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Pro-Social Motivation and Incentives*

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Abstract

This paper explores the role of incentives in providing goods and services that have significant social returns not captured in private returns which tend to be in environments where outcomes and performances are not easy to measure, and pro-social motivation plays an important role. We discuss how the presence of pro-motivation among agents involved in the provision of these goods and services changes the design of incentives. The paper also emphasises how heterogeneous pro-social motivation puts a premium on selection of agents in this context. We also discuss alternative theories of pro-social motivation.

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“And hence it is, that to feel much for others and little for ourselves, that to restrain our selfish, and to indulge our benevolent affections, constitutes the perfection of human nature; and can alone produce among mankind that harmony of sentiments and passions in which consists their whole grace and propriety.” Adam Smith, *The Theory of Moral Sentiments*, 1759 part 1 chapter 1.

1 Introduction

One of the central functions of effective polities is to organize the provision of goods and services which have large social returns above any private returns. If left to market-based price incentives, they will be under-provided. This underpins the traditional belief that markets are the most efficient way of producing private goods, while the government takes care of public goods and services while also correcting a range of market failures.

This view is no longer tenable for, at least, two reasons. First, a large body of evidence has accumulated on government failure due, for example, to corruption, waste, absenteeism, and poor quality of service.¹ Second, the increasing importance of private social-sector organizations such as non-profits, NGOs, and social enterprises as well as hybrid organizational forms such as public-private partnerships, and contracting-out, make it too restrictive to equate the provision of public goods and services with provision through government agencies.

There is a need therefore to shift the focus away from government versus market provision and instead look at the wider incentives that providers face, in order to generate insights into how public goods and services should be provided. Studying this requires a better understanding of the frictions that prevent an efficient allocation of goods and services with significant social returns.

This review builds a framework to develop the main ideas in an emerging literature that studies incentives in organizations with three core features: (i) the good or service being produced has a significant social component that is not captured by its market value; (ii) outcomes and inputs are difficult to measure; and (iii) some of those whose effort is needed are “motivated agents”, i.e. care about the output that they produce.²

¹See, for example, the World Development Report (2004) and Finan et al (2017).

²We depart from the standard models of agency in exploring non-pecuniary motivations

Outside of economics, exploring the implications of pro-social motivation would need scant justification. But there is a strong tradition of putting self-interest at the core of economic models. However, as the quote from Adam Smith at the beginning suggests, he was acutely aware of the importance of wider forms of motivation. Our focus fits into a broader line of research that models motivation beyond more standard selfish goals.³

The review develops an organizing framework for studying the link between motivation and incentives. It joins the theory of contracts and organizations with the focus in public economics focus on providing goods and services with social benefits efficiently. The literature on contracts and organizations has been careful in delineating frictions that are due to imperfect observability and contractibility and the attendant agency problems that they create. But the focus has mainly been on production of outputs where costs and benefits of actions are reflected in profits. Public economics has studied the importance of public good elements such as non-excludability and non-rivalry. However, it has traditionally spent little time on understanding the contracting frictions which underpin the reason why there is a “public” component in the first place. That said, Coase (1960) pointed out long ago that the problem of public goods provision is fundamentally grounded in the difficulty of creating property rights for those who gain or lose, along with problems of what in the language of modern contract theory would be called measurability and contractibility.⁴

In our benchmark model, an organization is charged with the deliver-

of agents, but after taking these motivations into account, they are assumed to make choices subject to constraints exactly as in standard economic models. As a result, the standard features of rational choice theory will apply – for example, more choices will not make an agent worse off. This distinguishes our approach from that of behavioral economics.

³See, for example, Akerlof and Kranton, (2010), Benabou and Tirole, (2006), Besley and Ghatak, (2005), Bowles, (1998, 2016), Kamenica, (2012), Murdock, (2003), and Sen (1977).

⁴While our focus will be on applications where there are social benefits that are external to the organization, it can also be applied to cases where these benefits are largely be localized to the organization and are valued mostly by those who are associated with the firm. For example, a commercial research laboratory, an elite school, a sports club, or an artistic organization may all produce something that have some public good component, but that is unlikely to be significant. However, the stakeholders may care about the benefits over and above any pecuniary aspects of their involvement (e.g., employees, alumni, fans) and the other two features may well apply - agency problems and presence of motivated agents.

ing a good or service with social costs or benefits. It must design an incentive scheme for its workers whose efforts determine the quality of the output. Workers may share the values of the organization, embodied in a form of pro-social motivation. We extend the benchmark model to incorporate measurement difficulties in the quality of the output, the possibility of multi-tasking considerations, and the selection of agents. We also explore alternative forms of non-pecuniary motivation: commitment to a mission, conforming to an identity, having reputational concerns, pursuing status and being altruistic.

Although the approach is stylized, its logic is useful in a range of applications such as providing education, health-care, prisons or policing. In all such cases, given the presence of social objectives such as equal access, or externalities, the level of provision would fall short of socially desired levels if it is left to the market. Organizations that are set up to provide such services are populated by teachers, doctors, nurses, prison guards or police whose professional ethics play a key role in shaping their behavior along with a commitment to making the organization successful. Although direct public provision plays a core role in these cases, some public services are also provided by NGOs and non-profit organizations and the ideas developed here are applicable for these examples too. Even in standard private for-profit firms, there are many aspects of business activity which have value not captured by profit; firms must choose how far they pollute the environment or support disadvantaged communities. Harnessing pro-social motivation may also be relevant here.⁵

Two robust messages emerge from the framework. First, non-selfish motivation and financial incentives are most often substitutes, justifying the limited use of monetary incentives in such contexts. Second, selection of agents based on their pro-social motivation matters for efficient provision; having a workforce that is committed to a pro-social cause may have beneficial consequences. This suggests a greater need to focus on a wider definition of human capital which includes commitment to pro-social goals.⁶

The wider policy context for this review is the perennial search by governments all over the world for more effective ways of delivering public services. Just how far standard payment-by-results is warranted has been at the cen-

⁵See Besley and Ghatak (2007, 2017a) and Hart and Zingales (2017) for topics such as corporate social responsibility and social enterprise that are relevant in this context.

⁶Ashraf and Bandiera (2017a) formulate this around the idea of altruistic capital.

tre of debates which began in the early 1990s spearheaded by works such as Osborne and Gaebler (1992) that focused on reforming the public sector and administrative services. The so-called “New Public Management” which was popular at the time suggested the possibility of an increased use of financial incentives. This led to a range of policy experiments many of which have proven controversial in part because they were viewed as an affront to the traditional ethos of the public sector where it is assumed that frontline workers are pro-socially motivated.⁷ Finan et al (2017) provides an excellent review of the state of knowledge in this area, particularly the set of papers based on evidence from field experiments on the use of incentives in the provision of public services, mostly looking at evidence from developing countries.

The remainder of the paper is organized as follows. In the next section, we review some of the background ideas relating to motivation in the context of public goods provision. Section 3 lays out a basic approach to study motivation in a canonical principal-agent problem and considers some extensions. Section 4 then looks at different models of motivation that can be represented in the framework. Section 5 outlines some unresolved issues and future directions for research.

2 Motivation and Public Service Provision

The broad idea of motivation in the context of public goods and services relates to a wider literature on the nature of motivation in economics. Bowles (2016) has emphasized the importance of pro-social motivation in a wide variety of situations including in market contexts. He also emphasizes, particularly in Bowles (1998), that pro-social preferences are endogenous and depends on the socialization of citizens. Other commentators, such as Sandel (2012), have emphasized how different means of allocating resources – e.g., making greater use of markets and financial incentives – can affect the kind of societal values that emerge.

Having motivated public servants at the core of public service delivery is central to many sociological accounts of bureaucracy. Both Weber (1922) and Durkheim (1956) saw commitment to public service as the *sine qua non* of effectively functioning bureaucracies which deliver services to their citizens. The idea of mission motivation in public bureaucracies is also emphasized in

⁷See LeGrand (2003) for a discussion of these issues.

Wilson (1989) and Tirole (1994). This contrasts with the standard economic theory of bureaucracy based on self-interest as developed in Niskanen (1972).

There is no ample evidence of differences in motivation between sectors of the economy. Dur and Zoutenbier (2014, 2015) find strong evidence for greater altruism of workers that select into public sector occupations in cross-country data and in the German Socio-Economic Panel. Barr et al (2011) uses two proxies for intrinsic motivations based on a survey-based measure of the health professionals' philanthropic motivations as well as one based on an experiment to measure pro-social motivations. They find that both proxies predict health professionals' decision to work in the non-profit sector. Gregg et al (2011) show that individuals who work in the non-profit sector undertake more unpaid overtime than those who are employed in for-profit firms, giving evidence of stronger motivation to work for non-profit goals by some workers.

Our core formulation of pro-social motivation is essentially identical to the idea of “warm-glow” in the literature on charitable donations (see, for example, the discussion in Andreoni, 2006). This is distinct from the standard model of altruism in economics because the utility that individuals receive is intrinsically linked to a person's involvement in a pro-social activity. With warm glow an individual cares about their own donation over and above the public goods that it funds. In our framework a worker cares about her contribution to a firm intrinsically over and above the output that it produces.

Pro-social motivation as conceived of here can be thought of as a part of the professionalization of public bureaucracies and public service delivery. Part of this is formulating a code of conduct that is internalized in the preferences of workers. There are examples where the codes are written explicitly.

The Law Society of England and Wales specifies the following code of conduct for its members as follows:⁸

Ethics involves making a commitment to acting with integrity and honesty in accordance with widely recognized moral principles.
Ethics will guide a professional towards an appropriate way to behave in relation to moral dilemmas that arise in practice.
Ethics is based on the principles of serving the interests of consumers of legal services and of acting in the interests of the ad-

⁸See <http://www.lawsociety.org.uk/support-services/ethics/>

ministration of justice, in which, in the event of a conflict, acting in the interests of the administration of justice prevails.

All of these are explicit exhortations to put values above self-interest.

The medical profession is also explicit about the values that professionals should adhere to. Perhaps the most famous statement of this is the Hippocratic Oath⁹ which states, among other things, that:

I will apply, for the benefit of the sick, all measures which are required, avoiding those twin traps of over-treatment and therapeutic nihilism...I will remember that I remain a member of society, with special obligations to all my fellow human beings, those sound of mind and body as well as the infirm...If I do not violate this oath, may I enjoy life and art, respected while I live and remembered with affection thereafter. May I always act so as to preserve the finest traditions of my calling and may I long experience the joy of healing those who seek my help.

The reference to the “joy of healing” in this quote is closely aligned with the idea of warm glow in agent motivation.

Our concept of agent motivation in public service contexts mirrors the idea of a public service ethos. Survey-based approaches, such as Perry (1996), have developed structured questionnaire for measuring this using six categories that try to elicit attitudes intended to measure having an outlook on life which is indicative of greater public service orientation: attraction to policy making; commitment to the public interest; social justice; civic duty; compassion; and self-sacrifice. These can be used to construct an overall measure of the strength of public service motivation. Moynihan and Pandey (2007) show that are strong correlations between organizational form and the kinds of measures of motivation that form the basis of these “Perry Scores”. Dal Bo et al (2013) use these measures in their study of the selection of bureaucrats in Mexico as part of a recruitment drive where they study whether higher wages led to selection of more able and/or motivated workers.

The notion of a mission-oriented organization staffed by motivated agents corresponds well to many accounts of employees in non-profit organizations. Weisbrod (1988) observes that

⁹This version was written in 1964 by Louis Lasagna, Academic Dean of the School of Medicine at Tufts University, and is used in many medical schools today.

“Non-profit organizations may act differently from private firms not only because of the constraint on distributing profit but also, perhaps, because the motivations and goals of managers and directors ... differ. If some non-profits attract managers whose goals are different from those managers in the proprietary sector, the two types of organizations will behave differently.” (page 31).

He also observes that

“Managers will ... sort themselves, each gravitating to the types of organizations that he or she finds least restrictive – most compatible with his or her personal preferences” (page 32)

He goes on to cite evidence to support the idea that such sorting is important in practice in the non-profit sector. For example, Ballou and Weisbrod (2002) state that “(w)hile the compensating differentials may explain why levels of compensation differ across organizational forms, it does not explain the differentials in the use of strong relative to weak incentives.”

3 Motivation and Incentives

This section develops a stylized model of motivation and incentives with three features. First, the service being produced generates a non-pecuniary social benefit that is not reflected in the profit of the organization. This captures a classical externality such as environmental protection, prevention of communicable disease, social benefits from primary education or policing. It could also be motivated by a goal of minimum provision in basic healthcare, education or housing. Second, these benefits are measured imperfectly limiting their use incentive contracts. Third, the employees are willing to commit more effort “for free” in a pro-social cause.

3.1 Benchmark Model

The precise formulation developed here is based on the model in Besley and Ghatak (2005). However, there are several closely-related formulations including Delfgaauw and Dur (2008), Francois (2000, 2007), Francois and Vlassopoulos (2008), Hagen (2006) and Prendergast (2003, 2007, 2008) which develop the idea of the importance of non-pecuniary motivation in organizations, particularly those that provide public services.

3.1.1 Projects

Consider an organization with a single employee (the agent) who is entrusted with carrying out a task with a binary outcome, $y \in \{0, 1\}$ where $y = 1$ denotes “success” and $y = 0$ denotes “failure”. The agent’s effort is normalized to be the probability of success and is denoted by $e \in [0, 1]$. The disutility of effort is $e^2/2$, i.e., it is quadratic in effort.

Success yields a financial return π and a social return S . The latter is the sum of returns to a community of N “beneficiaries”, i.e.

$$S = \sum_{i=1}^N s_i.$$

Thus the total payoff V is:

$$V = \begin{cases} S + \pi & \text{if } y = 1 \\ 0 & \text{if } y = 0. \end{cases}$$

We assume $V > 0$. In many applications, $\pi = 0$ (e.g., provision of some basic services like primary health or primary education where revenues are set only to cover cost) so that there are no profits associated with success and failure.¹⁰

Example 1: In a health care application the agent might be a doctor or a nurse whose actions affect the well-being of patients including those who may not be able to afford treatment.

Example 2: In an application to the justice system, the agents might be legal professionals such as judges or lawyers, who care about fairness of the outcome.

Key decisions are made by a principal who acts as a “trustee” on behalf of the beneficiaries. She has access to financial resources, e.g., from taxation, a financial endowment, or donations. Her objective function is

$$W = e V - C$$

where C is the financial cost of provision. The only element of costs that we focus on are wage payments with all other costs normalized at zero.

¹⁰In some applications, it may even be reasonable to suppose that $\pi < 0$, i.e., the organization makes negative profits funded by an endowment or other source of funds.

This formulation implies payments to agents are viewed as costs. Thus, even if providers get some utility due to their pro-social motivation, the principal does not value this directly. Thus, the approach that we are using is similar to the study of political agency problems where the view taken is that any rents that politicians get from delivering policies on behalf of voters are not welfare-relevant with the focus being exclusively on the welfare of voters.¹¹ The parallel to this idea in our setting is that we care only about the benefits that running public services delivers for their beneficiaries (who may also be tax payers or pay a service-fee) but not the utility that providers receive. Thus, even if doctors do experience a “joy of healing” we do not allow such payoffs to be used in deciding how to run the health system.

3.1.2 Agents

The payoff of the agent, who bears the disutility of effort, is

$$w + e(b + \theta) - \frac{e^2}{2}$$

where w is a flat component of her pay, b is an output-contingent aspect of her pay, and we refer to θ as motivation - the non-pecuniary payoff the agent gets when the task generates a successful outcome. Having $\theta > 0$, is the essence of agent motivation in this setting. Crucially, we attach motivation not just to working an organization but to good performance.¹²

We allow θ to vary in the population with I potential types, indexed by i , where

$$\theta_I \geq \theta_{I-1} \dots \geq \theta_1 = 0.$$

Thus, a higher index i corresponds to greater non-pecuniary motivation. Let γ_i be the fraction of agents in the population of type i . Below we will mostly use a two-type set up with $\theta \in \{0, \bar{\theta}\}$ where $\bar{\theta} > 0$, a fraction γ of agents being motivated, and the remaining fraction $(1 - \gamma)$ are unmotivated or selfish. We will focus on the case where $\theta_I \leq V$, i.e. even the most motivated agent does not fully internalize the value of the marginal social surplus.

We interpret θ_i as warm glow motivation rather than conventional altruism. It is the fact that the warm glow is aligned with effort that produces a

¹¹See Besley (2006) for a discussion of such models.

¹²Our results are not significantly affected if in addition to this, there was a flat (not outcome-contingent) component of motivation, relating to the rewards of entering certain occupations.

higher payoff for the beneficiaries which makes this pro-social motivation. A conventional model of altruism would associate θ_i with the gains from beneficiaries as embodied in S . Section 4.6 discusses the implications of this formulation.

We will focus initially on the case where θ_i is observable, thus setting aside issues of self-selection by workers in particular occupations. This issue is discussed in section 3.2.3 below.

3.1.3 Full Information

Consider first an environment in which the principal can write a contract with the agent that specifies the level of effort. In this case effort will be set to maximize the payoff of the principal who is assumed to act on behalf of the beneficiaries:

$$e^{**} = \arg \max_e \left\{ e V - \frac{e^2}{2} \right\} = V.$$

Since e is a probability, we normalize so that $V < 1$. This is the first-best level of effort and serves as a benchmark. Achieving this effort level need not depend on being able to contract directly over effort. If the outcome can be measured then it suffices to offer the agent a reward of $V - \theta$ to get the optimal effort level. Parallel to the concept of a “residual claimant” in the context of financial profits, we call this making the agent a “social residual claimant” since in such cases, she captures the full marginal social benefit from her effort.

We need to be sure that any arrangement respects the participation constraint of the agent. To explore this formally, suppose that the outside option is worth \bar{u} . To satisfy this, the principal has the option to offer a payment of w (which can, in principle, be negative). Then the agent’s payoff at e^{**} will be:

$$e^{**} V - \frac{e^2}{2} + w = \frac{V^2}{2} + w.$$

Now w can be adjusted to ensure that $\frac{V^2}{2} + w = \bar{u}$. If \bar{u} is very low then we would need to set $w < 0$, to make the participation constraint bind. In this case, the agent pays a “franchise fee” to the principal to work in the organization which increases the beneficiaries payoffs. This is like a case where an NGO provides a government service and uses donations or its endowments to pay some of the cost. The payoff to the principal who acts

on behalf of the beneficiaries is then

$$e^{**}V - w = V^2 - w = \frac{V^2}{2} - \bar{u}.$$

Setting $w < 0$ to reduce the agent to \bar{u} may not be an option if the agent has limited wealth.¹³ In this case, the agent will earn a rent. Such rents are not desirable given that the principal wishes to provide the service as least cost. This is the most natural case in most applications and so from now onwards we focus on the cases where the agent has no wealth.

Our focus on warm-glow pro-social motivation does affect the participation constraint of the agent compared to a case of pure altruism. This is because the agent gets her warm glow utility only if *she* is employed to provide the service. However, a pure altruist would value the project even if another agent is employed to deliver it thus affecting her perception of the outside option. We will examine the implications of this formulation in section 4.6.

3.1.4 Information Frictions

We now explore the case where effort cannot be observed and hence specified as part of the contract. This is the case studied in classical principal-agent problems. The principal now offers a compensation package to an agent whose motivation is θ that consists of two parts - a bonus, b , that is paid only when $y = 1$, and a fixed wage component, w .

The principal now solves the following problem:

$$\max_{\{b,w\}} (V - b)e - w \tag{1}$$

subject to:

(i) the *incentive constraint* which stipulates that the effort level maximizes the agent's *private* payoff given (b, w) :

$$e = \arg \max_{e \in [0,1]} \left(e [b + \theta] + w - \frac{e^2}{2} \right) = b + \theta.$$

(ii) the *participation constraint* of the agent that requires the agent's expected payoff is at least as high as his outside option:

$$e(b + \theta) + w - \frac{e^2}{2} \geq \bar{u}. \tag{2}$$

¹³Capital markets would not help as lending money to agents to buy such franchises would then lead to an agency problem between the agent and the lender.

To these we need to add a limited liability constraint to rule out the case where the principal franchises the project to her (as described above), thereby achieving the full-information outcome. Hence we assume that, in any state of the world, the agent's income cannot be below a certain level \underline{w} , where $\underline{w} \geq 0$. Formally this is:

(iii) a *limited liability constraint* requiring that the agent be left with at least \underline{w} :

$$b + w \geq \underline{w}, w \geq \underline{w}. \quad (3)$$

For simplicity, we set $w = \underline{w} = 0$ in what follows. This reflects the assumption of limited wealth that we mentioned before, and the fact that non-pecuniary penalties are ruled out.

In choosing the level of financial incentives, the principal faces a trade-off between providing incentives to the agent (setting b higher) and keeping costs of provision low. The outside option of the agent plays an important role in determining b . As is standard in these models, the fixed wage will be set at as low a level as possible (which happens to be $\underline{w} = 0$) since a higher wage has no effect on effort and so if the principal wants to reward the agent more, it is better to raise the bonus b .

There are two cases that can arise depending on whether the participation constraint is binding.

Suppose first that the participation constraint is not binding. Recognizing that $e = b + \theta$, the principal will choose the bonus to solve

$$\max_b (V - b)(b + \theta).$$

This yields $b = \frac{V-\theta}{2}$ and an effort level of $\frac{V+\theta}{2}$. So the principal sets incentive pay equal to half the difference in the societal valuation and the agent's valuation of success. Effort increases with θ but not one-for-one as the principal will adjust incentives in part to offset the effect of greater pro-social motivation. Since the agent is motivated, there is less need for a financial incentive.

The expected payoff of the principal in this case is $(V - b)e = \left(\frac{V+\theta}{2}\right)^2$ while that of the agent is $e(b + \theta) - \frac{e^2}{2} = \frac{(V+\theta)^2}{8}$. This will be the contract offered by the principal as long as the participation constraint of the agent is not binding, i.e.

$$\frac{1}{8}(V + \theta)^2 \geq \bar{u}. \quad (4)$$

which depends on V and θ being high enough relative to the outside option \bar{u} . Therefore, when the reservation payoff is low and the participation constraint does not bind, the agent earns an on-the-job rent which is increasing in θ .

If (4) does not hold the participation constraint is not satisfied when then $b = \frac{V-\theta}{2}$ and we have solve for b directly from the participation constraint, i.e. $\frac{1}{2}(b + \theta)^2 = \bar{u}$. The optimal incentive pay, in this case, is set by the outside option but with a discount to reflect the agent's motivation. Putting this together yields the following expression for the optimal financial incentive for providing the service:

$$b^* = \begin{cases} \frac{V-\theta}{2} & \bar{u} \leq \frac{1}{8}(V + \theta)^2 \\ \sqrt{2\bar{u}} - \theta & \text{otherwise.} \end{cases}$$

Whether or not the participation constraint binds, financial incentives and motivation are substitutes, i.e. a higher value of θ corresponds to lower b .

The corresponding effort level is given by:

$$e^* = \begin{cases} \frac{V+\theta}{2} & \bar{u} \leq \frac{1}{8}(V + \theta)^2 \\ \sqrt{2\bar{u}} & \text{otherwise.} \end{cases}$$

We saw that effort is increasing in θ when the participation constraint is not binding. However, when constraint is binding, then the effort put in by the agent is independent of θ ; there is an one-for-one crowding out of incentives as the agent becomes more motivated. However, agent motivation is still beneficial as it reduces the cost of employing the agent.

The expected payoff of the agent in this case is $\max\{\frac{1}{8}(V + \theta)^2, \bar{u}\}$ while the expected payoff to the principal is:

$$W(\theta) = \begin{cases} \frac{[V+\theta]^2}{4} & \bar{u} \leq \frac{1}{8}(V + \theta)^2 \\ \sqrt{2\bar{u}} [V + \theta - \sqrt{2\bar{u}}] & \text{otherwise.} \end{cases} \quad (5)$$

This is increasing in θ as is expected from the discussion above.

We now draw out four implications of the basic model.

First, the framework underpins the importance of pro-social motivation, such as the notion of “public service ethos” which we discussed above. Even when the participation constraint binds, there is a benefit from hiring a motivated agent is that effort can be elicited at lower cost. Equation (5) shows that the expected social payoff is increasing in θ whether or not the

participation constraint binds. Having a more motivated agent is always better for the beneficiaries as it lowers cost of provision.¹⁴

Second, the model says that selection on motivation matters and affects the contracts that agents receive. Since θ is observable, the principal can tailor the bonus to the type of agent who has been hired. More motivated agents receive a lower bonus payment and yet produce higher effort. So the public service ethos is valuable to the efficiency of provision. This does, however, raise the issue of self-selection when θ is unobserved which we will explore further in section 3.2.3.

Third, all else equal, motivated agents are more likely to earn an on-the-job rent. Unless the participation constraint binds more motivated agents earn greater on-the-job rents than less motivated agents. This rent comes from directly valuing the work that they do. Thus we would expect motivated agents to report higher levels of job-satisfaction. This is indeed consistent with a large empirical literature.¹⁵

Fourth, as in standard principal-agent models monetary incentives still elicit more effort. Hence the model does not result in monetary incentives crowding out effort. A useful way of thinking about the difference between a standard model of material motivation and the one with pro-social agent motivation is as follows. Since $e = b + \theta$, the elasticity of effort with respect to rewards is lower for more motivated agents. Hence, less incremental effort is created for each successive increment of financial rewards.¹⁶ To see this formally, note that from the incentive-constraint $e = b + \theta$ so that:

$$\frac{\partial \log e}{\partial \log b} = \frac{b}{b + \theta},$$

which is decreasing in θ . Although the model does not display crowd-out of effort with incentives, there is a “cross-sectional” implication which looks similar to this. Suppose that there are different organizations with agents having different levels of θ . Then those with higher θ will have lower incentives and higher effort. Hence higher incentives will be associated with lower effort even though the relationship is not causal.

¹⁴There is a large literature on the difference between public and private sector wages which bears directly on this. In general, there is heterogeneity across groups of workers and countries – see, for example, Postel-Vinay (2015) for discussion.

¹⁵See, for example, Ritz et al (2016) for a recent review.

¹⁶Prendergast (1999) emphasises how the provision of incentives in firms depends on the size of this elasticity.

3.2 Extensions

In this section we consider three extensions to the benchmark model of incentives with motivated agents that are relevant in organizations whose output generates social returns.

3.2.1 Poor Measurement

While measuring output is an issue in all sectors, these difficulties are particularly acute in public service provision; there are well-known difficulties of doing this reliably in health systems (see, for example, Propper and Wilson, 2012) and in education (Woessman, 2016). The framework that we are using can encompass these considerations incorporating insights from those who have explored measurement problems in principal-agent problems such as Baker (1992).

To explore this, suppose that $\pi = 0$, so that there is no signal of success or failure coming from financial flows. We also continue to set $w = \underline{w} = 0$.

Suppose then that, rather than observing y or V directly, the principal receives a signal of whether there is success or failure which we denote by $\sigma \in \{0, 1\}$ where

$$\text{Prob}\{\sigma = 1 : y = 1\} = \rho = \text{Prob}\{\sigma = 0 : y = 0\} \geq 1/2.$$

It is possible to observe failure when there is success and vice versa and a higher value of ρ denotes a better signal: there is perfect measurability when $\rho = 1$ and when $\rho = 1/2$, the signal is completely uninformative about whether there is success and hence not usable to incentivize the agent.

Rewards to the agent can only be made to depend on σ and not on y . The agent's expected payoff is now

$$[e\theta + \{e\rho + (1-e)(1-\rho)\}b] - \frac{1}{2}e^2.$$

The incentive constraint is:

$$e = \theta + (2\rho - 1)b.$$

Thus, effort is increasing in the quality of the signal, ρ , for any given level of the financial incentive. However, for $\rho < 1$, financial rewards elicit less effort. This will make using such rewards less attractive and if $\rho = 1/2$, financial incentives serve no purpose at all.

The principal's expected payoff is now:

$$[eV - \{e\rho + (1 - e)(1 - \rho)\}b].$$

Substituting e from the incentive-constraint, and focusing on the case where the participation constraint does not bind, the principal chooses b to solve:

$$\max_b [\{\theta + (2\rho - 1)b\} \{V - b(2\rho - 1)\} - (1 - \rho)b].$$

This yields the following first-order condition for the choice of b for an agent with motivation θ :

$$b^* = \max \left\{ \frac{1}{2(2\rho - 1)} \left(V - \theta - \frac{1 - \rho}{2\rho - 1} \right), 0 \right\}.$$

This immediately implies that measurement problems deter the use of financial rewards. The threshold for incentive pay is now $V > \theta + \frac{1 - \rho}{2\rho - 1}$ compared to $V > \theta$ when measurement is perfect. Even if $\theta = 0$ it may be optimal not use financial incentives.

Thus, this extension of the basic model explains precisely the logic of why poorer measurement of output in the provision of public services can also explain why financial incentives are used relatively rarely in such instances. This dovetails well with some of the ongoing policy discussions about using pay-for-performance in public services. A good example is the case of teacher incentives where there are doubts about whether having a testing regime for pupils is a sufficiently accurate basis for introducing performance-related pay. However, it is possible that deciding to introduce bonus pay is accompanied by attempts to improve the measurability of outcomes through new systems of performance management (increasing ρ). In this sense measurement of output and bonus pay can be complements.

This discussion of measurement issues reinforces more strongly why societies rely so heavily on pro-social motivation rather than incentives. If $b^* = 0$, then $e = \theta$ and the only way to elicit effort is through employing agents in providing the service who are motivated by the concerns about the beneficiaries. This further underlines why appealing to a public service ethos and professional ethics is deemed so important in promoting the effective provision of public services. It formally illustrates the rationale for the idealized notion of a Weberian bureaucracy staffed by motivated agents.

3.2.2 Multi-tasking

Multi-tasking is another frequently-cited reason for economizing on incentive pay in public services. As we shall see, it is also linked to measurement of outputs. Public service occupations rarely involve one-dimensional tasks. For example, school teachers are not just responsible for making sure that students do well in tests, but also for fostering a spirit of curiosity and instilling desirable social values. Considerations of multi-tasking are therefore often quite relevant in incentive design. Here too, there is no qualitative difference between public service provision, and the market economy. However, without prices to reflect the importance of tasks to the organization, it is difficult to create appropriate performance measures of the relevant outcomes based on profit incentives.

All work on multi-tasking owes a debt to the classic paper of Holmström and Milgrom (1991) who showed that using incentive pay based on the output of one task may induce the agent to substitute away effort from other tasks where output is harder to measure, which may be detrimental to the principal's interest. They argued that incentive pay is less likely to be used even if measurement of outputs associated with some tasks are well-measured because of inter-dependence between the tasks. Dixit (2002) emphasizes the importance of multi-tasking in public service settings and how these reduce high-powered financial incentives.¹⁷ Here, we bring these insights to bear by extending the core framework above to incorporate these ideas maintaining a focus on the importance of pro-social motivation in incentive design.

In the benchmark model, more effort made both π and S more likely and so there was no trade-off between financial and social objectives. A multi-tasking model gives a canonical way to study such a trade-off. For example, if a school reward teachers only on the test scores of their students, they are likely to cut down the efforts aimed at imparting skills such as curiosity and civic values that are hard to measure but important nevertheless. Overall the outcome may end up being less desirable than if they are paid a flat wage.

To see this more formally, suppose there are two tasks whose output measures are $y_1 \in \{0, 1\}$ and $y_2 \in \{0, 1\}$. The agent has to put in two types of effort in these two tasks, e_1 and e_2 , and the cost of effort for each task is $\frac{1}{2}(e_1^2 + \delta e_1 e_2)$ and $\frac{1}{2}(e_2^2 + \delta e_1 e_2)$, where we assume that $1 > \delta > 0$. This assumption implies that the tasks are substitutes since committing more effort to one task increases the marginal cost of effort committed to the other

¹⁷He also considers the importance of multiple principals in this context.

one.

We suppose that the principal values success in both tasks taking into account both financial and social payoffs. The marginal benefits from higher effort in each task will be denoted by V_1 and V_2 for task 1 and task 2 respectively. The agent too derives is motivated in relation to both tasks receiving a non-pecuniary benefit from success in each task, denoted by θ_1 and θ_2 . Although there is an element of pro-social motivation, this may not be perfectly aligned with goals being pursued by the principal in terms of the absolute and relative importance assigned to each task.

The principal can now reward each task different with a financial incentive for success in each task being denoted by b_1 and b_2 . We focus on the case there the participation constraint does not bind and also where $w = \underline{w} = 0$. As in the previous section, we allow the outcome to be mis-measured. However, we focus on this only in relation to one task: for task 2 there is a signal $\sigma \in \{0, 1\}$ such that

$$\text{Prob}\{\sigma = 1 : y_2 = 1\} = \rho = \text{Prob}\{\sigma = 0 : y_2 = 0\} \geq 1/2.$$

Output in task 1 is assumed to be measurable perfectly. Although this is an extreme case, it will serve to illustrate somewhat precisely why having effort on both tasks as substitutes and only one task being subject to measurement problems affects the way that incentives are crafted for both tasks, lowering the using of bonuses across the board.

The agent will now maximize

$$(b_1 + \theta_1)e_1 + b_2\{\rho e_2 + (1 - \rho)(1 - e_2)\} + \theta_2 e_2 - \frac{1}{2}e_1^2 - \frac{1}{2}e_2^2 - \delta e_1 e_2$$

by choosing e_1 and e_2 . This yields the following first order conditions:

$$\begin{aligned} b_1 + \theta_1 &= e_1 + \delta e_2 \\ b_2(2\rho - 1) + \theta_2 &= \delta e_1 + e_2. \end{aligned} \tag{6}$$

The principal's problem is now to choose b_1 and b_2 to maximize:

$$(V_1 - b_1)e_1 + V_2 e_2 - \{\rho e_2 + (1 - \rho)(1 - e_2)\} b_2.$$

subject to (6)¹⁸ Solving this yields:

$$\begin{aligned} b_1^* &= \frac{1}{2} \left[(V_1 - \theta_1) - \delta \frac{(1 - \rho)}{2\rho - 1} \right] \\ b_2^* &= \frac{1}{2(2\rho - 1)} \left[(V_2 - \theta_2) - \frac{(1 - \rho)}{2\rho - 1} \right] \end{aligned}$$

assuming an interior solution.¹⁹

This multi-tasking model generates a number of additional insights on the design of incentives with motivated agents. If there is no substitutability in the tasks, i.e. $\delta = 0$, then there is no interdependence in the way that they are incentivized and the factors that we have discussed above, agent motivation and measurement apply to each task separately. The tasks are also separated if $\rho = 1$, i.e. there is no measurement error in either task. Hence, any new features are due to $\delta > 0$ and $\rho < 1$. Now we find that measurement error in task two “spills over” to task one, flattening incentives across the board. This is a standard result in multi-tasking models. Here, it highlights how having poor performance measurement can contribute to overall flat incentives of the kind that are often seen for tasks in organizations with pro-social missions. As $\rho \rightarrow 1/2$, it is not optimal to incentivize either task. Then the organization will rely exclusively on agent motivation in both tasks.²⁰

3.2.3 Selection and Incentives

We now turn to selection and incentives. This is a natural concern in environments which rely on employing agents who care about the outcome directly.

¹⁸Simultaneously solving for e_1 and e_2 , we can obtain the following expressions for effort as a function of motivation levels and bonuses of:

$$\begin{aligned} e_1 &= \frac{b_1 - \delta(2\rho - 1)b_2}{1 - \delta^2} + \frac{\theta_1 - \delta\theta_2}{1 - \delta^2} \\ e_2 &= \frac{(2\rho - 1)b_2 - \delta b_1}{1 - \delta^2} + \frac{\theta_2 - \delta\theta_1}{1 - \delta^2}. \end{aligned}$$

¹⁹A corner solution at zero is possible and will prevail as $\rho \rightarrow 1/2$.

²⁰For the measurement to spillover across tasks, requires that the tasks cannot be unbundled, i.e. performed by different agents. Thus, this result applies only when there is genuine joint production.

But the assumption made so far, that θ , is observable, is too strong. Principals will wish to recruit the most motivated agents to perform a task and many public organizations have elaborate recruitment processes for selecting people with high pro-social credentials for key public service roles. Here we briefly discuss the possibility of designing different remuneration packages to achieve self-selection.²¹ As we shall see, the main issue in the current model is to get the motivated agents to differentiate themselves from selfish agents since the latter will tend to receive higher bonus pay. Intuitively, this imply reducing incentives paid to all types of workers. We will explore to what extent this logic is correct in our framework. As well as choosing different bonus levels, it will also be possible to use different levels of the fixed wage.

We now revert to the benchmark model with measurement problems or multi-tasking elements. To fix ideas we consider only two types of agents: motivated ($\theta = \bar{\theta}$) and unmotivated ($\theta = 0$) and we use the subscripts ‘ M ’ and ‘ U ’ to label them. We also focus on the case where the participation constraint does not bind for the motivated agent. Using the logic above, if θ is observable, she will receive a bonus $b_M = \frac{V-\bar{\theta}}{2}$ and puts in a higher level of effort $e_M = \frac{V+\bar{\theta}}{2}$. The unmotivated agent will receive $b_U = \frac{V}{2}$ and commit effort $e_U = \frac{V}{2}$. What creates a self-selection dilemma is the fact that motivated agents are treated less well as than unmotivated agents, i.e. receiving lower pay.

To explore the case where agents’ types are private information, note that the expected payoff of the motivated agent from the remuneration package above is $\hat{u}(\bar{\theta}) = \frac{(V+\bar{\theta})^2}{8}$ which we have assumed exceeds \bar{u} . For an unmotivated agent, the expected payoff is $\hat{u}(0) = \frac{(V)^2}{8} < \hat{u}(\bar{\theta})$. But will this induce agents to reveal their type truthfully?

If a motivated agent masquerades as an unmotivated agent and chooses the contract $b = \frac{V}{2}$ then the effort level will now be $e'_M = \frac{V}{2} + \bar{\theta}$ which exceeds e_M . And her expected payoff is $\frac{1}{2} \left(\frac{V}{2} + \bar{\theta}\right)^2$ which exceeds $\hat{u}(\bar{\theta})$. So, as we anticipated, she is better off with the contract intended for a unmotivated type. The reverse is true for an unmotivated agent. Thus all agents will pick the unmotivated agents contract and the motivated agent will get an even higher rent. There are two possible solutions to this: to offer only a single contract (a “pooling contract”) or to adjust the contracts to achieve

²¹See Delfgaauw and Dur (2007, 2008, 2010), and Prendergast (1999).

self-selection. Here we focus on the former.²²

If the outside option, \bar{u} is relatively low, then both kinds of agents earn a rent as long $\hat{u}(0) > \bar{u}$. Now both wish to work for the organization. The principal will now offer $b = \frac{V-\bar{\theta}}{2}$ or $b = \frac{V}{2}$ as the single contract depending on whether motivated or unmotivated agents are more abundant. However, if $\hat{u}(0) < \bar{u}$ then only the motivated workers will join the organization with a bonus of $\frac{V-\bar{\theta}}{2}$. In this case, *de facto* the screening problem is solved by having a sufficiently attractive outside option.²³ If $\bar{u} > \hat{u}(\bar{\theta})$, then the organization will have to offer an expected utility of \bar{u} to both types of agents. Now the participation constraint will bind for both types. Following the logic of the basic model, we will have $b_M = \sqrt{2\bar{u}} - \bar{\theta}$ while $b_U = \sqrt{2\bar{u}}$, and $e_M = \sqrt{2\bar{u}} = e_U$. The self-selection problem for the motivated types now reappears. However, if the only contract put on the table has $b_M = \sqrt{2\bar{u}} - \bar{\theta}$, the screening problem is solved since unmotivated agents will prefer to work elsewhere.²⁴

This illustrates how the screening problem depends on the strength of the outside option. When that is low and both motivated and unmotivated agents will join the organization. As \bar{u} goes up, the screening problem becomes easy to solve. The expected quality of public service provision will therefore be higher as \bar{u} goes up, through better selection on motivation. This is consistent with the empirical evidence in Finan et al, (2017) who show that despite the wage premium of public sector employees being higher in low-income countries than in high-income countries, the quality of provision is significantly lower.

There are many aspects of selection that could be explore. For example, Aldashev et al (2018) develop a model of self-selection where motivational self-selection into the non-profit sectors may be altered by the level of donations received by non-profit firms leading to more selfish workers being induced to work in that sector. Our framework has only a one-dimension

²²See Delfgaauw and Dur (2008, 2010) for an exploration of separating contracts.

²³See Ghatak, Morelli, and Sjöström (2007) about how the outside option affects the screening problem, and how in turn that may affect the outside option.

²⁴If in addition to the non-pecuniary payoffs a motivated agent receives when output is high, she also receives a flat non-pecuniary motivation $\varepsilon\bar{\theta}$ by working in the organization (where ε can be small), then that helps to solve the self-selection problem in the case where the participation constraint binds. The principal can then offer a contract that gives an expected payoff of $\bar{u} - \varepsilon\bar{\theta}$ to the M -type agent which will not yield an expected payoff of \bar{u} to the U -type agent.

difference between agents. However, it is also interesting to contemplate differences in both ability and motivation as has been studied by Delfgaauw and Dur (2010). In such contexts, there is a concern that low wages or incentive pay may appeal to low ability agents as well as those with greater pro-social motivation. Dal Bo et al (2013) and Ashraf et al (2018) provide empirical evidence suggesting higher wages or incentive pay actually selects agents that have both higher ability and are more motivated. This reinforces the importance of giving a prominent role to the study of selection in understanding organizations with wider missions than pure profit.

Our discussion of selection assumes that the alternative to having motivated agents is selfish workers who care only about money. Auriol and Brilon (2014) add an interesting additional dimension by supposing that there can be “malign” workers who get warm glow from destructive behavior.²⁵ The mission-oriented sector then has to monitor to deter such bad workers from working there. In the equilibrium of their model, bad workers work in the profit-oriented sector, which uses monitoring and bonus payments for good behavior increase to control the damage that such workers do.

4 Models of Pro-Social Motivation

The core set-up puts into sharp relief the role of motivation and how it interacts with the use of pecuniary incentives, in shaping organizational effectiveness. In this section, we focus now more on the microfoundations or narratives concerning where the non-pecuniary motivation comes from.

We begin by discussing the idea that motivation comes from agents having strong views about *how* the provision of relevant good or service is organized (“mission preferences”). We then discuss the idea of pro-social motivation related to the sociological concept of “identity”. Next, we explore pro-social motivation as a form of intrinsic motivation. We then consider a foundation based on signaling and reputation. After that, we consider the link between motivation and rewards for status. Finally, we look at the possibility that motivation comes from a case of pure altruism where the agent attaches a weight to the social surplus of the beneficiaries. We illustrate all of these possibilities in the core model developed above.

²⁵They use the example of paedofiles entering the child care sector. In our framework this would be an issue when θ is even higher for this type of worker compared to “good” motivated workers.

4.1 Mission Motivation

To introduce the idea of mission motivation, suppose that there is a variety of projects that can be undertaken denoted by $k = 1, \dots, K$. Associated with each project choice will be a payoff to the community of beneficiaries V_k and a payoff to the i -th motivated agent, $\theta_{ik} \geq 0$. The idea of missions is like a form of product differentiation in which public services can be provided in a plethora of different ways, following an approach introduced in Besley and Ghatak (2005). There are many real-world examples which capture the idea of heterogeneous missions such as differences in views about the nature or priorities in health systems, the kinds of curricula that should be pursued in schools, and what kinds of crime should be the priority of criminal justice and law enforcement systems.

A natural benchmark case would be to suppose that it is the interests of beneficiaries which should take priority over the interests of providers (the agent in our model) when choosing a mission. This naive view would assume that optimal service provision should be governed by choosing k such that:

$$k^* \in \arg \max_k \{V_k\}.$$

However, this ignores the fact that motivation of providers can matter to the efficiency of service provision since, if providers are highly motivated (θ_{ik} is large) for some particular mission, then a project can be undertaken at lower costs that may be well worth funding. More broadly, this highlights the role of diversity of providers in terms of “causes” they are motivated by and having a decentralized approach whereby providers are matched with projects such that their preferences are well-aligned with the mission of the project, as opposed to a top-down centralized approach of public good provision.

To illustrate the ideas further, we focus again on the case where the participation constraint is not binding. Consider a mission k and a motivated agent with preferences θ_{ik} . Then the benefit of the beneficiaries net of the cost of provision is:

$$W^k(\theta_{ik}) = \frac{(V_k + \theta_{ik})^2}{4}$$

and the optimal mission when employing agent i is therefore

$$\tilde{k}(i) \in \arg \max_k \{W^k(\theta_{ik})\}.$$

One striking implication of this is, the interests of the provider should optimally be taken into account even if she is not directly relevant to the

social objective. This is because whether or not the provider likes the mission will affect the cost of employing him/her. This provides a microfoundation for a commonly used way of modeling the objective function of non-profits. For example, Newhouse (1970) models the objective function of non-profit hospitals as depending in part on what physicians want.

We can also endogenize the selection of agents along with missions so that providers are matched to beneficiary priorities. Hence the principal now chooses an $\{k, i\}$ combination that are well-aligned or matched in the sense that the most appropriate agent is chosen to deliver the particular mission that is chosen, i.e.,

$$\{\tilde{k}, \tilde{i}\} \in \arg \max_{\{k, i\}} \{W^k(\theta_{ik})\}.$$

This model opens up the possibility of heterogeneous missions simultaneously being pursued by different providers. This is reminiscent of a Tiebout-style model of local public goods provision where there are competing services provided to cater for different tastes of providers.²⁶

One simple way to illustrate this is for $K = 2$ and two types of agents, $I = 2$. Suppose that

$$\theta_{ik} = \begin{cases} \bar{\theta} & \text{if } i = k \\ 0 & \text{otherwise.} \end{cases}$$

Hence agents are only motivated if they are working with their preferred mission. We assume that $V_1 = V_2$ so that beneficiaries do not care about the mission. Suppose providers of type 1 like mission 1, while providers of type 2 like mission 2.

Now sorting in heterogeneous public organizations reflecting the different kinds of pro-social motivation of providers can increase the expected payoff of the community. To see this formally, note that

$$W = \begin{cases} \frac{[V + \bar{\theta}]^2}{2} & \text{if } i = k \\ \frac{V^2}{2} & \text{otherwise.} \end{cases}$$

In particular, effort in a “matched” organization is $e = \frac{V + \bar{\theta}}{2}$, while it is $e = \frac{V}{2}$ in a mismatched organization. Besley and Ghatak (2005) formalizes how competition among organizations providing the public good for providers

²⁶See, for example, Wooders (1999).

with different mission preferences will lead to perfect sorting and produce the most efficient outcome.

Our framework also underlines the value of diversity in the non-profit sector provided that there is a variety of views on the way in which collective goods should be produced (as represented by the mission preferences). Weisbrod (1988) emphasizes this role of non-profit organizations in achieving diversity in public goods provision. For example, he observes that non-profits will likely play a more important role in situations where there is greater underlying diversity in preferences for collective goods in the population. For example, he contrasts the U.S. and Japan suggesting that greater cultural heterogeneity is partly responsible for the greater importance of non-profit activity in the U.S. Our analysis of the role of competition in sorting principals and agents on mission preferences underpins the role of diversity in achieving efficiency. As argued by Besley and Ghatak (2005), better matched organizations can result in higher effort and output. Hence, diversity may not only be good for the standard reason, namely, beneficiaries get more choice, but also in enhancing productive efficiency.

Our model supposes that the principals who run firms act in the interest of beneficiaries. However, just as there are differently motivated agents, there can be principals with different perspectives. Then instead of the principal being motivated by V , she may have a preference associated with success that reflects a warm-glow from success. This case is particularly relevant, for example, if different potential suppliers can compete to provide a service and the principal is also a donor who provides funding for a service.²⁷ Then any principal with personal wealth can set up an organization to provide a public service. If governments care about beneficiaries, then they can choose to whom they wish to give grants and other kinds of inducements to encourage selection of particular kinds of principals.

4.2 Identity and Motivation

Another way to interpret θ_i is as a reflection of a social identity adopted by a worker when she works in a public-sector organization. Moreover, instead of being fixed and exogenous, as we have assumed so far, it may be governed by actions undertaken by organizations and/or agents. The key insight of

²⁷Scharf (2014) explores warm-glow motives by competing suppliers and shows how this can lead to inefficient selection of non-profits.

Akerlof and Kranton (2005, 2010) in their work on the economics of identity is behavior that economists normally think of as governed by exogenously given preferences and standard trade-offs, such as between labor and leisure, often depend on the self-image of individuals, and their connection with others in a given social context.

Sociological theories have emphasized the social context-dependent nature of behavior. People use “social categories” to describe different roles and the notion of identity describes a person’s self-image which depends on how they conform with or depart from the norms for particular social categories in particular situations. For example, a teacher or a doctor, in dealing with a student or a patient may be governed by some socially governed norms of “good” behavior and departures from it may be costly, even though standard economic models (such as the classical principal-agent framework) would dictate that they simply take the most “self-interested” action.

Identity then corresponds to the self-classification of an individual as well as that of others. In everyday life, such identities include family, gender, race, culture, language, and ethnicity. However, they also affect how people self-categorize themselves in workplace settings. For example, someone who may act in a (narrowly) self-interested way in an anonymous setting may act like a good team-member or a helpful colleague in the workplace. Thus, being pro-social in particular contexts can be part of an assumed identity that then affects behavior.

It is beyond the scope of this paper to discuss these ideas in depth, but we can adapt our basic framework to illustrate some of their obvious implications in the context of how motivation and incentives interact. Suppose that $I = 2$ and that each agent is *ex ante* identical. There is a “default” identify called $i = 1$ where $\theta_1 = 0$. We suppose that an agent can adopt an identity $\theta_2 = \bar{\theta} > 0$. This is a person who identifies and internalizes the pro-social goals of the organization that they are working for, i.e., becomes a motivated agent in the sense of this paper. We will discuss the choice process in more detail below. To start with, we will suppose that it is costless to acquire the identify θ_2 and simply address whether there is indeed a “demand” for a pro-social identity.

To illustrate, we again take the case where the outside option is zero. Now, with $w = 0$, the expected payoff of an agent when $i = 1$, the neutral identity, is $\frac{V^2}{8}$ whereas for the agent $i = 2$, who has the pro-social identity, it is $\frac{(V+\bar{\theta})^2}{8}$.

Hence, it is clear that there are gains to the individual from assuming a pro-social identity when she works for a public service organization, all else being equal. We also saw above, that beneficiaries also benefit. This observation motivates the idea that it could be worthwhile for an organization charged with delivering a public service to commit resources in order to promote a pro-social ethos among its workforce. Equally, agents may themselves be willing to undertake costly actions which create a pro-social identity if they realize that this actually leads to greater utility. In other words, assuming identities can be completely economically rational by allowing people to adapt to the organization in which they work and get more out of being a member of it.

What forms might these actions take? Akerlof and Kranton (2005) give the example of rituals at West Point which are intended to socialize new recruits into being effective military personnel. Training programs upon entering an organization which encourage people to see the benefits that the work of the organization does are commonplace and can be understood as a form of socialization into making employees internalize pro-social objectives. Doctors who take the Hippocratic oath that we discussed above provide another example.

But, more generally, there is a question of how identity formation is a strategic practice rather than an unconscious process of social learning based on interactions with others. One could illustrate this in a simple way. Imagine that a firm can invest in motivational capital at pecuniary cost, m , which affects motivation. We can formally capture this by a function $\theta(m)$ that is strictly concave and increasing with $\theta'(\bar{m}) = 0$ for some $\bar{m} > 0$. To be concrete, this could reflect the amount of resources that go into teaching medical ethics to doctors. Now the organization which is running the public service can choose an optimal investment to maximize its project specific payoff given by:

$$\frac{\{V + \theta(m)\}^2}{4} - m.$$

The first-order condition for the investment in what we can call motivational capital, at an interior solution m^* , is:

$$\theta'(m^*) \frac{V + \theta(m^*)}{2} = 1.$$

Since we assume $\theta(m)$ is strictly concave, the second-order condition for a

global maximum, $2\theta''(m) + \{\theta'(m)\}^3 < 0$ will hold at $m = m^*$. Otherwise, there will be an corner solution where $m = 0$ or $m = \bar{m}$.

We can see right away that a higher value of V encourages investment in motivational capital, as does the elasticity of $\theta(m)$ with respect to m . However, if there was no moral hazard, and the motivational investment was chosen to maximize joint surplus of the organization and the employee, the level of investment would have been higher since the joint expected surplus is $\frac{3[V + \theta(m)]^2}{8} - m$. A more interesting and subtle insight is, if organizations carry out this investment, they may over-invest in motivational capital since if we were to maximize the employee's payoff, then the first-order condition would have been

$$\theta'(m) \frac{[V + \theta(m)]}{4} = 1$$

which implies a lower level of m given the concavity of m .

While this exercise is very simple (for example, it does not consider the social aspect of investing in m , investment by the employees, or the role of competing organizations), it suggests that investment in motivational capital. Understanding better how motivation in organizations is encouraged as part of the firm's human resource management strategy is an important topic for future research.

4.3 Intrinsic versus Pro-Social Motivation

Pro-social motivation as we have modeled can be equated with a certain kind of intrinsic motivation where agents undertake pro-social actions for their own sake or out of a sense of moral duty. Weber (1922) had the idea that some actions are undertaken as expressions of value rather than because of the ends that they achieve. And many outcomes of pro-social motivation have been explicitly linked to moral considerations. A case in point is Titmuss (1970) who emphasized donating blood as a pro-social action based on intrinsic motivation. Gneezy and Rustichini (2000) interprets the behavior of parents in Israeli day care centers as a form of pro-sociality.

Psychologists such as Deci and Ryan (2000, page 56) define intrinsic motivation as “..the doing of an activity for its inherent satisfactions rather than for some separable consequence. When intrinsically motivated, a person is moved to act for the fun or challenge entailed rather than because of external prods, pressures, or rewards.” They argue that there is considerable evidence

that such motivation exists. The idea of intrinsic motivation has no direct link to whether the act being undertaken is pro-social. Indeed, one way to think of intrinsic motivation is as an act of pure selfish indulgence. This idea is also distinct because psychologists resist thinking about this as some kind of instrumental non-pecuniary motivation.

While psychologists have a long history in studying these issues, it is only recently that economists have begun to study the implications of intrinsic motivation. Psychological research suggests a continuum between extrinsic and intrinsic motivation as suggested, for example, in Ryan and Deci (2000) which, in turn, builds on Deci and Ryan's (1985) self-determination theory. A range of psychological experiments have looked at these different forms of motivation. Some economists have now more squarely confronted the idea of intrinsic motivation and its consequences (see, for example, Frey (1997)).

According to Ryan and Deci (2000), extrinsic motivation comes in four different varieties that can be mapped into the approach taken here. At one extreme there are purely externally motivated rewards as in the standard economic model discussed above (external regulation). Next comes behavior that is motivated by self-image or reputational concerns (introjection). In both cases, an activity is not valued for its own sake and is only a means to an end. Then there are situations where an agent comes to value an action and endorses the goals associated with the task (identification). Next, there is integration where the agent's sense of self is congruent with the task in hand. Intrinsic motivation is then the residual category, which refers to the inherent enjoyment and satisfaction from the task or its outcome.

One key idea in the intrinsic motivation literature is that incentivizing a task can lead to crowd out effort. This was conjectured, for example, in the early work by Titmus (1970) on blood donation. Benabou and Tirole (2003) have developed a model of intrinsic motivation where performance incentives are offered by an informed principal who can adversely impact an agent's perception of a task or of her ability. Incentives can be negative reinforcers in the long run if they serve as negative signals of the principal's view of the task. This contrasts with the core model above where effort always responds positively to rewards. However, cross-sectionally, the model can produce something which looks like crowding out – specifically there will be a negative correlation between effort and bonuses in a population where θ_i is varying since b_i is higher where θ_i is lower and e_i is higher where θ_i is higher (even when the bonus is endogenously determined).

4.4 Signaling and Reputation

In this section, we review one particular approach to pro-social motivation and incentives based on the work of Benabou and Tirole (2006) simplified and adapted to the framework that we have developed here. In their model, individuals care about their social reputation or self-respect and rewards or punishments create doubt about the true motive for which good deeds are performed. What is key for their approach to work is that motivation comes from pro-social actions generating a public signal that is valuable to the individual concerned. Creating a reputation for pro-sociality would have a number of benefits. One possibility is that it has market value - for example, if an individual who is pro-social is expected to be more trustworthy in general, a pro-social reputation would command a wage premium by helping overcome contracting problems in the firm, and as a consequence of this, it might be a valuable asset in the labor market.²⁸ It could also be that pro-social individuals have access to better social networks or pool of potential partners. It is not necessary to be specific about the source of the benefit for the purposes of studying how the reputation-based model works.

We show now how the core model can capture this idea. To this end, suppose that individuals are in part motivated by a reputational benefit of being recognized as a motivated agent and suppose that there are just two types with $\theta \in \{0, \bar{\theta}\}$ with a fraction γ in a population having $\theta = \bar{\theta}$ and the remaining fraction $(1 - \gamma)$ having $\theta = 0$. Suppose also that the agent performing the task is a random selection among the population of agents. In effect, there is a pooling contract where all agents are treated the same. As before, there are two parts of the compensation, a bonus (b) and a wage (w).

We will focus on the case where the outside option is zero and where the fixed wage is zero. This will allow us to focus on the determination of bonus pay and how it is affected by signaling. Let $\{e_0, e_1\}$ be the effort of the non-motivated and motivated agents respectively if they are asked to perform the pro-social tasks described in the core model. These efforts will be determined in a signaling equilibrium.

The payoff of agent an agent with θ is

$$e[b + \theta] - \frac{1}{2}e^2 + \mu R(e : e_0, e_1) \tag{7}$$

²⁸This parallels the well-known career concerns model of Holmström (1999) where current actions reap future career rewards in the form of wage increases.

where $\mu R(e : e_0, e_1)$ is the reputational benefit from action e and μ is a parameter which represents the strength of the reputational motive. When choosing e , a given agent takes the choice of other agents (e_0 and e_1) as given.

We will suppose that $R(e : e_0, e_1)$ is simply the probability that the agent is motivated as perceived by those with whom she interacts and can observe whether or not she is successful in the task that she is assigned to. Hence

$$R(e : e_0, e_1) = e\psi(\sigma = 1 : e_0, e_1) + [1 - e]\psi(\sigma = 0 : e_0, e_1)$$

where, $\psi(\sigma = x : e_0, e_1)$ is the probability that the agent is motivated conditional on project outcome: success ($x = 1$) or failure ($x = 0$). We assume that those with whom she interacts use Bayes rule to update their beliefs after observing σ given a prior γ that she is motivated. This implies that, given a pair of effort levels $\{e_1, e_0\}$:

$$\begin{aligned}\psi(\sigma = 1 : e_0, e_1) &= \frac{e_1\gamma}{e_1\gamma + e_0(1 - \gamma)} \\ \psi(\sigma = 0 : e_0, e_1) &= \frac{(1 - e_1)\gamma}{(1 - e_1)\gamma + (1 - e_0)(1 - \gamma)}.\end{aligned}$$

It is useful to define Z as the average level of effort in the population:

$$Z \equiv (1 - \gamma)e_0 + \gamma e_1.$$

Then R can be rewritten as

$$R = \gamma \left\{ e \frac{e_1}{Z} + (1 - e) \frac{1 - e_1}{1 - Z} \right\}.$$

The first-order condition from (7) is:

$$b + \theta + \mu R_e(e : e_0, e_1) = e.$$

Then

$$\begin{aligned}R_e &= \gamma \left(\frac{e_1}{Z} - \frac{1 - e_1}{1 - Z} \right) \\ &= \frac{\gamma(1 - \gamma)\bar{\theta}}{Z(1 - Z)}\end{aligned}$$

using the fact that $e_1 = Z + (1 - \gamma)\bar{\theta}$ (while $e_0 = Z - \gamma\bar{\theta}$). As we can see, $R_e > 0$, which suggests positive returns from putting in higher effort for the same level of incentive pay.²⁹

Using the logic of the benchmark model, if society expects an agent to be pro-socially motivated with probability γ , and there are no reputational concerns ($\mu = 0$), the bonus would be $b^* = \frac{V - \gamma\bar{\theta}}{2}$. Then from the incentive constraint, $e_1 = \frac{V - \gamma\bar{\theta}}{2} + \bar{\theta} = \frac{V + (2 - \gamma)\bar{\theta}}{2}$ while $e_0 = \frac{V - \gamma\bar{\theta}}{2}$. Without any reputational concerns, and given the fact that bonuses are adjusted for the fact that with probability γ , the agent is motivated, motivated agents put in more effort while unmotivated agents put in less effort compared to our benchmark model where these types were known and the bonuses were adjusted accordingly.

Starting with this benchmark, suppose μ is small but positive. From the incentive constraint, $e = b + \theta + \mu R_e$ ($e : e_0, e_1$) we can see that now *both* types of agents will put in higher effort due to reputational concerns. This means, other than the direct effect of motivation we studied in the benchmark model, reputational concerns will alleviate moral hazard problems for all types of agents, irrespective of their level of motivation.

4.5 Status Rewards

The economic implications of the idea that human beings have a craving for status has been widely studied (see, for example, Frank, 1985). Societies often create non-pecuniary status rewards as a means of enhancing pro-social motivation. Older and classical examples of honors are military medals which are awarded for selfless sacrifice in battle. What is key to this argument is that recognition is a positional good which is valuable because it is scarce and brings social recognition. We now explore how the possibility of granting a status incentive can enhance motivation. Bradler et al (2016) conduct a field experiment which finds that workers who receive better recognition for performance, apart from any material rewards, work harder.

The formal framework that follows comes from Besley and Ghatak (2008).³⁰ The principal is now permitted to introduce a purely nominal reward – a positional good – to the agent in the event that the project that he is putting effort into is successful. We think of this as a recognition (e.g., a medal or a

²⁹A more complete treatment could also look at how the optimal level of b will adjust.

³⁰See Auriol and Renault (2008) for a related approach.

honor, such as “best teacher award”) being awarded for good performance in the framework laid out above. While not confined to public organizations, they are widely used in such contexts, most notably in the military. Moreover such awards are frequently structured to reward wider contributions to the public good rather than for those who have simply excelled in increasing their wealth.³¹

We think now in terms of there being a large number of agents working in parallel on projects with social returns and that \hat{e} is the fraction of them that produce successful projects. Other than giving them bonuses, they can also be awarded an award denoted by $\eta \in \{0, 1\}$ with entirely nominal value and which generates utility of $H(\hat{e})$ where \hat{e} is the fraction of agents in society who receive the positional good. We assume that $H_e(\hat{e}) < 0$ and $H(\hat{e}) = 0$ for $\hat{e} \geq \bar{e}$ where $\bar{e} \leq 1$. This formulation says that there is a crowding effect – if everyone gets the positional good then its value goes to zero.³² We will study a homogenous population where agents are entirely selfish but care about the status which comes from earning an honor.

We now consider how awarding medals to all agents who produce a positive output level affects the choice of monetary incentives. To get a simple closed form solution suppose that:

$$H(\hat{e}) = \begin{cases} \theta - \phi\hat{e} & \text{if } \hat{e} \leq \theta/\phi \\ 0 & \text{otherwise.} \end{cases}$$

We assume $\phi \in (0, 1)$. Thus, $\bar{e} = \theta/\phi$ is the critical fraction of agents producing high effort above which the value of status goes to zero.³³ We

³¹See Frey and Gallus (2017) for an interesting discussion of honours and awards from an economic perspective.

³²It is possible to consider more explicit microfoundations for this preference. Consider a simple career concerns setting. Suppose that there are high ability types in the population who always produce high output and a fraction α of the agents is of that kind. Status (and possibly future rewards) come from being this type. Others are like the standard agent who produce a positive output with probability e . Then with common effort level \hat{e} among the low ability agents, the probability that the agent is a high type conditional on having received the award is:

$$\frac{\alpha}{\alpha + (1 - \alpha)\hat{e}}$$

which is decreasing in \hat{e} .

³³One possible interpretation of this formulation is, if $\theta = \phi$, $(1 - \hat{e})$ is the percentage of workers not succeeding and the relevant group vis a vis whom a successful worker feels superior to.

assume that $\theta < V$, so that even if an individual is the only person receiving the award, it is not sufficient to motivate him/her to put in the first-best effort level.

Since getting an honor depends on how many others receive the honor, there is now interdependence in decisions. Hence we need to characterize a Nash equilibrium between the agents in the economy who take \hat{e} as given. Now

$$e \in \arg \max_e \left\{ e [b + H(\hat{e})] - \frac{e^2}{2} \right\}$$

which implies that $e = b + H(\hat{e})$. In this case, solving for \hat{e} , yields:

$$\hat{e}(b) = \frac{\theta + b}{1 + \phi}$$

which we assume is less than θ/ϕ so that the honor is scarce enough for it to have value. Assuming that the outside option of the agent is zero, we now have:

$$b^* = \arg \max_b \left\{ \frac{\theta + b}{1 + \phi} [V - b] \right\}$$

Repeating the logic that lead to the characterization of b and e in the benchmark model, the optimal contract sets $b = \frac{V - \theta}{2}$ and the corresponding effort level is

$$e = \frac{V + \theta}{2(1 + \phi)}.$$

Thus, even though agents are selfish, their belief in the value of the honor is sufficient for them to behave as if they are motivated, and bonuses are lower by exactly the value of the honor if an agent was the only one to receive it. However, because there is crowding, i.e., $\phi > 0$, overall effort is lower than in the case where θ is intrinsic pro-sociality. Moreover, a higher value of crowding makes society worse off, as there is less effort for a given amount of bonus pay.

It is interesting to ask whether society should introduce status rewards for pro-social behavior. It is clear that there is a trade-off. On the one hand, it allows some reduction in bonus pay where the status award is costless. However, crowding means that effort is lower since there is now a negative externality inflicted by other agents in society putting in high effort as that “devalues” the status award. Comparing the payoffs to society in both cases, we find that a sufficient condition for a status award to be valuable is

$\frac{\theta}{V} > \phi$, i.e., as long as the value of the award is high enough and crowding is sufficiently small.

4.6 Altruistic motivation

As we discussed above, the core of idea of pro-social motivation has an egoistic component because individuals care about their own contribution to the social good. A more conventional view of altruism supposes that behavior is motivated only by the payoffs experienced by others. We now explore the difference between a pure altruism model and the motivated-agents approach. We model this by allowing agents to attach a weight to the welfare of the beneficiaries.

Motivation is now given by $\theta_i = \lambda_i [V - b]$ where $\lambda_i \in [0, 1]$ reflects the extent of altruism. One immediate difference with the core model is that we deduct b from the payoff to reflect that higher financial bonuses reduce the surplus of beneficiaries. This direct dependence of θ_i on b means that we need to modify the formal analysis. Specifically, the incentive compatibility condition implies that effort maximizes

$$e \{b + \lambda_i (V - b)\} - \frac{e^2}{2} + w.$$

The first-order condition, assuming an interior solution, implies that $e_i = \{b + \lambda_i (V - b)\}$. With $\lambda_i > 0$, increasing incentives does not increase effort one for one, and if $\lambda_i = 1$, there is no effect of incentives on effort! This is because the agent perceives bonuses as reducing the benefits to beneficiaries one-for-one. However, with $\lambda_i = 1$, the agent will choose the effort level which is best for the beneficiaries of the service even without being given any incentives.

Altruistic motivation also changes the participation constraint since an altruist will care about the project outcome even if she is not selected to be the agent who actually provides the service. So her utility if she is not the agent but where an agent j is involved is

$$\bar{u} + e_j \lambda_i [V - b_j] - \lambda_i w$$

where e_j is the level of effort and b_j is the incentive pay offered to agent j .³⁴

³⁴The issue is somewhat subtle as this is based on each agent believing that if she is

To explore the implications of this, we will suppose that all potential agents are identical so that the subscript on λ_i can be dropped. The participation constraint must now be binding now even if $\bar{u} = 0$. This is because the agent will conjecture that the project will take place with another identical agent even if she is not involved. The only way to guarantee that an agent comes forward to provided effort is by increasing the fixed component of compensation so that

$$w = \bar{u} + \frac{e^2}{2} = \bar{u} + \frac{[b + \lambda [V - b]]^2}{2}.$$

Somewhat paradoxically, therefore, altruism actually raises the cost of employing an agent; she needs to be given the full cost of her effort which remains true even if $\lambda = 1$.

To solve for the optimal level of the bonus, note that the objective function of the principal acting on behalf of the beneficiaries is

$$[b + \lambda [V - b]] [V - b] - \frac{[b + \lambda [V - b]]^2}{2} - \bar{u}.$$

Maximizing this with by choosing b now yields the optimal financial bonus equal to

$$b^*(\lambda) = \max \left\{ \frac{V(1 - 3\lambda + \lambda^2)}{(1 - \lambda)(3 - \lambda)}, 0 \right\}.$$

Thus raises the possibility that with altruism, no incentive pay is offered and there is full reliance on altruistic incentives. Indeed this will occur for a critical value of $\lambda \geq \underline{\lambda}$ where $\underline{\lambda} \in (1/3, 1/2)$, i.e. if the altruistic motive is sufficiently strong.

4.7 Taking Stock

This section shows that the details for how agent motivation can matter a lot for the design of incentives. Perhaps this is not surprising as there are

not involved production of the good, then an equally altruistic agent will be. One could model the entry game in which each potential provider chooses whether or not to put themselves forward. This game has multiple pure strategy equilibria if the good is not provided when no agent comes forward. The symmetric mixed strategy solution which would create a positive probability that the good is not provided although this would be small in a large population of potential agents.

many deviations from pure self-interest and there is no reason to expect them to have common implications. A common theme however, is that standard implications of self-interest models need modifying. And to make practical use of the insights from the models requires some insight into the underlying psychology of pro-social motivation, i.e. knowing what drives that behavior in particular cases. The personnel economics of pro-social behavior looks like an interesting field where empirics and theory can be brought together and is part of wider agenda aimed at merging insights from psychology into the economics of organizations (see Kamenica, 2012)

5 Conclusion

This paper has reviewed the literature on the interaction between alternative models of agent motivation and the use of incentive pay in organizations that provide goods and services whose returns have a major social component that is not captured in profits. Such activities are also typically subject to severe measurement problems regarding outcomes and performance. We have reviewed different forms of motivation that have been suggested in the existing literature and tried to provide a unifying framework for thinking about them.

The focus has been on developing a theoretical framework that incorporates the concept of pro-social motivation in a standard principal-agent models, and how it interacts with the use of incentive pay . However, the framework may also be useful in thinking through the implications of practical efforts to utilize and reward actions which have a social component. There is now a large and growing empirical literature which looks at the impact of incentives on performance in areas where pro-social motivation is deemed to be relevant. Moreover, there have been increasing efforts to explore these issues in field experiments such as Ashraf et al (2014), Berg et al (2017), Deserranno (2017), Muralidharan and Sundararaman (2009) and Rasul and Rogger (2013). Finan et al (2017) provides an excellent review of this evidence and Ashraf and Bandiera (2017b) review the literature on the related issue of how incentives and social relationships interact in economic settings.

If the world is indeed populated by motivated agents with non-pecuniary goals then a whole host of questions arise about how to put such motivation to good use. Although we have applied these ideas to studying incentives,

there is a wider agenda that studies how organization structure (e.g., for-profit vs non-profit firms) and external factors, such as market forces and social norms, shape pro-social motivation and drive selection on motivation to organizations and sectors.³⁵ There is a whole agenda of unexplored questions which will help to inform policy towards better delivery of public services to citizens in a variety of settings. Moreover, there is the potential to unify the more standard approach to the economics of incentives with more sociologically and psychologically informed approaches.

³⁵Besley and Ghatak (2017a) use the idea of motivated agents to study the role of social enterprises alongside more traditional forms of organization, such as for-profits and non-profits. More work is needed on the forces which affect the dynamics of motivation in society (see Besley and Ghatak, 2017b for an evolutionary perspective), and what can foster the adoption of pro-social identities.

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