TOPIC 4. MARKET STRUCTURE

1. Perfect Competition
2. Pure Monopoly
3. Monopolistic Competition
4. Oligopoly

1. Perfect Competition

The theory of supply is based on the simplifying assumption of «perfect» competition in a market for a product. A **perfectly competitive market** exists when the following conditions prevail:

1. There are *many sellers* in the market competing to sell a product to many buyers. In a perfectly competitive market, the number of sellers usually exceeds 100 and is often in the thousands.
2. The products sold in the market are *homogeneous*, which means that each seller's product is identical to that of other sellers. A homogeneous product is one that's standardized. Grade A eggs are an example, as are bushels of soybeans of a given quality. Buyers view one seller's product as a perfect substitute for that of any other seller.
3. Each firm has a *very small market share* of total sales. Market share is a single seller's percentage of total sales over any period. Generally, in a perfectly competitive market, no seller's market share exceeds 1 percent.
4. No seller in the market regards competing sellers as a threat to its market share. *Firms are, therefore, unconcerned about their competitors' marketing or production decisions*.
5. *Information is freely available* on prices, technology, and profit opportunities. Also, resources are mobile.
6. There is *freedom of entry and exit* by sellers of the standardized good. This means there are no restraints preventing firms from entering the market, nor are there difficulties in ceasing operations.

In a perfectly competitive market, an *individual* seller cannot influence the market price of its product. Because each seller's product is a perfect substitute for that of any other seller in the market, buyers have no reason to prefer the product of one seller to that of any other. A firm that tries to charge more than the going market price for its product will lose all its customers to competing sellers.

In a perfectly competitive market, no individual firm can shift the market supply sufficiently to make a good scarcer or more abundant. Even if one firm withholds its entire production from the market, this won't cause the good to become scarcer and therefore won't result in an increase in the market price. If a firm floods the market with its output, the good won't become sufficiently more abundant to put downward pressure on market price. This means that no seller in the market can affect the price of the good by offering to sell either more or less of it.

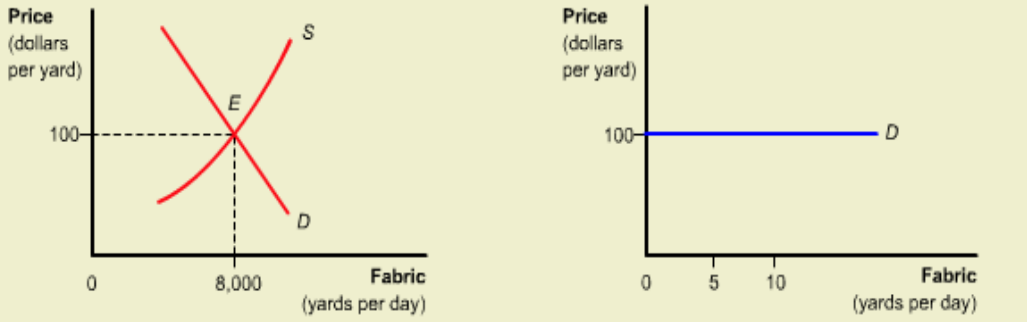
A **competitive firm** is one that sells its product in a perfectly competitive market. *A competitive firm is characterized as a "price taker," because it can only react to the market price and cannot, by itself, cause the market price to go up or down*. In a perfectly competitive market, the number of sellers depends on the profitability of selling the product.

Free entry and mobility of resources ensure that the number of sellers, and therefore market supply, will increase when it's profitable to sell a product in a market.The key idea underlying the notion of perfect competition is that individual firms *react to* rather than influence the prices of the products they sell. The model is relevant to markets in which prices are set largely by impersonal forces of supply and demand and firms take the market price as more or less given.The market demand curve is downward-sloping for a competitive *industry* composed of many firms selling a homogeneous product. Market price is determined by demand and supply in the competitive market, in which prices adjust until quantity demanded by the many buyers equals quantity supplied by the many sellers.

For example, suppose you run a small firm that weaves fabric sold by the yard. Suppose that 1,000 firms in your industry produce a standard woven fabric sold throughout the nation in a competitive market and that consumers regard the product of any one of these firms as a perfect substitute for the product of any other firm. The market in which these firms sell their fabric is perfectly competitive, and each firm can be considered a price taker. Each firm in the industry is very small and operates out of a very small plant in which it can produce a small amount of fabric each day.

Box 1 **Market Price and the Demand for the Output of a Competitive Firm**

The market price of fabric is $100. A competitive firm can sell all the fabric it wishes at that price. The demand for a competitive firm's output is infinitely elastic at the market price. The output of any one firm is a perfect substitute for that of any other firm.



In Box 1, graph **A** shows how the market price is determined by supply and demand and how this influences the demand as seen by any single competitive firm in the industry. The market demand and supply curves for the fabric intersect at point *E*. The corresponding market equilibrium price is $100 per yard, and the equilibrium quantity sold per day at that price is 8,000 yards.Graph B shows the demand curve as seen by any firm in the industry. This curve is a horizontal line. We can easily understand why by considering the short-run productive capacity of each firm in the industry. Suppose each firm can produce no more than 10 yards of fabric per day in its existing plant. The most any one firm can add to (or subtract from) market supply is therefore 10 yards per day. Even if any one firm adds or subtracts this maximum amount, the shift in the supply curve will be imperceptible. There would therefore be no perceptible effect on market price. To see this, go to A in Box 1 and note that removing 10 yards per day from the market quantity supplied of 8,000 at the $100 price won't noticeably change the quantity supplied. No firm has the capacity to make the good appreciably scarcer or more abundant. This means that any firm can sell all it wants at the

market equilibrium price. This being the case, there's no incentive to sell at any price lower than the market price. A firm that lowers its price won't be able to sell more than it would have sold otherwise. The price decrease would therefore lower revenue, but have no effect on the quantity sold and the cost of production. Thus, selling at a price below the market equilibrium price would decrease a firm's profit.The standardized product sold by any one competitive firm is a perfect substitute for that of any other competing seller. The horizontal demand curve of each firm in a competitive industry is perfectly elastic at the market price.

2. Pure Monopoly

A **pure monopoly** occurs when there's a single seller of a product that has no close substitutes. Buyers then have only one source of supply for that product. Perfect competition is characterized by the inability of individual sellers to control price. No individual firm produces a large enough share of the total market supply to affect price. Monopoly, on the contrary, is characterized by concentration of supply in the hands of a single firm.

A firm has **monopoly power** if it can influence the market price of its product by making more or less of the product available to buyers. Although pure monopoly is very rare, monopoly power is quite common.

Local monopolies are more common than national monopolies, and local markets are often served by single sellers. However, few, if any, products have no substitutes. A local electric power company may be the sole seller of electricity in an area, but electricity has substitutes. Natural gas and oil furnaces are good substitutes for electric heat.

In most regions where local monopolies provide public utility services, the seller can't set the price it charges for service. Most local monopolies that provide electricity, natural gas, and transportation services are regulated by state and local government agencies. In evaluating the rates charged by utility monopolies, these agencies are influenced by political as well as profit considerations. In fact, in many cases, utility monopolies are actually owned and operated by government agencies. The undesirable outcomes we expect when a pure monopoly is free to set its price lead to political intervention to control its pricing policies.

For any amount of monopoly power to continue to exist in the long run, the market must be closed to entry in some way. Either legal means or certain aspects of the industry’s technical or cost structure may prevent entry. A **barrier to entry** is a constraint that prevents additional sellers from entering a monopoly firm's market. We will discuss several of the barriers to entry that have allowed firms to reap monopoly profits in the long run (even if they are not pure monopolists in the technical sense).

Government Franchises and Licenses. Some barriers to entry are the result of government policies that grant single-seller status to firms. For example, local governments commonly give the right to install cable television systems to a single firm. Governments typically establish monopolies for the rights to sell electric power, and transportation, water, sewer, and natural gas service.

Patents and Copyrights. Patents and copyrights are another government-supported barrier to entry. They give creators of new products and works of literature, art, and music exclusive rights to sell or license the use of their inventions and creations. For example, many popular pharmaceutical prescription drugs used for treating high cholesterol, are patented. Patents and

copyrights provide monopoly protection for only a specified number of years. After a patent or copyright expires, the barrier to entry is removed.

The idea behind patents and copyrights is to encourage firms and individuals to innovate and produce new products by guaranteeing exclusive rights to the profits through monopoly supply for limited periods.

Ownership of the Entire Supply of a Resource. A monopoly can also be maintained by owning the entire source of supply of a particular input. De Beers, a South African corporation, had monopoly power in the diamond market because it controlled the sale of up to 90 percent of uncut gem diamonds, in the 1980s, through its Central Selling Organization. The Aluminum Company of America had a monopoly in the U.S. aluminum market until the end of World War II. Its monopoly was based on its control of bauxite ore, the source of aluminum, and its control of a few excellent sources of low-cost power.

Unique ability or knowledge can also create a monopoly. Talented singers, artists, athletes, and the «cream of the crop» of any profession have monopolies on the use of their services. Firms with secret processes or technologies have monopolies if other firms can't duplicate those techniques.

Cost Advantages of Large-Scale Operations and the Emergence of Monopolies. *Economies of scale* are cost savings that result from large-scale production. Such cost savings favor the establishment of monopolies, because bigger firms in industries for which economies of scale prevail can produce at lower average cost than smaller competitors.

If firms can continually reduce average costs of production and profits by expanding in the long run, one firm will eventually emerge as the dominant supplier. Under such circumstances, much higher average costs of production would result under perfect competition, which requires many small firms with small market shares. If perfect competition existed initially, it would end as soon as existing firms merged, or one firm purchased their assets and consolidated them to achieve lower average costs. Eventually, one firm would dominate. Once it does, new firms can't enter, because they're too small, initially, to achieve the low average costs that the dominant firm enjoys by virtue of producing the entire market supply in very large plants.

The term **natural monopoly** is sometimes used to describe a situation in which a firm emerges as the single seller in a market because of cost or technological advantages that lower the average cost of production. Competition among firms in such a market results in one large firm supplying the entire market demand at a lower average cost than that of two or more smaller firms. A natural monopoly can produce the entire quantity demanded by buyers at any price at a lower average cost than would be possible for each firm in its industry, if more than one firm existed. For example, a local electric company is a natural monopoly if the average cost of producing the quantity of electricity currently demanded is higher when more than one firm sells electricity.

A pure monopolist is the sole supplier of one product. A pure monopolist faces a demand curve that is the demand curve for the entire market for that good or service. *The monopolist faces the industry demand curve because the monopolist is the entire industry.*

Because the monopolist faces the industry demand curve, which is by definition downward sloping, its choice regarding how much to produce is not the same as for a perfect competitor.

When a monopolist changes output, it does not automatically receive the same price per unit that it did before the change.

In a perfectly competitive market, each buyer is charged the same price for every constant-quality unit of the particular commodity (corrected for differential transportation charges). Because the product is homogeneous and we also assume full knowledge on the part of the buyers, a difference in price cannot exist. Any seller of the product who tried to charge a price higher than the going market price would find that no one would purchase it from that seller. Monopolist, however, may be able to charge different people different prices or different unit prices for successive units sought by a given buyer.

When there is no cost difference, such strategies are called **price discrimination.** A firm will engage in price discrimination whenever feasible to increase profits. A price discriminating firm is able to charge some customers more than other customers.

To engage in price discrimination, a seller must meet the following conditions:

1. *The seller must be able to control the price of its product*.
2. *The product that's sold at more than one price must not be resalable*.
3. *The seller must be able to determine how willingness and ability to pay vary among prospective buyers*.

Monopolists engage in price discrimination when they can increase their profits by doing so.

3. Monopolistic Competition

Imperfect competition exists when more than one seller competes for sales with other sellers of similar products, each of which has some control over price. Individual sellers in such markets have a degree of *monopoly power*, which means they can influence the price of their product by controlling its availability to buyers.

Monopolistic competition exists when many sellers compete to sell a differentiated product in a market into which the entry of new sellers is possible. In a monopolistically competitive market, these conditions prevail:

1. *There are relatively large numbers of firms, each satisfying a small, but not microscopic, share of the market demand for a similar, but not identical, product.*

In a perfectly competitive industry, there are an extremely large number of firms. In pure monopoly, there is only one. In monopolistic competition, there are a large number of firms, but not so many as in perfect competition. This fact has several important implications for a monopolistically competitive industry.

2. *The product of each firm is not a perfect substitute for the products of competing firms.*

Perhaps the most important feature of the monopolistically competitive market is **product differentiation.** We can say that each individual manufacturer of a product has an absolute monopoly over its own product, which is slightly differentiated from other similar products. This means that the firm has some control over the price it charges. Unlike the perfectly competitive firm, it faces a downward-sloping demand curve. Consider the abundance of brand names for toothpaste, soap, gasoline, vitamins, shampoo, and most other consumer goods and a great many services. We are not obliged to buy just one type of video game, just one type of jeans, or just one type of footwear. We can usually choose from a number of

similar but differentiated products. The greater a firm's success at product differentiation, the greater the firm's pricing options.

3. *The firms in the market don't consider the reaction of their rivals when choosing their product prices or annual sales targets.*

4. *Relative freedom of entry and exit by new firms exists in monopolistically competitive markets.*

5. *Neither the opportunity nor the incentive exists for firms in the market to cooperate in ways that decrease competition.*

With so many firms, it is very difficult for all of them to get together to collude – to cooperate in setting a pure monopoly price (and output).

Collusive pricing in a monopolistically competitive industry is nearly impossible.

Also, barriers to entry are minor, and the flow of new firms into the industry makes collusive agreements less likely. The large number of firms makes the monitoring and detection of cheating very costly and extremely difficult. This difficulty is compounded by differentiated products and high rates of innovation.

Collusive agreements are easier for a homogeneous product than for heterogeneous ones.

Each separate differentiated product has numerous similar substitutes. This clearly has an impact on the price elasticity of demand for the individual firm. Recall that one determinant of price elasticity of demand is the availability of substitutes: The greater the number and closeness of substitutes available, other things being equal, the greater the price elasticity of demand. If the consumer has a vast array of alternatives that are just about as good as the product under study, a relatively small increase in the price of that product will lead many consumers to switch to one of the many close substitutes. Thus, the ability of a firm to raise the price above the price of *close* substitutes is very small. At a given price, the demand curve is highly elastic compared to a monopolist's demand curve. In the extreme case, with perfect competition, the substitutes are perfect because we are dealing with only one particular undifferentiated product. In that case, the individual firm has a perfectly elastic demand curve.

Monopolistic competition differs from perfect competition in that no individual firmin a perfectly competitive market will advertise. A perfectly competitive firm, by definition, can sell all that it wants to sell at the going market price anyway. Why, then, would it spend even one penny on advertising? Furthermore, by definition, the perfect competitor is selling a product that is identical to the product that all other firms in the industry are selling. Any advertisement that induces consumers to buy more of that product will, in effect, be helping all the competitors too. A perfect competitor therefore cannot be expected to incur any advertising costs (except when all firms in an industry collectively agree to advertise to urge the public to buy more beef or drink more milk, for example).

The monopolistic competitor, however, has at least *some* monopoly power. Because consumers regard the monopolistic competitor's product as distinguishable from the products of the other firms, the firm can search for the most profitable price that consumers are willing to pay for its differentiated product. Advertising, therefore, may result in increased profits. Advertising is used to increase demand and to differentiate one's product. How much advertising should be undertaken? It should be carried to the point at which the additional revenue from one more dollar of advertising just equals that one dollar of additional cost.

4. Oligopoly

Unlike a monopolistically competitive market, **oligopoly** is a market structure in which a few sellers dominate the sales of a product, and entry of new sellers is difficult or impossible. The product can be either differentiated or standardized.

How many is «a small number of firms»? More than two but less than a hundred? The question is not easy to answer. Basically, though, oligopoly exists when the top few firms in the industry account for an overwhelming percentage of total industry output.

Oligopolies often involve three to five big companies that produce the bulk of industry output. Between World War II and the 1970s, three firms - General Motors, Chrysler, and Ford - produced and sold nearly all the output of the U.S. automobile industry. Among manufacturers of chewing gum and coin-operated amusement games, four large firms produce and sell essentially the entire output of each industry.

All markets and all firms are, in a sense, interdependent. But only when a few large firms produce most of the output in an industry does the question of **strategic dependence** of one on the others' actions arise. In this situation, when any one firm changes its output, its product price, or the quality of its product, other firms notice the effects of its decisions. The firms must recognize that they are interdependent and that any action by one firm with respect to output, price, quality, or product differentiation will cause a reaction by other firms. A model of such mutual interdependence is difficult to build, but examples of such behavior are not hard to find in the real world. Oligopolists in the cigarette industry, for example, are constantly reacting to each other.

Recall that in the model of perfect competition, each firm ignores the behavior of other firms because each firm is able to sell all that it wants at the going market price. At the other extreme, the pure monopolist does not have to worry about the reaction of current rivals because there are none. In an oligopolistic market structure, the managers of firms are like generals in a war: *They must attempt to predict the reaction of rival firms*. It is a strategic game.

Why are some industries composed chiefly of a few large firms? What causes an industry that might otherwise be competitive to tend toward oligopoly? We can provide some partial answers here.

Economies of scale. Perhaps the most common reason that has been offered for the existence of oligopoly is economies of scale. Recall that economies of scale exist when a doubling of output results in less than a doubling of total costs.

Smaller firms in a situation in which the minimum efficient scale is relatively large will have average total costs greater than those incurred by large firms. Little by little, they will go out of business or be absorbed into larger firms.

Barriers to entry. It is possible that certain barriers to entry have prevented more competition in oligopolistic industries. They include legal barriers, such as patents, and control and ownership of critical supplies. Indeed, we can find periods in the past when firms were able not only to erect a barrier to entry but also to keep it in place year after year. In principle, the chemical, electronics, and aluminum industries have been at one time or

another either monopolistic or oligopolistic because of the ownership of patents and the control of strategic inputs by specific firms.

Oligopoly by merger. Another reason that oligopolistic market structures may sometimes develop is that firms merge. A merger is the joining of two or more firms under single ownership or control. The merged firm naturally becomes larger, enjoys greater economies of scale as output increases, and may ultimately have a greater ability to influence the market price for the industry's output.

There are two key types of mergers, vertical and horizontal. A **vertical merger** occurs when one firm merges with either a firm from which it purchases an input or a firm to which it sells its output. Vertical mergers occur, for example, when a coalusing electrical utility purchases a coal-mining firm or when a shoe manufacturer purchases retail shoe outlets.

Obviously, vertical mergers cannot *create* oligopoly as we have defined it. But that can indeed occur via a **horizontal merger,** which involves firms selling a similar product. If two shoe manufacturing firms merge, that is a horizontal merger. If a group of firms, all producing steel, merge into one, that is also a horizontal merger.

Behavior in oligopolistic markets is very difficult to analyze. The difficulty stems from the fact that the way firms behave depends crucially on *how they think their rivals will respond to their pricing policies*. The way firms compete in a market also depends on how they think their rivals will react to changes in advertising policies or to the introduction of new products.

A **price war** is a bout of continual price-cutting by rival firms in a market. It's one of *many* possible consequences of oligopolistic rivalry. Price wars are great for consumers, but bad for the profits of sellers.

Prices can also be expected to be close to minimum possible average cost when firms in an oligopolistic market fear that high profits will encourage new firms to enter the market. A **contestable market** is one in which entry of sellers is easy and exit isn't very costly. A seller can enter a contestable market quickly, whenever it's profitable to do so. It can leave such a market just as quickly, without incurring high transaction costs or losses.

The disastrous effect of price wars on the profits of firms in oligopolistic markets provides an incentive for sellers to collude to keep profit up. Such collusion is illegal in most nations, and governments may prosecute firms that collude to fix prices at high levels or at temporarily low levels to force competitors out of business.

A **cartel** is a group of firms acting together to coordinate output decisions and control prices, as if they were a single monopoly.

Cartels usually try to set penalties for firms that cheat on their assigned quotas. The fundamental problem is that, once a cartel price has been established, individual firms maximizing profits at that price can make more by cheating.

Price Leadership. In some oligopolistic markets, one dominant firm in the industry sets its price to maximize its own profits. Other firms simply follow its lead by setting exactly the same price. The dominant firm is called the **price leader.** There's no collusion or quota setting. For example, in banking markets, one or two large banks typically set the prime rate, which is the interest on loans to large corporations. Other banks quickly follow the lead of the large banks and adjust their own interest rates.Price leadership was believed to prevail in the automobile industry in the 1960s, when General Motors (GM) dominated the market by selling close to half the cars sold in the United States. Penetration of the market by foreign

suppliers has made it difficult today for GM to raise prices with the assurance that other firms in the industry will follow.Price leadership may result from the fact that the smaller firms fear retaliatory reactions by the dominant firm. When a dominant firm can produce at lower average cost than its smaller rivals, the smaller firms may hesitate to undercut its price. They reason that, although they'll temporarily gain sales, they'll ultimately lose a price war, because the larger firm can make economic profits at a price lower than their minimum possible average cost. Pricing policy designed to put rival firms out of business and to establish monopolies is called *predatory pricing*.

In some markets, price rigidity results when firms fear their rivals won't match price increases, but will match price cuts – this results in a kinked demand curve.