MARKET STRUCTURE

The goal of any firm is to maximize profit. That is easier said than done. Markets vary. Consequently, business strategies must vary. Actions taken by a firm in a competitive market will not work well in oligopolistic markets. To succeed in running a business, it is crucial to understand these differences in business environments. We will examine a variety of market environments from perfectly competitive, where no firm has any control, to monopolistic markets, where the firm has a considerable degree of control over its environment. In between these extremes lie the majority of markets, monopolistic competition and oligopolistic markets, where there are a few firms who must compete with differentiated products while considering what their competitors may or may not do. Our first stop will be perfect competition, a model you already have some familiarity with.

PERFECT COMPETITION

To understand what differentiates these different markets, one must first look at the underlying assumptions, which determines the market structure.

Assumptions

- Many buyers and sellers

  With many buyers and sellers in the market, no one seller or buyer can influence the price. Therefore, they are all price takers. The demand curve as perceived by the firm will be flat. It can sell as much as it wants, limited by its production capacity or cost structure, at the market price. It can do this because its total production is inconsequential to total market demand.

- Goods and resources are homogeneous.

  Since all goods are similar, the buyer does not care whose product he purchases. Firms cannot say that their product is better than another and therefore charge a higher price. Examples could be basic commodities such as flour, sugar, gas, electricity, etc. The question should be is one power company's electricity different than another? Is there a difference in gasoline (at the same octane rating) between one company and another such that you would notice it?

- Free entry and exit

  One of the advantages of a competitive market is that prices are very close to production cost. If prices were greater than their cost (remember we include a normal profit as cost) then firms would seek to enter this market, thereby driving down prices as supply increased relative to demand. For this to occur there has to be free entry.

  Let's talk briefly about what is needed to ensure free entry. There must be widespread production knowledge and technology. Capital must be movable. Restaurants provide a good example of this. Switching from a Mexican restaurant to an Italian restaurant. One can assume that most of the kitchen equipment will be usable. That which is not can be easily sold to acquire funds to buy other specialized equipment such as pasta maker. Funding to enter the business is easily acquired from a banker or venture capitalist. Knowledge of Italian cooking techniques is easy to acquire. If Italian cooking becomes far more profitable than Mexican then one can expect some switching.

  What might not be obvious is the need for free exit. Without free exit, oversupply conditions can exist for long periods of time leading to industry losses that may continue for some time until firms fall into bankruptcy, thereby lowering supply in a painful fashion. While these conditions probably don't exist to a severe degree in the restaurant business they do for durable

good and capital good producers. Changing from manufacturing cars to make home stereo equipment or to manufacturing homes probably is difficult to do without massive changes in the plant's structure, layout, equipment, or all of the above. Consequently when there is an excess capacity in the automotive market, it will exist for quite some time.

Knowing that exit out of a particular market is difficult or expensive may deter some firms from entry. Many firms in viewing expansion into another line of business must take into account not just short term profits but also long term demand and supply trends.

- No externalities

  As discussed in macroeconomics, externalities can result in oversupply or undersupply. They also invite government regulation.

- Perfect knowledge

  As discussed in macroeconomics the existence of asymmetric information, moral hazard, and adverse selection can alter the characteristics of the market. These conditions may require government intervention. Perfect and/or complete information requires that buyers and sellers have the same information sets. Neither one has an informational advantage that they can exploit in the market for profit.

Model

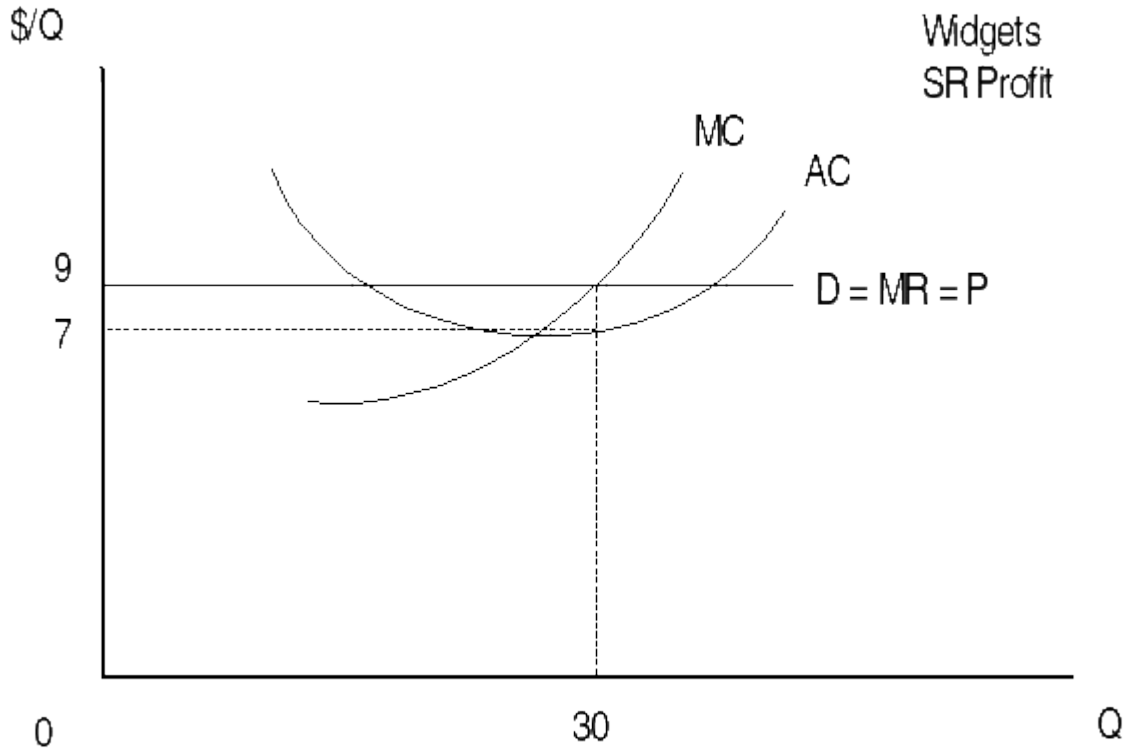
In economics, we use assumptions to build models. Models are useful for prediction, for explaining outcomes that we observe in markets, and as serving as an aid in developing business strategy.

In constructing models, we make extensive use of graphs. Graphs are useful in analyzing decision making by firms. Several key results emerge from this graphical analysis of the competitive market.

From the decision making perspective of the firm, price is already determined by the market. Pricing above the market will cause the firm to lose all of their customers to competitors. Pricing below the market will merely lower the firm's profits as the cost of servicing additional customers raises much faster than the revenue gained. Consequently, one of the first key results is:

- Produce where MR = MC

  Since P = MR, the demand curve as perceived by the firm as being flat. Basically it is cost of the good or service that determines how much is going to be produced. As each unit is produced it's MC increases. At the the point that it equals the MR achieved, which is its price, no further production is attempted. Any production beyond that point incurs a loss on each unit produced. Rational firms will stop here to maximize their profit.



In the above graph, a competitive firm has a flat demand curve. That is because the firm has such a small portion of the market that no matter how much more it produces, the additional production does not affect the market price. Under these circumstances, P = MR. Each additional unit brings in revenue equal to the market price. Another feature of this graph is that in the short run, a competitive firm could earn an economic profit. It would probably be due to fluctuations in seasonal demand. Here the firm produces 30 units with a profit margin of $2 per unit (9-7) producing a profit of $60 ($2 * 30).

What happens if a loss is incurred as demand falls?

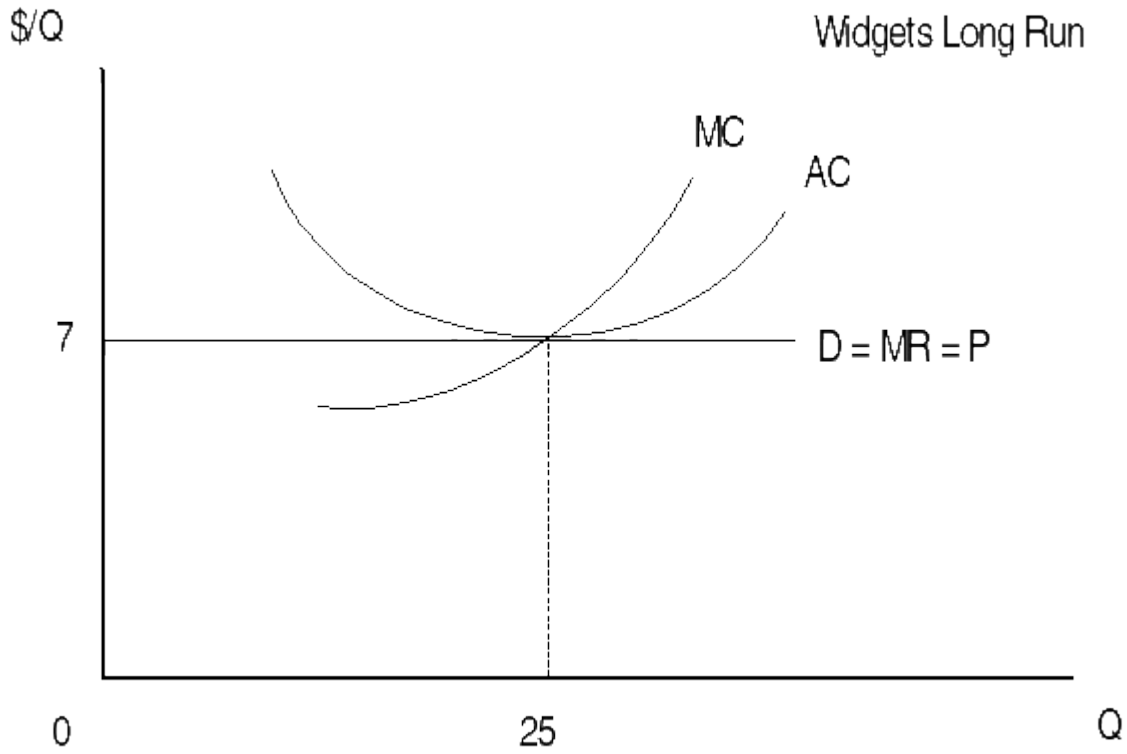
- In the short run produce as long as P>= AVC

In the short run, firm can continue production even though it incurs an economic loss. There are several reasons for this. One, while there may be an economic loss, an accounting profit may still exist. Secondly, even with an accounting loss there may be a positive cash flow. Depreciation is a noncash expense. As long as the bills can be paid the firm should remain in business. Thirdly, even with a negative cash flow the firm may still be able to operate (although only until the cash reserves run out). By delaying debt service, the firm can maintain enough cash for operational needs. This can only last a short time before creditors seek to liquidate the firm in bankruptcy proceedings.

The limits are clearly established when the firm cannot pay its variable costs. These are mainly labor and raw materials. Suppliers will cut off shipments very quickly if they are not paid. Workers will not last more than a few days (if not a few hours) after nonpayment of wages.

What determines short run could be seasonality, or for some firms the point in the business

cycle. For example, airlines tend to have periods of unprofitability as travel slackens considerably during an economic downturn. Confidence that downturns do not last and that business will return to normal encourages firms to ride out tough times.



- In the short run prices change, not supply; In the long run supply adjusts to demand

  As mentioned in the section introducing production theory, in the short run production capacity is relatively fixed. Variations in demand have more impact on price than on supply, as supply cannot change thus forcing price to control demand. In the long run, supply curves are more elastic thus moderating the change in price due to a change in demand. This elasticity is due to two factors, new firms entering the market, and current firms increasing production capacity. As shown in the graph above the firm produces 35 units at $7. Since TR = TC, no economic profit is being earned. Remember that a normal operating profit is a cost so the financial statements would reflect a profit.

- Prices reflect MC

  Due to the assumption of free entry and free exit, prices must track closely to product cost. Any economic profit is bid away by new competitors and economic losses are blunted by an exodus of firms leaving remaining firms to gain market share, hence profitability. (Please note that increased market share does not always imply higher profitability.) If production technology is such that are decreasing economies of scale exist in the factor markets then output increases will follow only if prices are increased. If there are economies of scale, then increasing demand may lower prices as firms are able to take advantage of economics of scale in the factor markets.

  Input prices may change. The cost of materials, labor, or capital may rise, or fall. As they do so,

prices in a competitive market will also change. There is a close relationship, in economics, we say correlation, between costs and prices.

As an example, consider gasoline. As oil prices rise in the Middle East, prices immediately rise at the retail gas station. Part of the reason is the slim unit profit margins. Oil companies cannot afford higher costs as profit margins turn into losses. Any sustained loss would put the oil company out of business.

Note: factor markets or input markets are labor and raw material inputs into your product.

Economic Efficiency

One of the great advantages of the competitive market model is that it achieves an important economic goal: efficiency. It actually does this in two ways, productional efficiency and allocative efficiency. Consequently the competitive market model is the standard to which all other models are measured.

- Productional Efficiency

  Productional efficiency is where AC is minimized. Society has goods that are produced using at least amount of resources thereby freeing resources to be used for other things. If standard of livings are to be improving constantly then there must be constant improvements in productivity.

- Allocational Efficiency

  Allocative efficiency is where P = MC; economic value = economic cost. This means that customers do not have to pay more than they need for a good. The savings can be used to buy other valuable goods and services.

- Public Policy

  A proper goal of public policy toward markets can be to encourage more competition. In a democracy that may not be achieved as special interest groups are very often able to convince legislators to grant special dispensations that have the effect of limiting competition and enabling those firms to earn economic profit.

Sidebar Discussion: Advertising in a Competitive Market.

In a perfectly competitive environment, it doesn't make sense to advertise. Since your product is no better than other products (by definition of perfect competition), and that is well known, then advertising does not gain customers. It becomes a cost that only lowers profit.

A good example would be agricultural goods. Advertising that one farmer's wheat is better than another's would be pointless. In fact, it is rarely done. Some efforts at branding fruits and vegetables has been done but the results are hardly encouraging. Most customers do not care where the fruit came from. Customers will buy Brazilian oranges as much as Florida oranges despite the huge sums spent by the Florida Growers Association. Probably, branding campaigns have shifted demand from one fruit to another such as from apples to orange juice. That may be enough to justify the cost.

MONOPOLY

Monopoly is one firm producing a particular good or service. There is no choice, if you want it, you have to buy it from them.

Assumptions

This discussion will focus on market assumptions that vary from those in the competitive market.

- Single seller, many buyers

  Compared to the competitive market model, now the seller has some market power, that is the ability to set prices rather than be just a price taker. The degree of market power is limited to alternatives that the buyer has in substituting other products for the seller's. A second broader limitation is that the monopolist now faces the demand curve. It is downward sloping which means that to sell additional quantities the seller must lower price. Any price-quantity combination that does not lie on the demand curve is not possible. The monopolist can only charge what the market will bear.

  With a downward sloping demand curve, the monopolist now has a marginal revenue function that declines faster than price, MR < P. To sell additional quantities not only must the monopolist lower prices to new customers but also to existing customers causing a loss of revenue greater than the change in price to new customers.

- No close product substitutes

  If customers are unable to use another product to satisfy their needs, then the market demand curve will be more inelastic. This will give the monopolist more market power, the ability to increase prices without losing quantity.

- Blocked entry into the market

  It is by entry barriers that a monopoly is established and maintained. Blocking entry will stop supply from adjusting to demand in the long run allowing the monopolist the opportunity to earn monopoly profits. Other firms cannot enter even though they see the economic profits earned by the monopoly firm. To the extent that companies can work around barriers then the market structure resembles that of monopolistic competition.

  Legal & Regulatory

  For many firms, entry into the market can be blocked by a legal restriction such as patent, copyright, or license. This is particularly important in the music, movie, software, and pharmaceutical industries. According the United States Constitution, these legal restrictions are supposed to have a limited time but Congress has extended the limits over 14 times. Companies, such as Disney which have a lot to lose when their copyright is going to expire, will lobby Congress for changes to the law.

  Costs

  The most traditional barrier of entry is economies of scale. This can refer to both production and distribution. Basically, there are large fixed costs up front. Part of the reason this is a barrier is that only large firms can afford such costs. Secondly, to recover such costs requires a large market of customers. If the size of plant necessary to achieve low costs is large relative to the market size, then it makes sense that only one firm will do it. The power industry is a good example of this. Efficient power generation requires a large generating plant. Additionally, it makes sense for one cabling grid to distribute this power as two would be redundant and expensive.

Network externalities

One of the more interesting barriers to entry involves network externalities. Customers may have what are called switching costs. That means it costs something to switch to another product or brand. Taken to an extreme, customers exhibit brand loyalty and will not try another firm's product. Firm's try to encourage this by advertising. Very often the brand becomes synonymous with quality in the customer's mind. These switching costs may be more psychological than real.

Other costs are very real and contribute to what is called network externalities. A network externality exists when customers save time and money adopting a standard product. Differing from the above in that switching costs favor a single product, network externalities favors a single type of product. To make it a monopoly, the firm has to make sure only they manufacture that product. For example, there are many word processors out in the market but one dominates it, Microsoft's Word. The reason is simple, firm's buy Microsoft's Word, not because it is such a superior product, but because everyone else has it, making it easy to exchange files.

The problem for Microsoft is to maintain that dominance. Other firms can and have produced word processors (Sun's OpenOffice Writer for example) that can import and export MS Word files. So every so often Microsoft comes out with a "new" version of Word which, of course, has a slightly different file format that is not readable by prior versions of Word nor by its competitors. The competitors will adapt but only after some time has elapsed. Firms upgrade their software since they feel everyone else will do the same. This ensures that Microsoft will have a nice cash flow from its word processor and keep competitors away.

When a new industry is being formed that exhibits network externalities, the strategy of the firm will be to offer its product at the lowest possible price to obtain maximum market share and establish network externalities as quickly as possible. Afterwards, increase the price and enjoy the monopoly profits.

Technology

Technology impacts entry barriers. Sometimes to create them but more often to destroy them. At one time, a long time ago, there was only one phone company in the United States, AT&T, otherwise known as "Ma Bell". With the advent of wireless telephone technology, and removal of AT&T's status in the law, there are now many telephone companies all competing for your business. With the coming of hydrogen fuel cells, the same thing is about to happen in power generation.

The music industry is trying to cope with the cheap efficient way of making copies of music, MP3, in the market. Their first response has been to sue anyone sharing copies over the internet. For a long while, the music industry refused to distribute music over the internet as it was more profitable forcing consumers to pay high prices for CDs that have only one or two songs that the consumer actually wanted. Sharply declining CD sales have forced the industry to adopt internet distribution of music. In the end this provides consumers with the music they actually want at a far cheaper price. But again, the music industry has tried to force software that has Digital Rights Management (DRM) abilities that stop unrestricted copying. It is very doubtful DRM will work. Is the movie industry next?

Model

- Demand considerations

  Monopolist faces the demand curve, MR < P, consequently profit is determined by the

difference between revenue and costs, just as in the competitive market. With pricing power the monopolist may be able to extract more revenue than in a competitive market and thus earn an economic profit. Positive economic profits are not guaranteed however as demand could still be less than cost. This could occur when product demand exhibits seasonal variation or cyclical variation in demand.

- Cost Structure

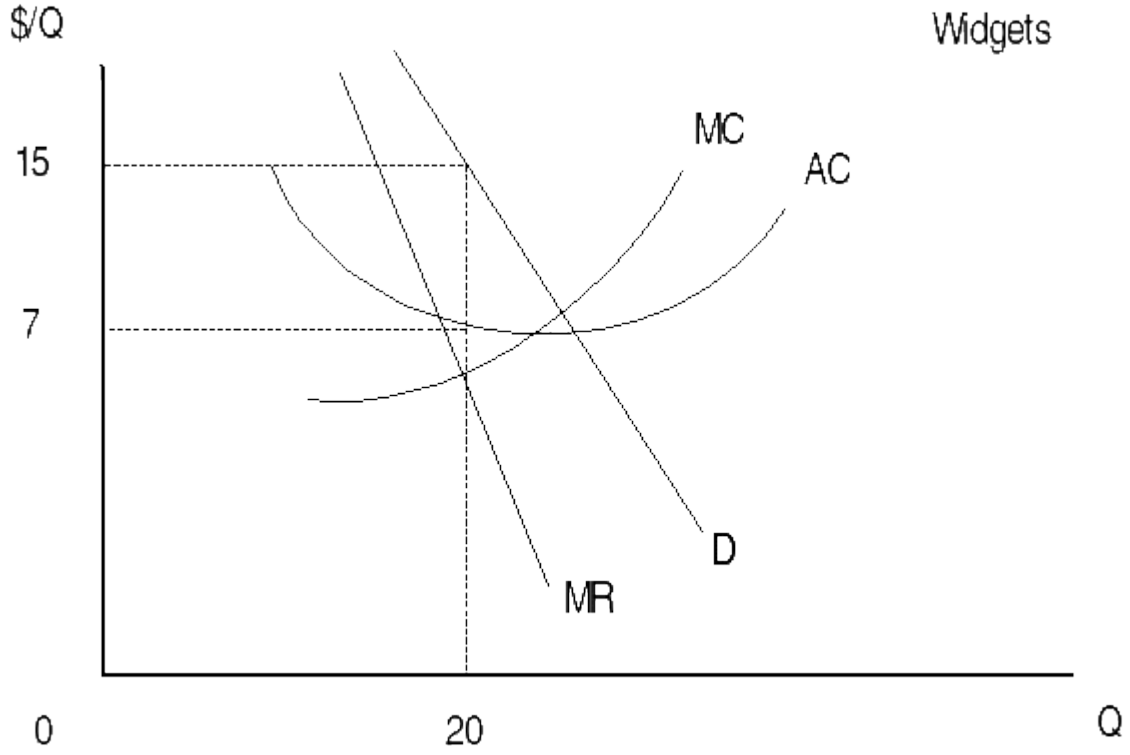
  Cost curve structure for the monopolist will be similar to that of competitive markets with some minor differences. While the firm seeks the best plant size in the long run just as in the competitive market model, in the short run the monopolist will produce a lesser quantity compared to competitive firms.

  The monopoly will not need to incur advertising costs as there is no competition to worry about.

  One problem that will affect long run and short run cost curves for monopolists is the problem of X-inefficiency. X-inefficiency occurs when the firm has no incentive to improve cost performance to improve profit performance as profit can be easily increased by increasing prices (there is a conceptual problem with this). This means that in the long run, plant efficiency will be become suboptimal as investments necessary for modernization are not made.

- Produce where MR = MC

  While this is nearly a universal rule in economics, the effect in monopoly will be different compared to the competitive market. With MR < Demand, MR < P, meaning that P > MC. This means that less output will be produced compared to the competitive market model. Monopolies price their product higher and produce less of it. In short, monopolies earn an economic profit.



In the above graph, note that production is to the left of the minimum AC at 20 widgets. Profit maximization is found at the quantity where MR = MC which is $7 per unit on the graph. The net profit margin is $9 per unit (P - AC or $16 -7) giving a total profit of $180 (20 * $9).

Key decisions

- In the short run produce as long as P>= AVC

  Even in a monopoly, there can be fluctuations in demand. At some point a decision has to be made if the business needs to be exited or to simply let the firm die. The same criteria apply to monopolies as does perfect competition.

- In the short run, prices change not supply, in the long run, supply may or may not adjust to demand

  One may argue that monopoly varies from this in that firms cannot enter the market. To that extent, supply will not adjust. Given the monopoly's profit maximization goal however, it may be profitable to build another plant. The adjustment may not match the competitive market adjustment but increased output may still result.

Economic Efficiency

- Productional Efficiency

  Monopoly does not have productional efficiency as AC is not minimized. Note that monopoly will still have the best sized plant for long run cost efficiency. In the short run it pays to restrict output to drive up market prices.

- Allocative Efficiency

  Allocative efficiency as P does not equal MC. Facing the market demand curve, any change in quantity causes MR to be different than P. As the production rule is to match MR to MC, MC does not equal P.

- X-Inefficiency

  When firms fail to improve cost performance over time, we say that X-inefficiency exists. Since monopolies can always raise prices to improve profit margins, it would seem there is very little incentive for monopolies to try to lower costs.

- Public Policy

  The purpose of public policy toward monopoly is to limit economic profit. Government has two basic choices: to intervene, or do nothing. Assuming the government wants to take action it has three generic types of intervention policies: one, prevention, two, nationalization, and three, regulation.

  - Prevention

    To accomplish prevention, the government will utilize antitrust laws, attempt to limit mergers between firms selling products in the same market, limit price fixing and territorial arrangements, and finally, prohibit monopolization of a market by a firm. In the United States, these are administrated by the Department of Justice.

  - Nationalization

    The second policy, nationalization, involves the takeover of ownership and operations of the firm. In the United States this option is severely limited. In other countries, it is used and justified by distributing the economic profits back to taxpayers via financing government operations that otherwise would have had to be financed using taxes.

  - Regulation

    The last option is to regulate the firm. Usually it is the price that is regulated. A regulatory commission is formed with the members either appointed or elected. When the regulated firms want a price increase, they must file a request. It is not automatically approved but must go through a hearing process where they present their case and other parties, ie. customers, may also participate either in support or in opposition to the proposed rate increase.

    There two main pricing concepts used: one, set P = AC; fair return price, secondly, set P = MC; socially optimal price. Average price is relatively easy to figure out as accounting data can be used. MC is problematic as marginal cost is not generated by accounting data but must be estimated by production engineers. As part of this cost, a normal operating profit margin is factored in. Many discussions can take place as to what a normal operating profit margin should be.

    One problem in regulation that arises is known as agency capture. As members of the regulatory commission face retirement on a government pension, they desire or need to seek work. Their superior analytical skills in, let us say the power industry, is of no use to anyone except those in the .....power industry. Knowing that good money can be made as a consultant, their actions toward the regulated may be tempered by the fact they are looking at their future employer. For the regulated industry, let's again use the power industry as an example, what better way to find someone experienced at power

regulation than those who have worked in the regulatory commission. You can see that niceness could pay here. That may not be in the best interests of the consumers.

Occasionally, the government will not intervene and there are several reasons why they may choose to do so. One, the market may be too small to support more than one firm. Two, the monopoly position may be perceived to be temporary. Three, monopoly may be considered 'desirable.'

Reasons that a monopoly could be considered desirable include: prices could be lower as monopoly gains economies of scale. Limits foreign competition and therefore preserves domestic employment Stabilizes business environment. Serves as a reward for technological innovation. The government is incompetent or worse corrupt.

Problems of defining monopoly power

There are several problems in defining monopoly. The first problem is in defining the market. When the Department of Justice took Microsoft to court, one of the defenses that Microsoft argued was they do not have a monopoly in computer software. That is true when you consider mainframes, networks, and specialty DSP processors. But in the desktop environment, Microsoft has 95% of the market. If that isn't a monopoly then what is? But the point is made that having a strong position in a market niche may not sustain a monopoly argument. If the market is defined more broadly to include other countries then Microsoft could argue that it doesn't have a monopoly as its market share in other countries isn't as strong as here in the United States.

One of the issues in the Microsoft case arose in the treatment of the internet browser. This could be considered to be a related product. If competitors controlled the market for related products then the argument of monopoly is weakened. Again the definition of what constitutes a related product can be debated. Microsoft has argued that a browser is an integral part of their operating system. But that doesn't hold true for other operating systems and their inclusion of a browser hurts Netscape which has (had?) a competing product.

A second problem arises in considering potential competition. The ability of other firms to increase supply, and technological change must be taken into consideration. Potential competition limits what prices a monopoly can charge. If excessive profits can be earned than these potential competitors will enter the market.

What determines potential competitors? Any firm that has production capacity to produce that product. That can include foreign as well as domestic firms. IBM can certainly produce operating system software as can various other companies. What has prevented IBM from successfully competing against Microsoft has been marketing. Microsoft's marketing machine is legendary. People believe Microsoft has a superior product or they believe that using any other product will cause software incompatibility problems. Microsoft only needed to announce that a new product was coming (in fact on more than one occasion Microsoft didn't have a product ready hence the term vaporware) and sales for competitors would immediately drop.

One key to firm behavior is how many competitors it has and the relative market share. There are several methodologies designed to summarize industry concentration with many variations. Some of them take the largest four largest companies and compute relative market share. This can be done through a straight average or a weighting procedure. The HHI Index is one of these measures. When the index number is above 80 then the Department of Justice takes a close look at the industry.

Finally the problem of determining monopoly profits. Monopoly profit exists when (P - MC) >

0. Unfortunately, accounting data does not provide MC. But if profits as percent of sales or equity are higher than average, well that is a clue.

Monopoly appendix:

Monopolies may not have any competition with other firms but sometimes they compete against themselves. This is the case with a monopoly that produces durable goods. By maximizing sales of their product in the current period they may be lowering future profit. The problem is that durable goods last more than one period. Customers may not repeat purchases until several periods into the future. Therefore production may be limited by more than suggested by simple production rules (MR = MC).

Given this problem, firms may choose to lease their product (IBM with mainframe computers, and Xerox with copiers). Another option may be to modify product durability (empirically this does not seem to be a popular production option as quality reputation suffers). Other product features such as service agreements, replacement parts and supplies, etc. offer the firm other opportunities for profit.

A complete analysis of this problem is beyond the scope of this course.

MONOPOLISTIC COMPETITION

Probably in excess of 80% of the market structures that exist today fall into the categories of monopolistic competition or oligopoly. The differences between monopolistic competition and oligopoly are slight, shades of gray. Some authors group them together. The best explanation I can offer is to consider monopolistic competition as almost a special case of oligopoly. I tend to look at oligopoly as requiring the firm to explicitly consider the actions of its competitors in every decision it makes. Knowing that the competition will react to each action the firm takes. In monopolistic competition, while competitors must be considered, the focus is on maximizing profit from the firm's customers. Competitor's actions do not have severe consequences on profitability (at least in the short run). It is the intensity of competition that affects business strategy choices.

Assumptions

- Differentiated products

  Under the competitive and monopoly market models it was assumed that there was only one product. In competitive markets the firm is only concerned with how much to produce, the price is fixed by the market. In monopoly, the firm has to decide what price to charge as well as how much to produce, subject to limitations imposed by the demand curve. Under monopolistic competition there are three types of decisions, price, quantity, and product. The situation becomes far more complicated. Not only can the physical product characteristics be altered but how it is promoted and to whom, can be changed. Marketing now plays a far more important role than previously. Advertising while not common in monopoly situations could be useful if it increased consumption. Here advertising is part of a grand marketing strategy to define a product niche that competes with similar but slightly different products produced by competing firms, that appeals to a particular market segment such as young teenagers.

  Product differentiation introduces the concept of attributes. The firm can alter the characteristics of the product to be offered. Consumer preferences can be thought of as attaching to the attribute or characteristics of the product itself. Two generic choices exist in production, variety and quality. Variety is defined as the quantifiable characteristics of a product that are solved by offering assortment. Quality is defined as the degree of a particular attribute.

  These choices become strategic decisions for firms. Firms can compete by offering different levels of quality, or variety such as flavored colas or low calorie colas.

- Free entry and free exit

  Most models of monopolistic competition assume free entry and free exit. The consequences when exit is not free are explored below. While free entry implies any firm can enter the market, thus limiting price power and profitability, the fact is that many firms through product differentiation, advertising, and service build barriers to entry.

  Dividing markets into segments discourages new entrants as a cost must be incurred to produce differentiated products. Segmented markets may not support more than one firm profitably. Consequently, a barrier to entry has been created.

  Let's say that you have an opportunity to invest in a shoe factory in Brazil. It makes a good profit. You go down to visit during carnival in Rio, collect your profit, and head to Argentina to invest in a ranching operation. Unfortunately for you at the airport the customs officer stops you and says you cannot take your money with you. It stays in Brazil. You can enjoy it during your visits to Brazil. Had you known this you might have considered other investment opportunities.

  While entry is easy if exit is not easy, entry may not happen. Let's say that you buy into a

mining project. Buying expensive and specialized mining equipment is a must. When the mine is exhausted the equipment is abandoned as it can not be used for anything else. Storing it or moving it is too expensive. Consequently mining is a risky business. Costs of failure are high but high profits are not impossible. It is difficult for competitors to enter without buying expensive equipment.

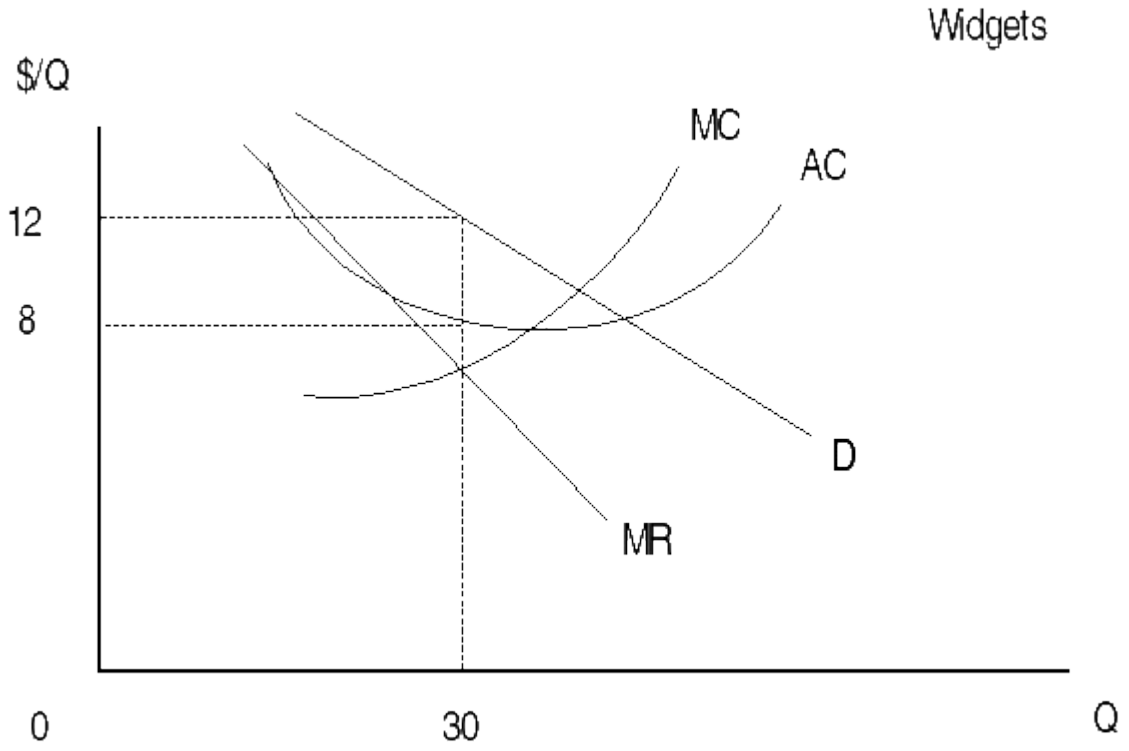
A different story exists in the restaurant business. If Italian restaurants are earning high profits, it is relatively easy to convert a Mexican restaurant to an Italian restaurant. Few changes are needed in the kitchen. Selling an specialized equipment is easy as there is a market for used ovens. Consequently, very few restaurants earn economic profits consistently.

In this case the lack of free exit inhibits free entry. One could say that free entry really doesn't exist. The distinction is drawn here because blocked entry is usually due to deliberate actions on the part of incumbent firms. Examples such as marketing barriers due to branding, legal barriers due to patents, trademarks, and licenses, or active acquisition of competitors, etc. Here one could enter but the expense of exit causes many firms to re-examine the risk. If specialized inputs such as mining equipment could find alternative uses then the nature of the market would change considerably.

Model Structure

Monopolistically competitive firms face the demand curve for their market segment. Consequently, firms have MR < P. Like monopoly no firm is guaranteed a positive economic profit. Demand curves under monopolistic competition are not as inelastic as monopoly as there are some product substitutes. No single price prevails for the differentiate products in the industry. An example of this would be the automotive industry where many types of cars and trucks are sold, each with a different price.

Cost curve structure is similar to monopolistic markets but with some differences. Additional costs for marketing and product differentiation are incurred. While marginal cost probably does not change (some authors argue that is does not but advertising could be considered a variable expense),the average cost curve shifts upward. Maximizing profit is subject to same rule, pick output at where MR = MC.



Compare this graph to that in monopoly. The demand curve for a monopolistic firm is much shallower. This reflects the fact that there are product substitutes. Note that the quantity produced is higher at 30 rather than 20 in monopoly. Again this reflect the shallower MR curve. The profit is also less, in this case it is $120 compared to $180 for monopoly.

Economic Efficiency

- Productional Efficiency

  Monopolistic competition does not have productional efficiency as AC is not minimized.

- Allocative Efficiency

  Allocative efficiency is not achieved as P does not equal MC.

- Public Policy

  But both inefficiencies are not as great as in monopoly. In fact, some studies argue they are relatively minimal in monopolistic competition. Additionally, the utility of having choices due to product differentiation may increase society's welfare.

Other Issues in Monopolistic Competition

Advertising

Advertising adds a very complicating factor. Advertising shifts the demand curve. More advertising shifts the demand curve further but usually at a decreasing rate. While for this course we use the same graphs as we do for monopoly, realize that there is a difference. We are in the realm of calculus if we are to find a solution.

Advertising is a tough subject for many economists. Some view it merely as a drain on economic efficiency, others far worse. I would argue advertising is absolutely necessary as a conveyor of information. Unfortunately advertising can also convey misinformation. There are different types of advertising. There is a difference in economic effect between advertising that publicizes price and advertising that pushes new product features. While advertising that includes pricing has a tendency to cause price competition, thereby eliminating economic profit and promoting economic efficiency, advertising that promotes product differentiation may allow for premium pricing therefore creating economic profit. Consequently one cannot view advertising as good or bad, it depends on circumstances.

Let's look at some specific generic arguments put forth about advertising. The benefits of advertising include: one, consumer information, two, allows increased output to realize greater economics of scale, three, promotes competition and stimulates product innovation, and four, advertising revenue supports communication infrastructure.

Criticisms of advertising include: one, advertising persuades not informs, two, advertising increases cost and therefore must be recovered in increased prices,three, advertising can be a substitute for price competition, and four, advertising bias reporting and programming.

Advertising Appendix:

What determines how much advertising is enough? The answer is when the cost is greater than the benefit. If it costs $100,000 to bring in an additional $80,000 of profit (profit before advertising cost I should add) then clearly it shouldn't be spent.

Advertising can have an elasticity just as price. There is an optimum amount of advertising. It's effectiveness does not increase proportionally with each expenditure. In fact, it can actually decrease as more advertising is purchased. People may tire of watching the same commercial over and over again. Watching a Coke commercial six times as opposed to three times does not necessarily induce one buy to buy twice as much Coke. Factors that determine advertising effectiveness are beyond the scope of this course and are covered in more detail in courses on advertising and marketing. But models to determine the optimum level of advertising are found in courses in managerial economics and industrial organization.

A clue as what that amount could be is found in reading leading retailers financial statements. Looking at advertising as a percentage of sales, many firms seem to run around 9% to 12%, however, some products such as soap run as high as 30%.

Price Discrimination

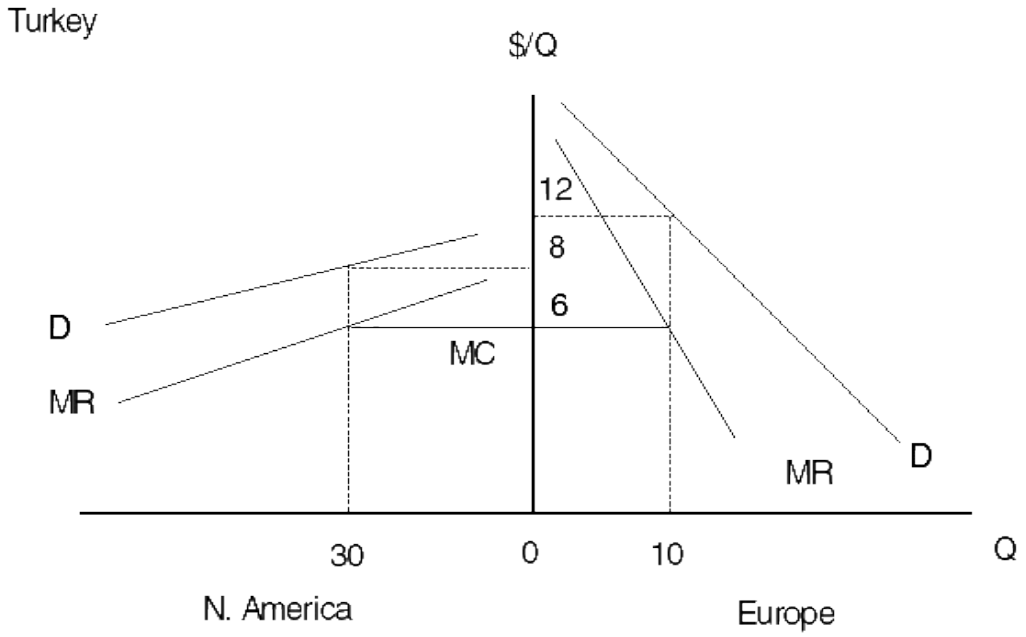
While there is a side variety of pricing practices, the vast majority are a form of price discrimination. What is price discrimination? There are two definitions that are commonly given: one, charging different prices to different buyers for the same or similar goods or services, two, charging prices such that the ratio of price to MC differs among buyers.

Price discrimination can take one of three forms, each labeled as degrees. Third degree: different prices charge to customers in different markets. Second degree: different prices charged to customers in different blocks of an item sold to a customer. First degree: a different price for each unit of an item sold to a customer. All forms require a knowledge of demand curves and an ability to segregate customers at a reasonable cost.

The goal of price discrimination is to generate more revenue by extracting consumer surplus. You may recall that consumer surplus is an amount that consumers are willing to pay but do not. So how do firms coax consumers to give up this cash? Marketing. By carefully researching customer types and

preferences, firms can vary their products to appeal to these distinct groups. This is segmenting the market. Between market segments, prices will be higher where demand is inelastic. By creating products that service these market niches, firms are often able to charge higher prices.

Example



Another possibility is geographically segmenting markets. In the graph above, the market for turkey is shown. One firm produces turkeys for both the North American and European markets. The marginal cost of production is constant and is shown as $6 per unit. Demand is higher but more elastic in North America. This is due to competitors. In Europe, demand is less but more inelastic. Most Europeans are not familiar with turkey but those that like it, like it a lot. The price charged in North America is set at the quantity where MC = MR at Q = 30. At Q = 30 on the demand line, the price that the market supports is $8. Following a similar process for Europe we arrive at a price of $12. In this example, we ignored the costs of shipping. More technical descriptions would include those costs.

It is common for a plant to produce product to ship to different markets. Pricing in different markets should reflect the different demand conditions.

Other Marketing and Pricing Practices

There are several common pricing practices that should be covered in any discussion on price discrimination, the practices of tying, bundling and two-part tariffs. I do not want to go into technical detail but rather give you a sense of what they are and how they might work.

- Bundling

  Bundling requires the purchase of two products at the same time. To be able to use this technique to extract additional funds from the consumer, it would make sense that consumers are heterogeneous, that is, they are not alike in their tastes. In other words, consumers would value one item of the package highly and the other would receive a low value. Other customers would value the other product highly and the first item's value poorly.

  Another version of bundling involves buying more of the same product at the same time. Quantity discounts would fit into this category.

A good example of bundling is found in restaurant pricing. Often diners have two choices: buy a la carte or buy the complete meal. Given that people spend a fixed amount on their meal, the restaurant is attempting to maximize profit by pleasing those customers that value a la carte highly and those customers who want a complete meal can have their cake and eat it too. :)

- Tying

  Tying is a special case of bundling. Tying requires customers to buy additional products and/or services related to the main product. Rationale for tying include quality control, product uniformity, protecting brand name, etc. The effect of tying is to engage in price discrimination is to increase profit. Examples include copiers requiring paper bought from the manufacturer, franchisees who must buy supplies from franchisers, application software for propriety operating systems, etc.

  If you buy the main product you are committed to buying the accessories and supplies. It is not uncommon for the accessories and supplies to generate the larger part of the profit.

  It should be noted here that Microsoft practices bundling and tying-in to an extreme degree. When you buy a computer, you are forced to buy their operating system, complete with certain software programs such as an internet browser, multi-media players, and of course, part of the Microsoft Office suite. It should also be noted that both the US Department of Justice and recently, the European Union have fought Microsoft on this points. It isn't clear to me who the winner will be in these battles.

- Two-Part Tariff

  As if bundling and tying were not enough, there is the practice called two-part tariffs that can be explained by price discrimination. It is not uncommon for some firms to charge an annual membership fee instead of or in addition to other charges. Amusement parks, sports clubs, health fitness, etc. charge membership fees.

  It is not an uncommon practice for firms to view the fixed charge as covering their fixed costs, such as capital, and the usage charge as covering their variable or operating expenses. From an economic perspective, the optimum level of fixed vs. variable fee does not depend on costs, it depends on the utility function. In essence, the firm is attempting to take some of the consumer surplus that exists. There are many possibilities, a fixed charge can allow a given level of usage, anything over that level of usage requires a per unit charge. This is quite common in cellular phone service contracts. The procedure for determining the level of fixed charge actually depends on determining the utility curve that exists when no money is spent on phone service. A more detailed description can be found in any text on industrial organization.

OLIGOPOLY

What is oligopoly? It is where there are few enough sellers of a product that the actions of one affect the other firms. Oligopolistic firms cannot be sure of what reactions will be from the other firms.

In many industries, there are a relativity few large firms that dominate the market. For example, the soda market has Pepsi and Coke. Personal computers have Dell, Hewlett-Packard, and Gateway. The movie industry with AOL Time Warner, Disney, and Sony. Office supplies with Staples and Office Depot.

In such a market, for example soda, Pepsi has to consider Coke's reaction to any business decision by Pepsi, whether it is a pricing change, introducing a new product,etc. This is the essence of oligopoly.

Assumptions

Unlike previous market structures, oligopoly does not have one single model explaining market behavior. In fact, market behavior can vary quite a bit depending on assumptions and strategies used by the participants. Some firms may compete in a market with standardized or vary similar products (pure oligopoly) or compete on the basis of differentiated products (differentiated oligopoly). Because competitors take actions based on what others do, game theory becomes useful. Moves occur over time. With the element of time and repeated actions, strategies become important.

In this section covering a oligopoly we will discuss cartels, where firms combine resources, then the Kinked Demand Curve, which explains a particular and common pricing problem firms face, then we will talk about game theory, a simple introduction on how to organize players, actions, and payoffs into strategies, and finally, a brief discussion of a couple of pricing practices.

Cartels

Perfect collusion is a formal arrangement of sharing managerial functions such as pricing, production, promotion, and profitability. Conditions favoring the formation of cartels are: few firms, significant entry barriers, inelastic product demand, homogeneous products, low profits, geographical concentration of firms, and finally the absences of legal prohibitions.

Let's discuss each of these conditions in some detail. For cartels to work, they must cooperate. As the number of firms increase, the difficulty of coordinating becomes considerably higher. Worse, it becomes more difficult to identify or punish cheaters. With only a couple of firms, it is easier to punish the cheater as the other firms may be willing to punish the cheater.

The objective of a cartel is to earn higher profits. For that to happen, several conditions are necessary. If firms inside the cartel earn high profits, then firms outside the industry will want to enter. There has to be a means to block their entry, otherwise, the cartel will lose market share and profits. A variety of barriers can exist. Just as in monopoly; patents, large capital outlays, excess capacity, brand preferences, etc.

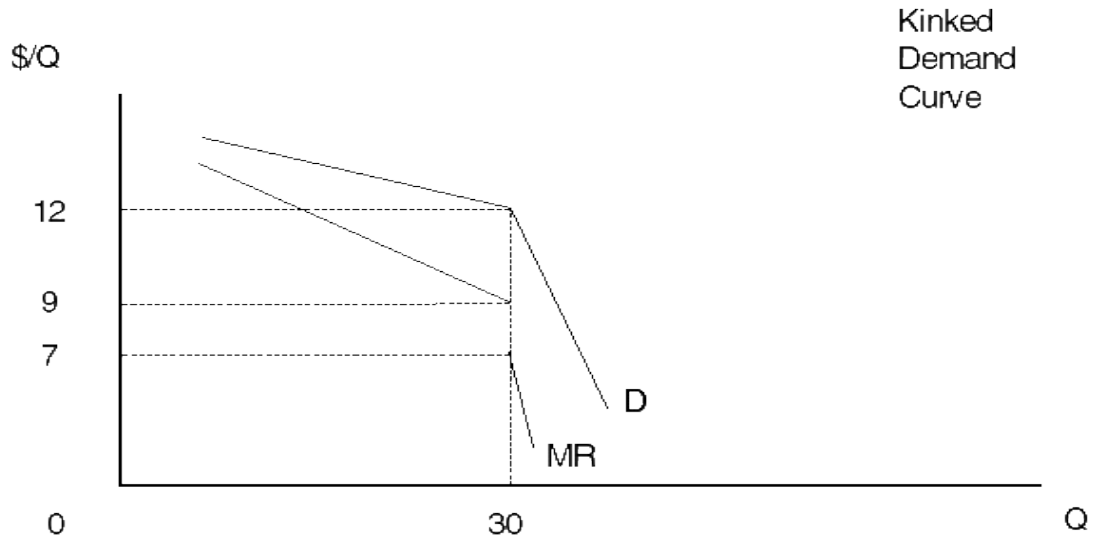
To earn high profits, firms in the cartel must have high margins, where $P > AC$.

The goal of cartels is earn monopoly profits. They must act as one firm. These can be achieved in one of several ways. The can combine all resources, thus becoming a centralized cartel, and share all resources. Secondly, they can coordinate behavior by splitting market share by agreeing on a division of production. This is known as a market sharing cartel.

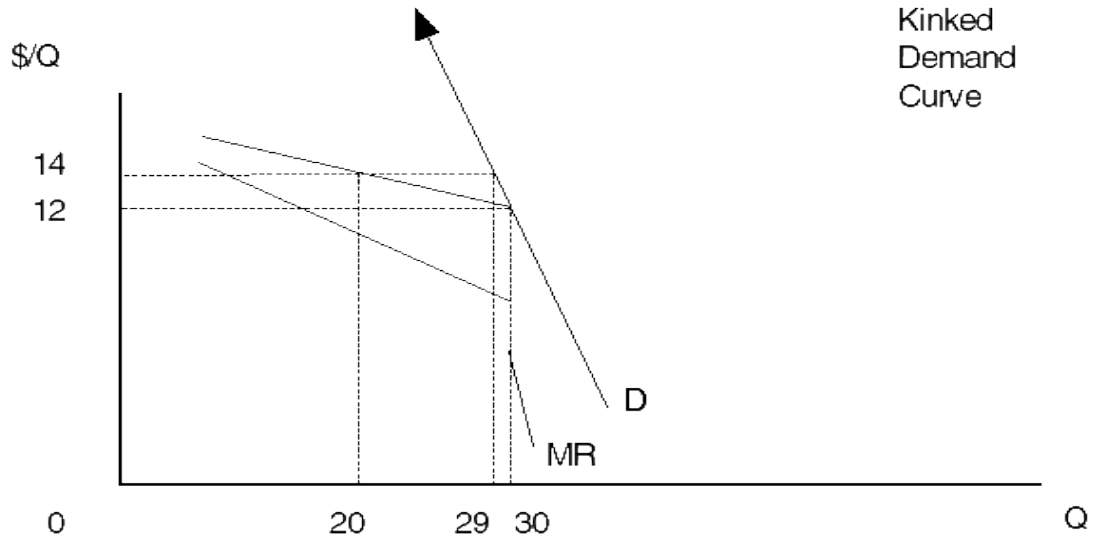
All cartels face problems of setting production quotas. In centralized cartels this becomes a problem of splitting profit. In market sharing cartels where production remains under the control of a separate firm, the incentive to cheat becomes very high.

Kinked Demand Curve Model

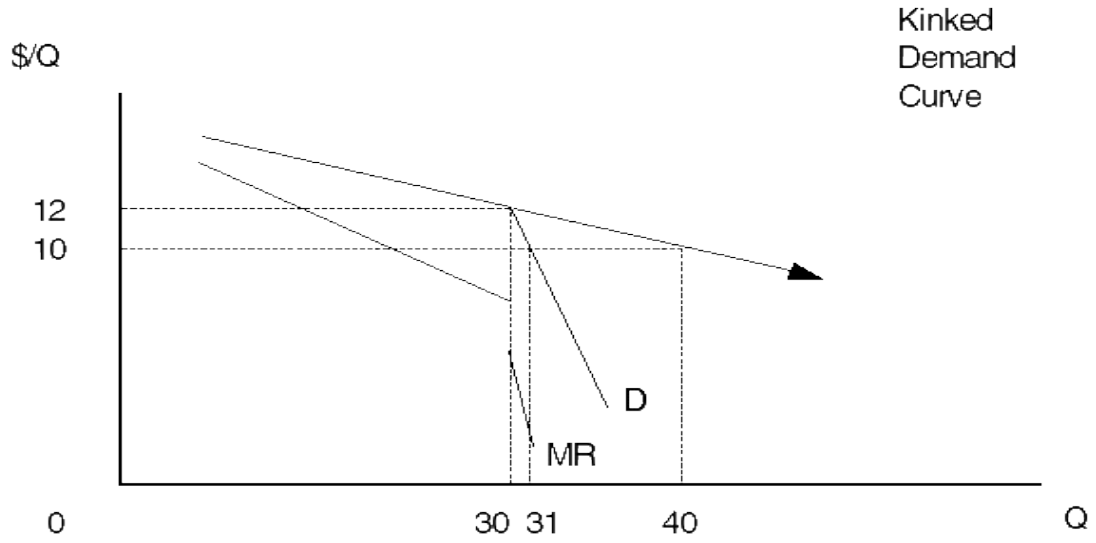
Firms match each other's price reductions but not price increases at the existing market price. Best option of firms is to stay at current price which becomes the 'sticky' price.



In the graph above, is an example of a kinked demand curve. Notice that MR is not a continuous line. MR is twice the slope of the demand line. The shallower (elastic) demand line has a shallow MR line. The MR and demand lines radiate from one point although that isn't ever seen in graphs like these. The same applies to the steeper (inelastic) demand and MR lines. While the demand curves intersect, at the same price and quantity, the MR lines do not intersect leaving a gap. The significance of this lies in the rule of setting Q where MR = MC. In this particular case, as long as MC lies between $9 and $7 per unit firms are optimizing, given the current market condition, their profit. To prove that, let's assume that one firm decides to change its price. We will call this the rebel firm. In this example, it will also make clear why the demand curve is kinked.



So let's say the firm believes that demand is inelastic. With inelastic demand, increasing price normally increases revenue. So our rebel firm increases its price to $14 expecting to sell 29 units increasing its revenue by $46. However, things don't go according to plan as the other firms do not increase their prices. Customers flock from the rebel firm to the other firms. The rebel firms only sells 20 units losing $80 in revenue.



Chastened, the firm wants revenge and since it appears the demand curve is elastic, it will lower its price below the rest. In an elastic environment, lowering the price increases revenue. So the rebel firm lowers its price to $10 projecting its revenue to increase by $40 but those dastardly other firms also lower their price. The rebel firm only sells an additional one unit thus losing $50 in revenue. Those other firms were not about to lose market share to the rebel firm so they will match price cuts but not price increases. This results in a sticky price. No one dares deviate from this price for the reason given.

Industries with an oligopolistic structure tend to have stable prices.

Oligopoly Pricing Practices

One of the biggest problems in an oligopolistic industry is coordination. Failure to coordinate, particularly on pricing, can result in a ruinous price war leading all firms into bankruptcy. Overt direct coordination, collusion, is illegal. Firms must learn strategies that allow them to adapt in an ever changing environment without disrupting competitors who may retaliate. Coordination has its rewards, higher profits. Sometimes called imperfect collusion, it is a tacit informal arrangement that arises to allow firms pricing power. Conditions promoting such a coordinated behavior are: stable market, stable production technology, economies of scale existence of some entry barriers, and urge to merge. To that end, a number of pricing practices have evolved. One of those is price leadership.

Price Leadership exists when one firm may assume the role of a price leader even if it is not a dominant firm, other firms follow as it is in their best self interest. Another type of pricing is dominant firm pricing. Dominant firm pricing exists when the dominant firm sets its price to maximize its profits. The fringe firms are allowed to sell any quantity at the dominant firm's price. The dominant firm accounts for most of the industry's sales (say 80%). The remaining sales are shared by the smaller fringe firms.

Game Theory

In an environment where firms must consider each other's actions, strategy must be adopted. Enter game theory. A game has players, actions, and payoffs. To start, let's consider very simple games with two players and two actions. Organized in tabular form, each cell is formed from the intersection of two actions. Within each cell is a listing of the payoffs to each player.

For an example, let's consider two law firms which we will name Black and Blue. They compete for customers by advertising. There are only two levels of advertising: High (H) and Low (L).

		Blue	
		High	Low
Black	High	5, 5	20, 0
	Low	0, 20	10, 10

The first entry in each cell is the profit that could be earned by Black, the second entry by Blue. Ideally, each firm would like to advertise at a high level, earning profits, with the competitor picking a low level, thus earning zero profits. If both select high profits, each earns $5 but if both pick low advertising each earns $10. Given that neither wants to go out of business, this would be the ideal solution. It isn't going to happen. Instead, the solution that neither wants will be each picking High and each earning only $5.

Let's see why. Consider Blue's best response given Black's actions. If Black selects High, Blue can pick High, earning $5 or Low earning $0. Blue would pick High, thereby maximizing his profit. If Black picks Low, Blue maximizes profit at $20 by picking High. We say that Blue has a dominant strategy, selecting High.

Strategy is a plan given the possible moves by other players. Here Blue considers Black's two possible moves, High and Low, and has found his best move to be always selecting High. Since the same move predominates, we say that it is a dominant strategy. In dynamic games, a dominant strategy often is a rule such as tit-for-tat, where if you hit me, I hit you, and if you are nice to me, I am nice to you.

Black's best response given Blue selecting High is also High. If Blue selects Low, then Black's best response is still High. Black also has a dominant strategy, High.

So the outcome neither wants, both selecting High, prevails. Is there an incentive for either player to deviate from this outcome? In other words, is this outcome a stable equilibrium? Equilibrium implies a possible outcome or result for the game given the actions of the players.

At this outcome, if Blue switches to Low then Blue loses profit. Black has the same situation. This test establishes what is known as a Nash equilibrium (they made a movie about this guy). Neither player can profitably deviate from this equilibrium. Games may have more than one equilibrium. Particularly, large multi-player and multiple action games.

This simple game can be extended to pricing, selecting product quality, location, etc. In the professional literature this particular situation found in the game just described is known as the Prisoner's Dilemma where the self-interest produces an outcome worse than a collective agreement could have produced.

Let's generalize a solutions procedure and use it to solve some interesting situations.

General Procedure to Solve Games with Simultaneous Moves

1. Determine horizontal player's best response to vertical players possible strategies.
2. Determine vertical player's best response to horizontal player's strategies.
3. Identify equilibria

Vertical vs. Horizontal

Vertical (Horizontal) player chooses strategy with highest payoff given strategy chosen by Horizontal (Vertical) player. Possible equilbria occur in cells containing best responses by both players (called Nash Equilibria). Consider the following payoff matrix, the first entry in each cell is the payoff to Horizontal, the second to Vertical.

		Vertical	
		A	B
Horizontal	A	2, 4	9, 6
	B	-2, 6	10, 10

Horizontal's best response to Vertical's strategy A is B. For Vertical's strategy B, Horizontal would pick B. Vertical's best response to Horizontal's strategy B is B. For Horizontal's strategy B, Vertical would pick B.

The equilibrium in this game, Vertical picks B, and Horizontal picks B. The interesting feature of this game is called Nash Equilibrium. It says that each player has picked the best response given what the other players responses. There can be several Nash Equilibria in a game. To see if that this is a Nash equilibria, we consider what happens if the other player deviates.

Given that Vertical has picked B, would it make sense for Horizontal to change? If Horizontal picks B, she has a payoff of 10, if she picks A, her payoff will decrease to 9. She does not regret her strategy, she has made the best choice given the circumstances.

What about Vertical? Given that Horizontal has picked B, could Vertical do better by picking A? The payoff of action B to Vertical is 10 but going to A would decrease the payoff to 6. Consequently, Vertical does not regret his choice of strategies.

The concept of regret is important here. Suppose the payoffs were to change slightly, let us say that the payoff to Horizontal using A when Vertical uses B (the NE cell), changes from 9 to 12. Then if Vertical selects B, Horizontal would have preferred A, thus the SE cell would not be a Nash equilibrium and

would be unstable. Potentially, there may be no solution to this new game. But in this case, there is. B is still the best strategy for Vertical. Horizontal knows that. By knowing that Vertical will pick B, Horizontal will pick A. A Nash Equilibrium will exist in the NE cell.

An Academic Application of Game Theory: The Professor and the Student

Let's have a little fun and consider this interesting game played in the classroom between professors and students. The student has two choices: high effort and low effort. Presumably high effort by students reflects increased learning as well as better grades but takes time away from other rewarding activities. While the professor would like to see high effort from the student, the student would prefer low effort. The professor also has two choices: high effort and low effort. What will be the outcome of this game?

Easy Professor

		Student	
		High	Low
Professor	High	25, 25	15, 40
	Low	30, 20	20, 30

The payoffs reflect the utility that each gains. The student desires to achieve a high grade with the least possible effort. Interestingly enough, the professor wants to achieve high performance with the least effort also. Each evaluates the benefit (utility) versus the cost in effort. Let's define utility to the professor as a function of grade average, pass rate, student evaluations, and number of preparation hours. Utility to the student is simply a ratio of grade to effort expended, where effort expended is number of study hours.

When the professor puts forth high effort, students do not need to put in long study hours to achieve a satisfactory grade, student's utility is higher. When professors devote low effort to the course, more study hours will be needed by the students to pass. This professor consistently prefers low effort over high effort. The easy professor's utility is such that low effort yields a much higher utility to the professor than high effort. Favorable student evaluations are more common under low effort by students. Favorable evaluations are more important to the easy professor than the goal of students actually learning the material. Therefore, the professor may actually prefer a low effort by students. It is doubtful that would ever by admitted.

When the student picks high effort, the professor's strategy will be low effort. When the student picks low effort, the professor will again maximize utility by picking low effort. The professor has a dominant strategy, low effort.

When the professor picks high effort, the student's strategy will be low effort. When the professor picks low effort, the student will again maximize utility by picking low effort. Consequently, the student has a dominant strategy, low effort. From a low effort easy professor it may be possible to exert low effort and attain a good grade. Low effort by the student and professor will be the Nash equilibrium in this game.

In the Easy Professor version of this game we assumed that the professor values a higher pass rate and favorable student evaluations. So much so that the professor would make the class easier. Now suppose the professor's preferences change. Suppose that by instituting high standards, the large number of failing students is considered desirable by the professor.

Hard Professor

		Student	
		High	Low
	High	20, 25	10, 30
Professor			
	Low	30, 20	15, 10

Note how the utility preferences have changed. The professor still consistently prefers low effort over high effort but for different reasons. This may reflect the hard professor's unfavorable view of student performance. Students are not prepared for class or are incapable. So why waste valuable time on ungrateful people? If they do perform, of course, the professor is usually happier unless the pass rate seems too high. The professor may value the reputation of being hard.

Students want to obtain a passing grade with a minimum of effort. Given a high effort by the professor, a low effort by students will attain that goal but a low effort by the professor will force students to work harder to attain a passing grade as the consequences of low effort are almost certain failure. That is why the utilities of low effort have changed compared to the previous game.

In the game with the Hard Professor, professor has a dominant strategy, low effort. Given the professor's choice, the student's best strategy is to pick high effort. Note that the student does not have a dominant strategy. Low effort would be the choice if professor choose high effort. The student now recognizes that the professor will not expend high effort to make the class easier. Consequently, the student must expend high effort or be terminated.

An Honest professor (I am not sure I really want to call this type honest, but I couldn't think of any better label, may my colleagues forgive me) values learning acquisition by students more than the unfavorable student evaluations that may result.

"Honest" Professor

		Student	
		High	Low
	High	35, 25	15, 40
Professor			
	Low	30, 20	20, 10

In this game the outcome will be indeterminate.

Ideally, the college may prefer high effort by both student and professor. The intrinsic rewards are high as reflected in the high utility for the professor. But if the students picks low effort the professor becomes discouraged as utility drops to 15. Consequently, due to disillusionment the professor prefers to exert low effort when students exert low effort.

When the professor exerts high effort, the student's study tasks become much easier as reflected by the higher utilities. Consequently, low effort yields a more than satisfactory return. But when the professor exerts low effort, more study time is required to study the material, paradoxically students may be forced to put in high effort or fail.

There is no equilibrium to this game. Frustration by both professor and student will be the result.

So how does one obtain high effort from students? If utility is truly a ratio of grade to effort then the higher the ratio the better. So a professor must design a course such that marginal effort to attain a higher grade is less than that required for the previous grade. In other words, it takes total effort must be increased to attain that 'A' but less additional effort than that required to attain the 'B'. Student behavior could be expected to follow economic patterns. Effort is expended to the point that marginal

effort equals marginal benefit.

Business facing a matrix as we have presented them here, may try to change the game outcomes by limiting options. In this example, both the Professor and college can change the environment by limiting "contract" options. If an easy professor wants to get the effort that a hard professor achieves from students, then grade on a curve may be a desirable procedure. The college can encourage student performance by limiting how many times a course may be taken, by increasing the tuition of retaken courses, or by limiting the number of withdrawals allowed in pursuing a degree. Loss of financial aid is a big factor in many student's decisions to study.

In the games so far, we have only considered a one time game. Such games are called static. We have also had the players move at the same time, simultaneous moves. It did not matter if one moved before another as long as the other did not know the outcome. However, when one player moves first and the second player sees the action, then the nature of the game changes. This is a dynamic game. Simple dynamic games, where each player knows the actions, outcome, strategies, etc. (complete information), and the history of the moves (perfect information), is solved using a technique known as backward induction.

Consider the following example, we have two firms moving into a developing suburban area known as LakeWorld. There is a choice of two prime locations: inside the mall, and outside the mall. Both can be profitable. Either/or both firms can move into either location.

One firm, Creamy Cafe will be ready to move in one month. A competitor, Miami Java plans to start operations in six months. The table below summarizes the profitability of each outcome.

		Miami Java (MJ)	
		Inside	Outside
Creamy Cafe (CC)	Inside	60, 85	65, 90
	Outside	55, 80	75, 50

If each moved without knowing each other's move, there would not be an obvious choice for either. Note that neither Creamy Cafe nor Miami Java have a dominant strategy.

But if Creamy Cafe moves first by moving inside, the MJ moves outside.

If CC decides to build outside, MJ's best choice would be to build inside, which maximizes MS's profit at 80, but leaves CC at 55.

Now that CC knows what MJ will do given CC's decisions, CC decides to build inside maximizing its profit at 65.

One may wonder how realistic such numbers could be, but remember this is an academic exercise. Consider however, that MJ typically has a higher profit than CC except when they compete against each other outside. Outside customers probably have slightly different preferences than inside customers. CC may satisfy those preferences better than MJ. MJ's profitability advantage may be due to having a lower cost structure.

Very often the value of game theory is to establish conditions necessary to achieve equilibrium. Hopefully, in this very short introduction to game theory you can appreciate how it can structure business (and other) decisions.

We are all players in the game of life.

Summary

This course can only touch the elements of business strategy that are affected by economics. A good follow up course to take for those who really aspire to learn the art of business would be Industrial Organization.

Study Guide

Fill-in-the-Blank

Perfect Competition

1. One of the assumptions of the competitive market is that there are many _____ and many _____.
2. Under the competitive market model, _____ are considered zero.
3. Under the competitive market model, all goods and services are _____.
4. Under the competitive market model, there is free ____ and _____.
5. Under the competitive market model. there is perfect _____.
6. _____ is the only decision firms need to make in a competitive market.
7. Competitive markets achieve both _____ and _____ efficiencies.
8. Marginal Revenue is equal to _____ in a competitive market.
9. The characteristics of a competitive market are _____.
10. Free exit implies that _____ can be sold or used for other purposes.
11. In a competitive market, the key operating decision is _____.
12. Economic profit does _____ in the long run.
13. Marginal revenue for a firm in a competitive market is _____.
14. Under perfect competition, economic profit _____ exists in the long run.
15. Free entry implies that _____ can enter the industry without significant effort.
16. In a competitive market, the best strategy in the long run is to _____.
17. In the short run in a competitive market, continue production until price drops below _____.
18. In the short run in a competitive market, _____ adjusts as demand changes.
19. In the long run in a competitive market, _____ adjusts as demand changes.
20. _____ exists when average cost is minimized.
21. _____ exists when the economic value equals economic cost; P = MC.
22. In a competitive market, as input prices rise, consequently, MC rises, then _____ must increase.

Monopoly

23. The key assumptions of a monopolistic market are _____.
24. Under a monopolistic market model, there is only one _____.
25. Barriers to entry implies that either _____ or _____ may not apply.
26. Monopolies must decide both _____ and _____.
27. Both short run and long run _____ profits are possible in a monopolistic market.
28. Marginal Revenue is _____ price, in a monopolistic market.
29. _____ occurs as firms fail to improve cost performance.
30. Demand curve for a monopolistic firm is _____
31. Blocked entry allows firms to earn _____.
32. _____ to the extent it forms an effective entry barrier, allows economic profits to be generated.
33. The goal of public policy towards monopoly is to _____.
34. Public policies toward monopoly antitrust laws are _____ type policies.
35. _____ policies toward monopoly take over the firm's operation and profits.
36. _____ of monopoly emphasizes price setting.
37. Monopoly profits exist when _____.
38. _____ measures industrial concentration.
39. _____policies restrain firms from monopolizing markets by prohibiting certain pricing and business practices.
40. _____ exists in regulatory commissions when regulators look to the regulated for jobs.

41.Governments may ignore monopolies due to a limited _____.
42.Firms may try to establish monopoly power by _____.

Monopolistic Competition

43.Profit can be enhanced by the practice of _____.
44.Market segmentation is a form of _____.
45.Under a monopolistically competitive market model, products _____ homogeneous.
46.Product variation can be used to limit ____ as well as _____markets.
47.Product variation can be accomplished by _____ and _____.
48.Expenditures for _____ will now be necessary for monopolistically competitive firms.
49.Monopolistically competitive firm's decision variables now include _____.
50.Benefits of advertising are _____.
51.Criticisms of advertising are _____.
52.Two conditions for price discrimination are _____ and _____.
53._____ allows firms to sell products in two different markets without fear of arbitrage taking place.
54._____ gives firms knowledge of pricing preferences.
55._____ is used to enhance revenue by a monopolistic firm.
56.Charging different prices to customers in different markets is called _____.
57.Charging different prices to a customer for a varying number of goods is called _____.
58.Charging different prices for each unit of a good to a customer is called _____.
59.The goal of price discrimination is to maximize profit by _____.
60.Firms maximize profit in price discrimination by setting higher prices in markets with _____ elasticity.
61.As firms advertise more, the effectiveness of each additional advertising dollar _____.
62.Price discrimination will not work when many _____ are available.

Oligopoly

63.Oligopolistic firms must take into account the _____ of the other firms.
64.Oligopolistic industries typically have a ____ large firms.
65._____ becomes important in making market decisions.
66._____ requires firms to take into account reactions of other firms before making an action.
67._____ form as firms join together to increase economic profits.
68.The major reason for a firm to join a cartel is that the firm is experiencing _____.
69.In an oligopolistic market, firms will _____ a competitor's price cut and _____ a price increase according to the Kinked Demand Curve Theory.
70.In oligopolistic markets, prices tend to be _____.
71.A problem for cartels is _____.
72._____ cartels share production facilities.
73._____ cartels divide up market share.
74.The goal of cartelization is to _____.
75._____ is a pricing practice where there is one upfront charge plus a usage charge.
76._____ exists when each player knows the actions, outcomes, strategies, etc. of a game.
77._____ is a plan of moves given moves the other player has available.
78.The basic elements of a game are _____.
79._____ is where the player picks the best response given the action by the other player.
80.A(n) _____ is one strategy that is the best regardless of the strategies of the other players.
81._____ exists when the history of the moves in a game is known by each player.

FIB Solutions

Perfect Competition

1. buyers, sellers
2. transactions costs
3. homogeneous
4. entry, free exit
5. information
6. Quantity [or production]
7. productional, allocative
8. price
9. many buyers and sellers, free entry and exit, no externalities, complete information, no transactional costs
10. assets
11. production
12. not exist
13. price
14. does
15. other firms
16. minimize costs
17. AVC
18. prices
19. supply
20. Productional efficiency
21. Allocational efficiency
22. prices

Monopoly

23. one seller, blocked entry
24. seller
25. free entry, free exit
26. price, quantity
27. economic
28. less than
29. X-inefficiency
30. downward sloping
31. economic profits
32. Product variation
33. limit economic profit
34. preventionist
35. Nationalization
36. Regulation
37. MC < P
38. HHI
39. Restrictive
40. Agency capture
41. market
42. buying competitors

Monopolistic Competition

43. price discrimination
44. price discrimination
45. are not
46. entry, segment
47. producing variety, varying quality
48. advertising
49. price, quantity, product characteristics
50. informs consumers, supports communications infrastructures, lowers average costs by increasing demand
51. persuades not informs, biases programming, increases costs
52. Market separation, demand conditions
53. Demand conditions
54. Price discrimination
55. Price discrimination
56. third degree price discrimination
57. second degree price discrimination
58. first degree price discrimination
59. capturing consumer surplus
60. lower
61. declines
62. product substitutes

Oligopoly

63. reactions
64. few
65. Strategy
66. Oligopolies
67. Cartels
68. low profits
69. match, ignore
70. sticky
71. cheating
72. Centralized
73. Market sharing
74. earn monopoly profits
75. Two tiered pricing
76. Complete
77. Strategy
78. players, actions, payoffs
79. Nash equilibrium
80. dominant
81. Perfect

True/False

Perfect Competition

1. There can be one buyer within the competitive market model as long as there are many sellers.
2. Travel to obtain the product can be considered a transaction cost.
3. Advertising can be expected in a perfectly competitive market such are agriculture, since my wheat is better than yours.
4. Free exit implies that capital assets can be sold or used for other purposes.
5. Quality is one element of complete information.
6. In perfect competition, firms expend much time and effort to determine the best price to charge.
7. In a perfectly competitive market, a firm's best strategy is to minimize costs.
8. Marginal revenue equals price in a competitive market.
9. The demand curve for a firm in a perfectly competitive market is flat.
10. Economic profit does not exist in perfect competition in the long run.

Monopoly

11. Monopolistic firm's minimize costs to maximize profits.
12. Advertising is a major element of strategy for "pure" monopolistic firms.
13. Both perfectly competitive and monopolistic firms maximize profit by producing quantity at the point where MR = MC.
14. The demand curve faced by a competitive firm is similar to that of a monopolistic firm.
15. Monopolies have productional efficiency but not allocative efficiency.
16. Incompetency or corruption may be a reason governments do not intervene in monopolistic markets.
17. The FBI has jurisdiction over antitrust cases.
18. The ability of other firms to increase supply is considered a factor in determing monopoly power.
19. One indicator of monopoly power is market share.
20. Determination of monopoly profit is relatively easy.

Monopolistic Competition

21. Product variation cannot form the basis of competition.
22. Firm's competing on the basis of advertising run the risk of advertising wars which lowers profit.
23. Cost structures between monopolistic and monoplistically competitively firms are similar.
24. The market demand curves for monopolistic and monopolistically competitive firms are similar.
25. Monopolistically competitive firms maximize profit where MC = MR.
26. A major goal of monopolistically competitive firms is to segment the market.
27. Monopolistically competitive firms can only earn an economic profit if they are able to erect entry barriers.
28. Product innovation is one form of competition.
29. Monopolistically competitive firms all earn some degree of monopoly profit.
30. The ability of other firms to produce similar but somewhat different products erode entry barriers.

Oligopoly

31. In a kinked demand curve, competitors will match price cuts but not price increases.
32. Cartel members have an incentive to cheat even though they are earning monopoly profits.

33. In dominant firm pricing, the dominant firm worries about the other firm's market share.
34. In a oligopolistic market, firms are more likely to match advertising expenditures.
35. Cartels usually sell a homogeneous good.
36. In the Kinked Demand Curve Theory, firms match each other's price increases but not price reductions at the existing market price.
37. Games are defined by players, actions, and payoffs.
38. Nash Equilibrium is defined as the point where a change in action would leave a player worse off given the actions taken by other players.
39. Strategy is defined as a complete list or plan of action for each action taken by another player.
40. Actions are decision points.
41. A dominant strategy exists where there is one best action regardless of the actions taken by the other players.
42. A dominant strategy must exist for an equilibrium to exist.
43. A game can only have one equilibrium.

T/F Solutions

Perfect Competition

1. False
2. True
3. False
4. True
5. True
6. False
7. True
8. True
9. True
10. True

Monopoly

11. False
12. False
13. True
14. False
15. False
16. True
17. False
18. True
19. True
20. False

Monopolistic Competition

21. False
22. True
23. False
24. False
25. True
26. True
27. True
28. True
29. False
30. True

Oligopoly

31. True
32. True
33. False
34. True
35. True
36. False
37. True
38. True
39. True
40. True
41. True
42. False
43. False

Problems & Exercises

1. Table 1.0 (Note: I will be revising this problem, you want to ignore this for now)

P	Q	AVC	MC
6	100	2	4
6	200	3	4
6	300	4	6
6	400	5	8
6	500	6	10

   a. What is the equilibrium quantity?
   b. What is the profit generated at this level?
   c. What is the fixed cost for this firm?
   d. What type of market is this?
   e. Assuming AVC is constant at $7, what is the BEP?

2. Table 2.0

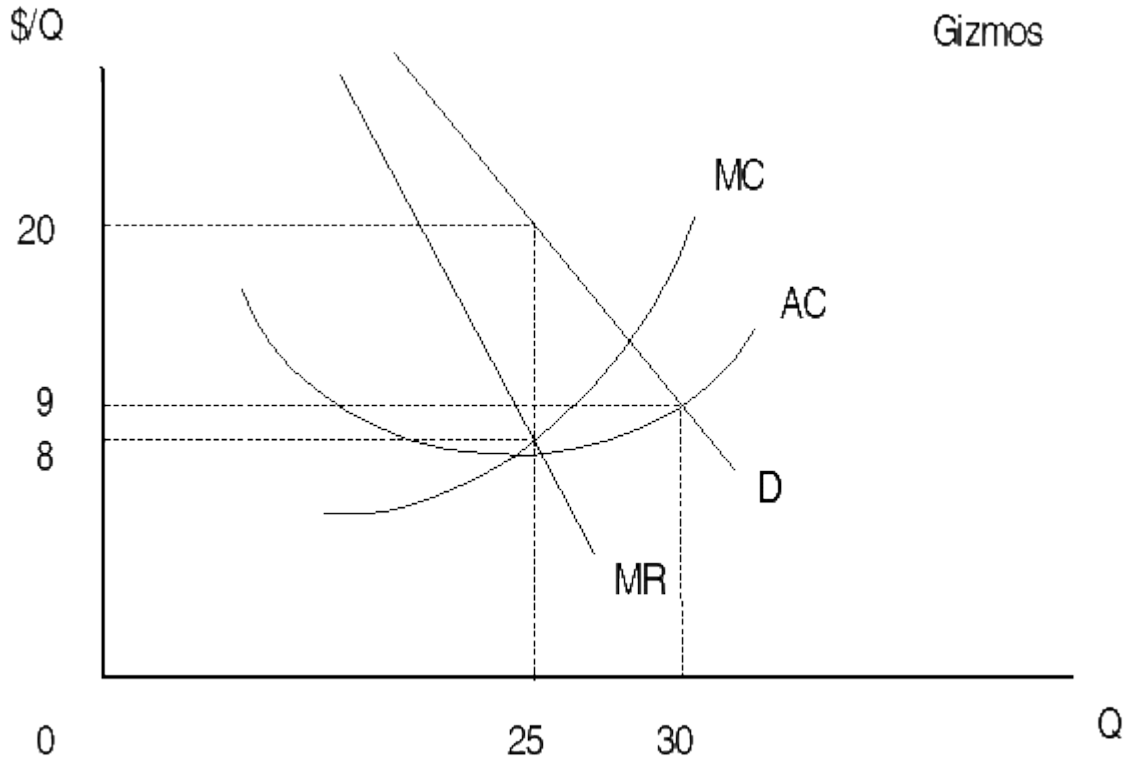
P	Q	MR	TR	FC	AVC	TC	AC	MC	Profit
8	100	8	800	0	6	600	6	6	200
7	200	6	1,400	0	6	1,200	6	6	200
6	300	4	1,800	0	6	1,800	6	6	0
5	400	2	-400	0	6	2,400	6	6	-400
4	500	0	2,000	0	6	3,000	6	6	-1,000
3	600	-2	1,800	0	6	3,600	6	6	-1,800

   a. What is the equilibrium quantity?
   b. What is the profit generated at this level?
   c. What is the break even point at the equilibrium price?
   d. What type of market is this?
   e. What is the price elasticity at P=7?

3. Table 3.0

P	Q	MR	TR	Adv	FC	AVC	TVC	TC	MC	Profit
8	100		80	100	100	3	300	500		300
8	200		1,600	200	100	3	600	900		700
7	200	6	1,400	100	100	3	600	800	3	600
7	300	4	2,100	200	100	3	900	1,200	3	900
6	300	4	1,800	100	100	3	900	1,100	3	700
6	400	3	2,400	200	100	3	1,200	1,500	3	900
5	400	2	2,000	100	100	3	1,200	1,400	3	600

   a. What is the equilibrium advertising level and quantity?
   b. What is the profit generated at this level?
   c. What type of market is this?
   d. What is the advertising elasticity at P=6?



4. From the graph above, answer the following questions.
    a. What is profit maximizing output?
    b. What is the profit at that output?
    c. What is the competitive market output?
    d. At Q = 25, what is the Total Revenue?
    e. At Q = 25, what is the Total Cost?
    f. At Q = 30, what is the Average Cost?
    g. At Q = 25, what is the Marginal Revenue & Price?

5. Expand or Not

Let's say you are considering expanding your pizzeria. Your competition, Pizza Dat is also considering the same. The numbers indicate the Net Present Value of the expansion.

		Pizza Dat	
		Expand	Not Expand
Pizzeria	Expand	12, 14	19, 6
	Not Expand	-2, 26	10, 10

a. What is Pizzeria's best strategy? Is it a dominant strategy?
b. What is Pizza Dat's best strategy? Is it a dominant strategy?
c. What would be the outcome, if any? Is there a Nash equilibrium?
d. What factors would change this game?

Problems and Exercise Solutions

1. Table 1.0
    a. 300 units
    b. TR - TC = Profit; 1,800 - 1,400 = $400
    c. $200
    d. Competitive
    e. 200 / (6 - 2) = 50 units

2. Table 2.0
    a. 200 units
    b. $200
    c. Cannot apply formula as FC = 0 but note that Q > 300 causes losses.
    d. Monopolistic
    e. 100% / 12.5% = 8.0

3. Table 3.0
    a. 200, 400
    b. 900
    c. Monopolistically Competitive
    d. 33% / 100% = .33

4.
    a. 25
    b. (20-7)*25= 300 Note: graph has to be revised to show ac =7
    c. 30
    d. (25*20) = 500
    e. (25*7) = 175
    f. 9
    g. 8, 20

5. Expand or Not
    a. Pizzeria's best strategy is determined by first realizing it does have a dominant strategy, expand. Regardless of what Pizza Dat does Pizzeria's payoffs are better under expansion.
    b. Pizza Dat's best strategy also has a dominant strategy, expand. Again, expand gives higher payoffs than not expand regardless of what Pizzeria does.
    c. The Nash Equilibrium would be for both to expand. Pizzeria earns 12, Pizza Dat earns 14.
    d. If the payoffs change.

Selected Definitions

Average Cost
: Cost per unit.

Allocative Efficiency
: Quantity is produced at where P = MC. Customers do not pay any economic profit. The economic value of the good equals its economic cost.

Cartel
: A group of firms seeking to act as one monopolistic firm.

Complete Information
: Each player knows the actions, outcome, strategies, etc.

Dominant Strategy
: One strategy is the best regardless of what the other player does.

Equilibrium
: Possible outcomes of the game given the strategies of the players.

Kinked Demand Curve
: Bent downward sloping demand curve produced by two demand curves, one elastic, one inelastic.

Marginal Cost
: The additional cost of producing one more unit.

Marginal Revenue
: Additional revenue per unit.

Monopoly
: One firm servicing a market.

Nash Equilibrium
: Where the player picks the best response given the action by the other player.

Network Externalities
: Where establishment of a standard allows customers to save money.

Outcome
: The result of the game.

Payoff
: The gain or loss to the individual player due to an action taken.

Perfect Information
: The history of the moves is known by each player.

Price Discrimination
: Ability to segment markets and customers to charge higher prices.

Prisoner's Dilemma
: Both players select strategy that results in sub-optimal outcome despite one strategy having a better outcome for both players.

Productional Efficiency
: AC is minimized. Units are produced at the lowest possible cost.

Strategy
: A plan of moves given moves the other player has available.

Sticky Price
: A pricing point from which firms cannot deviate without incurring significant losses.

Switching Costs
: The costs (real and psychological) of changing products by consumers.

Two-Part Tariff
: A pricing practice where there is one upfront charge plus a usage charge.

X-Inefficiency

Where continuous cost improvement is not pursued.