

CHAPTER 3**The Role of Information in an Economy****Learning Objectives**

1. After completing this chapter, you will be able to :
2. Describe how information costs affect the contracts between parties to a business contract.
3. Understand how opportunistic behavior affects business contracts
4. Understand the role of intermediaries as information specialists
5. Explain how the internet affects shopping and pricing power

3.1 Transaction costs and Information costs

It is costly to bring buyers and sellers together. The costs associated with making exchange possible are transaction costs such as travel cost, negotiation cost, and property rights enforcement cost, and the cost of acquiring information.

Transaction costs are those costs associated with bringing buyers and sellers together.

In real world markets-even those that are highly competitive- there is considerable uncertainty about current or future prices and even about product qualities. If such information were available instantaneously at no cost of time or money, such information typically does have its costs, and information costs have a substantial effect on real- world markets.

Information costs are the costs of acquiring information on prices, product qualities, and product performance.

Information costs include the costs of telephone, shopping, checking credentials, inspecting goods, monitoring the honesty of workers or customers, placing ads, and reading ads and consumer reports in order to acquire more economic information.

Information is costly because we have a limited capacity to acquire, process, store, and retrieve facts and figures about prices, qualities and location of products. Information is distributed over the populations in bits and pieces. The internet has, of course, reduced information costs.

Transaction costs are affected by information costs. The buyer and seller must first find each other and then agree on the price and other terms of the contract. Knowledge of the existence and location of a willing buyer is valuable information to the seller, just as knowledge of a willing seller is valuable information to the buyer. Without this information, economic transactions can not take place.

The microprocessor- the miniature brain behind modern computers and the so called information superhighway-has substantially brought down the costs of communicating and processing information. Despite enormous progress, though, the computer cannot read minds, predict the future, or start a fad. For example, computer software is an enormous market, but it takes a human being to write the software and make a prediction about what people will want to buy. Bill Gates became a multibillionaire with his Microsoft Corporation. This required unique human imagination. It is information costs that makes multibillionaires possible. If information costs were zero, the billions made by Bill Gates would have been spread over millions of people.

Because information is costly, each individual accumulates information that is specific to that person's particular circumstances. For example, a farmer has detail knowledge about local growing conditions, and consumers know a great deal about local food prices. This special information can be valuable. To quote the Nobel laureate F.A. Hayek:

A little reflection will show that there is beyond question a body of very important but unorganized knowledge which cannot possibly be called scientific in the sense of knowledge of general rules: the knowledge of particular circumstances of time and place. It is with respect to this every individual has some advantage over all others in that he possesses unique information of which beneficial use might be made.

By allowing people to be paid for their scarce information, the price system economizes on information costs. The auto mechanics does not have to learn nuclear physics, and the physicist does not have to know how to repair a car.

Information is typically a scarce and valuable commodity.
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3.2 The economy of search

We know that a perfectly competitive market is one in which all buyers pay the same price for the same product. In many real-world markets, however, the prices of even homogeneous goods (milk, bread, gasoline, etc) differ from store to store. In these real-world markets, it is more difficult for consumer to know the prices charged for the same items in different stores- even if consumers are aware of

price differences, the transaction costs of always going to the cheapest store may outweigh the advantages of the lower price. As a consequence, the price for the same good differs from location to location. Such markets are usually imperfect because different buyers appear to pay different prices for the same product. *From an economic viewpoint, however, the same good in a different location is considered a different product.*

Information gathering and price dispersion

A consumer incurs search costs while shopping, reading, or consulting experts in order to acquire pricing or quality information. Search costs explain why homogeneous products sell for different prices in different locations. A 32-inch Sony TV set may sell for different prices in stores one block apart, the same brand of milk may sell for different prices in adjacent grocery stores, and the same brand of dealerships located in the same part of town.

If information about the prices charged by different retail outlets were free (assuming that no location is more convenient than other), the same commodity would sell for the same price, as predicted by the theory of perfect competition. But information is not free; real resources must be devoted to gathering information. Therefore, in the real world, the prices of homogeneous products sold in different locations will be dispersed.

In gathering costly information, people follow the optimal search rule.

The optimal-search rule states that people will continue to acquire economic information as long as the marginal benefits of gathering information exceed the marginal costs.

When a person decides to buy a new car, the more information that person has on prices and on technical qualities of various automobiles, the better the eventual choice is likely to be. But it is costly to gather such information. It is costly to drive all over town to various dealers; it is costly to take time off from work or from leisure activities to compare prices; it may be expensive in terms of time and money to acquire and master technical information contained in the various consumer-guide reports on new automobiles. To gather all the available information about new cars would take an inordinate amount of time and money; therefore, the prospective buyer must draw line at the point where the marginal

benefit from acquiring more information is equal to the marginal cost of acquiring more information.

Figure 1 illustrates the optimal search rule. Suppose a consumer has just moved to a new town and is looking for the best place to buy a particular product. The consumer might visit several stores to collect valid price information. Thus, after some comparison shopping, the consumer will have a sample of the various price charged. The vertical axis measures the benefits and costs of search per visit. The horizontal axis measures the lowest known prices (S) that the consumer has collected through search. If the lowest known price is very small, the marginal benefit of search for that consumer will be low; if the lowest known price is very high, the marginal benefits of search will be high. The upward-sloping curve in Fig 1 shows the marginal benefits of search for different values of the lowest sampled price. Since the marginal cost of search is assumed to be independent of the lowest price sampled, it will remain unchanged over the range of S values. The price at which the marginal benefit of search (at point e) is the consumer's *reservation price*.

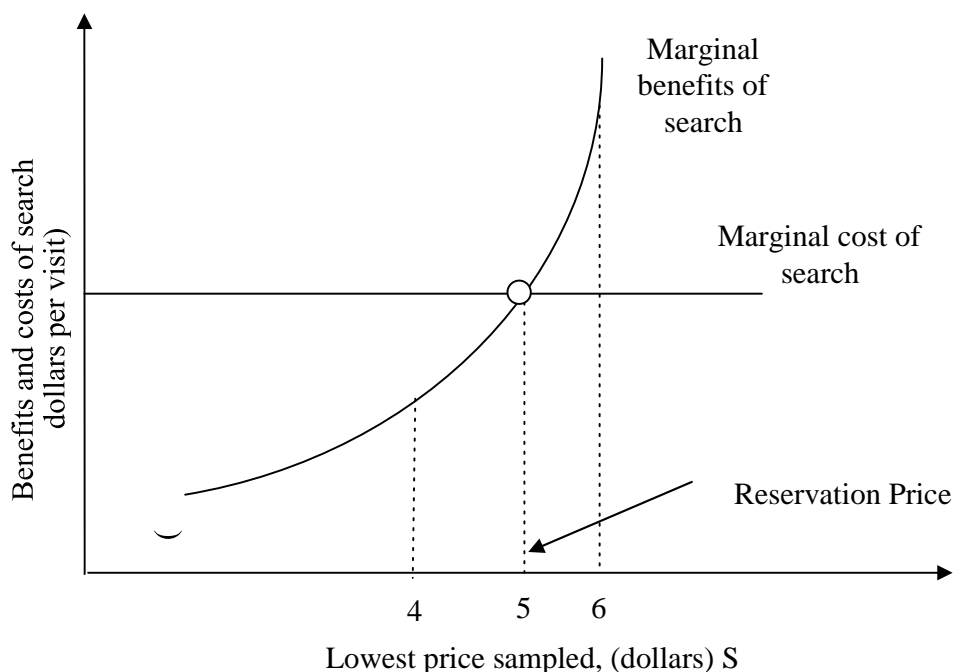


Fig: Optimal Search Rule

The **reservation price** is the highest price at which the consumer will buy a good. Although the consumer will buy any good with a price lower than the reservation price, he or she will continue to search for a lower price only if the lowest price found exceeds the reservation price.

The reservation price in Fig 1 is \$5. If the lowest price sampled is \$6, the consumer should still search because the marginal benefit of search exceeds the marginal cost of search. If the lowest price is below \$5, say \$4, the consumer will purchase the good because the marginal cost of search exceeds the marginal benefit of search. If the lowest price sampled is \$5, the consumer is indifferent regarding continued search, because \$5 is the highest price the consumer will pay for the product.

The reservation price occurs at a sampled price at which the marginal benefit of search equals the marginal cost of search.

We can apply the theory that consumers use a search rule where marginal benefits equal marginal costs to predict the extent of price dispersion on different products. Clearly, anything that raises the marginal benefits of search relative to the marginal costs of search will increase the amount of searching. The more resources devoted to searching, the closer will be the prices of homogenous products sold at different stores (high priced-stores will lose business to low-priced stores). The marginal benefits of search should be greater for expensive items; therefore, theory, the theory of search suggests that prices of more expensive items will be less widely dispersed than those of less expensive items.

There is considerable evidence to support this proposition. In a classic study, prices were found to be less widely dispersed for identical makes of automobiles than for identical brands of washing machines.

An increasing paradox is that the greater the number of people who search, the less the individual needs to search. If everyone devoted considerable resources to information searching, price dispersion and the gains to further search, would be reduced because the sellers would be aware of the search behavior.

Information costs can be minimized for consumers by organizations such as the Consumers Unions, which tests products and sells the results in a monthly magazine. Government can also reduce information costs by establishing minimum standards and carrying out inspections to ensure that these standards are being observed. Without these governmental regulation and inspections, the costs of personal inspection and information gathering would be excessive.

3.3 Information problems

Economics dealings between individuals are governed by contracts. When a good is purchased, the seller explicitly or implicitly guarantees that the good will work

according to an expected performance standard. An insurance contract stipulates that for a certain premium, the insurance company will pay out a certain amount of insurance if one or more specified events (a fire, a theft, or an automobile accident) occur. When information is costly, however, it can become difficult for one in a contract to monitor the other party's performance, and it can be difficult to check the claims made by economic agents trying to secure favorable contracts.

3.3.1 The moral hazard problem

It is not possible to buy insurance against poverty. No insurance company will sell you a policy that will pay you in the event of bankruptcy or unemployment. Such insurance does not exist because it could provide an incentive for a person to quit working or seek bankruptcy.

A moral-hazard problem exists when one of the parties to a contract has an incentive to alter his or her behavior after the contract is made at the expense of the second party. It arises because it is too costly for the second party to obtain information about the first party's post contractual behavior.

Moral hazard is the reason why every fire insurance policy contains a provision that fires deliberately set by a policy owner (or agent of the owner) are not covered. Indeed, insurance companies spend millions to investigate fires to determine if there was any foul play.

The basic consequence of the moral-hazard problem is that firms can offer only those contracts that will not be flagrantly abused by their customers. The kinds of contracts offered must be limited to those that will minimize the moralhazard problem.

As an illustration of the moral-hazard problem, consider the guarantees that are offered on products. When a car is purchased, the manufacturer often gives a warranty on a car such as "the first four years or 50,000 miles, whichever comes first." The reason it does not offer a simple four-year warranty is moral hazard: there is little cost imposed on the person driving the car 200,000 miles the first year. Taxi drivers, for example, could easily take advantage of a simple four-year warranty: they would not have to worry about the car breaking down after 50,000 miles. Thus, in order for taxi drivers and the like to pay the cost of extraordinary usage, the limit of 50,000 miles is added to the basic warranty.

A second example is provided by smoking. We have known for decades that smoking cigarettes is harmful to the smoker. Some people want to make cigarette manufacturers liable for the health damage caused by smoking. However, if manufacturers are made liable for the health risks of smoking, the unintended consequence would be that the incentive to smoke would be much greater. The higher health costs would be passed from the individual to the company. This is a highly inefficient method of social engineering. If the cigarette companies had to pay some of the health costs of their customers, they would have to charge a higher price for cigarettes, whether or not they smoked one cigarette a day or 100. When it is known that smoking exposes person to an additional health risk, it makes sense for society to place the cost on the individual doing the smoking.

A third example of moral hazard would be an automobile insurance policy that pays all damages if the policyholder is involved in a collision. Although it is unlikely that insured drivers would deliberately have collisions, such an insurance policy might give the driver an incentive to alter driving behavior. The driver might be less cautious in parking lots where most fender-bender accidents occur and might generally drive less defensively than normal. The insurance company cannot write into the contract that the driver drive defensively because it is not possible to monitor the behavior of individual drivers.

The contracting parties who stand to suffer will adopt measures to minimize or prevent post contractual opportunistic behavior. Most life insurance policies contain a clause that nullifies the contract in the case of suicide. The automobile insurer will require that drivers who have had accidents share the costs of losses by paying the first \$250 or \$500 to repair the damage, or by paying higher premiums in the future. If the claim is extremely large, the insurance company may even expend resources to investigate whether careless driving was involved.

In some instances, the moral-hazard problem is so severe that certain contracts can not be written at all, at least not by private profit maximizing companies. The poverty insurance mentioned earlier is such an example. In other cases, the moral-hazard problem is threatening enough that contracts must be limited. For example, private insurance companies find it difficult to issue general disability insurance because of opportunistic behavior. Although it is easy to establish disability in the case of lost arms or legs, it is difficult in the case of general back problems or emotional disturbances. Insurance companies expend enormous sums on information costs (maintaining a staff of physicians and investigators) to detect the opportunistic behavior that threatens their profitability.

3.3.2 The Adverse-Selection Problem

The moral-hazard occurs when one party to contract engages in opportunistic behavior after the contract is made. The adverse-selection problem arises prior to the making of the contract.

The **adverse-selection problem** occurs when a buyer or seller enters a disadvantageous contract on the basis of incomplete or inaccurate information because the cost of obtaining the relevant information makes it difficult to determine whether the deal is a good one or bad one.

When a contracting party does not know the real intentions of the other party, the party with the superior information may be able to lure the other party into accepting an unfavorable contract. A contract is unfavorable if one of the contracting parties would not have entered into it if he or she had the same information as the other party.

The adverse-selection problem is encountered by those who set automobile insurance rates. Good drivers are less likely than bad drivers to have accidents that lead to costly claims against the insurance company. With full information, good drivers would not have to subsidize bad drivers, because insurance companies would be able to differentiate between good drivers and bad drivers.

Insurance companies face a different world; Smith and Jones are exactly alike except that Smith is a good driver who has never had an accident and Jones is a terrible driver who has been lucky never to have had an accident. Smith knows she is a good driver; Jones knows she is an accident waiting to happen. What about the insurance company? Unless insurance agents were to follow Smith and Jones around town and interview friends and neighbors, the insurance company cannot differentiate between Smith and Jones at the same rate as Smith. If the insurance company knew more about Smith and Jones, Jones would have to pay higher insurance rates to compensate for the higher probability of an accident.

In another example, business firm wish to hire high-quality workers, but it is very costly to find out in advance the true characteristics of workers. Harry and Michael are alike except that Harry is diligent and hardworking while Michael is lazy and without ambition. There is no reason for Michael to inform a potential employer of his laziness, and Harry's claims of diligence are likely to be dismissed as boasting. Because Harry and Michael appear alike to the firm, they are hired at the same wage rate. Michael, aware of his bad work skills, jumps at the chance. Armed with better information, the firm would not have entered in this contract.

Health insurance companies must also face the adverse-selection problem. If insurance companies had perfect information on the health of insurance applicants, they would offer health insurance applicants; they would offer health insurance to healthy 70-year-old people at rates that would reflect their likely health claims. However, because it is impossible for insurance companies to gather extensive health data on individuals, the insurance company will have to rely on available statistical data on general trends for different age groups. The healthy 70-year-old has private information about his or her plans to follow a healthy lifestyle, but the insurance company does not have the same information. For example, whether a person takes a daily walk and eats plenty of fresh fruits and vegetables is information that an insurance company cannot monitor. The healthy 70-year-old must therefore enter into a health insurance contract paying the same premiums as unhealthy 70-year-olds. If the insurance company had access to private information, a more favorable contract would have been written for the healthy 70-year-old.

Markets have developed responses to a variety of information problems. Every effort is made by buyers and sellers to devise contracts that will somehow reveal the true character of the parties involved. For example, to deal with adverse selection and moral hazard, insurance companies include clauses allowing them either to cancel a person's insurance or to raise the rate as experience dictates. Adverse selection can be countered by changing the relative sizes of the basic insurance rate and the penalties, so that drivers will self-select themselves into good-risk or bad-risk categories. A low insurance rate with a high penalty for an accident will attract good drivers. A high insurance rate with the low penalty will attract bad drivers. The same principle applies to different categories of coverage. If you have liability insurance, the insurance company pays for the damage you cause to the other party. If you have collision insurance, the insurance company pays for part of the damage to your own car. Good drivers might opt for liability insurance instead of collision insurance.

3.4 The role of intermediaries

Intermediaries specialize in information concerning
Exchange opportunities between buyers and sellers
The variety and qualities of different products
The channels of marketing distribution for produced goods

Intermediaries buy in order to sell again or simply bring together a buyer and seller.

Real state brokers, grocery stores, department stores, used-car dealers, auctioneers, stockbrokers, insurance agents, and travel agents are all

intermediaries. All these professions "mediate" or stand between ultimate buyers and sellers in return for a profit. Today, many of these same intermediaries are facing competition from online computer services. For example, it is now possible to buy and sell stocks on a home computer.

Suppose an individual is willing to sell a private airplane for no less than \$20 million, and a potential buyer residing in some distant country is willing to pay \$25 million for such an airplane. How will they locate one another? Someone with information about the existence of the potential buyer and seller can act as an intermediary and bring the two together. It is possible for the seller to get \$20 million, for the buyer to pay \$25 million, and for the intermediary to charge as much as \$5 million for the service of bringing the two together.

Transactions of this sort occur frequently, although most transactions are less spectacular. The buyers and sellers of residential homes are brought together by realtors who charge a fee for this service. Stockbrokers bring together buyers and sellers of a particular stock. Auction houses bring together sellers of rare works of art and potential buyers, and they charge a fee for this service. Are such intermediaries cheating innocent buyers and sellers, or are they providing a service that is worth the price.

The role of intermediaries in providing information to buyers and sellers is often misunderstood. The export/import agent who brings the airplane buyer and seller together and pockets \$5 million may be regarded as criminal by people who think that this "go-between" is trading on the ignorance of others. When food prices rise, many consumers blame the intermediaries. Buyers and sellers of real estate often become upset with the high fees charged by realtors. Implicit in these complaints is the belief that the intermediaries are getting a reward for doing nothing or for doing very little.

The intermediary's share of the price varies substantially from good to good. In real estate, the broker typically receives a 5 to 10 percent fee for bringing together the buyer and seller. This fee depends upon competitive conditions in the market. In stock market transactions the fee varies from about 0.5 percent to 2 percent of the price of the stock. Supermarkets charge an intermediary fee of perhaps 10 percent to 50 percent of the wholesale price at which they buy.

The fee that intermediaries charge for their services, like other prices, depends on the amount of competition, on the degree of freedom of entry into the business, and the opportunity costs of bringing goods to the market. If the business is competitive, the fee will reflect a normal profit in the long run. For example, retail grocery stores are in a very competitive business; the typical supermarket earns

an accounting profit of about 1 percent on its sales. The markups on supermarket products are almost entirely used by paying rent, stock clerks, checkout clerks, produce specialists and butchers. The grocery store, for example, must hire employees to prepare produce and meat for display in quantities convenient for inspection and purchase; the store must maintain inventories of products on which it must pay carrying charges. The grocery store must select a location convenient to its customers and pay substantial rents for a good location. In return for the intermediary fee, consumers receive a convenient location, the convenience of inspecting goods before purchase, and the convenience of finding the quantity and quality of goods they want without packing, sorting, and searching for themselves.

Buyers and sellers could, in most situations, avoid paying the intermediary fee. Consumers could drive to farmers' markets and to wholesale distributors of meats and dairy products. They could even drive to canning factories. The intermediary, by specializing in bringing together buyers and sellers, is able to provide the service themselves.

Another function of intermediaries, such as department stores, is to certify the quality of goods. The consumer is confronted with a vast array of goods, some of which are so complicated that the buyer is at an enormous information disadvantage relative to the producer. In short, the consumer faces the adverse-selection. The number of producers is larger than the number of actual stores with which the consumer deals. In such circumstances, the intermediary performs the function of certifying the quality of the good for the buyer. The consumer is prepared to pay for this valuable service; thus, the intermediary is able to charge a higher markup over costs.

Car dealerships are certifiers of quality. These intermediaries are better informed about the quality of cars (because they can hire skilled mechanics) than the typical car buyers and they will take advantage of profit opportunities by buying used cars (perhaps from their new-car customers) and reselling them on their used-car lots. They may even provide a guarantee (usually with a time limit) that the used car is a not a "lemon". Customers will be willing to pay a fee (in the form of a price markup) for this certifier-of-quality service.

Manufacturer also certifies quality of identifying their products brand names. If prior to purchase and use consumers could not distinguish the product of one manufacturer from that all other manufacturers, there would be little incentive for the manufacturer to produce products of reasonable or uniform quality. Brand names such as Sara Lee, Levi's, Maytag, Intel, and Xerox serve as certifiers of product quality.

3.5 Speculation and Risk Bearing

Although product information is important to consumers, information about changes in the market conditions for any number of goods and services is important to speculators.

Speculators are those who buy or sell in the hope of profiting from market fluctuations.

The person who stocks up on peanut butter after hearing of a shortage of peanuts, the frozen-orange-juice distributor who buys oranges in response to a late frost in Florida, and the young couple that buys a house now because they fear home prices will rise beyond reach if they wait another year are all speculator, however, is more maligned than any other economic agent.

Most people, however, do not associate the term speculator with the family that stocks up on goods whose prices are expected to increase dramatically or purchases a home as an inflation hedge. Most people associate the term speculator with the person who buys up agricultural land and holds it for future shopping-centre development or the person who buys and sells foreign currencies or gold in the hopes of buying low and selling high. Such speculators buy or sell commodities in huge quantities in huge quantities hoping to profit from a frost, war, scare, bad news, or good news.

3.5.1 The economic role of the speculator

Speculators do, indeed, often profit from the misfortunes of others. They buy from the hard-pressed farmer when prices are low and they sell later at much higher prices. Has the farm family been robbed by the speculator? Not really. The farmer is not in the business of risk-bearing. Upon hearing of a frost in Florida, speculators buy oranges in large quantities, thereby driving up the prices of orange juice for the consumer. At the first sign of international trouble, speculators may buy gold and sell American dollars, thereby weakening the American dollar. The popular view of speculators is that they do only harm; however, *speculators are performing a useful economic function- that is, engaging in arbitrage through time.*

Arbitrage is buying in a market where a commodity is cheap and reselling in a market where the commodity is more expensive.

The arbitrageur buys wheat in Chicago at \$5 per bushel and resells it for \$5.10 the next minute in Kansas City. Thus, arbitrageurs serve to keep the prices of wheat in Chicago and Kansas City approximately equal.

Simple arbitrage of this type is not very risky because information about prices in Chicago and Kansas City can be obtained instantly from commodity brokers. Arbitrageurs must act quickly if they are to prosper. Unlike the arbitrageur, who buys in one location and sells in another, the speculator buys goods at *one time* and resells at *another time*. Speculation is a risky business because tomorrow's prices cannot be known with certainty. The speculator is bearing risks that others do not wish to carry.

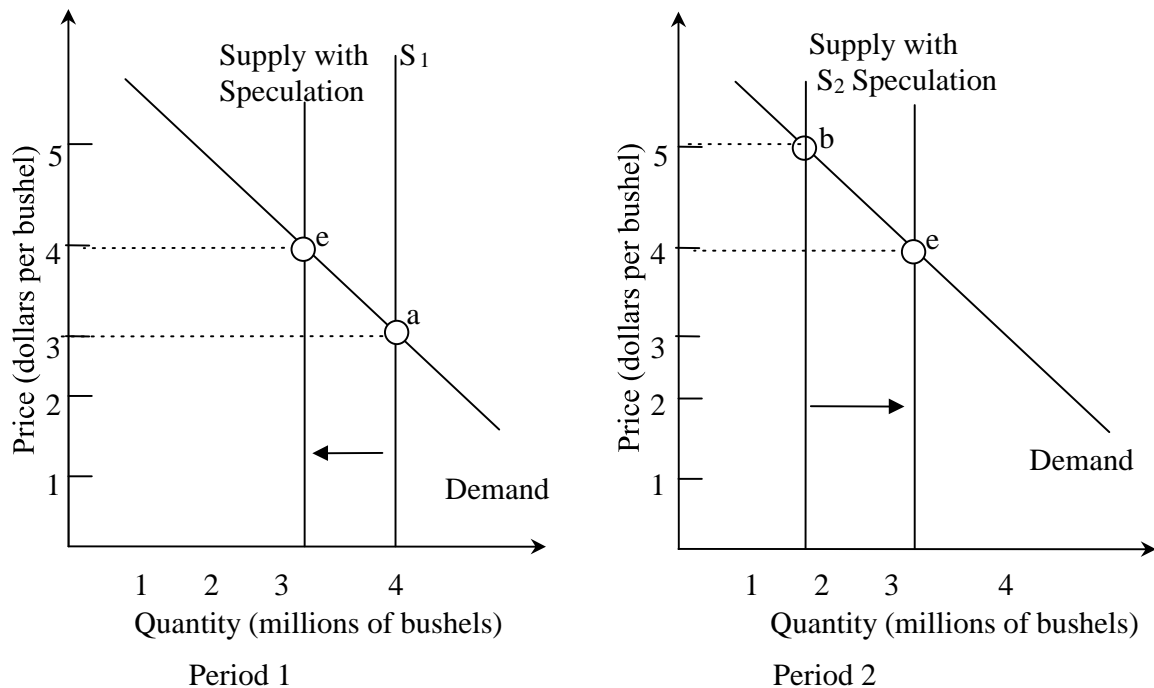
The speculator is performing the economic function of sharing in the risky activities of producers and consumers.

3.5.2 Profitable Speculation

The objective of the speculator is to make a profit by buying low and selling high. When the speculator is making profit- and when there are enough speculators- low price will be driven up and the high prices will be driven down. When speculators buy at low prices, they add to the demand and drive prices up. When speculators sell when prices are high, they drive prices down by adding to the supply.

Profitable speculation (that is, speculation that succeeds in buying low and selling high) stabilizes prices and consumption over time by reducing fluctuation in prices and consumption over time.

Profitable speculation is illustrated in Fig below. Panel (a) shows that the supply of wheat in the first period (say, 2000) is S_1 , or 4 million bushels. Panel (b) shows that the supply of wheat in the second (say, 2001) is S_2 , or 2 million bushels. If there were no speculation, the price of wheat would be \$3 in period 1 and \$5 in period 2 (we assume that demand does not change between the two periods). Thus, without speculation, prices and consumption would vary dramatically between the two periods.



If speculators correctly anticipate that next years' wheat crop will be small, they could make handsome profits by buying at \$3 and selling next year at \$5. But what happens as speculators begin to this year's wheat? When speculators buy wheat, they withdraw it from the market and place it in storage. As a result, the supply of wheat offered on the market is reduced. This trend will continue until the profits of the marginal speculator are driven to zero. When speculators buy 1 million bushels in the first period, the effective supply shifts (left) to 3 million bushels, and the price rise to \$4. When speculators resell this wheat in the second period, the effective supply also shifts (right) to 3 million bushels in year 2. When speculative profits are zero, the price will remain stable at \$4 and the quantity of wheat sold on the market will remain stable at 3 million bushels-despite substantial differences in the wheat harvest in the two periods. In this example, we assume that storage costs are zero. Had storage costs been positive, the price of wheat in the second period would have been higher by the cost of storage.

Profitable speculation shifts supplies from periods when supplies are relatively abundant and prices potentially low at periods when supplies are relatively scarce and prices potentially high. In this sense, profitable speculation provides the valuable economic service of stabilizing prices and consumption over time.

The \$4 price of wheat reflects all the available information about the future. In this sense, the market is efficient. No one can then make a profit buying wheat and reselling it because the price is the same in both periods. Profits can be made only

when information available to some people is not reflected in the current market price. Those individuals can make a profit by exploiting their information advantage.

In the preceding example, speculators accurately predicted the future. Such predictions are not as difficult as we might expect. For example, spring wheat is harvested in September and winter wheat is harvested in June or July. The amount of wheat harvested in other months is negligible. This seasonal pattern of wheat supply is predictable. What if no one were to speculate in this situation? In harvest months, farmers would harvest and sell their wheat, and wheat prices would be driven down to very low levels. In the months when very little wheat is harvested, wheat prices would be astronomical. Such a situation would not be satisfactory.

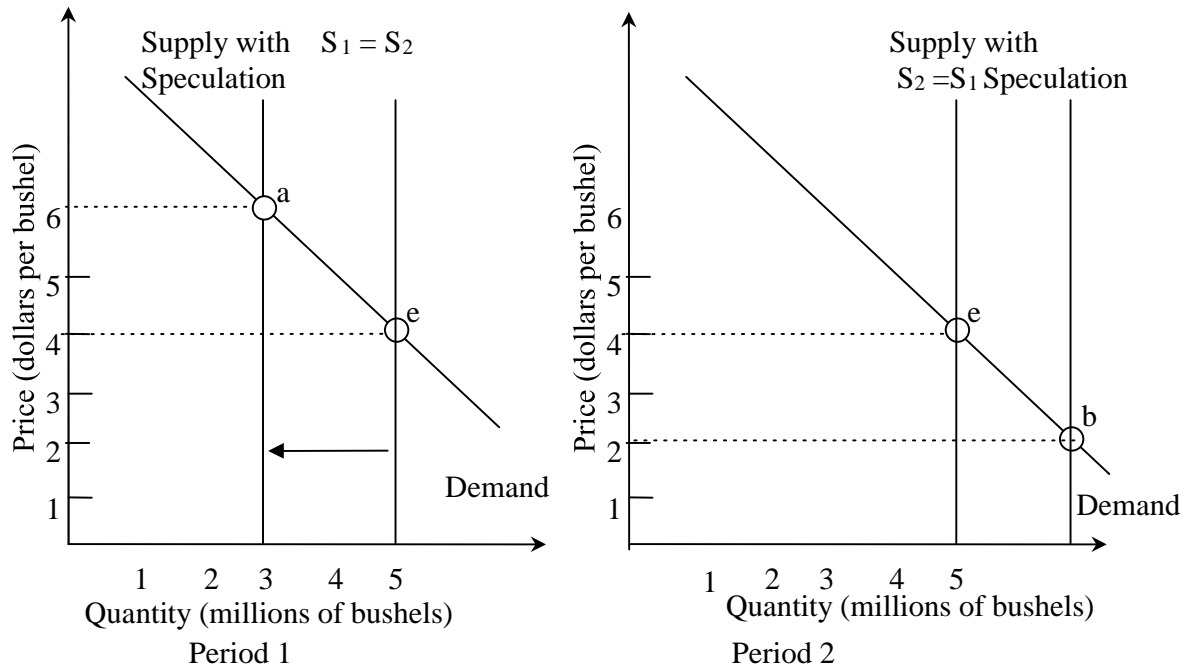
Because the pattern of wheat harvesting is well known, speculators (who also include the farmers who put their grain into storage rather than sell it immediately) purchase grain at harvest time, put it into storage, and then sell it throughout the rest of the year. This activity assures that we will not lack of wheat during the remainder of the year and that consumers will not have to pay wildly fluctuating prices. Of course, speculators will make some errors in the process; for instance, they may incorrectly predict the size of the coming harvest. However, these mistakes are minor compared to the situation that would exist if there were no speculators.

3.5.3 Unprofitable Speculation

Speculation is risky. Speculators cannot always guess correctly. They may buy when they think prices are low only to find that prices sink even lower. They may sell when they think prices are at their peak only to watch the prices rise even further. In such cases, speculation destabilizes prices and consumption over time. When prices would otherwise be high, such speculators are buying and driving prices even higher; when prices would otherwise be low, such speculators are selling and driving prices even lower.

Unprofitable speculation is shown in Figure below. The supply of corn is 5 million bushels in period 1 and will also be 5 million bushels in period 2. Because demand remains the same in the two periods, the equilibrium price of corn will be \$4 in both periods without speculation. Now assume speculators incorrectly guess that the supply of corn will decrease in period 2 because of an anticipated poor harvest. Speculators buy 2 million bushels, which they place in storage for later sale, driving up the price to \$6 in period 1 (point a). The speculators then wait in vain for a

decline in supply that never materializes. They must then sell the 2 million bushels in period 2, and they drive the price down to \$2 a bushels (point b).



Without speculations, the price and consumption would have been the same in both periods (point e). With unprofitable speculation, consumption is 3 million bushels in period 1 and 7 million bushels in period 2. Period 1 one's price is \$6 and period two's price is \$2. Unprofitable speculation is inefficient for the economy as a whole.

Unprofitable speculation is destabilizing because it creates artificial scarcity in some periods and artificial abundance in other periods. In this sense, speculation can be costly to society.

3.6 The Futures Market

Speculation is so highly specialized that markets have developed that separate the business of storing the commodity being bought and sold from their actual business of speculation. The grains speculator does not have to worry about what the purchase grain looks like, where it is stored, and how much to take out of storage. Those who wish only to speculate can buy and sell in a futures market.

A futures market is an organized market in which a buyers and sellers agree now on the price of a commodity to be delivered at some specified date in the future.

Many of us are familiar with futures market only through sensational press reports, like those about the oil-rich hunt family seeking unsuccessfully to corner the silver market, about European and Asian speculators driving the price of gold to dizzying heights, or about the increase in coffee prices -that is blamed on speculators following a freeze in Brazil.

The type of market most people know best is one in which there is an actual outlay of cash (or the arrangement of credits) for the immediate delivery of goods. The market in which a good is purchased today for immediate delivery is called a spot (or cash) market.

In a spot (cash) market, arrangement between buyers and sellers are made now for payment and delivery of the product now.

Most of the goods consumers buy and sell are transacted in spot markets. In the grocery store, consumers pay now for goods that are delivered now. Stocks, foreign exchange, gold, and commodities such as wheat, copper are traded in organized spot markets. Unlike the grocery store, however, such commodities are also traded on future markets.

Future contracts are brought and sold in futures markets. In a futures contracts, the terms (the price and the quantity) of a futures transaction are set today. The buyer of the futures contracts enters a contract today to purchase specified quantities of a good at a specified price at some specified date in the future. Both delivery and payment are to be made in the future. The seller is obliged to deliver the specified quantity of the good at the specified price at the specified future date. The seller of the future contracts need not even own the commodity at the time of the sale (but will, in many instances).

The seller of the future contracts is in a short position because something is being sold that is not owned. The buyer of the future contracts is in a long position because a claim on a good is being acquired.

When the seller agrees to sell and buyers agrees to buy at a specified price at a specified date in the future, what guarantees that both parties will fulfill their part of the bargain? The buyer and seller must each put-up cash -called a margin requirement- equal to a small percentage of the value of the contracts.

3.6.1 The Mechanics of Futures Trading

Future trading is different from the types of transactions, with which most people are familiar. Future trading is a topsy-turvy world. Traders can sell something before they buy it: traders are buying and selling obligation to buy or sell in the future a commodity they will likely never even see.

Most daily newspapers supply futures prices. The future price is the price agreed upon now for a commodity to be paid for and delivered on some future date; if at any time between now and future date, the seller or buyers can close out the future contract by engaging in an offsetting transaction. The seller offsets the transaction by simply buying another future contract with the same delivery date; a buyer closes out by selling another future contract with the same delivery date. Two examples of futures trading, illustrating a long position and a short position, follow.

3.6.2 A Long position

George Bull thinks that oil prices will rise in the future more than other buyers generally expect them to rise. In January, George thinks that the July oil price of \$21 is too low; he expects the actual price of oil in July to be well above \$21. On January 1, George buys 1000 barrels of July oil, paying the futures price of \$21 per barrel. George is now in a long position in oil.

On March 1, the price of July oil rises to \$22. George has made a profit because he bought the oil at \$21 a barrel and can now sell it for \$22 a barrel. If George closes out his long position by selling a contract for 1000 barrels of July oil, he will make a profit of \$1000 (or $\$1 \times 1000$ barrels). Even if George does not close out his long position, his broker will add \$1000 to his account.

3.6.3 A Short position

In January, Sue Bear thinks that July oil will be lower in price than people currently anticipate. She thinks that if she sells July oil at \$21 per barrel, the futures prices will fall and she can make a profit. Thus, Sue Bear sells 1000 barrels of July oil on Jan 1 at the market futures price of \$21 a barrel. Sue is now in a short position in oil (she sold something she does not completely own). While this will probably not be the case, it is convenient to think of Sue as the one who sells to George. If the price of the July Oil rises above \$21, Sue loses; if the price falls below \$21, Sue wins. As we already indicated, on March 1, the futures price of July oil is \$22. If Sue closes out her short position, she loses \$1 per barrel or \$1000. Even if she

does not close out her short position, her broker will deduct \$1000 from her account. In the futures market, there are no paper losses or paper gains.

3.7 Hedging

The person who "hedges a bet" bets both sides in order to minimize the risks of heavy losses. Such a person might bet \$ 5, it will rain tomorrow and \$4, it won't rain. Hedging also takes place in futures market.

Hedging is the temporary substitution of a futures market transaction for an intended spot transaction.

Futures market can provide an opportunity to traders of commodities in both spot and futures markets to reduce the risks of price fluctuations over time as well as to increase their profits. A futures market allows those involved in the distribution, processing, or storage of a good to concentrate on their specialized productive activities by taking advantage of the relationship between spot and futures prices.

Suppose, for example, that on July 1, the operator of a grain elevator buys 5000 bushels of wheat from a farmer \$5 a bushel (The spot price on that date). The grain is put into storage for intended sale at some date in the future. What are the risks to the operator? If the price of wheat drops, the operator will incur losses. Through the futures markets, the elevator operator hedges by immediately selling a future contracts for 5000 bushels of wheat to be delivered at a price of, say, \$ 5.15 in November.

If the elevator operator holds his wheat until November, the wheat purchased for \$5 can be delivered on the futures contract for \$5.15. The elevator operator has locked in a profit of \$0.15 per bushels to cover carrying charges.

Now suppose the a spot price of wheat falls and, 1 month later, the elevator operator sales this wheat for \$4 on the spot market to General Mills. On this spot transaction, he has lost \$5000 (\$1 per bushel on 5000 bushels). But what about the November futures contract that he previously sold? Because wheat price are falling, the price of November wheat might fall to \$4.10. Because the elevator operator previously sold November wheat for \$5.15 per bushel, this operator can close out the position by buying November at \$4.10 for a profit per bushel of \$1.05. The elevator operator can own $\$1.05 \times 5000$ or \$5250, by closing out the position. Through hedging, the elevator operator has not only limited the risk from falling grain prices, but has made a profit. The elevator operator loss \$5000 from the spot

market and gain \$5250 in the futures market and, in effect, on \$250- \$ 0.05 per bushels-by holding wheat for 1 month.

Large grain users, such as General Mills, can also hedge against the risk of fluctuating wheat prices by using the future markets. General Mills knows in July that it will require 100,000 bushels of wheat in December. It does not know what the price of wheat will be in December, but it can purchase a December futures contracts for 100,000 bushels of wheat at \$5 per bushel and thus protect itself against the risk that wheat will be selling well above %5 in December.

Hedgers and speculators play highly complimentary roles in the economy. Hedgers are interested primarily in storing commodities or in using these commodities in their business; they are interested in their particular business and in minimizing the risks of price fluctuation. The speculator, on the other hand, does not have to be concerned with the details of storing grains or making flour hand grain products the speculator specializes in information about supply and in the future there is division of labor between the hedger and speculator.

3.8 Information and Speculation in the futures market.

The futures market provides information concerning the future. This information is not always accurate; sometimes it predicts that prices will rise but instead they fall, and vice versa. Prices in features market reveal to the economy what speculators anticipate will happen to the prices of different commodities in the future. If the features price of wheat is well above the current spot price, then speculators believe that wheat will rise. These future prices represent the best information available to the economy on the courses of prices in the future.

Economic decisions must be made today concerning actions that must be take in the future. Farmers must plant crops that will not be harvested for many months; mine operators must plan the expansion of mine capacity. If prices in the future were known with certainty, such plan would be grossly simplified; however, the future is always uncertain. Clearly having a futures market that establishes effective future prices today is of great benefits in an uncertain world. For those who need to know future prices, a futures market provides a summery indicator of market sentiments-a single price reflects much of what people know today about tomorrow.

Summary

Information is costly because of our limited ability to process, store and retrieve facts and figures about the economy and because real resources are required to gather information. Individuals acquire information to the point where the marginal costs of acquiring more information equals the marginal benefit of more information.

Search costs explain the observed dispersion of prices. When the benefits to further search are great, price dispersion will be limited.

Two problems encountered by buyers and sellers because of the cost of information are the moral-hazard problem and the adverse-selection problem. The moral hazard problem refers to post-contractual opportunistic behavior; the adverse-selection problem refers to pre-contractual opportunistic behavior. Both arise because one party can not claims of the other party.

Intermediaries bring together buyers and sellers; they often buy in order to sell again and sometimes serve as certifiers of quality.

Speculators buy at one time in order to sell at another time. If speculators are profitable, they stabilize prices and consumption over time. If they are unprofitable, they destabilize prices and consumption over time.

In future market, contracts are made now for payment and delivery of commodities in the future. Futures markets provide information about the uncertain future and allow hedging by those who wish to reduce risks.

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Assignment Questions

1. Investors can purchase shares of stocks through a full-service broker (who provides information and investment advice) or the Internet. The commission charged by the full-service broker is much higher than that charged by the Internet broker. They both provide the service of buying the shares of stock ordered by the buyer. Explain why many investors use the services of the higher-priced brokers.
2. You have learned that prices of \$3, \$3.50, and \$4 are being charged by various pharmacies for the same generic drug. The marginal benefit of further search is \$.015; marginal cost is \$0.10. Should you search for a lower price?
3. You have been quoted the prices of \$20, \$21, \$23, \$24 for a wheel alignment on your car. The marginal benefit of further search is \$1, and the marginal cost is also \$1. What is your reservation price? Should you search further?
4. What are the transaction costs of selling a home? What effects do real estate brokers have on these costs?
5. If search costs in a market are zero and the market is competitively organized, what predictions can you make about price in this market?
6. The stock market is highly competitive, with thousands of speculators trying to buy low and sell high. Using the concepts of information and search costs; explain why with a little study and research we all can't get rich by playing the stock market.
7. What is moral-hazard problem? Give examples.

8. What is the adverse-selection problem? Give examples.
9. How will the adverse-selection problem be affected by the Internet?
10. Assume that on January 1, July wheat is selling for \$4. How could a speculator profit from the expectation that in July spot wheat will sell for \$3.50? How could a speculator profit from the expectation that in July spot wheat will sell for \$4.50?
11. Indicate whether each of the following examples is a potential moral-hazard problem or a potential adverse-selection problem.
 - a) "The chair broke when I sat down," complained the customer to the furniture store.
 - b) "This chair will last a lifetime," asserted the furniture salesperson.
 - c) "I am a safe, married driver," claimed the student buying car insurance.
 - d) "We insure all drivers," claims the ad.

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