

Lesson-28

Perfect Competition

Economists in general recognize four major types of market structures (plus a larger number of subtypes):

- Perfect Competition
- Monopoly
- Oligopoly
- Monopolistic competition

Market

A market consists of all the (potential) buyers and sellers of a particular good or service. For a market to exist, though, these potential buyers and sellers must have some way to communicate offers to buy and sell with one another. One possibility for them is to come together and yell at one another (as at the New York Stock Exchange). In traditional societies, craftsmen in a particular trade may all be located on the same street so that customers know where to go to buy.

Of course, many modern markets make use of a wide range of electronic communication methods, as do NASDAQ and the international currency markets.

Thus, it is natural to identify a market with the place where traders come together (as in the case of a stock market) or the means by which they communicate. But the market consists of the people willing to buy and sell.

Perfect Competition

What many economists call "p competition" is an idealized structure of an industry in which price competition is dominant-- in fact, the only form of competition possible. The terminology "perfect competition" is quite common but not quite universal. The term "pure competition" is also sometimes used. In this lesson, we will use the term "p-competition," where "p" stands for perfect, pure or price, whichever you may like.

A p-competitive structure is defined by four characteristics. For an industry to have a p-competitive structure, it must have all four of these characteristics, which are as follows:

- Many buyers and sellers
- A homogenous product
- Sufficient knowledge
- Free entry

These all are characteristics that favor price competition.

Many Buyers and Sellers

The idea is that the sellers and buyers are small relative to the size of the market, so that no one of them can "fix the price." If there are "many small sellers," it makes it much harder for any seller or group of sellers to "rig the price." Similarly, if there are "many small buyers," there is little opportunity for buyers to "rig the price" in their own favor.

Each seller reasons as follows-- "If I try to charge a price above the market price, my customers will know that they can get a better price from my competitors. My own share of the market is so small that all of my customers will be able to buy what they want from the competition-- and I won't have any customers left!" Thus, the seller treats the price as being given and determined by "the forces of the market" independently of his/her own output.

How many sellers should be there and how small? There is no absolute answer to that question, but there must be enough number of sellers. They must each be small enough

that each regards the price as being determined by the market, so that none of the sellers sees any opportunity to push the price up by cutting back on his or her output.

Similarly, there should be enough number of buyers. Each should be small enough that each one treats the price as being determined by the market and beyond his or her own ability to influence.

These conditions encourage the buyers and sellers in the market not to try to control the price but instead to compete against one another whenever quantity supplied differs from quantity demanded. This drives the price toward the equilibrium of supply and demand.

Homogeneity

If the product (or service) of one seller differed significantly from that of another seller, then each seller would probably be able to retain at least some of the customers, even at a very high price. These would be the customers who just prefer this seller's product (or service) to that of someone else. The assumption of homogenous products serves to rule that out.

But this assumption should not be taken too literally. No two potatoes are exactly alike. We are not assuming that the goods are alike-- only that the goods produced by one supplier are good substitutes for those offered by another seller. Thus, the potatoes don't need to be just alike, provided that, on average, Farmer Jones' potatoes are just as good as Farmer Green's.

This is especially important with respect to services. It would be hard to prove that two haircuts are just alike. But so long as the haircuts supplied by one barber are substitutable for the haircuts supplied by another-- and their conversation is about equally amusing-- then the "homogenous products" assumption is fulfilled.

"Homogenous products" means all suppliers sell products that are perfect substitutes. If different sellers sold different products, then customers might be reluctant to switch suppliers when one supplier raises the price. They might stick with the supplier even at

the higher price. This is because even at the higher price, they like the product of that firm more than the product of any other firm. By ruling this out, the homogeneity of products encourages price competition.

Knowledge

Some versions of the "perfectly competitive" structure include "perfect knowledge" as one of its characteristics. But, of course, "perfect knowledge" never exists in reality.

Perfect information is little less clear than the other assumptions-- we can hardly assume that people know everything there is to know. In practice, what is important is that each buyer and seller knows all about his or her opportunities to make deals. That is, he or she knows the terms on which other market participants will buy and sell. A seller would assume that his or her customers would know if the competition were selling more cheaply. If the customers did not know that they had alternatives, then even a very small seller might get away with pushing the price up, without losing many customers. Thus, the "perfect information" assumption complements the other assumptions. The assumptions that there are many small buyers and many small sellers, and the assumption of free entry, all mean that buyers and sellers have many alternatives of potential buyers and sellers to choose among. The assumption of sufficient information says that they know what those alternatives are.

Traders need to know quite a bit to compete effectively in markets. They need to know the terms on which other people are offering goods and services, or offering to buy, and the quality of the goods and services offered. They also need to know enough about costs to judge whether the trade is profitable or not. This is what is called "sufficient knowledge."

Free Entry

You must be remembering Adam Smith's concept of the "natural price"-- when the price of beer is high, so that brewing is especially profitable, people will enter the brewing trade and their competition with the established breweries will force the price down toward the "natural" price. As Smith was aware, in the long run the entry of new competition-- or the exit of unprofitable firms from the industry, to go into other trades--

is one of the most important aspects of competition. It is, thus, one of the four characteristics of the p-competitive structure.

Free entry means that new companies can set up in business to compete with established companies whenever the new competitors feel that the profits are high enough to justify the investment. This is, first and foremost, a legal condition. That is, in a "perfectly competitive" market, there are no government restrictions on the entry of new competition. This legal status is often called by the French phrase "laissez faire," meaning "let them make (whatever they want to make for sale)." But it could also be a practical condition. For example, if no one could set up in business without enormous capital investments, that might prove an effective limit on the entry of new competition. This is true especially if, for some reason, the capital cannot be raised by borrowing or issuing shares.

Let us sum up the four characteristics of p-competition:

1. Many small sellers-- The more the sellers, the more substitutes the consumer has.
2. Homogenous products-- When the product is homogenous, then the substitutes are "perfect substitutes."
3. Sufficient knowledge-- When customers know the prices offered by other sellers, they will be better able to switch, increasing elasticity further.
4. Free entry-- In the long run, companies may even enter the market to provide still more substitutes.

Other Market Forms

The other three market structure models can be defined in terms of the ways in which they deviate from the characteristics of p-competition.

In a "monopoly," there is just one seller of a good or service for which there is no close substitute.

In an "oligopoly," there are two or more, but only a few firms.

In “monopolistic competition,” the products are not homogenous but are "differentiated."

We do not have a standard model for "insufficient knowledge," but, at least in some cases, that seems to work similarly to "product differentiation."

The Competitive Firm

The next step is to explore the operation of a firm in a p-competitive industry. To be specific, what does the demand curve for the individual firm look like?

The individual firm's demand curve is different from that of the industry, and is more elastic. This is because substitutes increase elasticity. The customer of the firm has many good substitutes for that firm's output, namely, the output of other firms in the industry.

Firm Demand in P-Competition

Since a p-competitive structure is an idealization of these tendencies, we say that the demand curve for a p-competitive firm is infinitely elastic.

In fact, the demand curve for a p-competitive firm is a horizontal line corresponding to the going price.

And that makes sense because the price in a p-competitive market is determined by supply and demand, and not by the seller or the buyer. Conversely, so far as the seller or the buyer is concerned, the price must be a given, since it is determined by supply and demand. The seller has no control over the price. To say that the seller has no control over the price is to say that the price is given-- a constant, horizontal line-- from the point of view of the seller.

Economists sometimes express this by saying that the price is "parametric," meaning that while it may change from time to time, it does not change in response to the firm's output decision.

Firm Supply and Demand

All of our examples of profit maximization to date are based on the assumption of given prices. Thus, we already know that the supply curve of a p-competitive firm is the firm's marginal cost curve.

Thus, marginal cost = price is the same as quantity supplied = quantity demanded for the individual firm.

When marginal cost = price for each firm in the industry, we have quantity supplied = quantity demanded in the industry as a whole.

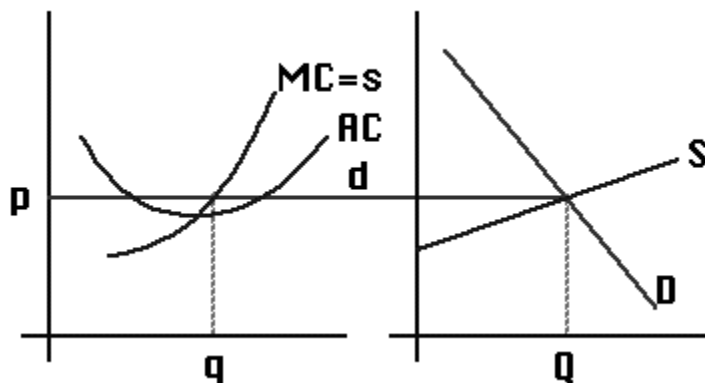


Figure 18.1

In the Figure 18.1, q , s and d refer to output, supply and demand from the point of view of the individual firm, respectively, and S , D and Q are for the industry as a whole. Cost and supply curves and demand curves are also shown. Price (per unit sold) is the same from all points of view.

Profits and Entry

In the picture shown above, the firm is making an "economic profit." All costs, explicit and implicit, are included in the firm's average cost curve. In particular, average cost includes the opportunity cost of capital investment. So, another way of putting it is that investors in this industry are making more than their best alternative investment in any other industry.

These profit opportunities will attract new firms into the industry. With "free entry," the (short run) supply curve of the industry shifts to the right, causing the price to drop until the economic profits are eliminated.

This process of entry and price change is known as the "long run equilibrium process," and it continues until "long run equilibrium" is attained. The following figure shows the firm and industry in "long run equilibrium."

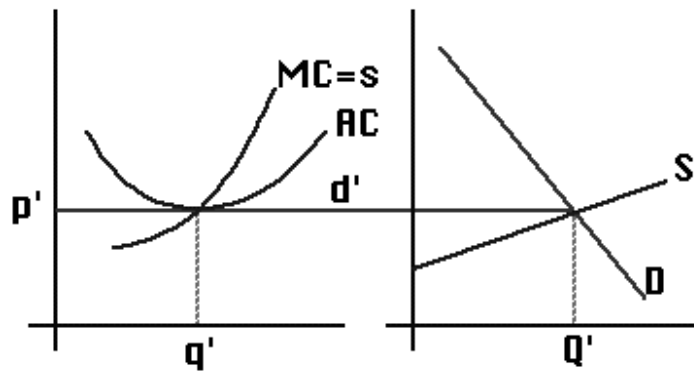


Figure 18.2

The new price, quantity, firm demand and short run supply are indicated by primes-- p' , q' , Q' , d' , S' . At a slightly lower price, the individual firm is lower on the MC curve and produces a little less. But, since there are more firms in the industry, the industry as a whole produces more.

P-Competitive Equilibrium as an Ideal

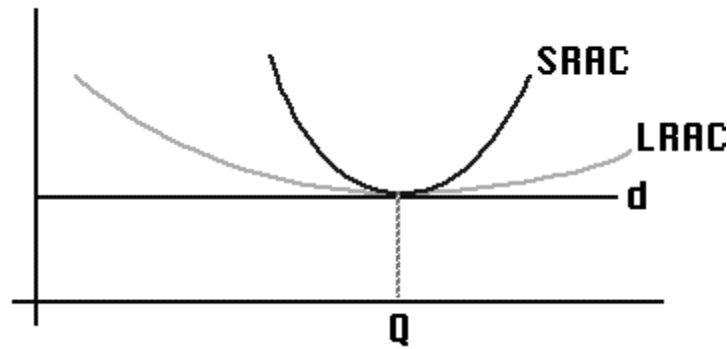


Figure 18.3

In the long run equilibrium of a p-competitive industry, each firm chooses the plant and equipment and productive capacity that gives the lowest average cost overall. This is shown by the Figure 18.3.

To see what this means, we might ask the following hypothetical questions:

1. If an industry is to produce a certain amount of output, how should the output be divided among the different firms?
2. More specifically, how many firms should share that production assignment?

If there are many firms, then each will be producing at a very small scale. They will not be taking advantage of the economies of scale, and cost per unit will be high. On the other hand, if there are very few firms, each will be producing on a very large scale, and suffering from diseconomies of scale. So, again, unit costs would be high. It would be best to balance the disadvantages of too large scale against the disadvantages of too small scale. It would be ideal to have just enough firms in the industry so that each is at the bottom of its average cost curve. The total cost of producing that output is then at a minimum.

What we see is that the equilibrium in a p-competitive industry does just that. That is one reason why economists often think of p-competition as an ideal.

The assumption is that the long run average cost curve is u-shaped, as shown in the figure. There may be some industries for which it is not true, and the argument would not be applicable to those industries.

Points about Long Run Equilibrium

We have seen that profits will lead to the entry of new firms into a p-competitive industry. This also works in the opposite direction-- if firms in the industry were taking losses, supply in the industry will decrease. Firms in the industry might continue to produce in the short run despite the losses. Remember that a profit-maximizing firm will continue to produce in the short run, as long as it can cover its variable costs. However, in the long run, firms will drop out of the industry if they continue to lose money. Thus, the supply curve of the unprofitable industry will shift to the left. But that, in turn, means prices will rise, and the long run equilibrium comes where the price is equal to average cost, as shown in Figure 18.2.

This could apply to any economic activity to which there is "free entry." Economic profits-- profits over and above the opportunity cost of capital-- will attract new entrants. Returns less than the opportunity cost of capital will cause firms to get out of the industry. This will continue until the return on capital in that activity is the same as the opportunity cost of invested capital, i.e. until profits are zero.

We might call this principle as "the entry principle." It says that in the long run, with free entry, returns to invested capital in an industry are just enough to offset the opportunity cost. When there are economic profits or losses, entry into the industry or exit of firms from it will shift the industry supply until economic profits are zero.

Long Run Supply

We can use these principles to explore the long run supply curve of the industry. Remember that in the short run, the capital plant and productive capacity of the industry is given, and the industry is made up of a certain group of firms. But in the long run, all of these things are variable. By definition, capital plant is variable in the long run-- in fact, all inputs are variable. And the number and identity of the firms in the industry is variable. As we have just seen, economic profits will bring more firms into the group, and losses will result in the exit of firms. Alfred Marshall expressed this by saying that a competitive industry is like a forest, and the firms are like the trees. A forest does not grow by having bigger trees, but by having more trees. And similarly, a competitive industry grows or shrinks primarily by having more or fewer firms.

Let us consider a simple case. The simplifying assumptions are as follows:

1. All firms have identical cost curves.
2. The cost curves are u-shaped as shown in Figure 18.3.
3. The cost curves remain stationary as the number of firms in the industry changes.

Now, let us look at the Figure 18.4. We start out in long run equilibrium with 10,000 firms producing a total output of Q_1 . Short run supply and demand curves are not shown. The average and marginal cost curves shown represent approximately those for the 10,000th firm with respect to its contribution to industry output, after the other 9,999 firms have produced their parts. (These cost curves are very exaggerated. Drawn to scale, they would be invisible).

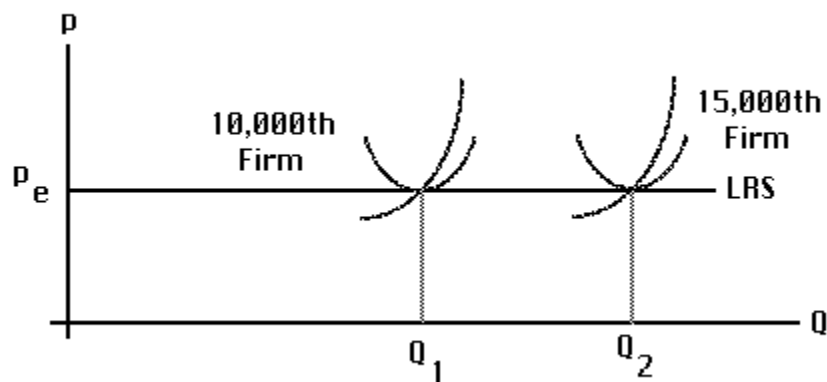


Figure 18.4

Now suppose that there is an increase in demand (not shown) and the price rises above p_e . The existing 10,000 firms will enjoy economic profits. These profits will attract new firms. So, the number of firms in the industry will grow, shifting the short run industry supply (not shown) to the right, and, thus, depressing the price back toward p_e . When will these new entries stop? The answer is only when economic profits are back to zero. We suppose, for this example, that this happens when there are 15,000 firms in the industry, producing Q_2 of output. As the (exaggerated) cost curves for the 15,000th firm show, the price will be back at p_e .

What this example shows us is that the long run supply curve in this case is a horizontal line corresponding to the bottom of the average cost curve of a firm in the industry.

We have been thinking of supply curves as being upward sloping. But as we noted, there are some exceptions. In the long run, supply may or may not be upward sloping.

Long Run Supply Curve

For each industry output, the long run supply curve shows the lowest price at which that output can be produced, so that the price covers all costs including the opportunity cost of invested capital.

Thus, the long run supply curve is a boundary-- the boundary between profitable and unprofitable prices, given industry output.

On simplifying assumptions, we conclude the following:

1. All firms have identical cost curves.
2. The cost curves are u-shaped.
3. The cost curves remain stationary as the number of firms in the industry changes.

The Long Run Supply (LRS) curve is a horizontal line. In economics, this special case is known as a constant-cost industry, for reasons that are probably obvious. But these simplifying assumptions cannot always be applied. Assumption 3 is the tricky one. For example, agricultural industries would clearly be exceptions to it.

Suppose, for example, that the demand for wheat increases, so wheat farming becomes profitable. Then, more farmers switch from producing other crops to producing wheat. But that increases the demand for the best wheat land, so the rental cost of that land increases. New firms will have to pay the higher rental cost or make use of land that is less well suited to producing wheat. Either way, the new firms will have higher costs. Thus, the cost curves will shift upward as the number of wheat farms increases, and the new long run equilibrium price will be higher. Agricultural industries are not constant cost industries, but increasing cost industries.

For an increasing cost industry, the long run supply curve is upward sloping. Some economists believe there are also decreasing-cost industries, with downward-sloping long run supply curves.

Example of Long Run Supply in a Constant-Cost Industry-- Computer Software

We are not sure that computer software is a constant-cost industry. One reason is that computer programs are not identical, so we would have to measure the output of the industry in some uniform units. Perhaps, to a rough approximation, the output can be measured in lines of code. Of course, not all lines are equal-- some lines are wasted and some are inspired. But this measure may work fine on average, and, in fact, businessmen do use lines of code as a measure of programmer output.

Let us assume, for the sake of the example, that software output can be measured on average by lines of code and that the industry is a constant-cost industry. The example is illustrated by Figure 18.5.

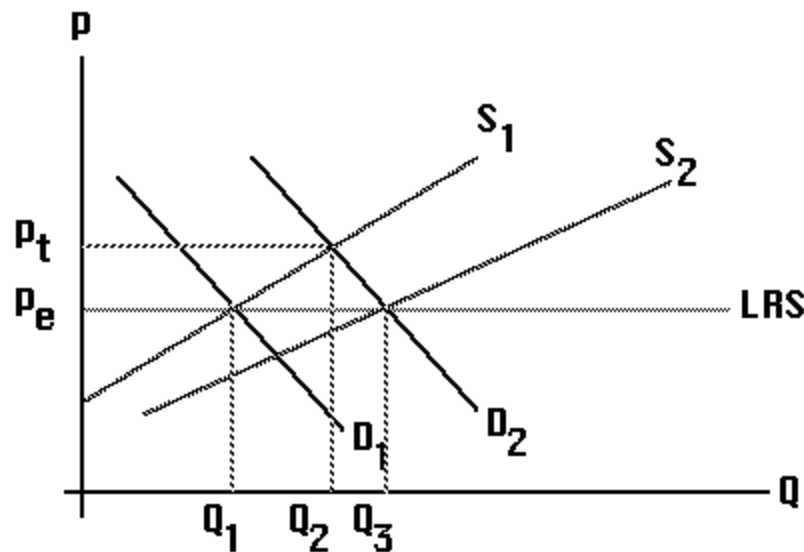


Figure 18.5

In the figure, the long run supply of computer software is the gray line LRS. At the beginning, we have long run equilibrium at p_e and Q_1 . Demand is D_1 and short run supply is S_1 .

Now, a breakthrough in computer hardware, a complementary good, increases the usefulness of computer software, and so does the increase in the demand for software. (The invention of desktop computers clearly had this effect.) In the short run, the price of computer software rises to p_t with Q_2 lines of software produced. At this price, software is a profitable industry-- the price is above the long run supply curve, which, by definition, is the boundary between profitable and unprofitable prices. Thus, there will be entry into the software industry (and more programmers and software engineers will be trained, an investment in human capital) so that the short run supply curve shifts to the right. The shift continues until the new long run equilibrium is reached at price p_e and production Q_3 with short run supply S_2 .

This two-stage adjustment process is the characteristic of industries characterized by free entry and supply-and-demand pricing.

Summary

The conduct and performance of an industry will depend to some extent on its structure. Among four major types of structures recognized by economists, we have focused on the p-competitive-- sometimes called perfectly or purely competitive-- structure as the one corresponding most closely to the supply and demand model. This structure can be described by four basic characteristics:

- Many buyers and sellers
- A homogenous product
- Sufficient knowledge
- Free entry

All of these characteristics push an industry toward predominant price competition. So p-competitive could also stand for "price-competitive." In the short run, the p-competitive industry's supply curve is its marginal cost curve. In the long run, entry of new firms and exit of firms already in the industry will lead to a price corresponding to average cost, inclusive of the opportunity costs of capital and other resources. In other words, there are

no "economic" profits. We have also found that the p -competitive model defines a kind of ideal in which rational self-interest leads to an allocation of resources in which given quantities of outputs are produced by enterprises of an efficient cost-minimizing scale. This remarkable finding is one modern counterpart to Adam Smith's conception of the "invisible hand."