Industrial Organization, Week 2
Theory of the firm and Monopoly

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Agenda

What is everyone trying to do?

- Consider the firms objective function
- $E[\pi(e, \epsilon)]$ Entrepreneurs function
- $E[\pi(e, \epsilon) - w(\pi(e, \epsilon))]$ Owner's objective function
- $u(w, e) = u((\pi(e, \epsilon), e)$ Manager's objective function

What the owner has to worry about

- $max_e Eu(w(\pi(e, \epsilon), e)) > u_0$ Individual Rationality, What else can I do?
- $Eu(w(\pi(e^*, \epsilon), e^*)) > Eu(w(\pi(e, \epsilon), e))$ Incentive compatibility, Do I have to work hard?
- Example: Every year a coin gets flipped and does either $+0$ or $+1$ to the owners profits. The manager first sees the noise and then chooses whether to work or be lazy. Working costs him nothing but adds 1 to the owner. The owner can only see a series of number floating, say, (0,2,1,1,1,1,2,0). He knows from the 2 that the manager worked hard and knows from the 0 that he didn't work hard. So how much should he compensate him?
- $[0, \epsilon, 2\epsilon]$

Agenda

What is a firm?

- Who would produce without firms?
- Government? Households? Individuals?
- What is the competitive advantage of firms relative to others?
- Individuals seem to be able to contract just like firms.
- Firms seem to have some legal advantages, (limited liability, partial ownership, lower taxes, etc)
- What is a firm? Can a firm pay everyone proportionatly to their output?
- Answer: Piece rate compensation vs time rate compensation

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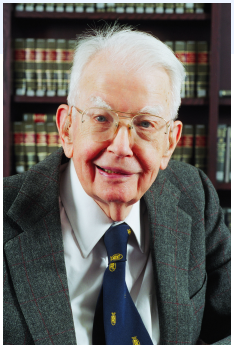
Theory of the firm 1: Specialization

- Adam Smith offers the first story
- Claim: Firms exist to enable specialization
- Story 1: People's minds are more erfficient when focused
- Story 2: There are switching costs between tasks
- Limitation: Explains why there is specialization, not why firms exist

Theory of the firm 2: Risk aversion

- Frank Knight offers a second solution
- Claim: Variation in forecasting ability
- Story: Some people can forecast demand, they hire people to help them react to their own forecast. Since the others can't trust the forecaster, they demand compensation that does not depend on performance.
- Limitation: Doesn't explain why there are firms even when demand is easier to forecast.
- Plausible revision: Variance in risk aversion

Theory of the firm 3: Transaction costs



- Coase, seminal "Nature of the firm"
- Claim: Presence of transaction costs
- Story: Firms exist because there is a cost to using the market price
- Limitation: Moves the question to, why are there transaction costs?

Theory of the firm 3: Transaction costs

Consider a rancher and farmer. The rancher can consider whether or not to take an action. If he takes the action he benefits to the extent of X but he costs the farmer Y. So clearly the action is beneficial if $X > Y$. But what if there is some cost to the two getting on the table, whatever its nature, psychological, informational, transportation cost etc, then the transaction won't take place at all. The cost of using the price mechanism.

Theory of the firm 4: Property rights

- Hart and Moore, Incomplete contracts
- To form coalitions where ex-ante investment can be rewarded
- Story: A firm is a structure which has the ability to reward people for things they didn't contract for.
- Limitation: A bit abstract, not clear what it's scope is

Agenda

What is a monopoly

- What is a monopoly?
- Definition: When there is only a single seller
- Why does it emerge?
- Natural monopoly, Government privileges, Historic reasons, Reputations
- Effect of monopoly:
- It reduces the quantity sold and increases prices. Unless it can discriminate,
- If monopolist can perfectly discrminate, first best, perfect appropriation

The firm: Revenue

$$\textit{Revenue} : R = p(q)q$$

$$\text{Marginal Revenue} : MR = \frac{dR}{dq} = \frac{dp}{dq}q + p = p(1 - \frac{1}{\eta})$$

$$\text{Where:} \eta = -\frac{dq}{dp}\frac{p}{q}$$

The firm: Profit

$Profit : max_q \pi(q) = qP(q) - C(q)$	Profit as a function of quantity
$FOC : qP'(q) + P(q) - C'(q) = 0$	A positive first derivative at zero is neccesary
$SOC : qP''(q) + 2P'(q) - C''(q) < 0$	Unique solution requires negative second derivative
Lerner's index : $\frac{P(q) - C'(q)}{P(q)} = \frac{1}{\eta}$	FOC re-arranged and divide by P

So the monopolist increases his markup as the demand becomes less price elastic

Monopoly Graph