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Lecture 1

The firm
★★★★★



Industrial
Economics

The question

- ★ *Why* do humans create firms?
- ★ Why some firms grow *uncontrollably*?
- ★ Why others do *not develop* much?
- ★ Why some firms *succeed* and *others vanish*?

★ But first:

-What is a *firm*?

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Types of firms

- ★ Sole proprietorship
 - ◆ owned by *one person* who may *employ others*
 - ◆ *unlimited liability* for debts
- ★ Partnership
 - ◆ a business owned by two or *more people* usually with *unlimited liability*
- ★ Corporation
 - ◆ a *limited liability* business that is a *separate legal entity*
- ★ Cooperative (Co-op)
 - ◆ has *members*, as opposed to shareholders, who *equally share* decision-making authority

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So, what is a firm?

- ★ A proposed definition:

"a firm is a commercial partnership of two or more persons"
- ★ But, this is mostly a *descriptive* definition and *does not address* the reason(s) of existence of the firm as an economic entity

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Four approaches to what a firm is

1. A firm is a *loophole* for the exercise of market power size leads to power
2. The firm is a *static synergy*
economies of scale and risk handling
3. The firm is an *incomplete contract*
authority can alleviate incompleteness
4. The firm as a *long-run relationship*
prevent hold-up and encourage specific investment

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1. Loophole for market power

Unification under the umbrella of the firm allows to develop the **size** to exploit the market **monopolistically**

- ★ **Horizontal Integration**: increase joint **market share** and enjoy **market power** in the commodity market
- ★ **Vertical Integration**: Allows for **control of the production** process, **exclusion** of competitors and **work around** the law.

Vertical loopholes

- ★ Price discrimination
 - ◆ A manufacturer may want to charge **different prices** to **different retailers**
 - ◆ This may be **illegal** and create the possibility of **arbitrage**
 - ◆ Integration allows for the **distribution** to be **internalized**
- ★ Intermediate price controls
 - ◆ Integration replaces **spot markets** with **internal** transactions
 - ◆ Internal **transactions** are **unobservable** to authorities
- ★ Taxation
 - ◆ Internalization of **transactions** and **distribution** allows companies to **circumvent taxation**.

2. Static synergy

- ★ The **production process** per se imposes an **optimal size** for the firm in each market
 - ◆ **Economies of scale**: The cost per unit decreases as production increases
 - ◆ **Economies of scope**: The cost per unit decreases as the firm produces different goods
- ★ The handling of **risk** imposes the **synergy**
 - ◆ Risk can be **diversified** more effectively with **scale**
 - ◆ This is crucial because **individuals** are usually **risk-averse**
 - ◆ The **firm** can have a **different attitude** towards risk than its **shareholders**.

3. Incomplete contract

- ★ Can we **replace** the firm with a network of contracts?
- ★ Contracts may be inefficient and incur **transaction costs**
 - ◆ **Unusual contingencies** might not be foreseeable,
 - ◆ Contingencies may be **too many** to be described by a contract
 - ◆ **Monitoring** the contract might be costly
 - ◆ **Enforcing** the contract might be costly and timely
 - ◆ **Distortion** of incentives in usual cases.

Transaction costs

- ★ Unspecified contingencies often lead to **conflicts** if they occur, requiring **external arbitration** or **bargaining**
- ★ A firm is an **integrated authority organization** there is some contracting but **the hierarchy settles** the unspecified contingencies.

4. Long-run relationship

- ★ The production process often requires **specific investment** by one of the parties
- ★ Investment specificity is measured by the **quasi-rents** the **difference** between the value of the asset in its **present use** and its value in the next **best alternative use**
- ★ High quasi-rents require **long-run** relationships it takes time for the investment to pay off
- ★ The party who **commits** to a specific investment is **vulnerable to opportunistic behavior** by the other party this is referred to as **the hold-up problem**.

Sunk cost

- ★ A cost is sunk if there is no way to **salvage** it
- ★ Sunk expenditures arise because productive activities often require **specialized** assets
 - ◆ We can distinguish between industry specific and firm-specific capital
 - ◆ Example: an airplane is a sunk expenditure to the airline industry, but not necessarily to the airline firm which made the original investment
- ★ Should sunk cost affect economic **decisions**? Δ

A model of investment

- ★ A **supplier** and a **buyer** consider trading **one good**
- ★ The **cost** for the supplier is $c(I)$
 - I is the level of **investment** and $c' < 0$ and $c'' > 0$
- ★ The **value** of the good for the buyer is $v > c(0)$
- ★ **Trading** at price p ,
 - ◆ **buyer** gains $v - p$
 - ◆ **supplier** gains $p - c(I)$
- ★ Assuming **equal bargaining power**

$$v - p = p - c(I) \Rightarrow p^* = \frac{v + c(I)}{2} \Delta$$

Investment

- ★ At p^* the supplier's profit is Δ p^*

$$\Pi_S = \frac{v + c(I)}{2} - c(I) - I$$
- ★ Maximizing with respect to I

$$\partial \Pi_S / \partial I = -0.5 \cdot c'(I) - 1 = 0 \Rightarrow c'(I_S^*) = -2 \quad (1)$$
- ★ The **joint gains** are: $\Pi_{S+B} = v - c(I) - I$
- ★ Again, maximizing w.r.t. I : $c'(I_{S+B}^*) = -1 \quad (2)$
- ★ From (1) and (2): $c'(I_S^*) < c'(I_{S+B}^*)$
- ★ Because of the **convexity** of $c(\cdot)$: $I_S^* < I_{S+B}^*$
 - the supplier does not capture all the savings from his investment so has the incentive to **underinvest** $\Delta \Delta$

Vertical relation model

- ★ A and B want to **cooperate** producing a good of **value** p
 - A undertakes the **intermediate** stage; B the **final** stage
- ★ **Cost** for A and B are

$$c_A = I + a \quad \text{and} \quad c_B = p_w + b$$
 - I is specific investment, p_w is the transfer price, a, b constants
- ★ A and B must **agree** in p_w beforehand

$$p_w \in [I + a, p - I - a - b]$$
- ★ If this set is **non-empty**, agreement is **feasible**
- ★ Say they **agree** that:

$$p_w = c_A + \frac{p - b}{2} \Delta$$

Opportunistic behavior

- ★ Assume now that a, b are **completely** salvageable
- ★ I however can be **partially** salvaged at $I_S \in [0, I]$
- ★ After the agreement on p_w and after A has **sunk** I , B has room to **re-negotiate** or threaten to **exit**
 - under the **excuse** that p has fallen, for example
- ★ In this stage, A will **accept any** $p_w \in (I_S + a, c_A + \frac{p-b}{2})$
- ★ Investment specificity allows B to **hold-up** A
- ★ Notice that hold-up can be **reversed** from A to B, if B faces a **termination cost** $T > I - I_S$
 - search costs** to find another partner, for instance $\Delta \Delta$

GM vs. Fisher

- ★ Klein, Crawford and Alchian published a monumental paper in 1978 about this infamous case
 - ◆ GM was one of the biggest car manufacturers in the world
 - ◆ Fisher Body was an iconic maker of car frames at the time
- ★ The case concerns a contract signed in 1919
 - ◆ Fisher would **supply all bodies** for GM for 10 years
 - ◆ The **transfer price** was set to AVC + 17.6%
 - ◆ Fisher would have to make **specific to GM investment** closed composite bodies – relocation close to GM plants
 - ◆ GM acquired 60% ownership of Fisher with no direct control right Δ

Unanticipated contingency

- ★ Till 1924 the contract **worked well**
Fisher indeed **built** 14 new mf locations near various GM plants
- ★ In 1925-26 GM increased its demand for closed bodies by Fisher by 200%
the market was growing and shifting towards closed cars
- ★ Such growth of demand was **unanticipated**
at the AVC + 17.6% Fisher's specific investments were recovered faster than expected because of EoS.

Economies of scale

- ★ Fisher cared a lot about developing **Economies of scale**
- ★ GM cared more about **streamlining the production** of the final product
- ★ Tensions grew in 1925 when Fisher **declined** to build a plant in Flint near Buick
 - ◆ Fisher preferred to produce the Buick frames in Detroit together with bodies it was producing for Chrysler (GM's competitor)
 - ◆ Fisher, however, marked up the shipping costs by 17.6%!

The Flint plant

- ★ The Flint plant was very **important** for GM
it ultimately became the **largest** car m/f plant in the **world**
- ★ Allegedly GM **offered** financing Flint but Fisher denied because **transfer price** would not be under the 1919 contract
- ★ Fisher **did not want** to finance the Flint plant, either upon completion in 1926 only 3 years would remain to the contract
- ★ Fisher knew that a potential **new contract** would define a lower **transfer price**
also, GM's 60% over Fisher could give GM **full control** after 1929.

Holdup, or not?

- ★ GM considered that Fisher is "**sitting on** the contract" for the remainder years
- ★ Fisher considered that GM was **holding it up** with the requirement for the **new plants**
after Fisher would sunk the investment, GM could hold it up after the contract expired
- ★ These tensions ended in 1926,
when GM **acquired** Fisher
- ★ GM cars carried Fisher's emblem
on their door sill plates until the mid-1990s
Fisher still exists as GM's division Fisher Coachworks, LLC.

Thank you!



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