Monopolies (continued):

First, an overview of what we’re going to do today:

1st: We’ll start with the economist’s argument (from the end of last class) about why there is a welfare loss due to simple monopoly restriction of output ($Q_{SM} < Q_{CE}$).

Keep in mind that by referring to it as a loss, we are, to an extent, using the idea that there is something wrong with this inefficiency. And by calling it a simple monopoly, we mean a single price monopoly as opposed to a discriminatory monopoly, which we will discuss later today.

2nd: Assuming that there is something wrong with monopoly, we will talk about the various kinds of public government policies towards monopoly.

3rd: We will introduce the topic of price discriminatory monopoly and see that there are three types of price discrimination: perfect/first degree discrimination, second degree/block rate, and third degree – the case in which the monopolist’s market can be broken into two separate markets and it can charge different prices in each market (this subject most frequently appears in exam questions).

If we have more time, we will also look at:

4th: Joint Products, in which a monopolist produces more than one product.

And lastly, if we can, we will look at the following topic, which is also covered in your Varian textbook.

5th: Edward H. Chamberlain’s theory of Monopolistic Competition. This refers to a situation in which each firm has its own differentiated product and, therefore, has a monopoly in its product.
We ended the last class by coming up with the following graph of how a simple monopoly compares to a competitive equilibrium:

If the firm were a price-taker, it would produce $Q_{CE}$ at a price of $P_{CE}$, and it wouldn’t make any profit. Of course, the monopolistic firm is *not* a price-taker, and so it elects to produce $Q_{SM}$ at a price of $P_{SM}$, producing a profit.

**The Welfare Loss due to the monopoly**

\[ \text{The Welfare Loss due to the monopoly} = \hspace{2cm} \]

\[ \text{This triangle (ABC), referred to as the Harberger triangle, represents the gain in consumer surplus to new buyers as you go from a simple monopoly to a competitive equilibrium.} \]

\[ \text{This curved triangle (BCD) represents the gain to sellers from new sales as you go from a simple monopoly to a competitive equilibrium.} \]

**Note:** It is very likely you will be tested on this topic, so make sure you are familiar with it.

But there are some critiques/qualifications of this argument; they question whether these two triangles are really appropriate measures of welfare loss due to monopoly.

**One Argument:** Using aggregate consumer surplus while ignoring the distribution of consumer surplus might be misleading. Perhaps we should give different weights (to gains and losses) to different individuals. For example, we could give more weight to the losses of poor people.

Economists have a counter for this argument: Potential gainers could theoretically compensate or “bribe” the losers. This may allow us to get a Pareto Improvement (where *no one* is made worse off). Still, if we don’t compensate the losers, all we have is the *potential* for a Pareto Improvement.
There are many others who have completely different arguments against our original approach to and calculation of the welfare loss to society:

a) Joseph Schumpeter  
   Joseph Schumpeter believed that monopoly profits were the just and necessary reward for a successful entrepreneur. He viewed entrepreneurial innovations (such as new means of production, new products, and new forms of organization) to be just as important as any new invention. Thus, monopoly profits derived from innovation encourage innovation. According to Schumpeter, Harberger’s triangle ignores this positive byproduct of monopolies and, therefore, significantly overstates the welfare loss to society.

b) Judge Richard Posner  
   Judge Richard Posner’s primary focus is on efficiency and avoidance of unnecessary costs. In his view, monopolies waste resources by engaging in rent seeking behavior and by trying to protect their monopoly, making it difficult for other firms to enter the market. These wastes of resources are in addition to the Harberger triangle; so in Posner’s view, the Harberger triangle underestimates the welfare loss to society.

c) Adam Smith (and, more recently, Harvey Leibenstein) hated monopolies because they do not have enough incentive to operate efficiently. This is the principal-agent problem. The idea is that since monopolies have the largesse of making a profit and are not always under the constant pressure of competition, they will get lazy. Since they may not be as driven to operate efficiently, they might not be minimizing costs and, therefore, the Harberger triangle underestimates the welfare loss to society.

d) John Kenneth Galbraith  
   John Kenneth Galbraith gives several arguments that the output of firms in monopolistic sectors is too big [which contrasts with our above expectation that production is lower (see how \( Q_{CE} > Q_{SM} \) in the above graphs)]. One of Galbraith’s arguments is that firms create a demand for their product; Galbraith rejects the consumer sovereignty theory. Another argument he makes as to why certain industries (such as the automotive industry) are too large rather than too small relies on the divergence between private and public benefit. Many monopolistic industries might create or take advantage of externalities such as (for the automotive industry) air pollution, traffic, and publicly funded highways. The idea is that there are too few public goods and too many private goods.

But, despite these concerns, most economists accept our original analysis which utilized Harberger’s triangle for its calculation of welfare loss.

So, working from the assumption borne by our initial analysis that monopolies produce a dead-weight loss and are bad, the next question becomes: what can the government do about it?
One possibility is for the government to try to prevent monopolies through **anti-trust laws**. In the example from last lecture, we created a monopoly by merging six of our sellers. Anti-trust laws would prevent that.

**Types of Anti-Trust Laws:**
- Prevention of mergers
- Break-up of existing monopolies
- Punishing anti-competitive practices such as predatory pricing or cartel agreements

So, if it’s feasible to have several firms in an industry, we might want to try and ensure that situation.

However, sometimes there are increasing returns to scale that lead to economies of scale – this is a situation of **natural monopoly**. That is, it is sometimes cheaper to have one firm than several firms.

Under competitive equilibrium, the firm would not make money. Therefore, the firm needs **subsidies**, **government ownership**, or even **regulation** that (with a rate schedule) would help recover costs.

The problem with government ownership is that you will then run into the Leibenstein incentive problem. The bureaucrats running the industry have no incentive to ensure efficiency because if costs outstrip revenue, taxpayer subsidies will cover the difference.

As for regulation, the way to do it is to set prices that allow firms to break even. Agencies set a rate schedule that allows firms to cover their expenses *plus* receive a fair rate of return on their investments. The problem is that if the allowable rate of return is greater than the interest rate, the firm will have an incentive to expand their capital expenditures much more than it would if it were in a market (and subject to the interest rates).

Another problem is that in many instances, over time, the regulatory agencies will become attached to and protective of the firms they are supposed to be regulating. For example, many agencies try to prevent the firms in their industry from going bankrupt.
Some criticize this approach and ask why we should regulate natural monopolies at all. They say that rather than allowing competition within the field, you could allow competition for the field. That would mean allowing potential competitors to bid for the right to produce. The argument against this is that it is impossible, in reality, to write up contracts for all of the potential contingencies that could arise.

**Contestable Market Theory**, championed by Alfred Kahn, argued that the existence of potential entrants into any market would push a monopoly to refrain from its price-raising behavior (this is conditional on the assumption that the monopoly does not have massive sunk costs). Kahn favored deregulation.

The problem is that deregulation causes a lot of firms to go bankrupt and also increases the use of **price discrimination**.

**Price Discrimination:**

Price Discrimination occurs when several different prices are charged to several different buyers for the same product.

\[
\text{Total Willingness of consumers to pay is } P_1 + P_2 + P_3 + P_4 + P_5 + P_6.
\]

\[
P_1 + P_2 + P_3 + P_4 + P_5 + P_6 = 60 + 50 + 40 + 30 + 20 + 10 = 210
\]

Whereas the Total Cost is: \( TC(Q) = 150 + 5Q \). \( TC(Q = 6) = 180 \)

So the total benefit for consumers (area \( ABCE \)) is greater than the total cost of production (area \( AHGE \)).

This means that the total amount that all of the consumers would be willing to pay is actually greater than the Total Cost. Therefore, this is a worthwhile project even if no one price will allow the firm to cover its costs.
First Degree Price Discrimination: Each consumer will get charged a price $P^d_i$. For example, the first buyer will pay $P^d_1 = 60$, and so on and so forth.

What this means is that the demand curve effectively becomes the marginal revenue curve. $Q_{CE} = Q_{DM}$, and the firm will suck up all of the available consumer surplus.

Second Degree Price Discrimination: The price paid for a good depends on the quantity bought. For example, Disneyland charges an entrance fee that is different for different people.

For example, let us say that there are two different customers with two different demand curves:

The Marginal Cost of the good is $5$.

What the firm could do is charge an entrance fee and then sell the product at a price of $5$.

For example, the firm could charge an entrance fee of $1499$ to buyer 1 and $1249$ to buyer 2.

Another example of this is a uniform price schedule. In the following example, a utility company offers different prices for different amounts of usage.

Here, a utility company is offering the same rate schedule to residents on the left and firms on the right. Notice that the firms end up getting a price of $P_I$, which is much lower than $P_R$. 
The firm will buy up to $Q_1$ electricity, provided that:

$$B_3 + B_2 > L_1 + L_2$$

Keep in mind, this rate schedule is a form of price discrimination even though the rate schedule is the same for all of the buyers.

**Third Degree Price Discrimination:** The firm is able to separate between different markets and charge different prices in each market. An example of this is student discounts at movie theaters.

It turns out that in third degree price discrimination, a profit-maximizing firm should set marginal cost equal to marginal revenue in each market. So the goal is to set prices so that marginal revenue in each of the markets is the same.

**Joint Products:**

Now we’ll quickly look at a monopolist that produces more than one product.

$$\pi(q_1, q_2) = TR(q_1, q_2) - TC(q_1, q_2)$$

**Note:** In general, $TR(q_1, q_2) \neq TR(q_1) + TR(q_2)$, because as $P_1$ changes, $P_2$ may change too.

Still, for simplicity’s sake, let’s (for now) assume that:

$$TR(q_1, q_2) = TR(q_1) + TR(q_2)$$

and $TC(q_1 + q_2) = TC(q_1, q_2)$ because we are dealing with a homogenous product.

The firm will want to operate where the marginal revenue of each product is equal to the marginal cost of both products – and where the marginal revenues are equal to each other:

$$MR_1(q_1) = MC(q_1 + q_2)$$
$$MR_2(q_2) = MC(q_1 + q_2)$$

Let’s look back at the example before

$$MR_1(q_1) = 55 - 2Q_1 = MC = 5$$, and this gives us:

$$q_1^* = 25$$ and $$P_1^* = 30$$.

$$MR_2(q_2) = 35 - Q_2 = MC = 5$$, giving us

$$q_2^* = 30$$ and $$P_1^* = 20$$. 
Recall that:

\[ MR(Q) = P(Q) \left( 1 - \frac{1}{\varepsilon} \right) \]

and for market 1:

\[ P_1 \left( 1 - \frac{1}{\varepsilon_1} \right) = MC = P_2 \left( 1 - \frac{1}{\varepsilon_2} \right) \]

This leads us to: if \( P_1 > P_2 \), then \( \varepsilon_1 < \varepsilon_2 \)

If it were possible to transport goods from market 2 to market 1 at a cost of 5, then the previous solution would not be the final solution.

\[ P_1 - P_2 = 5 \]

If the firm can raise \( P_2^\ast \) and lower \( P_1^\ast \), the solution is:

\[ q_1 = \frac{170}{6} \quad P_1 = 26\frac{1}{3} \]

\[ P_1 = 21\frac{1}{3} \quad q_2 = \frac{160}{6} \]

\[ q_1 + q_2 = 55 \]

So what’s our conclusion? Aggregate welfare is higher when the monopolist has less power to discriminate.