Contracting Out Versus In-House Provision

Hart, Oliver, Shleifer, Andrei and Vishny, Robert W. (1997), 'The proper scope of government: theory and an application to prisons,' Quarterly Journal of Economics, 112: 1119-58.

Focus: non-contractible investments e, i

a) cost reducing innovation e with adverse impact on quality

b) quality enhancing innovation i

If complete and comprehensive contract are possible then form of public service provision does not matter.

Approach here: incomplete contracts, due to unpredictable, unmeasurable, hard to describe events

Implementation of innovation requires approval of owner of an asset. Ownership of asset gives decision residual control rights

Players:

- The private firm is owned and run by a manager who maximes profits
- The public firm is run by a manager M who maximizes own utility
- The Government G maximizes welfare

Timing:

- Ownership is chosen
- Investor chooses i and e and bear cost $i + e$
    - Under private ownership, the firm can implement the innovations also without the Government approval. However, renegotiation (Nash Bargaining) may take place over the implementation of innovations (Nash Bargaining)
    - Under public ownership, the public manager cannot implement any innovation without the Government approval. Renegotiation (Nash Bargaining)may take place
    - Approved innovations are implemented. Benefits B and C are realized

Recall Nash Barganing solution:

If two parties obtain u_a, u_b in case of no agrement and U_a, U_b in case of agreement, then the NB solution with equal bargaining power yields each party:

$$\underbrace{u_i}_{Default\ Payoff} + \frac{1}{2} [\ \underbrace{U_a + U_b - u_a - u_b}_{Gains\ from\ Trade}]\ ;i=a,b$$

Basic service verifiable and paid P_0. It yields benefit B_0 and costs C_0.

Efforts i and e lead to new ideas (e.g. organization process) which, if implemented, generate effects on benefits and costs from the provision of the service.

Benefits from service provision

$$B = B_0 - b(e) + \beta(i)$$

Cost of service provision

$$C = C_0 - c(e)$$

Costs of efforts: $e + i$

Total cost: $C_0 - c(e) + i + e$

$b(0) = 0,\ b'(e) \geq 0, b''(e) \geq 0;\ c(0) = 0, c'(0) = \infty,\ c'(e) > 0, c''(e) < 0,$
$c'(\infty) = 0;\ \beta(0) = 0, \beta'(0) = \infty; \beta'(i) > 0, \beta''(i) < 0, \beta'(\infty) = 0.$ Note
$c' - b' \geq 0$ and $\beta'(i) > 0$ imply that both innovations are valuable.

Key assumptions:

- e, i observable but nonverifiable ex ante (noncontractible ex ante) - cannot foresee innovative ideas, but verifiable ex post (contractible ex post) - once innovation has been thought, it can be described in a contract.

- no alternative use for asset

- no alternative job for public manager, who can be partially substituted. If substituted after he has invested, then the innovations can be implemented with new manager but a fraction λ of the implementation gains are lost.

First best: Max $B - C - i - e$, which implies

$$-b'(e^*) + c'(e^*) = 1$$
$$\beta'(i^*) = 1$$

Both i and e types of innovation are welfare improving (i.e. generate gains).

PRIVATE OWNERSHIP

M has control rights and will implement e since enjoys direct gains $c(e)$ from implementation. It will choose:

$$c'(e_M) = 1$$

Instead, M has no direct gain from implementation of quality improving innovation. But G would enjoy direct gains $\beta(i)$.

Thus, M anticipates that if it invests i, it will then bargain with Gt to find an agreement.

Default payoffs:

$$u_M = P_0 - C - e - i; u_G = B_0 - P_0$$

Payoffs if agreement :

$$U_M = P_0 - C - e - i; U_G = B_0 + \beta(i) - P_0$$

Gains from trade:

$$U_M + U_G - u_M - u_G = \beta(i)$$

$\Rightarrow i$ is implemented through negotiations between G and $M,$ Nash bargaining, leading to 50:50 split of gains from trade. Anticipating this, M chooses i so that

$$\frac{1}{2}\beta'(i_M) = 1$$

PUBLIC OWNERSHIP

With public ownership, government has control rights and thus the power to allow implementation of innovations, but for that it needs the manager or a substitute. G has also the power to veto the implementation of an innovation wanted by M.

$\Longrightarrow$ Innovations are implemented through negotiations between G and M, Nash bargaining, leading to 50:50 split of gains from trade.

Default payoffs:

$$u_M = P_0 - e - i;$$

$$u_G = B_0 - P_0 + (1 - \lambda)(-b(e) + c(e) + \beta(i))$$

Payoffs if agreement :

$$U_M = P_0 - e - i; \quad U_G = B_0 - P_0 - C + (-b(e) + c(e) + \beta(i))$$

Gains from trade:

$$\lambda(-b(e) + c(e) + \beta(i))$$

Thus, M gets

$$\frac{\lambda}{2}(-b(e) + c(e) + \beta(i))$$

Therefore, M chooses e and i so that

$$\frac{\lambda}{2}(c'(e_G) - b'(e_G)) = 1$$

$$\frac{\lambda}{2}\beta'(i_G) = 1$$

It follows:

$$e^* > e_G$$

$$i^* > i_G$$

There is underinvestment in cost reduction and in quality improvement.

An increase in λ(inefficiency of substitution) increases efforts.

COMPARISON

Comparing investment under the two ownership structures with first best investment we have

$$e_M > e^* > e_G$$

$$i^* > i_M \geq i_G$$

Proof: Let $H(e^*) = -b(e^*) + c(e^*) - 1$. Then note that $H'(e^*) = 0$, $H'(e^M) < 0$ and $H'(e^G) > 0$. Since $H'(e) < 0$, the result follows. Similar reasoning for i.

- Private ownership leads to excessively strong incentive for cost reduction and to too weak incentives for quality improvement

- Public ownership leads to weak incentives for cost reduction and for quality improvement

- Optimal ownership depends on relative importance of i and e

- Private ownership (Contracting out) unambiguously better if

− deterioration of quality from cost reduction is small

− opportunities for cost reduction are small

− Inefficient incentives for public employees (λ small) $\Rightarrow e_G, i_G$ very small

− investment in cost reduction is verifiable

Public ownership (In-house) unambiguously better if

• deterioration of quality from cost reduction is high and

• quality improvement unimportant or

• incentives for public employees are efficient (λ close to 1)

• opportunities for cost reduction are high

Overall C always lower under private ownership, whilst B may be higher or lower under private ownership.