Non-Profit Status and Relational Sanctions: Commitment to Quality through Repeat Interactions and Organizational Choice

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April 30, 2015

Abstract

This paper examines how market-based sanctions facilitate commitment to quality and how such sanctions affect organizational choice. An entrepreneur can organize either a for-profit or a non-profit firm in selling product or service. While the entrepreneur can distribute all the profits from a for-profit firm to herself, she faces a non-distribution constraint with respect to a non-profit firm and has to convert its profits into private benefits (such as perquisites), which entails a deadweight loss. Because realized quality is not verifiable and is subject to error, customers impose relational sanctions against the firm when low quality product or service is delivered. With relational sanctions, both types of firm provide the same (expected) quality, but the size of the relational sanctions and the entrepreneur's organizational preferences differ. When converting profit into private benefits becomes more difficult at the margin, because temptation to shirk from investing in quality gets weaker, a non-profit firm is subject to shorter relational sanctions and, this, in turn, can make a non-profit status more attractive for the entrepreneur. The entrepreneur is more likely to organize a non-profit (1) as quality becomes a noisier signal of investment; (2) as the non-distribution constraint gets stronger at the margin; (3) when a for-profit firm is levied profit tax or a non-profit firm receives production subsidy; or (4) as the profit margin shrinks due, for instance, to a stronger competition in the market. The paper also shows how properly tailored profit tax can improve welfare and how ex ante identical entrepreneurs can choose different organizational forms when legal enforcement of non-distribution constraint gets weaker as the number of non-profit firms in the market increases.

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Introduction

One of the most influential theories on why non-profit organizations exist is that non-profit status works as a signal of, or a commitment to produce, high quality product or service (Hansmann, 1980 and 1996). The typical assumption is that quality is not verifiable and thus not contractible, and because non-profit status imposes a non-distribution of profit constraint on the organization, the entrepreneur who controls a non-profit firm is more likely to spend resources in providing high quality to the consumers rather than maximizing the firm's profit for distribution to herself (Glaeser and Shleifer, 2001). While the theory has produced many testable predictions and has been subjected to various empirical testing, questions remain. If formal, contract-based incentive scheme is not feasible because quality is not verifiable, why don't reputational, relational, or other market-based sanctions provide the necessary investment incentive? Presumably, even a for-profit firm would want to commit to, or create a "reputation" of, providing high quality, not because it cares about quality provision per se but because it can command a higher price and realize a larger profit. In fact, we observe the presence of for-profit firms that provide similar products and services in numerous industries, including health care (hospitals and nursing homes), media, performing arts, research, and even education. What effect do market-based or relational sanctions have on the organizational choice and organizational behavior?

This paper attempts to address some of these questions by more explicitly incorporating repeat interactions. The paper assumes an entrepreneur who can organize either a for-profit or a non-profit firm. Both types of organizations are endowed with the identical production technology and the entrepreneur may care only about the return she receives from the organization. Due to the non-distribution constraint, however, in order for the entrepreneur to receive any distribution from a non-profit firm, she has to convert its profit into private benefits (such as perquisites or in-kind distributions) and converting profits into private benefits entails a deadweight loss. An important assumption is that the larger the profit she wants to convert into private benefits, the larger the proportionate deadweight loss: the conversion technology is subject to decreasing returns to scale (Burkart, Gromb, and Panunzi, 1998). The reason can stem from both sheer physical limitations (there are only so many corner offices and work holidays that the entrepreneur can grant herself) and, more importantly, legal constraint (as the size of the perquisites gets larger, they are more likely to be challenged by the public authorities, including state prosecutors and the internal revenue service, potentially leading to the loss of its non-profit status) (Hansmann, 1980, and Malani and Posner, 2007).

The decreasing returns to scale in private benefit extraction has an important implication for a non-profit organization, especially in terms of the relational sanctions the organization faces. Compared to a for-profit firm, a non-profit firm faces with a weaker (but nonetheless positive) incentive to shirk from providing high quality. When the shirking incentive is smaller, smaller relational sanctions become necessary to keep the firm in line. In equilibrium, a for-profit organization is subject to stronger relational sanctions than a non-profit organization. Stronger relational sanctions against a for-profit organization, in turn, implies that, from the entrepreneur's perspective, even though her per-period return from a non-profit firm may be smaller, her long-run expected return may actually be higher, since the duration during which the

firm is subject to relational sanctions is shorter. This can explain why an entrepreneur, who cares only about her return from the organization (and without any altruistic or other non-pecuniary motive to provide high quality), may still want to set up a non-profit, rather than a for-profit, organization.

The theory leads to a number of implications. First, the paper shows that when relational sanctions provide the necessary incentive, in equilibrium, non-profit and for-profit organizations produce the same (expected) quality and at comparable prices. This can explain why it may be difficult to show empirically that non-profit organizations, in general, provide higher quality product or service to their customers. It also shows why both types of organizations will "behave" in a similar way (Norton and Staiger, 1994, and Duggan, 2000). Second, the theory suggests that as the non-distribution constraint becomes more binding, i.e., the decreasing returns in private benefit conversion becomes stronger, an entrepreneur is more likely to use a non-profit form. The stronger the decreasing returns, the incentive to shirk gets weaker which, in turn, leads to shorter relational sanctions. This also implies that in terms of reducing deadweight loss and increasing welfare, the policy should focus more on prohibiting non-profits from making large distributions: it should focus more on the slope rather than the level of non-distribution constraint.

Third, a non-profit organization becomes more attractive as the realized quality becomes a less reliable signal of the firm's investment into quality. As the realized quality becomes a poorer signal, relational sanctions get imposed more frequently and for a longer duration. Conversely, when the signal gets very accurate, for-profit organization is a preferred organizational choice for the entrepreneur. This suggests that, when relational sanctions are present, the accuracy of the realized quality on predicting firm's investment into quality is a better predictor of organizational choice than the non-verifiability of realized quality per se. Fourth, the model shows that as the degree of competition in the market gets higher, represented by a lower equilibrium price and a lower profit margin, a non-profit organization becomes more attractive for the entrepreneur. As the per-period return shrinks, the differential relational sanctions have a bigger effect on an organization's long-run profit. Furthermore, because the shirking temptation is larger for a for-profit firm and the relational sanctions are imposed by taking away the profit a firm makes, in equilibrium, the market has to guarantee a larger profit for a for-profit than for a non-profit firm. Non-profit firms are better able to sustain smaller profits and still solve the investment problem. These results suggest that non-profit organizations is more likely to endure fluctuations in market demand and profit margins, for instance, in terms of entry and exit decisions (Chakravarty, Gaynor, Klepper, and Vogt, 2006), and also that non-profit firms are less likely to convert into for-profit firms when competition gets stronger and profit margins get thinner (Cutler and Horwitz, 2000).

Fifth and finally, the model can also explain why we observe the emergence for-profit charities and the presence (and co-existence) of for-profit organizations in many markets, without resorting to reasons based on altruism, tax or subsidy, or heterogeneity in production technology. One reason has to do with the exogenous differences in private benefit extraction. When some entrepreneurs are better at converting cash flow into private benefits, they will choose a non-profit form while others will opt for for-profit. This implies that, as empirically documented (Cutler and Horwitz, 2000), when the industry is subject to an exogenous shock,

such as better access to financing, we should observe a systemic conversion from one form to the other. The second reason is based on the relationship between the degree of legal enforcement against distribution and the number of non-profit firms in the market. When, for instance, legal enforcement of non-distribution constraints against non-profits gets weaker when the number of non-profits in a given sector gets large (due for instance to the limited enforcement resources that the public agencies face), we can observe ex ante identical entrepreneurs choosing ex post different organizational forms.

The paper is organized as follows. Part I briefly reviews the relevant literature. Part II presents a repeated game theoretic model. An entrepreneur-seller makes an initial organizational choice and subsequently interacts with a single buyer over time. Although the seller can exert costly, unobservable investment (effort) in each period to increase the likelihood of providing high quality product or service to the buyer, because realized quality is not verifiable, the buyer must resort to relational sanctions to provide the requisite incentive to the seller. The size of the relational sanctions depends on, among others, the seller's profit from deviation which, in turn, depends on the organizational status. After the equilibrium is derived, comparative statics results are presented. Part III focuses on the implications of the model, including how the model can explain some of the puzzles surrounding organizational choice, such as the co-existence of both for-profit and non-profit organizations in the same industry and geographical market, the mid-stream conversion from one organizational form to another, and differential responses to changes in market conditions. It also makes suggestions on how the legal policy can lead to higher social welfare. The last part concludes with thoughts for future research, including more expressly taking into account the effect of competition and taking a closer look at the internal organizational issues. All the proofs are in the appendix.

I. Related Scholarship

In his seminal works on no-profit organizations, Hansmann (1980, 1996) make two important observations.[1] First, non-profit organizations, such as hospitals, nursing homes, and universities, often operate in an environment where the quality of the service or the product delivered is difficult or impossible to verify in court.[2] Second, an important characteristic of a non-profit organization is that it is barred from distributing any profits it earns to persons who exercise control over the firm (the non-distribution constraint). Instead, a non-profit organization can "distribute" its profits only through non-cash "perquisites," such as shorter workdays, better working environment, better offices, and more generous fringe benefits. When quality is not verifiable and an explicit, contract-based incentive cannot be used, non-profit status and the non-distribution constraint, according to Hansmann, works as a signal or commitment to provide

[1] See Arrow (1963) and Easley and O'Hara (1983) for earlier, costly verification or asymmetric information-based theories of non-profit organizations and Pauly and Redisch (1973) for a model of non-profits that maximize the returns for the employees. See also Weisbrod (1988, 1998), Rose-Ackerman (1996), Lakdawalla and Philipson (1998), and Glaeser (2002) for more comprehensive surveys of the existing theories, testable empirical predictions, and descriptive and empirical data.

[2] There is a long line of research on the issues of third party verification, starting with Klein, Crawford, and Alchian (1978), Grossman and Hart (1986), and Hart and Moore (1988). See Hart (1995) for a synthetic presentation of the main themes in the literature. See also Baker, Gibbons, and Murphy (1994, 2003) and Levin (2003) for the implications of non-verifiability on relational incentive contracts and its interaction with asset ownership; and Choi and Triantis (2008) for how an increase in verification cost can actually lower agency cost.

higher quality, since the non-profit entrepreneurs have a weaker incentive to chisel on quality and maximize the organization's profits.

Taking these points from Hansmann, Glaeser and Shleifer (2001) more formally models the interaction between the non-distribution constraint and the incentive to provide quality. They present a static model, in which an entrepreneur, who has both altruistic and profit motives, can organize and operate either a for-profit or a non-profit firm. When a non-profit firm is organized, the entrepreneur has to incur a deadweight loss in converting the firm's profit into perquisites for her consumption. Consistent with the commitment to quality hypothesis, they show that the weaker incentive to maximize profits (due to the non-distribution constraint) induces the entrepreneur to put more emphasis on her altruistic motive to provide high quality.[3] They argue that a non-profit status make constituents of the organization, such as customers, employees, or donors, to feel more protected and this allows the entrepreneur with a competitive advantage in the marketplace. An important implication of their model is that the organizational choice is directly linked to how much consumers care about quality: when the preferences for quality is sufficiently high, the market will be served by non-profit firms, whereas when the preferences are weak, for-profit firms will dominate.

Empirical research on non-profit organizations, while mildly supportive of the non-contractible quality theory, has not produced a definitive answer as to whether the two types of organizations behave in a systematically different manner.[4] Duggan (2000), for instance, examines the hospital industry finds that non-profit hospitals are just as responsive to financial incentives and are no more altruistic than for-profit hospitals.[5] Malani and Posner (2007) observes the emergence of for-profit charities, citing Google and Starbucks "charities" as examples, and doubts whether non-profit organizations are better at providing non-verifiable quality to consumers. They argue for delinking organizational status from tax benefits and for similar tax treatments for for-profit charities.[6] On the other hand, Chou (2002) shows that there are differences in health outcomes between for-profit and non-profit nursing homes. Erus and Weisbrod (2003) shows that compensation/incentive structures used in hospitals systematically differ, with for-profit hospitals using stronger profit-based compensation, although they also found that the difference decrease with competition, HMO penetration, and over time.

[3] The results are similar in spirit to the multi-task principal-agent model by Holmstrom and Milgrom (1991), who show that when an agent can engage in multiple tasks, only some of which are verifiable and contractible, when the tasks are substitutes, the principal would want to reduce the express incentive on the verifiable tasks so as to induce more effort on non-verifiable tasks.

[4] See also Malani and David (2008), who shows that non-profit firms do not seem to engage in extensive advertising, at least through the internet and yellow page listings, to let consumers know of their non-profit status. When for-profit and non-profit firms offer the same level of quality to consumers, as the model shows, what may be more important is whether the consumers become aware of the organizational status after the transaction. Steinberg and Weisbrod (2008) argues that while "severe methodological challenges" remain, the overall evidence suggests that the two types of organizations behave differently in a systematic manner.

[5] See also Norton and Staiger (1994) and McClellan and Staiger (2000) that show that when for-profit and non-profit hospitals are located in the same geographical area, they serve an equivalent number of uninsured patients, though for-profit hospitals are more likely to locate in better-insured or lower total quality areas; and Cutler and Horwitz (2000) that shows how non-profit hospitals tend to follow for-profit hospitals' operational behavior.

[6] Hines, Horwitz and Nichols (2010), on the other hand, argues that charitable activities of for-profits already receive favorable tax treatment and granting for-profit entities additional tax benefits will encourage tax arbitrage and introduce significant administrative complexity.

Chakravarty, Gaynor, Klepper, and Vogt (2006) finds that, as far as entry and exit decisions are concerned, non-profit hospitals are less responsive to changes in demand. Finally, Horwitz (2007) and Horwitz and Nichols (2009) show that non-profit hospitals behave more like for-profit hospitals as the market share of for-profit hospital rises.

II. A Simple Model of Relational Sanctions and Organizational Choice

Suppose there is an entrepreneur who wants to set up an organization to provide products or services (collectively, goods) to consumers. To make the analysis simple, we will assume that once the organization has been set up, the seller-entrepreneur (S) will deal with a single long-term buyer-customer (B).[7] At $t = 0$, the seller makes an organizational choice: the seller decides whether she will operate a for-profit or a not-for-profit entity: $O \in \{FP, NP\}$. The main implication of the organizational choice, as will become clearer shortly, has to do with the ease with which the seller can distribute profits to herself. We assume that the organizational choice is known to the buyer. In subsequent periods, $t \in \{1,2,3, \dots\}$, the seller transacts with the buyer-customer. In any period, the relationship can terminate with a positive probability (due, for instance, to an unforeseen dissolution or liquidation of one of the parties). The parties also value present dollars more than future dollars. Both of these effects can be captured by assuming the parties discount future earnings by a factor of $\delta \in (0,1)$, which is assumed to be the same for both parties.

In terms of the transaction, in each period, $t \in \{1,2,3, \dots\}$, the buyer approaches the seller and inquires about purchasing a single unit of good (product or service). To keep the analysis simple, let's assume that the seller, in response, makes the buyer a take-it-or-leave-it offer, which the buyer either accepts or rejects.[8] The seller's offer contains two elements: description of the good and price, represented by (g, p). We assume that the quality of the good is not verifiable (and therefore not contractible), so the variable g can only identify what type of product or service the seller is providing and not its quality. If the buyer rejects the offer, both parties get a payoff of zero (their "normalized" outside reservation values) for that period. If the buyer accepts, the buyer pays the price, and the seller chooses the level of effort (investment) that affects the quality of the delivered good. More precisely, the realized quality can be either high or low, $q \in \{q_H, q_L\}$, and the seller's choice of effort (or per-period investment) affects the probability that the good will be of high quality (q_H).

[7] The analysis can be easily extended to a setting in which the seller transacts with a new buyer each period. What will be important in that setting is that the future buyers observe (perhaps with some noise) the past quality realizations. Also, when the seller is facing a new buyer each period and past monetary payments are not observed, the parties will not be able to implement a relational contract, under which the seller's promise to pay sufficient compensation (similar to liquidated damages) in case of low quality, backed by sufficiently severe relational sanctions against non-payment, with all punishments moved off to the equilibrium. With one long-run buyer, we assume that such a relational contract is not feasible for simplicity. See Levin (2003) and Baker and Choi (2014) for more on this analysis.

[8] Allowing the seller-entrepreneur to make a take-it-or-leave-it offer to the buyer makes the seller the residual claimant of the transaction. This convenient assumption allows us to compare the efficiency of different sanctioning regime by simply looking at the seller's long-run profit. It also minimizes the length of the relational sanctions necessary to provide the requisite incentive which, in turn, maximizes welfare. If the buyer and the seller were to split the surplus, as is done in Corollary 3, although the basic analysis will remain the same, efficiency comparison will become more cumbersome. The buyer will also have to impose longer relational sanctions (and generate a larger deadweight loss) to solve the incentive problem.

The seller's effort (investment) choice also comes at two levels: $e \in \{e_H, e_L\}$. The seller's effort is unobservable to the buyer or to any third party (and therefore not contractible). Low effort (e_L) costs the seller $c_L \geq 0$ and produces $\alpha \in (0,1/2)$ chances of producing high quality (q_H) good. On the other hand, high effort (e_H) costs the seller $c_H > c_L$ and leads to $(1-\alpha) \in (1/2,1)$ chance of producing high quality.[9] The cost and probability parameters are independent of the organizational form: both organizational types are endowed with the same production technology. The buyer values high quality goods more than low quality: respective valuations are given by $v_H = v(q_H)$ for high quality and $v_L = v(q_L)$ for low quality, where $v_H > v_L \geq 0$. We assume that although both parties observe the realized quality, neither the realized quality nor the buyer's valuations are verifiable.[10] Finally, we assume that it is efficient for the seller to choose high, rather than low, effort and if the seller chooses low effort, the expected surplus is negative: $E(v|e_H) - c_H > 0 > E(v|e_L) - c_L$.[11]

On the organizational form and the non-distribution constraint, we assume that for a for-profit organization, the seller-entrepreneur is free to distribute the profit to herself. So, for instance, if she charges the buyer the price p and chooses the high level of (investment) effort (e_H), the organization realizes a profit of $\pi = p - c_H$ and distributes the same amount to the entrepreneur.[12] On the other hand, for a non-profit organization, the organization cannot directly

[9] The uncertainty in quality realization can come either from technological uncertainty (e.g., even after performing the best possible surgery, the outcome may still be poor) or due to other idiosyncratic shocks that affect the customer's experience (e.g., even when the same service or product is offered, some consumers may have a poor experience). Without the uncertainty in quality realization, however, relational sanctions will solve the incentive problem at no cost regardless of the organizational status, and the selfish entrepreneur will always prefer a for-profit organization. As will be shown, when α is sufficiently small, the entrepreneur will prefer a for-profit organization.

[10] When realized quality can be verified but at a cost (which can consist of both litigation cost and court error), the optimal deterrence regime may rely on both contract-based (or legal) sanctions and relational sanctions. However, when non-profit organizations will be subject to (weakly) less severe relational sanctions, as will be shown shortly in Lemma 1, conditional on any given level of legal sanctions, and when legal sanctions reduce the total surplus from the transaction (and the equilibrium profit), a selfish entrepreneur may still choose a non-profit organizational form and the rest of the analysis will follow. See Baker and Choi (2014) for a more complete analysis of the interaction between legal and relational sanctions.

[11] The assumption that the expected surplus is negative with low investment (effort) is done for analytic convenience. With the assumption, the unique Nash equilibrium of the stage game is $(No\ Purchase, Low\ Effort)$, producing zero profit for the seller. If positive, the Nash equilibrium of the stage game will be $(Purchase, Low\ Effort)$ at a sufficiently low price ($p \leq E(v|e_L)$) and the seller will be able to make a (weakly) positive profit during the punishment stage. The magnitude of punishment will still be equal to the size of the deadweight loss and the main results will remain unchanged.

[12] Although we assume that the entrepreneur has no altruistic motive throughout, we can easily generalize the model to allow the entrepreneur to have some direct concern over quality or over the consumer's utility, as is done in Hansmann (1980, 1996) and Glaeser and Shleifer (2001). The main results of the paper, including that on organizational preference, will not change so long as the entrepreneur's altruistic motive is not too strong. For instance, for a for-profit seller who cares about the buyer's utility, the seller's return can be represented as $\omega(p - c_i) + (1-\omega)(E(v|e_i) - p) - c(e_i)$ where $\omega \in [0,1]$. When $\omega \geq \frac{E(v|e_H) - E(v|e_L)}{(c_H - c_L) + \left(E(v|e_H) - E(v|e_L)\right)} \equiv \overline{\omega}_{FP} \in (1/2,1)$, seller's direct concerns over buyer's utility is not strong enough so that the buyer has to impose some, though weaker, relational sanctions to solve the incentive problem. On the other hand, when $\omega < \overline{\omega}$, the incentive problem disappears. The comparable cut-off threshold for non-profits, which depends on the equilibrium price, is $\overline{\omega}_{NP}(p) = \frac{E(v|e_h) - E(v|e_l)}{\phi(p - c_L) - \phi(p - c_H) + \left(E(v|e_h) - E(v|e_l)\right)} > \overline{\omega}_{FP}\ \forall p \in [c_H, E(v|e_H)]$. The differential thresholds imply that, not

transfer the profit to the entrepreneur. Rather, the firm has to compensate the entrepreneur through other means, such as fringe benefits, perquisites, or in-kind distributions. Conversion of cash profits into perquisites for the benefit of the entrepreneurs is inefficient in the sense that a one dollar of profit will generate less than one dollar forth of benefit for the entrepreneur; and the larger the amount of profit to be converted, the larger the size of the inefficiency (deadweight loss). This may be due to (1) technological constraint on converting cash-flows into perquisites; (2) legal constraint that the non-profit organization faces in distribution;[13] and/or (3) the fact that the entrepreneur faces a sharper diminishing marginal utility with respect to in-kind distributions. To capture this idea, we assume that for a non-profit entrepreneur, for any profit $\pi \geq 0$, the size of the perquisite-based distribution is $\phi(\pi)$ where $\phi(0) = 0$, $\phi'(0) = 1$, $\phi'(\pi) > 0$, and $\phi''(\pi) \leq 0$. In words, as the size of the profit gets larger, it becomes (weakly) more difficult, at the margin, for the non-profit entrepreneur to convert that profit into entrepreneur's private benefit.[14] To make the analysis more straightforward, in most cases, we'll assume that $\phi(\pi)$ is strictly concave: $\phi''(\pi) < 0$.

With these parameters, if the seller and the buyer were to transact only once, regardless of the organizational status and the price offer (p) made by the seller, the (weakly) dominant strategy for the seller is to choose low effort (e_L). Rationally expecting this, the buyer will reject all offers made by the seller. The unique Nash equilibrium of the stage game, therefore, is $(Not\ Purchase,\ Low\ Effort)$ and both parties earn zero. Table 1 presents the stage-game payoffs when the entrepreneur sets up a non-profit organization. Note that $\phi(p - c_L) > \phi(p - c_H)$, leading the seller to choose low effort when the buyer accepts the seller's offer. For a slight abuse of notation, since the two profit levels will be of primary concern to us, for analytic convenience, we adopt scalar variables (ϕ_H, ϕ_L), such that $\phi(E(v|e_H) - c_L) \equiv \phi_L \cdot (E(v|e_H) - c_L)$ and $\phi(E(v|e_H) - c_H) \equiv \phi_H \cdot (E(v|e_H) - c_H)$. In words, ϕ_i stands for the fraction of the expected surplus the non-profit entrepreneur can turn into perquisites, conditional on the seller's effort (investment) choice (e_i). By assumption, $0 < \phi_L \leq \phi_H < 1$ with the weak inequality becoming strict when $\phi''(\pi) < 0$. For the for-profit organization, we can simply replace $\phi(p - c_H)$ and $\phi(p - c_L)$ with $(p - c_H)$ and $(p - c_L)$, respectively, and the same Nash equilibrium will result.

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surprisingly, as the entrepreneur cares more about consumer welfare (as ω gets lower), the entrepreneur is more likely to choose a non-profit status.

[13] When large, non-pecuniary distributions are made to the entrepreneur as a proxy for the organization's profits, state attorneys general and the Internal Revenue Service can bring legal actions against the organization and the recipient of the distribution for remedy, possibly including denial of beneficial tax treatment. See Hansmann (1980), Malani and Posner (2007), and Fishman and Schwarz (2012) for more detailed analyses of the legal enforcement of the non-distribution requirement.

[14] In the corporate finance literature, a controlling shareholder (or a manager) can turn firm's cash-flows into her private benefit but only at a deadweight loss that increases as the size of the private benefit grows. See, e.g., Burkart, Gromb, and Panunzi (1998). Although the entrepreneur may want to spread out the distribution over time, the time discounting will produce similar decreasing returns to scale. Suppose the firm makes a profit of $\pi > 0$ in a given period. If the firm were to distribute all of its earnings as perquisites in that period, the entrepreneur will get $\phi_L \pi$, whereas if it were to divide that into two distributions over two periods, in each period, the entrepreneur will receive $\phi_H(\pi/2)$ where $\phi_L < \phi_H$. But with the discount factor of δ, the present value of the two distributions is $\phi_H(\pi/2) + \delta\phi_H(\pi/2) = \frac{(1+\delta)}{2}\phi_H\pi < \phi_H\pi$.

(π_B, π_S)	High Effort (e_H) (Invest in Quality)	Low Effort (e_L) (Not Invest in Quality)
Not Purchase (Reject)	(0,0)	(0,0)
Purchase (Accept)	$(E(v\|e_H) - p, \phi(p - c_H))$	$(E(v\|e_L) - p, \phi(p - c_L))$

Table 1: Stage Game Payoffs for a Non-Profit Organization

To induce the seller to exert costly effort (investment) in in producing high quality, the buyer has to engage in relational sanctions.[15] Since the seller's effort (investment) choice is private information but the realized quality (while not verifiable) is observed by the buyer, the buyer can impose relational sanctions against the seller based on the realized quality. Suppose, initially, at $t = 1$, the buyer believes that the seller will exert high effort (investment) and is willing to purchase the good so long as $p \leq E(v|e_H)$. At any period $t \in \{1,2,3, \dots\}$, if the buyer observes low quality (q_L), the buyer's belief switches to low effort (e_L) for $T \in \Re^+$.[16] When the buyer believes that the seller will put in low effort (in the punishment phase), parties revert to the Nash equilibrium of $(Not\ Purchase,\ Low\ Effort)$. The equilibrium validates the buyer's belief. After T punishment periods, the buyer's belief switches back to high effort (e_H) and the buyer becomes willing to purchase from the seller again so long as $p \leq E(v|e_H)$. We'll assume that the buyer chooses T just sufficient enough to solve the incentive problem.[17] The size of T depends on, among others, the organizational form chosen by the seller, since this will affect the seller's incentive to deviate. Let T_O, where $O \in \{FP, NP\}$, stand for the respective lengths of punishment for for-profit and non-profit organizations. We will assume that, for both organizational types, the seller is sufficient patient (δ close to 1), so that when the buyer uses the grim-trigger punishment strategy ($T_O \to \infty$), the incentive problem can be solved.

Lemma 1 *In equilibrium, both types of organizations are subject to relational sanctions, but a for-profit organization is subject to a lengthier relational sanctions than a non-profit organization:* $T_{FP} \geq T_{NP} > 0$.

The results of Lemma 1 are fairly straightforward and its intuition can be easily presented. Because the seller's effort (investment) choice is not observable, and the realized quality (though observed by the buyer) is subject to error, in order to provide the necessary investment incentive to the seller, there has to be some relational punishment imposed against the seller in equilibrium ($T_O > 0$). The size of the relational punishment depends on the

[15] Although the sanctions imposed by the buyer can also be thought of as "reputational" or "market" sanctions, because there is no type uncertainty with respect to the seller, we will avoid the term "reputational" and exclusively use the term "relational."

[16] The punishment period, T, being a real number (rather than a natural number) is done for analytical convenience. The buyer's restoration of belief that the seller is choosing high effort, at the end of the punishment period, has to be done with a positive probability.

[17] This assumption requires the buyer to be aware of all the relevant parameters of the relationship. This may impose a strong informational burden. Also, when there are more than one buyer, e.g., a market with dispersed consumers, coordinating on the optimal relational sanctions may also be difficult. Perhaps the buyers (or the market) can overcome the informational and coordination burden through learning by doing and through dissemination of information. At minimum, the rest of the analysis can be thought of as that on social welfare boundaries (or the maximum possible welfare that can be achieved in equilibrium).

additional return the seller can capture through deviation. Although both types of organizations have the same technology (α and c_i's) in affecting quality, because the non-profit organization is subject to the non-distribution constraint and converting profits into private benefits for the entrepreneur is subject to decreasing returns to scale ($\phi_H > \phi_L$ when $\phi''(\pi) < 0$), the non-profit entrepreneur, compared to the for-profit entrepreneur, faces a weaker (but still positive) incentive to deviate. Hence, the length of relational punishment can be shorter against a non-profit firm than against a for-profit firm ($T_{FP} > T_{NP} > 0$). The result implies that, to the extent that the non-distribution constraint is effective, empirically, market participants, including consumers, should be more lenient towards non-profit organizations. Also, if we think of the non-distribution constraint being the result of some legal enforcement, the result exemplifies how public enforcement can aid or complement the market mechanisms in solving the commitment problem.

Proposition 1 *Even with the non-distribution constraint, the entrepreneur may earn a higher return from a non-profit organization. There exists a* $\bar{\alpha} \in (0,1/2)$*, so that the entrepreneur strictly prefers a non-profit when* $\alpha > \bar{\alpha}$ *and a for-profit when* $\alpha < \bar{\alpha}$*. The entrepreneur is more likely to form a non-profit organization as* ϕ_H *increases or as* ϕ_L *decreases.*

Building on the results from Lemma 1, Proposition 1 demonstrates that when comparing the performance of for-profit organization with that of non-profit, there are two important factors to consider. First, because of the non-distribution constraint, in each period when there is trade, the non-profit entrepreneur captures a lower fraction (ϕ_H versus 1) of the equilibrium profit ($E(v|e_H) - c_H$). This will make choosing a non-profit form less attractive. On the other hand, because the non-distribution constraint creates a weaker incentive to deviate from providing high quality, a non-profit organization will be subject to a shorter (less harsh) relational sanctions compared to a for-profit organization (Lemma 1). This latter effect makes choosing a non-profit form more attractive for the entrepreneur. Note that while the magnitude of the first factor, a smaller distribution to non-profit in case of trade, depends on the size of the overall surplus ($E(v|e_H) - c_H$) and the equilibrium price ($p - c_H$), the latter effect, shorter relational sanctions ($T_{FP} > T_{NP} > 0$), is dictated largely by the deviation incentive, in particular, the difference in costs (Δc), which is independent of the equilibrium price. This will have an important implication on the degree of competition and the organizational choice (Corollary 3).

The entrepreneur's preference over the two organizational forms will depend on the relative magnitudes of these two opposing forces, which, in turn, depend on α. A marginal change in α produces three distinct effects on each organization's long-run return (V_O^+). First, as α gets larger, the buyer's equilibrium reservation value, given by $E(v|e_H)$, decreases and this reduces the size of the surplus and each organization's per-period profit margin. Second, from the incentive perspective, because a larger α makes the realized quality a less reliable indicator of costly investment, it requires bigger relational sanctions for both types of organization: $\frac{\Delta c}{1-2\alpha}$ for for-profit and $\frac{\lambda}{1-2\alpha}$ for non-profit, where $\lambda = (\phi_L/\phi_H) \cdot (E(v|e_H) - c_L) - (E(v|e_H) - c_H) < \Delta c$. Finally, the bigger the α, the more likely the relational sanctions get imposed on the equilibrium path: $\alpha \frac{\Delta c}{1-2\alpha}$ for for-profit and $\alpha \frac{\phi_L \cdot (E(v|e_H) - c_L) - \phi_H \cdot (E(v|e_H) - c_H)}{1-2\alpha}$ for non-profit. All three effects will reduce the organization's long-run return when α increases but the three effects

manifest differently depending on the organizational form. Let us illustrate these points with the aid of some graphics.

Figure 1 graphically represents the relationship when $\phi_H > \phi_L$ and $V_{NP}^{+}(\bar{\alpha}_{FP}) > V_{FP}^{+}(\bar{\alpha}_{FP})$. When $\alpha = 0$, so that there is a one-to-one correspondence between unobservable investment and observed quality, no relational sanctions are imposed in equilibrium and the entrepreneur strictly prefers a for-profit form that allows her to capture the maximal amount of surplus from the transaction. When $\alpha > 0$, however, because the realized quality no longer serves as a perfect indicator of investment, relational sanctions get imposed in equilibrium and the sanctions become lengthier and more frequent as α rises (the second and the third effects). Lengthier and more frequent relational sanctions not only reduce the long-run profit of both types of organizations (V_O^{+} strictly decreases as α rises) but also make the non-profit form more attractive because non-profits are subject to less severe relational sanctions (V_{FP}^{+} has a steeper downward slope). Hence, we get a threshold $\bar{\alpha}$ such that, whenever $\alpha \in (\bar{\alpha}, \bar{\alpha}_{NP}]$, the entrepreneur will strictly prefer a non-profit organization (V_{NP}^{+} is both positive and also strictly larger than V_{FP}^{+}). Overall, the results imply that, when market sanctions are taken into account, an important indicator over organizational form is the relationship between realized quality and unobservable investment (given by α in the model). The model also predicts that non-profit organizations should be more prevalent when the realized quality is a poor indicator of underlying investment or effort (e.g., higher education or certain services provided by hospitals), and we should observe a larger presence of for-profit organizations when there is a stronger correlation between investment and realized quality (e.g., media or certain sectors of health care).

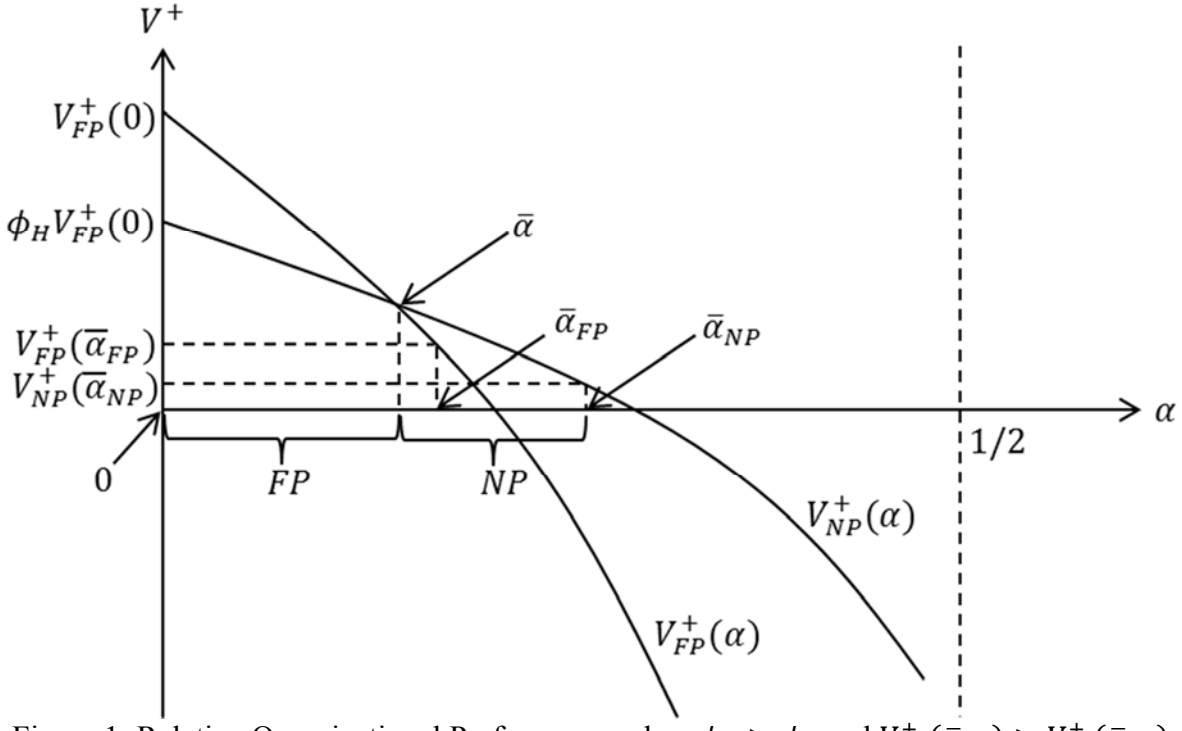

Figure 1: Relative Organizational Performance when $\phi_H > \phi_L$ and $V_{NP}^{+}(\bar{\alpha}_{FP}) > V_{FP}^{+}(\bar{\alpha}_{FP})$

In addition to α, the entrepreneur's organizational choice also depends on how easily she can extract private benefit from the organization, which are determined by (ϕ_H, ϕ_L). There are two distinct possibilities to consider. First, when ϕ_L decreases, although the entrepreneur's equilibrium per-period return from a non-profit firm (given by $\phi_H(E(v|e_H) - c_H)$) does not change, because the seller's incentive to deviate gets smaller, the size of the relational sanctions decreases (T_{NP} gets smaller). And shorter relational sanctions increase the non-profit firm's long-run expected return. Coming back to Figure 1, a decrease in ϕ_L makes the V_{NP}^+ curve pivot (rotate) upward, thereby decreasing $\bar{\alpha}$. As an extreme case, when $\phi_L = \phi_H$, both V_{FP}^+ and V_{NP}^+ curves cross the horizontal axis at the same point, thereby making a non-profit form strictly inferior to a for-profit organization. Second, an increase in ϕ_H produces two effects. A higher ϕ_H allows the seller to more efficiently realize her private benefit from a non-profit firm's profit. At the same time, with ϕ_L being held constant, the seller faces a smaller incentive to deviate (just like a decrease in ϕ_L) reducing the length of relational sanctions (T_{NP} gets smaller) and boosting the non-profit's long-run profit. From Figure 1, an increase in ϕ_H shifts up the entire V_{NP}^+ curve, thereby shifting $\bar{\alpha}$ to the left. Finally, note that because a for-profit entrepreneur faces a larger incentive to deviate, in equilibrium, the market has to guarantee a larger profit to a for-profit than to a non-profit organization (so that a bigger punishment is imposed when profit is taken away through relational sanctions). This is the reason why a non-profit can operate with lower equilibrium return at the maximum possible α: $V_{NP}^+(\bar{\alpha}_{NP}) < V_{FP}^+(\bar{\alpha}_{FP})$. This will, in turn, make a non-profit firm more viable when the market becomes more competitive and the equilibrium price falls (as we will see in Corollary 3).

In terms of social welfare, the model incorporates two types of inefficiency. First is the loss of trade that stems from relational sanctions. Given that there is no trade when the buyer is imposing relational sanctions, the longer the relational sanctions, the bigger the loss in social welfare. Since a non-profit organization is subject to shorter relational sanctions (Lemma 1), relational sanctions-based inefficiency is smaller for a non-profit firm. Second type of inefficiency is the deadweight loss that stems from conversion of profit into entrepreneur's private benefits in a non-profit organization (which, in equilibrium, is determined by ϕ_H). Because a for-profit firm is not subject to such conversion-based deadweight loss, this makes the non-profit firm less attractive from the social welfare perspective. In terms of organizational choice, when the entrepreneur, with the power to make take-it-or-leave-it offers, is the residual claimant, she fully internalizes both types of inefficiency and makes the choice that maximizes welfare.[18] On the other hand, when either the for-profit firm is subject to income (or profit) tax or the non-profit firm is subject to production subsidy, as is observed in the real world, the entrepreneur's organizational choice will not generally be consistent with welfare maximization. At the same time, such tax or subsidy can be chosen to improve welfare. We analyze these policy instruments in the following two Corollaries.

[18] If the buyer can impose an efficient relational sanctions (that relies on a price drop from $p = E(v|e_H)$ to $p = c_H$ while giving the seller a chance ($\eta > 0$) to revert back to the high price equilibrium, when realized quality is high, to provide the seller with an incentive to exert high effort even in the punishment state), since there will no longer be any deadweight loss from such relational sanctions, non-profit organizational form will always produce a lower welfare due to the deadweight loss that stems from private benefit conversion. On the other hand, given that the non-profits are subject to a weaker incentive to deviate, the reversion probability will be higher for non-profits than for for-profits.

Corollary 1 *Suppose for-profit organization is subject to profit tax so that the entrepreneur receives* $\beta(\pi) \in [0,1]$ *as distribution in each period, where* $\beta'(\pi) > 0$, $\beta(0) = 0$, $\beta'(0) = 1$, $\beta'(\pi) > 0$, *and* $\beta''(\pi) \leq 0$.

1. *If* $\beta''(\pi) = 0$ *and* $\beta'(\pi) = \overline{\beta} > 0 \ \forall \pi$, *relational sanctions against the organization* (T_{FP}) *is independent of the tax rate* ($\overline{\beta}$) *and the entrepreneur is more likely to form a non-profit organization. Compared to the case of no profit tax, social welfare will be lower. If* $\overline{\beta} < \phi_H$, *the entrepreneur will strictly prefer a non-profit organization.*

2. *When* $\beta''(\pi) < 0$, *the entrepreneur is more likely to form a for-profit organization as* $\beta_H - \phi_H$ *gets larger or as* $(\beta_H - \beta_L) - (\phi_H - \phi_L)$ *gets larger, where* $\beta_H \cdot (E(v|e_H) - c_H) \equiv \beta(E(v|e_H) - c_H)$ *and* $\beta_L \cdot (E(v|e_H) - c_L) \equiv \beta(E(v|e_H) - c_L)$. *If* $\beta_L \leq \phi_L$ *and* $\beta_H \geq \phi_H$, *the entrepreneur will always choose a for-profit status and the social welfare will be (weakly) higher compared to the case of no profit tax.*

From the entrepreneur's perspective, tax on for-profit organization's income (or distribution to the entrepreneur) functions just like the deadweight loss $(1 - \phi_i)$ that she must incur when converting profit into private benefits from a non-profit organization. When the marginal tax rate is progressive ($\beta''(\pi) < 0$), incentive to shirk and distribute a large amount of profits gets smaller and so will the relational sanctions. At the same time, the entrepreneur will get a smaller fraction of profit in each period. More generally, organizational preference and the effect on social welfare will depend on (1) the difference in the equilibrium tax rate $(\beta_H - \phi_H)$ and (2) the relative progressivity of the tax rate on for-profits and private benefit conversion rate of the non-profit $((\beta_H - \beta_L) - (\phi_H - \phi_L))$. As a special case, when $\beta_L \leq \phi_L$ and $\beta_H \geq \phi_H$, by forming a for-profit organization, the entrepreneur will receive a larger distribution (in equilibrium) and be subject to shorter relational sanctions. Since there is no deadweight loss from profit conversion, either, social welfare will be (at least weakly) higher. As another special case, when the marginal tax rate is constant ($\beta''(\pi) = 0$), while a for-profit organization loses a fraction of its income to the government, it does not gain any in terms of reduced relational sanctions. Therefore, the entrepreneur is less likely to choose the for-profit status and this reduces welfare because a non-profit organization also generates deadweight loss from private benefit conversion.

Corollary 2 *Suppose the non-profit organization's production cost can be subsidized so that the seller bears the cost of* γc_i *where* $\gamma \in (0,1)$. *Relational sanctions against the non-profit organization will strictly decrease* (T_O *decreases) and the entrepreneur will be strictly better off. While the entrepreneur becomes more likely to form a non-profit organization, but the effect on welfare is uncertain.*

One of the important policies favoring non-profit organizations is the provision of various types of subsidy, such as tax deductible donations, tax-favored financing, and exemptions from property or sales tax. Corollary 2 examines the effect of such production subsidy on non-profit firms and the entrepreneur's organizational preference. With subsidy, non-profit firms are better off in equilibrium. The effect manifests through two distinct channels. First, the subsidy directly increases the per-period profit of the firm by lowering the equilibrium production cost (from c_H to γc_H). The second effect is through the size of the relational sanctions. When the subsidy

proportionately reduces the production cost, it reduces the cost differential between high and low effort (from Δc to $\gamma\Delta c$), thereby reducing the incentive to shirk on quality. This, in turn, lowers the size of the relational sanctions (T_{NP} decreases) and increases the long run profit of the firm. Not surprisingly, when such production subsidy applies only to non-profit firms, the entrepreneur is more likely to organize a non-profit rather than a for-profit firm. It is easy to show that when such production subsidy is also offered to for-profit organizations, they will benefit as well. Furthermore, if the subsidy can be targeted towards high cost (c_H), so that, for instance, the firm faces γc_H and c_L, although the first best cannot be achieved unless $\gamma c_H \leq c_L$, relational sanctions will get shorter, thereby improving welfare compared to the case where the subsidy is less discriminate.

Compared to the case of no subsidy, however, it is uncertain whether the subsidy to non-profit organizations will increase welfare. Although the reduction in relational sanctions is welfare enhancing, this is (at least partly) offset by an increase in deadweight loss from converting higher equilibrium per-period profit (from $E(v|e_H) - c_H$ to $E(v|e_H) - \gamma c_H$) to private benefit. When the latter effect is stronger (so that each non-profit firm is reducing welfare), there could also be additional welfare loss from organizational choice: since production subsidy makes non-profit firms strictly better off, the entrepreneur becomes more likely to choose a non-profit rather than for-profit form and such organizational choice is welfare-reducing. When we combine the results from Corollaries 1 and 2, therefore, we see that properly calibrated profit tax on for-profit organizations can function better at improving welfare. Under Corollary 1, when the profit tax is sufficiently progressive, while leaving the entrepreneur with enough profit in equilibrium (when both $(\beta_H - \beta_L) - (\phi_H - \phi_L)$ and $\beta_H - \phi_H$ get larger), for-profit organizations are subject to less relational sanctions and the entrepreneur becomes more likely to choose the for-profit status, both of which will increase welfare. Finally, taxing for-profit income has the added benefit of producing additional revenue for the government as well, whereas production subsidy will reduce government revenue and may require additional expenditure of resources.

Before we proceed, a short note about the necessary conditions for Corollaries 1 and 2 is in order. They assume that the realized profit, the cost, or both are observed by the relevant government authorities so that the proper amount of tax or subsidy can be levied. At the same time, they are not observed by consumers (or the firm cannot credibly reveal them to the consumers) since, otherwise, the consumers will be able to tailor relational sanctions based on the realized cost and/or profit. Production subsidy in the form of tax benefits that accrue to donors or investors, in particular, will be quite difficult to observe (or verify) from the consumers' perspective. If the assumption is not realistic, taxing profit or subsidizing production cost will not be feasible, in which case, the policy tools examined in both Corollaries will not be available. Alternatively, however, we could assume that both (or either) are observed by others, including consumers, but with sufficient noise. Profit, for instance, can also come from other sources that produce uncertain stream of cash flow and cost can be subject to various temporary or technological shocks. With sufficient noise, consumers will rely primarily (but not necessarily exclusively) on the realized quality in imposing relational sanctions, e.g., when the realized quality is a much superior indicator of firm behavior, and the main conclusions of the model will carry through. The effect of having such additional signals is informally discussed in the section on Implications.

Corollary 3 *Suppose the seller no longer has the power to make a take-it-or-leave-it offer to the buyer and the equilibrium price is determined as a solution to Nash bargaining, where the seller receives* $\theta \in [0,1]$ *of the equilibrium per-period surplus:* $p(\theta) = \theta \cdot E(v|e_H) + (1-\theta) \cdot c_H$. *There exists* $(\underline{\theta}_{NP}, \underline{\theta}_{FP})$ *with* $0 < \underline{\theta}_{NP} < \underline{\theta}_{FP} < 1$ *such that, if* $\theta \in [\underline{\theta}_{NP}, \underline{\theta}_{FP})$, *the entrepreneur will only form a non-profit organization. As* θ *decreases,* $\underline{\theta}_{NP}$ *decreases, making it more likely that the entrepreneur will choose a non-profit organization.*

The effect of market pricing pressure on the organizational choice is examined in Corollary 3. If we drop the assumption that the seller gets to make a take-it-or-leave-it offer and let the bargaining power between the buyer and the seller to be more evenly shared, the equilibrium price can be represented as a solution to Nash bargaining: $p = \theta \cdot E(v|e_H) + (1-\theta) \cdot c_H$ where θ represents the seller's relative bargaining power. As shown in the Corollary, as the equilibrium price decreases (as θ falls), the entrepreneur becomes more likely to choose the non-profit status. As the equilibrium price goes down, the amount of profit that the entrepreneur can distribute to herself decreases, which makes the for-profit status less attractive: $p - c_H$ and $\phi(p - c_H)$ both converge to zero as p converges to c_H. However, shorter relational sanctions against non-profit organizations, determined primarily by the difference in costs (Δc), persist regardless of the equilibrium price. When the per-period difference in returns thus gets smaller but the difference in (expected) durations on relational sanctions remains, forming a non-profit organization becomes more attractive for the entrepreneur. Furthermore, as briefly noted in Proposition 1, because a for-profit entrepreneur faces a larger incentive to deviate, in equilibrium, the market has to guarantee a larger profit to a for-profit than to a non-profit organization (so that a larger punishment gets imposed when the profit is taken away through relational sanctions). Therefore, a non-profit firm can operate with a lower equilibrium return and this makes the non-profit status more attractive when the equilibrium market price is low.

We have so far assumed that the non-profit entrepreneur responds to an exogenously given private benefit extraction technology that exhibits a decreasing rate of return ($\phi''(\pi) \leq 0$). An important premise behind the assumption was that of legal enforcement. If a non-profit organization were to distribute profit directly or make a large in-kind distribution, presumably, it will be subject to a legal sanction by the relevant governmental authorities.[19] At least in theory, whether or not a relevant government entity will challenge a non-profit organization's activities will depend on the amount of resources spent on such enforcement, and when there are many non-profit organizations in a given sector, given the limited enforcement resources, non-profit organizations will be more likely to be able to evade detection and successfully make a large distribution to its controller. When consumers expect this to be the case, it will, in turn, have an effect on the market's response in terms of relational sanctions and the organizational preference of the entrepreneur. To parsimoniously capture this idea, we assume that as the number of non-profit organizations (given by N_{NP}) increases in the market, the non-distribution constraint gets

[19] The two most important authorities in the United States are (1) state attorneys general and (2) the Internal Revenue Service. Unlike for-profit corporations, which could be subject to their shareholders' direct or derivate lawsuits, consumers or donors to a non-profit institution do not have a standing (apart from that based on breach of contract) to challenge a non-profit organization's operations, including compensation for its executives and other employees. See generally, Fishman and Schwarz (2012).

weaker: $\phi(\pi|N_{NP})$ to converge to 1 and $\phi''(\pi|N_{NP})$ converges to 0 as N_{NP} gets larger.[20] The following Corollary examines the effect of change in non-distribution constraint on the equilibrium organizational form.

Corollary 4 *Suppose there is a unit mass of firms, indexed by* $i \in [0,1]$*, with each firm's organizational choice given by* $O_i \in \{NP, FP\}$*, that can operate in the market. Let* N_{NP} *and* N_{FP} *represent the mass of firms with respective organizational choice, such that* $N_{NP} + N_{FP} = 1$*. Suppose also that the equilibrium market price is given by* $p = E(v|e_H)$ *and that* $\phi(\pi|N_{NP}) \to 1$ *and* $\phi''(\pi|N_{NP}) \to 0\ \forall \pi$ *as* $N_{NP} \to 1$ *with* $\phi(\pi|0)$ *given as before. When* $\alpha \leq \overline{\alpha}$*, only for-profit organizations operate; when* $\overline{\alpha} < \alpha \leq \bar{\alpha}_{FP}$*, both for-profit and non-profit organizations can co-exist; and when* $\bar{\alpha}_{FP} < \alpha \leq \bar{\alpha}_{NP}$*, only non-profit organizations operate.*

Corollary 4 analyzes the equilibrium organizational selection when the non-distribution constraint ($\phi(\pi|N_{NP})$) becomes less binding as the number (or fraction) of non-profit firms increases in the market. Now we can divide the α space into (possibly) three regions. When α is sufficiently small ($\alpha \leq \overline{\alpha}$), we know from previously that for-profit firms will outperform non-profit firms and, hence, the entrepreneur will always choose a for-profit status. Similarly, when α is sufficiently large ($\bar{\alpha}_{FP} < \alpha \leq \bar{\alpha}_{NP}$), non-profit firms produce a positive long-run profit while for-profit firms make a negative profit and the entrepreneur will always choose a non-profit status. The most interesting region is the middle: $\overline{\alpha} < \alpha \leq \bar{\alpha}_{FP}$. Here, the entrepreneur can choose either for-profit or non-profit but because non-profit produces a larger long-run return, the entrepreneur will have an incentive to choose a non-profit status. However, as the number of non-profit firms increases, the non-distribution constraint becomes less binding and their returns converge to that of for-profit. In equilibrium, the entrepreneur will be indifferent between the two organizational types and both types can co-exist in the market.[21] The results suggest that we should observe co-existence of both types of organizations when realized quality is sufficiently noisy of the underlying (unobservable) investment.

III. Implications

The model itself is fairly straightforward, but it renders a number of predictions that are consistent with the empirical findings and also suggestions for policy. Foremost, when

[20] Although we do not adopt a specific functional form, one tractable example can be $\phi(\pi|N_{NP}) = \pi(1 - \rho(\pi(1 - N_{NP})))$ where $\rho \in (0,1)$ controls the rate of convergence. In terms of linking more directly to the limited resources story, we can let $\sigma(\pi, e_D|R, N_{NP}) \in [0,1]$ be the probability of detection, where R stands for the government's resources and e_D stands for the amount of resources that a firm spends (e.g., conversion into more obscure types of private benefits) in avoiding detection at cost $\psi(e_D) \geq 0$, with $\psi'(e_D) > 0$ and $\psi''(e_D) \geq 0$. As a simple form of punishment, we can assume that the government takes away the distributed private benefits or profit when detected. As the profit grows, the firm will spend more resources in avoiding detection, and with $\psi(e_D)$ sufficiently convex and $\sigma(\pi, e_D|R, N_{NP})$ not too convex with respect to π, the share of profit that the entrepreneur gets to capture as private benefits, at the margin, will fall. This will generate $\phi(\pi|N_{NP})$ that is concave with respect to π.

[21] The results are similar in spirit to that in Gibbons, Holden and Powell (2012). They show how ex ante homogeneous firms can choose ex post heterogeneous governance structures (either engineering-focused or marketing-focused) when the proliferation of one-type of firm creates a larger return for the other type so that, in equilibrium, firms become indifferent between choosing either type of governance structure. In our story, proliferation of non-profit firms leads to less enforcement against distribution which, in turn, makes for-profit firm relatively more attractive. Hence, the lower return is more through the effect on non-market, regulatory enforcement intensity.

relational, market-based sanctions are taken into account, both for-profit and non-profit organizations deliver the same (expected) level of quality to their customers. This is in contrast to the previous theoretical works that have argued that non-profit organizations have a stronger incentive to produce higher quality (or weaker incentive to shirk). Previous studies, however, looked primarily into a single-period commitment problem. In that setting, it would not be surprising to see that weaker profit motive (through the non-distribution constraint) will generate a bigger incentive to invest in quality. When relational sanctions are possible, on the other hand, both for-profit and non-profit organizations can be incentivized to invest in quality. Perhaps this can explain why empiricists, for instance, Duggan (2000), have had trouble finding definitive quality differences between for-profit and non-profit organizations in certain industries, such as medical care and education.

While the equilibrium (expected) quality is the same for both types of firms, the severity of the market sanctions differ. When conversion of profits to private benefits (perquisites) exhibit decreasing returns to scale, non-profit firms face a weaker (but still positive) incentive to invest in quality and this implies that relational sanctions against non-profit firms can be shorter. Because, in equilibrium, both types of firms make optimal investment into quality, relational sanctions end up decreasing their respective equilibrium profits. The shorter relational sanctions for non-profit firms imply that, ceteris paribus, their long-run profit will be generally higher. While the per-period private benefit the entrepreneur receives from the firm may be lower, when the increase in private benefits due to shorter relational sanctions is strong, the entrepreneur will prefer setting up a non-profit, rather than a for-profit, organization even though she has no altruistic motive and cares only about the return she gets from the firm. In the previous studies, because non-distribution constraint always reduced the return for the entrepreneur, for the entrepreneur to set up a non-profit organization, other exogenous factors, such as altruistic motive or tax considerations, had to be relied on. With relational sanctions, this is no longer necessary.

The model can also explain both the co-existence of for-profit and non-profit organizations within the same market and also conversion from one form to another. This can be done in two different ways. First, when certain entrepreneurs are more efficient at converting profits into private benefits (e.g., ϕ_H higher), they are more likely to form non-profit organizations to compete against for-profit organizations. Hence, those who are better at private value extraction will use non-profit organizations while the others will opt for for-profit status. The source of variation here is not the underlying production technology, quality of the product or service offered, consumer preference heterogeneity, or how much the entrepreneur directly cares about quality or consumer welfare,[22] but the ability to convert cash flows into private benefits.[23] Second, even if all entrepreneurs are identical ex ante, because non-distribution

[22] In Glaeser and Shleifer (2001), for instance, as the entrepreneur cares more about provision of quality, she is more likely to choose the non-profit form. Their model also shows that, when certain consumers do not care as much about quality, there could be co-existence of the two types of firms, in which for-profit firms supply low quality goods to consumers who care less about quality while non-profit firms care to those who care more about quality. With relational sanctions, however, in equilibrium, both the non-profit and for-profit firms will supply the equal level of quality. Empirical studies seem to suggest that when both for-profit and non-profit organizations compete in the same market, they behave more like each other. See Part I on Related Scholarship.

[23] When such private benefit extraction technology is subject to change or shock, due for instance to the changes in the law, the entrepreneur will convert the organizational form from for-profit to non-profit and vice versa. Cutler

constraint requires a legal enforcement and public authorities have limited resources, we can have endogenous co-existence of for-profit and non-profit in the same market. As shown in Corollary 4, as the number of non-profit organizations increases, legal enforcement of non-distribution gets weaker which, in turn, makes choosing a non-profit form less attractive. In equilibrium, there could be ex post heterogeneity in organizational form despite ex ante homogeneity among entrepreneurs. Corollary 4 also shows that the co-existence is not a necessary phenomenon. When for-profits are clearly superior or clearly inferior at providing quality (when α is sufficiently large or sufficiently small), we will observe only for-profits or only non-profits operating in the market.

More interestingly, even when the private benefit extraction technology is not subject to shocks or exogenous changes, shifts in the market conditions can also lead to changes in preferences over one type of form over another. As shown in Proposition 1, as consumers receive more accurate signal of the firm's investment behavior (α gets smaller), less relational sanctions are imposed in equilibrium, and the entrepreneur is more likely to organize the activity using a for-profit firm. More accurate signal can come from either better disclosure or more competition in the market that allows firms to distinguish themselves with more proxies or indices of quality.[24] Further, as shown in Corollary 3, as the market competition, measured by how close the equilibrium price is to the cost of production, gets stronger, the entrepreneur is more likely to organize the production activity using a non-profit firm. This suggests that, if we were to start initially with some for-profit and non-profit firms in a given market, as the degree of competition rises and the equilibrium price falls, for-profit firms are more likely to exit the market or to convert to non-profit. The opposite will happen as the degree of competition falls and the equilibrium price rises. The results are roughly consistent with Chakravarty, Gaynor, Klepper, and Vogt (2006), who finds that for-profit firms are more sensitive to the market conditions in terms of entry and exist decisions, and with Norton and Staiger (1994), who finds that for-profit hospitals are more likely to locate to an area with a lower fraction of uninsured in population.

In terms of the policy implications, to reduce the amount of deadweight loss, imposing and enforcing restrictions on how non-profit entrepreneurs pay perquisites is important. The emphasis should not be on the across the board limitation but more on larger amounts of distribution: the emphasis should be on the slope and not the level. Imposing more stringent limitations on large distributions of profits actually induces non-profit organizations to better solve the commitment problem and rely less on relational sanctions that engender deadweight loss. It will also induce more product and service to be delivered by non-profit, rather than for-profit, organizations. One possible way of approaching this objective could be through

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and Horwitz (2000) conducts in-depth studies of hospitals converting from non-profit to for-profit status. The study finds that although for-profit hospitals have access to better source of financing, e.g., equity investment, and are more successful when examined through financial measures, in the long-run, non-profit hospitals behave in similar ways as for-profit hospitals, for instance, in terms of exploiting loopholes in Medicare.

[24] When buyer receives additional signal of the seller's investment behavior, say $s \in \{s_H, s_L\}$ that correlates with the seller's investment choice and is conditionally independent from $q \in \{q_H, q_L\}$, the relational sanctions are likely to be triggered only when the buyer observes both s_L and q_L, thereby reducing the deadweight loss. This will make a for-profit organization more attractive for the entrepreneur. If s is verifiable, they are likely to use both formal contract (based on s) and relational sanctions (based on q). See Baker, Gibbons, and Murphy (1994), and Baker and Choi (2014).

imposition of "luxury" tax (or partial to complete revocation of tax benefits) on large in-kind distributions. At the other end of the spectrum, one can even consider allowing some amount of profit distribution to the entrepreneur ($\phi_H \to 1$) as another form of making large perquisite-based distribution relatively more difficult. Finally, based on the results from Corollaries 1 and 2, when the policy choice is between lowering the income tax and increasing the production subsidy, properly tailored and sufficiently progressive income tax against for-profit firms is more effective in reducing deadweight loss than production subsidy. Imposition of income tax has the added benefit of generating additional government revenue while provision of subsidy either requires government resources or reduces government revenue.

Concluding Remarks

While previous research has focused on the choice between for-profit and non-profit organizations in a more static (one-period) setting, when quality of product or service produced is not verifiable, one reasonable means of providing necessary investment (effort) incentive is through relational, market-based sanctions with repeated interactions. The paper has shown that when such dynamic interactions are taken into account, both for-profit and non-profit firms can be incentivized to undertake desired investment in quality. At the same time, the severity of the relational sanctions will differ depending on the organizational form. Because non-profit organizations face the non-distribution constraint that, under reasonable assumptions, makes it more difficult to distribute a large amount of in-kind payment to its controller (entrepreneur), non-profit organizations will face a weaker (but positive) incentive to deviate and less severe relational sanctions will be necessary. Less severe relational sanctions, in turn, can explain why an entrepreneur, who may not have any altruistic motive, can prefer setting up a non-profit, rather than a for-profit, organization. While a non-profit firm will allow the entrepreneur to make a smaller (in-kind) return in each period, the entrepreneur will be able to realize those returns for a longer period in expectation, thereby increasing the long-run return.

The analysis generated a number of predictions. In terms of organizational preference, the model has shown that the entrepreneur is more likely to organize a non-profit firm (1) as the realized quality becomes a weaker signal of investment; (2) as the non-distribution constraint gets stronger at the margin; (3) when a for-profit firm's profit is subject to tax or a non-profit firm's production is subsidized; or (4) when there is more competition in the market and the profit margin gets smaller. The first prediction, in particular, suggests that an important motivator over organizational choice is not the non-verifiability of realized quality per se but how strongly the realized quality is related to the underlying investment. Also, the fourth prediction supports the empirical finding that non-profit firms are less sensitive, in terms of entry and exit decisions, to changes in market conditions. Finally, when the intensity of public enforcement of the non-distribution constraint is inversely related to the number of non-profit firms in the market, when the realized quality is sufficiently noisy, the entrepreneur will, in equilibrium, be indifferent between choosing either a non-profit or a for-profit firm. The model demonstrates how both for-profit and non-profit organizations can co-exist even when all underlying parameters, including the entrepreneur's ability to extract private benefit and the cost structures for both types of organizations, are identical.

While the model has generated a number of predictions that are consistent with the empirical data and also some policy proposals, more research needs to be done in enhancing our understanding of these organizational forms. One is the effect of competition. The paper has made some suggestions on how both types of organizations would compete in a single market and how to think about the effect of competition on organizational choice, for instance, using a reduced-form Nash bargaining solution. On the other hand, a more explicit account of cross-organizational competition and, in particular, how competition interacts with relational sanctions can lead to a better understanding of the industry dynamic.[25] As documented by Chakravarty, Gaynor, Klepper, and Vogt (2006), there seems to be meaningful difference between the organizational forms in terms of entry and exit decisions. Also, as shown by Cutler and Horwitz (2000), non-profit organizations seem to behave differently when there are more for-profit firms in the market. Another is examining more closely the incentive issues within the organization. As documented by various empirical research, for instance, Erus and Weisbrod (2003), there seems to be important difference between organizational types on how respective managers are compensated and incentivized.[26] As many scholars have peeked into the organizational box of for-profit firms, taking a closer look at the incentive (agency) issues within a non-profit organization remains an important agenda.

[25] Even when there are multiple firms competing in the same market with homogeneous goods, when realized quality is not verifiable, customers will have to rely on relational sanctions to incentivize the firms and the firms will have to make a positive profit in equilibrium ($\theta \geq \underline{\theta} > 0$), as shown in Corollary 3. Without a positive per-period profit, imposing relational sanctions will not produce any incentive effect. At the same time, when there are multiple firms in a market, relational sanctions may be easier to impose when customers can switch from one firm to another upon receiving low quality.

[26] With non-verifiable quality, the principal will have to rely on a relational contract to provide necessary incentive to the agent. The relational contract used to incentivize the agent can be coordinated with the relational sanctions imposed by customers against the firm. One possible reason why non-profit firms have more flat incentive scheme is that a stronger pay-for-performance may run into the non-distribution constraint. More reliance on relational sanctions can have important implications on, among others, the boundaries of the firm issues. See, e.g., Baker, Gibbons, and Murphy (1994, 2003) and Levin (2003).

Appendix: Proofs

Proof of Lemma 1. To find the optimal punishment period (T_O), we need to solve a recursive program. Let's start with the for-profit organization. Suppose we are in a non-punishment state, where the buyer believes that the seller is choosing e_H. The buyer is willing to pay up to $E(v|e_H)$ and, with the power to make a take-it-or-leave-it offer, the seller will offer $p = E(v|e_H)$. The seller's long-run expected profit from choosing e_H is given by

$$V_{FP}^{+} = p - c_H + (1-\alpha)\delta V_{FP}^{+} + \alpha\delta V_{FP}^{-}$$

The expression V_{FP}^{-} is the seller's long-run profit when the parties are at the beginning of the punishment state. With the punishment length of T_{FP}, we have $V_{FP}^{-} = \delta^{T_{FP}} \cdot V_{FP}^{+}$. When we solve for V_{FP}^{+}, we get

$$V_{FP}^{+} = \frac{E(v|e_H) - c_H}{(1-\delta) + \alpha\delta(1-\delta^{T_{FP}})}$$

If the seller were to deviate and choose low effort, the seller's long-run profit is

$$p - c_L + \alpha\delta V_{FP}^{+} + (1-\alpha)\delta V_{FP}^{-}$$

To induce the seller to choose high effort, we need

$$p - c_H + (1-\alpha)\delta V_{FP}^{+} + \alpha\delta V_{FP}^{-} \geq p - c_L + \alpha\delta V_{FP}^{+} + (1-\alpha)\delta V_{FP}^{-}$$

The weak inequality reduces to

$$\delta(1-\delta^{T_{FP}})V_{FP}^{+} \geq \frac{\Delta c}{1-2\alpha}$$

With the expression for V_{FP}^{+}, the weak inequality becomes

$$\delta(1-\delta^{T_{FP}})\frac{E(v|e_H) - c_H}{(1-\delta) + \alpha\delta(1-\delta^{T_{FP}})} \geq \frac{\Delta c}{1-2\alpha}$$

Note that the left hand side of the expression is strictly increasing with respect to T_{FP}, and as $T_{FP} \to 0$, we get $\delta(1-\delta^{T_{FP}})\frac{E(v|e_H)-c_H}{(1-\delta)+\alpha\delta(1-\delta^{T_{FP}})} \to 0$, violating the incentive condition. Hence, in equilibrium, we need $T_{FP} > 0$.

For a non-profit organization, the basic problem is similar but with the non-distribution constraint. The seller's long-run expected profit from choosing high effort is given by

$$V_{NP}^{+} = \phi(p - c_H) + (1-\alpha)\delta V_{NP}^{+} + \alpha\delta V_{NP}^{-}$$

With the punishment length of T_{NP}, we have $V_{NP}^{-} = \delta^{T_{NP}} \cdot V_{NP}^{+}$. When we solve for V_{NP}^{+}, we get

$$V_{NP}^{+} = \frac{\phi_H \cdot (E(v|e_H) - c_H)}{(1-\delta) + \alpha\delta(1-\delta^{T_{NP}})}$$

If the seller were to deviate and choose low effort, the seller's long-run profit is

$$\phi_L \cdot (E(v|e_H) - c_L) + \alpha\delta V_{NP}^{+} + (1-\alpha)\delta V_{NP}^{-}$$

To induce the seller to choose high effort, we need

$$\begin{aligned}\phi_H \cdot (E(v|e_H) - c_H) + (1-\alpha)\delta V_{NP}^{+} + \alpha\delta V_{NP}^{-} \\ \geq\ \phi_L \cdot (E(v|e_H) - c_L) + \alpha\delta V_{NP}^{+} + (1-\alpha)\delta V_{NP}^{-}\end{aligned}$$

The weak inequality reduces to

$$\delta(1-\delta^{T_{NP}})V_{NP}^{+} \geq \frac{\phi_L \cdot (E(v|e_H) - c_L) - \phi_H \cdot (E(v|e_H) - c_H)}{1-2\alpha}$$

With the expression for V_{NP}^{+}, the weak inequality becomes

$$\delta(1-\delta^{T_{NP}})\frac{E(v|e_H) - c_H}{(1-\delta) + \alpha\delta(1-\delta^{T_{NP}})} \geq \frac{(\phi_L/\phi_H) \cdot (E(v|e_H) - c_L) - (E(v|e_H) - c_H)}{1-2\alpha}$$

When we examine the respective incentive conditions, note first that the left hand sides of the inequalities are identical when $T_{FP} = T_{NP}$. When we compare the right hand sides, we see that

$$\frac{(\phi_L/\phi_H) \cdot (E(v|e_H) - c_L) - (E(v|e_H) - c_H)}{1-2\alpha} \leq \frac{\Delta c}{1-2\alpha}$$

The inequality is strict when $\phi_L < \phi_H$. When $\phi_L < \phi_H$, therefore, non-profit firm will be subject to a weaker incentive requirement, thus requiring $T_{FP} > T_{NP}$. In other words, when there is a decreasing returns to scale in terms of converting cash profit into private benefits (e.g., perquisites) for the entrepreneur, the non-profit executive will have a weaker incentive to deviate from the desired behavior and thus will require a weaker relational sanctions. *QED*

Proof of Proposition 1. For a for-profit firm, the incentive condition was given by

$$\delta(1-\delta^{T_{FP}})\frac{E(v|e_H) - c_H}{(1-\delta) + \alpha\delta(1-\delta^{T_{FP}})} \geq \frac{\Delta c}{1-2\alpha}$$

The incentive condition provides us with the maximum possible α. When $T_{FP} \to \infty$, the inequality becomes: $\frac{\delta}{(1-\delta)+\alpha\delta}(E(v|e_H) - c_H) \geq \frac{\Delta c}{1-2\alpha}$. When we solve for α, we get

$$\alpha \leq \frac{\delta(E(v|e_H) - c_H) - (1-\delta)\Delta c}{\delta(2(E(v|e_H) - c_H) + \Delta c)} \equiv \bar{\alpha}_{FP}$$

Given that the buyer will choose minimum T_{FP} necessary to solve the incentive problem, when we substitute the weak inequality with equality, and solve for $\delta(1-\delta^{T_{FP}})$, we get

$$\delta(1-\delta^{T_{FP}}) = \frac{(1-\delta)\frac{\Delta c}{1-2\alpha}}{(E(v|e_H) - c_H) - \alpha\frac{\Delta c}{1-2\alpha}}$$

When we use this expression to simplify $V_{FP}^{+} = \frac{E(v|e_H) - c_H}{(1-\delta)+\alpha\delta(1-\delta^{T_{FP}})}$, we get

$$V_{FP}^{+} = \frac{1}{1-\delta}\left\{E(v|e_H) - c_H - \frac{\alpha\Delta c}{1-2\alpha}\right\}$$

Note that $\frac{\partial V_{FP}^{+}}{\partial \alpha} < 0$. After some algebra, we also get

$$V_{FP}^{+}(\bar{\alpha}_{FP}) = \frac{2(E(v|e_H) - c_H) + \Delta c}{2-\delta} > 0$$

Hence, with the maximum possible α, the for-profit firm's long-run return is strictly positive. For a non-profit firm, the incentive condition was

$$\delta(1-\delta^{T_{NP}})\frac{E(v|e_H) - c_H}{(1-\delta)+\alpha\delta(1-\delta^{T_{NP}})} \geq \frac{(\phi_L/\phi_H)\cdot(E(v|e_H) - c_L) - (E(v|e_H) - c_H)}{1-2\alpha}$$

When $T_{NP} \to \infty$, the inequality becomes: $\frac{\delta}{(1-\delta)+\alpha\delta}(E(v|e_H) - c_H) \geq \frac{\rho}{1-2\alpha}$ where $\lambda \equiv (\phi_L/\phi_H)\cdot(E(v|e_H) - c_L) - (E(v|e_H) - c_H)$. When we solve for α, we get

$$\alpha \leq \frac{\delta(E(v|e_H) - c_H) - (1-\delta)\lambda}{\delta(2(E(v|e_H) - c_H) + \lambda)} \equiv \bar{\alpha}_{NP}$$

Note that since $\lambda \leq \Delta c$ whenever $\phi_L \leq \phi_H$, when $\phi_L \leq \phi_H$, $\bar{\alpha}_{NP} \geq \bar{\alpha}_{FP}$, with the inequality being strict when $\phi_L < \phi_H$. When we perform similar algebra to derive the non-profit's long-run return, we get

$$V_{NP}^{+} = \frac{\phi_H}{1-\delta}\left\{(E(v|e_H) - c_H) - \alpha\frac{(\phi_L/\phi_H)\cdot(E(v|e_H) - c_L) - (E(v|e_H) - c_H)}{1-2\alpha}\right\}$$

This expression can be rewritten as

$$V_{NP}^{+} = \frac{\phi_H}{1-\delta}\left\{E(v|e_H) - c_H - \frac{\alpha\Delta c}{1-2\alpha}\right\} + \frac{1}{1-\delta}\frac{\alpha}{1-2\alpha}(\phi_H - \phi_L)\{E(v|e_H) - c_L\}$$

Similar to a for-profit, we have $\frac{\partial V_{NP}^{+}}{\partial \alpha} < 0$ and

$$V_{NP}^{+}(\bar{\alpha}_{NP}) = \frac{\phi_H(2(E(v|e_H) - c_H) + \lambda)}{2 - \delta} > 0$$

When we compare $V_{NP}^{+}(\bar{\alpha}_{NP})$ with $V_{FP}^{+}(\bar{\alpha}_{FP})$, we see that $V_{FP}^{+}(\bar{\alpha}_{FP}) > V_{NP}^{+}(\bar{\alpha}_{NP})$ whenever $\phi_H < 1$ and/or $\phi_H > \phi_L$. Recall that with the assumption of $\phi_H \geq \phi_L$, $\bar{\alpha}_{NP} \geq \bar{\alpha}_{FP}$. This implies that when $\alpha \in (\bar{\alpha}_{FP}, \bar{\alpha}_{NP}]$, only the non-profit firm will be able to survive in the market.

When we subtract V_{NP}^{+} from V_{FP}^{+}, we get

$$V_{FP}^{+} - V_{NP}^{+} = \frac{1 - \phi_H}{1 - \delta}\left\{E(v|e_H) - c_H - \frac{\alpha \Delta c}{1 - 2\alpha}\right\} - \frac{1}{1 - \delta}\frac{\alpha}{1 - 2\alpha}(\phi_H - \phi_L)\{E(v|e_H) - c_L\}$$

First, when we differentiate the expression with respect to α, ϕ_H, or ϕ_L we get

$$\frac{\partial(V_{FP}^{+} - V_{NP}^{+})}{\partial \alpha} = -\frac{1}{(1 - 2\alpha)^2} \cdot \left(\frac{(1 - \phi_H)\Delta c}{1 - \delta} + \frac{(\phi_H - \phi_L)(E(v|e_H) - c_L)}{1 - \delta}\right) < 0$$

From the first inequality, we see that, as $\alpha \to 0$, $V_{FP}^{+} - V_{NP}^{+} \to \frac{1-\phi_H}{1-\delta}\{E(v|e_H) - c_H\} > 0$ and as $\alpha \to 1/2$, $\frac{\alpha}{1-2\alpha} \to \infty$, so that $V_{FP}^{+} - V_{NP}^{+} \to -\infty$. Hence, there exists a unique $\bar{\alpha} \in (0, \bar{\alpha}_{FP}]$ such that the entrepreneur strictly prefers a non-profit when $\alpha \geq \bar{\alpha}$ and a for-profit, otherwise. In terms of the exact location of $\bar{\alpha}$, we can compare $V_{FP}^{+}(\bar{\alpha}_{FP})$ with $V_{NP}^{+}(\bar{\alpha}_{FP})$. With some algebra, we have

$$\begin{aligned} V_{NP}^{+}(\bar{\alpha}_{FP}) - V_{FP}^{+}(\bar{\alpha}_{FP}) &= \frac{\phi_H}{1 - \delta}\left\{(E(v|e_H) - c_H) - \bar{\alpha}_{FP}\frac{\lambda}{1 - 2\bar{\alpha}_{FP}}\right\} - \frac{1}{1 - \delta}\left\{E(v|e_H) - c_H - \frac{\bar{\alpha}_{FP}\Delta c}{1 - 2\bar{\alpha}_{FP}}\right\} \\ &= \frac{\phi_H\{(1 - \delta)\Delta c - \bar{\alpha}_{FP}\delta(\Delta c - \lambda)\}}{(1 - \delta)\delta(1 - 2\bar{\alpha}_{FP})} - \frac{(1 - \delta)\Delta c}{(1 - \delta)\delta(1 - 2\bar{\alpha}_{FP})} \\ &= \frac{\bar{\alpha}_{FP}\delta(\phi_H - \phi_L)}{(1 - \delta)\delta(1 - 2\bar{\alpha}_{FP})}(E(v|e_H) - c_L) - \frac{(1 - \phi_H)(1 - \delta)\Delta c}{(1 - \delta)\delta(1 - 2\bar{\alpha}_{FP})} \end{aligned}$$

where we used the equality $\Delta c - \lambda = \frac{\phi_H - \phi_L}{\phi_H}(E(v|e_H) - c_L)$. As $\phi_H \to 1$ but $\phi_H - \phi_L > 0$, $V_{NP}^{+}(\bar{\alpha}_{FP}) - V_{FP}^{+}(\bar{\alpha}_{FP}) > 0$ and vice versa. Since $V_{FP}^{+} - V_{NP}^{+} = \frac{1-\phi_H}{1-\delta}\{E(v|e_H) - c_H\} \geq 0$ when $\alpha = 0$, when $V_{NP}^{+}(\bar{\alpha}_{FP}) - V_{FP}^{+}(\bar{\alpha}_{FP}) > 0$, we get $\bar{\alpha} < \bar{\alpha}_{FP}$. If $V_{NP}^{+}(\bar{\alpha}_{FP}) - V_{FP}^{+}(\bar{\alpha}_{FP}) < 0$, we get $\bar{\alpha} = \bar{\alpha}_{FP}$.

Next, when we differentiate $V_{FP}^{+} - V_{NP}^{+}$ with respect to ϕ_H or ϕ_L we get:

$$\frac{\partial(V_{FP}^{+}-V_{NP}^{+})}{\partial\phi_H}=-\frac{1}{1-\delta}\left\{E(v|e_H)-c_H-\frac{\alpha\Delta c}{1-2\alpha}\right\}-\frac{1}{1-\delta}\frac{\alpha}{1-2\alpha}\{E(v|e_H)-c_L\}<0$$

$$\frac{\partial(V_{FP}^{+}-V_{NP}^{+})}{\partial\phi_L}=\frac{1}{1-\delta}\frac{\alpha}{1-2\alpha}\{E(v|e_H)-c_L\}>0$$

From the first inequality, since $\frac{\partial(V_{FP}^{+}-V_{NP}^{+})}{\partial\phi_H}<0\ \forall\alpha$, as ϕ_H increases, $\bar{\alpha}$ must (at least weakly) decrease. Hence, the entrepreneur is more likely to choose a non-profit form. Also, from the expression for $V_{NP}^{+}(\bar{\alpha}_{FP})-V_{FP}^{+}(\bar{\alpha}_{FP})$, we see that an increase in ϕ_H makes it more likely to have $V_{NP}^{+}(\bar{\alpha}_{FP})-V_{FP}^{+}(\bar{\alpha}_{FP})>0$ so that $\bar{\alpha}<\bar{\alpha}_{FP}$. In the extreme, from the expression for $V_{FP}^{+}-V_{NP}^{+}$, when $\phi_H\to 1$, the first expression disappears and only the second expression remains, producing $V_{FP}^{+}-V_{NP}^{+}<0\ \forall\alpha$ and $\bar{\alpha}=0$: non-profit strictly dominates for-profit. Finally, from the second inequality, we see that as ϕ_L rises, $\bar{\alpha}$ must increase, thereby making the entrepreneur more likely to choose a for-profit form. Also, from $V_{NP}^{+}(\bar{\alpha}_{FP})-V_{FP}^{+}(\bar{\alpha}_{FP})$, an increase in ϕ_L makes it less likely to have $V_{NP}^{+}(\bar{\alpha}_{FP})-V_{FP}^{+}(\bar{\alpha}_{FP})>0$, thereby pushing $\bar{\alpha}$ towards $\bar{\alpha}_{FP}$. *QED*

Proof of Corollary 1. When a for-profit firm is subject to a tax rate of $1-\beta(\pi)\in[0,1]$, the for-profit's long-run return can now be written as

$$V_{FP}^{+}(\beta)=\frac{1}{1-\delta}\left\{\beta_H\cdot(E(v|e_H)-c_H)-\alpha\frac{\beta_L\cdot(E(v|e_H)-c_L)-\beta_H\cdot(E(v|e_H)-c_H)}{1-2\alpha}\right\}$$

where scalars (β_H,β_L) are defined by $\beta_H\cdot(E(v|e_H)-c_H)\equiv\beta(E(v|e_H)-c_H)$ and $\beta_L\cdot(E(v|e_H)-c_L)\equiv\beta(E(v|e_H)-c_L)$.

When we subtract V_{NP}^{+} from $V_{FP}^{+}(\beta)$, we get

$$V_{FP}^{+}(\beta)-V_{NP}^{+}=(\beta_H-\phi_H)\left\{E(v|e_H)-c_H-\frac{\alpha\Delta c}{1-2\alpha}\right\}+\frac{1}{1-\delta}\frac{\alpha}{1-2\alpha}[(\beta_H-\beta_L)-(\phi_H-\phi_L)]\{E(v|e_H)-c_L\}$$

Hence, the entrepreneur is more likely to form a for-profit organization as $\beta_H-\phi_H$ gets larger or as $[(\beta_H-\beta_L)-(\phi_H-\phi_L)]$ gets larger.

As a special case, suppose $\beta_L\le\phi_L$ and $\beta_H\ge\phi_H$, so that $\beta_H-\phi_H\ge 0$ and $[(\beta_H-\beta_L)-(\phi_H-\phi_L)]\ge 0$. The difference in valuations becomes:

$$V_{FP}^{+}(\beta)-V_{NP}^{+}=(\beta_H-\phi_H)\left\{E(v|e_H)-c_H-\frac{\alpha\Delta c}{1-2\alpha}\right\}+\frac{1}{1-\delta}\frac{\alpha}{1-2\alpha}[(\beta_H-\beta_L)-(\phi_H-\phi_L)]\{E(v|e_H)-c_L\}\ge 0$$

In this case, the progressive tax structure functions as a stronger deterrent against deviation. Hence, with a for-profit firm, not only will the entrepreneur be entitled to receive a larger per-

period distribution in equilibrium ($\beta_H \geq \phi_H$) but she will also face shorter relational sanctions. The entrepreneur will (at least weakly) prefer a for-profit form and the shorter relational sanctions also improve welfare.

As another special case, when $\beta''(\pi) = 0$ so that $\beta_H = \beta_L = \overline{\beta}$, for-profit's long-run return simplifies to

$$V_{FP}^{+}(\overline{\beta}) = \frac{\overline{\beta}}{(1-\delta)}\left\{E(v|e_H) - c_H - \frac{\alpha\Delta c}{1-2\alpha}\right\}$$

Note that, compared to the case with no profit tax, the magnitudes of the relational sanctions and the attendant deadweight loss are the same. The profit-difference between two organizational forms becomes

$$V_{FP}^{+}(\overline{\beta}) - V_{NP}^{+} = (\overline{\beta} - \phi_H)\left\{E(v|e_H) - c_H - \frac{\alpha\Delta c}{1-2\alpha}\right\} - \frac{1}{1-\delta}\frac{\alpha}{1-2\alpha}(\phi_H - \phi_L)\{E(v|e_H) - c_L\}$$

Compared to the case of no profit tax ($\overline{\beta} = 1$), the entrepreneur is more likely to choose a non-profit form ($\bar{\alpha}$ shifts to the left). This, in turn, decreases social welfare since even though the profit tax does not create a deadweight loss, the entrepreneur suffers a personal reduction in return. When $\overline{\beta} < \phi_H$, the entrepreneur will strictly prefer a non-profit organization, regardless of α. *QED*

Proof of Corollary 2. When the seller bears the cost of γc_i, for the non-profit organization, the incentive condition becomes

$$\delta(1-\delta^{T_{NP}})\frac{E(v|e_H) - \gamma c_H}{(1-\delta) + \alpha\delta(1-\delta^{T_{NP}})} \geq \frac{(\phi_L(\gamma)/\phi_H(\gamma)) \cdot (E(v|e_H) - \gamma c_L) - (E(v|e_H) - \gamma c_H)}{1-2\alpha}$$

where we have introduced new expressions: $\phi(E(v|e_H) - \gamma c_H) \equiv \phi_H(\gamma) \cdot (E(v|e_H) - \gamma c_H)$ and $\phi(E(v|e_H) - \gamma c_L) \equiv \phi_L(\gamma) \cdot (E(v|e_H) - \gamma c_L)$. Note that since both $E(v|e_H) - \gamma c_L$ and $E(v|e_H) - \gamma c_H$ are increasing and $\gamma\Delta c$ is decreasing as γ gets smaller, $\phi_L(\gamma)/\phi_H(\gamma)$ decreases as γ decreases. The right hand side of the inequality can be re-written as

$$\frac{(\phi_L(\gamma)/\phi_H(\gamma)) \cdot (E(v|e_H) - c_L) - (E(v|e_H) - c_H) + (1-\gamma) \cdot ((\phi_L(\gamma)/\phi_H(\gamma))c_L - c_H)}{1-2\alpha}$$

When $\phi_L(\gamma) \leq \phi_H(\gamma)$, $(1-\gamma) \cdot ((\phi_L(\gamma)/\phi_H(\gamma))c_L - c_H)$ strictly negative. Hence, both the left and right hand sides decrease as γ decreases, leading to a strictly smaller T_{NP}. Non-profit's long-run profit becomes

$$V_{NP}^{+}(\gamma) = \frac{1}{1-\delta}\Big\{\phi_H(\gamma)\cdot(E(v|e_H)-\gamma c_H) - \alpha\frac{\phi_L(\gamma)\cdot(E(v|e_H)-\gamma c_L)-\phi_H(\gamma)\cdot(E(v|e_H)-\gamma c_H)}{1-2\alpha}\Big\}$$
$$= \frac{\phi_H(\gamma)}{1-\delta}\Big\{E(v|e_H)-\gamma c_H-\frac{\alpha\gamma\Delta c}{1-2\alpha}\Big\}+\frac{1}{1-\delta}\frac{\alpha}{1-2\alpha}(\phi_H(\gamma) - \phi_L(\gamma))\{E(v|e_H)-\gamma c_L\}$$

As γ decreases, $V_{NP}^{+}(\gamma)$ strictly increases. Hence, when production subsidy is provided only to non-profit organizations, entrepreneur becomes more likely to form a non-profit organization ($\bar{\alpha}$ shifts to the left).

There are two opposing effects on welfare. Although a strictly smaller T_{NP} decreases the deadweight loss from relational sanctions, the deadweight loss from private benefit conversion (measured by $(1-\phi_H(\gamma))\cdot(E(v|e_H)-\gamma c_H)$) increases because the entrepreneur realizes a larger per-period profit in equilibrium. If the latter effect is larger, this will decrease welfare. Furthermore, there also is the effect on organizational choice. Since the entrepreneur becomes more likely to choose non-profit, when non-profit creates a larger deadweight loss, conversion from for-profit to non-profit will further decrease welfare. *QED*

Proof of Corollary 3. With $p(\theta) = \theta\cdot E(v|e_H) + (1-\theta)\cdot c_H$, respective incentive conditions are

$$\delta(1-\delta^{T_{FP}})\frac{p(\theta)-c_H}{(1-\delta)+\alpha\delta(1-\delta^{T_{FP}})} \geq \frac{\Delta c}{1-2\alpha}$$

and

$$\delta(1-\delta^{T_{NP}})\frac{p(\theta)-c_H}{(1-\delta)+\alpha\delta(1-\delta^{T_{NP}})} \geq \frac{\lambda(\theta)}{1-2\alpha}$$

where we have introduced new expressions: $\phi(p(\theta)-c_H) \equiv \phi_H(\theta)\cdot(p(\theta)-c_H)$, $\phi(p(\theta)-c_L) \equiv \phi_L(\theta)\cdot(p(\theta)-c_L)$, and $\lambda(\theta) \equiv (\phi_L(\theta)/\phi_H(\theta))\cdot(p(\theta)-c_L)-(p(\theta)-c_H)$. By assumption, θ and ϕ_i are inversely related: $\frac{\partial\phi_i(\theta)}{\partial\theta} < 0$. From the incentive conditions, the maximum α necessary can be found as:

$$\alpha \leq \frac{\delta(p(\theta)-c_H)-(1-\delta)\Delta c}{\delta(2(p(\theta)-c_H)+\Delta c)} \equiv \bar{\alpha}_{FP}(\theta)$$

and

$$\alpha \leq \frac{\delta(p(\theta)-c_H)-(1-\delta)\lambda(\theta)}{\delta\big(2(p(\theta)-c_H)+\rho(\theta)\big)} \equiv \bar{\alpha}_{NP}(\theta)$$

These thresholds are equivalent to those from Proposition 1, except for the fact that they now depend on θ. Note that when $\phi_H(\theta) > \phi_L(\theta)$, we have $\lambda(\theta) < \Delta c$ and $\bar{\alpha}_{FP}(\theta) < \bar{\alpha}_{FP}(\theta)$. Furthermore, as θ decreases, both $\bar{\alpha}_{FP}(\theta)$ and $\bar{\alpha}_{NP}(\theta)$ decrease.

In order to have $\bar{\alpha}_{FP}(\theta) \geq 0$, we need $\delta(p(\theta) - c_H) - (1-\delta)\Delta c \geq 0$. With the expression $p(\theta) = \theta \cdot E(v|e_H) + (1-\theta) \cdot c_H$, this is equivalent to

$$\theta \geq \frac{(1-\delta)\Delta c}{\delta(E(v|e_h) - c_H)} \equiv \underline{\theta}_{FP}$$

The comparable lower bound for the non-profit organization is $\underline{\theta}_{NP} \equiv \frac{(1-\delta)\lambda(\theta)}{\delta(E(v|e_h)-c_H)} < \underline{\theta}_{FP}$. Therefore, if $\theta \in [\underline{\theta}_{NP}, \underline{\theta}_{FP})$, only the non-profit organizations can operate in the market. In terms of the price, $p(\underline{\theta}_{FP}) = \frac{(1-\delta)\Delta c}{\delta(E(v|e_h)-c_H)}(E(v|e_h) - c_H) + c_H = c_H + \frac{(1-\delta)}{\delta}\Delta c$. Hence, when $p \in [c_H + \frac{(1-\delta)}{\delta}\lambda(\theta), c_H + \frac{(1-\delta)}{\delta}\Delta c)$, only the non-profit firms will operate in the market.

Finally, when $\phi(\pi)$ is strictly concave, both $\phi_L(\theta)/\phi_H(\theta)$ and $\lambda(\theta)$ increase as θ rises. Conversely, as θ decreases, both $\underline{\theta}_{NP}$ and $c_H + \frac{(1-\delta)}{\delta}\lambda(\theta)$ decrease, thereby increasing the region in which only the non-profit will survive and operate. *QED*

Proof of Corollary 4. First, from the proofs of Proposition 1, we know that when $\bar{\alpha}_{FP} < \alpha \leq \bar{\alpha}_{NP}$, for-profit organizations make a strictly negative long-run profit and, hence, $O_i = NP\ \forall i$. Note, however, the total mass of firms operating in the market will be strictly less than one: $N_{NP} < 1$ and $N_{FP} = 0$. Second, we also know that when $\alpha \leq \overline{\alpha}$, for-profit organizations make a strictly larger long-run return than non-profit organizations. Therefore, hence, $O_i = FP\ \forall i$.

Third, suppose $\overline{\alpha} < \bar{\alpha}_{FP}$ and $\overline{\alpha} < \alpha \leq \bar{\alpha}_{FP}$. In this region, while both types of organizations make a (at least weakly) positive long-run return, non-profit organizations perform better than for-profit organizations: $0 \leq V_{FP}^{+}(\alpha) < V_{NP}^{+}(\alpha)$. Suppose we initially start with $N_{FP} = 1$ and $N_{NP} = 0$ and consider a marginal increase in N_{NP}. As $\phi(\pi|N_{NP}) \to 1$, $V_{NP}^{+}(\alpha)$ will decrease. From the scalar representation of

$$V_{NP}^{+}(\alpha|N_{NP}) = \frac{1}{1-\delta}\Big\{\phi_H(N_{NP}) \cdot (E(v|e_H) - c_H) - \frac{\alpha}{1-2\alpha} \cdot (\phi_L(N_{NP}) \cdot (E(v|e_H) - c_L) - \phi_H(N_{NP}) \cdot (E(v|e_H) - c_H))\Big\},$$

an increase in N_{NP} implies that $\phi_H(N_{NP}) \cdot (E(v|e_H) - c_H) \to (E(v|e_H) - c_H)$ and $(\phi_L(N_{NP}) \cdot (E(v|e_H) - c_L) - \phi_H(N_{NP}) \cdot (E(v|e_H) - c_H)) \to \Delta c$. The first effect increases, while the second effect decreases, $V_{NP}^{+}(\alpha|N_{NP})$. Note that the second effect is multiplied by $\frac{\alpha}{1-2\alpha}$, which can be substantially large when α is close to $1/2$.

Hence, there are two possible convergence scenarios. First, when $\frac{\alpha}{1-2\alpha}$ is sufficiently large, we'll have some $\widehat{N}_{NP} < 1$ where $V_{NP}^{+}(\alpha|\widehat{N}_{NP}) = V_{FP}^{+}(\alpha)$ and $\phi(\pi|\widehat{N}_{NP}) < 1$. In such a case, we'll have the co-existence of both for-profit and non-profit firms. Second, we can have $V_{NP}^{+}(\alpha|N_{NP}) \to V_{FP}^{+}(\alpha)$ as $N_{NP} \to 1$ while $V_{NP}^{+}(\alpha|N_{NP}) \geq V_{FP}^{+}(\alpha)\ \forall N_{NP}$. In that case, the market will eventually be dominated by non-profit firms but they operate (and the market treats them) just like for-profit firms. *QED*

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