

# Economics of Information

## LECTURE 2

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# Information and production

- information is an economic good: it is costly and valuable
- a firm can purchase information, or it can expend resources in research and development to wrest it from nature

## BUT

- the way information enters the production function is different than the way other goods do
- the same piece of information can be used over and over again, by the same or a different producer, regardless of the scale of production

## Arrow (1996)

- increasing returns can occur for other reasons than information
- but with information, constant returns are impossible

# Information and production (cont'd)

## information as a choice variable

information is a *signal*, i.e. an observed random variable which may be of no economic interest itself but which is not independent of unobserved variables which affect benefits or costs

- the cost of information is related to its accuracy
- information is often about *rates* (e.g. returns on securities, unit costs...)
- then, the cost is independent of absolute magnitudes

### BUT

- the *value* depends on the scale of its utilisation
- e.g. gross income  $\propto$  scale of utilisation  $\perp$  cost of information
- reasonably, demand for information increases with scale
- then uses on high scale are more accurate than uses on low scale

### THEN

- also the expected rate of return increases with scale !

# Information and production (cont'd)

*“the presence of increasing returns leads to the conclusion that the opportunity to acquire information about investments leads to a situation in which the rate of return to investment rises with the amount invested”* [ibidem, p.125]

- this mechanism can explain part of the inequality of income
- departures from equality are self-reinforcing !

## Example: process innovation

- extensive search for lower unit costs is economically justified only if the new process is applied on a large scale
- the larger the scale, the lower the unit cost because of more R&D
- justifies endogenous theories of economic growth

# The transmission of technical information

- so far we have been talking about *acquisition* of new knowledge
  - i.e. expenditure of resources on information to make better decisions
  - what about *transmission* ?
  - once information is obtained it can be transferred (copied) *cheaply*
  - thus, it is difficult to make information into property
  - patents and copyrights induce *artificial* scarcity with limited power
    - duration
    - piracy
    - labour mobility
    - release of new product
    - written and oral material
    - learning through informal contacts
  - scarcity is intended to create the incentives for acquiring information
- diffusion of innovation is socially optimal *ex-post* but not *ex-ante*

# Implications for industrial organisation

- in standard economic theory the firm is a locus of knowledge, embodied in a production possibility set
- but where is knowledge located ? where does it reside ?
- some of it might be stored in a *proprietary* database
- but the most important part is embodied in individuals, acquired by means of interaction with other workers and sources outside the firm

## BUT

- in the neoclassical model workers are *not* part of the firm
- they are input purchased on the market
- **dilemma**: what knowledge is *peculiar* to a firm ?

# Implications for industrial organisation

- labour mobility is neither zero nor infinite
- then patterns of information dynamics are moderate and predictable
- a firm can treat and value its information base as an *asset*
- value of a *going concern* considerably exceeds  $\sum$  physical assets
- knowledge embedded in production workers, managers, technical personnel... constitutes a large share of market capitalisation
- all of this depends on low mobility: how to explain it ?
- Becker (1962) '*firm-specific human capital*'
- each firm has a different way of *coding* information (e.g. *routines*)
- the code is itself part of the firm's information base
- $\exists$  multiple optimal codes
- choice is highly path-dependent

Thank you for your attention!

**see you on**  
**Monday, 26th March**  
**h. 17:00 – Aula 6**

