

Market Structures

This topic considers how markets are organized, specifically how the level of competition is determined.

We begin with *perfect competition*. We have already modeled perfect competition in our basic model of supply and demand. Recall that a key feature of perfect competition is that both sides of the market have no market power. As a result, if a firm charges a penny above the equilibrium price, they will lose all their sales. This is obviously not realistic. Perfect competition is thus a reference point. Real markets may come close, but none is actually perfectly competitive.

So what would it take for a market to be perfectly competitive? There are some basic conditions:

1. all firms must produce a fully identical product. This means that consumers must have no taste for variety among different firms' output. Some agricultural products, like milk, come close.
2. all consumers must be small enough to have no market power.
3. firms must be able to freely enter and enter the market. There need not actually be a large number of producers. There only needs to be the ability of other producers to quickly enter the market to take a share of any excess profits in order to ensure that all producers are price takers.

The presence, or lack thereof, of barriers to entry is thus critical to the nature of a market. If there are barriers to entry, #3 is violated and firms may exercise market power. There are numerous real world examples of barriers to entry.

- i. Fixed costs/economies of scale. Consider an electrical producer. It is very costly to supply the first customer with electricity because it entails building a power plant (or other source) along with other infrastructure. As a result, we tend to only see a small number of firms in local energy markets.

ii. intellectual property. In some markets proprietary knowledge may make it hard for new firms to enter the market.

iii. legal barriers. Examples include patents, which grant inventors the exclusive rights to sell a product, or licenses, which restrict the number of producers.

iv. Illegal barriers. One example of this is predatory pricing. Suppose that I control a market. If I have more resources than a new entrant, I could charge a below equilibrium price to drive any new entrant out of business. This is illegal in many economies. Or I could just murder any new entrants.

v. Collective bargaining. This applies to labor markets where a union or other worker association negotiates working conditions for all employees. The key is that other workers cannot enter and negotiate individually.

Features of Perfect Competition

A perfectly competitive market has some important features. First, free entry and exit ensures that firms produce at the minimum of the average total cost curve, both in the short and long run. This must be true because if it were not, new firms could enter the market and capture the entire market by charging less than the existing average total cost.

A second feature is the link between perfect competition and economic profits. Suppose that all potential producers will enter the market if and only if economic profits are equal or greater than zero (in other words, firm owners never pass up a higher income). If a perfectly competitive market delivered positive economic profits, other firms would choose to enter. Likewise, if economic profits were negative, some firms would leave the market. The only stable equilibrium is where economic profits equal zero.

Monopoly

Monopoly refers to a case where a market has a single supplier. There must be a barrier to entry to create a monopoly. Under perfect competition, each firm is a price taker and their only

decision is how much to produce. Under monopoly, the firm chooses where on the demand curve it wants to be. It may choose any combination of price and quantity, as long as it is on the demand curve.

We can look at how the monopolist maximizes profits in two different ways. The first is geometrically. Here, the monopolist chooses the demand curve that yields the biggest producer surplus. They do this by restricting quantity in order to drive up the price. The monopolist can usually increase their profits (recall that profits are producer surplus less fixed costs), by charging a higher price. But too high of a price reduces profits by reducing sales by too much.

The more inelastic demand is, the higher the markup above marginal cost will be. This is because higher prices will have less of an adverse impact on sales.:

Graph: Monopoly with elastic and inelastic goods.

Monopoly works the same way in labor markets. In labor markets, the monopolist may be the only worker capable of performing a type of work: I cannot enter the market for all-star NBA players because I can barely dunk. Or it may represent a labor union which bargains on behalf of all workers in a market. In this case, the monopolist against restricts quantity (employment) in order to achieve a higher price (wage) and does so to maximize producer surplus.

We can solve the monopolists problem a second way by looking at a sample demand curve.

Table 1: Market where Marginal Cost Equals \$20

Units	Marginal Utility	Revenue	Marginal Revenue	Acc. Profit
1	\$100	\$100	100	80
2	\$90	\$180	80	140
3	\$80	\$240	60	180
4	\$70	\$280	40	200
5	\$60	\$300	20	200
6	\$50	\$300	0	180
7	\$40	\$280	-20	140
8	\$30	\$240	-40	80
9	\$20	\$180	-60	0
10	\$10	\$100	-80	-100

This example assumes that marginal cost is constant at \$20. Under perfect competition, this would also be the price. The monopolist, however, charges \$60 and sells 5 units (technically they are indifferent between this outcome and selling 4 units at \$70. As always, the monopolist restricts supply in order to drive up the price.

Table 1 includes the monopolist's revenue and marginal revenue, which is the change in revenue from each additional unit. In general, the outcome that maximizes the monopolist's profits occurs where marginal revenue equals marginal cost.

Students should calculate and compare consumer and producer surplus under monopoly and perfect competition. They should then calculate deadweight loss.

Policy Responses to Monopoly

Because monopoly produces deadweight loss, policy makers often try to prevent them from capturing markets. Most of these policies fall under the banner of *antitrust law*. The details of antitrust law vary by country, but often include the following:

- i. Regulation of mergers and mechanisms to prevent those which result in excessive market power (not just monopoly).
- ii. Mechanisms for breaking up existing monopolies.
- iii. Forbidding closed unions shops (where firms may only hire existing members of a labor union) or union shops (where membership in a union is a condition of employment).
- iv. Right to work laws where non-union members cannot be obligated to pay union dues. Some U.S. states, but not all, have such laws.
- v. Provisions (including criminal provisions) that disallow firms from colluding on pricing decisions.

Monopsony

Monopsony is the demand equivalent of monopoly where there is just a single demander. In this case, the monopsonist restricts quantity in order to *lower* the price. Geometrically, the monopsonist chooses the point on the supply curve that maximizes consumer surplus.

Graph: Monopsoist with elastic and inelastic goods.

Monopsony may occur in goods and services markets (*e.g.* where a government is the only

buyer of military goods). It is of particular interest, however, in labor markets. Here, there are two important implications:

- i. If firms have market power, then minimum wage laws may not have the same impact on employment as predicted by our supply and demand model with perfect competition.
- ii. Suppose that a labor market includes both a monopolist and a monopsonist, a scenario that is relatively likely in a labor market. The resulting price and quantity is not clear from theory. Instead, the supplier and demander will bargain over the price and quantity. Adding a labor union may offset the monopsonist's market power and move the equilibrium closer (though not necessarily equal to) to that of perfect competition.

Price Discrimination

So far, we have assumed that a firm must charge the same price to all consumers. Under *price discrimination*, a firm may charge different prices to different consumers. If this is the case, a monopolist may be able to further increase their profits. Suppose, for example, that a firm may charge two prices. It will choose a high price for high demand customers and a low price for low demand customers:

Graph: Price Discrimination

The more effective a firm is at price discrimination, the more surplus it can capture. A perfectly effective firm could set a different price for every unit, set that equal to marginal utility, and capture the entire area under the demand curve.

Whether price discrimination is possible depends on the specifics of the market. One example is airfares. Customers who buy on short notice usually have higher marginal utility than those who book well in advance. Airlines thus charge more for tickets sold closer to the date of the flight. Another example is the marijuana store I drove by yesterday. They offer 20% off sales made between 8-10 AM. Apparently, the kind of consumer who buys his weed at 9 AM has a lower marginal utility than other consumers. Other examples include coupons, loyalty programs, bulk pricing, etc. Price discrimination is not generally illegal in most economies.

Oligopoly

Oligopoly refers to cases where a limited number of firms supply the good or service. This gives the firms partial market power. We can think of perfect competition and monopoly as extremes, with oligopoly occupying the ground in the middle. The theory of oligopoly pricing is murkier than for monopoly or perfect competition. We will consider the case of duopoly, where there are two firms: owned by Chad and Zoe. Consider an example where we assume the following:

1. Were there a monopoly, the price would be \$10 and the profits would be \$100. If the firms each set a price of \$10, they will share these profits and each will make \$50.
2. Firms can also set a price of \$8. If both firms, set a price of \$8, both will make a profit of \$10.
3. To keep it simple, assume that the only prices that a firm can charge are \$8 and \$10.
4. If one firm charges \$8 and the other charges \$10, the former captures the entire market, and earns profits of \$90. The latter loses \$40 and its owner is forced to listen to “Watermelon Sugar” on a loop for 10 hours straight.

We can represent this game with a *payoff matrix*:

Table 2: Payoffs for (Chad, Zoe)

	Chad Picks \$8	Chad Picks \$10
Zoe Picks \$8	(10,10)	(-40,90)
Zoe Picks \$10	(90,-40)	(50,50)

First suppose that this game will only be played once. Suppose that Chad expects Zoe to pick \$8. He is thus better off choosing \$8 because were he to pick \$10, he would lose \$40 and be subject to that no talent assclown Harry Styles. Now suppose that Chad expects Zoe to choose \$10. Once again, Chad is better off also picking \$8 to capture the entire market.

Chad thus chooses \$8 no matter what. Zoe’s problem is the same, she also chooses \$8, and both end up earning \$10. The problem is that if they coordinated, they both could have chose the higher price and both would earn higher profits. The uncoordinated equilibrium is thus Pareto inefficient.

It may be possible in some cases for Chad and Zoe to coordinate to jointly boost their profits. They could for example, form a *cartel* where they collude on price and there is some way to enforce their agreement. In many cases, cartels are illegal and colluding to fix prices sometimes is a criminal offense. Another example is if instead of being played once, the game is played over and over. Both firms may have an incentive to choose the higher price knowing that if they cheat, it will bring them immediate excess profits but at the expense of moving to the worse outcome in later periods.

This type of analysis is known as *game theory*. Another, classic example is the Prisoners’ Dilemma, which essentially just relabels the previous example. Two evil criminals, Bill B. and Tom B, have been arrested for one of the many murders that they committed. If they both stay silent, they will each be convicted of a lesser charge and serve 3 years. If one confesses and the other stays silent, the former will go free while the latter will serve life in prison. If they both confess, they will each get 20 years:

Once again, if they cannot cooperate, both killers will confess and serve 20 years. This is inefficient because were they to cooperate, they would each have served only three. The problem

Table 3: Payoffs for (Bill B,)

	Bill B. Confesses	Bill B. Stays Silent
Tom B. Confesses \$8	(20,20)	(Life, 0)
Tom B. Stays Silent \$10	(0, Life)	(3,3)

is there is no way to enforce any deal in this example. Also note that we are defining Pareto efficiency only in terms of the two killers. It does not consider the well being of other parties in this example. The world is obviously better off putting B. Belichick and T. Brady away.

Monopolistic Competition

We conclude by considering a final market structure, *monopolistic competition*. This is similar to perfect competition except that firms produce a differentiated good and consumers have a taste for variety. As a result, monopolistically competitive firms have some market power and raising their price one cent above their competitors will not cause them to lose their entire market. This makes monopolistic competition more realistic than perfect competition for most markets.

The key feature of monopolistic competition is that there is still free entry and exit (this is the “competition” part). As a result, if there are positive economic profits, new firms will enter the market, driving them down to zero. Likewise, free entry and exit means that production happens at the bottom of the (short or long-run) cost curve. Monopolistic competition is thus very similar to perfect competition. This allows us to use perfect competition, which is easier, as an approximation for monopolistic competition, which is more realistic.