Competition and Incentives with Motivated Providers:

A Theory of Social Entrepreneurship

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(preliminary)

Motivation

- The standard economic view of markets emphasizes efficiency properties of markets in efficiently providing private goods.
  - The Hayekian view emphasizes how private entrepreneurs have better information about the right thing to do for consumers.
- The same view emphasizes that markets generally result in inefficiently low provision of public goods.

- This paper explores efficient provision of goods which are partly public and partly private in nature
  - fits many public services such as health, education, public transport, (football?).
  - we consider a role for motivated providers (social entrepreneurs)

What is a Socal Entrepreneur?

From J. Gregory Dees, "What Makes a Social Entrepreneur"

- What is a social entrepreneur?

  "Social entrepreneurs are one species under the genus entrepreneur. They are entrepreneurs with a social mission."

- But does social entrepreneurship thrive in a market context?

  "(M)arkets do not do a good job in of valuing social improvements, public goods and harms, and benefits for people who cannot afford to pay. These elements are often essential to social entrepreneurship."

The Approach

- This presentation puts forward an approach with two features:
  - there is a need for flexible provision – providers have private information about the true payoffs/costs which affect some of the decisions made by the organization
    - we will refer to this as mission design.
  - some potential providers are motivated, i.e. have pro-social goals.
    - creates a role for selection as well as incentives in delivering public services.

Overview

- What is the optimal structure of provision?
  - show the sense in which it is better to have motivated agents providing services
  - also show that it is necessary for them to have appropriate incentives
- Look at the conditions under which market provision can deliver optimal public services with motivated agents
  - social entrepreneurs will be donors as well as service providers.

- We put forward a contractual structure with three features:
  - incentives: it gives correct incentives for decentralized actions given private information
  - selection: it selects in the best (cheapest) provider and extracts all surplus
  - free-riding: it avoids the problem of free-riding in private provision.

Structure

- Begin by studying the planner's problem when information is perfect.
- Optimal contractual problem when there issues of incentives and selection.
- Discuss how to decentralize the optimum
- Explore some additional issues.

Basic Framework

- In the benchmark model:
  - There is a good which has public and private elements.
  - The state of the world that creates social payoffs/costs is private information.
  - It is uncertain ex ante whether the commercial or social action is optimal.
  - There is a set of potential producers who vary in their pro-social motivation.

- There is a single (representative) consumer who gets a private benefit of b from consuming a good.
  - it is easy to extend the analysis to many consumers.

- There is also a numeraire good of which they have an endowment and utility is linear in this good.

- There is also a benefit to non-consumers from consumption of the good which we denote by $\theta(x, s)$
  - where $s \in \{0, 1\}$ is the state of the world and $x \in \{0, 1\}$ is an action taken by the producer which affects the nature of the good produced in a way that we specify below.

– Let q be the probability of state 0.

– we will refer to the choice of x as the mission choice – as it affects the nature of the social return to producing the good.

– The social payoffs satisfy

$$\begin{aligned} \theta(1,1) &= \theta(1,0) = 0 \\ &\quad \text{and} \\ \theta(0,0) &= \bar{\theta} > \theta(0,1) = \underline{\theta} > 0. \end{aligned}$$

- There is a state-contingent cost of producing the good denoted by $c(x, s)$.

- We make the following assumptions on costs:

$$\begin{aligned} c(1,1) &= c(1,0) = \underline{c} \\ &\text{and} \\ c(0,1) &= c(0,0) = \bar{c}. \end{aligned}$$

- We denote the consumption decision as $\delta(x, s) \in \{0, 1\}$.

- We denote the price of the good when it is provided in a market by $p(x, s)$.

- We focus on the case where

- $\bar{\theta} > \bar{c} - \underline{c} > \underline{\theta}$.

- This is the most interesting case where the additional cost of producing the high social return ($x = 0$) is worthwhile in state 0 but not in state 1.

- This will require an organization to behave flexibly.

- Were this not the case, the government could simply mandate a mission for the organization of $x = 0$.

Producers

- There is a set of N potential providers who preferences in state s are:

$$\lambda_j \theta(x, s) + x_j$$

  where x_j is private consumption.

- We label so that: $0 = \lambda_1 \leq \lambda_2 \leq ... \leq \lambda_N = \bar{\lambda}$.

- So if $\lambda_N = 0$, then all providers are not motivated.

- Each provider can earn $\bar{u}$ in some other activity.

The Nature of Motivation

- One interpretation of $\lambda_j \theta(x, s)$ is pure ego rent.
  - happy do-gooders (warm glow)
- But $\lambda_j \theta(x, s)$ could also be a pure public good preference
  - this creates the potential for free-rider problems among potential social entrepreneurs
  - government needs to convince providers that the service will not be provided without them.

The First Best

- The planner wishes to maximize:

$$\begin{aligned} S &= q\left[\theta\left(x(0),0\right)+b-c\left(x(0),0\right)\right]\delta\left(x(0),0\right) \\ &\quad +\left(1-q\right)\left[\theta\left(x(1),1\right)+b-c\left(x(1),1\right)\right]\delta\left(x(1),1\right) \end{aligned}$$

- θ is total social value of the public good

Mission Integrity

- The first best is as follows:

$$x^*(0) = 0 \text{ and } x^*(1) = 1$$

- This justifies referring to state 0 as the "social state" in which it is worthwhile to produce the "expensive" action $x = 0$ since it generates social benefits.

- We will refer to state 1 as the commercial state in which it is better to produce the action $x = 1$.

- It will be optimal to have consumption in every state ($\delta\left(x(s), s\right) = 1$) provided that:

$$\theta\left(s, s\right) + b - c\left(s, s\right) \geq 0.$$

- The first best can be implemented by a social planner if he can observe the state $s \in \{0, 1\}$.

The Second Best

- Two main issues:
  - the state is private information
    - need to achieve mission integrity (correct action)
    - full residual claimancy may lead to $x = 1$ being chosen in $s = 0$
    - flat incentives may lead to $x = 0$ being chosen in $s = 1$
  - type is private information
    - selection – need to design a contract that is only attractive to the motivated type.

Solution

- We now construct a contract in which the first best mission and selection is achieved.

- There are two contractible variables: c and x
  - Since they are perfectly correlated it is sufficient to focus on one, say c

- As c takes two values, it is sufficient to consider a cost share α of the entrepreneur and a fixed payment w (positive or negative)
  - In this interpretation, he pays a fraction α of the cost out of his pocket.

- Let

$$\Delta c \equiv \bar{c} - \underline{c}.$$

- In principle, a contract is a pair $\alpha(\lambda), w(\lambda)$ for each type which satisfies:
  - mission integrity (correct action)
  - selection (each type picks the contract that is intended for him/her)
  - voluntary participation.

- The solution turns out to have the government offering only a single contract which is attractive only to the most motivated agent, $\lambda_N = \bar{\lambda}$.

- Hence, we will consider only a single contract $w\left(\bar{\lambda}\right), \alpha\left(\bar{\lambda}\right)$

Main Result

Proposition 1 *The optimal contract achieves the first best and has the following structure:*

1. *If* $\bar{\lambda} > \hat{\lambda} = \frac{\Delta c}{\bar{\theta}}$ *then:*

$$w\left(\bar{\lambda}\right) = \bar{u} - q\left(\bar{\lambda}\bar{\theta} - \Delta c\right) + \underline{c} \text{ and } \alpha\left(\bar{\lambda}\right) = 1.$$

2. *If* $\bar{\lambda} \leq \hat{\lambda}$, *then*

$$w\left(\bar{\lambda}\right) = \bar{u} - \bar{\lambda}q\left(\bar{\theta} - \underline{\theta}\right) + \frac{\bar{\lambda}\underline{\theta}}{\Delta c}\underline{c} \text{ and } \alpha\left(\bar{\lambda}\right) = \frac{\bar{\lambda}\underline{\theta}}{\Delta c}.$$

Argument

Step 1: Mission Integrity

- If $\alpha = 1$ (residual claimancy) then the problem is getting the social action in state 0.

- If $\alpha = 0$ (non-profit) then the problem is getting the commercial action in state 1.

- But if $\lambda_j \geq \frac{\Delta c}{\overline{\theta}}$, then the first problem is eliminated and a motivated agent will get the right mission.

- Now consider the case where $\lambda_j < \frac{\Delta c}{\overline{\theta}}$.
  - the agent is insufficiently motivated.

- Consider a contract $\left\{\alpha\left(\lambda_j\right), w\left(\lambda_j\right)\right\}$ then how can this achieve mission integrity?

- In state 0 we want an entrepreneur with motivation λ_j to prefer choosing $x = 0$ (the high cost action)

$$w\left(\lambda_j\right) + \lambda_j \overline{\theta} - \alpha\left(\lambda_j\right) \overline{c} \geq w\left(\lambda_j\right) - \alpha\left(\lambda_j\right) \underline{c}$$

or

$$\frac{\lambda_j \overline{\theta}}{\Delta c} \geq \alpha\left(\lambda_j\right)$$

- In state 1 we want entrepreneur with motivation λ_j to prefer choosing $x = 1$:

$$w\left(\lambda_j\right) - \alpha\left(\lambda_j\right) \underline{c} \geq w\left(\lambda_j\right) + \lambda_j \underline{\theta} - \alpha\left(\lambda_j\right) \overline{c}$$

or,

$$\alpha\left(\lambda_j\right) \geq \frac{\lambda_j \underline{\theta}}{\Delta c}.$$

- As $\overline{\theta} > \underline{\theta}$ these can be combined as

$$\frac{\lambda_j \overline{\theta}}{\Delta c} \geq \alpha\left(\lambda_j\right) \geq \frac{\lambda_j \underline{\theta}}{\Delta c}.$$

- So the cost share needs to be restricted.

- In the case where $\lambda_j = 0$, then the provider needs to get a fixed wage to achieve the first best.

Selection

- We need to show that under the contracts proposed, only the most motivated agent will apply.

- If $\bar{\lambda} \geq \hat{\lambda}$, then there are two cases. Consider $\lambda' < \bar{\lambda}$:
  - if $\lambda' \in \left[\hat{\lambda}, \bar{\lambda}\right]$, then α is equal to 1 for both to achieve mission integrity
  - also, if a λ'-agent chooses the contract meant for the $\overline{\lambda}$-type he gets less than his reservation payoff:

$$w\left(\bar{\lambda}\right) + q\left(\lambda'\bar{\theta} - \Delta c\right) - \underline{c} = \bar{u} + q\left(\lambda' - \bar{\lambda}\right)\bar{\theta} < \bar{u}.$$

– If $\lambda' \leq \hat{\lambda}$, then under the contract meant for a $\overline{\lambda}$-type a λ'-agent will choose $x = 1$ in state 0

– using this fact, his payoff upon choosing the proposed contract is again less than $\bar{u}$:

$$w\left(\overline{\lambda}\right) - \underline{c} = \bar{u} - q\left(\overline{\lambda}\overline{\theta} - \Delta c\right) < \bar{u}.$$

- Now consider what happens when $\bar{\lambda} < \hat{\lambda}$.
- Let $\alpha\left(\bar{\lambda}\right) = \frac{\bar{\lambda}\underline{\theta}}{\Delta c} < 1$
- This ensures mission integrity for a $\overline{\lambda}$-type agent
- Two cases
  - λ' is such that $\frac{\lambda_j \overline{\theta}}{\Delta c} \geq \frac{\bar{\lambda}\underline{\theta}}{\Delta c}$
  - Then mission integrity is satisfied for a λ'-agent given $\alpha\left(\bar{\lambda}\right) = \frac{\bar{\lambda}\underline{\theta}}{\Delta c}$

– Also, a λ'-type will not find the contract attractive as

$$w\left(\bar{\lambda}\right)+\lambda' q\bar{\theta}-\frac{\bar{\lambda}\underline{\theta}}{\Delta c}\left(q\bar{c}+\left(1-q\right)\underline{c}\right)=\bar{u}+q\left(\lambda'-\bar{\lambda}\right)\bar{\theta}<\bar{u}.$$

– λ' is such that $\frac{\lambda_j\bar{\theta}}{\Delta c}<\frac{\bar{\lambda}\underline{\theta}}{\Delta c}$

– Then mission integrity is not satisfied for a λ'-agent given $\alpha\left(\bar{\lambda}\right)=\frac{\bar{\lambda}\underline{\theta}}{\Delta c}$

– always chooses $x=1$

– Also, a λ'-type will not find the contract attractive as

$$w\left(\bar{\lambda}\right)-\frac{\bar{\lambda}\underline{\theta}}{\Delta c}\underline{c}=\bar{u}-\bar{\lambda}q\left(\bar{\theta}-\underline{\theta}\right)<\bar{u}.$$

Implications

- If $\bar{\lambda} = 0$, i.e., there are no motivated providers, then we have:

$$w\left(\bar{\lambda}\right) = \bar{u}$$

and we have a contract in which the provider is paid a fixed wage and the cost of provision is financed by government.

- But this is equivalent to a non-profit where there is a mandate that $p\left(x, s\right) = c\left(x, s\right)$.

- As we shall below, there is a difference between a contractual requirement to make zero profit and making zero profit in a competitive market.

- For $\bar{\lambda} < \hat{\lambda}$, the optimal contractual form is a social enterprise where the government restricts the extraction of profits to align mission incentives

- Incentives are needed for motivated agents to induce them in this case to take the commercial action when required.

- The non-profit form fails for these agents because they have insufficient commercial motivation.

- This is consistent with an arrangement in which there is partial assignment of varying revenue streams by government to the social enterprise based on cost:

$$p(x,s) = \left(1 - \frac{\bar{\lambda}\underline{\theta}}{\Delta c}\right) c(x,s).$$

- The social enterprise needs to donations to survive, i.e. to co-finance the provision of the good.

- This helps to achieve selection and mission incentives.

- If $\bar{\lambda} \geq \hat{\lambda}$, then there is a quasi-private firm in which the firm can (without legal restriction) be a full residual claimant on the surpluses created.

- Sufficiently motivated providers need not have their commercial incentives curtailed.

- They too make donations to the provision of the public service and this helps to achieve selection, lowering the cost to government of providing public services.

Free-riding?

- The above contract that we have proposed also solves the free-rider problem in the case where motivation is of a public good variety.

- The most motivated provider knows that it is not attractive for a less motivated provider to offer.

- Hence, the contract provides a commitment device.

Market provision

- Having offered a contractual arrangement to solve the incentive, selection and free-rider problem, we can now try to generate an insight into the nature of market failure in the delivery of public services in this context.

- We will develop a model of market competition among the N potential providers who compete to provide the service by offering prices Bertrand style.

Market Equilibrium

- Consider first the case where $\lambda < \hat{\lambda}$ and assume that $b > \underline{c}$

Proposition 2 *Suppose that* $\lambda < \hat{\lambda}$*, then the market equilibrium has* $p(x, s) = \underline{c}$ *and* $x = 1$ *for* $s \in \{0, 1\}$.

- The market equilibrium has zero profits – and in a conventional sense competition works.

- However, the market cannot deliver the socially optimal mission even if some entrepreneurs are somewhat motivated.

- The contract that we have proposed fixes the market failure in this case by attenuating the profit motive suitably.

- But, as we saw, in general some market incentives is needed if agents are motivated.
  - There is needs to a be legal (contractual) structure beyond the standard notion of residual claimancy
  - It is clear why a market equilibrium that generates zero profits is different from a non-profit firm in this context.

- Now suppose that $\bar{\lambda} > \hat{\lambda}$.

- We now have

Proposition 3 *Suppose that $\bar{\lambda} \geq \hat{\lambda}$. Then a competitive (Bertrand) provision with a social entrepreneur exists and achieves the first best: $p(x, s) = \underline{c}$ and $x = s$ for $s \in \{0, 1\}$.*

- The market equilibrium price of the good is unchanged.

- However, the social entrepreneurs are willing to give up profits to take the correct action in the social state.

- So with sufficient motivation, the first best can apparently be achieved without government intervention

- This kind of model seems to fit football entrepreneurs who are willing to subsidize football clubs with their own money.

- Competition now only increases the amount of private wealth that is needed.

Free-riding in Market Equilibrium

- Free-riding is now a potential issue in the case of this market equilibrium with social entrepreneurs.

- Observe: the result is stated as there exists a Nash equilibrium where a single social entrepreneur with $\lambda_j > \hat{\lambda}$ provides the good.
  - But an inefficient (mixed strategy) Nash equilibrium also exists where there is no efficient provision with some probability.
  - Our proposed contract provides coordination away from that equilibrium.

– The government is serving the Coasian role of creating a property right and then auctioning off provision.

Further Issues

- The contract that we have proposed to efficiently decentralize public provision with motivated providers requires that motivated providers also have a source of co-finance

- This could potentially match the model of public private partnerships in city academies that we have seen in the U.K. where providers have to raise private donations before bidding to run schools.

- Our model gives some insight into how incentives and selection interact in this kind of private outsourcing activities

  – future work will consider the raising of these private funds explicitly.

Concluding Comments

- We have laid out a framework for thinking about provision of public services when
  - social benefits are not contractible
  - the social cost/benefit decision rests on the expertise of decentralized private information of providers
  - there are heterogeneous providers some of whom are motivated (potential social entrepreneurs)
- Unlike our previous work on motivated agents, this paper has shown that in the mission alignment dimension, there is typically a need for incentives only for motivated agents and not for standard (greedy agents).

  - This is because we have focused on a different aspect of the problem (mission alignment rather than effort provision).

- Under fairly strong assumptions – wealth endowed social entrepreneurs can achieve first best provision

  - but the circumstances as brought out here are quite specific.