1

MONOPOLY

A market that has only one seller but many buyers.

The Monopolist

1. faces the entire market demand.
2. completely controls the amount of output available for sale.
3. has the ability to impact prices, limited by the market they face (elasticity).

Average revenue - price per unit sold

$$AR(Q) = P(Q)$$

Total revenue - Price per unit × units sold

$$TR(Q) = P(Q) \times Q$$

Marginal revenue – change in revenue resulting from a one unit increase in output.

$$MR(Q) = \frac{dTR}{dQ}$$

2

THE MONOPOLIST'S PROFIT MAXIMIZING CHOICE

Suppose a firm's profit is given by:

$$\pi(Q) = TR(Q) - TC(Q)$$

First order conditions:

$$\frac{d\pi}{dQ} = \frac{dTR}{dQ} - \frac{dTC}{dQ} = 0$$

$$MR(Q) - MC(Q) = 0$$

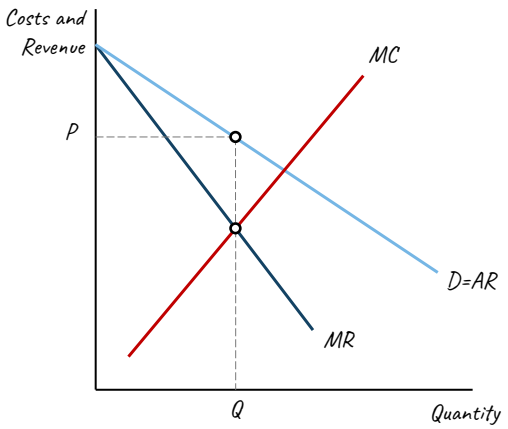
Rearrange to find the profit-max condition:

Produce where $MR(Q) = MC(Q)$

But what about price?

Determined using the inverse demand curve

$$P = AR(Q)$$



3

A MOTIVATING EXAMPLE...

Mylan is a national monopoly producing EpiPens, a life–saving medical product.

Their weekly demand function is:

$$\boldsymbol{Q^D = 1{,}800 - 2P}$$

where P is the price in dollars for an EpiPen and Q is the number of EpiPens sold per week.

Determine is Mylan's marginal revenue function.

$$\boldsymbol{Q^D = 1{,}800 - 2P}$$

4

A MOTIVATING EXAMPLE...

$P(Q) = 900 - 0.5Q, \quad MR(Q) = 900 - Q$

Suppose that Mylan has annual variable costs of:

$$VC(Q) = 100Q + \frac{Q^2}{2} \rightarrow MC(Q) = \frac{dVC}{dQ} = 100 + Q$$

And fixed costs of $\$50,000$ per year.

Determine Mylan's profit-maximizing quantity and price.

A MOTIVATING EXAMPLE...

$P(Q) = 1500 - 0.5Q, \quad MR(Q) = 1500 - Q$

Suppose that Mylan has annual variable costs of:

$$VC(Q) = 100Q + \frac{Q^2}{2} \rightarrow MC(Q) = \frac{dVC}{dQ} = 100 + Q$$

And fixed costs of $\$50,000$ per year.

Determine Mylan's profit-maximizing quantity and price.

$P^* = 700, \quad Q^* = 400$

Determine whether Mylan wants to shut down or operate.

Profit if they shutdown?

$\pi = -FC$

$= -\$50{,}000$

Profit if they operate?

$\pi = P \times Q - (VC(Q) + FC)$

$= 700 \times 400 - \left(100 \times 400 + \frac{400^2}{2} + 50{,}000\right)$

$= \$110{,}000$

A MOTIVATING EXAMPLE...

What do we know about Mylan?

$P(Q) = 900 - 0.5Q$

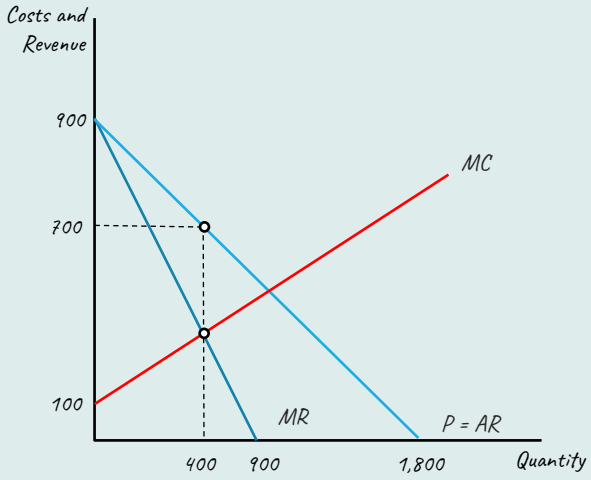
$MR(Q) = 900 - Q$

$MC(Q) = 100 + Q$

$P^* = 700,\ Q^* = 400$

Graph Mylan's demand, marginal revenue, and marginal cost curves.

Label the profit maximizing P and Q.



INVERSE ELASTICITY PRICING RULE (IEPR)

To maximize profit, a firm operates where the markup of price above marginal costs as a percentage of price is equal to negative the inverse of price elasticity of demand.

$$\frac{P - MC}{P} = -\frac{1}{\varepsilon_d}$$

- When demand is inelastic, ε_d is a small negative number, price will far exceed marginal cost.
- When demand is elastic, ε_d is a large negative number, price will be very close to marginal cost.

The IEPR applies to a firm operating in a perfectly competitive market as well…

- a firm in a perfectly competitive market faces a perfectly elastic demand ($\varepsilon_d \to -\infty$)

If $\varepsilon_p = -\infty$,

then $-\frac{1}{\varepsilon_p} = 0$

$$\Rightarrow \frac{P(Q) - MC(Q)}{P(Q)} = 0$$

$$\Rightarrow P = MC(Q)$$

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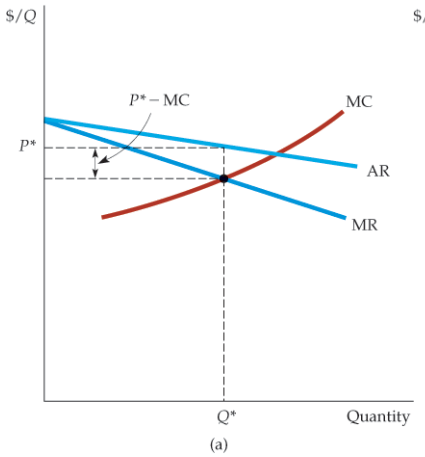
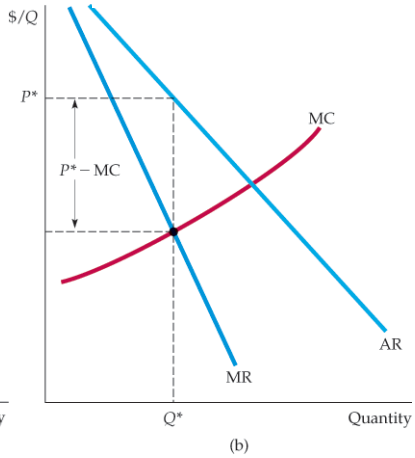
THE RULE OF THUMB FOR PRICING

$$\frac{P - MC}{P} = -\frac{1}{\varepsilon_d}$$

Elastic Demand



Inelastic Demand



Rearrange…

$$P = \frac{MC}{1 + 1/\varepsilon_d}$$

10

QUANTIFYING MARKET POWER

The power of an individual economic agent to affect the price that prevails in the market.

Obvious approach: examine by how much the profit maximizing price exceeds marginal cost.

Lerner Index of Market Power

$$L = \frac{P - MC}{P}$$

Value is always between 0 and 1.

- In a perfectly competitive market, $P = MC \Longrightarrow L = 0$
- As monopoly power increases, $L \to 1$

This can also be expressed as…

$$L = \frac{P - MC}{P} = -\frac{1}{\varepsilon_d}$$

If we know the elasticity of the firm's demand curve, we can determine the degree of market power.

MARKUP PRICING: SUPERMARKETS & CONVENIENCE STORES

Supermarkets

Several supermarkets usually serve an area.

A supermarket cannot raise its prices very much without losing customers to other stores.

Elasticity of demand $= -10$

$$P = \frac{MC}{1 - 1/10} = 1.11 \times MC$$

Set prices 11% above MC

MARKUP PRICING: SUPERMARKETS TO DESIGNER JEANS

Convenience stores

Convenience stores typically charge higher prices than a supermarket

Their customers are less price sensitive because they are seeking convenience

Elasticity of demand $= -5$

$$P = \frac{MC}{1 - 1/5} = 1.25 \times MC$$

Set prices 25% above MC

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THE SOURCES OF MARKET POWER

The ultimate determinant of market power is the firm's elasticity of demand (which we have seen from the Lerner Index)

Three factors determine a firm's elasticity of demand

The elasticity of market demand.

- Sets a lower limit on the magnitude of the elasticity of demand or each firm.

The number of firms in the market.

- Market power falls as the number of firms increases.
- Barriers to entry can limit number of firms and help maintain market power.

The interaction among firms.

- Aggressive competition will reduce market power
- Cooperation will increase market power.

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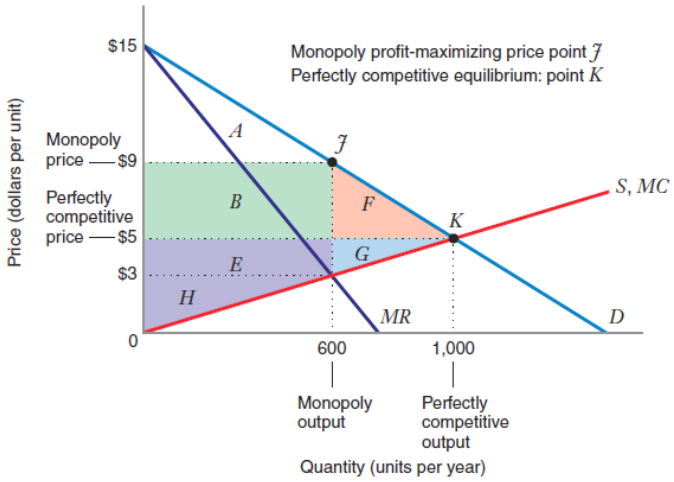
DEADWEIGHT LOSS DUE TO A MONOPOLY

Compared to the efficient competitive outcome:

1. Monopolists produce too little.
2. Charge too high of a price.

The result is:

- Consumers lose B and F
- Producers gain B and lose G
- Deadweight loss = F + G



16

BACK TO THE MOTIVATING EXAMPLE

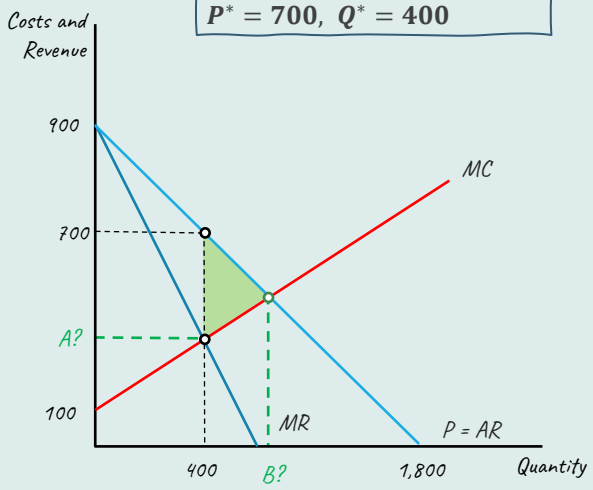
$P(Q) = 900 - 0.5Q$
$MR(Q) = 900 - Q$
$MC(Q) = 100 + Q$
$P^* = 700,\ Q^* = 400$

Consider again Mylan and their sales of EpiPens.

Determine the deadweight loss at the profit maximizing price and quantity.

A is MR(Q) when Q = 400

B is where P(Q) = MC(Q)



17

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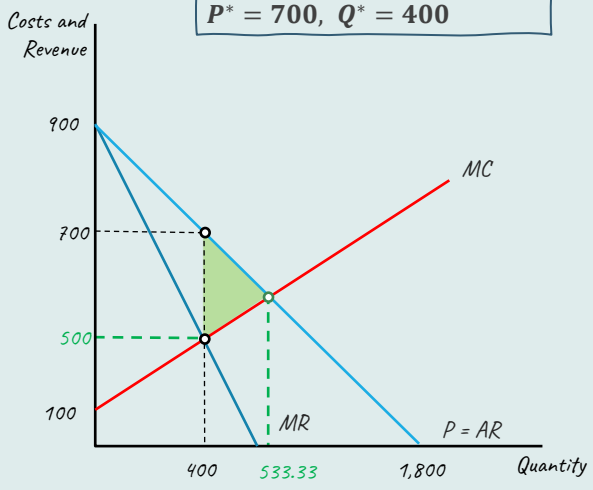

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RENT SEEKING

Spending money in **socially unproductive efforts** to acquire, maintain or exercise monopoly power.

1. Lobbying activities to obtain government regulations that make entry by competitors more difficult.
2. Advertising
3. Legal efforts to avoid antitrust scrutiny.
4. Installing (but not using) extra capacity to convince potential entrants that they will not be able to sell enough to make entry worthwhile.

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MYLAN'S RENT SEEKING BEHAVIOR

Primary Approach…

Advertising and Reputation Building

How do they do it?

1. Built their brand around an image of dependability and safety.
2. Established the EpiPen4Schools program that has provided 65,000 schools with more than one million free EpiPens.
3. Partnered with one of the most beloved brands on earth – Walt Disney Parks and Resorts.

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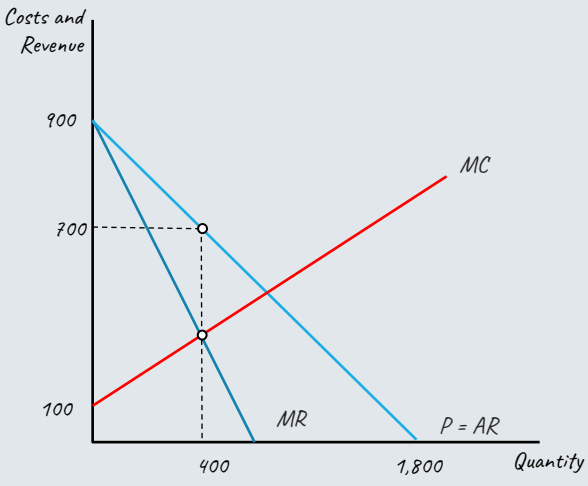
A TAX ON A MONOPOLIST



Consider Mylan Again...

$P(Q) = 900 - 0.5Q$
$MR(Q) = 900 - Q$
$MC(Q) = 100 + Q$
$P^* = 700,\ Q^* = 400$

Suppose the government levies a tax of **$100 per EpiPen on Mylan.**

1. What will happen to Mylan's profit maximizing price and quantity?
2. How much of the tax will consumers pay?
3. How much of the tax will Mylan pay?

22

A TAX ON A MONOPOLIST

$P(Q) = 900 - 0.5Q$
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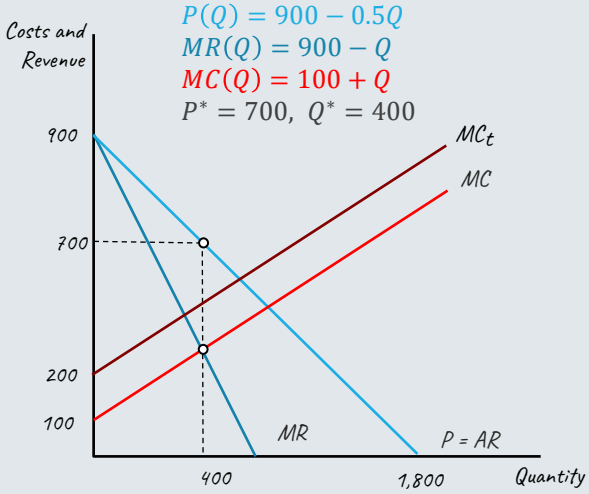


Consider Mylan Again...

Suppose the government levies a tax of **$100 per EpiPen on Mylan**.

1. What will happen to Mylan's profit maximizing price and quantity?

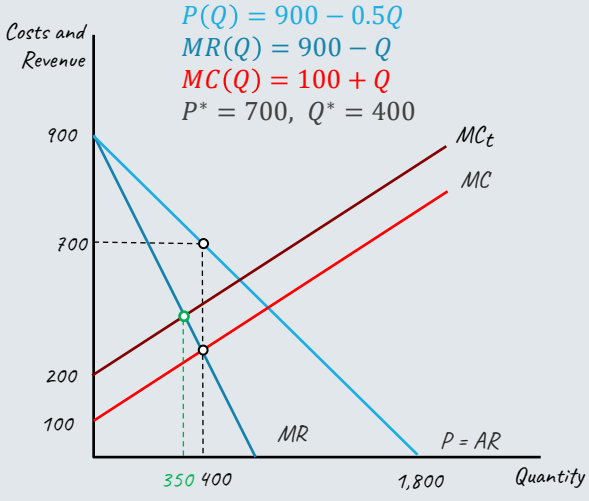
Step 1: Incorporate the tax

$$MC_t = MC + t$$
$$MC_t = 100 + Q + 100$$
$$MC_t = 200 + Q$$

23

A TAX ON A MONOPOLIST

$P(Q) = 900 - 0.5Q$
$MR(Q) = 900 - Q$
$MC(Q) = 100 + Q$
$P^* = 700,\ Q^* = 400$



Consider Mylan Again...

Suppose the government levies a tax of **$100 per EpiPen on Mylan**.

1. What will happen to Mylan's profit maximizing price and quantity?

Step 2: Solve for Q_t^*

$$MC_t = MR$$
$$200 + Q = 900 - Q$$
$$2Q = 700$$
$$Q_t = 350$$

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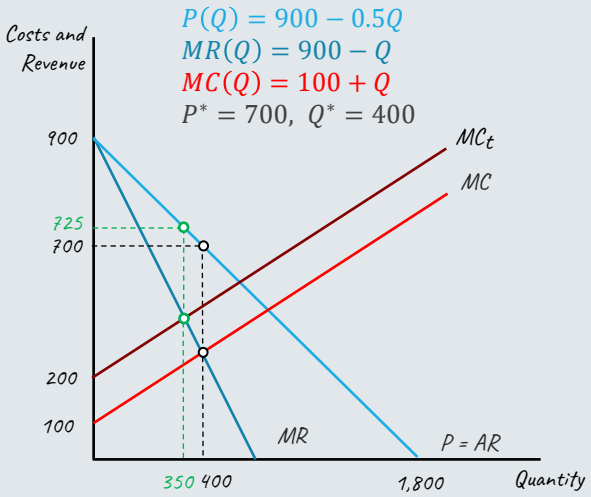
A TAX ON A MONOPOLIST



Consider Mylan Again...

Suppose the government levies a tax of **$100 per EpiPen on Mylan.**

1. What will happen to Mylan's profit maximizing price and quantity?

Step 3: Solve for P_t^*

$P_t = 900 - 0.5Q_t$

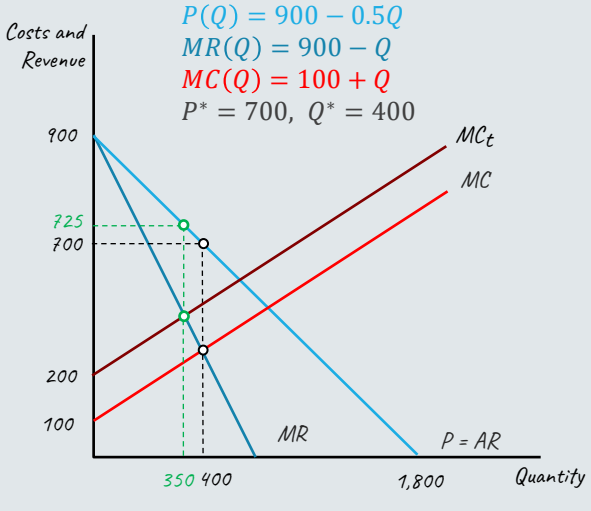
$P_t = 900 - 0.5(350)$

$P_t = 900 - 175$

$P_t = \$725$

25

A TAX ON A MONOPOLIST



Consider Mylan Again...

Suppose the government levies a tax of **$100 per EpiPen on Mylan.**

1. What will happen to Mylan's profit maximizing price and quantity?

$P_t = \$725,\ Q_t = 350$

2. How much of the tax will consumers pay?

When there was no tax, they paid $P^* = \$700$

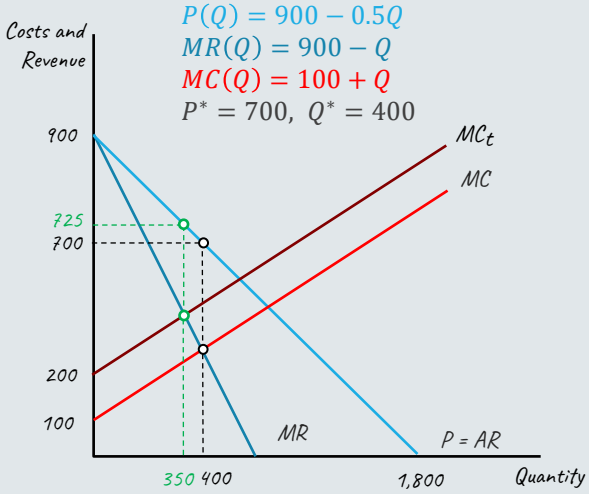
Once the tax is in place, they pay $P_t = \$725$

They are paying $725 - $700 = **$25 of the $100 tax**

26

A TAX ON A MONOPOLIST

$P(Q) = 900 - 0.5Q$
$MR(Q) = 900 - Q$
$MC(Q) = 100 + Q$
$P^* = 700,\ Q^* = 400$



Consider Mylan Again...

Suppose the government levies a tax of **$100 per EpiPen on Mylan**.

1. What will happen to Mylan's profit maximizing price and quantity?

   P_t = \$725, Q_t = 350

2. How much of the tax will consumers pay?

   \$25 of the \$100 tax

3. How much of the tax will Mylan pay?

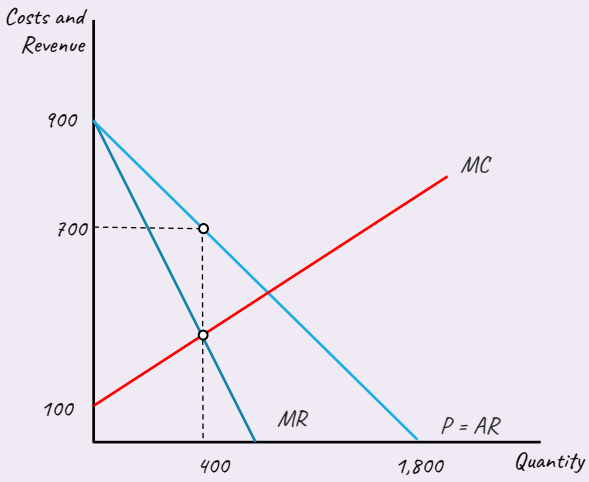
When there was no tax, they were paid P^* = \$700

Once the tax is in place, they charge P_t = \$725

But they only get to keep P_m = \$725 – 100 = \$625

They are paying \$700 - \$625 = \$75 of the \$100 tax

A TAX ON THE BUYERS



Consider Mylan Again...

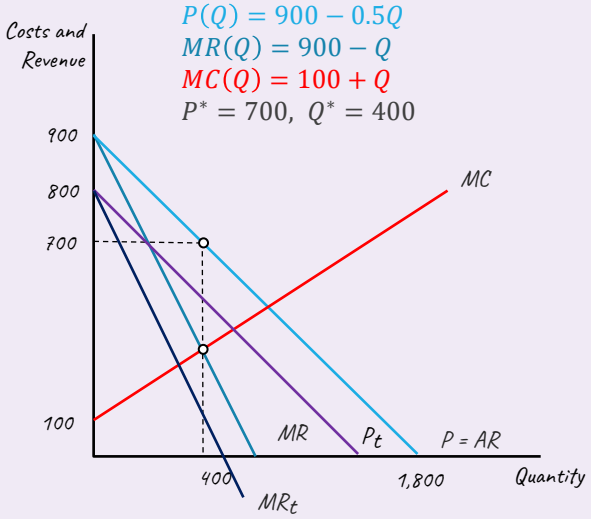
$P(Q) = 900 - 0.5Q$
$MR(Q) = 900 - Q$
$MC(Q) = 100 + Q$
$P^* = 700,\ Q^* = 400$

Suppose the government levies a tax of **$100 per EpiPen on the buyers**.

1. What will happen to Mylan's profit maximizing price and quantity?
2. How much of the tax will consumers pay?
3. How much of the tax will Mylan pay?

A TAX ON THE BUYERS

$P(Q) = 900 - 0.5Q$
$MR(Q) = 900 - Q$
$MC(Q) = 100 + Q$
$P^* = 700,\ Q^* = 400$



Consider Mylan Again...

Suppose the government levies a tax of **$100 per EpiPen on the buyers.**

1. What will happen to Mylan's profit maximizing price and quantity?

Step 1: Incorporate the tax

Update Demand...

$P_t = P(Q) - t$

$P_t = 900 - 0.5Q - 100$

$P_t = 800 - 0.5Q$

Find Marginal Revenue

$TR_t = 800Q - 0.5Q^2$

$MR_t = 800 - Q$

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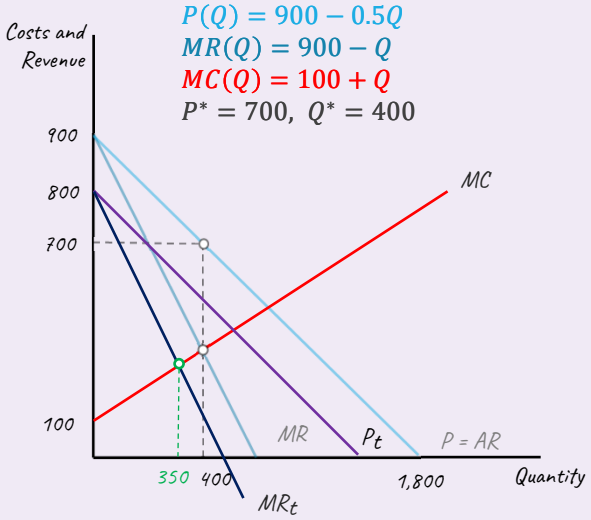
A TAX ON THE BUYERS

$P(Q) = 900 - 0.5Q$
$MR(Q) = 900 - Q$
$MC(Q) = 100 + Q$
$P^* = 700,\ Q^* = 400$



Consider Mylan Again...

Suppose the government levies a tax of **$100 per EpiPen on the buyers.**

1. What will happen to Mylan's profit maximizing price and quantity?

Step 2: Solve for Q_t^*

$MC = MR_t$

$100 + Q = 800 - Q$

$2Q = 700$

$Q_t = 350$

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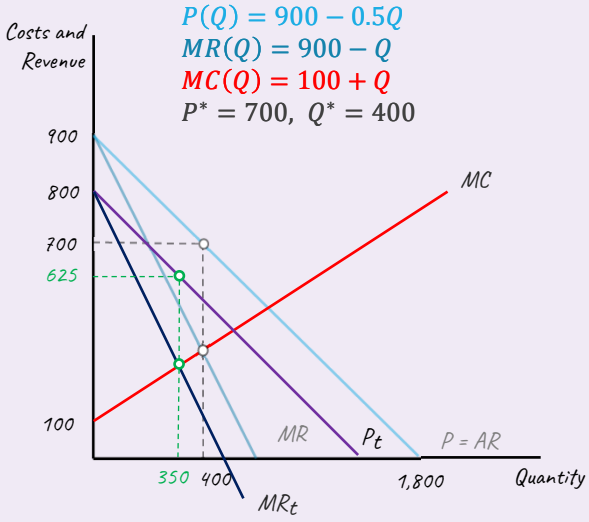
A TAX ON THE BUYERS

$P(Q) = 900 - 0.5Q$
$MR(Q) = 900 - Q$
$MC(Q) = 100 + Q$
$P^* = 700,\ Q^* = 400$



Consider Mylan Again...

Suppose the government levies a tax of **$100 per EpiPen on the buyers.**

1. What will happen to Mylan's profit maximizing price and quantity?

Step 3: Solve for P_t^*

$P_t = 800 - 0.5Q_t$

$P_t = 800 - 0.5(350)$

$P_t = 800 - 175$

$P_t = \$625$

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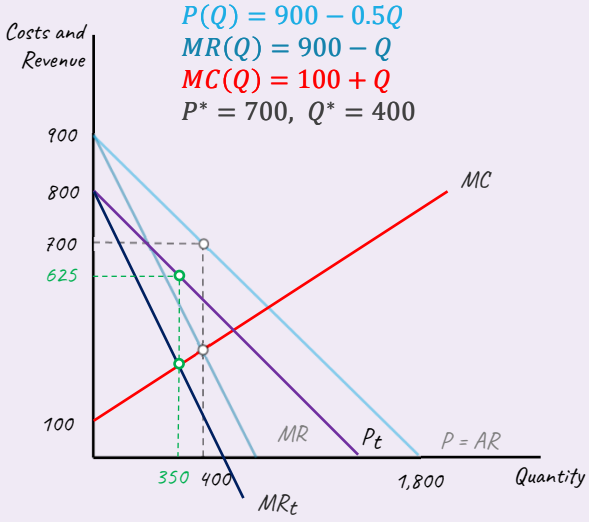
A TAX ON THE BUYERS

$P(Q) = 900 - 0.5Q$
$MR(Q) = 900 - Q$
$MC(Q) = 100 + Q$
$P^* = 700,\ Q^* = 400$



Consider Mylan Again...

Suppose the government levies a tax of **$100 per EpiPen on the buyers.**

1. What will happen to Mylan's profit maximizing price and quantity?

$P_t = \$625,\ Q_t = 350$

2. How much of the tax will consumers pay?

When there was no tax, they paid $P^* = \$700$

Once the tax is in place, they pay $P_t = \$625$

They owe an additional \$100, $P_b = \$625 + 100 = \$725$

They are paying \$725 - \$700 = **\$25 of the \$100 tax**

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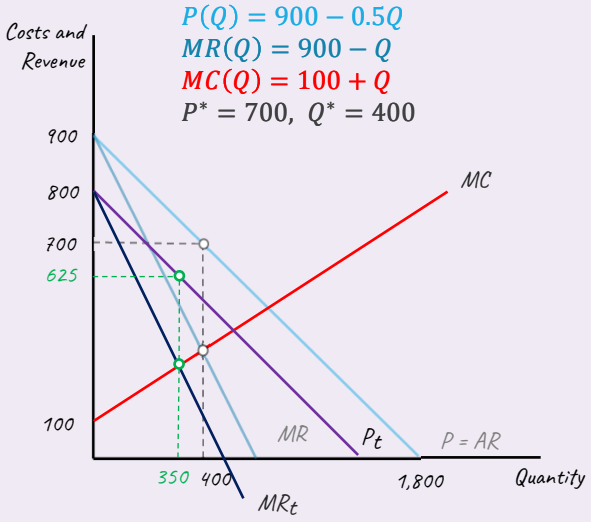
A TAX ON THE BUYERS

$P(Q) = 900 - 0.5Q$
$MR(Q) = 900 - Q$
$MC(Q) = 100 + Q$
$P^* = 700,\ Q^* = 400$



Consider Mylan Again...

Suppose the government levies a tax of **$100 per EpiPen on the buyers.**

1. What will happen to Mylan's profit maximizing price and quantity?

   P_t = \$625, Q_t = 350

2. How much of the tax will consumers pay?

   \$25 of the \$100 tax

3. How much of the tax will Mylan pay?

   \$75 of the \$100 tax

When there was no tax, they were paid P^* = \$700

Once the tax is in place, they are paid P_t = \$625

They are paying \$700 - \$625 = \$75 of the \$100 tax

33

A TAX ON THE BUYERS

Suppose the government levies a tax of **$100 per EpiPen on the buyers.**

1. What will happen to Mylan's profit maximizing price and quantity?

   P_t = \$625, Q_t = 350

2. How much of the tax will consumers pay?

   \$25 of the \$100 tax

3. How much of the tax will Mylan pay?

   \$75 of the \$100 tax

A TAX ON A MONOPOLIST

Suppose the government levies a tax of **$100 per EpiPen on Mylan.**

1. What will happen to Mylan's profit maximizing price and quantity?

   P_t = \$725, Q_t = 350

2. How much of the tax will consumers pay?

   \$25 of the \$100 tax

3. How much of the tax will Mylan pay?

   \$75 of the \$100 tax

The only difference is the "market price"
The tax burdens are the same!

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WHAT IF A FIRM HAS TWO PLANTS?

Economic intuition suggests that…

1. Output should be divided between the two plants so that the marginal cost is the same in each plant.
   - If not, the firm can reduce costs by reallocating more of the output to the lower cost plant.
2. Profit maximizing output occurs where Marginal revenue equals Marginal cost
   - If $MR > MC_1 = MC_2$ then the firm should increase production.
   - If $MR < MC_1 = MC_2$ then the firm should decrease production.

…firm should produce such that

$$MR(Q_1 + Q_2) = MC_1(Q_1) = MC_2(Q_2)$$

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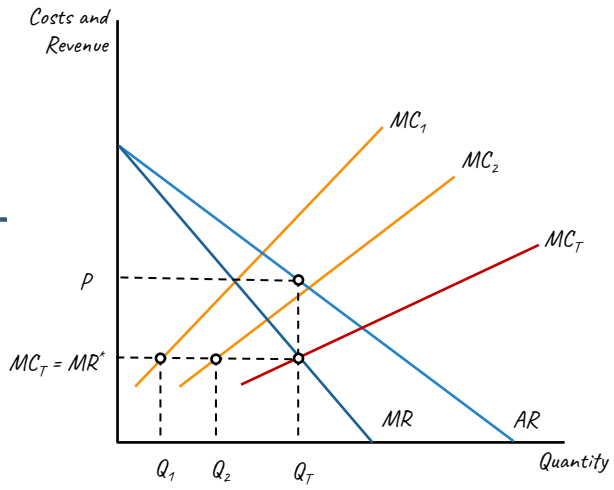
GRAPHICAL DEPICTION WITH TWO PLANTS

1. Form MC_T (multi-plant MC) by horizontally summing the individual marginal costs.
2. The firm produces Q_T, where $MR = MC_T$
3. Divide Q_T between the two plants by setting $MC_1 = MC_2 = MC_T$

Ultimately, we will have a system of 4 equations and 4 unknowns:

$$Q_T = Q_1 + Q_2$$
$$MC_1(Q_1) = MC_2(Q_2)$$
$$MC_1(Q_1) = MR(Q_T)$$
$$P = AR(Q_T)$$



A MULTIPLANT MONOPOLY EXAMPLE

A monopoly operates two plants with marginal cost schedules

$MC_1 = 4 + \frac{Q_1}{2}$ and $MC_2 = 7 + \frac{Q_2}{4}$

They sell in a market where demand is given by $P = 12 - \frac{Q_T}{6}$.

1. Find the monopolist's $\boldsymbol{MC_T}$ when $\boldsymbol{Q_T > 6}$.
2. Find the monopolist's optimal Q_T and P.
3. Find the optimal division of the monopolist's quantity between its two plants.

Step 1: Invert the two marginal cost curves

$MC_1 = 4 + \frac{Q_1}{2}$

$MC_2 = 7 + \frac{Q_2}{4}$

A Multiplant Monopoly Example

A monopoly operates two plants with marginal cost schedules

$MC_1 = 4 + \frac{Q_1}{2}$ and $MC_2 = 7 + \frac{Q_2}{4}$

They sell in a market where demand is given by $P = 12 - \frac{Q_T}{6}$.

1. **Find the monopolist's MC_T when $Q_T > 6$.**
2. Find the monopolist's optimal Q_T and P.
3. Find the optimal division of the monopolist's quantity between its two plants.

Step 2: Add them…

$$Q_1 = 2MC_1 - 8, \qquad Q_2 = 4MC_2 - 28$$

$$Q_T = Q_1 + Q_2$$

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A Multiplant Monopoly Example

A monopoly operates two plants with marginal cost schedules

$MC_1 = 4 + \frac{Q_1}{2}$ and $MC_2 = 7 + \frac{Q_2}{4}$

They sell in a market where demand is given by $P = 12 - \frac{Q_T}{6}$.

1. **Find the monopolist's MC_T when $Q_T > 6$.**
2. Find the monopolist's optimal Q_T and P.
3. Find the optimal division of the monopolist's quantity between its two plants.

Step 3: Rearrange…

$$Q_T = 6MC_T - 36$$

40

A Multiplant Monopoly Example

A monopoly operates two plants with marginal cost schedules

$MC_1 = 4 + \frac{Q_1}{2}$ and $MC_2 = 7 + \frac{Q_2}{4}$

They sell in a market where demand is given by $P = 12 - \frac{Q_T}{6}$.

1. Find the monopolist's MC_T when $Q_T > 6$.
2. **Find the monopolist's optimal Q_T and P.**
3. Find the optimal division of the monopolist's quantity between its two plants.

Step 1: Set $MC_T = MR$

$$MC_T = \frac{Q_T}{6} + 6, \qquad MR = 12 - \frac{Q_T}{3}$$

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A Multiplant Monopoly Example

A monopoly operates two plants with marginal cost schedules

$MC_1 = 4 + \frac{Q_1}{2}$ and $MC_2 = 7 + \frac{Q_2}{4}$

They sell in a market where demand is given by $P = 12 - \frac{Q_T}{6}$.

1. Find the monopolist's MC_T when $Q_T > 6$.
2. **Find the monopolist's optimal Q_T and P.**
3. Find the optimal division of the monopolist's quantity between its two plants.

Step 2: Plug $Q_T = 12$ into inverse demand (to find price)

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Step 1: Find MC_T when $Q_T = 12$

$$MC_T = 6 + \frac{12}{6}$$

Why do we do this?

To be optimal, we need

$$MC_1 = MC_2 = MC_T = MR$$

We already did this!

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Step 2: Set $MC_1 = MC_2 = 8$

$MC_1 = 4 + \frac{Q_1}{2} = 8$

$MC_2 = 7 + \frac{Q_2}{4} = 8$

A MULTIPLANT MONOPOLY EXAMPLE

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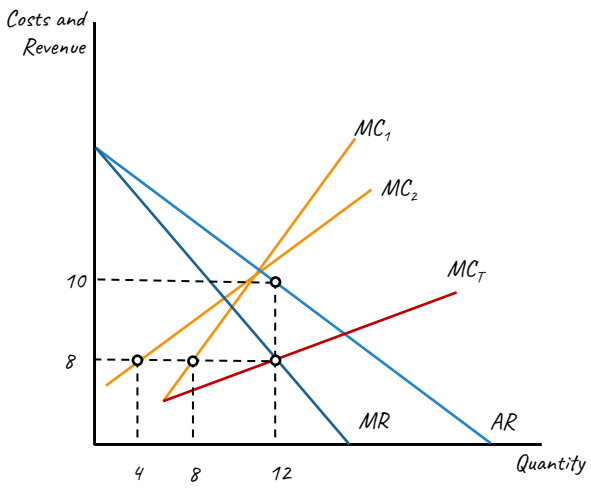

AN ALTERNATIVE WAY TO SOLVE…

Optimality requires…

$MR(Q_T) = MC_1(Q_1) = MC_2(Q_2) = MC_T(Q_T)$

Where $Q_T = Q_1 + Q_2$

and $P = AR(Q_T)$

We can rearrange this to…

(1) $MC_1(Q_1) = MC_2(Q_2)$

(2) $MC_1(Q_1) = MR(Q_1 + Q_2)$

(3) $P = AR(Q_1 + Q_2)$

For this problem you would solve…

(1) $4 + \frac{Q_1}{2} = 7 + \frac{Q_2}{4}$

(2) $4 + \frac{Q_1}{2} = 12 - \frac{Q_1 + Q_2}{3}$

to find Q_1 and Q_2

Then plug $Q_T = Q_1 + Q_2$ into inverse demand **to find price…**

$$P = 12 - \frac{Q_T}{6}$$

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to find Q_1 **and** Q_2

Then plug $Q_T = Q_1 + Q_2$ into inverse demand **to find price…**

$$P = 12 - \frac{Q_T}{6}$$

Solve (1) for Q_2

$$4 + \frac{Q_1}{2} = 7 + \frac{Q_2}{4}$$
$$\frac{Q_1}{2} - 3 = \frac{Q_2}{4}$$
$$Q_2 = 2Q_1 - 12, \quad (3)$$

Plug (3) into (2) and solve for Q_1

$$4 + \frac{Q_1}{2} = 12 - \frac{Q_1}{3} - \left(\frac{2Q_1 - 12}{3}\right)$$
$$4 + \frac{Q_1}{2} = 12 - \frac{Q_1}{3} - \frac{2Q_1}{3} - 4$$
$$\frac{3Q_1}{2} = 12 \Rightarrow Q_1 = 8$$

Plug $Q_1 = 8$ into (3) and solve for Q_2

$$Q_2 = 2(8) - 12 \Rightarrow Q_2 = 4$$

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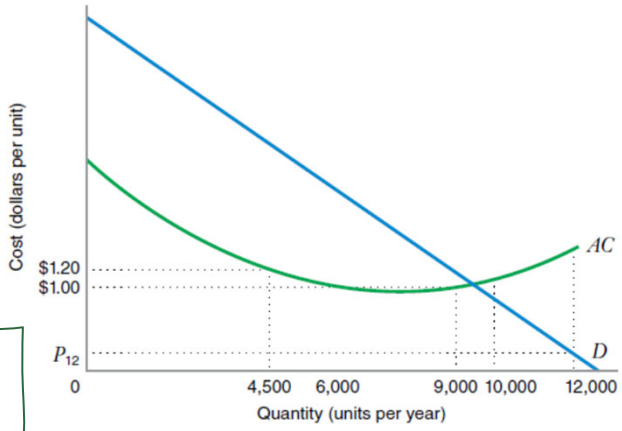
NATURAL MONOPOLY

This will occur if a firm experiences economies of scale over the relevant range of output.

Occurs if, for any relevant level of industry output,

the total cost incurred by a single firm producing that output is less than

the combined total cost that two or more firms would incur if they divided that output among themselves.



Example:

- In the early 1990 two firms entered the satellite broadcasting market in the UK.
- Neither could make a profit – accumulated losses of more than $1.5 billion.
- Merged by the end of 1990.

BARRIERS TO ENTRY

Factors that allow an incumbent firm to earn positive economic profits while making it unprofitable for newcomers to enter the industry.

Structural Barriers to Entry

exist when incumbent firms have cost or demand advantages that would make it unattractive for a new firm to enter the industry.

1. Economies of scale
2. Positive network externalities

Legal Barriers to Entry

exist when an incumbent firm is legally protected against competition.

1. Patents
2. Government regulations

Strategic Barriers to Entry

result when an incumbent firm takes explicit steps to deter entry.

1. Reputation for aggressive response to entrants

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WHAT ABOUT A MONOPSONY MARKET?

When there are one or only a few buyers, some buyers may have market power – a buyer's ability to affect the price of a good.

→ Often referred to as **monopsony** power

Monopsony

A market in which there is a single buyer and many sellers.

Example: a company coal town, where the coal company acts the sole employer and therefore the sole purchaser of labor in the town.

Oligopsony

A market with only a few buyers and many sellers.

Example: Major U.S. automobile manufacturers compete with one another as buyers of tires.

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MONOPSONIST

The Monopsonist

1. is the entire market demand.
2. completely controls the amount of output purchased.
3. has the ability to impact prices, limited by the market they face (elasticity of supply).

(assume that the seller side of the market is competitive)

Marginal value – additional benefit from purchasing one more unit of the good

$$MV(Q) = P^d(Q)$$

Average expenditure – Expenditure per unit

$$AE(Q) = P^s(Q)$$

Total expenditure – Price per unit × units purchased

$$TE(Q) = P^s(Q) \times Q$$

Marginal expenditure – change in expenditure resulting from a one unit increase in purchases.

$$ME(Q) = \frac{dTE(Q)}{dQ}$$

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THE MONOPSONIST'S PROFIT MAXIMIZING CHOICE

The buyer's "profit" is given by:

$$\pi(Q) = V(Q) - TE(Q)$$

First order conditions:

$$\frac{d\pi}{dQ} = \frac{dV}{dQ} - \frac{dTE}{dQ} = 0$$

$$MV(Q) - ME(Q) = 0$$

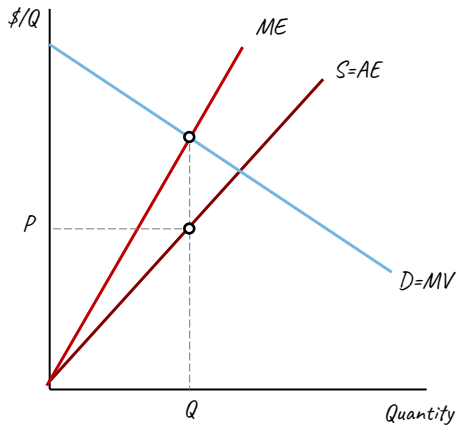
Rearrange to find the profit-max condition:

Purchase where $MV(Q) = ME(Q)$

But what about price?

Determined using the inverse supply curve

$$P = AE(Q)$$



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A MONOPSONY EXAMPLE

Madison Hospital is a monopsonist employer of nurses in a small city.

The inverse demand for nurses is:

$$w^d(L) = 90{,}000 - 100L$$

The inverse supply of nurses is:

$$w^s(L) = 30{,}000 + 100L$$

where w is the annual wage of a nurse and L is the number of nurses.

1. Determine Madison Hospital's marginal expenditure function.

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3. Find the profit maximizing number of nurses and the wage.

$AE(L) = 30{,}000 + 100L$

$ME(L) = 30{,}000 + 200L$

$MV(L) = 90{,}000 - 100L$

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4. What would the number of nurses hired, and the wage be if Madison Hospital acted like a price taker?

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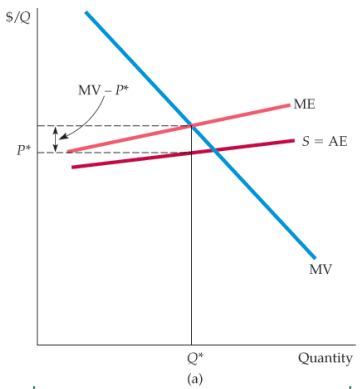
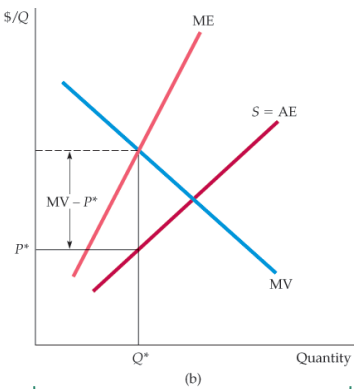
MONOPSONY POWER DEPENDS ON PRICE ELASTICITY OF SUPPLY

Elastic Supply



Price is close to the competitive equilibrium

Inelastic Supply



Price is much lower than what is competitive

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IEPR FOR A MONOPSONY

There is an inverse elasticity rule for monopsonists as well!

A monopsonist should purchase where…

$$\frac{MV - P}{P} = \frac{1}{\varepsilon_s}$$

(ε_s is the elasticity of supply)

Implication…

the price markdown from marginal value rises as supply becomes less elastic.

What is the significance?

Can help distinguish between a monopsony labor market and a perfectly competitive labor market.

If Price $< MV$, we know the labor market is not competitive.

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THE SOURCES OF MONOPSONIST POWER

The elasticity of market supply	The number of buyers in the market	The interaction among buyers
Less elastic – more power and lower prices	One buyer – faces entire market supply (inelastic)	Aggressive competition – less power and higher prices
More elastic – less power and higher prices	Many buyers – each faces a small fraction of market supply (extremely elastic)	Less competition or collusion – more power and lower prices

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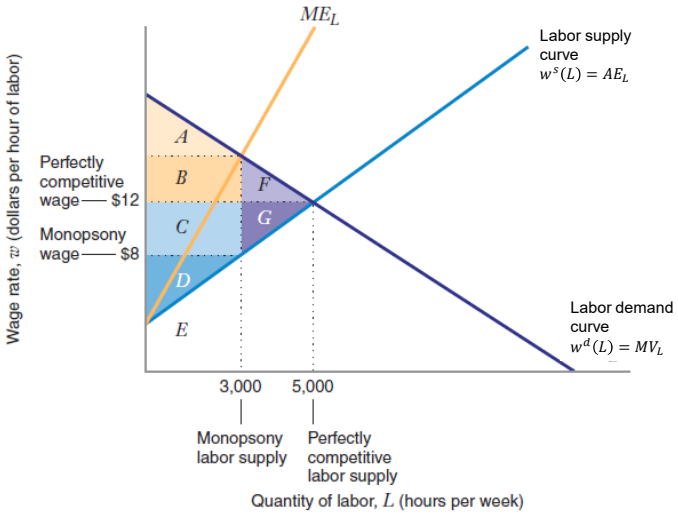
DEADWEIGHT LOSS FROM MONOPSONY POWER

Compared to the efficient competitive outcome:

1. Monopsonist purchases too little.
2. Pays too low of a price.

The result is:

- Producers lose C and G
- Consumers gain C and lose F
- Deadweight loss = F + G



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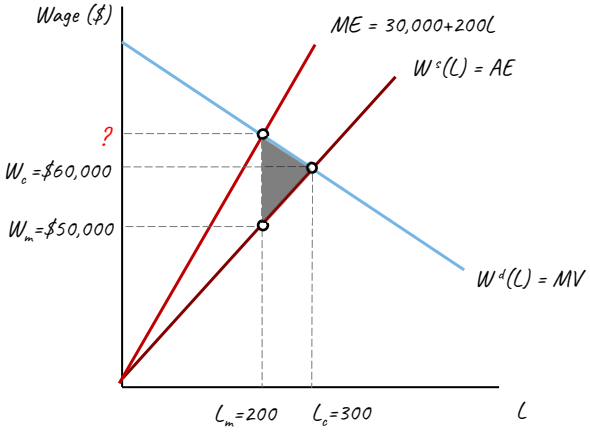
5. Determine the deadweight loss associated this this monopsony.



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