OWNERSHIP AND RESIDUAL RIGHTS OF CONTROL

Ownership is usually considered the best way to incentivize economic agents:

- To create
- To protect
- To increase

The value of their own assets

- How can ownership been defined?
- The economic theory has deeply analysed the link between property and residual rights of control

The ownership 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.

If it were possible to draft a <u>complete contract</u> in which all the rights were specified for any contingency, there would be nothing residual, and hence there would be no needs to attribute the "residual" rights of control

But contracts can't be complete (transaction cost economics)

Ownership => reduction of transaction costs

- 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.

Assume an economy with two economic agents:

- 1 buyer
- 1 seller

sequence of the events

- **In t=0**:

    buyer and seller meet

    The parties only know the probability distribution of

    the relative benefits and costs from the exchange

- **In t=1:**

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

- In **t=0** buyer and seller agree that in **t=1** the exchange will take place.

- Between **t=0 and t=1** each party can devote resources to an activity that increases the surplus from the exchange, that is:

- Each party may undertake an investment ex-ante (before t = 1, when the exchange takes place).

- The investments are relationship-specific

CONTRACTS ARE INCOMPLETE:

there is no contract that in **t=0** can bind the parties to their ex-ante investment decisions and/or to their ex-post exchanges (once the realization of costs and benefits from the exchange are known).

HOWEVER,
In **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 right to decide what and how much will be exchanged → THE RESIDUAL RIGHTS OF CONTROL

Whatever the allocation of the residual rights

- in 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:

- In the economy considered by the model, there are 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).

HENCE:

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

- What determines the distribution of the ex-post surplus from the exchange?

- It depends on the allocation of the residual rights of control:

HENCE:

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

- It is relevant to identify the allocation of the residual rights of control that maximizes the surplus from the exchange through the effect on the ex-ante investment decisions.

- Or to identify the allocation of residual rights of control that mostly approximates the investment decisions to the level that maximizes the surplus from the exchange.

THE MODEL

Sequence of the events

In **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 $s \in S$ (s$_1$ is, for example, a certain realization of benefits and costs in the contingency 1 ... and so on)

In **t=0**

the parties negotiate the allocation of the residual rights of control.
We consider three kinds of allocation:

- **buyer-control;**

- **seller-control;**

- **Nonintegrated relationship**

- In the first two, the residual rights to take the relevant ex-post decisions are respectively assigned to the buyer or to the seller.

- In the nonintegrated relationship the relevant ex-post decisions are taken by the two parties jointly, that is to say, each party has a right of refusal

0 < t < 1

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

a_B= ex-ante investment chosen by the

buyer

a_S = ex-ante investment chosen by the

seller

$C(a_B)$ = investment cost function of Buyer

$C(a_S)$ = investment cost function of Seller

In **t=1**

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

$$a_B \qquad a_S \qquad s$$

- The parties negotiate the action to undertake (ex-post), that is the **decisions** about what and how much to exchange:

$$d \in D$$

Each party receives his own payoff from the interaction, given by:

- the utility from the exchange (function of the ex-ante investment, the state of the world and the ex-post decisions)
- net of ex-ante investment costs.

If we indicate the utility functions of buyer and seller as:

$$U_B = U_B(a_B; a_S; s; d)$$

$$U_S = U_S(a_B; a_S; s; d)$$

- Buyer's payoff is:

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

- Seller's payoff is:

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

Causality links

let's go back to the first period:

In **t=0**,

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

$$E\pi_B = EU_B - c(a_B) \rightarrow \text{Buyer}$$
$$E\pi_S = EU_S - c(a_S) \rightarrow \text{Seller.}$$

Always in **t=0:**

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

    buyer-control;

    seller-control;

    Nonintegrated relationship

In **0<t<1**

- The parties decide their levels of investment.

- The investment decision is such to maximize the expected payoff, which, of course, depends also on the decided kind of allocation (of the residual rights of control).

- Consider that the parties have chosen a **buyer control allocation**

Which are the expected payoffs in this situation?

- As in any case of backward induction, we have to start from the end, from when the ex-post action (the decision of what and how much to exchange) is taken

- Remember that under the buyer control allocation the choice of the action $d \in D$ is up to the Buyer

In the absence of renegotiation ex-post

the buyer chooses *d* so as to to maximize his utility function :

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

$\hat{d}_B \rightarrow$ the maximizing choice of the buyer's

ex-post payoff, in the absence

of renegotiation

When $d = \hat{d}_B$, the social surplus, i.e. the sum of the utilities of both buyer and seller, 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 social surplus** is maximized under a buyer-control allocation.

In fact,

- In this kind of allocation, the decision **d** is chosen by the **buyer without any consideration about the seller's utility**,
- while maximizing the **total surplus** requires that the ex-post decision **d** is the solution to the problem:

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

- $d*\rightarrow$ the choice that maximizes the social surplus

- The social surplus is:

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

If:

$$TS^* > TS^B$$

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

It is irrelevant if:

- It is the buyer who offers the seller a reward to leave the initial decision $\hat{d}_B$ in favour of the new decision d^*,

Or if:

- It is the seller who offers the buyer a reward to leave the initial decision $\hat{d}_B$ in favour of the new decision d^*,

Because in any case the final decision is of the buyer

- and 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 (that is when $d = \hat{d}_B$**)**

Grossman-Hart-Moore (GHM hereafter**)** assume that in the ex-post renegotiation each party will receive half of the increase in the surplus arising from the renegotiation itself

We can then write the payoff of each party as follows:

Buyer's Payoff:

$$\pi_B =$$

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

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

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

Seller's payoff:

$$\pi_S =$$

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

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

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

In 0<t<1

- Each party chooses the investment level so as to maximize his expected payoff, that is

- The buyer 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 seller 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 social surplus from the exchange?

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

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

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

$\Rightarrow$ The jointly solution of the investments (both a_B and a_S) that maximizes the social surplus obtained by implementing the ex-post efficient decision d^*.

Be:

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

- We have no reason to expect that:

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

In fact:

- In the ex-ante choice of investment (the one made in 0<t<1) under *buyer control,* each party values only ½ the increase in the utility given by the transition from $\hat{d}_B$ to *d**

- The same applies, for each kind of allocation of the residual rights of control.
- We can hence assert that the **ex-ante investment maximizing choices** are different from the **efficient ex-post social surplus maximizing choices** under each kind of allocation:

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

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

   iii) $\hat{a}_B^{NI} \neq a_B^*$; $\hat{a}_S^{NI} \neq a_S^* \rightarrow$ *Nonintegrated*

   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?

- **The answer is negative**.

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

GHM assume that the investment's marginal benefit is increasing in the control.

- Under *buyer control,* an increase of investments generates an increase in the buyer's utility that is greater than the increase of the seller's utility due to the increase of his investment, and vice-versa, under *seller 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*

- The assignment of the residual rights of control to one party, then implies an <u>increase of the ex-ante investment</u> by that party (who has the residual rights of control) and a <u>reduction of the ex-ante investment</u> by the other party

- This implies that 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 and whose investments' marginal benefit is higher)

- Under-investment or over-investment depend on the specific elasticity of the utility function to the ex-ante investment decisions.

- In any case, the optimal allocation of the residual rights of control is the one which better approximates the ex-ante investment decisions of the buyer and of the seller to the social optimum

- hence the optimal allocation of the residual rights of control is the one that confers the residual rights of control to the party whose investment is more relevant in the formation of the surplus from the transaction,

- the party whose investments allow to achieve the highest social surplus

- In which situations it is convenient a vertical integration and in which situation it is better a nonintegrated relationship.

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* is therefore optimal when one firm's investment decision is particularly important relative to the other firm's,

⇒Whereas *nonintegration* is desirable when both investment decisions are somewhat important

The predictions of the model and the empirical evidence

- The model predicts that the more important the investment of one party, the higher the probability of *vertical integration.*

- Conversely, when the marginal contribution of the investment of each party is similar, the priority is *non-integration.*

- This prediction is rather difficult to test because it requires information on the marginal contribution of the ex-ante investment of each party.

- This explains the limited number of studies aimed at assessing the empirical relevance of the GHM model, and instead the massive use of case study

Grossman-Hart (1986): a study of the american insurance industry.

In the insurance industry:

- some firms have a SALES FORCE that primarily sells its own company's products.

- These companies are called →DIRECT WRITERS

- The sales force may include:
    - employees or
    - agents who are independent contractors.

DIRECT WRITERS: it is the insurance company and not the agents that owns **the list of policyholders**

Ownership of the list of policyholders:

- entitles the insurance company to sell insurance to the policyholders if the agents terminates the relationship with the insurance company.

- The agent has no right to renew the insurance policy with a different company. He cannot leave the company and take his clients with him.

Insurance companies that are **NOT DIRECT WRITERS** sell insurance through independent agents and brokers → **<u>independent agents</u>**

- THEY, rather than the company, own the list.

- An independent agent can sell any insurance company's product to his client.

- If the independent agent terminates his relationship with a particular insurance company, he can take his clients with him.

- Even without the termination of the relationship, if the agent thinks that his client would be happier with the insurance of another company, the agent can encourage the client to change the company.

The choice here is between:

- *I control* → (The insurance company has the residual rights of control)

- *A control*→ (The independent agent has the residual rights of control)

Nonintegration has non meaning (it actually coincide with A control)

- We assume that the agent devotes efforts that is not verifiable (by the insurance company) to acquiring and keeping clients.
- The greater this effort, the more likely it is that a typical client will renew his insurance in the future, that is, that he will be persistent.

Examples of this effort:

- The care with which the agent adapts the initial policy to the client's needs
- The efficiency with which he deals with a claim once the policy is in force.

This effort yields dividends in the future.

- For example, a claim dealt with speedily today is likely to induce the client to renew next year and the year after.

We have seen that the marginal benefits of the investment are increasing under the control.

Hence:

1. If the company owns the list (*I control*):

- The agent will have insufficient incentives to deliver persistent clients → he will underinvest in such activity.

- The company, on the other hand will have high incentives in building the list → it will overinvest in this activity

2. If the agent owns the list (*A control*)

- The company will underinvest in the building of the list

- the agent will overinvest in delivering persistent clients.

Example: the <u>whole life insurance</u>.

- A life insurance policy will involve a longer-term contract than automobile insurance or fire insurance,

- because a short term policy gives very little protection to a person against the event that he will be sick but not die during the term of the life insurance policy and then be uninsurable thereafter.

- As a result a life insurance costumer has less tendency to switch insurance companies than does an automobile insurance costumer.
- In case of life insurance, renewals are relatively insensitive to the agent's actions!

GH's analysis predicts that:

- in products in which the renewal is not guaranteed and is sensitive to the agent's actions, the agent will be more likely to own the list,

- Whereas in products in which the renewal is more certain and is less sensitive to the agent's actions, the company will be more likely to own the list

$\Rightarrow$These predictions are consistent with facts characterizing the insurance industry