

Monopoly

I. What is a monopoly market?

Recall that in the previous chapter on perfect competition we also defined monopoly as follows:

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1. Lots of buyers only one seller
 2. Single firm is the market.
 3. Homogenous product.
 4. Barriers to entry.

In reality, both the second and the third characteristic come from the first, a single firm in the industry. Obviously, if there exists only one firm in the market then that firm is large relative to the market (2) and all firms (the one existing firm) produces the same product (3).

Over the years when I ask for examples of monopolies in class, some of the most common answers include:

- Public Utility companies (producing electricity, natural gas, and drinking water).
- The Postal Service (first class mail)
- Microsoft Corp. (found to be monopoly in both the U.S. and the E.U.)

Other examples include:

- The British East India Company (British company awarded monopoly by the British crown to trade with India and China).
- Standard Oil Co. (found to be a monopoly and broken up by the courts in 1911).
- AT&T (found to be a monopoly and broken up by the courts in 1982.)

What is firm demand/market demand in a monopoly market?

Recall that when we asked the same questions for perfectly competitive markets that we found that firm and market demand were quite different. In monopoly, however, firm and market demand are the same because only one firm exists in the market.

T or F - A monopoly can charge any price it wants and the consumer must pay that price.

This statement is false even though the first part is correct. In fact, any firm can charge any price it wants as a general rule.

Monopolies do have less competition but consumers do not have to buy their product. Hence, as the monopoly charges a higher price, we expect that quantity demanded will fall (law of demand). Figure 1 shows the downward sloping demand curve of a

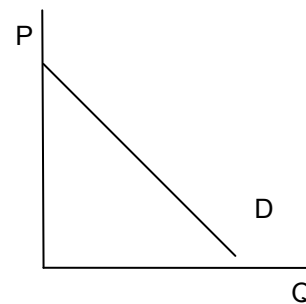


Figure 1

monopolist market. Demand is determined by consumers not by the monopoly firm and depends upon all the normal types of factors that affect consumer choice. Students should remember two points about market power:

- Price is a factor of market power, the ability to increase price without decreasing sales
- Monopoly has more market power than Perfect Competition, but does not have absolute market power.

II. Short-run profit maximization

Recall that all profit maximizing firms produce where $MR=MC$. For a perfectly competitive firm, marginal revenue was easy to calculate because they could sell all they wanted at the market price. For monopolists, however, who have downward sloping demand curves in order to sell more they have to drop the price.

- Recall that MR = the extra revenue gained from selling one more unit of good.
- Table 1 shows a downward sloping demand curve for a monopolist. Notice that as price falls quantity demanded rises. Use Table 1 to calculate both TR and MR .

Table 1			
P	Q	Total Revenue	Marginal Revenue
Demand		$TR = P \cdot Q$	$MR = \Delta TR / \Delta Q$
10	0	0	-
9	1	9	9
8	2	16	7
7	3	21	5
6	4	24	3
5	5	25	1
4	6	24	-1
3	7	21	-3
2	8	16	-5
1	9	9	-7

Why is $MR = 7$ when $Q = 2$ when price equals 8? (Hint: What happens to the price of the first unit sold?)

Notice that $MR < P$ (which is given by the demand curve) as shown in Figure 2 to the right.

Figure 3 shows both D and MR for a monopolist as does Figure 2 but also adds in the cost curves we developed previously. Because the firm is in the short-run the ATC , AVC , and MC are all u-shaped (law of diminishing returns.)

The monopoly firm has to answer the same questions that the perfectly competitive firm faced:

- Graphical Analysis – Questions to be answered using Figure 3.

1. At what q is π maximized?

Recall from above that all profit maximizing firms produce at the quantity where $MR = MC$. In Figure 3 this occurs at q_1 .

2. What P does a firm charge?

The answer for a monopoly firm is a little more complicated than for a perfectly competitive firm. Here, unlike in perfect competition, the firm has a downward sloping demand curve and can increase its price without losing all of its sales. How high should it set the price? Recall that the firm is producing q_1 and wants to be able to sell all of that output. Hence, it cannot set the price so high that it cannot sell q_1 . The appropriate price that is the maximum price it can just sell all of q_1 . This is given by the demand curve at q_1 – which occurs at point a . So the appropriate profit maximizing price is P_1 .

3. What does π equal?

Again, all firms are primarily interested in their profits. Similar to perfect competition, in order to calculate profits in Figure 3, there are a number of other questions that must be answered before profit can be calculated. All of these are calculated at the profit maximizing output, q_1 .

- $Q = q_1$ = distance 0 to q_1 .
- The price is given by the demand at point $a = P_1$.
- $MR = MC$ at point $c \Rightarrow$ both equal the distance from 0 to e .
- The average costs:
 - ATC = distance 0 to d .
 - AVC = distance 0 to e .
 - $AFC = ATC - AVC$ = distance e to d .

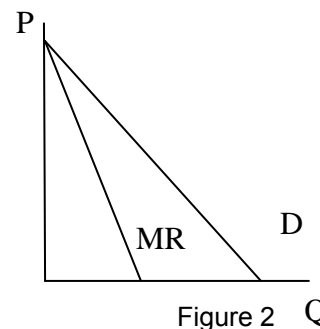


Figure 2
Figure 2

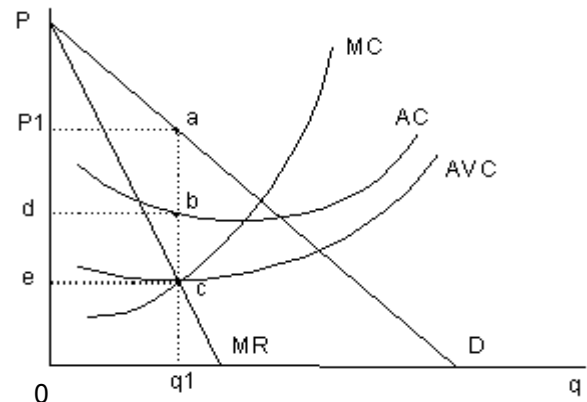


Figure 3

- Total Revenue and Total Costs
 - $TR = p \cdot q = \text{distance } 0 - q_1 \cdot \text{distance } 0 - P_1 = \text{area of the rectangle } 0 - P_1 - a - q_1.$
 - $TC = ATC \cdot q = \text{area of the rectangle } 0 - d - b - q_1.$
 - $TVC = AVC \cdot q = \text{area of the rectangle } 0 - e - c - q_1.$
 - $TFC = AFC \cdot q = \text{area of the rectangle } e - d - b - c.$
- Profit. Recall that there are two methods of calculating profits.
 - $\pi = TR - TC = \text{the area of the rectangle } 0 - P_1 - a - q_1. \text{ minus the area of rectangle } 0 - d - b - q_1 = \text{the area of rectangle } d - P_1 - a - b.$
 - $\pi = TR - TC = p \cdot q - ATC \cdot q = (p - ATC) \cdot q.$ Again, this is the most useful equation but gives the same answer. Notice that profit is positive here because $P > ATC.$

4. Loss Minimization for Monopolist Firms

Loss minimization for a monopolist is the same basic decision as it is for perfectly competitive firms. Recall the three possibilities that can occur in the short-run for all firms:

- $\pi > 0$, which occurs whenever $P > ATC$. In this case the firm clearly continues to produce.
- $\pi = 0$, which occurs whenever $P = ATC$. In this case the firm will still continue to produce (zero economic profit implies that all costs, including opportunity costs are covered.)
- $\pi < 0$, which occurs whenever $P < ATC$. Should the firm shutdown in this situation?

Recall the answer to this question for perfectly competitive firms – firms should only shut down if they cannot cover their variable (not fixed) costs. Thus, if price falls below AVC then the firm will shutdown.

5. What is the industry/market short-run supply curve?

A supply curve shows quantity supplied given the price, ceteris paribus. Recall that for perfectly competitive firms, the firm's short-run supply curve equals their MC curve above AVC. Unfortunately, for monopoly firms the relationship between price and quantity supplied is more complicated.

To illustrate this fact, examine Figure 3 again. Recall that the firm produces where $MR=MC$ at q_1 . Hence, the MC curve does show quantity supplied. If the MC curve were the firm's supply curve then the price would be given by MC at that output level or a price of $0 - e$. However, the firm can, and will, charge a higher price for this level of output, all the way up to a price of P_1 , which is given by the demand curve.

Hence, the interaction of MC and MR determine quantity supplied but the demand curve determines price. This means that no single curve determines quantity supplied and price. Unlike for perfect competition, in monopoly no supply curve exists.

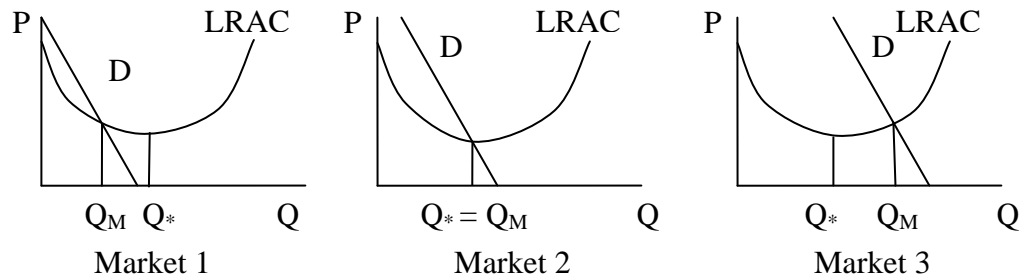
III. The Long-run in Monopoly

- The long-run equilibrium in monopoly markets:
 - if $\pi > 0$, the positive profits attract firms to the market in the long-run
 - However, monopolies have entry barriers which keep potential competitors from entering the market.
 - Hence, π remains positive.
 - If $\pi < 0$, the negative profits cause the firm to go out of business / leave industry in the long-run (there are no fixed costs, recall).
 - If the firm exits in the long-run, then it has no revenue but also avoids all costs so that $\pi = 0$.
 - Thus in the long-run π is ≥ 0 .
 - Make sure you know what the long-run equilibrium looks like graphically.
- What are Entry Barriers?
 - Anything that either prevents potential competitors from entering a market or makes it so costly for them to enter that it no longer is profitable to enter.
 - Types of Entry Barriers (examples are given in each category)
 - 1) Artificial Barriers
 - Legal Barriers
 - Government awarded/protected monopolies
 - Patents, copyrights, and trademarks
 - ◆ Patents award a monopoly to the creation of new technology or inventions. The monopoly is limited in time, currently 20 years.
 - The US Postal Service has a Government protected monopoly on 1st class mail
 - Business Practices – things that business can do to make it more costly for other firms to profitably enter the industry. Some business practices are legal and others illegal under anti-trust laws. There exist lots of business practices that serve as entry barriers. Below are just a few examples.
 - Price Cutting – reducing prices to make it less profitable for competing firms.
 - Only legal if $P \geq ATC$
 - Style changes – annual style changes to increases prices for entering firms (e.g., car industry, fashion industry) – entrants have to come up with new styles every year rather than just one time.
 - Illegal Barriers
 - Business practices
 - Price discrimination
 - Only illegal if differences in P are not the result of differences in cost
 - Price Cutting
 - illegal if $P < ATC$
 - Threats, violence, coercion, force, duress – note that some threats are legal (e.g., a threat to not buy or do business with someone is usually

legal) and some are illegal (e.g., a threat to break someone's leg if they don't buy from you is illegal.)

2) Natural Barriers/ Natural Monopolies

- A byproduct of economies of scale
 - A factor of fixed costs needed to produce efficiently (technologically).
 - As size \uparrow LRAC \downarrow
- For a natural monopoly economies of scale must be large enough to drive out all other competition.



- When the market quantity demanded, Q_M , is \leq the long run cost minimizing level of production for the firm, Q^* , then a natural monopoly exists, e.g. Market 1 and Market 2. In other words, when the LRAC is declining over the entire range of demand, then a natural monopoly exists.
- If Q_M is greater than Q^* then natural barriers to entry decrease and new firms can enter the market, e.g. firm 3.
- In Market 1, for example, a monopoly can charge a price that is lower than any smaller firm because LRAC rises as firm size falls.