5. Market Structures

Learning Objectives

This summary includes a review and an analysis of the principles set forth by CFA Institute. Upon review of this summary, you should be able to:

- ***Explain market structures, including perfect competition, monopolistic competition, oligopoly, and pure monopoly and know the market structure under which a firm operates .....pg. 68***
- ***Understand relationships between price, marginal revenue and cost, economic profit, and elasticity of demand for each of these market structures .....pg. 69***
- ***Explain a firm's supply function for each market structure .....pg. 69***
- ***Explain and calculate the profit maximizing price and output for firms under each market structure .....pg. 72***
- ***Explain pricing strategy in each market structure .....pg. 72***
- ***Understand the effects of demand changes, firm exit and entry, and other factors on long-run equilibrium for each market structure .....pg. 72***
- ***Explain how concentration measures are used in identifying market structures, and their limitations .....pg. 83***

Overview

This summary looks at types of markets, concentration in markets, and how this impacts profitability, demand, and firm exit and entry.

Market Types

Learning Objective: Explain market structures, including perfect competition, monopolistic competition, oligopoly, and pure monopoly and know the market structure under which a firm operates.

The four market types are:

1. Monopoly
2. Oligopoly
3. Perfect competition
4. Monopolistic competition

A **monopoly** is *a market where there is an exclusive seller of a product for which there are no good substitutes, and there are high entry barriers for that product*.

An **oligopoly** is *a market with a small number of sellers in an industry*. Some characteristics of an oligopoly are:

- a small number of competing firms
- interdependence among the sellers since each is relatively large, compared with the size of the market
- large economies of scale
- high entry barriers

Economies of scale are the most significant barrier. Other barriers could include patent rights and control over an essential resource, i.e., petroleum or land.

Perfect competition refers to *markets where there are multiple firms selling identical products*. It is difficult to differentiate goods in perfect markets and prices are well known. Commodities markets are examples of this.

Product differentiation is how competing firms make their products different from their competitors, for example, through packaging, design, color, etc. Unlike commodities, which are homogeneous goods, differentiated products have distinguishable characteristics, such as differences in:

- quality
- design
- location
- method of production

Monopolistic competition occurs when *there are multiple firms selling similar products*. This term is used because while every firm has a monopoly on the *exact* product it produces, it faces competition because many close substitutes exist.

Sellers in competitive price-searcher markets face competition both from firms already producing in the market and from potential new entrants into the market. If profits are present, new rivals will enter the market (since there are low entry barriers) until all profits have been eroded by firm entry.

Market Forces

Learning Objective: Understand relationships between price, marginal revenue and cost, economic profit, and elasticity of demand for each of these market structures.

Learning Objective: Explain a firm's supply function for each market structure.

Price takers *must sell their products at the market price. Since each price taker's production is small compared to total market output, price takers can sell their total output at the market price. However, they cannot sell their output at a price greater than the market price*. In a price takers' market:

- each firm produces identical products (homogenous goods)
- the output supplied by a single firm has little or no effect on the market price
- each seller faces a horizontal (or perfectly elastic) demand curve

Price-searchers are *businesses whose product has a downward sloping demand. The amount the company can sell is inversely related to the price charged*. The firm chooses the price, but the quantity sold depends on the price charged.

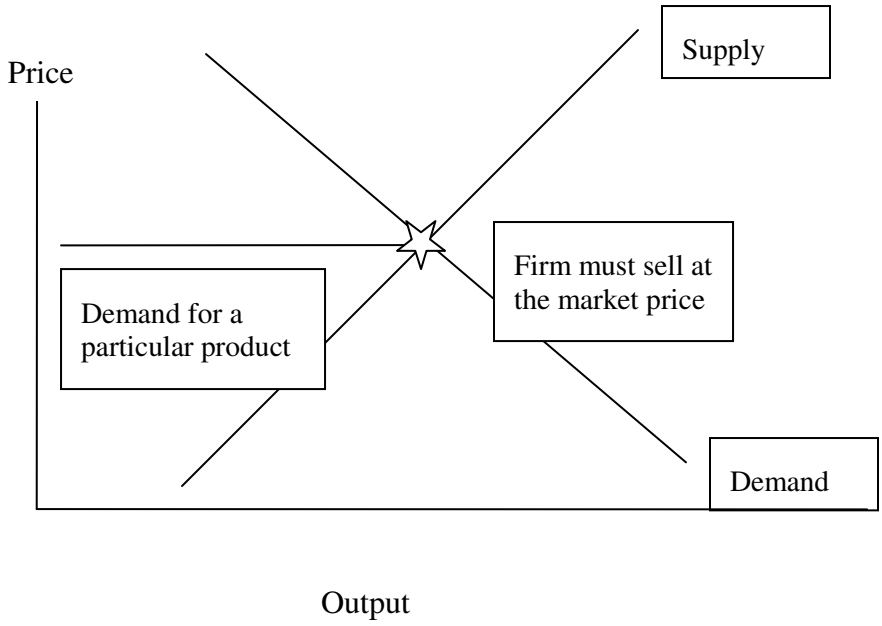
Dynamic competition: Competition indicates *rivalry (or competitiveness). Each competitor wants to provide a better deal to buyers considering quality, price, and product information*. Competition implies a lack of collusion among sellers.

Pure Competition Conditions

In a perfectly competitive market:

- all firms in the market are producing a homogeneous product
- a large number of independent firms participate in the market
- each supplier faces the same cost conditions
- each buyer and seller is small relative to the total market
- no **barriers to entry** exist (*difficulties that potential rivals have in entering a business*)

Firms must take the market price, and this price is determined by supply and demand:



Monopolies

Monopoly is *a market where there is an exclusive seller of a product for which there are no good substitutes, and there are high entry barriers for that product*. Monopolies exist when there are high barriers to entry and no close substitutes for a product or service.

Four factors may create entry barriers:

1. *economies of scale* - High fixed costs result in large producers enjoying lower ATC. New entrants may be forced to achieve large-scale production in order to compete.
2. *government licensing* - Licensing, a requirement that potential competitors obtain a certificate of permission from the government, is often used to limit entry in various occupations and business activities.

3. *patents (legal barriers)* - The grant of an exclusive right to use a specific process or produce a specific product for a period of time (17 years in the U.S.) also creates a barrier to the market.
4. *control over an essential resource* - A single firm or group of firms may have control over a resource essential for production in a certain industry.

A monopoly will not exist when there are close substitutes. For example, Bell telephone had a monopoly over local phone service for many years. Now many consumers have cell phones or internet service phones, and no local Bell service at all. On the other hand, you most likely must turn to your electric utility for electric service. While you could own a generator to generate your own electricity, this is costly and inconvenient for many consumers.

Monopolistic Competition

Monopolistic competition is *another term used to describe a price-searching market*. This term is used because although every firm has a monopoly on the *exact* product it produces, it faces competition because many close substitutes exist.

In monopolistic competition, there are:

- *many competing firms, each with a small market share* - Each firm has limited ability to set prices. Collusion, or price fixing, is not possible.
- *differentiated products* - Products of competing firms are similar, but not identical.
- *easy exit and entry* - Firms cannot make economic profits over the long term. Firms experiencing economic losses leave the industry.
- *competition on price, quality, and marketing* - While there is limited ability to set prices, firms that produce higher quality products can charge higher prices. Firms must market or advertise their products to explain to consumers why theirs are better or how they are different from competitors' products.

Sellers in competitive price-searcher markets face competition both from firms already producing in the market and from potential new entrants into the market. If profits are present, new rivals will enter the market (since there are low entry barriers) until all profits have been eroded by firm entry.

In the short run, producers operating in monopolistic competition act like monopolies. To maximize profits, firms will produce until MR = MC. If demand is at levels where MR > MC, then firms will make an economic profit. If not, then they will operate at a loss. In the long run, companies making losses will exit the business and new firms will enter profitable businesses. Enough firms will exit or enter until all firms are making zero economic profit.

The main differences between perfect and monopolistic competition are:

- *excess capacity* - In perfect competition, a firm will produce to its capacity - average total cost is at its lowest. In monopolistic competition, firms will have excess capacity. If they lowered prices, they could sell more, but then they could be producing at a point where costs exceeded revenues.
- *mark-up* - In perfect competition, price equals marginal cost. In monopolistic competition, price is marked up: it exceeds marginal cost. The mark-up is the result of price discrimination. There is variety in the firms' products in monopolistic competition, and consumers value variety. Variety is also costly. It would be more cost efficient but less interesting if everyone wore exactly the same clothes. So, given the variety provided by monopolistic competition, it is reasonably efficient, even though price is greater than marginal cost.

Oligopolies

An **oligopoly** is *a market with a small number of sellers in an industry*. A **duopoly** is *an oligopoly with only two firms*. Some characteristics of an oligopoly are:

- a small number of competing firms
- interdependence among the sellers since each is relatively large, compared with the size of the market
- large economies of scale
- high entry barriers

Economies of scale are the most significant barrier. Other barriers could include patent rights and control over an essential resource, i.e., petroleum or land.

Profit Maximization

Learning Objective: Explain and calculate the profit maximizing price and output for firms under each market structure.

Learning Objective: Explain pricing strategy in each market structure.

Learning Objective: Understand the effects of demand changes, firm exit and entry, and other factors on long-run equilibrium for each market structure.

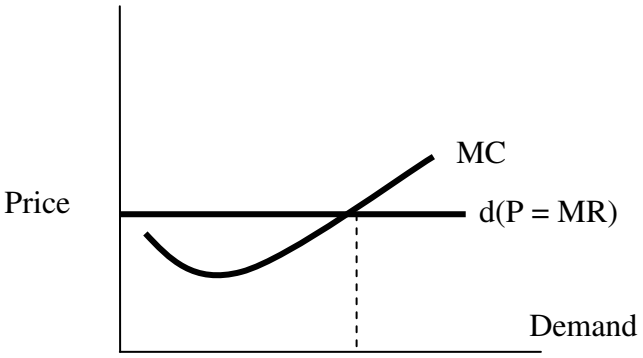
Marginal revenue (MR) is *the additional revenue derived from the sale of an additional unit of output*. This is equal to price for the price taker.

Mathematically:

MR = Change in total revenue / Change in output

In the short run, the purely competitive firm expands output until marginal revenue (which equals price) is equal to marginal cost. This is the point where the firm maximizes profits. *Thus, P = MC = MR is the profit maximizing point for the competitive firm.*

Profit Maximization for a Competitive Firm



A competitive firm maximizes profits by producing where P = MC = MR. Under this profit-maximizing condition, the portion of the firm's short-run marginal cost curve that lies above its average variable cost is the short-run supply curve of the firm. This is the supply curve of the firm, because if price drops below AVC then the firm stops production and supply goes to zero.

Total revenue is *sales price times quantity sold*. **Total costs** *equal average total costs (ATC) times output level*. When total revenues are greater than total costs, the firm has a short-run economic profit. When the cost of producing an additional unit is greater than the price received for that unit, the firm will stop producing more.

Marginal revenue (MR) is *the revenue received from an additional unit of output*, or the change in total revenue divided by the change in output. **Marginal cost (MC)** is *the cost of producing an additional unit of output*. Since a price taker sells all output at the same price, P, then marginal revenue is price. Profit is revenues minus costs. Over the short term, a price taker will produce more output until price, or marginal revenue, is exactly equal to marginal cost, or P = MR = MC. Profits increase as long as each additional unit's price is greater than its costs. At some point, as more units are produced the cost structure will change, say new equipment is needed, or a new warehouse must be built to accommodate the additional units. Eventually, over the long run, the cost of an additional unit will exceed its price, and the firm will not make any additional units. Looking at this concept using total revenues and costs, profit is maximized when total revenues minus total costs is at the highest level possible.

Losses and Exiting the Business

If changes take place in the market that depresses the price below a firm's average total cost, the profit maximizer has three options:

1. *continue operation in the short run* - A firm with total revenues that are less than total costs will incur fixed costs even if it temporarily shuts down. Therefore, if a firm anticipates that the market price will increase in the future (at a level justifying a decision not to exit the business) *it will continue to operate in the short run as long as it is covering its variable costs*. This is because it can apply any revenue in excess of variable costs to the payment of fixed costs, a situation that could not exist if the firm went out of business.
2. *shutdown* - The firm may temporarily halt business operation. The firm does not sell its assets, and variable costs are eliminated; the firm's fixed costs continue. *A shutdown may occur if the market price declines below the firm's AVC in the short run.* In this case, a temporary shutdown is preferable to short-run operations.
3. *go out of business* - A firm sells its assets, avoids its fixed costs, and permanently exits the market. *The firm chooses this option if in the short run it cannot cover its variable costs and does not anticipate a future rise in the market price*.

The Short-Run Supply Curve for the Market

In a purely competitive industry, the short-run market supply curve is the horizontal summation of the marginal cost curves (above the level of average variable cost) for all firms in the industry. Since individual firms will supply a larger amount at a higher price, the short-run market supply curve slopes upward to the right.

Long-Run Equilibrium

Long-run equilibrium in a competitive industry implies that price-taking firms are earning the normal rate of return. Any profit in excess of their opportunity cost will attract additional firms into the industry, which will cause prices to fall. Economic profits would thus be eliminated (that is, their minimum ATC will just equal the market price). The converse is true if the firms are suffering economic losses: firms exit the industry until the price rises enough to restore zero economic profit.

If there is an increase in demand, over the short run, the firm can make economic profits. This will attract new entrants into the market and existing firms may find it is now profitable to expand their output. As supply increases, the short-run profits will be eliminated. If costs are unchanged, then the price for the good will revert to its initial level, even though output has permanently increased.

Suppose instead there are economic losses or a decrease in demand, and the industry is earning less than the required market rate of return. The market price decreases, and firms will find that their revenues are lower than costs. Producers will decrease output. Less capital will flow into the industry as some firms exit the industry and others choose not to replace old equipment.

Industry supply will decrease. Prices will rise in the short run. Over time, the short-run supply curve will decline until price increases enough to allow the firms still in the industry to make their required rate of return.

The long-run market supply curve indicates the minimum price at which firms will supply various market output levels, given sufficient time both to adjust plant size and to enter or exit the industry. The shape of the curve depends on what happens to the cost of production as the industry's output is altered. There are three possible shapes to the long-run supply curve:

1. A **constant cost industry** is *an industry where factor prices and costs of production stay constant while market output expands*. The long-run market supply curve is horizontal because suppliers do not need to be induced by higher prices to supply more output since their costs are constant across all levels of output.
2. **Increasing cost industries** are *industries where costs of production increase while industry output expands*. In an increasing cost industry, higher market demand can only be accommodated through higher prices. The long-run market supply curve for the product will therefore, slope upward.
3. **Decreasing cost industries** are characterized by a *market supply curve that slopes downward and to the right. Because the market is competitive, each firm must lower prices as output increases because they must produce where ATC equals price (and in a decreasing cost industry, ATC is falling)*.

Supply Elasticity and the Role of Time

It is less costly to expand output slowly in response to a demand increase. For example, the immediate response to an increase in demand is to extract more production from existing facilities. Eventually, a new plant can be built to meet increased demand. Therefore, the market supply curve is more elastic in the long run than in the short run. The firm's short-run response is limited by the fixed nature of some of its factors of production. Within this framework, however, some firms can expand some factors more quickly than others. For example, hiring additional workers for a third shift can be implemented more quickly than building a new plant. Generally, it is more cost effective to increase output slowly when demand rises. Expanding output will increase over time as long as price is greater than costs. The market supply curve has greater elasticity when an industry has more time to change output levels.

Monopolies

Like other price-searchers, a monopolist faces a downward sloping demand curve. In order to sell more output, price must decrease (i.e., the monopolist's marginal revenue curve lies below the demand curve). The *monopolist will expand output until marginal revenue equals marginal cost*.

This profit maximizing output rate can be sold at a price along the firm's demand curve. However, unlike the price-searchers in monopolistic competition, *the monopolist's profits cannot be eroded by rival entrance*. Entering rivals cannot expand supply, cut prices, and erode a monopolist's long-run profits. Profit represents the difference between price and ATC times the

number of units of output sold. If the ATC curve of a monopolist is above its demand curve (i.e., demand for the product is not high enough), economic losses will result. Therefore, the profitability of a monopolist is limited by the demand for its product. The monopolist, however, has considerable pricing power and can charge a higher price for its unique product.

In monopolist competition, if a large number of firms produce a product, and one firm is able to differentiate its product making it appear better than other firms' products, then that firm will be able to charge a higher price. The more dissimilar that firm's product is compared to the other firms, the more the market will be like a monopoly.

Monopoly versus Perfect Competition

	Quantity Produced	Price	Marginal Revenue	Marginal Cost	Demand	Average Total Cost
Monopoly						
	Output is expanded until MR = MC	Price charged is from demand curve for its rate of sales	When profit is maximized, MR = MC	When profit is maximized, MR = MC	If there are losses (low demand) the monopolist will exit the business	Output will increase as long as total revenues are greater than total costs
Perfect Competition						
	Output is expanded as long as more output increases revenues more than costs	Firm must accept market price. When price exceeds total average cost, firms make economic profits. Firms cannot make long-run economic profits.	P = MR = MC	P = MR = MC	Perfectly elastic demand for products	First shut down if they can't recover average total cost

A monopoly is inefficient. It restricts output and sells for a price higher than the equilibrium price, creating a deadweight loss. Consumer surplus decreases because consumers must pay more for the goods and because they are getting less of the good than demanded. Producers gain from higher prices, but lose because they are producing less than the equilibrium quantity. Monopolies produce less at a higher cost and increase price at a level greater than the increased cost of production. Monopolies also redistribute surpluses. Some of the lost consumer surplus goes to the monopoly producer. When there is perfect competition, the firm has no pricing ability and must accept the market price.

Another cost of a monopoly is **rent seeking**, *working to take part of a consumer or producer surplus or economic profit*. For example, a part of a monopoly's economic profit comes from taking part of the consumer surplus for itself. Rent seekers may either buy or create a monopoly to obtain excess profits. An example of rent seeking behavior is expending resources to get Congress to pass protections like quotas and tariffs that will benefit a limited group of producers. Rent seeking behavior can reach equilibrium, so only a normal profit and not a monopoly profit is made. For example, suppose there are a limited number of seats on the New York Stock Exchange (whose members can make profits because of their greater knowledge about trading in their securities). In equilibrium, the price of a seat on the exchange will be bid up to the point where only normal profits, not monopolistic profits, can be made.

Price Discrimination

Price discrimination is *when a seller charges different prices for the same product or service*. In order to gain from price discrimination, price-searchers must be able to:

1. recognize and separate at least two groups with varying elasticities of demand
2. ensure that those who buy at low prices do not resell to customers who are charged higher prices

Under price discrimination, groups with the most inelastic demand are charged high prices and groups with more elastic demand are charged low prices. Therefore, under price discrimination, inelastic consumers are worse off while elastic consumers are better off. Allocative efficiency is enhanced under price discrimination because more output is produced overall. If the firm can divide its customers into groups with differing demand elasticities, and it can control reselling, the firm may be able to gain from price discrimination by charging higher prices to inelastic demand groups and lower prices to elastic demand customers. It can also increase total gains from trade and allow production where otherwise there would be no production. Generally, producer surplus is increased, while total consumer surplus is decreased.

Perfect price discrimination *occurs when a producer can sell its output for the highest prices that anyone will pay*. In this case, the monopolist captures all of the consumer surplus. Here, the market demand curve and marginal revenue curves are the same. It is to the producers' advantage to lower the price, say through advertised specials, and sell additional units (still keeping the higher price for those willing to pay it). The producer will sell until MR = MC. This is efficient, but instead of consumers and producers sharing the surplus, the producer captures all of it.

Oligopolies

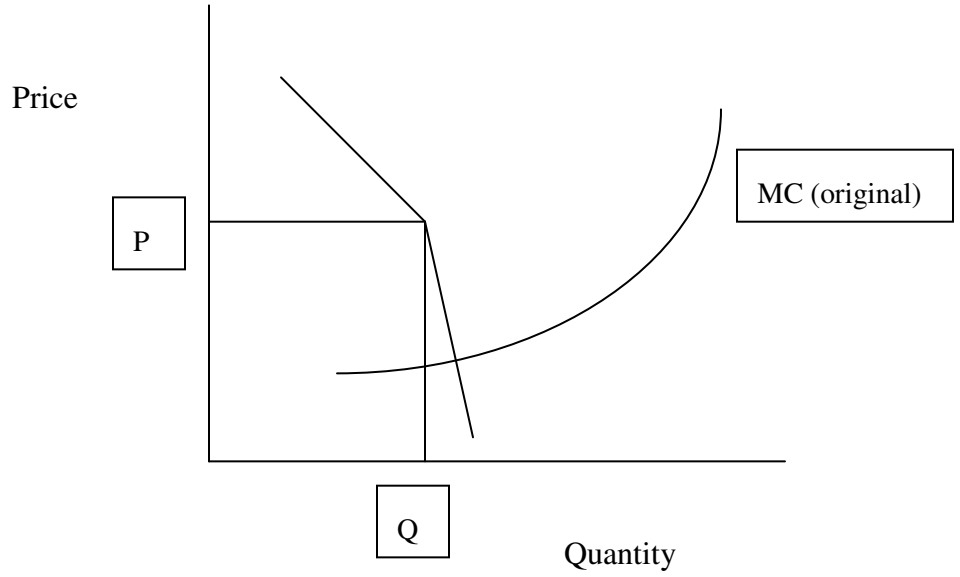
Two models to describe oligopolies are:

1. kinked demand curve model
2. dominant firm model

Kinked Demand Curve

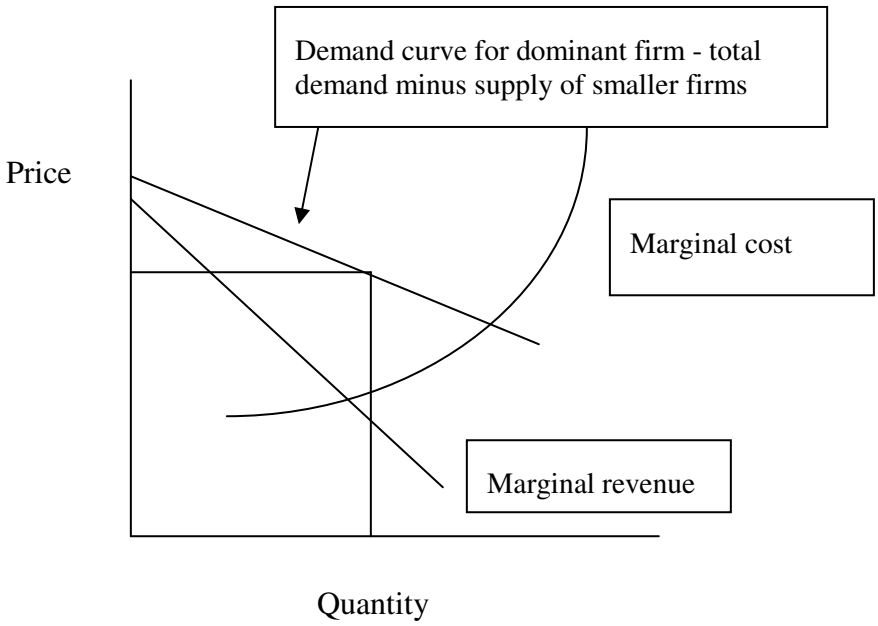
This model assumes that if one firm raises prices, other firms in the oligopoly will not raise prices, but if prices are cut, other firms will lower prices.

At price P and quantity Q there is a kink in the demand curve. If prices are greater than P, then increasing the price by a small amount leads to a large decrease in quantity sold. If price is less than P, large price cuts lead to low increases in the quantity sold. If competitors also lower prices, then there is no advantage to cutting prices. Firms produce at the point where MR = MC. This model states that price and quantity are not very sensitive to small cost changes. The main problem with this model is that the assumptions about other firms' not raising prices when one does and cutting prices when another firm does may not be correct.



Dominant Firm

This model states that the dominant firm has a large cost advantage over competing firms in the oligopoly. The dominant firm sets prices for the remaining firms. The dominant firm behaves as a monopoly and the remaining firms are price takers, behaving like firms in perfect competition. The dominant firm sets the price where MR = MC. The smaller firms accept the price set by the dominant firm.



Game theory is *the study of behavior that looks at how others are expected to behave*, and can be used to study oligopolies. Games have the following characteristics: rules, strategies, outcomes, and payoffs.

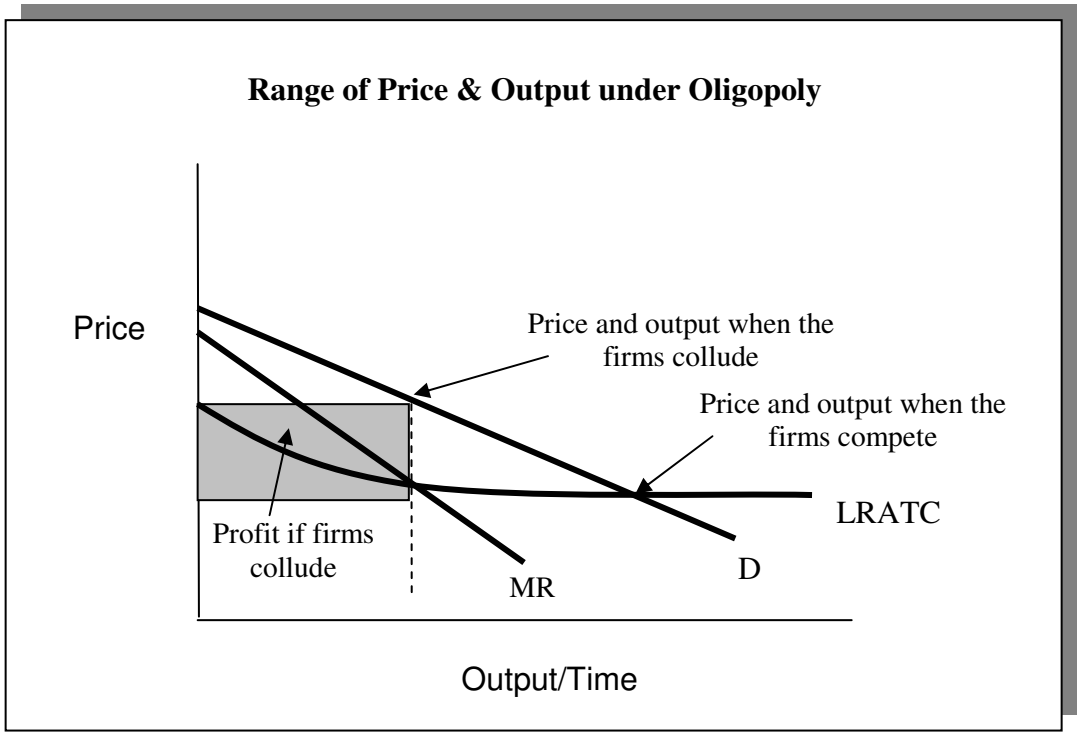
Prisoners' Dilemma

In the prisoners' dilemma, two people are arrested. The police only suspect the two are guilty and can only convict if one of them confesses. The prisoners are separated. If both confess, they will receive identical prison sentences. If one confesses and testifies against the other, the one that confesses first will receive a short prison sentence, while the other will face a very long prison term. Nash equilibrium (developed by John Nash of "A Beautiful Mind" fame) happens when player one makes the best decision, given player two's actions and vice versa. For example, if player 1 confesses, then it is in the best interest of player 2 to also confess to avoid the very long prison sentence. The same is true for player 1 if player 2 confesses. In this case, it is in the best interest of both prisoners to confess. But this is not the best outcome for both prisoners. It would be better if neither of them confessed, then neither would be convicted of a crime. There is no way to avoid the bad outcome from confessing because the prisoners cannot communicate with each other.

Applying Game Theory to Oligopolies

Firms in an oligopoly can choose to collude or not to collude. The key factor in determining the demand facing an oligopolistic firm is the pricing behavior of close rivals. Thus, an oligopolist must predict how rival firms and consumers will react to price adjustments. Although it is impossible to determine the precise price and output policy that will emerge in oligopolistic industries, it is possible to analyze two extreme cases. Readers should recognize that in reality, oligopolies operate somewhere in between the following two examples.

Collusion



Under **collusion**, *firms agree to avoid various competitive practices, specifically price reductions*. *Oligopolistic firms restrict output to the monopoly level (i.e., to the point where MR = MC)*. The market price is set at the monopoly price, and all firms earn monopoly profits. A **cartel** is an example of *a collusive arrangement: sellers coordinate supply decisions so that the joint profits of members will be maximized*.

No Collusion

Under no collusion or non-cooperation, all oligopolistic firms set their price independently. In this case, the market price is driven to the competitive price since all firms will lower their price as much as possible in order to attract customers. Any firm with a price above the competitive level will have zero demand. The *zero profit rule applies when oligopolists do not collude*.

There is an incentive to cheat among oligopolists. If there is an undetected price cut, the firm cutting prices will attract more customers, both those who would not purchase the good at the higher price, and customers of competing firms. The demand curve for an individual firm in the oligopoly will be more elastic than the overall market demand curve. The price that maximizes prices for the whole industry is higher than the price that is best for an individual firm which charges a lower price than the remaining firms in the oligopoly. Like the prisoners' dilemma, each firm in the oligopoly faces a conflict: cooperate with competitors to maximize joint profits or secretly cheat on the agreement to maximize its share of the joint profits. A firm does not benefit from cooperating if the other firms cheat.

In this case, Adam Smith's invisible hand principle is violated. There may be a Nash equilibrium in which the best outcome (all firms cooperating) is not in the best self interest of each individual firm. *An equilibrium in which the best strategy is to cheat, no matter what the strategy of the other firms*, is called **dominant strategy equilibrium**. If such an equilibrium doesn't exist, the firms may be playing a game of chicken, where the first player to flinch loses. If one firm improves its products, it knows its research will be copied, and it will lose the benefits from innovating. It hopes its rival firm will innovate instead, so it can copy that research. If neither firm innovates, then no firm gains. Equilibrium only exists if one firm innovates and the other copies.

Many games are repeated. **Cooperative equilibrium** exists *when firms make and share monopoly profits*. This occurs if cheating is punished. In a "tit for tat" strategy, the firms take turns cheating, and therefore share monopoly profits. In a "trigger strategy," if one firm cheats, the others also cheat, reducing economic profits to zero in the long run. This can result in price wars among oligopolistic firms.

Contestable Markets

A market is **contestable** if:

- *the costs of entry and exit are low, so a firm risks little by entering,*
- *there is efficient production, and*
- *zero economic profits should prevail*.

A market can be contestable even if capital requirements are high. Potential, as well as actual competition, discipline contestable markets in the following two ways:

1. Prices will not be higher in the long run than the level necessary to achieve zero economic profits.
2. The minimum cost of production will occur.

Both of these results occur because the presence of any profitable opportunity will attract entrants, thus driving down the price to the level of per unit costs.

Entrepreneurs must find the profit-maximizing price for their products, where marginal revenues equal marginal costs, as indicated in economic models. However, the models do not show how and when new products will be developed. Entrepreneurial judgment must be used to decide about the answers to such questions as what consumer reaction will be to a new product, can the new business be expanded, can financing be obtained, etc.

Factors Reducing Collusion

Collusion is by nature an unstable agreement. Collusion is more difficult under the following circumstances:

1. *When detection and elimination of price cuts is difficult, collusion is less appealing*. If cheating is profitable and difficult to police, oligopolistic rivals are more likely to take advantage of such opportunities.
2. *The possibility of effective collusion declines when the number of firms in an oligopolistic market increases*. This is because the larger the number of firms, the more difficult it is to communicate, negotiate, and enforce agreements among firms.
3. *Entry barriers are low*. Other firms will be attracted into an industry with unusually high profits, thus eliminating oligopolistic profits.
4. *Demand instability tends to increase the honest differences of opinion among oligopolists about what is best for the industry*. The larger the differences in expectations about future demand, the greater the potential for conflict among oligopolistic firms.
5. *Aggressive antitrust enforcement takes place*. As the threat of getting caught increases, participants will be less likely to attempt collusive behavior.

Since the market power of oligopolists differs in each market, it is difficult to accurately describe the true consequences and nature of oligopolistic behavior.

Market power is *when a firm that is not a pure monopolist earns greater than zero profits, indicating that it has some monopoly power*. Because the firm has few (or weak) competitors, it has a degree of freedom from the discipline of vigorous competition. Market power refers to the ability of a firm to influence the market, and, more specifically, market price.

Defects in Markets with High Entry Barriers

- Reduced competition in a market limits consumer options, resulting in allocative inefficiency.
- Consumers' best interests may not be served. With less competition, profits and losses do not properly induce firms to enter and to exit from industries. Thus, inefficient firms will continue to produce.
- Rent seeking is encouraged by governmental grants of monopoly power. Firms attempting to secure and maintain grants of market protection will waste resources. Output is reduced as the result of these activities.

The theory does not specifically predict impacts on price and output for oligopolies. Rival oligopolists may act independently and bring price down to the cost of production as in a competitive market. Or, they could collude and realize perfect cooperation, in which case prices would rise to the level of a monopoly. Or, the actual prices and output may fall in between those of competitive and monopolistic models. In an oligopoly, firms have some pricing power, but it

is dependent on the prices of competing firms, potentially leading to collusion or price leadership by a dominant firm, as described above.

Concentration

Learning Objective: Explain how concentration measures are used in identifying market structures, and their limitations.

Concentration measures include:

- **Four firm concentration ratio** - *the percentage of sales held by the four largest firms in an industry*.

  This would be zero in a market with perfect competition, and 100 in a highly concentrated market. In general, a ratio of more than 60% is indicative of a high degree of concentration (oligopoly), and less than 40% indicates a competitive market.

- **Herfindahl-Hirschman Index (HHI)** - *the square of the market share percentage of each firm, summed over the largest 50 firms in that industry*(or less than 50 if there are fewer than 50 firms in the market).

  This number is small in competitive markets. An HHI greater than 1,800 indicates an uncompetitive market, and mergers which result in HHIs greater than 1,800 are more likely to be challenged by the Justice Department antitrust division. Suppose there are five firms in a market, with the following market shares:

  Firm 1: 30%, Firms 2, 3, and 4: 20% each, Firm 5: 10%. The HHI for this industry is $30^2 + 20^2 + 20^2 + 20^2 + 10^2 = 2{,}200$.

  A market with an HHI this high is considered to be uncompetitive. If two of the firms in this market wanted to merge, they would be less likely to obtain permission from the Antitrust Division of the Justice Department for a merger.

In addition to the above concentration measures, concentration can be gauged by:

- barriers to entry - Low barriers to entry, even in concentrated industries can lead to greater competition in the future.
- number of firms in the industry
- product type - Is the product a commodity or can it be easily differentiated?
- price control - Does the firm control price? Is price subject to regulation or market forces beyond the control of the firm?

Limitations of concentration measures include:

- scope of the market - Is there a small, domestic market for a product or is there a global market? For example, there is limited worldwide demand for a local newspaper, but there is a wider market for clothing, worldwide.
- entry barriers - Do firms enter and exit the industry easily or often?
- market and industry definitions - Markets and industries may not correspond. Companies may compete in multiple product markets, some competitive and others less competitive. Companies may also switch from industry to industry depending on market demands. There may be smaller, sub-markets within an industry that are more or less competitive than the overall market.

Most U.S. markets are competitive. In addition to domestic competition, U.S. companies face competition from international companies as well.