Firms, Property Rights and Incomplete Contracts

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Roadmap

- Transaction costs and the theory of the firm.
- Externalities and property rights.
- Asset specification and incomplete contracts.

Theory of the firm

- "The Nature of the Firm", by Coase (1937).
- How do we usually describe the price mechanism?
  - The invisible hand.
  - Sir Arthur Salter: The normal economic system works itself. For its current operation it is under no central control, it needs no central survey.
- It seems that the direction of resources is dependent directly on the price mechanism. There is no planning at all.

Coase's criticism

- Within a firm, the description does not fit at all.
- How do we allocate resources within a firm?
  - Plans, orders, commands.
- Why?
- Why not use the price mechanism?

Previous views

- Marshall: Introduces organisation as a fourth factor of production.
- Clark and Knight: Gives the co-ordinating function to the entrepreneur.
- But it is usually argued that co-ordination will be done by the price mechanism.
- Why is there any firm?

Coase's answer

- There are costs of using the price mechanism: Transaction costs.
- What are the examples of transaction costs?
  - The costs of discovering prices.
  - The costs of negotiating and bargaining.
  - The costs of specifying terms in contracts.
  - .....
- By forming an organization and allowing some authority to direct the resources, certain transaction costs are saved.

Further questions

- Why is not all production carried by one big firm?
- What determines the boundary of the firm?
  - The tradeoff between organization costs and transaction costs.
  - As a firm gets larger, the costs of organizing additional transactions within the firm may rise.
- A firm will stop expanding when its marginal organization costs equals its marginal transaction costs.

Evaluation

- What are the contributions of this paper?
  - Raised a very important question.
  - Introduced a concept that is both tractable and realistic.
  - Applied marginal analysis to determine the boundary of the firm.

Theory of property rights

- "The Problem of Social Costs", by Coase (1960).
- What is externality? Why is it a problem?
- How do we usually deal with externality?
  - The Pigou tax.
  - If a factory pollutes a river, who should be taxed?

Example: cattle and crop

Numbers in Herd (Steers)	Annual Crop Loss (Tons)	Crop Loss per Additional Steer (Tons)
1	1	1
2	3	2
3	6	3
4	10	4

Example: cattle and crop

- Assume that:
  - The annual cost of fencing the farmer's property is \$9.
  - The price of the crop is \$1 per ton.
  - The net profit of cattle is \$3 per steer.
- What if the cattle-raiser is liable for the damage?
- What if no one is liable for the damage?
- Are these outcomes efficient?

Coase Theorem

Coase Theorem

If the pricing system is assumed to work without cost, bargaining will lead to a Pareto efficient outcome regardless of the initial allocation of property rights.

The role of transaction costs

- However, the assumption of no transaction costs is far away from realistic.
- What does the author really want to say when there are transaction costs?
- In the real world with positive transaction costs, the initial allocation of property rights will substantially influence efficiency.

Other theory of the firm and property rights

- Residual claimer: Alchian and Demsetz (1972).
- Information costs: Jensen and Meckling (1976).
- Measurement costs: Holmstrom and Milgrom (1991).
- Public domain: Barzel (1997).

Asset specification

- Williamson (1971, 1975, 1979).
- A power plant has strong cost-based incentives to locate near a coal mine.
- It can sign a contract with the coal mine before building a factory.

Hold-up problem

- However, after the factory is built, it becomes a sunk cost.
- The coal mine will have an incentive to renegotiate the contract so as to increase the price of coal.
- We say this is a "hold-up" problem.
- If the power plant anticipates this "hold-up" situation, it may simply decide not to make the investment.

Incomplete contracts

- Grossman and Hart (1986), Hart and Moore (1990).
- Basic observation: Contracts are incomplete.
- People are boundedly rational and cannot anticipate all possible contingencies.

An example

- A tycoon: wants to go adventure (240).
- A chef: learn how to make a special type of cuisine (-100).
- A skipper: can be easily replaced.
- They meet and sign contract at date 1, then the chef decides whether to learn the skills for the cuisine ($x \in \{0, 1\}$).
- Payments are made at date 2. Then the utility of adventure is realized.
- Symmetric bargaining power.

An example

- Suppose that x is contractible, which means payments can be contingent on x. What would be the optimal contract?
- Suppose that x is non-verifiable, and thus non-contractible. What would happen?
- In both cases, who should own the boat?

An example

- The key assumption is that some states are non-contractible:
  - future events;
  - innovations;
  - unaware contingencies;
  - human capital.
- When non-contractible events occur, parties have to bargain over what should be done.
- Ownership is a source of bargaining power.

A (somewhat) formal model

- A buyer and a seller contract at date 0 on the delivery of an indivisible product.
- At date 1, they can both invest to increase the value of the product.
- They observe each other's investment and trade at date 2.

Asset specific investment

- At date 1, the seller's and buyer's investments are denoted e_S and e_B, respectively.
- The seller's cost of producing the product is $c(e_S)$, which is decreasing in e_S.
- The buyer's value of the product is $v(e_B)$, which is increasing in e_B.
- There are many other buyers and sellers as outside options.
  - If a buyer trades with an outside seller, the latter incurs cost $c(0)$.
  - Similarly, if a seller trades with an outside buyer, the latter has a value $v(0)$.
- Assume that $v(0) \geq c(0)$.

Ownership structures

- Suppose that neither investments nor ex post cost and value are verifiable.
- Grossman-Hart-Moore argue that the optimal contract comes from either buyer-ownership or seller-ownership.
- Joint ownership is dominated because it precludes outside opportunities and therefore offers neither party further protection from expropriation.

Challenges

- Maskin and Tirole (1999a; 1999b).
- Option-to-sell contract: There is joint ownership. At date 2, however, one party, drawn at random with equal probabilities, receives the right to sell his/her share to the other party at a pre-specified price:

$$p_S = \frac{1}{2}[v(e_B^*) - c(0)];$$
$$p_B = \frac{1}{2}[v(0) - c(e_S^*)].$$

- If a party exercises his exit option, the other party pays a fine F large enough.
- This simple contract achieves the first best. But the question is: Why we do not observe this quite often in reality?

Discussion and applications

- Financial contracting: Aghion and Bolton (1992).
- Contracts as reference points: Hart and Moore (2008).
- Endogenous incomplete contracts: Bolton and Faure-Grimaud (2009a, 2009b).
- Cognition and incomplete contracts: Tirole (2009).