

## **The Science of Economics**

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### **1. How markets work**

In order to understand the concept of a market, it is helpful to look at its evolution.

Trade may have begun with informal agreements among neighbours, such as the basket-weaver offering his handiwork to the farmer next door, in exchange for some of the farmer's fresh vegetables. But, in time, trade became carried out on a more community-wide basis - in particular gathering spots called markets. Today, we use the term "market economy" to refer to a society where people meet their needs through voluntary agreements of exchange. A "market" is not a particular place or group of people, but the process of voluntary production, exchange, distribution, and consumption.

Initially, trade was carried on through **barter** - the direct exchange of one good for another. However, for large-scale trading, barter is a cumbersome business: any farmer, for example, who wants to swap his vegetables for some tools, needs not only to find someone willing to trade in tools, but to trade tools specifically for vegetables. Trade through barter requires what is called "a double coincidence of wants".

The story of how traders solved this problem has been related by many authors, Menger (1871, p. 258) being the first to analyze it in detail. As related by Menger, although barter limited the exchanges of traders "there were elements in their situation that everywhere led men inevitably, without the need for a special agreement or even government compulsion, to a state of affairs in which this difficulty was completely overcome. Traders realized that they could exchange their specialized products for commodities which had a greater marketability, which they could then trade for what they wanted to consume." Cattle, for example, were readily saleable in many areas.

And so, in any particular market area, certain goods, such as cattle, cocoa beans, gold, or wampum, became intermediate goods with exchange value, and the use of such goods for payments became a social custom. Menger emphasizes the importance of custom, since "the actual performance of exchange operations of this kind presupposes a knowledge of their interest on the part of economizing individuals" (p. 261).

Money eliminated the need for the more cumbersome system of bartering, but whether one is trading with money or through barter, the act of voluntary exchange is what creates a market. As set forth in Chapter 1, a "market" is the totality of voluntary economic acts in some context. The term market denotes anything from an exchange between two individuals on a street corner, to the more elaborate trading on Wall Street. A market process cannot be perceived as detached from the people who create it.

Classical economists noted that a free market will allocate scarce resources effectively without the need for any central direction. The output produced is generally the amount that people wanted to buy, without severe shortages or surpluses. How is it that production manages to adjust to the continually changing wants of consumers?

Markets are able to allocate resources through the price system. Prices serve as a signal to a consumer about the relative costs of goods, which they compare to their subjective valuations of these goods. Prices also indicate the costs and revenues to producers. Consumers and producers react to prices in their buying and selling decisions, determining the types and quantities of products.

If more of one item - a hammer for instance - is demanded, hammers become sold out. There is a temporary shortage. This will cause the price of a hammer to rise, eliminating the shortage. But then since producers are making a greater profit, this stimulates them to produce more hammers. As more hammers are supplied, the price of hammers will go down again, though perhaps not to the previous level, since it may cost more to draw resources from other uses in order to make more hammers. And so the market ends up with more hammers, perhaps at a bit higher price, equilibrating the desires of consumers with the costs of producers.

Similarly, imagine that too much of a certain commodity, such as coffee, has been supplied. Through competition among sellers to get rid of their coffee, the price will be pushed down. But at the lower price there is less profit, so producers will reduce their supply, thereby reducing the glut of coffee.

So we can see that through an enormous system of trial and error the price system will ultimately balance supply with demand - fluctuating prices will ensure that a glut or shortage of an item or service does not persist.

Adam Smith, in his classic text *The Wealth of Nations*, praised the workings of the price system. He demonstrated how through the price system, the individual's pursuit of his own interest contributes to the well-being of others. Thus, from the pursuit of individual interest, society is led, by an invisible hand, to the common good.

Smith showed that "self-interest" in the course of history had led to the specialization and division of labour. The exchange - through trade in markets - which naturally followed specialization, was responsible for the world's progress. As such it should be allowed to progress unhindered by government intervention.

## **2. Competition**

The achievement of community welfare through the pursuit of individual interest presumes a freely competitive market. **The term "competition" has two meanings. One is rivalry among producers and consumers, bidding against one another for goods or sales.** It is only through competition that more producers enter a market when profits are high, increasing supply and reducing the price. As such, the economic society envisaged by Smith was to be devoid of both economic privileges and monopolies, which hinder competition.

Rivalrous competition is criticized as being chaotic, but it is in fact an orderly process, a spontaneous rather than planned order that follows ethical rules, namely that of not harming others. Far from being destructive, rivalrous firms competing for scarce resources determine the best use of the resources by their bidding for them. Without this competition, we could not perform economic calculations, because in a complex economy there would be no way of knowing the relative scarcity of resources relative to consumer demand.

If competition is prevented from operating in any way, whether by organised groups, criminals, or legislation, the result is usually higher prices or a lower quality of goods and services, as well as the social waste of inefficiency.

Competition tends to eliminate profits other than normal returns to the factors of production. The firms that maintain the lowest costs of production will earn a greater share of profits. In an effort to keep costs of production down to a minimum every avenue of innovation will be explored. Indeed, the process of competition is essential to efficiency - it provides for cost saving innovations and induces firms to adapt to change.

**The second meaning of "competition" is an absence of monopoly power.** One obvious barrier to rivalrous competition is tariffs and quotas imposed at national borders will be discussed in Part II. The main point, for now, is that trade barriers reduce competition and increase the cost of the goods in the affected industries.

Another barrier is a government-granted monopoly, the privilege of being the sole supplier in an industry ( e.g., British Rail).

Licenses restrict entry into an industry to certain specified persons. The alleged reason is to assure some standard of competency, but the result is often restricted entry even for qualified practitioners.

Marketing boards - such as the Potato Marketing Board in the U.K. controls the size of the potatoes coming on to the market as a means of restricting the supply and thereby controlling the price.

Other restrictions on competition will be discussed in [Chapter 9](#), on the role of government.

### **3. Market structure**

The market structure of an industry consists of the number of firms and their relative size. Different market structures induce different types of competition.

The degree of industry concentration can be measured using the Herfindahl index. You first calculate the fraction of the industry that each firm has. Then square this fraction. Finally, add up the squares. The result is a concentration index between zero and 1, 1 being an absolute monopoly and a number close to zero being atomistic.

#### **atomistic competition**

The more concentrated an industry is in terms of fewer number of firms and more inequality of size, the greater monopoly power the firms have, and thus the less competition there is in the sense of absence of monopoly power. The least monopolistic structure, then, is that in which there are many, thousands and millions, of firms, none of which is large enough to affect the price of the product, and in which there are no barriers to the entry and exit of firms into that industry. This structure is called "atomistic" competition, and also confusingly called "perfect" competition. The latter term implies that other structures are imperfect, which is misleading, since if the most effective forms of structure for some industry is not atomistic, it is not imperfect.

In atomistic competition, a firm is so small relative to the rest of the industry that it must sell its output at the price set by industry supply and demand. This implies that the product of that industry is homogenous or uniform, so that if one firm tried to sell at a price a bit above the market, no one would buy its product, since others are selling the same stuff for less. As noted above, atomistic competition also has complete freedom of entry and exit. Any firm can set up production within the industry and any firm can quit.

If firms in atomistic competition make economic profits (as discussed in Chapter 7), then new firms will enter the industry to obtain some profits. As the industry expands, the industry supply curve shifts out and hence price will be driven down the demand curve. Economic profits are therefore a short-run situation; in atomistic competition, economic profit tends to be zero, and the firms only make normal accounting profits that provide normal returns to the factors of production.

But wait a minute, you say. What if, for example, one farm has superior land than another. Wheat farming may be an industry with atomistic competition, but the farms with better land will have more profit!

Yes, they will have higher accounting profits, but the better land has a higher rent, so after subtracting out the rent from the accounting profit, the net economic profit is still zero. The producer surplus goes to rent.

But wait another minute! Something seems goofy here. Each firm in atomistic competition has no control over the price, yet the industry price can move up and down as industry supply and demand curves shift. So how can industry prices change if no one firm can change the price?

Here's how it works. Suppose we have a million wheat farmers. One farmer wants to sell his wheat. He calls a wholesale dealer. The wholesale dealer might be overstocked with wheat, so he calls his broker at the commodity exchange, where the wholesaler can buy or sell all he wants at the quoted price. In the commodity market, there are thousands of buy and sell bids being entered every minute. The price is set second-by-second by the brokers who match the buy and sell bids. No single bidder can dictate a price, but each bidder has a small influence by increasing the bid in one or the other direction. So the price is set in auction markets, with each bidder having a tiny influence but none being able to dictate a price.

In atomistic competition, firms produce at the lowest possible cost, which is the industry's minimum average cost. If any one firm could produce at a lower cost, it would do so to get an enormous competitive advantage, selling at a bit lower price than the others, so the other firms would copy the first one's production function and also produce at lowest possible cost.

Atomistic competition has the happy result that production takes place in the most efficient way, not only for the firms, but also for society, since the price of the product is just equal to the marginal cost of producing it. As you may recall from Chapter 7, the marginal cost crosses the average cost line at the bottom of average cost. Atomistic competition is socially efficient because the marginal revenue of a firm equals the price of the good, so that if any more were sold, the social costs would be higher than the price, and if any less were sold, the cost of one more unit would be less than what people would be willing to pay. When price equals marginal cost, social benefits from the good just match the social cost of the resources.

### **monopoly**

The other extreme of market structure is monopoly. A monopoly exists either when there is only a single seller of a particular good or service, or as a different type of monopoly, when there is no entry into the industry for the expansion of product. We can call the first type an **absolute monopoly** and the second an **entry-monopoly**. Economists today usually mean absolute monopoly when they use the term "monopoly," although classical economists also referred to entry-monopoly.

If there is only one firm in an industry, the firm's demand curve is that of the industry, so it has the ability to set either the price or quantity of output. Note that in a market economically it cannot do both, since if it sets a price, market demand will determine the output sold at that price. A government monopoly, operating outside a market, can of course dictate both price and quantity, forcing people to consume and pay a price.

A profit-maximizing number-monopoly will set its price at the level where its marginal cost equals its marginal revenue. Since its demand curve slopes down, its marginal revenue curve slopes down too, and even steeper. This is because each extra unit of output is not only sold at a lower price, but all previous units are also sold at that lower price. So where the two curves intersect, the marginal revenue is less than the demand curve, where the price is, and the difference is an economic profit (since the marginal cost curve also includes all implicit costs). This is not an entrepreneurial profit, but a monopoly profit, since it is not due to the uncertainty of the market, but on the contrary, to assured profits due to the lack of competition.

An absolute monopoly, secure in the fact that it is the only producer of a good, can limit supply so as to maintain a higher price. Consumers could be made better off if production were expanded production, lowering the price (the monopoly owner could even be compensated for his loss of profit and society would still be better off).

A monopoly can also practice price discrimination, the practice of charging different prices to different types of users. Firms price discriminate when they have discounts to older people or children. In Eastern Europe, some expensive restaurants charge a higher price to tourists than to

the locals. Price discrimination increases sales by adjusting the price to the elasticity of demand, with the demand of wealthier customers more inelastic, or less responsive to price increases, i.e. they continue to buy even at the higher price.

A monopoly having no current competition may face potential competition if its economic profits are consistently high (such as from abroad), so it may be induced to keep its price below the short-run profit-maximizing level.

In entry-monopoly, even where there are many firms, they can earn economic profits, since other firms cannot enter to expand the output. An example of entry monopoly is taxi cabs in New York City; one needs a government permit to enter the field, but the number of permits is fixed, so to enter, one needs to buy a permit from a previous owner. Land, being fixed in supply, works the same way.

The four types of absolute monopoly are locational monopoly, natural monopoly, new-product monopoly, and government-protected monopoly.

- A **locational monopoly** is the only firm in some immediate market area, such as the only drug store in a small town. Such firms can have monopolistic profits, but these profits are limited by competition from farther-away firms and from non-market factors, such as the personal relationships that may develop in a small town.
- A **natural monopoly** occurs when there are economies of scale and, since the supply for a firm curve slopes down, the first firm to achieve a big size has a competitive economy, driving the smaller ones out of business. Examples include municipal utilities such as piped water; a second firm would duplicate the pipes of the first, and bringing in water by truck is much more expensive.
- A **new-product monopoly** is a temporary restriction against competition for creators of new literature (copyrights) and for new inventions (patents).
- A **government-protected monopoly** is a legal barrier to entry not warranted by new products.

**Patents** are a controversial form of monopoly. Some argue that patents are necessary to protect the investment in research of the inventor and stimulate new inventions; others that they give the inventor too much of a monopolistic privilege.

Actually, patents are simply a method of economizing on contracts. It would be costly for the maker of a new firm to make a contract with each buyer not to copy the item, especially to enforce such a contract. Patents, like copyrights, simplify the contract with a notice on the product that it is patented and a conventional number of years that the contract applies for. Patents also enable the inventor to register his invention and check to see that it is really new. No one is coerced into buying the product, so the patent facilitates the market by simplifying property rights rather than being a privilege or intervention.

Hence, new-product monopolies may charge higher prices than they would in a competitive market structure, but these new products might not be brought to market otherwise, so the net result is usually beneficial. This is not so for government-protected monopolies. Here, the public

pays a higher price and gets less output for no good economic reason. Government-protected monopolies are an intervention, and do not exist in a pure market economy.

That leaves us with natural monopolies, a difficult problem for economics as well as politics.

- One way government has dealt with them is to set a price, usually at the average cost (including some margin of accounting profit). A problem with this method is that the firm has little incentive to control costs, other than from government oversight and hearings, which may not be effective in controlling costs. The commissioners regulating a monopoly may have come from that industry and may in fact be working to benefit its owners rather than the public.
- In many cases, the government runs the industry directly. In some cases, government enterprises such as trains and subways provide good service, though often not, but it is again difficult to control the costs, and the incentive of the government agents may be to increase their own benefits and power, which increases costs.
- A third option is to periodically open control of the firm to a competitive bid. The industry itself is a monopoly, but bidding to own it for a while can be highly competitive. The highest bidder then runs the outfit for a certain period of time, charging what it pleases. But the government keeps the fee paid by the bidder. If the bidding is competitive, this fee represents the monopoly profit, which is now paid to the government. The company then has the incentive to minimize costs during its operations. This option is also not perfect, because the firm still charges the public a monopoly price, but it avoids the social waste of artificially high costs that may compensate for that.
- A fourth option exists when the firm cannot make a profit only from the user charges, but when the service is a territorial collective good that increases rents. Suppose there is a subway in a city, which is a natural monopoly. Even maximizing profits, the revenues would not cover the costs. But there is a second profit in the increased land value and rent, which when added to the fares would make the operation profitable. The service can therefore be funded by a combination of rent and user charges, especially when the charges are based on the congestion of the service, charging more when it is crowded to compensate society for the crowding the users impose and to even out the usage.

### **Monopolistic Competition**

Whereas with atomistic competition, there is a uniform product, with monopolistic competition, there are many firms, but there is product differentiation: each firm produces a different version of the product, such as a different style, brand, or location. There is competition, but each firm also has a mild monopoly on its variant, the products being close substitutes. There are also no barriers to the entry of new firms and increased production. Examples of product differentiation include different brands and types of toothpaste, and different locations of retail stores.

Because of this mild monopoly, each firm faces a downward-sloping demand curve, and has some control over price. These firms will then set prices where marginal costs equal marginal revenues. But over the long run, because of competition, there will tend to be no economic profits, firms operating where the price equals the average cost. But since this cost curve is tangent to the demand curve (coming down to touch it and then bouncing off), the firms are not

operating at the minimum possible average cost. Critics call this type of market structure "imperfect competition," saying that there are too many firms, and also too many artificial varieties of products. But product variety is valued by many people. Critics also say there is too much advertising, but again, given different varieties, it is natural to want to draw customers to your brand, and advertising helps pay for newspapers, magazines, radio, and television.

It is unrealistic to expect markets where products are or can be differentiated to behave like those where they are uniform. The market has in fact produced generic brands as well that have less fancy labels for lower prices. Firms try to influence consumers, but in the end, consumers choices are voluntary. There is nothing imperfect about an outcome that is the best one can have given the conditions of the products.

### **Oligopoly**

**An oligopoly, an industry with few sellers, includes both a "pure oligopoly" with a homogenous product and a "differentiated oligopoly," with product differentiation.** There are often few firms in an industry due to economies of scale, which induce firms to become large. A firm in an oligopoly is very much affected by the action of any of its competitors, but exactly how it responds depends on circumstances. A type of game can be played by one firm lowering price and the others responding, and like chess, the oligopoly game has no one exact sequence of plays.

Oligopolists can collude to create an industry monopoly among them, either secretly or openly as a cartel. But there will be a great temptation to cheat on the agreement, since a firm that lowers its price just a bit will be able to sell much more product. If one or more of the firms sell below the cartel price, then eventually that price cannot be maintained, and the oligopoly will fall apart. Also, new firms may enter the industry to take advantage of the cartel price, and as the supply curve shifts outward, the increased product must be sold at a lower price. The cartel must either lower its price or fall apart.

#### **4. Government and competition**

Governments have reacted to oligopolies and collusion with anti-trust laws, breaking large firms into small ones. But the success of this policy has been questioned, since large firm size or high concentration does not necessarily imply that the market can be improved by intervention. Some firms become large because they provide superior goods and services - breaking them up would punish market success. Large firms can also capture the benefits of research, and focusing only on industry within a country overlooks the fact that we live in a global economy, and in a market economy, there can be plenty of competition.

Moreover, government agents do not have the knowledge needed to know just how much competition is optimal, and they are unable to know the unintended consequences of meddling in the market.



While trying to break up some industry oligopolies, governments sometimes deliberately create them with price controls and restrictions on entry. For example, some city governments limit the number of *taxi cab* firms and cars. Before 1978, the *airline* industry in the U.S. was prevented from competing in prices, and the entry of new firms was restricted. The industry therefore engaged in non-price competition, such as offering more luxurious service or more frequent flights on half-empty airplanes. Many consumers prefer lower prices to such high-cost services.

As noted, competition is not just the existence of many firms, but of rivalry among them. In a free market, rivalry for the consumer's marginal dollar or pound will ultimately win out against inefficiencies, since in a global economy any excess profits or costs are like bait to the hungry wolves stalking the woods for profit opportunities. The best that government can normally do is to take down the barriers but prevent the consumer sheep from being fleeced, with stiff laws against fraud, and easy access to the courts, making the loser of a lawsuit pay all legal costs.

Though competition is rivalrous, at the same time, firms have an incentive to cooperate where their interests are mutual. Firms create industry associations to provide them with research, information, and camaraderie. Hence, competition and cooperation are complements rather than opposites in a market economy.

The best policy for government with respect to competition is normally to let the market process do its work, avoid imposing restrictions and costs, and concentrate on protecting property rights and the resolution of disputes brought before its courts. It is difficult enough to provide a sound legal basis for market processes without trying to improve outcomes when the cure may well be worse than the alleged disease.

The next chapter will take a closer look at the outcomes of our current economies and analyze them to see whether it is indeed the market or intervention that is the foundational cause.