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information economics

The term refers to a broad set of problems in economics in which information known privately by some individuals can affect the outcome for a group as a whole.

1. Individuals know things that other individuals do not know and they may use this information strategically to further their own personal interests.
2. All the information that is relevant to a group's decision or choice may not be centrally available to any one individual. Besides the opportunities that this may present for strategic use of private information, this also raises questions of what information should be communicated among the group members in order to allow a good or even optimal collective choice for the group.

relevant related fields of economics and social science:

1. game theory (problem 1)
 2. team theory (problem 2)
 3. mechanism design (problems 1 and 2)
 4. the theory of organizations (especially, accountancy)
 5. information economics is increasingly of interest to computer scientists and engineers
- Asymmetric information* refers to a situation in which different people know different things.

0.0.1 Examples

1. A competitive marketplace
 - a. Adam Smith's *Wealth of Nations*
2. A planned economy such as Soviet Union
 - a. Hayek and the "socialist controversy" – its role in inspiring the field of information economics
3. the *principal-agent problem*

One party (the principal) employs another party (the agent) to perform a service for him. The agent may have private information about the appropriate service to provide (i.e., he may have special expertise), or his actions on behalf of the principal may not be fully observed or monitored by the principal. How should the principal compensate the agent as a function of the outcome of the agent's action so as to provide the agent with the proper incentives to take the best action on behalf of the principal?

The world is full of principal-agent relationships.

- a. example in the text book: the principal arrives in a city that is new to him and acquires a taxi to drive him to his hotel. The taxi driver is the agent. The best outcome for the principal is the shortest trip to the hotel. The best outcome for the

taxi driver is a large wage at the end of his day. Does the system of fares provide the driver with the incentives to use his expertise to find the quickest route to the hotel? Or does he instead have the incentive to take a circuitous or indirect route?

i. components of the problem: a linear fare schedule

$$\text{fare} = f + rx,$$

where f is a fixed fee upon setting the taxi meter, r is a rate, and x is either distance or time. It is also presumed that the driver bears a fixed cost of $c > 0$ between passengers. (I'm using different notation here than the text.)

ii. two extremes: $f = 0$ vs. $r = 0$.

(a). $f = 0$: The driver has the incentive to make x large in order to decrease the number of fixed costs c that he bears during his workday. This payment scheme can also induce drivers to refuse rides to people going to particular destinations.

(b). $r = 0$: The driver receives a fixed fare for picking up a passenger. His goal is therefore to minimize x so that he can pick up another passenger. This is optimal for the passenger, and it is often used in cities (i.e., a "fixed fare" between the airport and a common destination). It can be hard on the driver, however, if driving times may vary considerably.

(c). What about $f < c$, $f = c$, and $f > c$?

$f = c$: In this case, the fixed fare f exactly compensates for the expected cost of finding a new passenger, and so the driver has no reason to make x either large or small.

$f > c$: The driver in this case makes a profit of $f - c$ by dropping off one passenger and picking up another. He therefore benefits from turnover in passengers; lots of small trips are to his advantage.

$f < c$: The driver in this case bears a loss of $f - c$ by dropping off one passenger and picking up another. He is therefore better off by keeping a passenger in his taxi for a long time.

iii. the possibility of c large on a slow day, or other reasons for a long wait between passengers.

iv. Should the passenger's utility be a function of both the fare and x ? I.e., both the travel time and the cost?

$$u(\text{fare}, x) = u(f, r, x)$$

b. client-lawyer relationship – points to the significance of uncertainty in the outcome of the agent's action in making the problem interesting and difficult

i. "billable" hours versus a percentage of a settlement

c. home seller and real estate agent

i. the most common arrangement is that the seller pays 5-6% of the entire sales price to his realtor. If the buyer is represented by a realtor, this payment is split between the two agents.

- ii. What are the "bad" consequences for the home seller of this particular method of paying his realtor? Can you propose a contract that provides better incentives for the realtor to work hard on behalf of the home seller?
- d. patient and doctor. The patient is interested in his own health. One of the doctor's interests is his own salary. The doctor may increase his salary by providing more services or tests on the patient. The doctor also wishes to avoid the possibility of malpractice lawsuits by being extremely meticulous in his care. The patient wants all appropriate tests performed, but he does not want unnecessary tests because: (i) even with insurance, he may bear some of the cost; (ii) the test may be painful; (iii) the test is time-consuming; even if he does not bear the full cost of the test (either because of government or private insurance), the patient may find the waste of economic resources to be personally distasteful and bad for our society. How do we provide incentives to doctors to exercise the "best judgment" in choosing tests and procedures, and what exactly do we mean by the "best judgment"?
- e. two aspects of the principal-agent relationship: *hidden action* vs. *hidden information*
 - i. Campbell describes the taxi problem as hidden action, but it seems more like hidden information. The two attributes overlap.
 - ii. hidden actions give rise to the problem of *moral hazard*, while hidden information give rise to the problem of *adverse selection*. These are two terms that originate in the insurance business.
 - iii. moral hazard and my college dormitory (the night watchman)
 - iv. moral hazard in the news: the banking industry
 - v. moral hazard and the origination of loans