motivated, nonprofits and social enterprises are equivalent, as managers always put more weight on mission than on profits. However, for moderately motivated managers, the flexibility of social enterprises mitigates the mission-profit trade-off, and we find that giving them discretion over action choice can be beneficial from the point of view of effort incentives. For these managers, the total expected return from effort (pecuniary plus mission-related) is higher than in nonprofits or for-profits. However, this effect has to be balanced against the fact that if the social payoff is very valuable to the founder, then nonprofits should be chosen over for-profits as well as social enterprises. The trade-off between greater incentives that come from managerial autonomy, and the founder's valuation of the social payoff given the nonrival nature of the social payoff between the manager and the founder drives organizational form in our model. This allows us to break out of the for-profit versus nonprofit trade-off, which the existing literature has mostly focused on. Our approach also gives a range of empirical predictions about where in the economy we would expect social enterprises to emerge in terms of features of the technology.

We find that a more motivated manager puts in greater effort, which lessens the efficiency loss in a nonprofit, which a motivated founder tends to favor. We characterize conditions under which this complementarity between founder and manager motivation leads to stable assortative matching, where selfish managers and founders match together in for-profit firms, highly motivated founders and managers set up nonprofit firms, and those with middle levels of motivation set up social enterprises.

This result shows that social enterprises can exist even when one allows for market competition for managers from other forms of enterprise. It also is practically relevant in the context of the debate about what it takes to have social enterprises making a difference beyond what can be achieved by a nonprofit or a for-profit.

Another interesting implication of our framework is that when the founder does not like the social payoff (puts a negative weight on it) then our model corresponds to a standard agency problem where the social payoff is like a private benefit to the manager. We show for-profits that prohibit taking the pro-social action will be the preferred organizational form if the founder dislikes the social payoff enough. This is an interesting result given the well-known claim by Friedman (1970) that the only social responsibility of business is to make profits.

The approach that we take challenges a central tenet of standard economic design where the assumption of *homo economicus* restricts attention to agents with narrowly self-interested goals. Here, we show that the sustainability of social enterprise can rest on the selection of agents with appropriate motivations to achieve a trade-off between profit and wider social goals.

The remainder of the paper is organized as follows. Section I discusses some related literature. Section II lays out the theoretical framework where firms employ motivated managers to make decisions that affect profits and some social objective. In Section III, we use the model to compare three organizational forms: for-profits, nonprofits, and social enterprises. Section IV develops the model to allow motivated managers and firm founders to match. Section V discusses some empirical implications and concluding comments are in Section VI.

I. Related Literature

There is significant popular discussion of the role of social enterprises in the economy, given that there are many real-world examples of social enterprises in both the developed and developing worlds (see Porter and Kramer 2011). The management literature presents many interesting case studies. For example, Lendstreet Financial pursues the social mission of helping indebted people reduce their debts by delivering financial literacy programs and incentives that encourage responsible repayment. Yet prior to delivering these services to a new client, Lendstreet purchases the client's debt from institutional investors. When the client increases their repayment, Lendstreet earns revenue which enables it to sustain its operations.[2] The commercial microfinance sector is another good example where the social mission of relaxing borrowing constraints of the poor has come head to head with profiting at the expense of the poor, raising the spectre of "mission drift" (see Yunus 2011). Ben and Jerry's is an ice cream brand which was 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.[3] In this case, the

[2] See Lee and Battilana (2013).
[3] See the discussion in Page and Katz (2012).

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 (McLean 2010).

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, for example, Ashraf, Bandiera, and Jack 2014; Ashraf, Bandiera, and Lee 2015; Akerlof and Kranton 2005; Bénabou and Tirole 2006, 2010; Besley and Ghatak 2005; Delfgaauw and Dur 2010; Francois 2000; and Kosfeld and von Siemens 2011). The general thrust of the literature is that intrinsic motivation reduces the need to give explicit incentives (e.g., Besley and Ghatak 2005) but in the current paper, greater motivation mitigates the mission integrity problem and this allows the use of higher powered financial incentives to stimulate effort.[4] A key issue which emerges in our study of matching is how founder and manager motivation are endogenously similar so social enterprises tend to have a shared vision throughout the firm. This links the paper to the literature on corporate culture such as Van den Steen (2010a, b).

The extensive literature on nonprofits (Hansmann 1980, Weisbrod 1988, and Glaeser and Shleifer 2001) is also relevant. A key theme of this literature is that the "nondistribution constraint" used by nonprofits may be a constrained optimal choice in the presence of agency problems that are often in the nature of multitasking problems (Holmstrom and Milgrom 1991) where high-powered incentives can distort allocation of effort away from tasks whose outputs are hard to measure. This leads to a cost-quality trade-off; for-profits lower costs at the expense of low, unverifiable quality, whereas nonprofits reduce the incentive to shade quality in order to cut costs. The choice of organizational forms depends upon how much the principal values quality (or any other nonpecuniary aspects of production) as opposed to profits.

Even though, as we noted above, the potential role of nonprofits to attract motivated managers is recognized (see, for example, Weisbrod 1988), the formal literature has not explicitly considered the role of intrinsically motivated managers, and how their presence and selection interacts with the underlying agency problems. Our key contribution is to show that once heterogeneity of manager motivation and self-selection is taken into account, social enterprises emerge as a natural alternative that allows us to go beyond the standard for-profit versus nonprofit trade-off. Another point of departure is that we have a transferable utility setup, and so it is possible to "sell" the project to the manager (whether through sales, rental, or franchising), which would overcome the agency problem by making him the full residual claimant. In our setup, the social payoff is nonrivalrous between the founder and the manager, and that is how the founder's motivation matters for organizational choice. If the founder did not care about the social payoff, then organizational choice would reflect the effort ranking of managers, which in turn would reflect the motivation of the manager. On the other hand, for any given level of manager

[4] For experimental evidence, see Besley and Ghatak (2013), Fehrler and Kosfeld (2012), and Tonin and Vlassopoulos (2010).

motivation, the greater the founder's motivation, the more likely a nonprofit will be chosen over a social enterprise (or for-profit) despite the advantage of the social enterprise in terms of managerial incentives.

Following Andreoni (1990), the literature on charitable giving has focused on the importance of a warm glow motive in giving to charity. Our model of motivated managers and founders can be interpreted as a form of warm glow in the sense identified there. The importance of such motives in organizational design is less appreciated than in charitable giving. As emphasized in Andreoni and Payne (2013), there is significant heterogeneity in preferences that is consistent with the idea that there is potential for selection to be important.

The paper is also related to the emerging literature among economists on corporate social responsibility (CSR). Here, we will have a trade-off between mission and profits. In contrast, that literature is largely interested in the possibility that the pursuit of pro-social ends could enhance profitability. For example, in Baron (2001), Bagnoli and Watts (2003), Besley and Ghatak (2007), and Kotchen (2006), the presence of socially responsible consumers drives this possibility.

There is also a link to the literature on delegation and incentives (e.g., Aghion and Tirole 1997), where giving greater discretion or authority to managers over project choice can improve effort incentives, as is the case with managers in social enterprises. In our model of social enterprise the manager has the authority to control the mission, whereas in a for-profit or a nonprofit the mission is not under the manager's control—in the former case, it is to always maximize financial returns and in the latter case, it is to prioritize the social mission over any financial considerations.

Finally, the part of our model that relates to the composition of the pie in terms of social and private payoff is related to the political agency literature that deals with the issue of the decision-making politician taking the "right" action in a given state of the world that is unobservable to the voter, which is similar in spirit to our state-contingent action choice problem (see, for example, Besley 2004, Maskin and Tirole 2004, and Smart and Sturm 2013).

II. Theoretical Framework

The Firm.—Consider a firm which produces a discrete good or service which it sells to its customers. The financial profit to the firm $(\hat{\pi})$ takes two values, $\pi > 0$ and 0.

The good may also generate a nonpecuniary benefit relating to a social objective. This will (stochastically) depend on the firm's actions as well as exogenous factors. This benefit is like a standard externality, excluding consumer surplus and the financial profit of the firm. However, the benefit need not be completely *external* to the firm; it may also be valued by those who are associated with the firm. We will be more explicit in formulating the payoffs below. Let Θ denote the total social payoff (in units of money) among all stakeholders, i.e., those who work in the firm and/or have an interest in the decisions that it makes.

The firm consists of a founder (or an owner) and a manager. Firms are established by founders who are motivated by a combination of profits and social payoffs. To be specific, let us suppose the firm charges a price p and the consumer receives a utility of v; it costs δ to produce a unit of the good. The net surplus to the consumer from consuming the good is $v - p$, i.e., consumer surplus. The firm's financial profit is $\hat{\pi} = p - \delta$. We normalize the reservation payoff of the consumer if she does not consume the good to zero, and so the firm can charge up to $p = v$. The firm can choose how to price the good, who to allocate it to, and/or the choice of technology which affects the production cost, δ.

We have two broad types of social objective in mind.[5] The first is a *redistributive* motive. 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 they should value access to certain goods in their pricing strategy. So they could hold down prices p to the minimum possible level (δ) and ration access to deserving individuals. For example, a university might care that students from disadvantaged backgrounds are admitted or a hospital might value medical care being made available to poor patients.

The second type of social objective is in the nature of *externalities* associated with the good's production. For example, environmental externalities may arise requiring firms to trade off cost efficiency against social costs of pollution. Suppose a firm can choose between two technologies that differ in costs ($\overline{\delta}$ and $\underline{\delta}$ with $\overline{\delta} > \underline{\delta} > 0$) but with the costlier technology associated with lower pollution levels. Then the firm's choice would be to decide whether it is worth giving up profits by choosing the costlier technology if the environmental benefits external to the firm are substantial enough.

In both of these cases, the payoff related to the social objective is likely to be *nonrival*. To the extent that the founder and the manager both care about it (in addition to other citizens who are not directly involved), they too receive a nonpecuniary payoff. This contrasts with the standard agency framework where rewards are pecuniary, and therefore rivalrous.

Another feature of these examples is that it is plausible to think factors that drive the decisions made by firms are subject to private information. For example, only the manager may have access to information that makes it possible to judge whether an individual is truly deserving of preferential treatment, or whether in a given project the environmental costs of using the default low-cost technology are high or not. What is key is that the production or the distribution of the good has a potential conflict between profits and social objectives, and yet the underlying reason for making a decision is not observed by the founder or the wider group of stakeholders.

Below, we study how firms handle the trade-off in a decentralized way using organizational design and a selection of intrinsically motivated managers. The social payoff will be generated (stochastically) as a joint by-product in the production or allocation of the private good or service; i.e., there is no way of separating the social outcome from the production or allocation of this good. This rules out alternative and equivalent ways of achieving the same social objective, either through

[5] A third possible social objective could be related to paternalism, e.g., in markets where consumers face behavioral or informational issues. Although this has been popularized recently by behavioral economics, the idea is much older and is related to Musgrave's (1959) 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.

government action (e.g., public provision or regulation) or through private initiative (e.g., the manager and the founder donating their time or money to a charity).

The trade-off between private and social costs and benefits is a classic problem in public economics and is usually dealt with using the instruments of taxes and subsidies. Similarly, agency problems within an organization are dealt with through incentive schemes and aspects of organizational design (such as delegation). In the setting we look at, these two sets of problems are intertwined—the desirability of sacrificing profits for the social objective is state contingent, and only the decision-maker observes the state.

Decisions.—The manager has two decisions to make. The first is effort, $e \in [\underline{e}, 1]$, where $\underline{e} \geq 0$, and the second is an action $x \in \{0, 1\}$ relating to balancing profit considerations with the social objective (e.g., the decision to preferentially allocate the good to a consumer or the choice of technology).

The choice of effort is as in standard agency models, with greater effort leading to higher likelihood of both profits and the social payoff. Effort is modeled as a continuous choice, with greater effort creating a shift in the distribution of payoffs in the sense of first-order stochastic dominance.

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 of *eliciting* effort is increasing.

The choice of x is a binary decision that affects how far social payoffs are prioritized relative to profits. 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 profit-maximizing action. The choice of x will be subject to what we call the mission integrity problem—is the manager's decision consistent with the social mission of the firm.

Timeline, *States*, *and Payoffs*.—After the manager is recruited, she chooses e and this stochastically 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 potential overall (pecuniary and nonpecuniary) surplus that the firm is able to generate. Let z denote the reward from high effort to the manager in the state $r = H$, which includes financial as well as any nonpecuniary payoff. We assume that when $r = L$, the manager is paid 0, an issue that is discussed greater detail below in the section on *The Contracting Problem*. Since the probability of $r = H$ is e, we can define the manager's choice of e as

$$\hat{e}(z) = \underset{e \in [\underline{e}, 1]}{\arg\max} \left\{ze - c(e)\right\}. \tag{1}$$

Let the manager's indirect utility function be denoted as

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

[6]This stronger condition is needed for only Propositions 2 and 4 below.

After the realization of r, which the manager observes, there is a further state $s \in \{h, l\}$ that 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. After s is realized, which the manager observes, he chooses x unless it is contractually specified to be either always 0 or always 1. After this the outcomes are realized.

The outcomes depend on the states (r, s) and the choice of action (x) by the manager. They consist of two outputs: financial profit to the firm $(\hat{\pi})$, which takes two values, $\pi > 0$ and 0; and a social payoff, Θ. The social payoff Θ is the *total* value of the social payoff to society, which includes the manager, the founder, and all other citizens. Instead of the total social payoff, notationally it will be helpful to work with the *average* social payoff (i.e., the value of the social payoff to the average citizen), denoted by θ. This is assumed to take three possible values, θ_h, θ_l, and 0 with $\theta_h > \theta_l \geq 0$. The social payoff depends on the state of the world $s \in \{h, l\}$. A "high" value social state is indicated by $s = h$, and a "low" value social state by l.

Let there be $N - 2$ citizens who are not involved in the firm as founders or managers but nonetheless care about what it does. Let $\gamma^F \theta$ and $\gamma^M \theta$ be the value of the social payoff to the founder and the manager, so that the total number of "caring" citizens is N. We assume γ^F and γ^M are non-negative and can possibly take a value higher than 1 (which can be interpreted as them caring about the social objective more than the average for all caring citizens) but is bounded above by some real number $G > 0$. Let $\gamma^i \theta$ be the value of the social payoff to the ith citizen $(i = 1, 2, \dots, N-2)$ where $\gamma^i \in [0, G]$. In the special case where all citizens including the founder and the manager have the same valuation, $\gamma^i = \gamma^F = \gamma^M = 1$. Notice that, in general, $\Theta = \left(\gamma^F + \gamma^M + \sum_{i=1}^{N-2} \gamma^i\right)\theta = N\theta$ holds by definition.

It is useful to relate the model to the two examples discussed above.

In the case where the firm is interested in enhancing the access of some consumers, the social payoff arises if "deserving" consumers receive the good. If they receive the good at cost, i.e., $p = \delta$, then consumers receive a net surplus of $v - \delta$. This is a transfer from the firm to these deserving consumers and so the sum total of consumer surplus and financial profits to the firm remains the same (equal to $v - \delta$) independent of the choice of x. However, society at large receives a positive payoff when these consumers belong to a deserving group. The social payoff varies depending on how deserving the group is deemed to be. For example, the social payoff when a student who comes from a very poor background gets free admission to a school could be θ_h, while for a student from a not-so-poor background it is θ_l.

Now consider the second example, where firms choose a production technology. In this case, choosing $x = 1$ could be choosing a method of production that is more costly but has a positive externality, for example, in terms of lower pollution. The private value generated by the good is v, and the price charged is $p = v$. However, the cost of production takes two values, $\underline{\delta}$ and $\overline{\delta}$, with $\overline{\delta} > \underline{\delta} > 0$. If the firm chooses $x = 1$, which means the cost of production is $\overline{\delta}$, then financial profits are zero (assuming $\overline{\delta} = v$) but a positive externality is generated. Unlike the previous example, here the sum total of the consumer surplus and the financial profits to the firm depend on the choice of x. The value of the positive externality is state contingent, with θ_s for $s \in \{h, l\}$ capturing the variation in background factors that affect the size of the benefits from adopting a greener technology.

The following table summarizes the *total* social and financial payoffs for all (x, s, r) combinations.

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

	$x = 1$	$x = 0$
$s = h$	$N\theta_h$	π
$s = \ell$	$N\theta_\ell$	π

.

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

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

.

That is, if $r = H$ then it is feasible to generate a profit but this depends on the choice of x. In particular, if $x = 0$ then profits are positive but there are no social payoffs. But if $x = 1$ then profits are zero, but depending on s, social payoffs can be high or low. In particular, if $s = h$, which occurs with probability q, choosing $x = 1$ yields $N\theta_h$ while if $s = l$, which occurs with probability $1 - q$, choosing $x = 1$ yields $N\theta_\ell$. If $r = L$, then only the low profit results independent of the action choice, and there is also no scope for generating a positive social payoff.

Let

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

denote the expected average social payoff.

To simplify notation, let

$$\beta_s \equiv \frac{\theta_s}{\pi} \quad \text{for} \quad s = h, l.$$

Correspondingly, let $\bar{\beta} \equiv \frac{\bar{\theta}}{\pi}$. This normalizes the average social payoffs by the financial payoff and provides a unit-free measure of the relative importance of the social payoff.

From the point of overall efficiency, there are three possible cases. If the total social payoff in state $s = l$ exceeds the financial payoff, i.e., $N\theta_l > \pi$ or $\beta_l N > 1$, then the efficient decision is to always choose $x = 1$. If the total social payoff in state $s = h$ is lower than the financial payoff, i.e., $N\theta_h < \pi$ or $\beta_h N < 1$, then the efficient decision is to always choose $x = 0$. In these cases, by stipulating $x = 1$ or $x = 0$, the efficient trade-off between profit and social objective can be achieved. The interesting case that we will focus on is where

$$\beta_h N > 1 > \beta_l N.$$

This implies that in $s = h$, $x = 1$ should be chosen, while for $s = l$, $x = 0$ should be chosen.

Informational and Contracting Assumptions.—We assume that the states r and s are observed only by the manager. Also, the manager's effort e too is private information, as in standard models of moral hazard. In addition, the nonpecuniary social payoffs θ_s $(s = h, l)$ are nonobservable to the founder, and hence, noncontractible. They are not directly experienced by the founder (or the rest of society) during the time frame of the contracting period and can be thought of as similar to a credence good. It is the belief (which in equilibrium will be true in expected terms) that a *deserving* student or patient was granted access, or that a technology adopted made a *big* difference to reducing pollution that generates these payoffs. In contrast, the manager has the knowledge about the true state of the world, and he therefore experiences the social payoff more directly.

The manager's action choice x as well as financial profits (π or 0) are assumed to be observable and contractible. We also assume that the manager's and the founder's motivation (γ^M and γ^F) are public information.[7]

We assume that there are no constraints on (financial) residual claimancy (e.g., risk aversion or limited liability). This is for reasons of parsimony, namely to minimize the number of departures from the first-best world, and also tractability.[8] All through, we assume that the founder makes a fixed up-front transfer T to the manager (which can also be negative).

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.[9] This will play a key role in achieving mission integrity in a social enterprise. There is a pool of potential managers who have some expertise not necessarily possessed by all citizens who care about the social objective. They are drawn from a subset of all citizens. Potential managers differ in terms of how much they value the social payoff. A manager of type j derives a payoff of $\gamma_j^M \theta$ from the outcome related to the social objective (recall that θ is the average social payoff). Each manager has an outside option, u_j.[10] We will drop the subscript j when referring to an individual manager for the remainder of this section to simplify notation.

[7] We discuss relaxing this in footnote 20 in Section IV.

[8] The assumption that everyone is risk neutral and there are no transferability constraints also simplifies the analysis of the matching problem studied in Section IV below.

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

[10] This can be determined endogenously in a competitive recruitment process as modeled in Section IV below.

Founders (*Social Entrepreneurs*).—We think of founders as entrepreneurs who endow the firm with a constitution (an organizational form) that could specify a rigid mission, and recruit managers to run the firm on their behalf. Even if he delegates running the organization, the founder retains rights over the idea or technology or the brand that is created that allow her to choose the organizational form although she has no direct control over the management of the organization.

The core case on which we focus is where $\gamma^F \geq 0$, i.e., the founder values the pro-social mission of the enterprise. This means that we are in a common-interest environment rather than the standard conflict of interest setting of agency theory, which here corresponds to $\gamma^F < 0$. If a founder who cares solely about financial profit $\gamma^F = 0$ hires a manager who cares about a pro-social mission $\gamma^M > 0$, then he can still potentially "profit" by allowing the manager to indulge his pro-social preference as long as this lowers the cost of hiring the manager sufficiently.

The Contracting Problem.—There are two main agency problems in this framework: one type of effort affects the total size of the pie, and the other one the composition of the pie in terms of social and private payoff.

First, there is the possibility that the manager could be covering up his failure to get $r = H$ by appearing to pick the pro-social mission. Hence, if he observes $x = 1$, the founder would not know whether the manager succeeded in making the firm profitable $(r = H)$ but chose to pursue the social mission, or whether the manager failed $(r = L)$, since in both cases observed financial profit is zero. Second, there is a need to ensure that the manager makes the right decision on the mission versus profit trade-off. Thus, conditional on $r = H$, the founder wishes the manager to choose the right action depending on the realization of $s \in \{h, l\}$. Depending on the manager's motivation, he may choose profit over mission more or less often than the founder would like.

Since $\hat{\pi}$ and x are verifiable, we permit contracts that depend on these variables. The key contracting problems are to ensure mission integrity, i.e., incentive compatibility in the choice of x, as well as providing incentives for e.[11] While $\hat{\pi}$ and x take on two values each, conditional on $x = 1$, $\hat{\pi} = 0$ in all states of the world, and conditional on $x = 0$, $\hat{\pi} = \pi$ or 0 depending on $r = H$ or L. Therefore, the founder gets to observe only one of the following *three* possible pairs of $(x, \hat{\pi})$: $(1, 0)$, $(0, 0)$, and $(0, \pi)$. It therefore suffices to restrict attention to three possible payments to the manager: b_{10}, b_{00}, and $b_{0\pi}$, where $b_{x\hat{\pi}} \equiv b(x, \hat{\pi})$. To ensure mission integrity in state $r = H$, the following inequalities need to hold:

$$b_{10} + \gamma^M \beta_h \pi \geq b_{0\pi} \geq b_{10} + \gamma^M \beta_l \pi$$

or

$$\gamma^M \beta_h \pi \geq b_{0\pi} - b_{10} \geq \gamma^M \beta_l \pi.$$

[11] What we call the mission integrity problem can be reformulated as a multitasking model, as pointed out by Holmstrom and Milgrom (1991) in a different but related context (footnote 11 of Holmstrom and Milgrom 1991).

This implies that $b_{0\pi} - b_{10} \geq 0$. In state $r = L$, there is no mission integrity problem and the manager gets paid b_{10} or b_{00} depending on whether he chooses $x = 1$ or 0. Suppose $\sigma \equiv \frac{b_{0\pi} - b_{10}}{\pi}$ is the profit share of the manager. Then the mission integrity constraints can be written as

$$\frac{\sigma}{\beta_h} \leq \gamma^M \leq \frac{\sigma}{\beta_l}.$$

Assuming that mission integrity is achieved (i.e., $x = 1$ when $s = h$, and $x = 0$ when $s = l$), the manager's expected payoff is

$$U^M = e\left\{q\left(b_{10} + \gamma^M \beta_h \pi\right) + (1-q)b_{0\pi}\right\} + (1-e)\max\{b_{10,} b_{00}\} - c(e) + T.$$

Correspondingly, the founder's expected payoff is

$$U^F = e\left[q\{\gamma^F \beta_h \pi - b_{10}\} + (1-q)(\pi - b_{0\pi})\right] - (1-e)\max\{b_{10,} b_{00}\} - T.$$

As we noted above, the fixed payment T can be positive or negative.

Without loss of generality, we can restrict attention to $b_{10} \geq b_{00}$ since a high value of b_{00} can only hurt effort incentives while having no role in ensuring mission integrity. In that case, the choice of e is given by $\hat{e}\left(q\left(b_{10} + \gamma^M \beta_h \pi\right) + (1-q)\, b_{0\pi} - b_{10}\right)$ or $\hat{e}\left(q\gamma^M \beta_h \pi + (1-q)\left(b_{0\pi} - b_{10}\right)\right)$. The highest value of $\left(b_{0\pi} - b_{10}\right)$ that is consistent with mission integrity is $\gamma^M \beta_h \pi$, yielding an effort level of $\hat{e}(\gamma^M \beta_h \pi)$. As $b_{0\pi}$ and b_{10} correspond to profit realizations of π and 0, if $b_{0\pi} - b_{10} > \pi$ then the manager will have more than 100 percent marginal financial incentives and may "fake" financial success (e.g., borrow π from outside) and we therefore restrict ourselves to $b_{0\pi} - b_{10} \leq \pi$. Hence, for $\gamma^M \beta_h > 1$, mission integrity is satisfied with full residual claimancy ($b_{0\pi} - b_{10} = \pi$) so long as $\gamma^M \beta_l \leq 1$.

The founder may not always wish to ensure a state-contingent flexible choice of x and may settle for either $x = 1$ or $x = 0$ in all states of the world.

First, choosing $x = 1$ may be preferable if allowing for a flexible action choice is too costly in terms of effort incentives. For example, if $\gamma^M \beta_h \pi$ is close to 0 (because the manager is unmotivated) then $\hat{e}(\gamma^M \beta_h \pi)$ would be low and the founder may prefer not to ensure mission integrity and give the manager full residual claimancy, i.e., set $b_{0\pi} = \pi$ and $b_{10} = 0$. Second, the founder might care a lot about the social objective (γ^F is high) and therefore, independent of the manager's motivation, may prefer $x = 1$ in all states of the world. In this case, the founder can simply stipulate $x = 1$. Third, if $\gamma^F < 0$ then the founder disapproves of the social objective that is valued by the manager, and may prefer a for-profit organization where he can constrain the manager to choose $x = 0$. Indeed, the inability of managers in firms to pursue nonprofit objectives is a defining feature of the standard model of the corporation and its obligation, enshrined in law, to pursue shareholder value.

Suppose $x = 1$ is contractually stipulated ex ante. Then in all states of the world, observed profits will be 0 and the observed action choice will be $x = 1$. Therefore, the manager will get a flat pay of b_{10} (in principle, which can be negative), so that we can set $T = 0$. The expected payoffs of the manager and the founder will be

$$U^M = e\gamma^M\overline{\beta}\pi + b_{10} - c(e);$$

$$U^F = e\gamma^F\overline{\beta}\pi - b_{10}.$$

In this case, the contracting problem is simple: the choice of effort is $\hat{e}(\gamma^M\overline{\beta}\pi)$ and given the reservation payoff u of the manager, $b_{10} = u - \phi(\gamma^M\overline{\beta}\pi)$.

Suppose instead that $x = 0$ is agreed upon ex ante. Then in all states of the world, observed profits will be π or 0, and the observed action choice will be $x = 0$. Therefore, the manager will get a variable pay of $b_{0\pi}$ or b_{00} contingent on $x = 0$ and $\hat{\pi} = \pi$ or 0. The expected payoffs of the manager and the founder in this case will be

$$U^M = e\,b_{0\pi} + (1-e)\,b_{00} - c(e) + T;$$

$$U^F = e(\pi - b_{0\pi}) - (1-e)\,b_{00} - T.$$

In this case too, the contracting problem is simple. Given that it is a transferable utility setting, the manager should be made full residual claimant to achieve an efficient choice of e. The following contract would achieve it: $b_{0\pi} = \pi$, $b_{00} = 0$, and $T = u - \phi(\pi)$. This would yield an effort level of $\hat{e}(\pi)$.

Organizational Forms.—To relate the optimal contracting approach above to the choice of organizational form, we allow organizations to vary in two dimensions. The first of these is whether the founder stipulates ex ante the action choice affecting the trade-off between social mission and profits. That is, organizations will differ in terms of whether the manager has the authority to choose x or whether it is fixed by the founder. Second, organizations vary in the degree to which the manager is financially incentivized. In the subsequent analysis, for simplicity, we assume that rather than σ taking any continuous value between 0 and 1, it can only take two discrete values: 0 or 1. That is, we restrict attention to organizational forms where either the manager is a full residual claimant or has a flat payoff. Allowing the manager to be a *partial* residual claimant would expand the parameter range for which social enterprises (described below) would be preferred, but does not significantly change the main conclusions. We will return to this issue in the next section when we discuss the results.

We will focus on three organizational forms:

- FP represents a for-profit with a rigid mission of profit maximization $(x = 0)$ where managers are full (financial) residual claimants. 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, she will put in effort $\hat{e}(\pi)$ and her expected payoff will be $\phi(\pi) + T$.

- NP represents a nonprofit with a rigid pro-social mission $(x = 1)$ where managers are paid a flat wage.[12] Managers will be motivated to put in effort only in so far as they value the social payoffs. Hence effort will be $\hat{e}\left(\gamma^M \overline{\beta}\pi\right)$, i.e., effort now depends on how far the manager values the mission. Her expected payoff will be $\phi\left(\gamma^M \overline{\beta}\pi\right) + T$.
- SE represents a social enterprise where the citizen-manager has control rights over the action and so may choose whether to earn a profit or pursue a social purpose and is a full (financial) residual claimant. Thus, the social enterprise is a hybrid where there is scope for a flexible trade-off between the pro-social mission and profit. In terms of the optimal contracting approach, in an SE mission integrity is satisfied. The action choice in a social enterprise will therefore be

$$\hat{x}\left(\gamma^M; s\right) = \underset{x \in \{0,1\}}{\arg\max} \left\{\gamma^M \beta_s x + [1 - x]\right\} \pi \quad \text{for } s \in \{h, l\}$$

$$= \begin{cases} 1 & \text{if } \gamma^M \geq \dfrac{1}{\beta_s}. \\ 0 & \text{otherwise} \end{cases}$$

Let $v\left(\gamma^M\right) \equiv \sum_{s \in \{h,l\}} q_s \left[\hat{x}\left(\gamma^M; s\right)\gamma^M \beta_s + \left(1 - \hat{x}\left(\gamma^M; s\right)\right)\right]\pi$ where $q_h = q$ and $q_l = 1 - q$. It is the expected payoff (social and financial) when the state is $r = H$. Then effort will be $\hat{e}\left(v\left(\gamma^M\right)\right)$ and the expected payoff of the manager is $\phi\left(v\left(\gamma^M\right)\right) + T$.

In each case, managers receive a fixed payment from (or make a payment to) the organization's founder to run the firm, T, which is pinned down by the outside option. 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 nonprofit firm, it would 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; they could either work for free or donate to the organization.[13]

We are identifying SEs as organizations where incentive compatibility is satisfied in terms of action choice regarding the profit versus mission trade-off by giving the manager control rights over the action choice. Alternatively, we can think of SEs as organizations where the founder stipulates a state-contingent action choice, and because incentive compatibility is satisfied, the manager indeed chooses the desired state-contingent action. We are identifying FPs as organizations where mission integrity is not satisfied and the manager has full (financial) residual claimancy. This could be because the founder chooses a rigid mission (for example, when $\gamma^F < 0$).

[12] Our model of a nonprofit organization follows the literature in emphasising how a nondistribution constraint ensures that the nonprofit mission is not compromised for private gain (e.g., Hansmann 1980, and Glaeser and Shleifer 2001). Here, it ensures that the enterprise is never tempted to choose a highly profitable course of action at the expense of the mission.

[13] When we consider competition and matching below, the level of T will be determined endogenously by the need to attract managers to run the firm in a competitive market setting.

Alternatively, the founder may not stipulate a rigid mission, but given the type of manager (low but positive values of γ^M), chooses not to induce mission integrity. Similarly, an NP is an organization where mission integrity is not satisfied but the manager has zero (financial) residual claimancy. This could be because the founder chooses a rigid mission (for example, when γ^F is positive and large). Alternatively, the manager may have the formal control rights over the mission, but given that he puts some weight on the social mission ($\gamma^M \geq 0$), he will always choose the pro-social mission.

In our analysis, the type of manager plays an important role in driving organizational choice. If all managers had the same type (e.g., $\gamma^M = 0$, as typically assumed in the literature on nonprofits) then the only contracting instruments would be the degree of residual claimancy and control rights over the action choice. Given heterogeneous types of managers, the need for the founder to choose a rigid mission would only arise in the case of nonalignment of preferences (e.g., $x = 0$ when $\gamma^F < 0$ and $\gamma^M > 0$, and $x = 1$ when $\gamma^F > 0$ and high, and γ^M small). In other cases, given the type of manager, formal and real authority in the choice of x are going to be equivalent given incentive compatibility.

III. Comparing Organizational Forms

We begin by looking at effort choices. We then compare welfare.

Let z be the expected payoff to the manager conditional on $r = H$. This will typically be a combination of financial and nonpecuniary payoffs as discussed above. The expected payoff of the manager is therefore

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

and the choice of effort is given by $\hat{e}(z)$. We begin with a simple but useful observation. The proof of this and subsequent results are in the Appendix.

OBSERVATION 1: *The larger the expected payoff of the manager (z) conditional on success $(r = H)$, the greater her effort and the higher her ex ante expected payoff.*

The proof follows directly from the properties of $\phi(z)$ and $\hat{e}(z)$. It reflects the standard logic of residual claimancy in promoting effort incentives. That said, it is important to bear in mind that z could include, wholly or partly, the nonpecuniary payoff from pursuing a pro-social mission.

Action and Effort Choices.—The action choice is relevant only in a social enterprise. For $\gamma^M \in [\underline{\gamma}, \overline{\gamma}]$, where $\underline{\gamma} \equiv \frac{1}{\beta_h}$ and $\overline{\gamma} \equiv \frac{1}{\beta_l}$, a manager's social payoff is more important than profits when $r = H$ and $s = h$ and vice versa when $r = H$ and $s = l$. Hence, we make a second observation.

OBSERVATION 2: *In a social enterprise the action choice depends on γ^M. Managers with $\gamma^M \in [\underline{\gamma}, \overline{\gamma}]$ choose state-contingent actions, those with $\gamma^M \geq \overline{\gamma}$ choose $x = 1$ while those with $\gamma^M < \underline{\gamma}$ choose $x = 0$.*

This emphasizes that although a social enterprise always has the possibility of a flexible trade-off, whether this is realized depends on the kind of citizen-manager in place. Observation 2 implies that, for any given level of founder valuation, γ^F, if social enterprises are at all chosen, it will be for managers with $\gamma^M \in [\underline{\gamma}, \overline{\gamma}]$. Otherwise, there is nothing a social enterprise can do that cannot be mimicked by a for-profit or a nonprofit where $x = 0$ or $x = 1$ is stipulated ex ante. The motivation of the manager and the flexibility that is granted to them under a social enterprise has an immediate and interesting implication in terms of effort choice of managers.

PROPOSITION 1: *The effort level in a social enterprise is (weakly) higher than in a for-profit or a nonprofit, and strictly so for* $\gamma^M \in (\underline{\gamma}, \overline{\gamma})$, *when it is the chosen organizational form. Moreover, there exists* $\hat{\gamma} \equiv \frac{1}{\overline{\beta}}$ *such that effort is higher (lower) in a for-profit than a nonprofit for* $\gamma^M < \hat{\gamma}$ $(\gamma^M > \hat{\gamma})$.

Effort is higher in a social enterprise precisely because of the discretion over action choice that a flexible mission permits. By decentralizing this to a manager, the founder empowers him to choose the action that will maximize his payoff conditional on success, and this gives the best incentives to put in effort. When $\gamma^M \in (\underline{\gamma}, \overline{\gamma})$, in a social enterprise, conditional on success $(r = H)$, the manager's expected payoff is higher than that of nonprofits or for-profits, and due to this complementarity, she puts in more effort.[14] This result reflects the important role of intrinsic motivation (γ^M) and heterogeneity in it in driving organizational choice and providing effort incentives. However, effort incentives on the part of the manager are only one part of the story, and to understand organizational choice, the value the founder puts on the social objective plays an important role, an issue to which we turn now.

Organizational Choice.—We now consider which organizational form is optimal once we take the founder's valuation into account. The founder's expected payoff is

$$U^F = e\Big(q\big[x_h \gamma^M \beta_h \pi + (1 - x_h)(\pi - b)\big] + (1 - q)\big[x_l \gamma^M \beta_l \pi + (1 - x_l)\big](\pi - b)\Big),$$

where $b = 0$ in an FP or SE and $b = \pi$ in an NP, and $x_s\big(s \in \{l, h\}\big)$ is the action taken by the manager in state s. As we noted above, the fixed payment T can be positive or negative.

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

$$S^{FP}(\gamma^F, \gamma^M) = \phi(\pi);$$

$$S^{NP}(\gamma^F, \gamma^M) = \gamma^F \overline{\beta} \pi \hat{e}\left(\gamma^M \overline{\beta} \pi\right) + \phi\left(\gamma^M \overline{\beta} \pi\right);$$

$$S^{SE}(\gamma^F, \gamma^M) = \gamma^F \Bigg(\sum_{s \in \{h, l\}} q_s \hat{x}\left(\gamma^M; s\right) \beta_s \pi\Bigg) \hat{e}\left(v\left(\gamma^M\right)\right) + \phi\left(v\left(\gamma^M\right)\right).$$

[14] Notice that if the choice was restricted between NP and FP only, then the critical value of γ^M such that a manager is indifferent is $\gamma^M = \hat{\gamma}$, which lies between $\underline{\gamma}$ and $\overline{\gamma}$, and FP preferred for $\gamma^M < \hat{\gamma}$ and NP preferred for $\gamma^M > \hat{\gamma}$.

We ignore the consumer surplus from these calculations, since it is present in all cases and does not affect the comparative analysis. We also ignore the payoff of the rest of society. For now, we take the matching of founders and managers as given, relaxing this in the next section.

To maximize joint surplus, the action in state s should be governed by whether $\left(\gamma^M + \gamma^F\right)\beta_s \gtrless 1$. However, due to informational constraints, the choice is governed solely by the manager's preferences (in a social enterprise) or can be rigidly stipulated (in a for-profit or a nonprofit). The selection of a manager with a specific γ^M along with an organizational form are the two instruments at the disposal of the founder to influence action choice as well as effort.

Earlier we compared effort across organizational forms. However, effort is one of the key considerations in choosing a particular organizational form. If the founder did not value the social payoff ($\gamma^F = 0$), then effort would be the only consideration since the manager's payoff is monotonically increasing in effort and given there are no constraints on transfers between the manager and the founder. In particular, organizational choice would reflect the ranking in terms of effort. If the founder does value the social payoff ($\gamma^F > 0$) then that constitutes the other key consideration in organizational choice and can potentially overturn the ranking implied by effort. This follows from the fact that the social payoff is nonrival between the founder and the manager and this feature can potentially go against the intuition of what we would expect from standard contracting problems where payoffs are typically rivalrous (even when nonpecuniary).[15]

The Case for Social Enterprise.—We will now look at two dimensions of the environment. To begin with, we will look at how heterogeneity in the types of the founder and manager affects whether a social enterprise yields the highest social surplus. We will then look at how the choice of a social enterprise varies with the likelihood that the commercial or social state is realized (variation in q). In each case, we will illustrate this with quantitative simulations of the gains.

Variation in Founder and Manager Motivation: First we consider what happens as we vary the motivation of the founder and manager. In comparing organizational forms, we consider the critical levels of founder motivation for a given level of manager motivation that make a particular organizational form optimal. We define the parameter space relative to a nonprofit 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 nonprofit 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 nonprofit 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.

[15] See, for example, Besley and Ghatak (2001), who study the optimal ownership structure of assets in the context of public goods.

PROPOSITION 2:

(*i*) *For low levels of manager motivation* ($\gamma^M \in [0, \underline{\gamma}]$), *a for-profit yields the same surplus as a social enterprise and is preferred to a nonprofit if the level of founder motivation is below* $\Gamma_{FP}(\gamma^M) > 0$, *a function that is strictly decreasing in* γ^M, *with* $\Gamma_{FP}(0) > \frac{1}{\beta}$ *and* $\Gamma_{FP}(\underline{\gamma}) > \pi\left[1 - \frac{\overline{\beta}}{\beta_h}\right]$.

(*ii*) *For middle levels of manager motivation* $\left(\gamma^M \in \left(\underline{\gamma}, \overline{\gamma}\right)\right)$, *a social enterprise strictly dominates a for-profit and is preferred to a nonprofit if the level of founder motivation is below* $\Gamma_{SE}(\gamma^M) > 0$, *a function that is strictly decreasing, with* $\Gamma_{SE}(\underline{\gamma}) > 0 = \Gamma_{SE}(\overline{\gamma})$.

(*iii*) *For high levels of manager motivation* ($\gamma^M \geq \overline{\gamma}$), *a nonprofit 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 proposition characterizes organizational choice as a function of the levels of founder and manager motivation. Manager motivation matters because it affects which action related to the mission versus profit trade-off will be chosen, and effort. The founder's motivation matters because it trades off the gains from effort incentives for the manager with the value put on the social payoff.

For a given level of the founder's motivation, the higher γ^M is, the more likely a social enterprise will be chosen over a for-profit, and a nonprofit will be chosen over a social enterprise.

On the other hand, for a given level of the manager's motivation, the higher γ^F is, the more likely a nonprofit will be chosen over a for-profit or a social enterprise. Existing theories of nonprofits correspond in our framework to the case where manager motivation is low, and the choice is between a nonprofit or a for-profit and the former is preferred when the founder is sufficiently motivated. This is based on the logic of the multitasking model—for-profits have higher effort due to the manager being incentivized, but sacrifice the social payoff, and if these are big enough to the founder, she will choose a nonprofit despite effort being lower.[16]

We show that for moderate levels of manager motivation, a social enterprise can be optimal as long as the manager will choose the correct action as effort will be higher than both for-profits and nonprofits. Therefore, even if the founder does not care much about the social cause, a social enterprise will be preferred to a for-profit. Of course, if the founder cares a lot about the social cause, then a nonprofit will be chosen.

There is a complementarity between founder and manager motivation since a more motivated manager puts in greater effort, which lessens the efficiency loss in a

[16] Previous discussions of the merits of for-profit and nonprofit enterprises such as Glaeser and Shleifer (2001) have focused on the case where managers are not motivated, i.e., $\gamma^M = 0$. As we have already stressed, there is no role for social enterprises in this case in our setting since there is no way of achieving the flexible mission which is the hallmark of balancing profits with purpose. Moreover, for a nonprofit to be a good idea we would have to allow for a lower bound on effort or the social output would have to be somewhat more contractible.

nonprofit. When managers are highly motivated, motivated founders always choose a nonprofit form. We examine this issue in detail in Section IV, where we study matching.

We now illustrate the two switch lines in Proposition 2 for the case of constant elasticity of effort, using the cost of effort function $c(e) = \frac{1}{1+1/\mu} e^{\left(1+\frac{1}{\mu}\right)}$. The constant elasticity of effort is μ, which is assumed to be positive and less than one (given our assumption $c'''(e) > 0$). It is readily verified that in this case, $\hat{e}(z) = z^{\mu}$ and $\phi(z) = \frac{1}{\mu+1} z^{\mu+1}$.

Fixing $q = \frac{1}{2}$, we have

$$\Gamma_{SE}\left(\gamma^M\right) = \frac{\frac{1}{1+\mu}\left[\left(\gamma^M\overline{\beta}\right)^{1+\mu} - \left(\sigma\left(\gamma^M\right)\right)^{1+\mu}\right]}{\sum_{s\in\{l,h\}} \frac{\hat{x}\left(\gamma^M; s\right)\beta_s}{2} \left(\sigma\left(\gamma^M\right)\right)^{\mu} - \overline{\beta}\left(\gamma^M\overline{\beta}\right)^{\mu}},$$

where

$$\sigma\left(\gamma^M\right) \equiv \sum_{s\in\{l,h\}} \frac{\hat{x}\left(\gamma^M; s\right)\gamma^M\beta_s + \left[1 - \hat{x}\left(\gamma^M; s\right)\right]}{2}$$

and

$$\Gamma_{FP}\left(\gamma^M\right) = \frac{\frac{1}{1+\mu}\left[1 - \left(\gamma^M\overline{\beta}\right)^{1+\mu}\right]}{\left[\left(\gamma^M\overline{\beta}\right)^{\mu}\right]\overline{\beta}}.$$

In terms of our earlier notation, $\sigma\left(\gamma^M\right) = \frac{v\left(\gamma^M\right)}{\pi}$ for the case $q = \frac{1}{2}$.

We will illustrate this for a range $\gamma^M \in [0.8, 1.2]$. We set $\beta_h = 1.10$ and $\beta_l = 0.90$. A large number of studies suggest that a reasonable number for μ is 0.2.[17] There are three ranges of γ^M corresponding to Proposition 2. For $\gamma^M < \underline{\gamma}$, the social enterprise and for-profit yield the same outcome. This is the dotted line in Figure 1. For high enough γ^F, there is a case for a nonprofit over a social enterprise or for-profit. However, as γ^M decreases, effort goes down and so for low values of γ^M a nonprofit is not a good idea unless γ^F is very high.

In the range $\gamma^M \in \left[\underline{\gamma}, \overline{\gamma}\right]$, a social enterprise strictly dominates a for-profit because the manager puts in a higher effort given his ability to choose the mission-related action. As in the first range, for high enough values of γ^F, nonprofits dominate social enterprise, and the higher γ^M is, the lower the relevant threshold, since even under a nonprofit, effort is not too low. This threshold is given by the dark solid line. For high values of γ^M ($\gamma^M \geq \overline{\gamma}$), nonprofits and social enterprise are equivalent since the manager always chooses the pro-social action. To summarize, Figure 1 maps out clearly the space in which a social enterprise is desirable, where founders

[17] See, for example, Bandiera, Barankay, and Rasul (2007) in the context of a field experiment. As noted in Prendergast (2015) it is also consistent with the findings in the literature on taxation and labor supply.

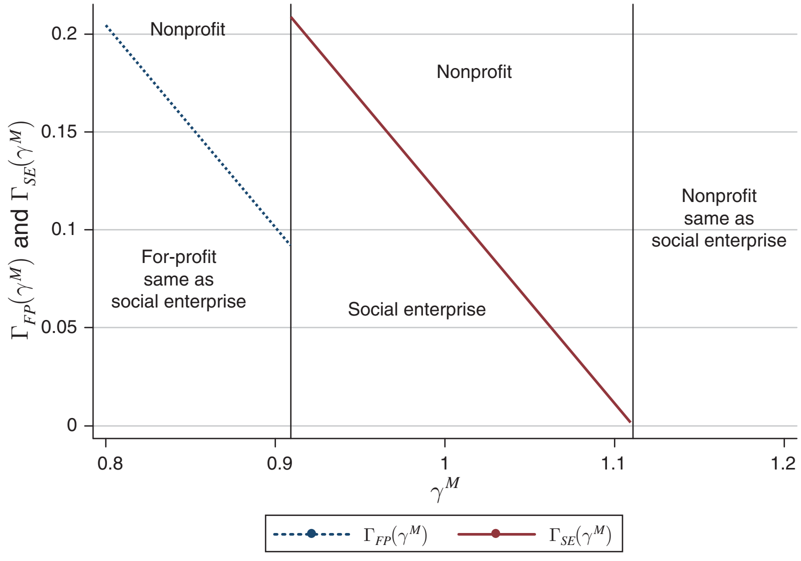

Figure 1

care for social returns but not sufficiently enough to make foregoing profits in all cases worthwhile.

Variation in the Likelihood of the High Social State: We now consider how varying the probability that the high value social state occurs (q) changes the case for a social enterprise versus a nonprofit (as the joint surplus from for-profits does not depend on q, it is left out of the comparison). The core trade-off between a social enterprise and a nonprofit is clear: effort is higher in the former but compared to the latter, the founder misses out on the social payoff whenever $s = l$. When $q = 1$, a nonprofit and a social enterprise have the same joint surplus, while for $q = 0$, nonprofits have strictly lower surplus than social enterprises (which in turn is the same as for-profits). In general, as q increases, the surplus under both nonprofits and social enterprises goes up but to make the comparison between the two tractable, we need to make some simplifying assumptions. We take the case where $\gamma^M = \gamma^F = 1$, i.e., the manager will pick the "right" state-contingent action in a social enterprise and the manager and founder have the same preference over profits and mission (which is the same as that of the average citizen). We also take the case of constant elasticity of effort, μ.

Let $S^{NP}(1, 1) \equiv \hat{S}^{NP}$ and $S^{SE}(1, \underline{1}) \equiv \hat{S}^{SE}$. Let $\tilde{\beta} \equiv q\beta_h + (1-q)$, so that $v(1) = \tilde{\beta}\pi$. Note also that $\tilde{\beta} > \overline{\beta}$. It is now straightforward to check that social surplus in a nonprofit is

$$\hat{S}^{NP} = \frac{2+\mu}{1+\mu}\left(\overline{\beta}\right)^{1+\mu}\pi^{1+\mu}$$

and in a social enterprise is

$$\hat{S}^{SE} = \left\{\frac{2+\mu}{1+\mu}\left(\tilde{\beta}\right)^{1+\mu} - (1-q)\left(\tilde{\beta}\right)^{\mu}\right\}\pi^{1+\mu}.$$

Intuitively, we know that for social enterprises to yield significant gains relative to nonprofits, q cannot be too large. However, the difference in the surplus under the two organizational forms, and how it changes with respect to q, depends on the size of β_l (e.g., if β_l is relatively high, the loss from nonprofits is relatively low, independent of q) and how elastic is effort (μ), since as q changes, effort responds under both organizational forms. The observation below offers sufficient conditions for social enterprises to have higher surplus than nonprofits for all values of q and for this difference to be monotonically decreasing as q increases: so long as β_l is not too high, and the effect via changes in effort is not significant (which is true if μ is small).

OBSERVATION 3: *Suppose* $\gamma^M = \gamma^F = 1$, *and* $c(e) = \frac{1}{1 + 1/\mu} e^{\left(1+\frac{1}{\mu}\right)}$. *If* $\beta_l \leq \frac{1}{2}$ *and* μ *is small*, $\hat{S}^{SE} - \hat{S}^{NP} \geq 0$ *for all* $q \in [0, 1]$, *strictly so for* $q < 1$, *and is strictly decreasing in* q.

This is intuitive: if the high social state is very likely, then nonprofits are almost as good as social enterprises and so we would expect the advantage of social enterprises to be higher for lower levels of q. However, if β_l is large (say, close to 1), then nonprofits are almost as good as social enterprises for all values of q and therefore the advantage of social enterprises will be higher the lower is β_l.

To sum up, while Proposition 2 characterized organizational choice in terms of the pro-social motivation of the founder and the manager, Observation 3 shows that under certain reasonable conditions, the advantage of SE over NP is decreasing in the likelihood of the high social state.

To give a quantitative illustration, the percentage gain from a social enterprise relative to a nonprofit is given by $\Delta(q, \beta_h, \beta_l, \mu) = \frac{\hat{S}^{SE}}{\hat{S}^{NP}} - 1$. As in the previous quantitative exercise, we set $\mu = 0.2$. There are three cases we consider in terms of values of $\beta_h = 1.10$, $\beta_l = 0.90$; $\beta_h = 1.05$, $\beta_l = 0.95$; and $\beta_h = 1.15$, $\beta_l = 0.85$. This illustration is given in Figure 2, where we have plotted the gains for the entire range of $q \in [0, 1]$ for these three cases. As expected, the figure shows that the relative efficiency of a social enterprise is most when q is far below one. For the highest value of β_ℓ, the gains are small, at about 5 percent for $q \leq 0.6$. However, when β_ℓ is 0.95 and $\beta_h = 1.05$, the gains are much more substantial, e.g., about 15 percent–20 percent when $q \leq 0.2$. While only illustrative, it does show the possibility of nontrivial social benefits from having the kind of flexible mission allowed by a social enterprise. However, the magnitude of the gains is contingent on the nature of the magnitude of the trade-off between profit and social purpose.

The Case for a For-Profit.—Above we mentioned that if $\gamma^F < 0$ then there is a potential case for a for-profit. This allows us to complete the picture in the sense that all organizational forms that we considered can be optimal. If $\gamma^M = 0$, then a for-profit is always optimal when $\gamma^F = 0$. However, the more interesting possibility is where $\gamma^M > 0$. The attraction to a founder with $\gamma^F < 0$ of hiring a motivated manager is that he gets effort from that manager who is also willing to take a pay cut or offer a higher franchise fee to the founder to run the firm. This must be

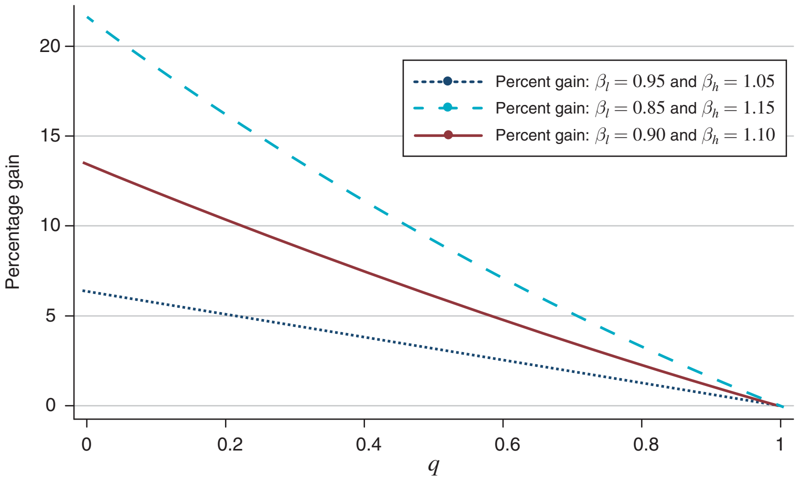

Figure 2

traded off against the way that such founders view the firm as causing "pollution" when $\gamma^F < 0$ and $x_s = 1$. For example, when $\gamma^M \overline{\beta} = 1$, the effort level under a nonprofit is the same as in a for-profit but the overall surplus in an NP is lower, since the expected payoff from success $\left((\gamma^M + \gamma^F)\overline{\beta}\pi\right)$ is lower than that under for-profits (π) as $\gamma^F < 0$.

Thus, for for-profits to be potentially attractive in this range relative to nonprofits, the critical value of γ^F would have to be negative. This can be viewed as a representation in our framework of the classic conflict of interest that has been in the focus of agency problems due to managerial discretion. In this case, the founder/owner of a firm wishes to discourage such "rent-seeking" behavior since picking $x_s = 1$ is a form of managerial indulgence at the expense of the founder.[18] We record this as the following proposition.

PROPOSITION 3: *For any $\gamma^M > 0$, a for-profit will dominate a nonprofit or a social enterprise if γ^F is sufficiently negative.*

This result highlights how our core theory of social enterprise is based on positive *mutual* gains from picking a pro-social action. Otherwise, the basic agency problem of how to align the preferences of the manager and the founder crops up. That said, γ^F has to be sufficiently negative to overcome the possibility that a founder wishes to exploit the fact that $\gamma^M > 0$ in an SE or NP since he can profit by leasing or selling the firm to the manager in exchange for a higher price, or pay him a lower wage.

In Figure 3, we illustrate Proposition 3 using the same parameter values that we assumed for Figure 1. We expand Figure 3 compared to Figure 1 to encompass negative values of γ^F. For the sake of comparison, we focus on the ranges of γ^M such that for-profits are never chosen if $\gamma^F \geq 0$, i.e., the second and the third of the

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

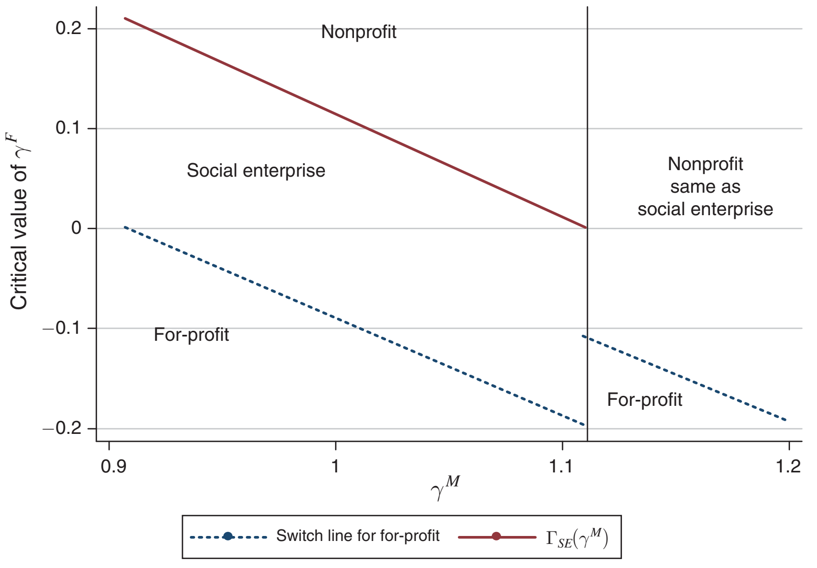

FIGURE 3

three regions in Figure 1. Figure 3 illustrates the critical range of $\gamma^F < 0$ for which a for-profit is better than a social enterprise and/or nonprofit. There is a jump in the switch line at a point at which a nonprofit and a social enterprise converge. This is because we always have a pro-social mission in a social enterprise or nonprofit and hence the for-profit has an additional advantage since it generates π instead of $\beta_l \pi$ half of the time (recall that we have set $q = 1/2$ in this illustration). However, as γ^M increases, this advantage diminishes since a nonprofit or social enterprise produces more effort, so the switch continues to slope downward as a function of γ^M.

Government Action?—A more subtle possibility arises by considering what happens if the social cause can also be pursued through government action, as in the standard public economics literature. This also bears on Milton Friedman's well-known critique of corporate social responsibility (see Friedman 1970). He argues that government should take responsibility for regulating public goods and bads, leaving firms to focus on profit maximization. This argument might be extended to cast doubt on any kind of firm that tries to take a more pro-social stance to doing business, as in our model of social enterprise.

To explore this, we return to the model's core setup to observe that the *socially* optimal strategy for the firm should be governed by whether

$$\beta_s N \gtrless 1,$$

i.e., where the payoff of the full range of stakeholders, and not just founders and managers, is taken into account. Were the government able to choose x_s and if β_s were observable, then the government would choose a state-contingent regulation to achieve mission integrity. However, this would not necessarily bring forth the right level of effort if the government could not set e directly—the classic effort moral hazard problem. To do this, the government would have to monetize the social surplus and reward the firm based on $\sum_{i=1}^{N-2} \gamma_i \beta_s \pi$, i.e., transfer the social surplus to the firm as an additional profit. Thus firms would give their managers financial incentives which monetize social returns—a form of Pigouvian subsidy in this context. In terms of our concrete examples this would be like a government grant for picking deserving consumers and/or picking a green technology.

However, since s is private information, this is not a feasible option. That said, this issue is only binding when there is a government that wishes to implement a flexible mission, i.e.,

$$\beta_h N > 1 > \beta_l N.$$

Otherwise, the government would be able to introduce a regulation to mandate either $x = 1$ or $x = 0$. For some kinds of externalities we do see this approach being taken.

Our model makes clear that achieving the optimal social trade-off with a social enterprise will only work when there is a manager-founder pair who implement the socially optimal trade-off between profits and purpose. There is no guarantee that this will be the case when a private firm takes this decision in a decentralized manner. This makes clear why social enterprises as envisaged here will not necessarily achieve what a benevolent government would ideally like. Thus, we expect social enterprise to be most effective only when the interest in the decision by the rest of society $\sum_{i=1}^{N-2} \gamma_i$ is relatively small relative to what the insiders, i.e., founder and manager, desire. This is a case where the cause is closer to being of local rather than national interest, where there is particular concern about the issue among the founder and manager.

Thinking explicitly about interests outside of the firm also suggests how the model could be developed to allow citizens to influence the mission of the firm directly, what Baron (2001) calls "private politics." This would work when the payoff $\sum_{i=1}^{N-2} \gamma_i \beta_s \pi$ would enter into the firm's payoff through direct influence, as in the case of private lobbying. Whether this leads to better or worse alignment between private and social preference depends exactly on which groups of citizens are organized. It would also depend on whether founders of firms who appoint managers could anticipate this by strategic delegation, as in models of lobbying with citizen candidates such as Besley and Coate (2001).

Relaxing Some Assumptions: There are several features of our model that may appear restrictive and here we briefly discuss the consequences of relaxing some of them.

Allowing Partial Residual Claimancy: In the paper we restrict attention to the profit share of managers to $\sigma \in \{0, 1\}$. If we allow σ to take any value between 0 and 1, then the mission integrity constraints can be written as $\frac{\sigma}{\beta_h} \leq \gamma^M \leq \frac{\sigma}{\beta_l}$. Recall that we defined a social enterprise as one where the manager has authority to choose x and his profit share is 1. We defined an interval $[\underline{\gamma}, \overline{\gamma}]$ where $\underline{\gamma} \equiv \frac{1}{\beta_h}$ and $\overline{\gamma} \equiv \frac{1}{\beta_l}$ such that for managers for whom γ^M lies in this interval, the mission integrity constraints are satisfied. Substituting $\sigma = 1$ above, this is verified.

We know that effort incentives are increasing in σ. The highest value of σ that is consistent with mission integrity is $\gamma^M \beta_h$, yielding an effort level of $\hat{e}(\gamma^M \beta_h \pi)$. Hence, for $\gamma^M \beta_h > 1$ (or $\gamma^M > \underline{\gamma}$) we have $\sigma = \min\{1, \gamma^M \beta_h\} = 1$ and mission integrity is satisfied with full residual claimancy so long as $\gamma^M \leq \overline{\gamma}$. For $\gamma^M > \overline{\gamma}$, $\sigma \geq \gamma^M \beta_l$ can no longer be satisfied and the manager will always choose $x = 1$, as we saw.

Since this is a transferable utility setup, there is no cost to the founder of giving the manager full residual claimancy (which would not be the case if the manager was risk averse or there were limited liability constraints, for example). Since effort is increasing in σ, $\sigma < 1$ will only be chosen when $\gamma^M \beta_h < 1$ or $\gamma^M < \underline{\gamma}$ because then $\sigma = \min\{1, \gamma^M \beta_h\} = \gamma^M \beta_h$. In the paper, since we restrict attention to $\sigma = 1$, mission integrity cannot be satisfied when the manager has authority over action choice for $\gamma^M < \underline{\gamma}$. Allowing partial residual claimancy makes it possible to have mission integrity in this parameter region. As a result, the parameter region for which social enterprise is chosen potentially expands. However, $\sigma < 1$ means effort is lower in a social enterprise with partial residual claimancy than for a for-profit. That is one respect in which our results are modified. As a result, the same trade-off that we saw between for-profits and nonprofits in the paper for the parameter zone $\gamma^M < \underline{\gamma}$ now shows up between for-profits and social enterprises (with partial residual claimancy). That is the other respect in which our results are modified. In the limit, as $\gamma^M \to 0$, $\sigma \to 0$ and so social enterprise with partial residual claimancy approaches a pure nonprofit as the manager's motivation goes to 0.

Placing a Bound on the Total Weight on Pro-social Motivation and Money.—In our setup, when a manager cares more about social outcomes, he also cares more overall about success. Could this be driving the result that social enterprises elicit greater managerial effort? To examine this, let managers put a weight λ on the social payoff and $(1-\lambda)$ on money. Therefore, under a for-profit, a manager receives $(1-\lambda)\pi$ and under a nonprofit he receives $\lambda\{q\theta_h + (1-q)\theta_l\} = \lambda\overline{\theta}$ or $\lambda\overline{\beta}\pi$. Under a social enterprise with flexible mission and managerial autonomy, his expected payoff is

$$\hat{v}(\lambda) = q\max\{\lambda\theta_h, (1-\lambda)\pi\} + (1-q)\max\{\lambda\theta_l, (1-\lambda)\pi\}.$$

For social enterprises to possibly dominate for-profits, we need $\lambda\theta_h \geq (1-\lambda)\pi$, or $\lambda \geq \frac{\pi}{\theta_h + \pi} = \frac{1}{\beta_h + 1} \equiv \underline{\lambda}$. Similarly, for social enterprises to possibly dominate nonprofits, we need $\lambda\theta_l \leq (1-\lambda)\pi$, or $\lambda \leq \frac{\pi}{\theta_l + \pi} = \frac{1}{\beta_l + 1} \equiv \overline{\lambda}$. It turns out that managers with $\lambda \in [\underline{\lambda}, \overline{\lambda}]$ choose state-contingent actions, those with $\lambda \geq \overline{\lambda}$ choose $x = 1$, while those with $\lambda < \underline{\lambda}$ choose $x = 0$. Also, the effort level in a social enterprise is (weakly) higher than in a for-profit or a nonprofit, and strictly so for $\lambda \in (\underline{\lambda}, \overline{\lambda})$, when it is the chosen organizational form. Moreover, there exists $\hat{\lambda} \equiv \frac{1}{\overline{\beta}+1}$ such that effort is higher (lower) in a for-profit than a nonprofit for $\lambda < \hat{\lambda}$ $(\lambda > \hat{\lambda})$, which corresponds to Proposition 1. What changes is that while effort is increasing in λ for nonprofits, it is decreasing in λ

for for-profits. For social enterprises, effort is increasing or decreasing in λ when, respectively, $q\,\theta_h > (1-q)\,\pi$ or $q\,\theta_h < (1-q)\,\pi$. In contrast, in our model, effort in social enterprises is increasing in manager motivation (γ^M), as is effort in nonprofits, while effort in for-profits does not change with manager motivation.

Therefore our result on effort in social enterprises, when chosen, being higher than that of either nonprofits or for-profits for the same parameter range does not depend on the particular formulation of managerial motivation. It is driven by the fact that in the relevant range of manager motivation, SE leads to an action choice that literally is the best in both states, and the complementarity between action and effort choice in the manager's payoff function.

IV. Competition and Matching

Looking beyond exogenously matched founder-manager pairs, whether social enterprises as described here can arise in a market setting depends on them being able to compete for workers against for-profit and nonprofit firms. We saw that there is a complementarity between founder and manager motivation as the efficiency loss in a nonprofit from lower managerial effort would be less, the more motivated the manager.

We now explore the logic of this. We model competition by considering matching of founders and managers. The transfer from the founder to the manager, T, can adjust to ensure that, for a given founder-manager pair, the most efficient organizational form is chosen. Specifically, we study a market equilibrium where managers match with firms set up by founders, who choose an organizational form.

We assume types of founders and managers to be observable and also that preferences are not affected by the type of the matched partner (e.g., M does not directly care about F's type). We focus on the implications of stable matching, defined as allocations of founders and managers that 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 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.

For simplicity, we focus on the case of three types of founders and managers, ranked in terms of how much weight they put on the social mission. 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 be summarized by a one-to-one matching function $\phi : \mathcal{A}_F \cup \mathcal{A}_M \rightarrow \mathcal{A}_F \cup \mathcal{A}_M$ such that (i) $\phi(f_i) \in \mathcal{A}_M \cup \{f_i\}$ for all $f_i \in \mathcal{A}_F$, (ii) $\phi(m_j) \in \mathcal{A}_F \cup \{m_j\}$ for all $m_j \in \mathcal{A}_M$, and (iii) $\phi(f_i) = m_j$ if and only if $\phi(m_j) = f_i$ for all $(f_i, m_j) \in \mathcal{A}_F \times \mathcal{A}_M$. A founder (manager) is unmatched if $\phi(f_i) = f_i$ ($\phi(m_j) = m_j$). What this function does is to assign each founder (manager) to at most one manager (founder) and to allow for the possibility that a founder (manager) remains unmatched, in which case he (she) is described as "matched to himself (herself)."

The founder and the manager types determine how much the cause is valued and are denoted by $\gamma^F(f)$ and $\gamma^M(m)$ respectively. We assume that $\gamma^F(f_0) = \gamma^M(m_0) = 0$; $\gamma^M(m_2) > \overline{\gamma} > \gamma^M(m_1) > \underline{\gamma}$; 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 mission, while type m_1 agents would achieve mission integrity only if they worked in a social enterprise. 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 $\tau, \kappa \in \{0, 1, 2\}$, 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 $N(f_1) = n(m_1)$, but $N(f_0) > n(m_0)$. This puts social enterprises and nonprofits under maximum competitive pressure from for-profit firms who will be seeking to recruit managers and will be willing to bid up managers' wages to the point where expected profit is zero.

Associated with each possible match $(f_\tau, m_\kappa) \in \mathcal{A}_F \times \mathcal{A}_M$ is a choice of organizational form $J(f_\tau, m_\kappa) \in \{FP, NP, SE\}$ 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 2, for matched pairs (γ^F_1, γ^M_0) and (γ^F_2, γ^M_0) either a for-profit or a nonprofit may be the best organizational form, depending on the value of $\Gamma(\gamma^M_0)$ relative to γ^F_1 and γ^F_2. Similarly, for the pairs (γ^F_1, γ^M_1) and (γ^F_2, γ^M_1) either a social enterprise or a nonprofit may be optimal depending on the value of $\Gamma_{SE}(\gamma^M_1)$ relative to γ^F_1 and γ^F_2.

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 forms of 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 nonprofit firms, and those with middle levels of motivation set up social enterprises.

Stable matching will require one further condition, which guarantees that a nonprofit organization values a more motivated manager more than a social enterprise does for the same (positive) level of founder motivation. For this, we need to ensure that effort does not increase too much with manager motivation in the range $\gamma^M \in [\underline{\gamma}, \overline{\gamma}]$, because social enterprises have a strict advantage over nonprofits in terms of manager effort in this range. A sufficient condition for this is given as part of the following result.

PROPOSITION 4: *Suppose that the elasticity of effort at $\underline{\gamma}\overline{\beta}$ is less than $\dfrac{\underline{\gamma}\overline{\beta}\beta_l}{q(\beta_h - \beta_l)}$, 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 $\gamma^F_1 < \Gamma_{SE}(\gamma^F_1)$ and NP otherwise; and (iii) $J(f_2, m_2) = NP$.*

This result shows that social enterprises can emerge in a matching market against competition from other organizational forms.[19] This means that founders and managers have similar views about organizational goals, both preferring the flexible

[19] 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, as shown in the proof of Proposition 2. Therefore, the elasticity of

mission that balances profits with purpose. 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.[20]

This result also shows how allowing heterogeneity in manager and founder motivation and matching provides predictions that are distinctive from existing theories of nonprofits based on multitasking arguments. For example, for managers with low levels of motivation, a motivated founder will choose a nonprofit, while founders with low motivation may set up a social enterprise or a nonprofit with managers who are motivated. However, if we allow for matching, the low motivation manager and founder will pair up in a for-profit enterprise, while the more motivated manager and founder will pair up in a social enterprise or nonprofit.

V. Empirical Implications

The approach taken in this paper suggests some empirically testable propositions about which sectors of the economy social enterprise might emerge in as an organizational form.

Fundamentally, we identify social enterprises with middle-range values of external benefits and costs. For goods that are associated with a large social externality (β_l high enough in our model), we should always expect nonprofits. For cases where the externality is small (but not necessarily zero), we expect to see for-profits dominate. This implication could be empirically investigated, even though comparing across organizational forms would be subject to the usual identification problems associated with organizational form being endogenous. We would expect pure for-profits to have higher financial profits but a poorer record in terms of social objectives (e.g., pollution) compared to social enterprises. Nonprofits in turn would

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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

$$\frac{\hat{e}'\left(\underline{\gamma}\overline{\beta}\pi\right)}{\hat{e}\left(\underline{\gamma}\overline{\beta}\,\pi\right)} < \frac{\beta_l}{\pi q(\beta_h - \beta_l)},$$

which is equivalent to

$$\hat{\varepsilon}\left(\underline{\gamma}\overline{\beta}\,\pi\right) < \frac{\underline{\gamma}\overline{\beta}\,\beta_l}{q(\beta_h - \beta_l)}.$$

A sufficient condition for this assumption to hold is $\frac{\left(\underline{\gamma}\overline{\beta}\right)\beta_l}{q(\beta_h - \beta_l)} > 1$, which is easy to verify in applications.

[20] Our assumptions about the distribution of types of founders and managers implies that all the surplus will accrue to managers. Therefore, type m_0 agents receive $T_0 = S^{FP}\left(\gamma_0^F, \gamma_0^M\right) = \phi(\pi)$, type m_1 agents receive $T_1 = \max\left\{S^{NP}\left(\gamma_1^F, \gamma_1^M\right), S^{SE}\left(\gamma_1^F, \gamma_1^M\right)\right\}$, and type m_2 agents receive $T_2 = S^{NP}\left(\gamma_2^F, \gamma_2^M\right)$. However, they do not automatically ensure that self-selection constraints are satisfied for managers in an assortative matching equilibrium if there is asymmetric information about managers' types. To see this, suppose we start with an assortative matching equilibrium, and then pull out the managers from two different organizational forms, say an NP with the pair (γ_2^F, γ_2^M) and an SE with the pair (γ_1^F, γ_1^M). If their identities are concealed, would they have an incentive to self-select back into their existing positions? For this to happen, both the following conditions need to hold:

$$S^{SE}\left(\gamma_1^F, \gamma_1^M\right) \geq S^{NP}\left(\gamma_2^F, \gamma_1^M\right);$$

$$S^{NP}\left(\gamma_2^F, \gamma_2^M\right) \geq S^{SE}\left(\gamma_1^F, \gamma_2^M\right),$$

whereas assortative matching only implies that $S^{SE}(\gamma_1^F, \gamma_1^M) + S^{NP}(\gamma_2^F, \gamma_2^M) \geq S^{NP}(\gamma_2^F, \gamma_1^M) + S^{SE}(\gamma_1^F, \gamma_2^M)$.

have better records in terms of social objectives than social enterprises, but worse records in terms of financial efficiency.

The model also gives a steer about which sector we should expect to see social enterprises emerge in. Key to our argument is the social dimension being intrinsically bundled with the production of the good. The decentralized information in firms is the key to this point—firms know best the true social versus financial cost-benefit trade-off associated with their decisions. Also, as noted above, social enterprise will be more effective when the insiders care a lot more about the social objective than the rest of society. We would expect social enterprises to emerge in sectors where this is true, namely when the cause is more local. If the costs and benefits were known to third parties and/or were of sufficient societal concern, then the externality could be taken care of by having separate action on the social dimension either by governments or nonprofits.

Our approach also suggests that empirical explanations of social enterprises need to go beyond standard considerations like incentives and legal rules, exploring the underlying preferences of those who are attracted to work in such firms. Researchers have increasingly been aware of the role of public service motivation in nonprofits and government (see, for example, Dal Bó, Finan, and Rossi 2013). However, public service motivation tests could also be applied to managers in private firms that try to balance profit with purpose. Investigating this further in social enterprises seems like an important aspect of empirical research in this area if the ideas in the theory presented here are to be taken seriously.

In other work, we directly tested some of the implications of our model in the lab (Besley, Ghatak, and Marden 2015). We carried out a real effort experiment in the lab to simulate the effort incentive problem. We asked participants to play three different games—one where they keep their earnings, one where they know that the earnings will be donated to a charity of their choice, and a third one where they have discretion over whether to keep the earnings themselves or donate them to a charity of their choice. In the last one, we stochastically varied the amount of the matching contribution we would make to charity conditional on the participant being successful, to simulate the $s = h$ and $s = l$ states. We interpreted this game as corresponding to how we model social enterprise. All individuals played all three games. Therefore, we were able to compare effort for the same individual in these three different games—one where she keeps the winnings, one where she knows the winnings will be donated to a charity of her choice, and the third one, where she has discretion over whether to keep the winnings and there is an exogenous shock that determines the desirability of making a charitable contribution by varying how much a charity will get if the player contributes \$1 (\$2 or \$0.20).

One of our key empirical findings is, for the same individual the effort level is highest under social enterprise, relative to both for-profits and nonprofits, which relates to Proposition 1.

In the experiment, we estimate the social motivation of individuals by using a method that measures public service motivation (the so-called Perry Tests). In our experiment, we tested if these measures of pro-social motivation predict the likelihood of an individual to donate to charity under the social enterprise (when they have a choice) and we find strong evidence for this.

Subject to all the limitations of the experiments (e.g., external validity), this clearly shows that our framework can facilitate empirical work in the economics of social sector organizations. There are many interesting issues that seem worth exploring. For example, we analyze the role of sorting and one can think of experimental approaches that get into the issue of organizational choice (nonprofit or social enterprise or for-profit) depending on who is matched with whom.

VI. Concluding Comments

This paper has explored a specific aspect of social enterprise—the possibility of having flexible missions which balance profit with purpose. We have argued that employing mission-sympathetic citizen-managers is a means of creating an incentive compatible trade-off. This illustrates the idea that has been discussed informally that there is a role for sympathetic managers and workers in social enterprises. Founders (or guardians of the mission more generally) can employ managers with similar preferences over this trade-off. Our framework makes precise how this works in a specific model and motivates how social enterprise can generate a middle ground that champions of this innovative organizational form have articulated informally.

We have been able to anchor the comparison between social enterprise with more standard organizational forms. The key point is that there is a range of manager motivation where selection "works" and provides the ideal trade-off between profit and purpose that a for-profit and nonprofit fail to achieve. The paper therefore gives a role to a recruitment strategy based on motivation (rather than ability) in explaining how social enterprises can thrive and achieve a balance between social goals and profit. However, there is also an implicit government failure in the background with regulation being unable to achieve the optimal trade-off.

An important issue that is worthy of further investigation is the financing sides of different forms of enterprises in our framework. Unlike nonprofits, social enterprises are able to issue equity as a means of enhancing their access to capital markets. The fact that they are also able to make commercially oriented decisions provides a profit which can be distributed to shareholders. This raises interesting questions about whether the balance between profits and purpose will be undermined by shareholder influence in such cases.

There are other areas where the ideas in this paper are applicable given the importance of motivated agents. 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 or politicians in the case of the media, which cares about how the enterprise is run. In both cases, owners own such enterprises because they too care about success in nonprofit 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 not 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 and how this is limited by human motivation.[21] It is an abiding concern of economists since Adam Smith that markets do not work on the basis of altruism. It perhaps therefore goes against the grain to suggest that social enterprise is different. But wider interest in pro-social motivation (see, for example, Bénabou and Tirole 2010) has opened up discussion to human motivation being an asset rather than only a constraint on what can be achieved. The key question is whether selection can work in practice and sustain an incentive-compatible outcome from a social point of view. Our matching analysis suggests that pro-social matching can indeed be a stable outcome. This is important as it shows that social enterprise can emerge when there is competition between organizational forms.

Greater awareness of particular externalities should also create more demand for social enterprise as stakeholders come to value the need to balance profit with purpose even if this means forgoing some of the benefits of high-powered incentives. In recent years, high inequality generated in the financial sector (particularly through rent-seeking and anti-social forms of risk-taking) is viewed by many as a kind of societal pollution. 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 to denounce economic reasoning, particularly in spheres where social goals matter. On this score, our analysis provides grounds for both promise and pessimism. It is promising since social enterprise can be used to allow those with certain kinds of pro-social preferences to express and act upon these as managers of private enterprises. But it is pessimistic when human nature rather than organizational rules provides a limit on what can be achieved. The paper illustrates the importance of nonselfish preferences in the functioning of social enterprises. Whether these values are hardwired or pliable then becomes a key determinant of what can feasibly be achieved in a market setting.

Appendix: Proofs

PROOF OF OBSERVATION 1:

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

PROOF OF OBSERVATION 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 nonprofit 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 nonprofit and a social enterprise but a for-profit will

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

be strictly dominated. Finally, for $\gamma^M \in (\underline{\gamma}, \overline{\gamma})$, the manager will choose $x = 1$ when $s = h$ and $x = 0$ when $s = l$ in a social enterprise. In this case, $v(\gamma^M) = [q\gamma^M \beta_h + (1-q)]\pi > \max\{1, \gamma^M \overline{\beta}\}\pi$. Therefore, the social enterprise is preferable to the manager to a for-profit or a nonprofit. ∎

PROOF OF PROPOSITION 1:

For $\gamma^M \leq \underline{\gamma}$, the manager will always choose $x = 0$ under a social enterprise, and so effort will be the same between a for-profit and a social enterprise, namely $\hat{e}(\pi)$. For $\gamma^M \geq \overline{\gamma}$, the manager will always choose $x = 1$ under a social enterprise, and so effort will be the same between a nonprofit and a social enterprise, namely $\hat{e}(\gamma^M \overline{\beta} \pi)$. However, for $\gamma^M \in (\underline{\gamma}, \overline{\gamma})$ the manager's effort is $\hat{e}(v(\gamma^M))$. As $v(\gamma^M) = \{q\gamma^M \beta_h + (1-q)\}\pi > \max\{1, \gamma^M \overline{\beta}\}\pi$, it strictly exceeds effort under a for-profit or a nonprofit. If the choice is between for-profits and nonprofits only, then the critical value of manager motivation will be given by $\hat{e}(\pi) = \hat{e}(\gamma^M \overline{\beta} \pi)$, or $\gamma^M \overline{\beta} = 1$. Therefore, we can define $\hat{\gamma} \equiv \frac{1}{\overline{\beta}}$ such that effort is strictly higher under a for-profit if $\gamma^M < \hat{\gamma}$ and under a nonprofit if $\gamma^M > \hat{\gamma}$. ∎

PROOF OF PROPOSITION 2:

The equality $S^{FP}(\Gamma, \gamma^M) = S^{NP}(\Gamma, \gamma^M)$ is equivalent to the value of $\gamma^F = \Gamma_{FP}$ that solves $\phi(\pi) = \gamma^F \overline{\beta} \pi \hat{e}(\gamma^M \overline{\beta} \pi) + \phi(\gamma^M \overline{\beta} \pi)$. This is equivalent to

$$\text{(A1)} \quad \pi \hat{e}(\pi) - c(\hat{e}(\pi)) = (\gamma^F \overline{\beta} \pi + \gamma^M \overline{\beta} \pi)\hat{e}(\gamma^M \overline{\beta} \pi) - c(\hat{e}(\gamma^M \overline{\beta} \pi)).$$

It is straightforward to verify that $\Gamma'_{FP}(\gamma^M) < 0$: totally differentiating (A1), we get

$$\frac{d\gamma^F}{d\gamma^M} = -1 - \overline{\beta}\pi\gamma^F \frac{\hat{e}'(\gamma^M \overline{\beta} \pi)}{\hat{e}(\gamma^M \overline{\beta} \pi)} < 0.$$

For $\gamma^M = 0$, the right-hand side of (A1) is lower than the left-hand side at $\gamma^F \overline{\beta} = 1$, and therefore $\Gamma_{FP}(0) > 1/\overline{\beta}$, which lies between $\underline{\gamma}$ and $\overline{\gamma}$. At $\gamma^M = \underline{\gamma}$, $\gamma^M \overline{\beta} = \frac{\overline{\beta}}{\beta_h} < 1$ and therefore, at $\gamma^F \overline{\beta} + \gamma^M \overline{\beta} = 1$, the left-hand side is larger. Therefore, the two sides can be equal only if γ^F exceeds some minimum threshold, given by $\Gamma_{FP}(\underline{\gamma}) > \left(1 - \frac{\overline{\beta}}{\beta_h}\right)\frac{1}{\overline{\beta}}$.

Also, as $\Gamma'_{FP}(\gamma^M) < 0$ and $\Gamma_{FP}(0) > \Gamma_{FP}(\underline{\gamma}) > 0$, $\Gamma_{FP}(\gamma^M) > 0$ 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 $\Gamma_{FP}(\gamma^M)$ such that for $\gamma^F \geq \Gamma_{FP}(\gamma^M)$ NP dominates FP. The function $\Gamma_{FP}(\gamma^M)$ is strictly negatively sloped, with $\Gamma_{FP}(0) > \frac{1}{\overline{\beta}}$ and $\Gamma_{FP}(\underline{\gamma}) > \left(1 - \frac{\overline{\beta}}{\beta_h}\right)\frac{1}{\overline{\beta}}$. Notice that $\frac{1}{\overline{\beta}} > \left(1 - \frac{\overline{\beta}}{\beta_h}\right)\frac{1}{\overline{\beta}}$.

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

$$v(\gamma^M) = [q\gamma^M \beta_h + (1-q)]\pi.$$

Also, $v(\gamma^M) > \pi \max\{\gamma^M \overline{\beta}, 1\}$ for $\gamma^M \in (\underline{\gamma}, \overline{\gamma})$. At $\gamma^M = \underline{\gamma}$, $v(\gamma^M) = \pi > \gamma^M \overline{\beta}\pi$ and at $\gamma^M = \overline{\gamma}$, $v(\gamma^M) = \pi\gamma^M\overline{\beta} > \pi$. The equality $S^{SE}(\Gamma, \gamma^M) = S^{NP}(\Gamma, \gamma^M)$ is equivalent to $\gamma^F = \Gamma_{SE}$ solving

$$\gamma^F q \beta_h \pi \hat{e}\left(v\left(\gamma^M\right)\right) + \phi\left(v\left(\gamma^M\right)\right) = \gamma^F \overline{\beta} \pi \hat{e}\left(\gamma^M \overline{\beta} \pi\right) + \phi\left(\gamma^M \overline{\beta} \pi\right)$$

or

$$\text{(A2)} \qquad \left(v\left(\gamma^M\right) + \gamma^F q \beta_h \pi\right)\hat{e}\left(v\left(\gamma^M\right)\right) - c\left(\hat{e}\left(v\left(\gamma^M\right)\right)\right)$$
$$= \left(\gamma^F \overline{\beta} \pi + \gamma^M \overline{\beta} \pi\right)\hat{e}\left(\gamma^M \overline{\beta} \pi\right) - c\left(\hat{e}\left(\gamma^M \overline{\beta} \pi\right)\right).$$

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

For $\gamma^M = \underline{\gamma}$, $v(\gamma^M) = \pi$ and the surplus under an FP, $\pi \hat{e}(\pi) - c(\hat{e}(\pi))$ is strictly less than that under an SE $\pi \hat{e}(\pi) - c(\hat{e}(\pi)) + \gamma^F q \beta_h \pi \hat{e}(v(\gamma^M))$ since under the SE the social action is chosen when $s = h$ and the founder benefits from that, even though the manager's payoff is by construction the same for $\gamma^M = \underline{\gamma}$. Therefore, an SE strictly dominates an FP. As $v(\gamma^M) = \pi > \gamma^M \overline{\beta} \pi$, the critical level of γ^F such that an NP dominates an SE has to be higher than the one for an FP, namely $\Gamma_{FP}(\underline{\gamma})$. In particular, consider the threshold

$$\left(\gamma^F + \underline{\gamma}\right) \beta_l = 1,$$

(which is consistent with $\underline{\gamma}\beta_l < 1$). For this value, $\gamma^F \overline{\beta} + \underline{\gamma}\overline{\beta} = \left(\gamma^F + \underline{\gamma}\right) q \beta_h + (1 - q)$ and the total payoff conditional on success is the same under an NP and an SE. However, the effort level is strictly higher under an SE. Therefore, $\Gamma_{SE}(\underline{\gamma})$ is strictly higher than $\Gamma_{FP}(\underline{\gamma})$, which in turn exceeds $\left(1 - \frac{\overline{\beta}}{\beta_h}\right)\frac{1}{\overline{\beta}} > 0$ as shown earlier.

For $\gamma^M = \overline{\gamma}$, $v(\gamma^M) = \pi\gamma^M\overline{\beta}$. Therefore, the effort level is the same under an SE and an NP, and therefore, for any $\gamma^F > 0$, an NP must dominate. At $\gamma^F = 0$ they yield the same surplus.

Observe that

$$\Gamma'_{SE}\left(\gamma^M\right)$$
$$= -1 - \frac{\phi\left(v\left(\gamma^M\right)\right) - \phi\left(\gamma^M \overline{\beta} \pi\right)}{\left[\pi \overline{\beta} \hat{e}(\gamma^M \overline{\beta} \pi) - q \beta_h \pi \hat{e}\left(v\left(\gamma^M\right)\right)\right]^2} \cdot \frac{\partial\left[\overline{\beta} \pi \hat{e}\left(\gamma^M \overline{\beta} \pi\right) - q \beta_h \pi \hat{e}\left(v\left(\gamma^M\right)\right)\right]}{\partial \gamma^M}$$

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

$$\frac{\partial\left[\overline{\beta}\,\pi\,\hat{e}\left(\gamma^M \overline{\beta}\,\pi\right) - q\,\beta_h\,\pi\,\hat{e}\left(v\left(\gamma^M\right)\right)\right]}{\partial\gamma^M} = \left(\overline{\beta}\,\pi\right)^2 \hat{e}'\left(\gamma^M \overline{\beta}\,\pi\right) - \left(q\,\beta_h\,\pi\right)^2 \hat{e}'\left(v\left(\gamma^M\right)\right).$$

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

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

Hence it will hold whenever $c'''(e) > 0$. 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 OBSERVATION 3:

We know that $\hat{S}^{SE} > \hat{S}^{NP}$ for $q = 0$ and $\hat{S}^{SE} = \hat{S}^{NP}$ for $q = 1$. The condition for the sign of the derivative of $\hat{S}^{SE} - \hat{S}^{NP}$ with respect to q to be negative is

$$\left(\frac{\tilde{\beta}}{\overline{\beta}}\right)^{\mu} < \frac{(2+\mu)\left(\beta_h - \beta_l\right)}{(2+\mu)\left(\beta_h - 1\right) + 1 - \dfrac{(1-q)\,\mu\left(\beta_h - 1\right)}{\tilde{\beta}}}.$$

It can be verified that $(2+\mu)\left(\beta_h - \beta_l\right) > (2+\mu)\left(\beta_h - 1\right) + 1$ so long as $\beta_l < \frac{1+\mu}{2+\mu}$. Since the right-hand side of the condition displayed above is always strictly larger than 1, while the left-hand side is close enough to 1 for μ small enough, as q increases, $\hat{S}^{SE} - \hat{S}^{NP}$ decreases monotonically from strictly positive $(q = 0)$ to zero $(q = 1)$. The proof follows. ∎

PROOF OF PROPOSITION 3:

Suppose $\gamma^M \overline{\beta} = 1$ so that the effort level under a nonprofit is the same as in a for-profit. Clearly, overall surplus in an NP is lower, since the expected payoff from success is lower than for-profits, as $\gamma^F < 0$. In contrast, if $\gamma^F = 0$, then a nonprofit 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 nonprofit. Similarly, for $\gamma^M = \underline{\gamma}$, $v\left(\gamma^M\right) = \pi$ and so for $\gamma^F = 0$, a for-profit and a social enterprise yield the same surplus, which is higher than that of a nonprofit. But if $\gamma^F < 0$, an FP will dominate both. Therefore, for any $\gamma^M \in [\underline{\gamma}, \overline{\gamma}]$ such that a social enterprise dominates a nonprofit 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. ∎

PROOF OF PROPOSITION 4:

Our assumptions on the fraction of each type imply that all the surplus will accrue to managers. Both $S^{NP}(\gamma^F, \gamma^M)$ and $S^{SE}(\gamma^F, \gamma^M)$ have a positive cross-partial derivative with respect to γ^M and γ^F. Also, $S^{FP}(\gamma^F, \gamma^M)$ 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.,

$$f(\gamma_a^F, \gamma_a^M) + f(\gamma_b^F, \gamma_b^M) > f(\gamma_a^F, \gamma_b^M) + f(\gamma_b^F, \gamma_a^M)$$

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

$$C \in \left[f(\gamma_b^F, \gamma_b^M), f(\gamma_a^F, \gamma_a^M)\right].$$

Then

$$g(\gamma_a^F, \gamma_a^M) + g(\gamma_b^F, \gamma_b^M) = f(\gamma_a^F, \gamma_a^M) + C.$$

As

$$f(\gamma_a^F, \gamma_a^M) \geq \max\left\{f(\gamma_a^F, \gamma_b^M), f(\gamma_b^F, \gamma_a^M), C\right\}$$

and

$$f(\gamma_a^F, \gamma_a^M) + C \geq f(\gamma_a^F, \gamma_a^M) + f(\gamma_b^F, \gamma_b^M) > f(\gamma_a^F, \gamma_b^M) + f(\gamma_b^F, \gamma_a^M)$$

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 $g(\gamma_a^F, \gamma_b^M) + g(\gamma_b^F, \gamma_a^M) = f(\gamma_a^F, \gamma_b^M) + C < f(\gamma_a^F, \gamma_a^M) + C = g(\gamma_a^F, \gamma_a^M) + g(\gamma_b^F, \gamma_b^M)$; (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 $g(\gamma_a^F, \gamma_b^M) + g(\gamma_b^F, \gamma_a^M) = f(\gamma_a^F, \gamma_b^M) + f(\gamma_b^F, \gamma_a^M) < f(\gamma_a^F, \gamma_a^M) + f(\gamma_b^F, \gamma_b^M) < g(\gamma_a^F, \gamma_a^M) + C = g(\gamma_a^F, \gamma_a^M) + g(\gamma_b^F, \gamma_b^M)$. 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 2, $\frac{\partial^2(S^{NP} - S^{SE})}{\partial \gamma^F \partial \gamma^M} > 0$. Therefore,

$$\frac{\partial(S^{NP} - S^{SE})}{\partial \gamma^M} > \left.\frac{\partial(S^{NP} - S^{SE})}{\partial \gamma^M}\right|_{\gamma^F = 0} = \overline{\beta}\pi\hat{e}(\gamma^M\overline{\beta}\pi) - q\beta_h\pi\hat{e}\left(v\left(\gamma^M\right)\right)$$

$$= (1-q)\beta_l\pi\hat{e}(\gamma^M\overline{\beta}\pi) - q\beta_h\pi\left[\hat{e}\left(v\left(\gamma^M\right)\right) - \hat{e}(\gamma^M\overline{\beta}\pi)\right].$$

We want to show this is positive. From Observation 1, $\hat{e}(z)$ is increasing and from the proof of Proposition 2 it is concave. Therefore

$$\hat{e}\left(v\left(\gamma^M\right)\right) - \hat{e}(\gamma^M\overline{\beta}\pi) < \left[v\left(\gamma^M\right) - \gamma^M\overline{\beta}\pi\right]\hat{e}'(\gamma^M\overline{\beta}\pi)$$

$$= (1-q)(\pi - \beta_l\pi\gamma^M)\hat{e}'(\gamma^M\overline{\beta}\pi).$$

For our proof, it is sufficient to show that $q\beta_h\pi(\pi - \beta_l\pi\gamma^M)\hat{e}'(\gamma^M\overline{\beta}\pi) < \beta_l\pi\hat{e}(\gamma^M\overline{\beta}\pi)$ 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 $q\beta_h\pi(\pi - \beta_l\pi\underline{\gamma})\hat{e}'(\underline{\gamma}\overline{\beta}\pi) < \beta_l\pi\hat{e}(\underline{\gamma}\overline{\beta}\pi)$, which follows from the assumption in the statement of the proposition, namely $\left(\hat{\varepsilon}\left(\underline{\gamma}\overline{\beta}\pi\right) < \frac{\underline{\gamma}\overline{\beta}\beta_l}{q(\beta_h - \beta_l)}\right)$ given that that $\underline{\gamma} = \frac{1}{\beta_h}$. 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 have 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, 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 an FP and (f_2, m_0) would be an NP or FP. As $\max\{S^{NP}, S^{FP}\}$ is strictly supermodular, the non-assortative match is not stable. If they are rematched assortatively, i.e, (f_0, m_0) and (f_2, m_2), these would be an FP and an 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 an SE, but (f_1, m_0) could be an FP or an NP, and (f_1, m_1) could be an NP or an SE. This generates four possible cases, of which (f_1, m_0) being an FP and (f_1, m_1) being an 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 an NP and (f_1, m_1) is an 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 subcase is where (f_1, m_0) is an FP and (f_1, m_1) is an 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 an NP, but (f_2, m_1) could be an NP or an SE and (f_1, m_1) could be an NP or an SE. Obviously, if (f_1, m_1) is an NP then (f_2, m_1) would be an NP as well. Obviously, if all four organizational forms are NPs, 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.,

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

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. ∎

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