Intrinsic Motivation

Mission and Motivated Workers

- A bookstore may not be just interested in maximizing profits
- A bookstore worker may not be just interested in maximizing wages
- Distinguish between utility from work and mission-motivated preferences
  - a book-lover may derive utility from working in a bookstore
  - a mission-motivated bookstore worker only derives utility when he successfully achieves his mission (e.g., promote a certain type of books to customers)
- Mission-motivated workers may be particularly relevant for (some parts of) the public sector and NGOs
- They are probably quite relevant in the private sector too, especially for those workers who can exercise discretion and influence

Model

- The outcome of a project is either “success” or “failure”
- The probability of success depends on (is equal to) worker effort e
- Cost of effort is $C(e) = e^2/2$
- The organization can pay its worker depending on success or failure, but wages must be at least $\underline{w}$ because of limited liability constraint
- Both principal and agent are risk neutral

Firms and Workers

- Two types of firms:
  - type $i = 0$ is purely profit-oriented—gets payoff π_0 if project is a success
  - type $i = 1$ has a mission—payoff is π_1 if project is successful
    - π_1 may include both monetary and nonmonetary components
    - π_1 may be larger than or smaller than π_0
- Two types of agents:
  - type $j = 0$ only cares about wages
  - type $j = 1$ derives nonmonetary benefit of $\theta > 0$ when project succeeds, provided that the project's mission aligns with his own mission motivation

Optimal Contract

- Consider a type 1 firm hiring a type 1 worker
- Wages are w_l if project fails and w_h if project succeeds
  - limited liability constraint suggests that the firm should just set $w_l = \underline{w}$
  - define the "bonus" upon project success by $b = w_h - \underline{w}$
- If worker participates, she chooses e to maximize

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

- First-order condition is

$$e^* = b + \theta$$

- At $e = e^*$, worker's payoff from working with this principal is

$$u^* = e^*(b+\theta) + \underline{w} - (e^*)^2/2 = \underline{w} + (b+\theta)^2/2$$

Participation Constraint

- The lowest b that would induce the worker to participate is given by $\underline{w} + (b+\theta)^2/2 = \overline{u}$, so

$$\underline{b} = \begin{cases} \sqrt{2(\overline{u}-\underline{w})} - \theta & \text{if } \overline{u} > \theta^2/2 + \underline{w} \\ 0 & \text{if } \overline{u} \leq \theta^2/2 + \underline{w} \end{cases}$$

- If the firm chooses $b = \underline{b}$, its payoff is

$$\begin{aligned} \Pi(\underline{b}) &= e^*(\underline{b})(\pi_1 - \underline{b}) - \underline{w} = \\ &= \begin{cases} \sqrt{2(\overline{u}-\underline{w})}\left(\pi_1 - \sqrt{2(\overline{u}-\underline{w})} + \theta\right) - \underline{w} & \text{if } \overline{u} > \theta^2/2 + \underline{w} \\ \theta\pi_1 - \underline{w} & \text{if } \overline{u} > \theta^2/2 + \underline{w} \end{cases} \end{aligned}$$

Solution

- If the firm chooses $b > \underline{b}$, its payoff is

$$\Pi(b) = (b + \theta)(\pi_1 - b) - \underline{w}$$

- The marginal benefit of choosing b slightly above $\underline{b}$ is

$$\Pi'(\underline{b}) = \pi_1 - \theta - 2\underline{b}$$

  - this is positive if $\underline{b} < (\pi_1 - \theta)/2$
  - this is negative if $\underline{b} > (\pi_1 - \theta)/2$

- Optimal b is given by either interior solution to first-order condition or a corner solution:

$$b^* = \begin{cases} (\pi_1 - \theta)/2 & \text{if } \underline{b} < (\pi_1 - \theta)/2 \\ \underline{b} & \text{if } \underline{b} \geq (\pi_1 - \theta)/2 \end{cases}$$

Efficiency Wages

- When $\underline{b} < (\pi_1 - \theta)/2$
  - $b^* > \underline{b}$, so workers earn a surplus above their reservation utility
  - worker effort is $e^* = (\pi_1 + \theta)/2$, and her payoff is $u^* = \underline{w} + (\pi_1 + \theta)^2/8$
  - the firm's profit is $(\pi_1 + \theta)^2/4 - \underline{w}$
- When $\underline{b} \geq (\pi_1 - \theta)/2$
  - $b^* = \underline{b}$, so workers earn no rent
  - worker effort is $e^* = \underline{b} + \theta$, and her payoff is $\overline{u}$
  - the firm's profit is $\Pi(\underline{b})$
- Higher intrinsic motivation θ will
  - lower the optimal bonus (low-powered incentive in mission-oriented organizations)
  - raise worker effort (worker effort is positive even when the bonus is 0)
  - raise worker utility and raise firm profit
- Size of bonus and level of effort are negatively correlated across firms with different values of θ

Divergent Objectives

- The principal's payoff π_1 from project success depends on the mission chosen
  - let $x \in X$ represent the mission, and let $\pi_1 = g(x)$
  - the principal prefers to choose x^p to maximize $g(x)$
- Workers also have their own idea about what the firm's mission should be
  - their intrinsic payoff depends on the mission through $\theta = h(x)$
  - their ideal mission is x^a, which maximizes $h(x)$
  - effort will fall off if the principal adopts mission x^p

Worker Empowerment

- Recall that the firm's profit is $(\pi_1 + \theta)^2/4 - \underline{w}$
- The principal is better off if he chooses a mission to maximize $g(x) + h(x)$ instead of just maximizing $g(x)$
- this is usually a compromise between x^p and x^a
- The principal is empowering the firm's workers
  - the firm is better off letting its workers provide some input on the choice of the firm's mission
  - even though the principal does not choose his ideal mission, he achieve a reasonable mission but with higher probability (higher effort) and lower cost (lower bonus)
- Workers also benefit from the compromise because bonus will be rather low if they insist on choosing x^a

Competition

- The reservation utility of a motivated worker is partly determined by the wage she could get in the for-profit sector
- An increase in π_0 for type 0 firms (or an increase in productivity in these firms) raises the outside option $\overline{u}$
- A higher $\overline{u}$ increases the $\underline{b}$ needed to induce participation in type 1 firms
- Because $b^* = \underline{b}$ when $\underline{b} \geq (\pi_1 - \theta)/2$, the bonus in type 1 firms will have to rise

Matching

- Mission-oriented firms tend to attract motivated workers
- Motivated workers are less attractive to profit-oriented firms because these workers would command a compensating differential to be induced to work for such firms
- Weisbrod (1988): "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. . . . 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"

Centralization

- Imagine a centralized school system where the “mission” (or education philosophy) is dictated by a central authority
- Workers whose views about education are different from the centralized mission may be demotivated
- Allowing more decentralization where schools have more autonomy in choosing their own mission may raise productivity in those schools
- It may indirectly raise productivity in the centralized schools through the competition effect