OWNERSHIP AND RESIDUAL RIGHTS OF CONTROL

Ownership →to incentivize economic agents:

- To create
- To protect
- To increase

The value of their own assets

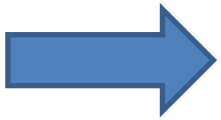
The property of an asset

$\Rightarrow$Having the residual rights of control on that asset

Having the right to take any decision on that asset that has not explicitly been considered by contracts.

$\rightarrow$ contracts are incomplete

Residual rights of control + residual returns

 **incentives**

Who takes the relevant decisions (residual rights of control) also bears the financial consequences of his choices.

The way in which the property rights are allocated among different agents may influence the efficiency of the transaction.

Example: shipping company and truck drivers

Owning the assets guarantees a surplus and so creates a stronger investment incentive:

1. if it is important to maximize one party's investment, then that party should own all the assets

   → *vertical integration*

2. if the maximization of investments of both the parties is relevant, then dividing the assets between the parties is efficient.

   → *nonintegration*

Property rights theory of the firm

- Grossman, S. and O. Hart (1986), The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration, *Journal of Political Economy*, 691-719.
- Hart, O. and J. Moore (1990), Property Rights and the Nature of the Firm, *Journal of Political Economy*, 1119-58.

→ The ownership of the firm is the right to decide in all those contingencies in which the actions of the parties are not governed by a contract.

→ Costs and benefits of integration through the allocation of the property rights.

DEFINITION: the firm is composed of the assets that it owns

Assets = machines, inventories, industrial warehouse, buildings…

Ownership = having both the residual rights of control and the residual returns

They develop a theory of integration/non-integration based on the attempt of the parties to write a contract to efficiently allocate the property rights (that is, the residual rights of control and the surplus) among themselves.

→ Investments are specific

Theoretical framework

Assume an economy with two economic agents:

1 buyer

1 seller

sequence of the events

- **t=0**:

  buyer and seller meet

  The parties only know the probability distribution of the relative benefits and costs from the exchange

- **t=1:**

  the realization of the benefits and costs will be known by all the parties.

- **t=0:**

  buyer and seller agree that in **t=1** the exchange will take place.

- **0<t<1:**

  Each party may undertake an investment ex-ante

  The investments are relationship-specific

CONTRACTS ARE INCOMPLETE:

No contract at **t=0** can bind the parties to their ex-ante investment decisions and/or to their ex-post exchanges

HOWEVER,
At **t=0**, the parties may contractually allocate the residual rights of control.

The parties may assign

- to the buyer,
- to the seller or
- to both the parties

THE RESIDUAL RIGHTS OF CONTROL

(what and how much will be exchanged)

Whatever the allocation of the residual rights

- at **t=1** (ex-post) the parties can **renegotiate** their decisions about the exchange,

BUT

- in the absence of agreement the party that owns the residual rights of control has the last word and has the right to decide how to proceed.

Causality links:

Three crucial steps:

I. the allocation of the residual rights of control (t=0);

II. the ex-ante investment decision (0<t<1);

III. the ex-post negotiation (t=1).

- The **distribution of the surplus** from the exchange decided in the ex-post negotiation (**t=1**)

- determines the intensity of the **investment ex-ante (0<t<1),**

- which in turn determines the value of the **total surplus** generated by the exchange (**t=1**).

The distribution of the surplus from the exchange has implications in terms of efficiency.

Remember: the allocation of the residual rights of control determines the distribution of the surplus

- The allocation of the residual rights of control influences the ex-ante investment decisions and has implications in terms of efficiency.

- To identify the allocation of the residual rights of control that maximizes the surplus from the exchange through the effects on the ex-ante investment decisions

THE ANALYTICAL MODEL

Sequence of the events

t=0

- buyer and seller observe the probability distribution of the benefits and costs from the exchange.

  Each realization in a specific contingency is said state of the world:

$$s \in S$$

t=0

- The parties negotiate the allocation of the residual rights of control:

  - **buyer-control;**
  - **seller-control;**
  - **Non-integration**

$0 < t < 1$

- buyer and seller choose their own ex-ante investment:

  α_B= ex-ante investment chosen by the buyer

  α_S = ex-ante investment chosen by the seller

  $C(\alpha_B)$ = investment cost function of Buyer

  $C(\alpha_S)$ = investment cost function of Seller

t=1

- Buyer and seller may observe the level of ex-ante investments and the state of the world:

$$a_B \quad a_S \quad s$$

- The parties negotiate the actions to undertake. The **decisions** about what and how much to exchange:

$$d \in D$$

Remember: *d* depends on the allocation of the residual rights of control

t=1

- Each party receives its own payoff from the interaction:

- Buyer's payoff:

$$\pi_B = U_B - c(a_B) = U_B(a_B; a_S; s; d) - c(a_B)$$

- Seller's payoff:

$$\pi_S = U_S - c(a_S) = U_S(a_B; a_S; s; d) - c(a_S)$$

U_B , U_S = utility functions of buyer and seller

Causality links

t=0:

- The two parties know their expected payoff (in each state of the world, *s*):

$$E\pi_B = E\left[U_B - c(a_B)\right] \rightarrow \text{Buyer}$$

$$E\pi_S = E\left[U_S - c(a_S)\right] \rightarrow \text{Seller.}$$

t=0:

- The parties negotiate the allocation of the residual rights of control:

  buyer-control;

  seller-control;

  Non-integration

0<t<1

- The parties decide their levels of investment in order to maximize the expected payoff (which depends also on the decided kind of allocation of the residual rights of control)

- Consider a **buyer control allocation**

(0<t<1)

Which are the expected payoffs in this situation?

Backward induction

- Under buyer control $d \in D$ is up to the Buyer
- The buyer chooses *d* so as to to maximize his own utility function:

$$\max_{d} U_B(a_B; a_S; s; d)$$

- $\hat{d}_B$ → buyer's maximizing choice of the ex-post payoff

(Backward induction)

When $d = \hat{d}_B$, the total surplus is:

$$TS^B = U_B\left(a_B; a_S; s; \hat{d}_B\right) + U_S\left(a_B; a_S; s; \hat{d}_B\right)$$

NOTE

- Not necessarily **the total surplus** is maximized under a buyer-control allocation.
- Maximizing the **total surplus** requires that the ex-post decision ***d*** is the solution to the problem:

$$\max_d U_B(a_B; a_S; s; d) + U_S(a_B; a_S; s; d)$$

(Backward induction)

- $d^* \rightarrow$ the choice that maximizes the total surplus

- The total surplus is:

$$TS^* = U_B(a_B; a_S; s; d^*) + U_S(a_B; a_S; s; d^*)$$

(Backward induction)

If:

$$TS^* > TS^B$$

It is in the interests of both the buyer and the seller to **renegotiate** the Buyer's initial choice

The final decision is of the buyer

- He agrees to renegotiate the choice about *d* if and only if:

  the ex-post surplus he gets (when *d*=*d**) is at least equal to the one he obtained in the absence of renegotiation (when $d = \hat{d}_B$ **)**

(Backward induction)

Assumption:

In the ex-post renegotiation each party will receive half of the increase in the surplus arising from the renegotiation itself, and that if efficient ($TS^* > TS^B$), the ex-post renegotiation will be completed.

(Backward induction)

Buyer's Payoff:

$$\pi_B =$$

$$U_B\left(a_B; a_S; s; \hat{d}_B\right) +$$

$$\frac{1}{2}\left\{\left[U_B(a_B; a_S; s; d^*) + U_S(a_B; a_S; s; d^*)\right] - \left[U_B\left(a_B; a_S; s; \hat{d}_B\right) + U_S\left(a_B; a_S; s; \hat{d}_B\right)\right]\right\} - C(a_B) =$$

$$\frac{1}{2}\left[U_B(a_B; a_S; s; d^*) + U_S(a_B; a_S; s; d^*)\right] + \frac{1}{2}\left[U_B\left(a_B; a_S; s; \hat{d}_B\right) - U_S\left(a_B; a_S; s; \hat{d}_B\right)\right] - C(a_B)$$

(Backward induction)

Seller's payoff:

$$\pi_S = U_S\left(a_B; a_S; s, \hat{d}_B\right) +$$

$$\frac{1}{2}\left\{\left[U_B\left(a_B; a_S; s, d^*\right) + U_S\left(a_B; a_S; s, d^*\right)\right] - \left[U_B\left(a_B; a_S; s, \hat{d}_B\right) + U_S\left(a_B; a_S; s, \hat{d}_B\right)\right]\right\} - C\left(a_S\right) =$$

$$\frac{1}{2}\left[U_B\left(a_B; a_S; s, d^*\right) + U_S\left(a_B; a_S; s, d^*\right)\right] + \frac{1}{2}\left[U_S\left(a_B; a_S; s, \hat{d}_B\right) - U_B\left(a_B; a_S; s, \hat{d}_B\right)\right] - C\left(a_S\right)$$

In 0<t<1

- The <u>buyer</u> solves:

$$\max_{a_B} E\pi_B =$$

$$E\left\{\frac{1}{2}\left[U_B(a_B;a_S;s;d^*)+U_S(a_B;a_S;s;d^*)\right]+\frac{1}{2}\left[U_B\left(a_B;a_S;s;\hat{d}_B\right)-U_S\left(a_B;a_S;s;\hat{d}_B\right)\right]\right\}-C(a_B)$$

- The <u>seller</u> solves:

$$\max_{a_S} E\pi_S =$$

$$E\left\{\frac{1}{2}\left[U_B(a_B;a_S;s;d^*)+U_S(a_B;a_S;s;d^*)\right]+\frac{1}{2}\left[U_S\left(a_B;a_S;s;\hat{d}_B\right)-U_B\left(a_B;a_S;s;\hat{d}_B\right)\right]\right\}-C(a_S)$$

Be:

$\hat{a}_B^B$ = buyer's maximizing choice, under *Buyer-control*

$\hat{a}_S^B$ = seller's maximizing choice, under *Buyer-control*

- Are they efficient?

- Do they maximize the total surplus from the exchange?

- The answer is **negative.**
- Why?

The choice of efficient ex-ante investment is given by the solution to the problem:

$$\max_{a_B;a_S} E\left[U_B(a_B;a_S;s;d^*)+U_S(a_B;a_S;s;d^*)\right]-C(a_B)-C(a_S)$$

Be:

a_B^* and a_S^* the solutions to the total surplus maximizing problem.

- No reason to expect that:

$(\hat{a}_B^B;\hat{a}_S^B) = (a_B^*;a_S^*)$

- The same applies, for each kind of allocation of the residual rights of control.

i) $\hat{a}_B^B \neq a_B^*$; $\hat{a}_S^B \neq a_S^*$ → *Buyer control*

ii) $\hat{a}_B^S \neq a_B^*$; $\hat{a}_S^S \neq a_S^*$ → *Seller control*

iii) $\hat{a}_B^{NI} \neq a_B^*$; $\hat{a}_S^{NI} \neq a_S^*$ → *Non-integrated relationship*

- No allocation of the residual rights of control allows an ex-ante efficient level of investment.

- Does it mean that one is as good (or as bad) as the other?

$\Rightarrow$The best allocation is the one that minimizes the distortion of the ex-ante investment with respect to the socially optimal investment.

Assumption:

The investment marginal benefit is increasing in the control.

Under *buyer control*:

$$\frac{\partial U_B^B}{\partial a_B} > \frac{\partial U_S^B}{\partial a_S}$$

Under *seller control*:

$$\frac{\partial U_B^S}{\partial a_B} < \frac{\partial U_S^S}{\partial a_S}$$

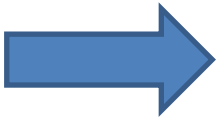
$\Rightarrow$the incentive to invest is stronger for the buyer than for the seller under *buyer control*

And

$\Rightarrow$the incentive to invest is stronger for the seller than for the buyer under *seller control*

Each allocation of the residual rights of control can lead to:

- *under-investment*: a level of investment less than the socially optimal level of investment (by the party that has no residual rights of control)
- *over-investment*: a level of investment greater than the socially optimal level of investment (by the party that has the residual rights of control)



The optimal allocation of the residual rights of control confers the residual rights of control to the party whose investment is more relevant in the formation of the surplus from the transaction

Grossman-Hart (1986, p. 716):

- "If firm *i* owns firm *j*, firm *i* will use its residual rights of control to obtain a large share of the ex-post surplus,
- and this will cause firm *i* to overinvest and firm *j* to underinvest.
- Under ***nonintegration***, on the other hand, the ex-post surplus will be distributed more evenly, and so each firm will invest **to a moderate extent."**

⇒***Integration*** → when one firm's investment decision is particularly important relative to the other firm's investment

⇒***nonintegration*** → when both investment decisions are somewhat important

Privatization and Public versus Private Ownership

Costs and benefits of privatization and public versus private ownership.

When contracts are incomplete, the identity of the owner becomes highly relevant, because the owner retains the residual rights of control and the residual surplus

- **P** (the principal) → government who desires the production of some public service

- **A** (agent) → a manager in charge of producing this service

CONTEXT OF PRIVATIZATION

The government cares about:

- production efficiency (cost minimization)
- quality of service

- quality of welfare services may be hard to specify in a contract
- the private contractor has an incentive to produce at lowest cost

Assume the agent can make two different types of innovations:

- cost innovations
- quality innovations

- A **government-owned service provider** will have little incentive to invest in either innovation, since he is not the residual claimant

- A **private contractor** will have stronger incentives both to improve quality and to reduce costs.

They show that the private contractor's incentive to engage in cost reduction is typically **too strong**.

Hence, in general:

the greater the adverse consequences of (non-contractible) cost-cutting on (non-contractible) quality, the stronger is the case for government ownership.

- Outsourcing and privatization can be harmful because of excessive cost reduction and concomitant quality reduction

- competition may wholly or partly mitigate the problem of quality reduction
- But….what about welfare services as prisons?

LIMITS

- A theory of intrafirm organization is completely absent
- Theory of the firm without managers
- No distinction between ownership and control