

# SIGNALS

The informed individuals would improve their situation revealing their information to the other (not informed) party.

Examples:

- The owner of a good used car;
- A potential worker of high ability;
- A firm that about a new product

BUT

How to reveal in a simple and straight way such “hidden information about quality”?

The party with:

- greater information
- high quality of her goods/services
- Produces a

→ **SIGNAL**

that distinguishes itself from whom is offering “low quality”.

The less informed party to the transaction has an incentive to lead the informed party to:

→ ***SELF-SELECT***

as having a good/service which is of high or low quality.

## SPENCE'S JOB MARKET SIGNALING MODEL

Michael Spence (1973). "Job Market Signaling".  
*Quarterly Journal of Economics*, **87** (3): 355–374.

# Economic theory about the acquisition of education by individuals:

## 1. The “human capital theory”

- ((Gary S. Becker (1993, ed.). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. Chicago, University of Chicago Press.)),
- individuals acquire education up to the point where:

$$MC(\text{education})=MB(\text{education})$$

Cost of education = direct cost +  
indirect cost (opportunity cost)

Benefit of education = the prospect of higher  
remuneration

Implicit assumption: workers productivity  
depends on education

Empirical test: positive correlation between the  
number of years of education and the wages of  
workers (returns to schooling)

## 2. The «theory of the signals»

Individuals are different in terms of individual abilities, and education is a (indirect) **signal** of their quality (Spence, 1973).

With asymmetric information and adverse selection, more skilled individuals will seek indirect forms for signaling their abilities to the firm

If the acquisition of education is easier for individuals of higher ability

- Potential employees:

it will be convenient for individuals of higher ability to acquire higher levels of education

to signal their greater ability to the firm, and hence to obtain a higher wage.

- Firm:

It will be convenient linking wages to the educational level

 **education is a signal**

**Signal:** some activity or decision that demonstrates that the agent who undertakes it has certain skills or characteristics  
(belongs to some specific subset of the population)

Job market is characterized by asymmetry of information.

In the model:

- the not informed agent (the employer)
- tries to discriminate the market (**screening**)
- leading the informed agents (potential employees) to **self-select**
- on the basis of a **signal** of quality.

- A firm wants to hire a number of workers, but it is not able to identify ex-ante the potential workers of «good quality»
- The potential workers may not have their own reputation
- The firm has real problems in distinguishing more productive workers from less productive workers

→ To solve this problem of imperfect information, the firm may decide to rely on a *signal*

- Signals  $\neq$  indices

Signals: those observable characteristics attached to the individual that are subjected to manipulation by him

- Signals: Characteristics of the candidates observable by the firm

and that allow the firm to attribute to each worker the status of "high productive" employee or "low productive" employee.

The employer may decide ex-ante:

- "high productive" candidates  
the ones characterized by a high level of education
- "low productive" candidates  
those who have not reached that level of education.

## Contract from the firm:

- higher salary for more educated workers
- lower salary for less educated workers

Does the signal "*level of education*" work?

What are the properties that a signal must exhibit for screening the market?

## First (Paradoxical) case

signal of quality:

“to be a member of an association of workers with free registration”

All workers would choose to get the signal by joining the association

⇒ The signal would not be efficient

## First result:

to be efficient, a signal must be *expensive*  
for the «senders»

## Second case

signal of quality:

“to be a member of an association of workers with an entry fee to be paid»

- The fee is the same for all types of workers

All workers (both the high productive and the low productive) would compare the fee with the higher salary they would get as members of the association (the signal)

⇒ The signal would not be efficient

## **Second result:**

to be efficient, a signal must be more expensive for a group of «senders» (the least productive) than for the other group.

What about the signal «level of education»?

1. Studying is expensive:

studying requires effort

2. The acquisition of a given level of education is **more expensive** for individuals characterized by low productivity.

- Education is just a signal.
- Education does not increase workers productivity.

The idea is extreme: if there were perfect information there would be no need for education

- The causality direction is not:  
higher education → higher productivity
- but:  
higher productivity → lower costs of acquiring  
education → higher education

Problem:

- Which level of education?
- Examples with «years of education» → threshold  
value

## ***SEPARATING OR SCREENING EQUILIBRIUM***

- Who owns the signal (threshold value of the level of education) is considered highly productive;
- Only for more productive agents it is convenient to get the signal;
- The firm's belief that the acquisition of the signal is a test of quality is confirmed by the facts.