Lecture 8:

Public Organization I: Public versus Private Ownership

- What is public organization?
  - Deals with questions related to the design and scope of public service provision
  - It is a comparatively new subject as there was traditionally little concern with these issues.

- Key issues
  - Role of competition

- Incentive deisgn
- Ownership

* Often in public debates – ownership gets a lot more play than it deserves.

* We will study these issues in two lectures:
  - Lecture 1: Ownership issues using an an incomplete contracts framework
  - Lecture 2: Discussion of competition and incentives

Ownership: Overview

- The Grossman-Hart-Moore framework taught us about understanding the boudaries of firms

- Here, we will use this framework to think about the boundaries of the state.

- Basic ideas:

  - hold-up problem

  - contractual incompleteness

  - renegotiation

- ownership defines default payoffs

- Standard result for private goods – ownership should be determined by relative importance of investments

- In the context of the state, one of the most interesting/important issues concerns the role of non-governmental organizatons (NGOs)

- These are frequently not-for-profit firms that are given the task of running public services

- Question – when is it optimal to have outside ownership by NGOs?

- Is for-profit ownership of public services ever optimal?

- To look at these issues, we will build a simple model of public goods provision where ownership matters.

- This is based on Besley and Ghatak (2001).

Framework

- There is a single time period in which a public project can be carried out.

- Two players, g and n, can undertake human capital investments that will increase the benefits generated by the project (e.g., through improved quality).

- These investments can be interpreted as project specific skills or knowledge that are not fully transferable to others in the absence of the investor.

- The project is 'public' in the sense that the *benefits* that it generates (as distinct from the non-human assets associated with the project, or the investments themselves) are non-rival and non-excludable to g and n.

- Let $Y = (y_g, y_n)$ denote the vector of investment decisions.

- The human capital investments are specific to the project and lose value if employed in alternative uses.

- The benefit from the project depends upon the investment level and is denoted by $b(Y)$.

- We assume that $b(y_g, y_n)$ is a smooth, increasing and concave function satisfying the Inada endpoint conditions.

- In addition we assume $b(0, 0) > 0$ and $\frac{\partial^2 b(y_g, y_n)}{\partial y_g \partial y_n} \geq 0$, i.e., investments are (weak) complements.

- The two players value the project to different degrees and payoffs are quasi-linear in project valuation and money.

- If g contributes C_g to the project's costs, its payoff is

$$\theta_g b(Y) - C_g$$

  where $\theta_g > 0$ is the valuation parameter of g.

- If n contributes C_n then its payoff is

$$\theta_n b(Y) - C_n$$

  where $\theta_n > 0$ is the valuation parameter of n.

- In the absence of any contracting problems, the parties will choose the level of investments to maximize joint surplus:

$$(\theta_n + \theta_g)\, b\,(Y) - y_g - y_n.$$

- Let y_i^* denote the joint surplus maximizing level of the investment by party i.

- Lindahl-Samuelson type rule:

$$(\theta_g + \theta_n)\, b_k \left(y_g^*, y_n^*\right) = 1 \text{ for } k \in \{1, 2\}\,,$$

  where $b_k(\cdot)$ is the derivative with respect to the kth argument.

- Under our assumptions, $y_g^* > 0$ and $y_n^* > 0$ and $(\theta_g + \theta_n)\, b \left(y_g^*, y_n^*\right) - y_g^* - y_n^* > 0$. Thus, it is optimal for the project to go ahead when both party's valuations are taken into account and the joint surplus maximizing investments are implemented.

Contracting Problems

- The investments in the project cannot be specified *ex ante*.

- Each party will possess some bargaining power after the investments have been sunk, even if at the beginning of the game each party could choose from many partners.

- Assume Nash bargaining:

  – parties are assumed to split their renegotiation surplus 50/50 over the disagreement point.

- The public good nature of the project implies that, if the parties disagree (which does not happen on the equilibrium path), then *both* parties may be better off *ex post* by transferring ownership from the original owner to the other party.

- **Stage 1:** g and n decide who should own the project, i.e. have residual rights of control over the assets created. The owner undertakes the design of the project.

- **Stage 2**: If a partnership is formed then g chooses y_g and n chooses y_n which are henceforth sunk and cannot be changed.

- **Stage 3**: g and n bargain over whether to continue with the project with transfers being possible at this stage.

- Ownership matters because it defines different status quo payoffs in the bargaining game.

- Assume that if the owner takes over the project completely in the event of bargaining breaking down, then each party enjoys a reduced level of surplus from the project.

- Let $B^i(y_g, y_n)$ denote the benefit, where $i \in \{g, n\}$ with $B^i(y_g, y_n) \leq b(y_g, y_n)$.

- These functions are also assumed to be increasing and concave with $\frac{\partial^2 B^i(y_g, y_n)}{\partial y_g y_n} \geq 0$ and $B^i(0, 0) > 0$ for $i = g, n$.

ASSUMPTION 1: The marginal investment returns under different ownership structures satisfy:

$$\begin{aligned} b_1(y_g, y_n) &\geq B_1^g(y_g, y_n) > B_1^n(y_g, y_n) \text{ for all } y_n \\ b_2(y_g, y_n) &\geq B_2^n(y_g, y_n) > B_2^g(y_g, y_n) \text{ for all } y_g. \end{aligned}$$

- – This says that the marginal return to a given type of investment is highest in the event of disagreement when the party that made the investment is the owner.

Stage 3:

- Let $\bar{u}_g^i(Y)$ and $\bar{u}_n^i(Y)$ denote the default payoffs of g and n when i $(= g, n)$ is the owner.

- If the two parties are able to reach an agreement, then $(\theta_n + \theta_g)b(Y)$ is *ex post* joint surplus.

- Transfers:

$$
\begin{aligned}
t &= \arg\max_z(\{\theta_n b(Y) - z - \bar{u}_n^i(Y)\} \\
&\quad * \{\theta_g b(Y) + z - \bar{u}_g^i(Y)\}) \\
&= \frac{(\theta_n - \theta_g)\, b(Y) + \bar{u}_g^i(Y) - \bar{u}_n^i(Y)}{2}.
\end{aligned}
$$

The net of transfer *ex post* payoffs of g and n are therefore :

$$\frac{(\theta_g + \theta_n)\, b\,(Y) + \bar{u}_g^i\,(Y) - \bar{u}_n^i\,(Y)}{2}$$

$$\frac{(\theta_g + \theta_n)\, b\,(Y) + \bar{u}_n^i\,(Y) - \bar{u}_g^i\,(Y)}{2}.$$

Stage 2:

- We now contrast ownership by g and n.

- When i is the owner $(i = g, n)$ the default payoffs are:

$$\begin{aligned} \bar{u}_g^i(Y) &= \theta_g B^i(y_g, y_n) \\ \bar{u}_n^i(Y) &= \theta_n B^i(y_g, y_n). \end{aligned}$$

- Thus:

$$\begin{aligned} v_g^i(y_g, y_n) &= \frac{(\theta_n + \theta_g) b(y_g, y_n) + (\theta_g - \theta_n) B^i(y_g, y_n)}{2} && (1) \\ &\quad - y_g, && (2) \end{aligned}$$

$$v_n^i(y_g, y_n) = \frac{(\theta_n + \theta_g)\, b(y_g, y_n) + (\theta_n - \theta_g)\, B^i(y_g, y_n)}{2} \quad (3)$$

$$-y_n. \quad (4)$$

- Investment levels form a Nash eq:

PROPOSITION 1: Suppose that Assumption 1 holds. Then, at any Nash equilibrium, investment levels are below their joint surplus maximizing levels. Giving ownership to the party with the highest valuation improves investment incentives for both parties and results in the highest possible level of joint surplus.

- Key observation: Giving the ownership to the more caring party raises the marginal return to investing of *both* parties.

– From (1) and (3) ownership affects investment only from the second term in the payoffs:

  * $(\theta_g - \theta_n) B^i (y_g, y_n)$ for the government

  * $(\theta_n - \theta_g) B^i (y_g, y_n)$ for the NGO.

– If $\theta_g > \theta_n$, then investment incentives are higher for both when g ownership raises the marginal return for g and lowers the marginal return for n.

– But under Assumption 1, this is precisely what happens under g ownership.

– The opposite holds true for $\theta_g < \theta_n$ where n ownership is optimal.

– The public goods nature of the project is key to understanding this –

each party receives a payoff from the project's completion even if she is not directly involved with it.

– This implies that the party who cares more about the project, say n (i.e., $\theta_n > \theta_g$), has a greater disagreement payoff whether or not she continues to be involved with the project.

Hart-Shleifer-Vishny

- Our basic case was of a pure public good.

- Suppose that there is also a private good component associated with the project.

- For example, both g and n could invest to devise ways of cutting costs of running a school, but this could adversely affect school quality.

- Suppose that there is a single investor (n) and

$$b(Y) = \mu(y_n),$$

$$B^n(y_g, y_n) = \mu(y_n)$$

$$B^g(y_g, y_n) = \lambda\mu(y_n)$$

where $\lambda < 1$.

- Suppose also that the good has a private good component, $\beta(y_n)$ – could be thought of as cost reduction benefits which accrue to the contractor.

- Let α and $(1-\alpha)$ denote the relative importance of the public and private good components of these investments in joint surplus.

- If n is fired only a fraction λ_n of the total benefits of her investments (i.e., the sum of the private and public good components) are available.

- If the investments were contractible then the value of y_g and y_n chosen to maximize joint-surplus would be given by :

$$\alpha(\theta_g + \theta_n)\mu'(y_n) + (1 - \alpha)\beta'(y_n) = 1.$$

- If g is the owner, the disagreement payoffs of g and n are

$$\begin{array}{l} \lambda_n \left[\alpha\theta_g\mu(y_n) + (1 - \alpha)\beta(y_n)\right] \\ and \\ \lambda_n\alpha\theta_n\mu(y_n). \end{array}$$

- Then:

$$\begin{aligned} & \frac{1 - \lambda_n}{2}(1 - \alpha)\beta'(y_n) \\ & + \frac{1}{2}\left\{(1 - \lambda_g)\,\theta_g + (1 + \lambda_n)\,\theta_n\right\}\alpha\mu'(y_n) \\ = \ & 1. \end{aligned}$$

- If n is the owner, then the disagreement payoffs are

$$\alpha\theta_g\mu(y_n)$$
$$and$$
$$\alpha\theta_n\mu(y_n) + (1-\alpha)\beta(y_n).$$

- The assumption is that the owner appropriates the private good component.

- Hence:

$$(1-\alpha)\beta'(y_n) + \theta_n\alpha\mu'(y_n) = 1.$$

- Suppose that $\theta_n = 0$ (for-profit firm) then:

- High θ_g implies a preference for government ownership
- If λ_n is close to one then there is a high preference for private ownership y_n is lower regardless of ownership
- A larger private good component is good for n ownership – it can better or worse for g ownership.

* A high θ_n militates towards n ownership