



# Chapter 9

## Market Equilibrium

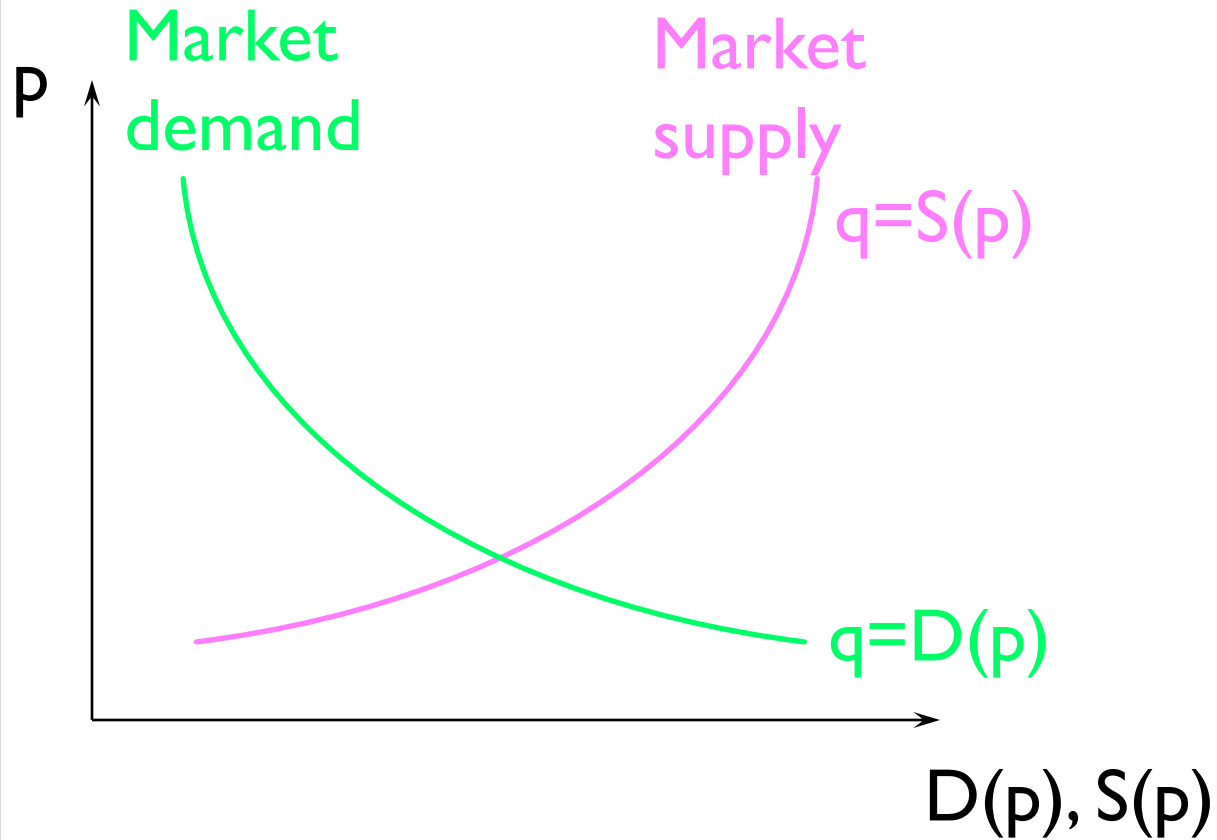
# Topics to be Discussed

- Market equilibrium
- Quantity tax and equilibrium
- Tax incidence
- Deadweight loss

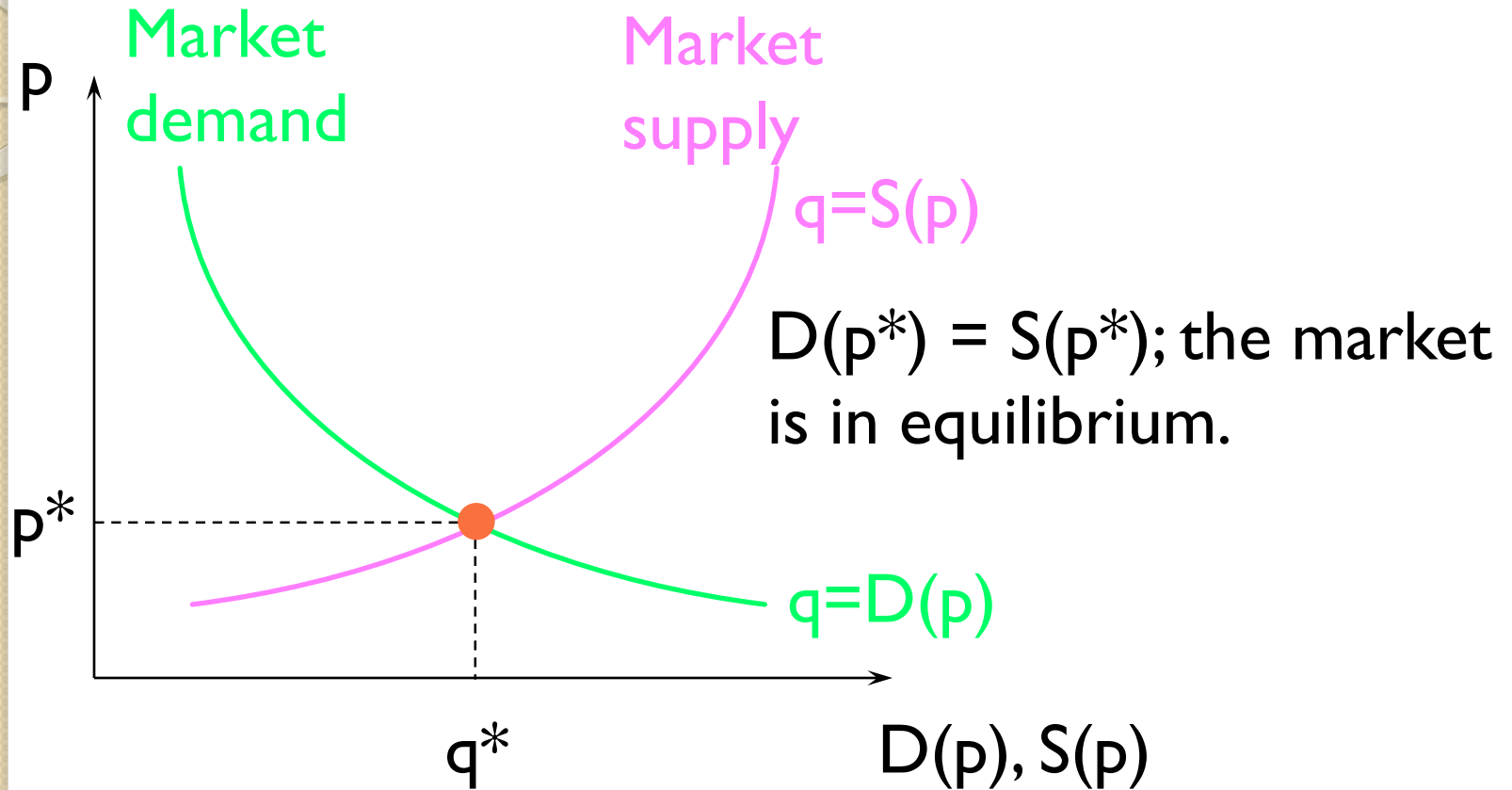
# Market Equilibrium

- A market is in **equilibrium** when total quantity demanded by buyers equals total quantity supplied by sellers.
- Also called “market is cleared”

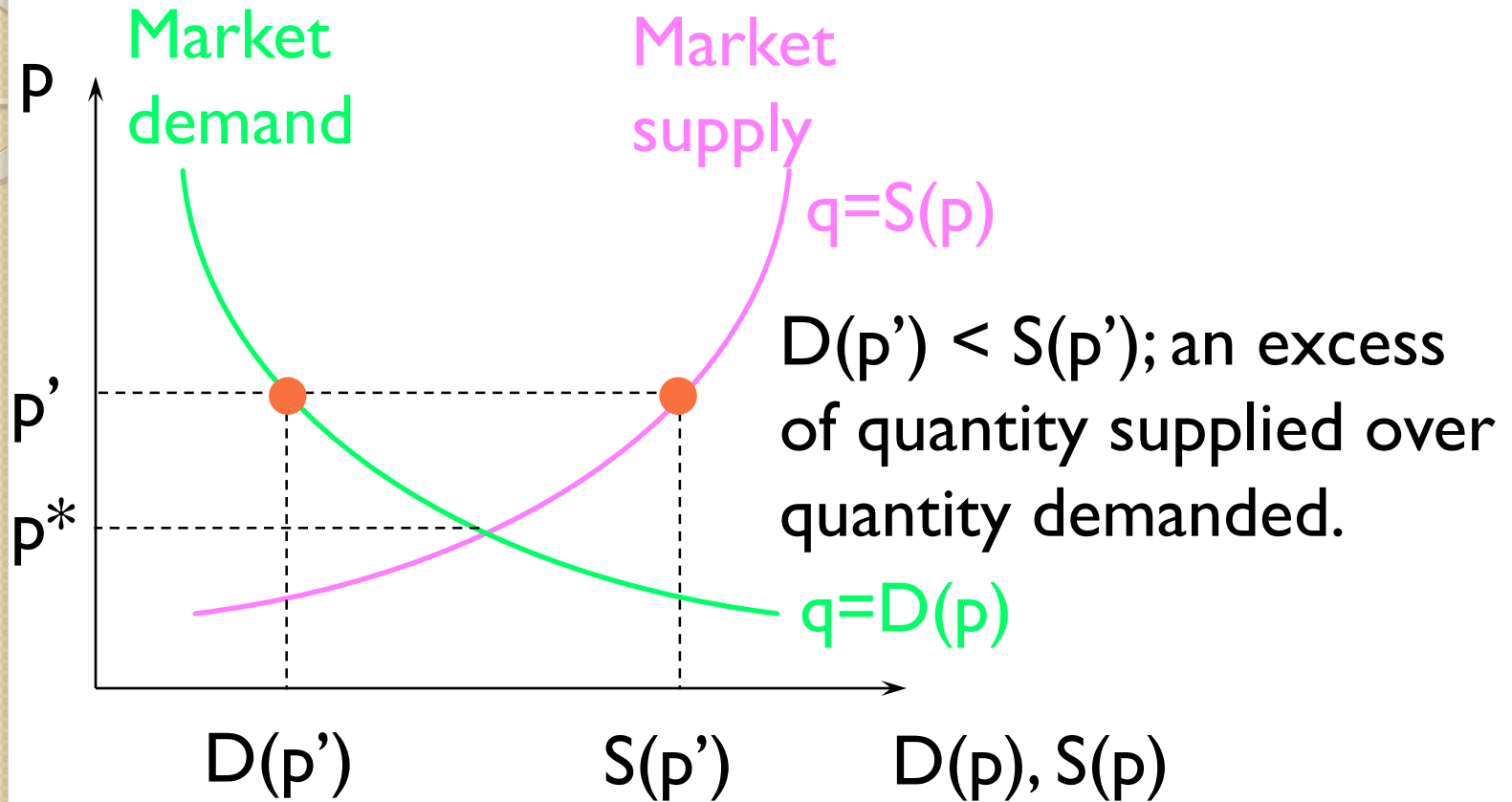
# Market Equilibrium



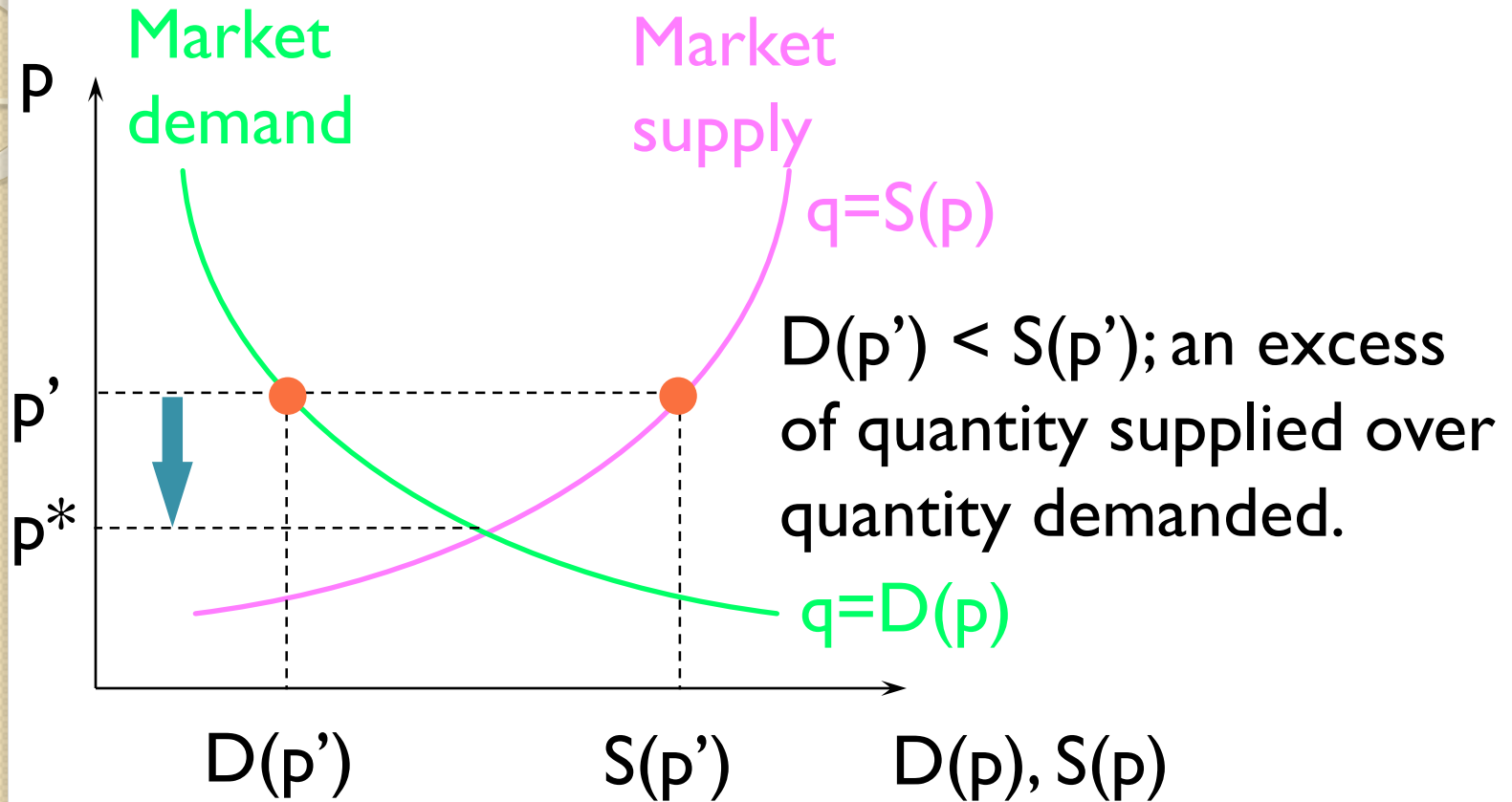
# Market Equilibrium



# Market Equilibrium

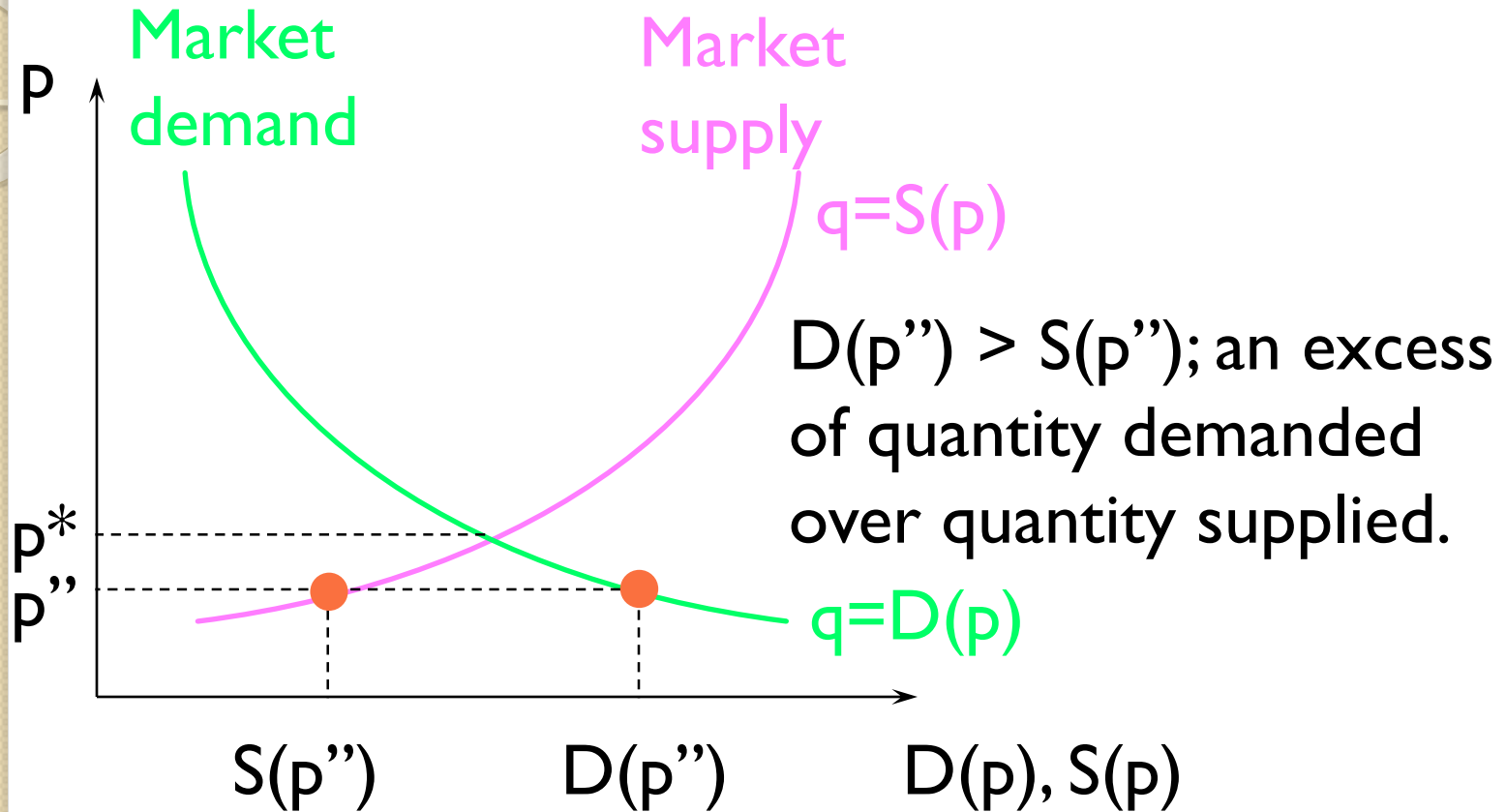


# Market Equilibrium



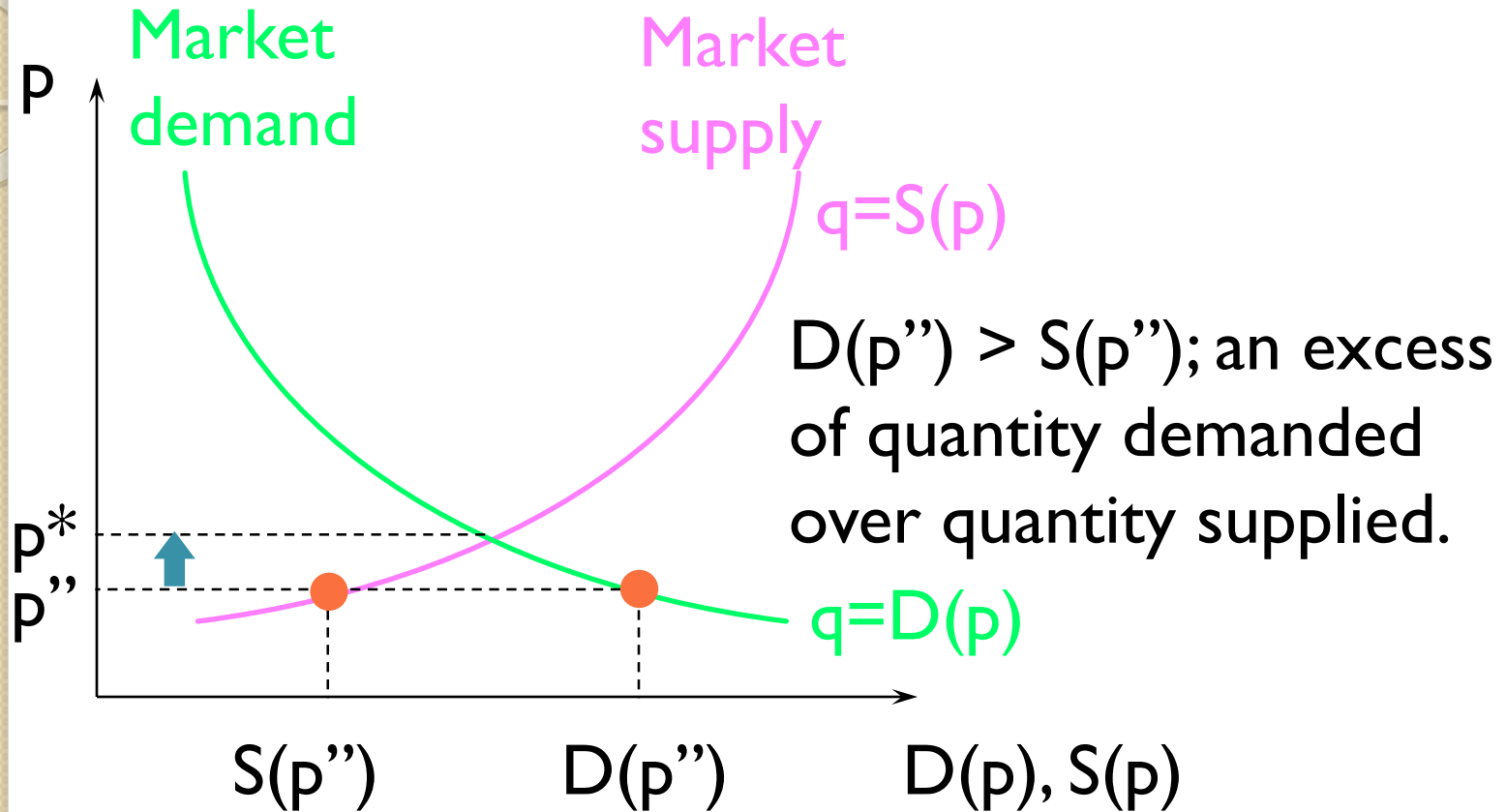
Market price must fall towards  $p^*$ .

# Market Equilibrium





# Market Equilibrium



Market price must rise towards  $p^*$ .

# Market Equilibrium

- We can calculate the market equilibrium price and quantity using  $D(p)=S(p)$
- Can we calculate the market equilibrium using the inverse market demand and supply curves?
- Yes, it is the same calculation
- $P_d(q)=P_s(q)$ .

# Market Equilibrium

$$q = D(p) = a - bp \Leftrightarrow p = \frac{a - q}{b} = D^{-1}(q),$$

the equation of the inverse market demand curve. And

$$q = S(p) = c + dp \Leftrightarrow p = \frac{-c + q}{d} = S^{-1}(q),$$

the equation of the inverse market supply curve.

# Market Equilibrium

$D^{-1}(q),$   
 $S^{-1}(q)$

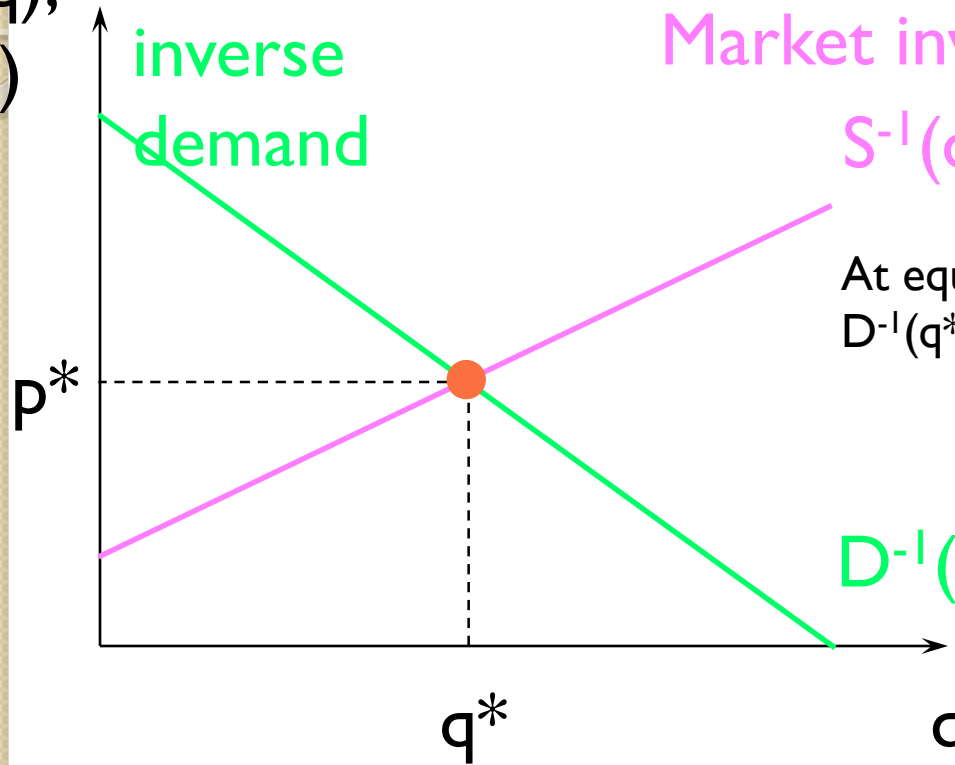
Market  
inverse  
demand

Market inverse supply

$$S^{-1}(q) = (-c+q)/d$$

At equilibrium,  
 $D^{-1}(q^*) = S^{-1}(q^*)$ .

$$D^{-1}(q) = (a-q)/b$$



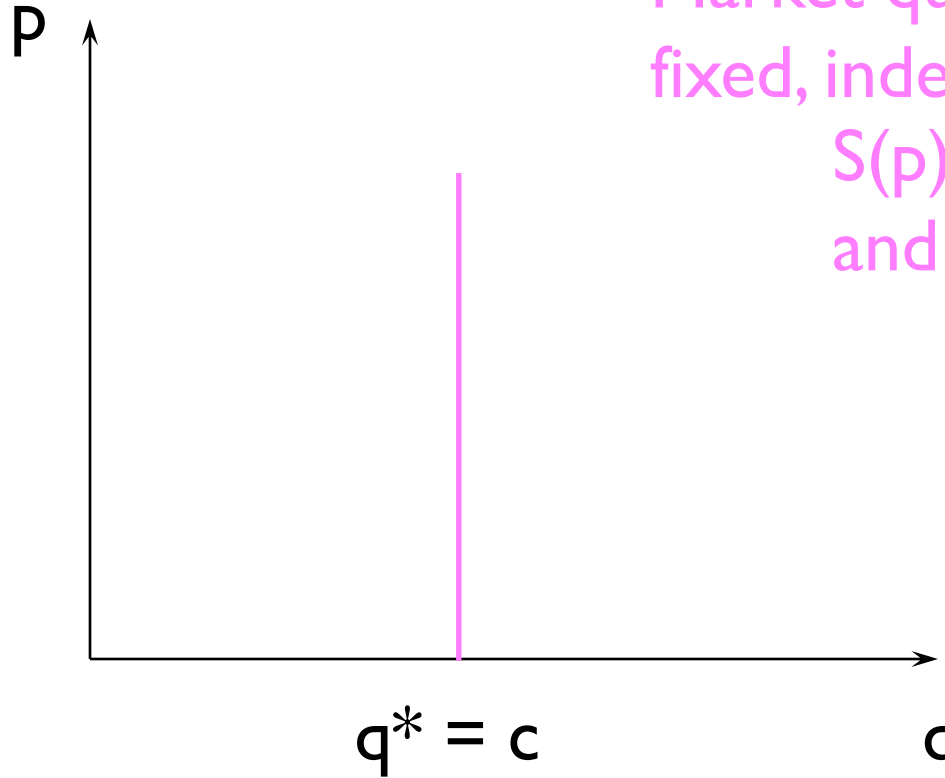
# Market Equilibrium

- Two special cases:
  - quantity supplied is fixed, independent of the market price, and
  - quantity supplied is extremely sensitive to the market price.

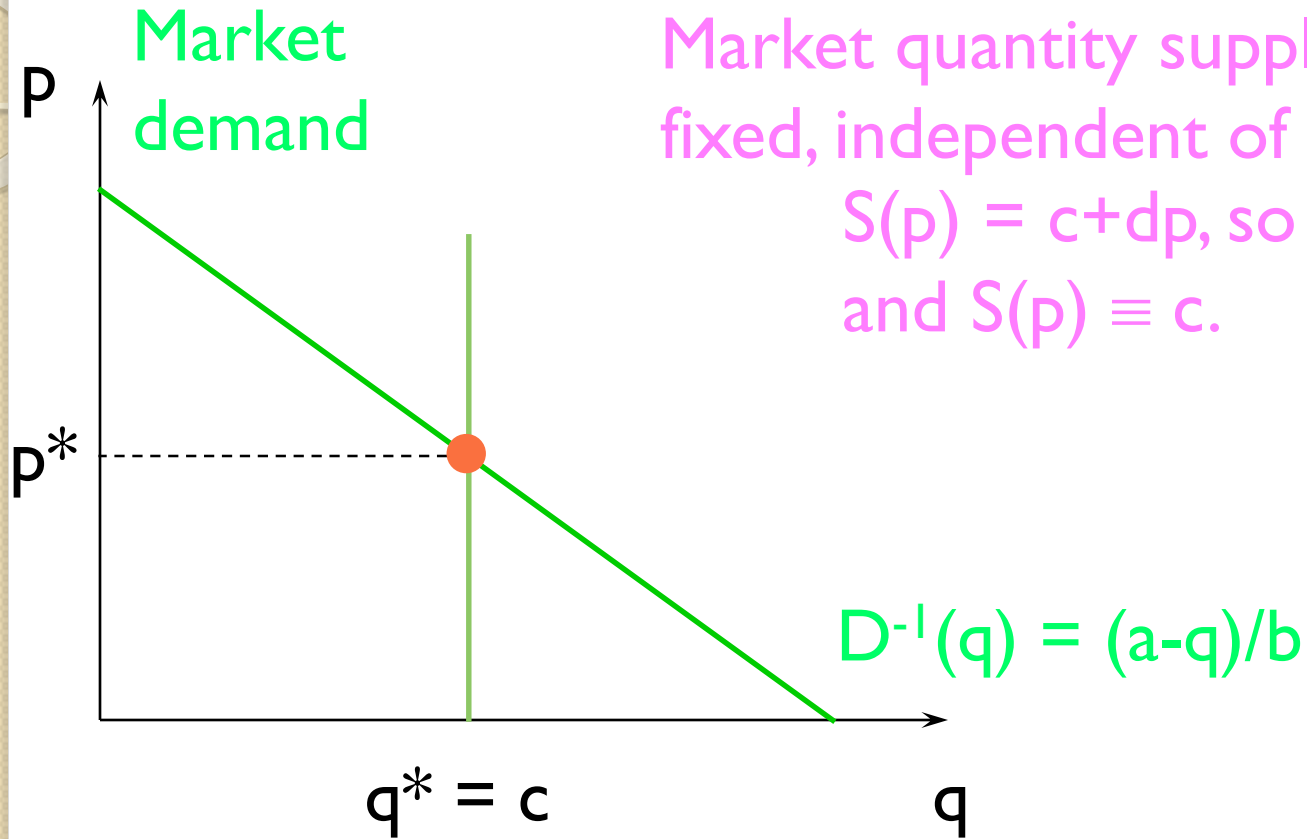
# Market Equilibrium

Market quantity supplied is fixed, independent of price.

$S(p) = c + dp$ , so  $d=0$   
and  $S(p) \equiv c$ .



# Market Equilibrium



# Market Equilibrium

Market  
demand

Market quantity supplied is  
fixed, independent of price.

$S(p) = c + dp$ , so  $d=0$   
and  $S(p) \equiv c$ .

$$p^* = (a-c)/b$$

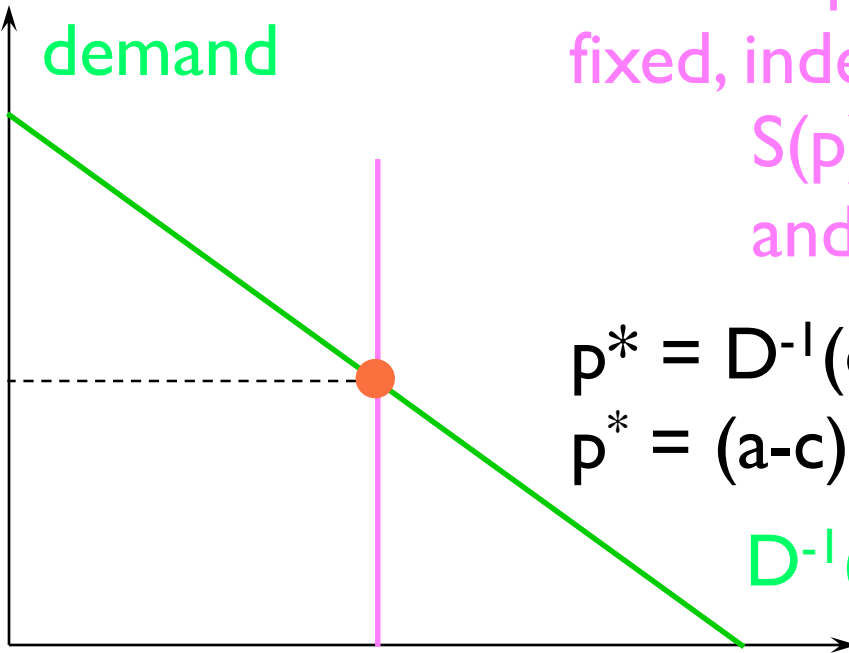
$$p^* = D^{-1}(q^*); \text{ that is, } p^* = (a-c)/b.$$

$$D^{-1}(q) = (a-q)/b$$

$$q^* = c$$

$q$

$p$

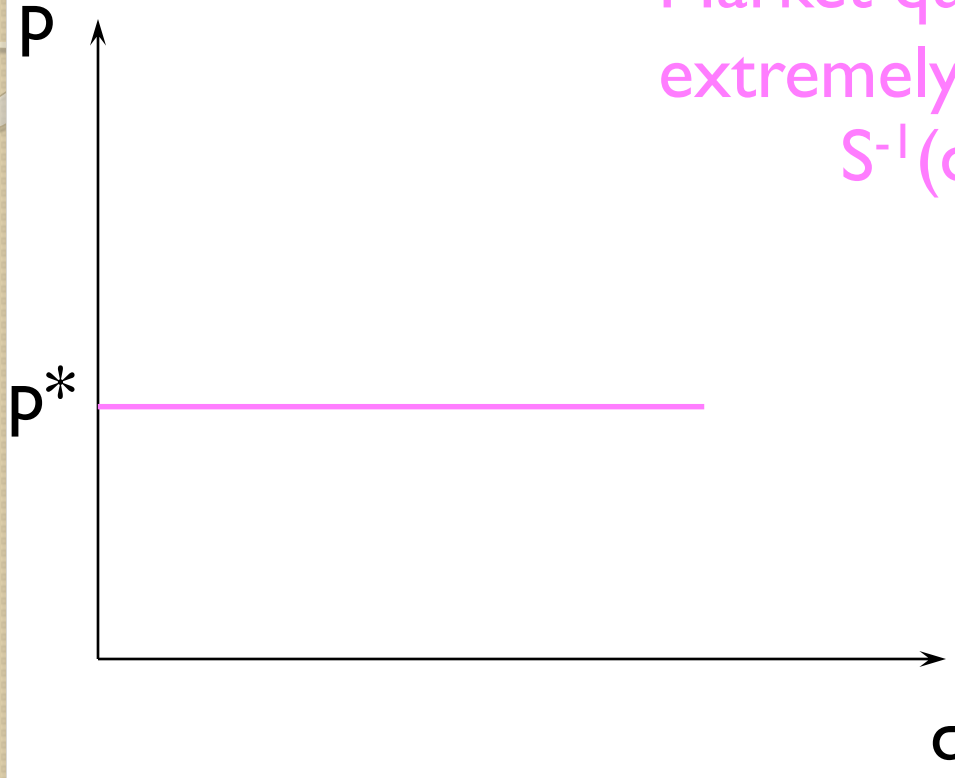




# Market Equilibrium

Market quantity supplied is extremely sensitive to price.

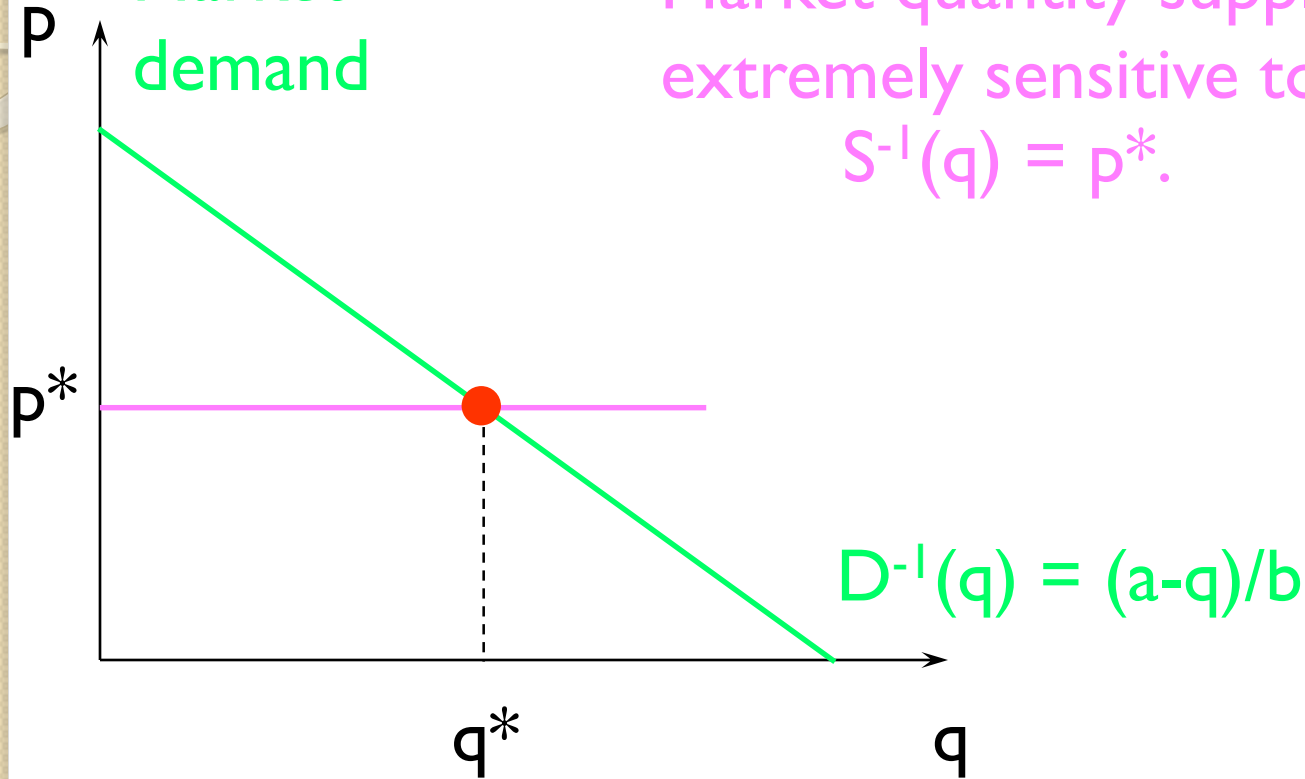
$$S^{-1}(q) = p^*.$$



# Market Equilibrium

Market  
demand

Market quantity supplied is  
extremely sensitive to price.  
 $S^{-1}(q) = p^*$ .



# Comparative Statics

- Shifting demand curves
  - Income
  - Price of other products
- Shifting supply curves
  - Technology
- Taxes

# Quantity Taxes

- A quantity tax levied at a rate of  $\$t$  is a tax of  $\$t$  paid on each unit traded.
- If the tax is levied on sellers then it is an **excise tax**.
- If the tax is levied on buyers then it is a **sales tax**.

# Quantity Taxes

- What is the effect of a quantity tax on a market's equilibrium?
- How are prices affected?
- How is the quantity traded affected?
- Who pays the tax?
- How are gains-to-trade altered?

# Quantity Taxes

- A tax rate  $t$  makes the price paid by buyers,  $p_b$ , higher by  $t$  from the price received by sellers,  $p_s$ .

$$p_b - p_s = t$$

# Quantity Taxes

- Even with a tax the market must clear.
- I.e. quantity demanded by buyers at price  $p_b$  must equal quantity supplied by sellers at price  $p_s$ .

$$D(p_b) = S(p_s)$$

# Quantity Taxes

$$p_b - p_s = t \quad \text{and} \quad D(p_b) = S(p_s)$$

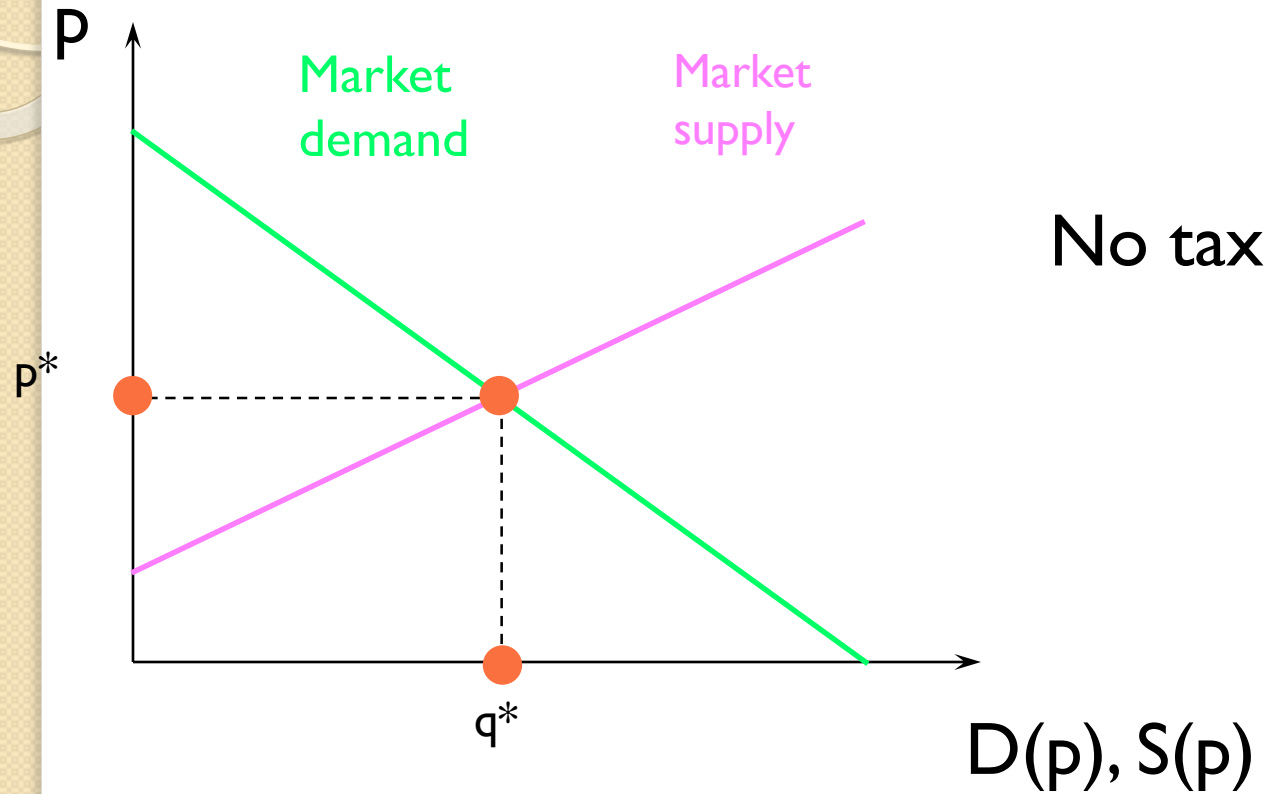
describe the market's equilibrium.

Notice that these two conditions apply no matter if the tax is levied on sellers or on buyers.

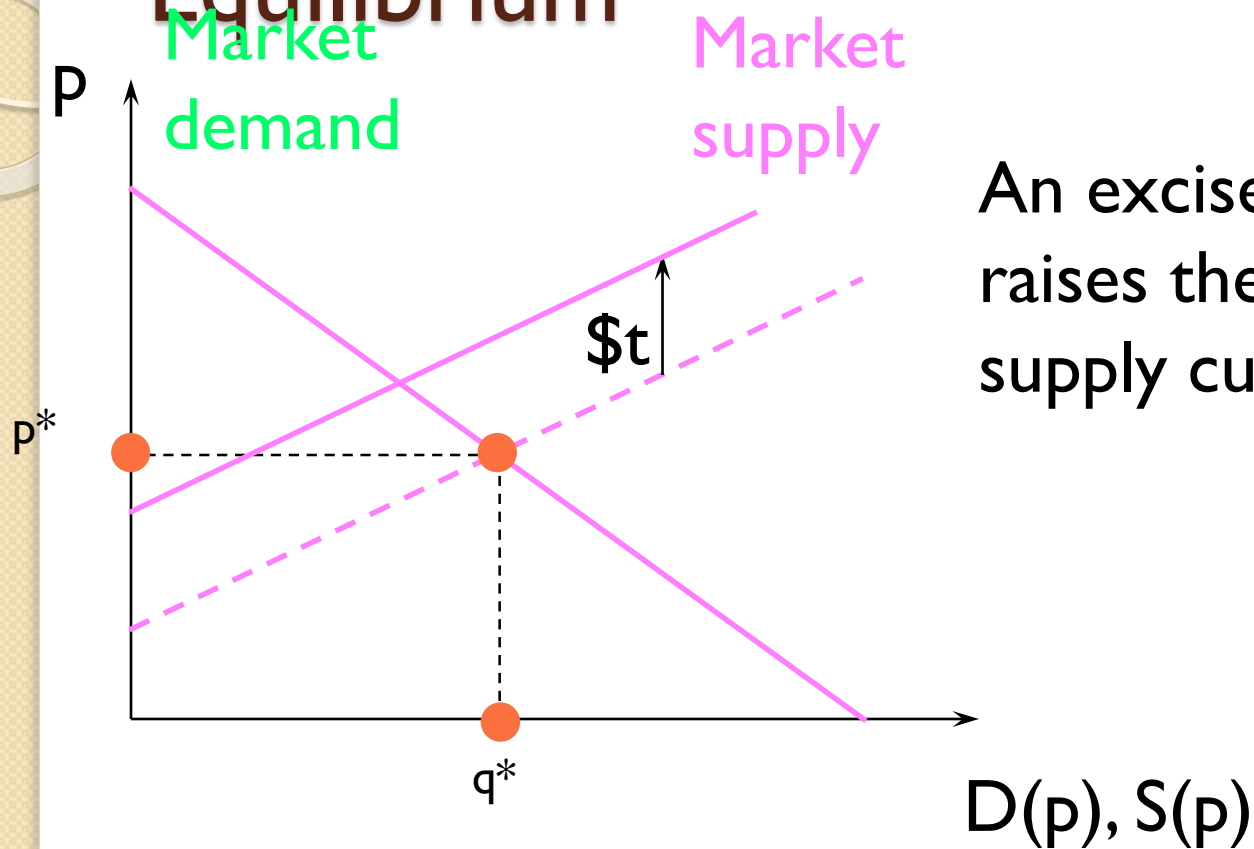
Hence, a sales tax rate  $t$  has the same effect as an excise tax rate  $t$ .



# Quantity Taxes & Market Equilibrium

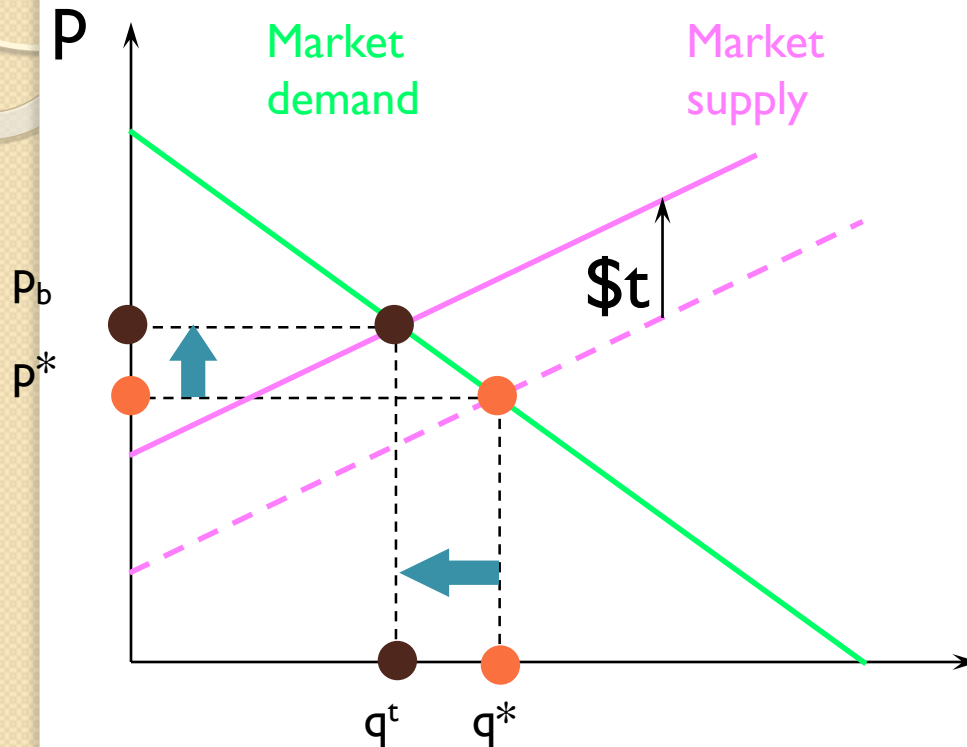


# Quantity Taxes & Market Equilibrium



An excise tax raises the market supply curve by  $\$t$

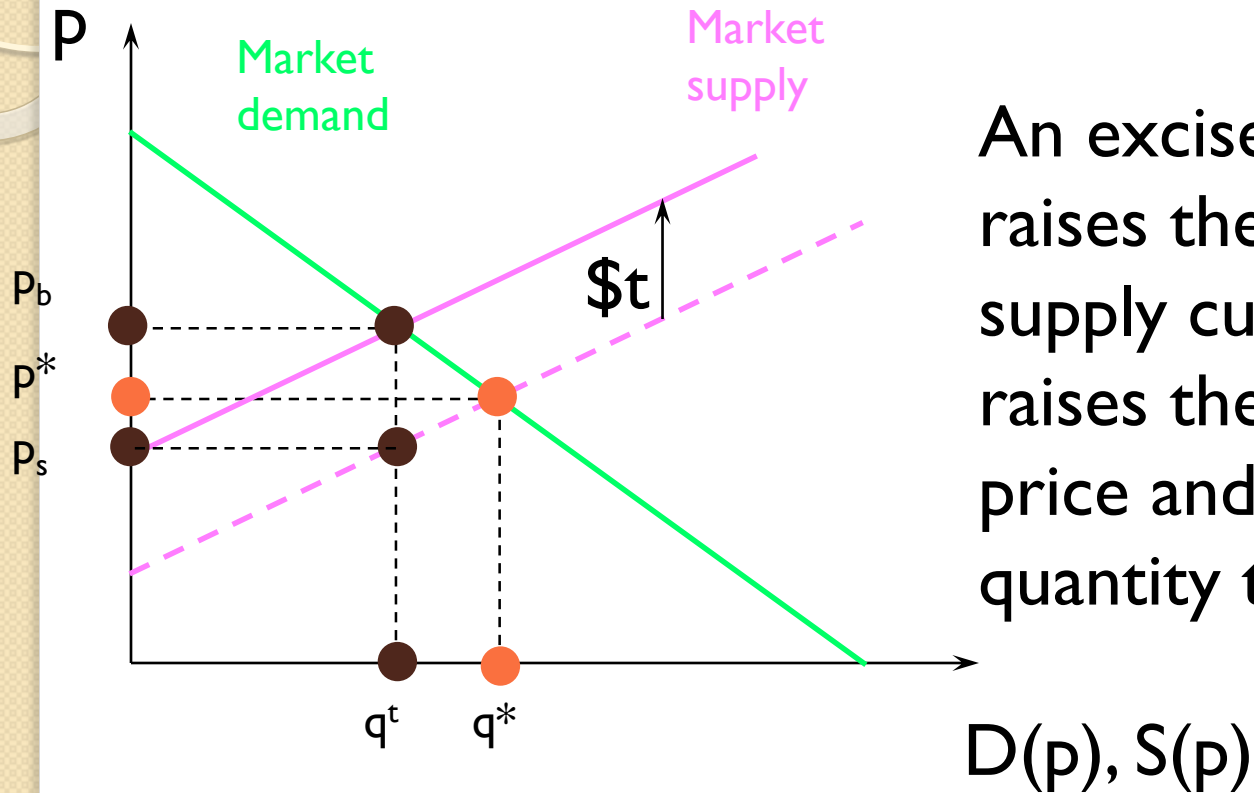
# Quantity Taxes & Market Equilibrium



An excise tax raises the market supply curve by  $\$t$ , raises the buyers' price and lowers the quantity traded.

$D(p), S(p)$

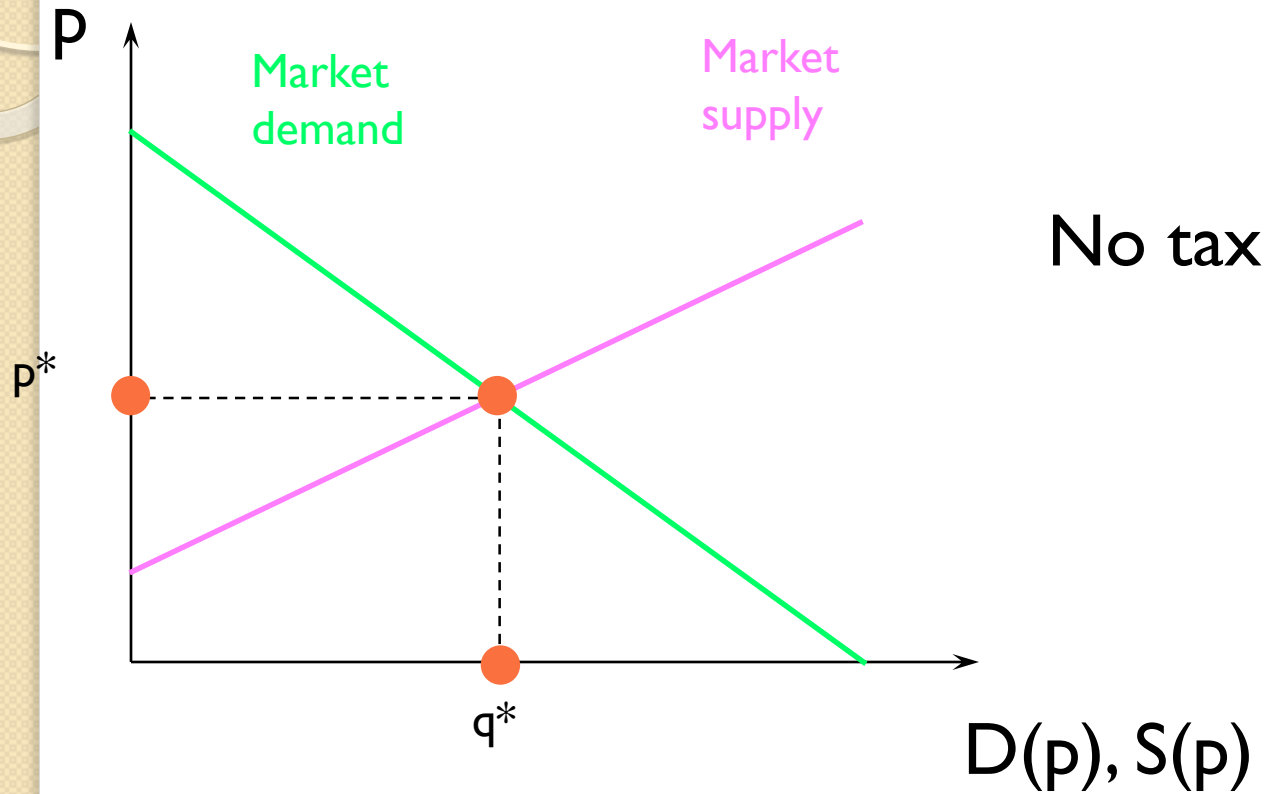
# Quantity Taxes & Market Equilibrium



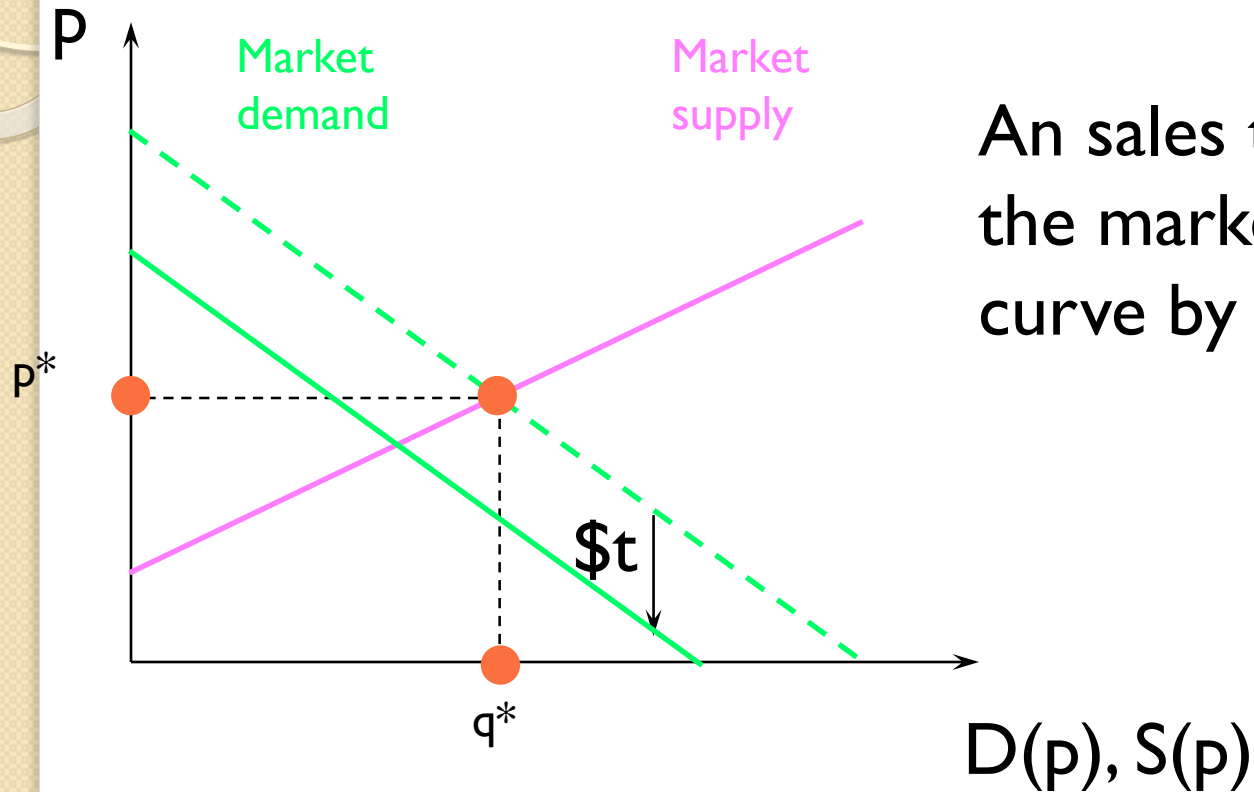
An excise tax raises the market supply curve by  $\$t$ , raises the buyers' price and lowers the quantity traded.

And sellers receive only  $p_s = p_b - t$ .

# Quantity Taxes & Market Equilibrium

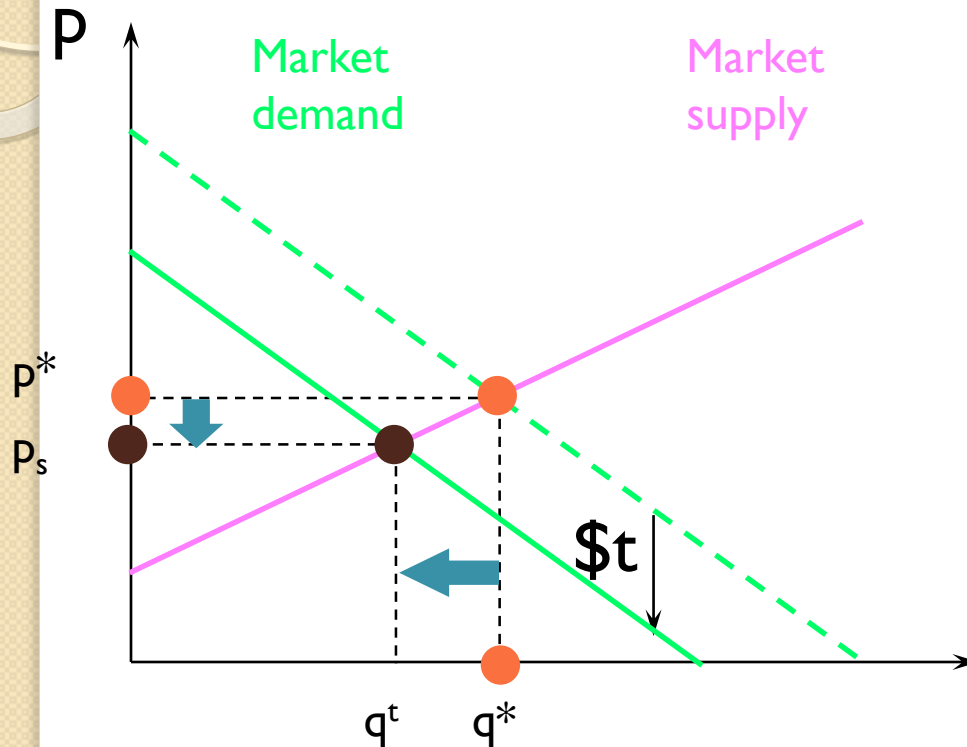


# Quantity Taxes & Market Equilibrium



An sales tax lowers the market demand curve by  $\$t$

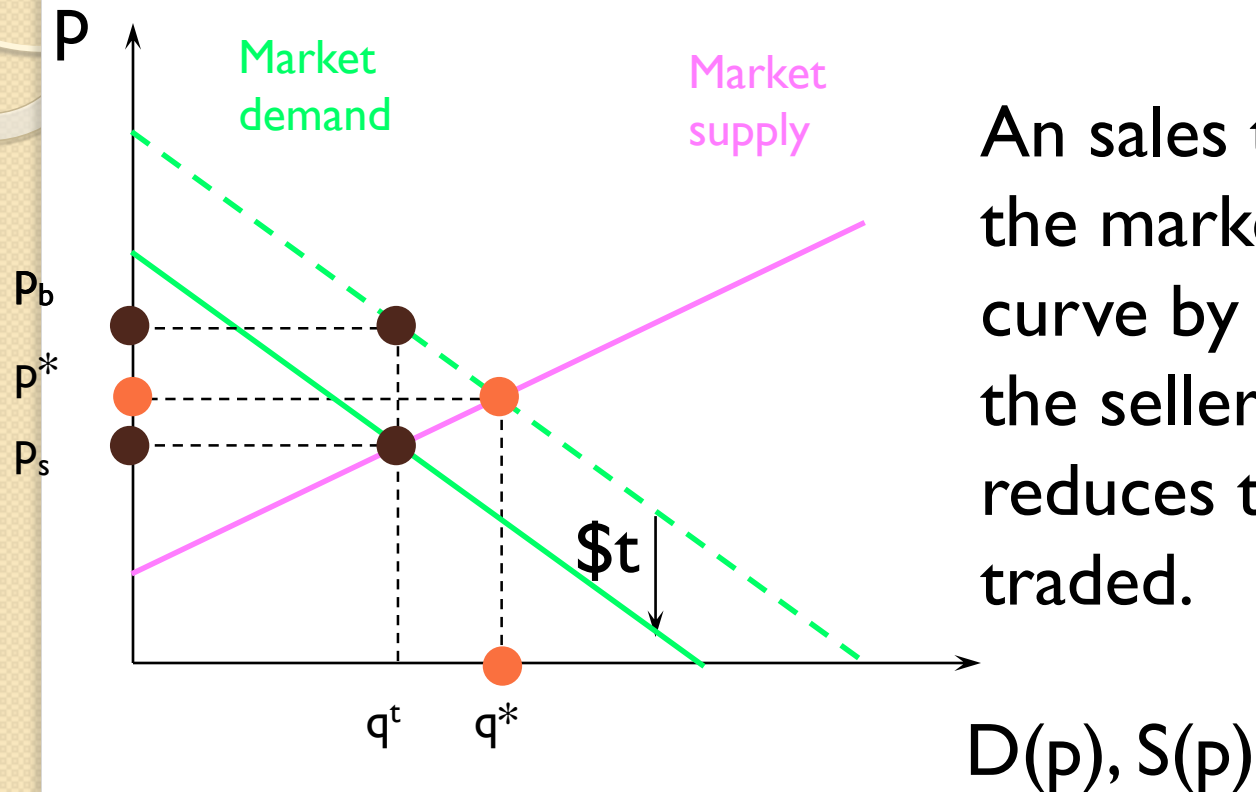
# Quantity Taxes & Market Equilibrium



An sales tax lowers the market demand curve by  $\$t$ , lowers the sellers' price and reduces the quantity traded.

$D(p), S(p)$

# Quantity Taxes & Market Equilibrium

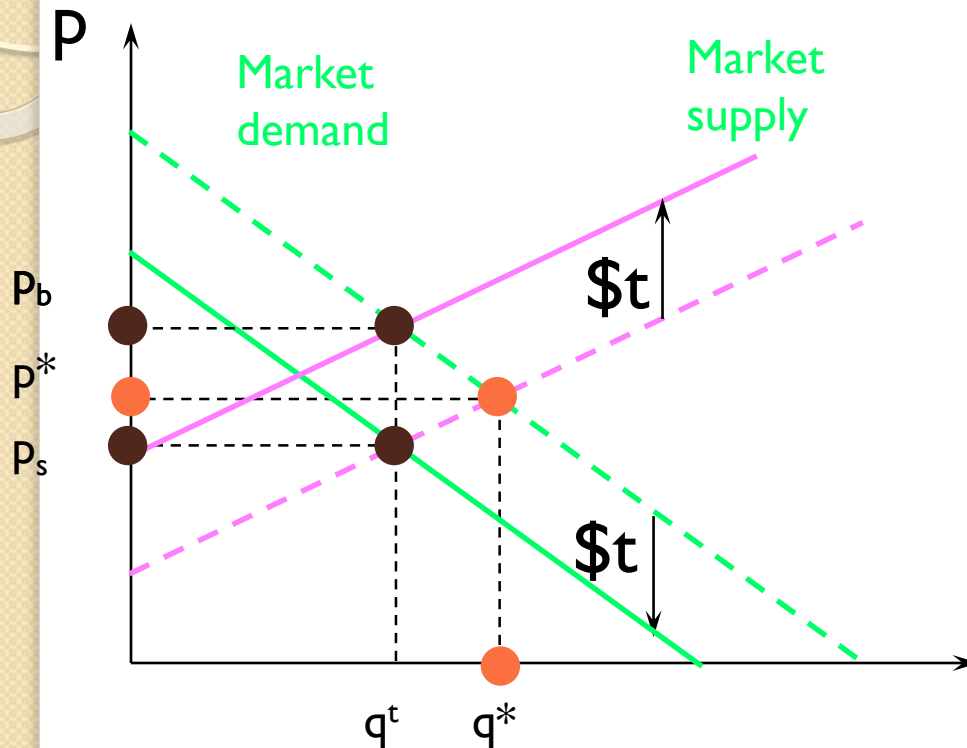


An sales tax lowers the market demand curve by  $\$t$ , lowers the sellers' price and reduces the quantity traded.

And buyers pay  $p_b = p_s + t$ .



# Quantity Taxes & Market Equilibrium

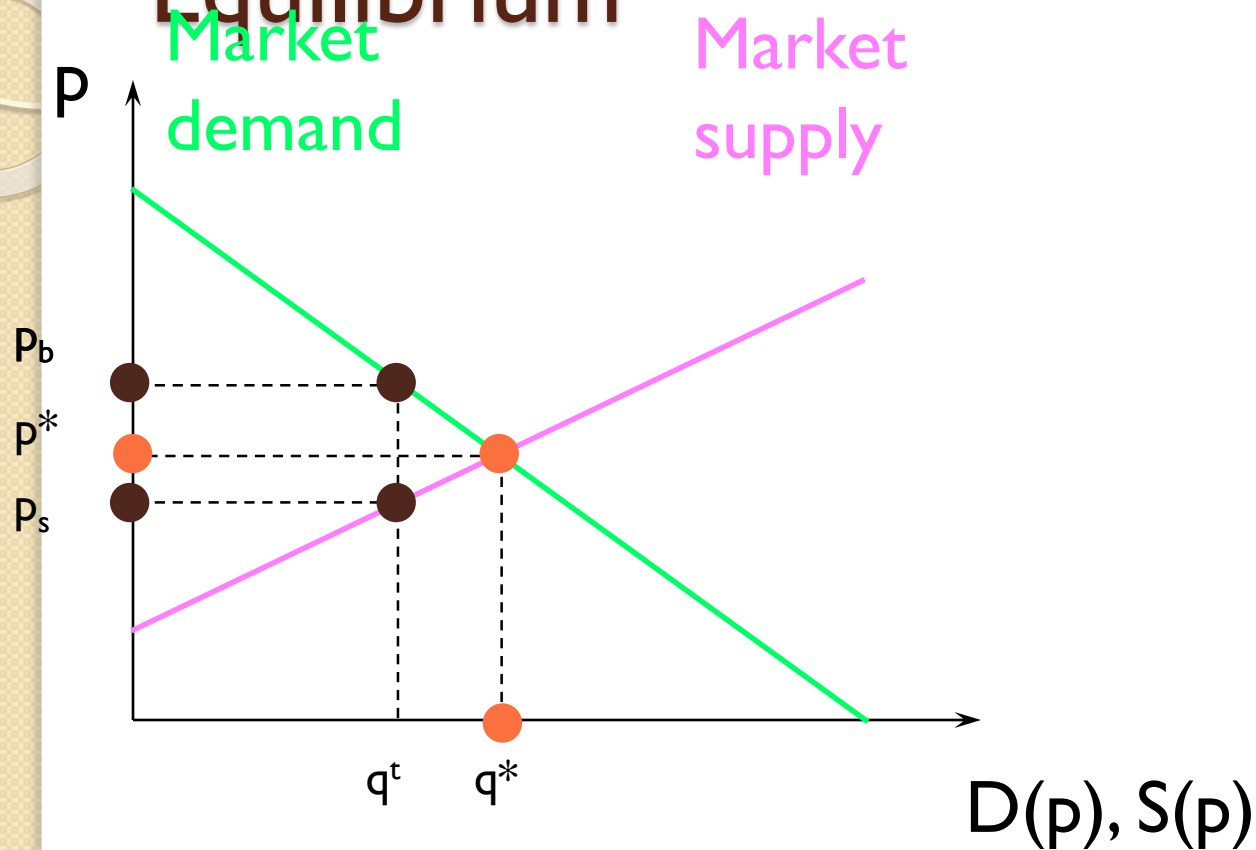


A sales tax levied at rate  $\$t$  has the same effects on the market's equilibrium as does an excise tax levied at rate  $\$t$ .

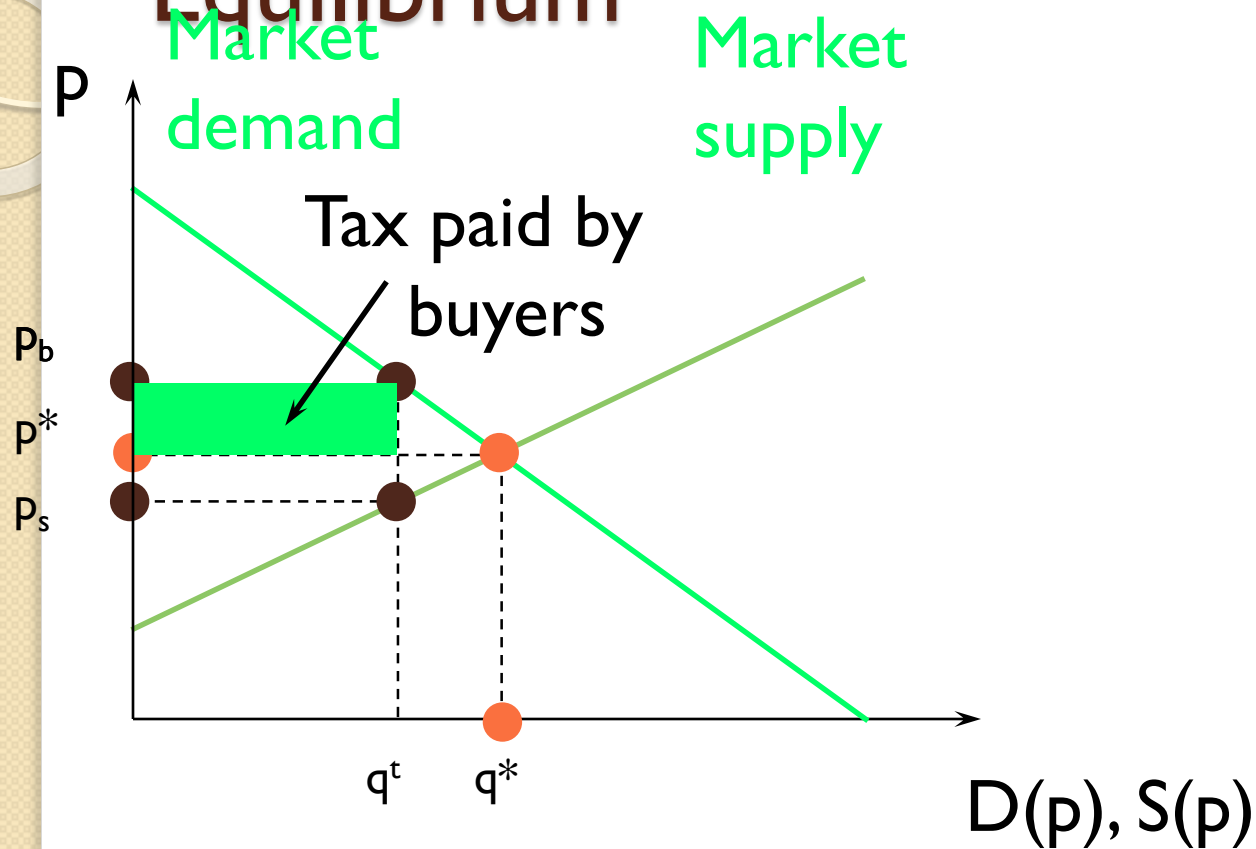
# Quantity Taxes & Market Equilibrium

- Who pays the tax of  $\$t$  per unit traded?
- The division of the  $\$t$  between buyers and sellers is the **incidence** of the tax
- The incidence of a quantity tax depends upon the own-price elasticities of demand and supply

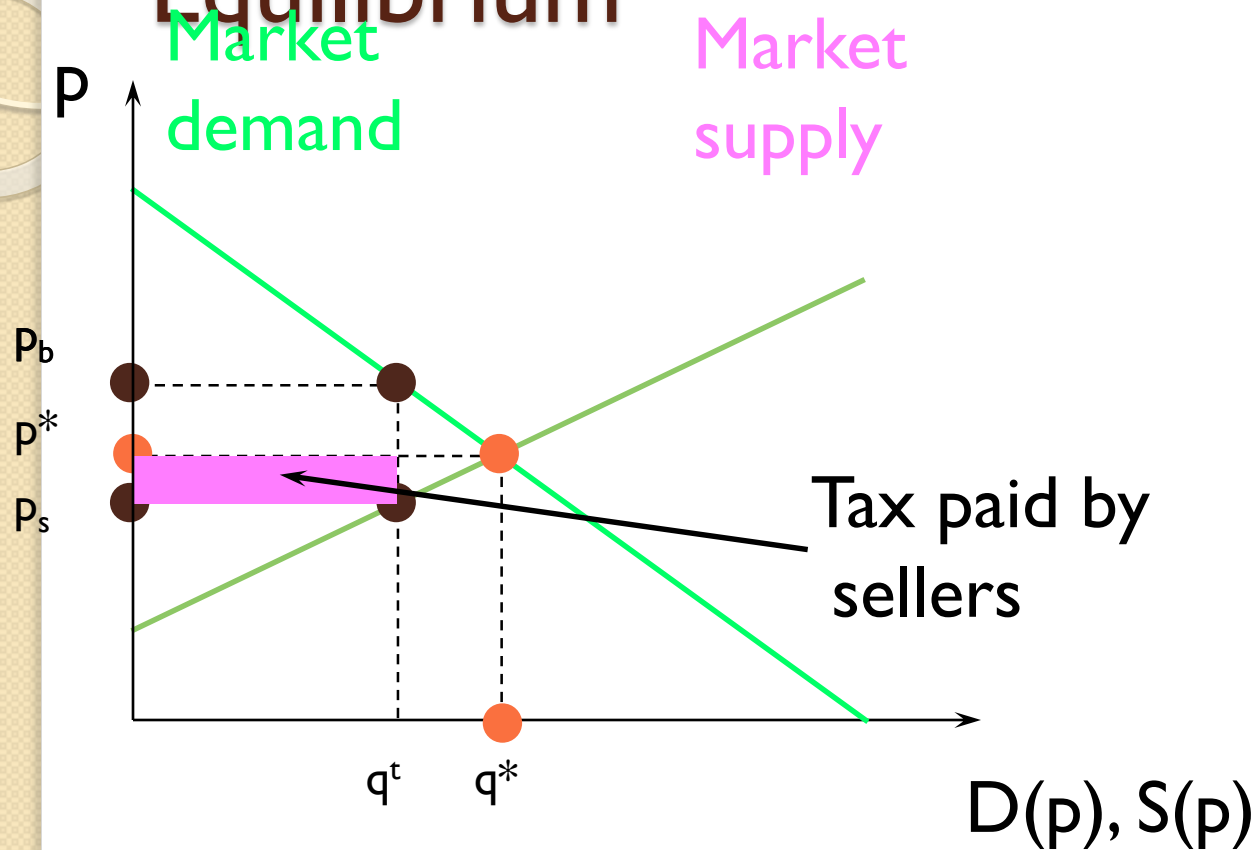
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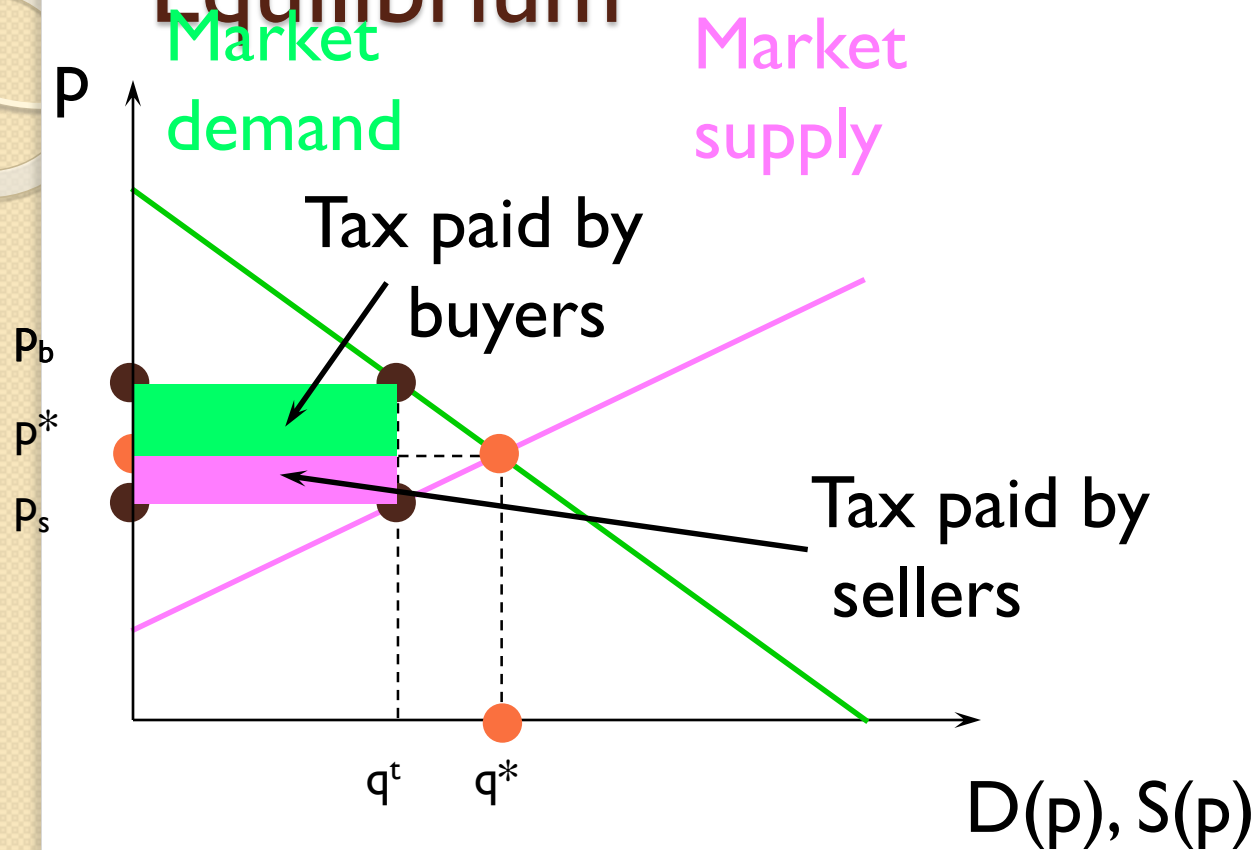
# Quantity Taxes & Market Equilibrium



# Quantity Taxes & Market Equilibrium



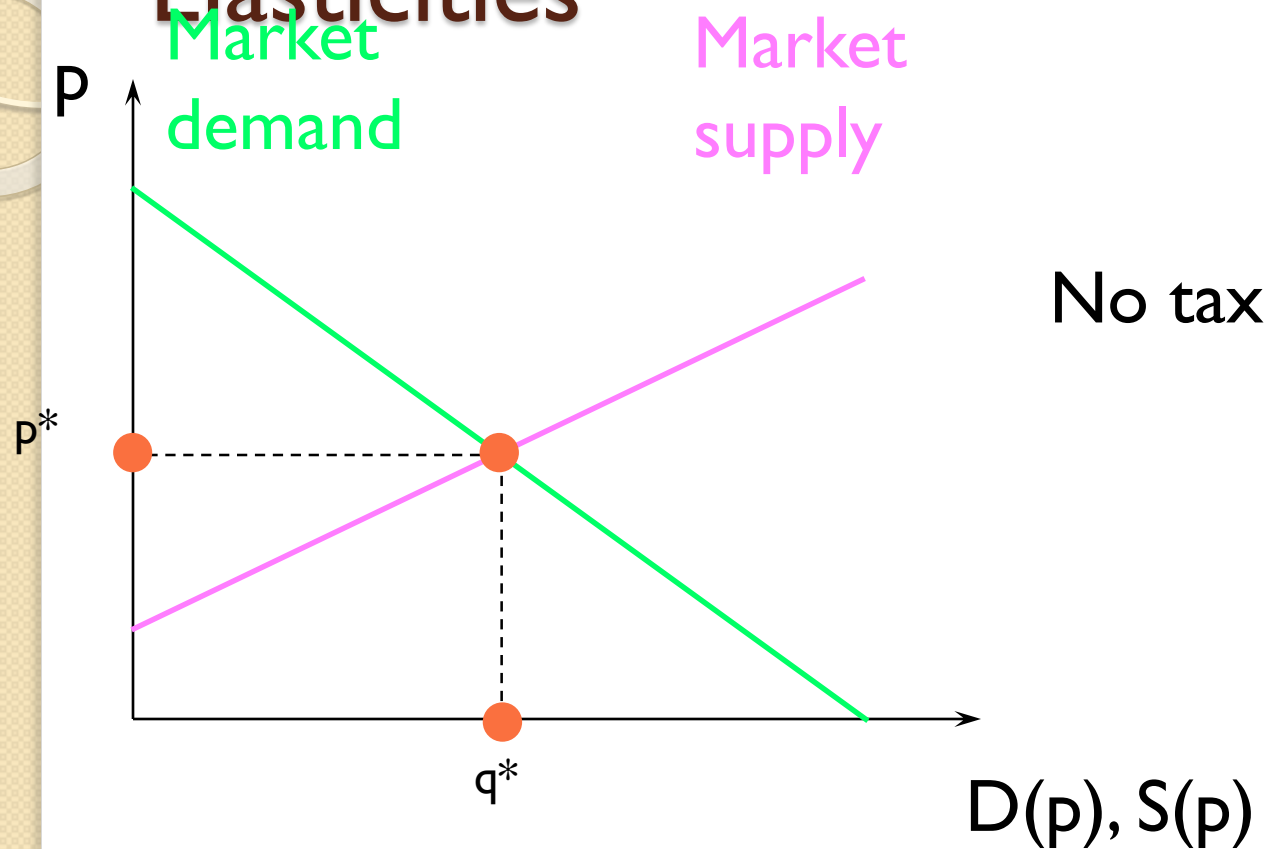
# Quantity Taxes & Market Equilibrium



# Deadweight Loss and Own-Price Elasticities

- A quantity tax imposed on a competitive market reduces the quantity traded and so reduces gains-to-trade (*i.e.* the sum of Consumers' and Producers' Surpluses).
- The lost total surplus is the tax's deadweight loss, or excess burden.

# Deadweight Loss and Own-Price Elasticities

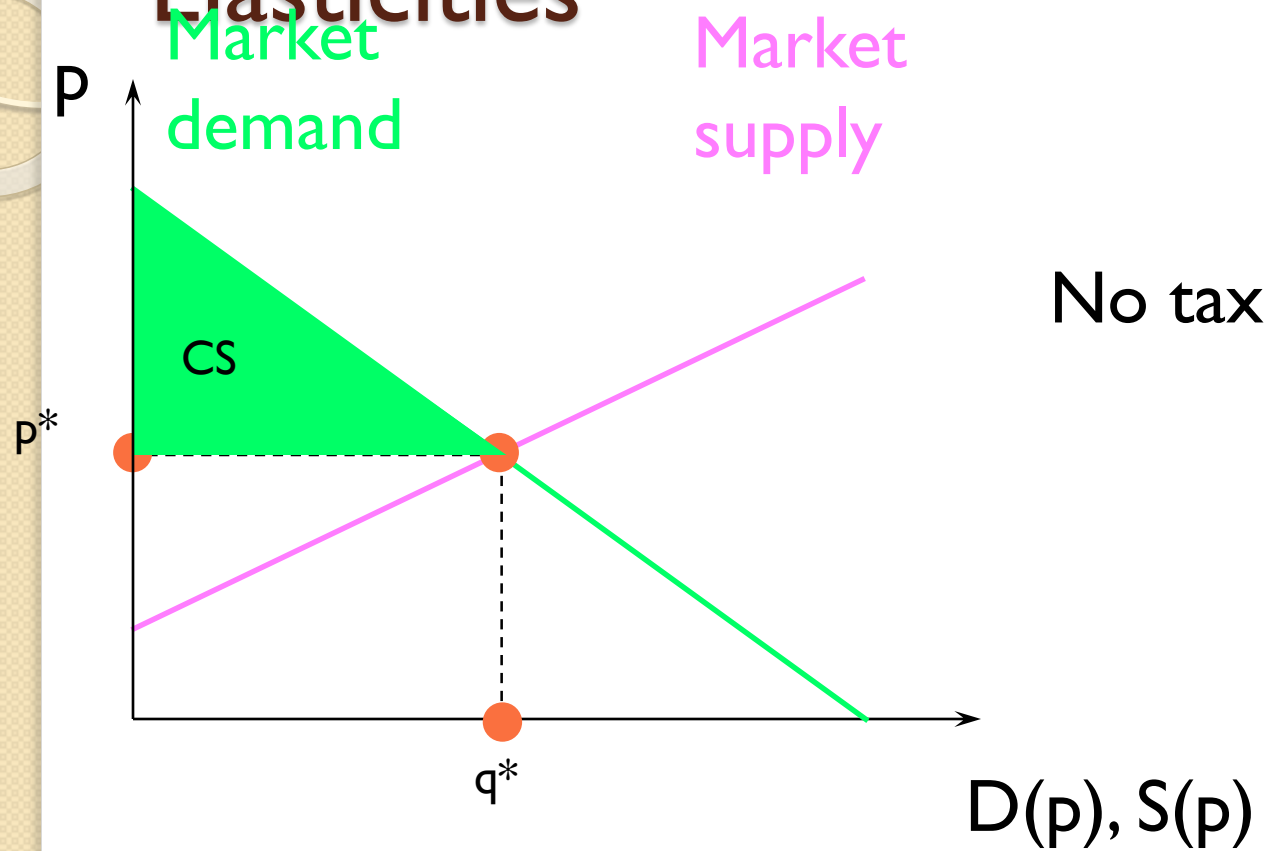




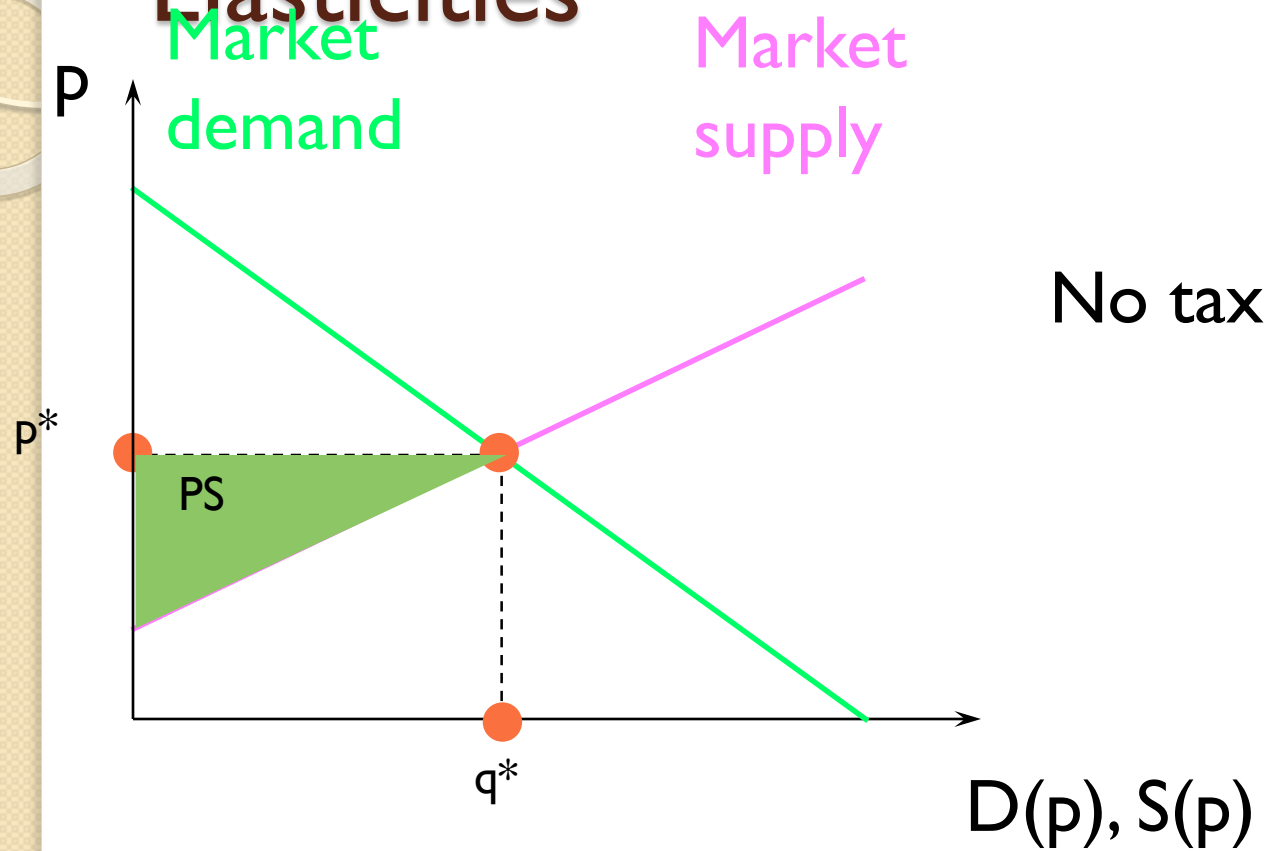
# Pareto Efficiency

- At the market equilibrium  $q^*$  we have a Pareto efficient outcome: at  $q^*$ , the willingness to pay for an extra unit is just equal to the willingness to supply an extra unit at that price
- $Q^*$  maximizes the social welfare (CS+PS)

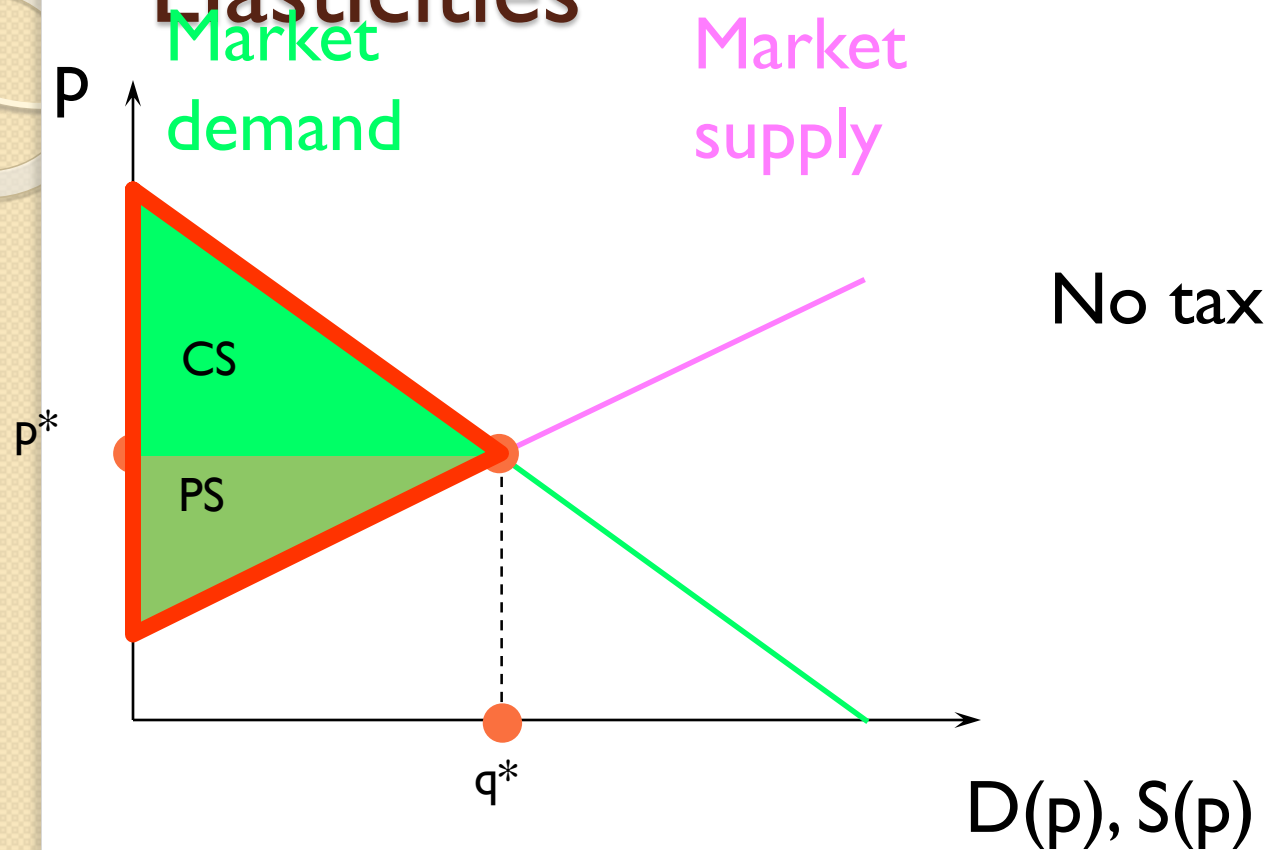
# Deadweight Loss and Own-Price Elasticities



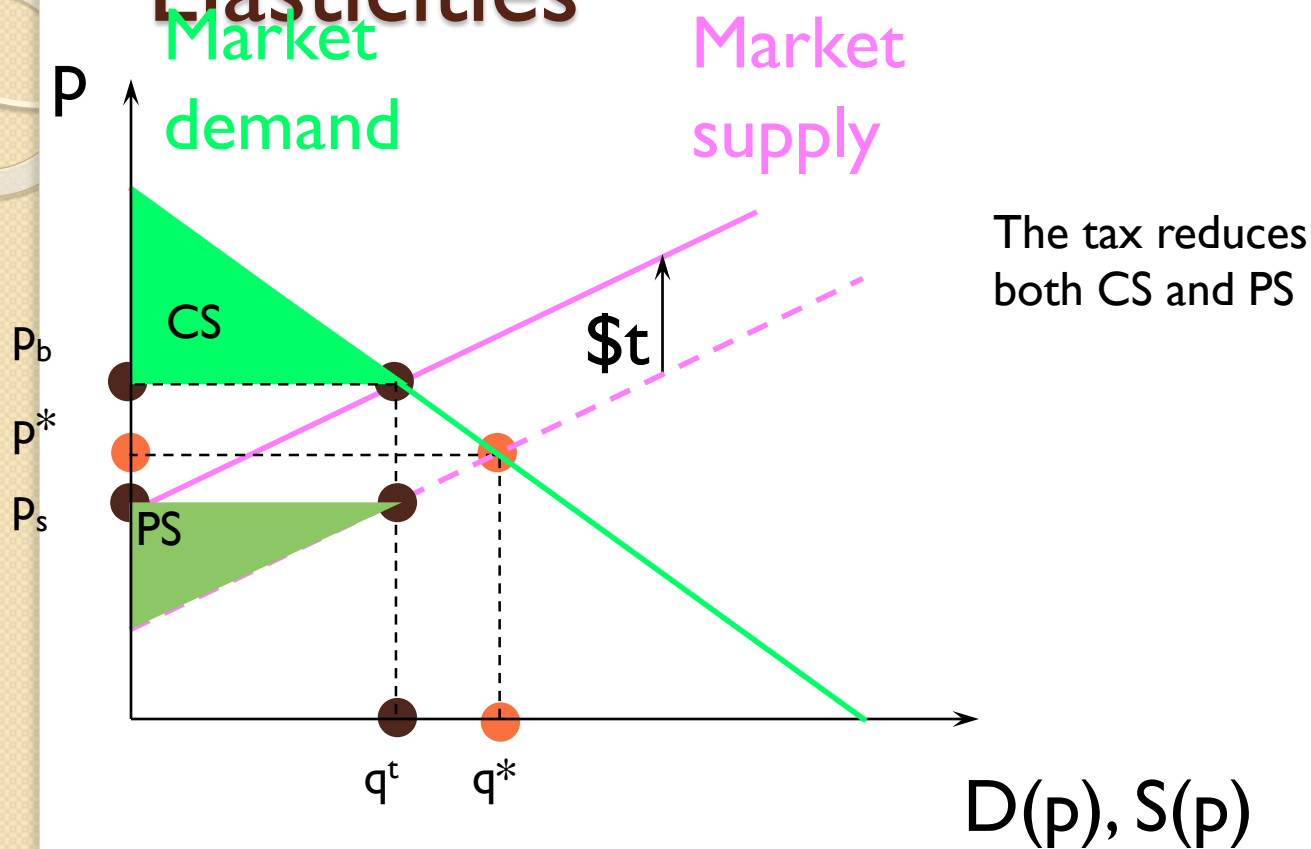
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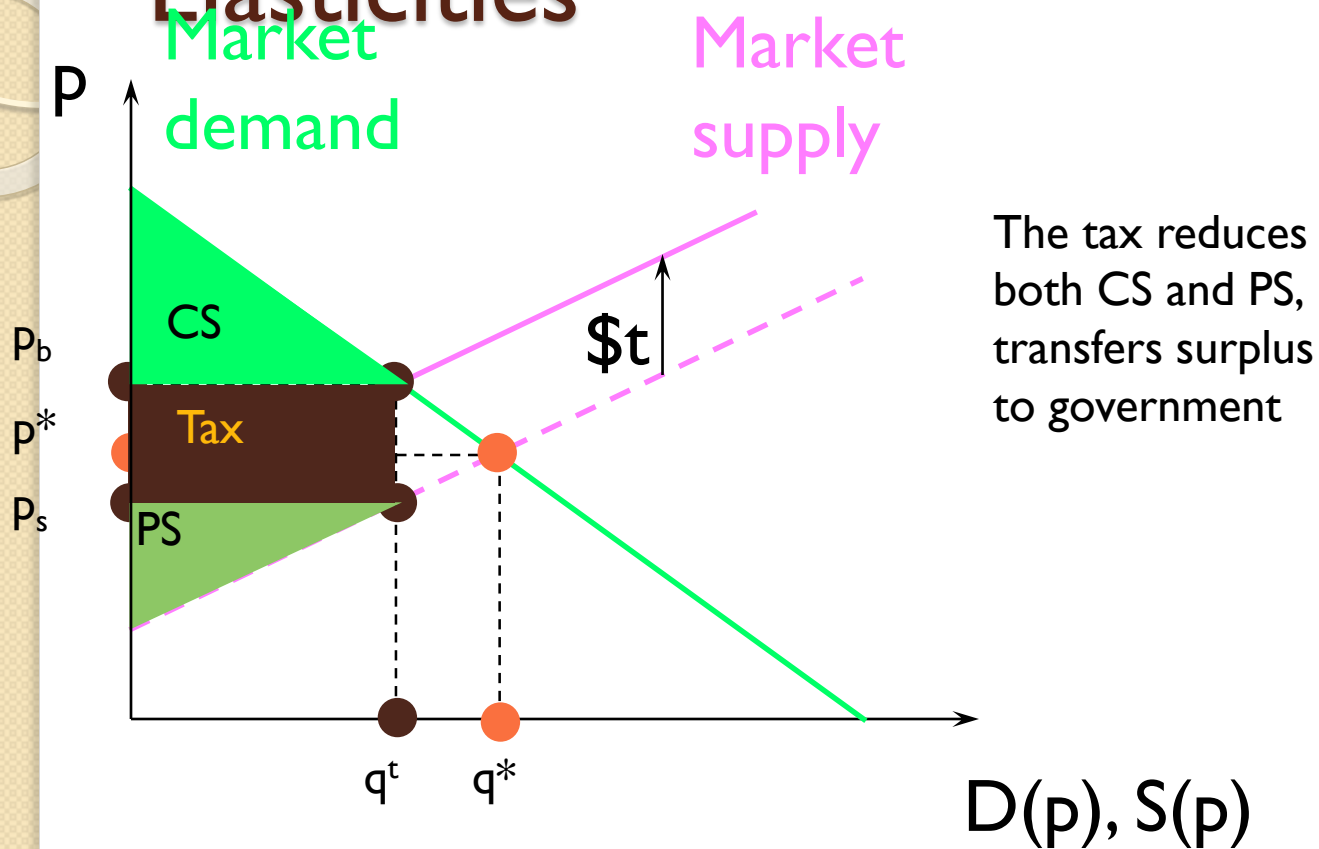
# Deadweight Loss and Own-Price Elasticities



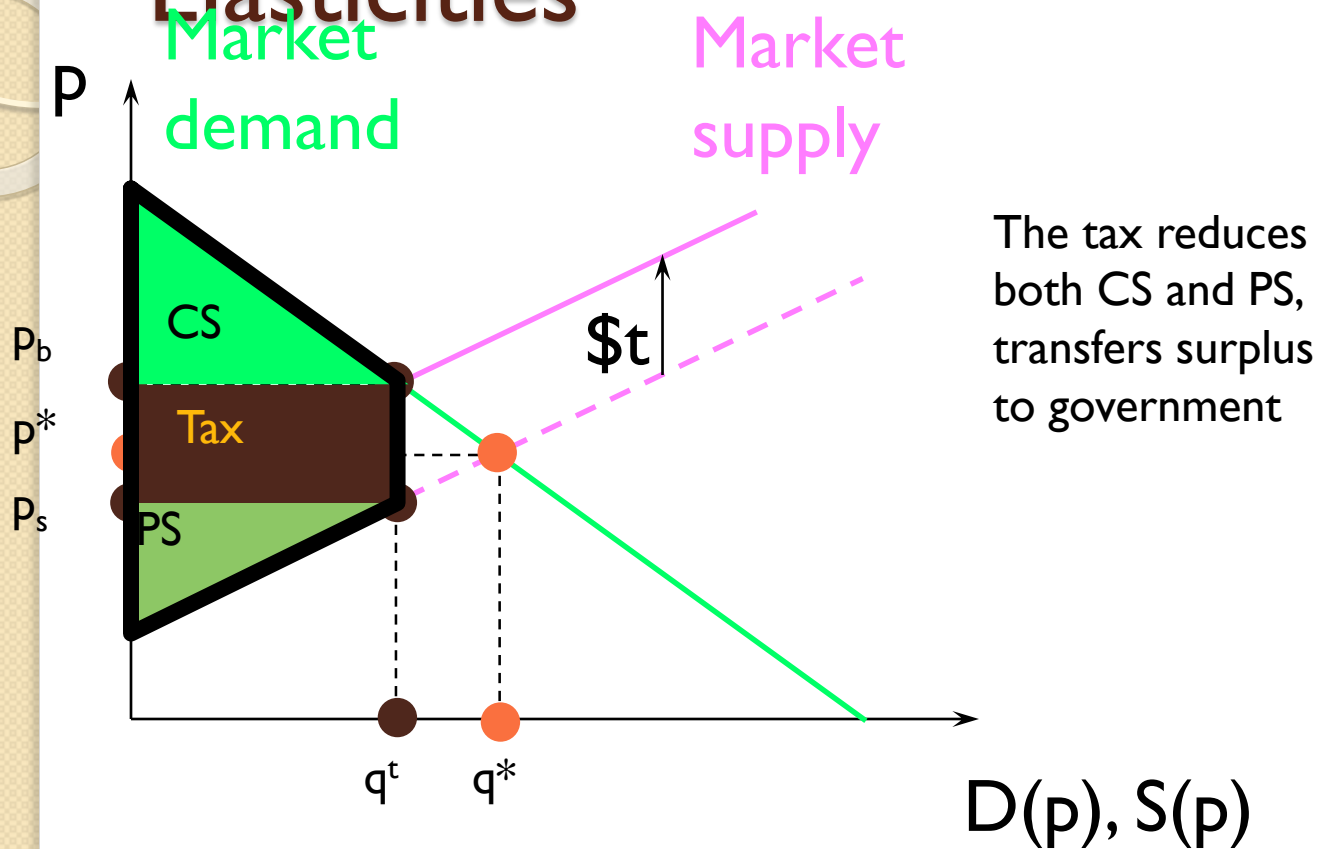
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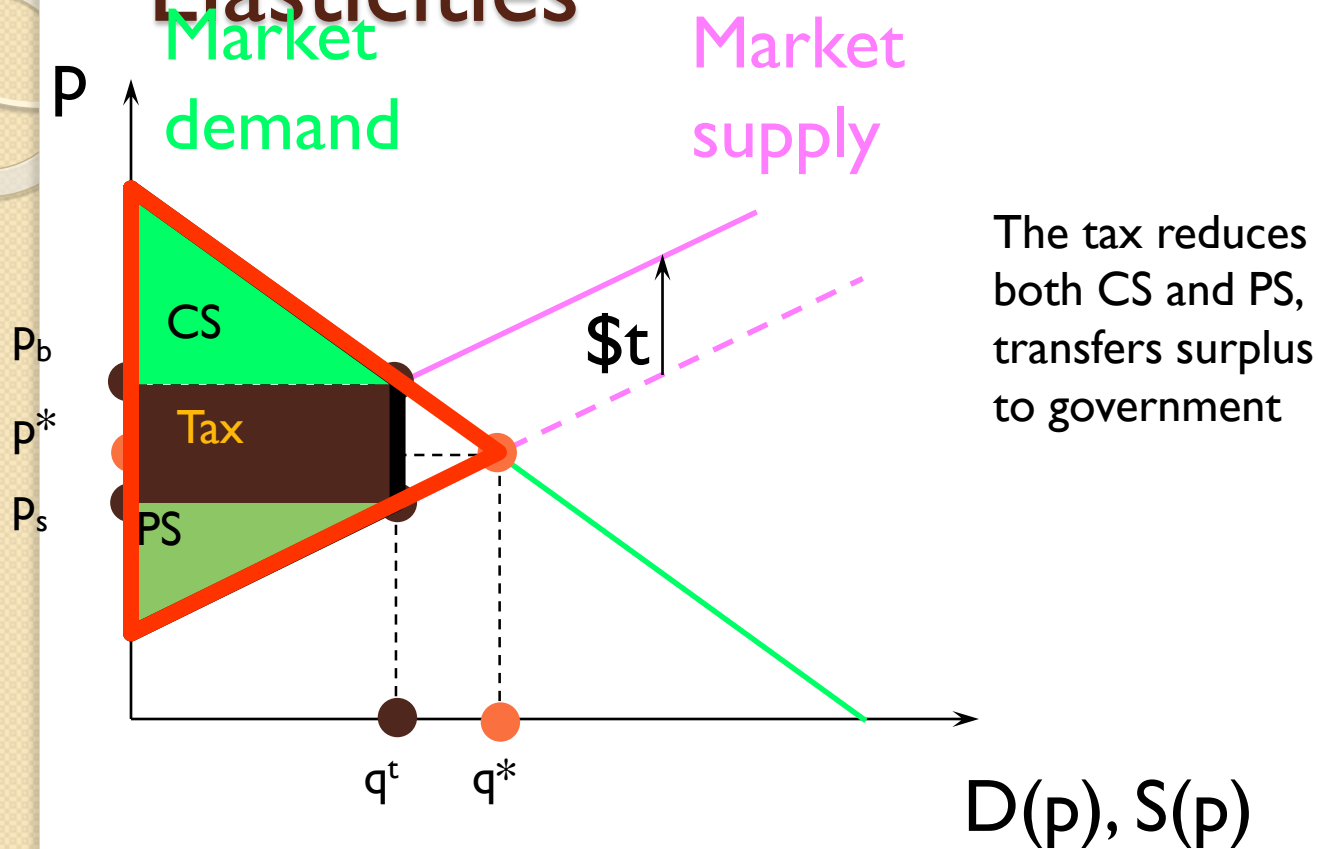
# Deadweight Loss and Own-Price Elasticities



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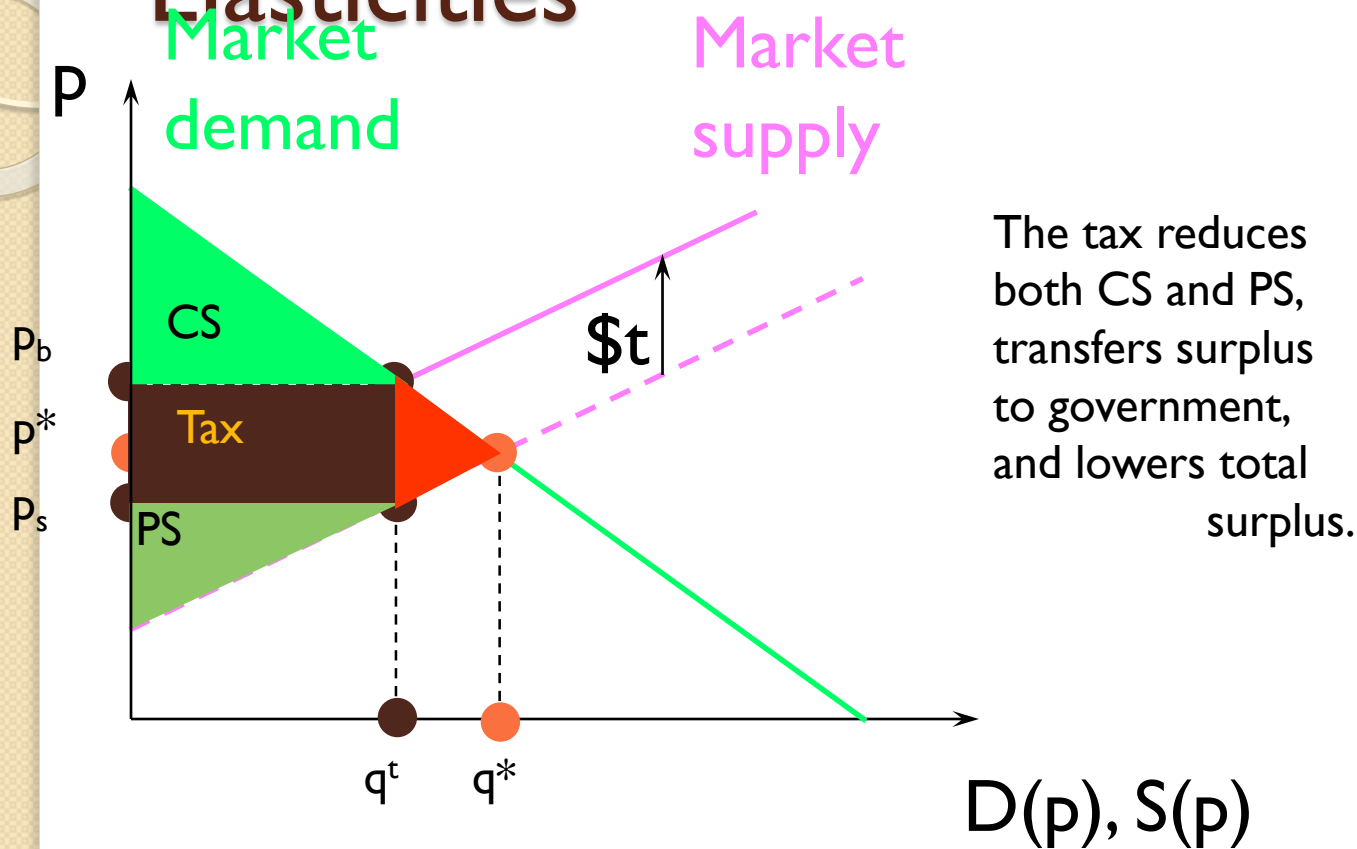


# Deadweight Loss and Own-Price Elasticities

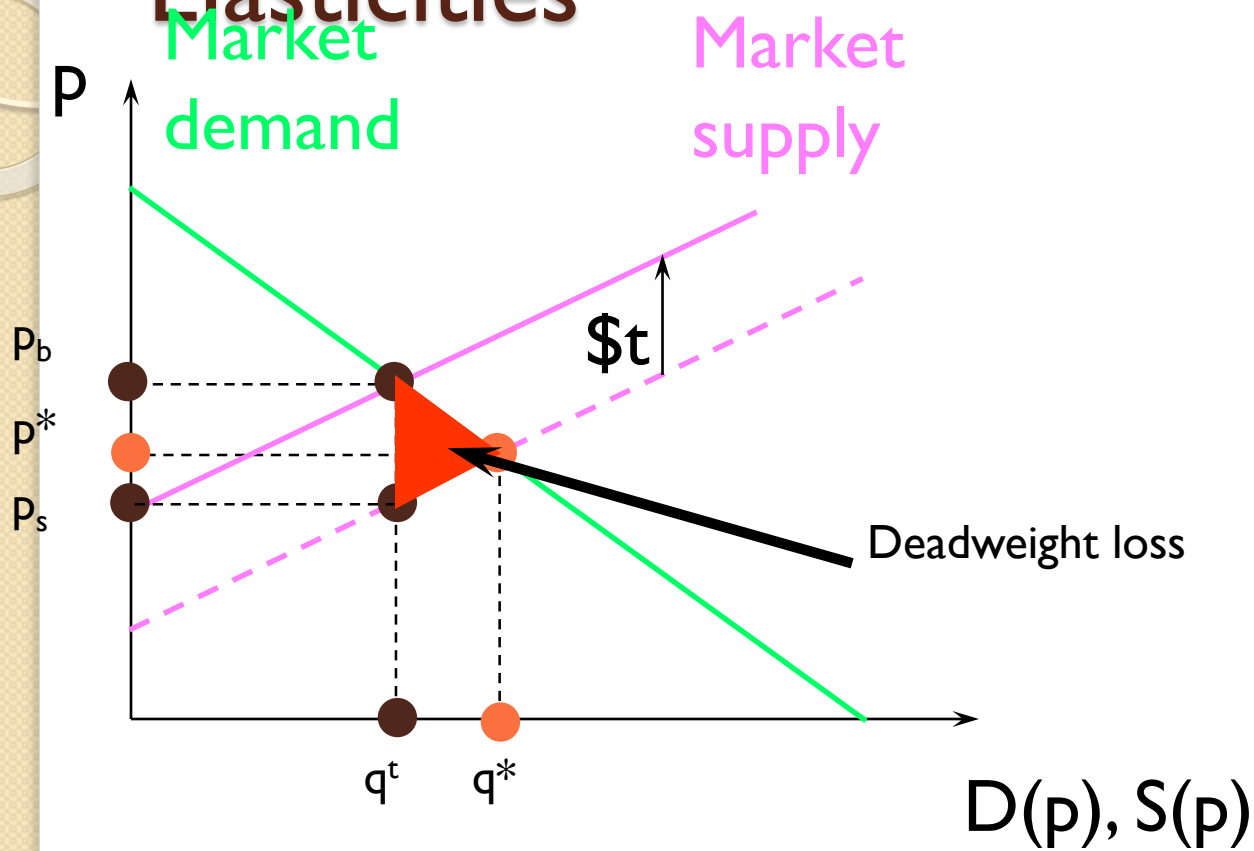




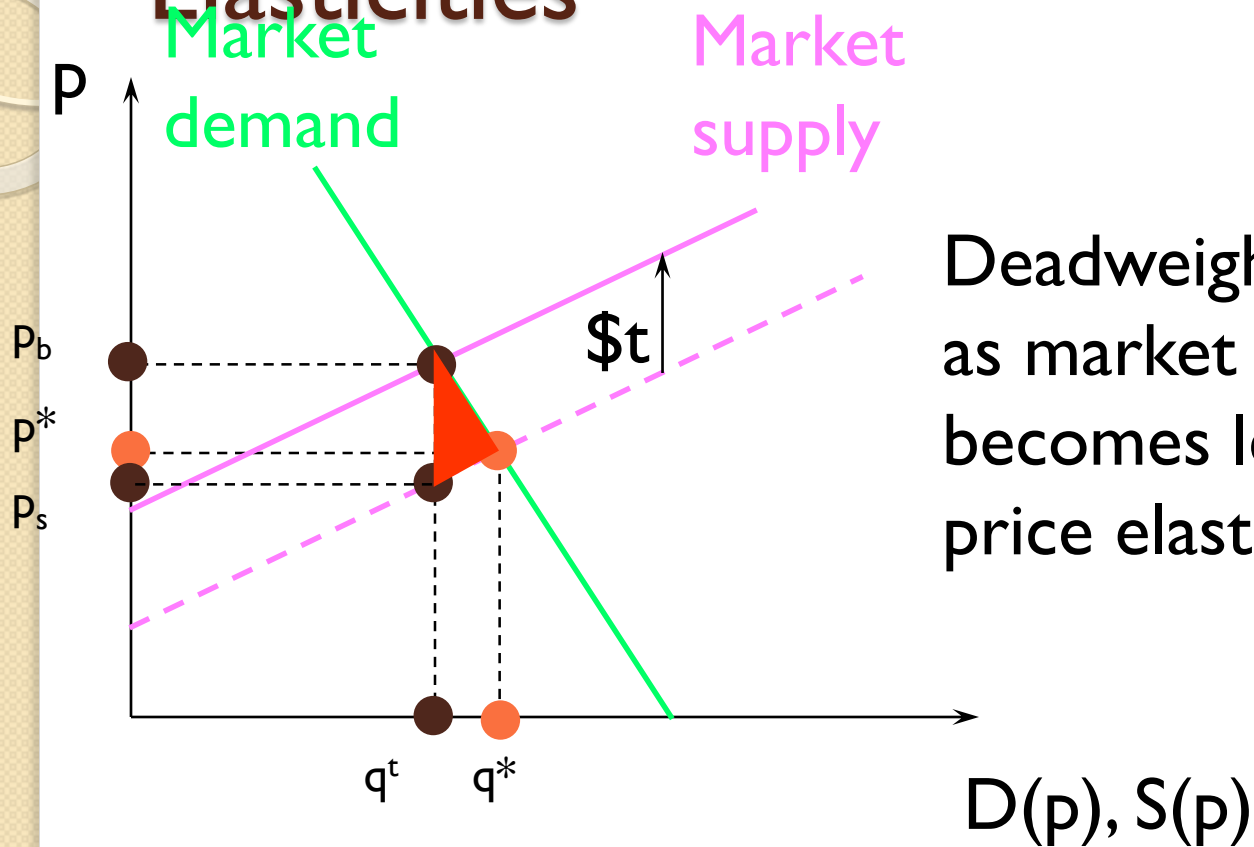
# Deadweight Loss and Own-Price Elasticities



# Deadweight Loss and Own-Price Elasticities

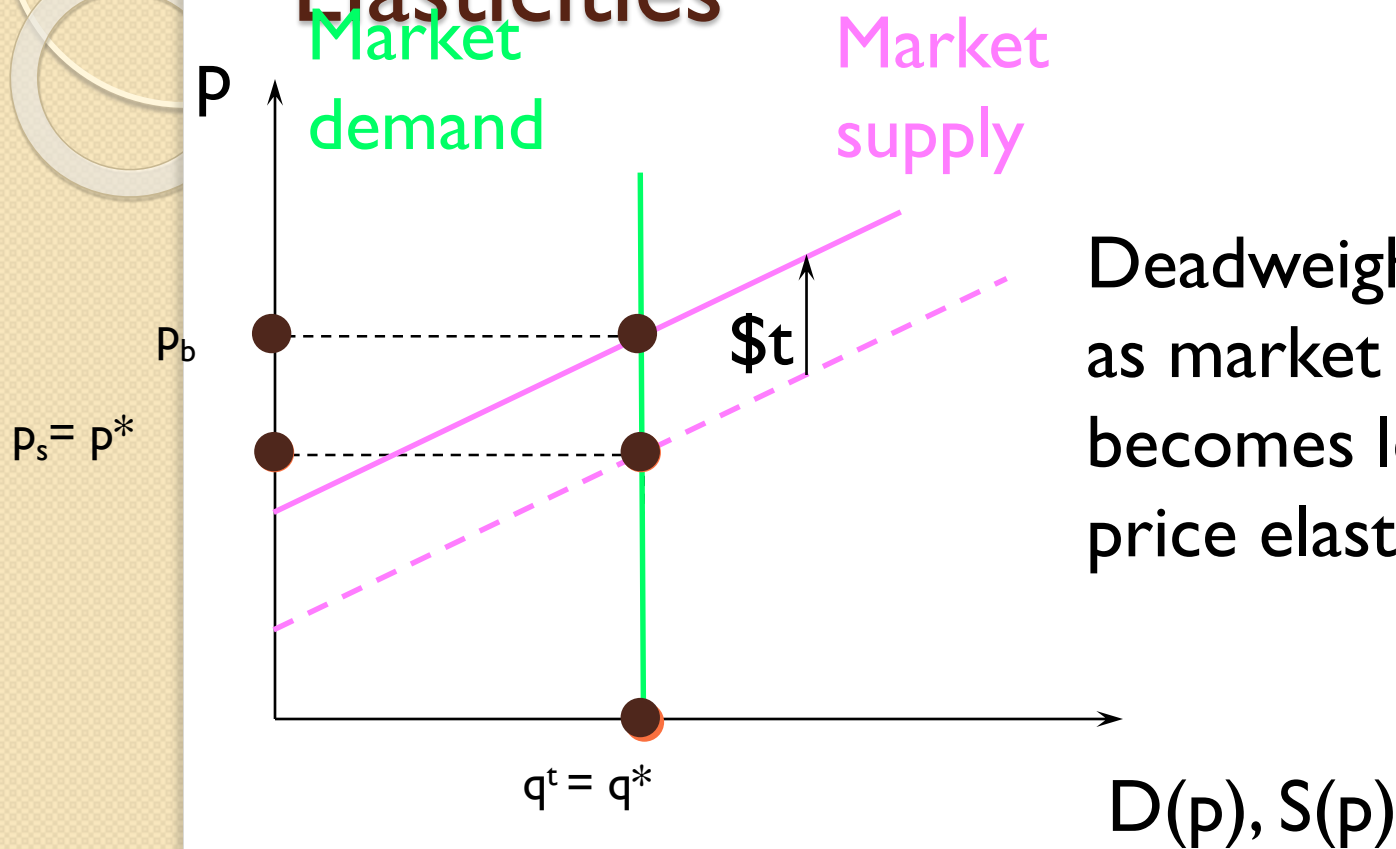


# Deadweight Loss and Own-Price Elasticities



Deadweight loss falls as market demand becomes less own-price elastic.

# Deadweight Loss and Own-Price Elasticities



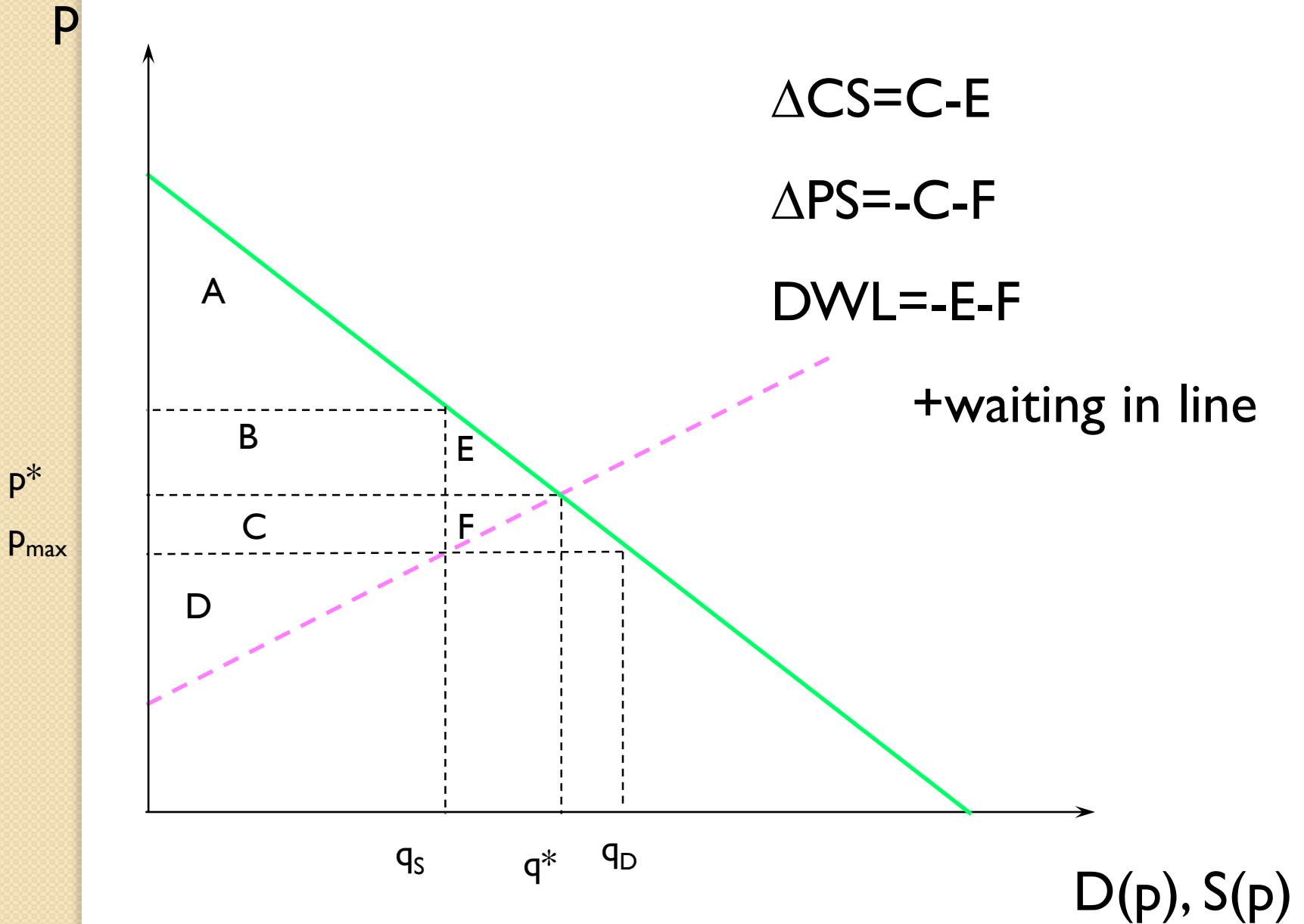
Deadweight loss falls as market demand becomes less own-price elastic.

When  $\varepsilon_D = 0$ , the tax causes no deadweight loss.

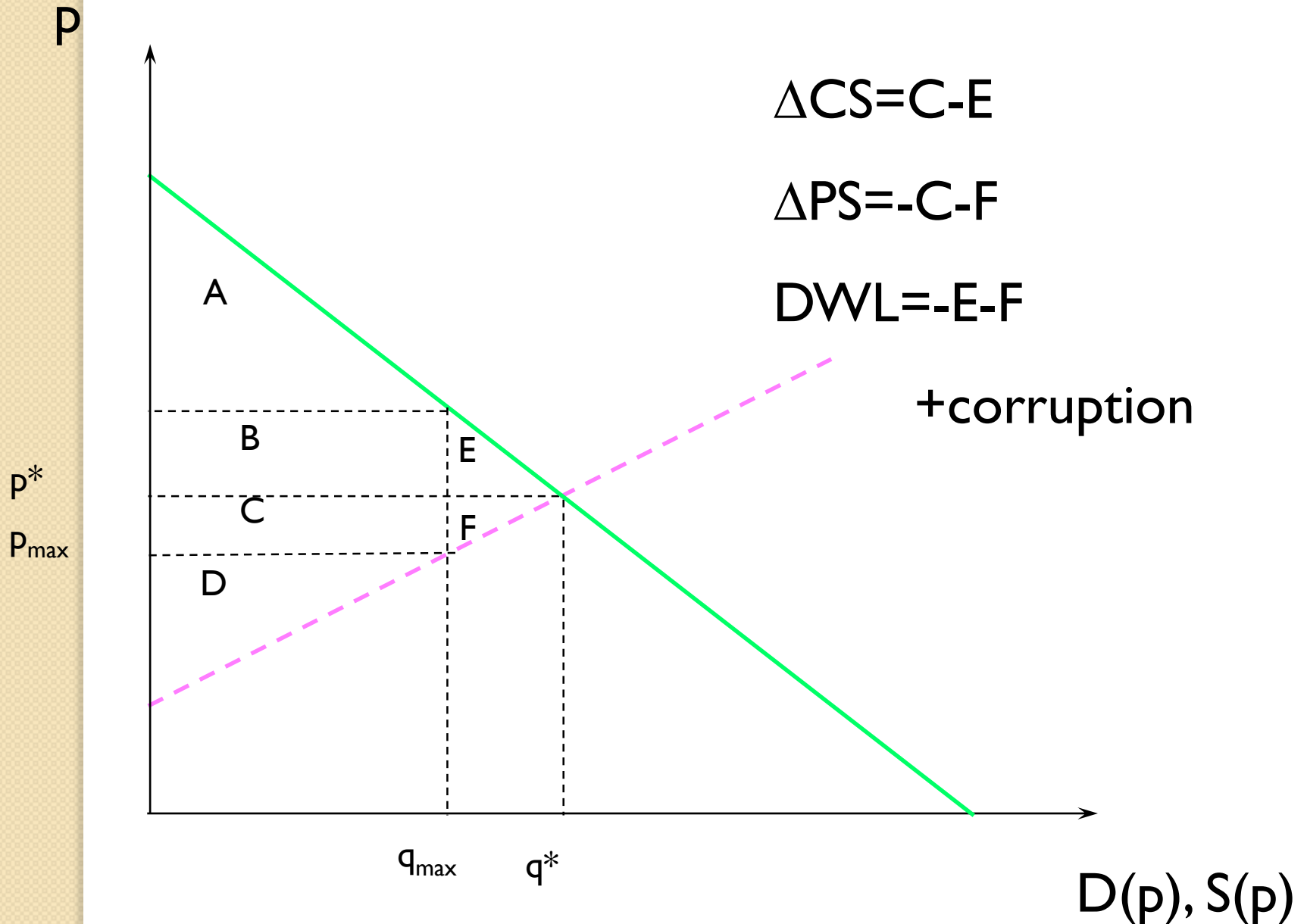
# Deadweight Loss and Own-Price Elasticities

- Deadweight loss due to a quantity tax rises as either market demand or market supply becomes more own-price elastic.
- If either  $\varepsilon_D = 0$  or  $\varepsilon_S = 0$  then the deadweight loss is zero.

# Price control



# Price control with rationing



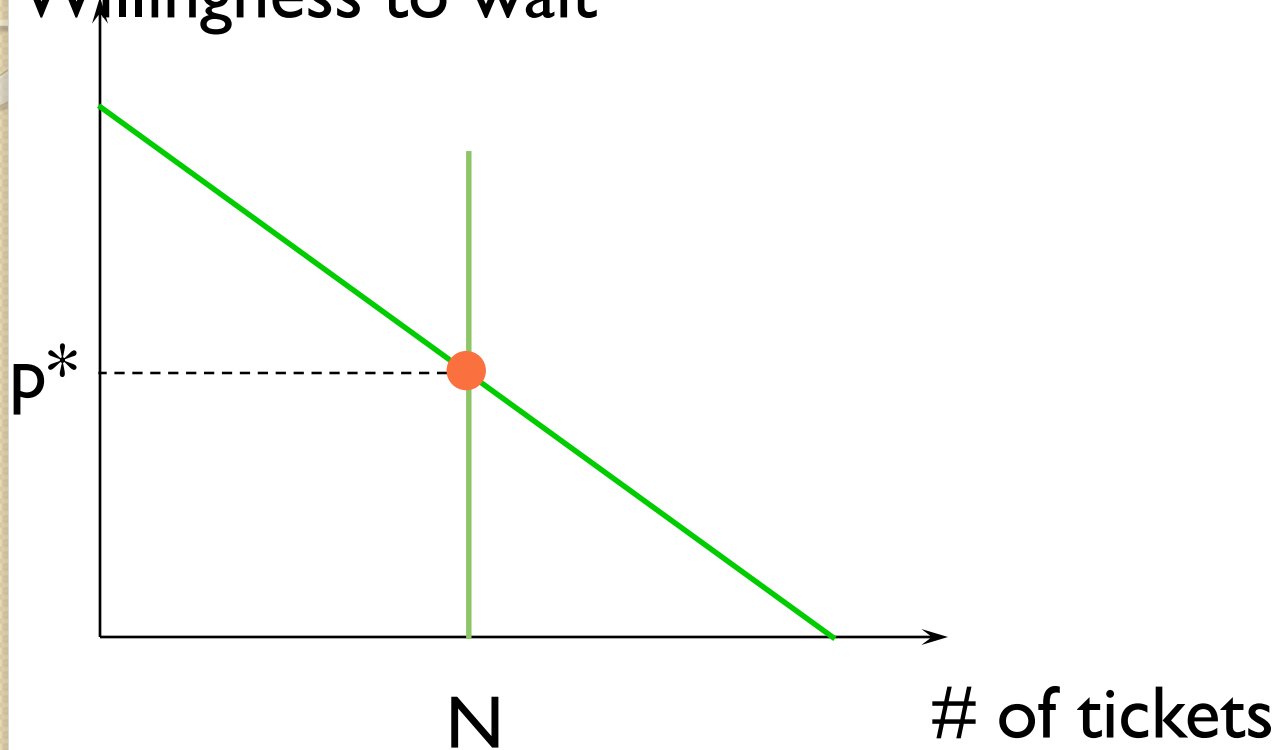
# Application: Waiting in Line

- Waiting in line is an alternative (non-market) way of allocating scarce resources
- Is it efficient compared to market mechanism?
- Suppose there is a championship basketball game and tickets are free but limited
- The tickets will be distributed according to the principle of “first-come-first served”
- Willingness to pay vs. willingness to wait



# Waiting in Line

Willingness to wait



# Why is it so different?

- Waiting time is a private cost and provides no benefits to suppliers
- Waiting time is a pure deadweight loss
- Allocation by waiting time will leave room for ***gain from trade***
- Market price measures both private cost and social benefit
- Market mechanism assures that scarce resources are allocated to most-productive uses

# Announcement

- Problem Set 3, due on May 14
- Chapter\_7\_8\_new



# Chapter 10

## Market Power: Monopoly and Monopsony

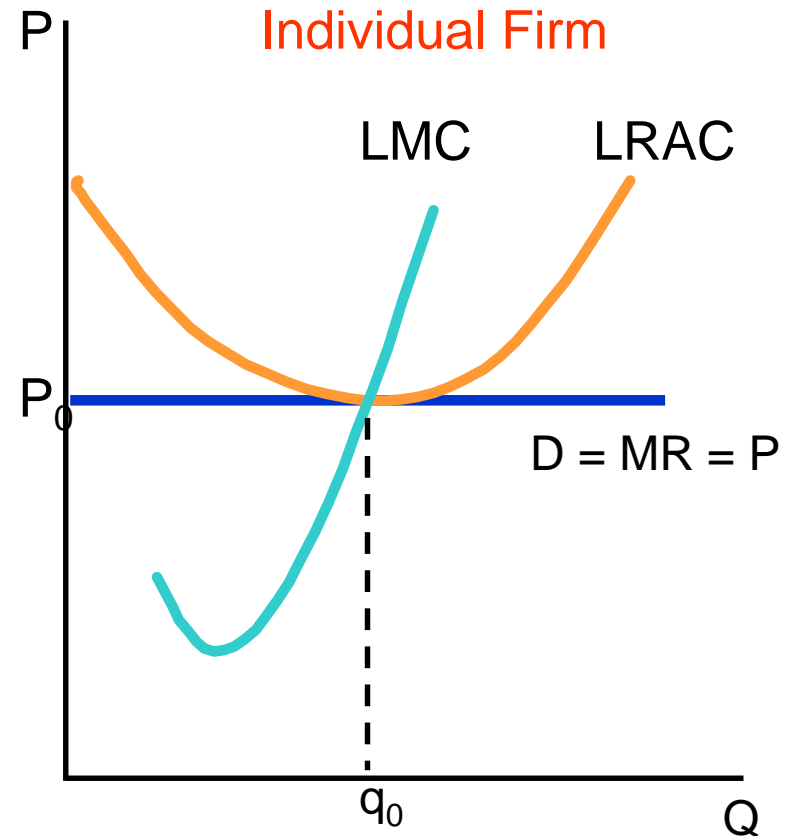
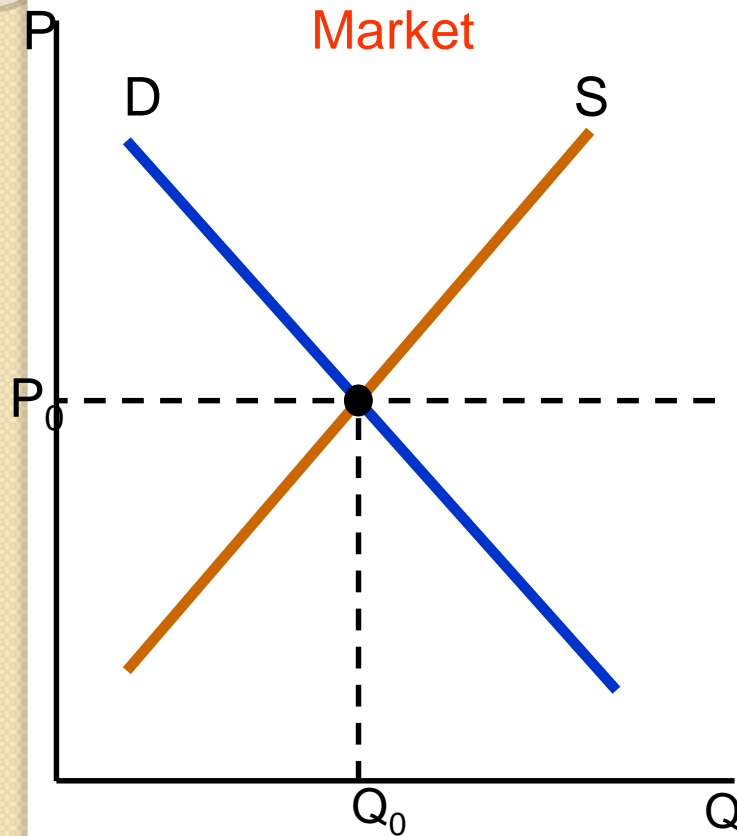
# Topics to be Discussed

- Monopoly and Monopoly Power
- Sources of Monopoly Power
- The Social Costs of Monopoly Power
- Monopsony and Monopsony Power
- Limiting Market Power: The Antitrust Laws

# Review of Perfect Competition

- $P = MC = AC$
- Normal profits or zero economic profits in the long run
- Large number of buyers and sellers
- Homogenous product
- Perfect information
- Firm is a price taker

# Review of Perfect Competition



# Monopoly

- Monopoly
  1. One seller - many buyers
  2. One product (no good substitutes)
  3. Barriers to entry
  4. Price Maker



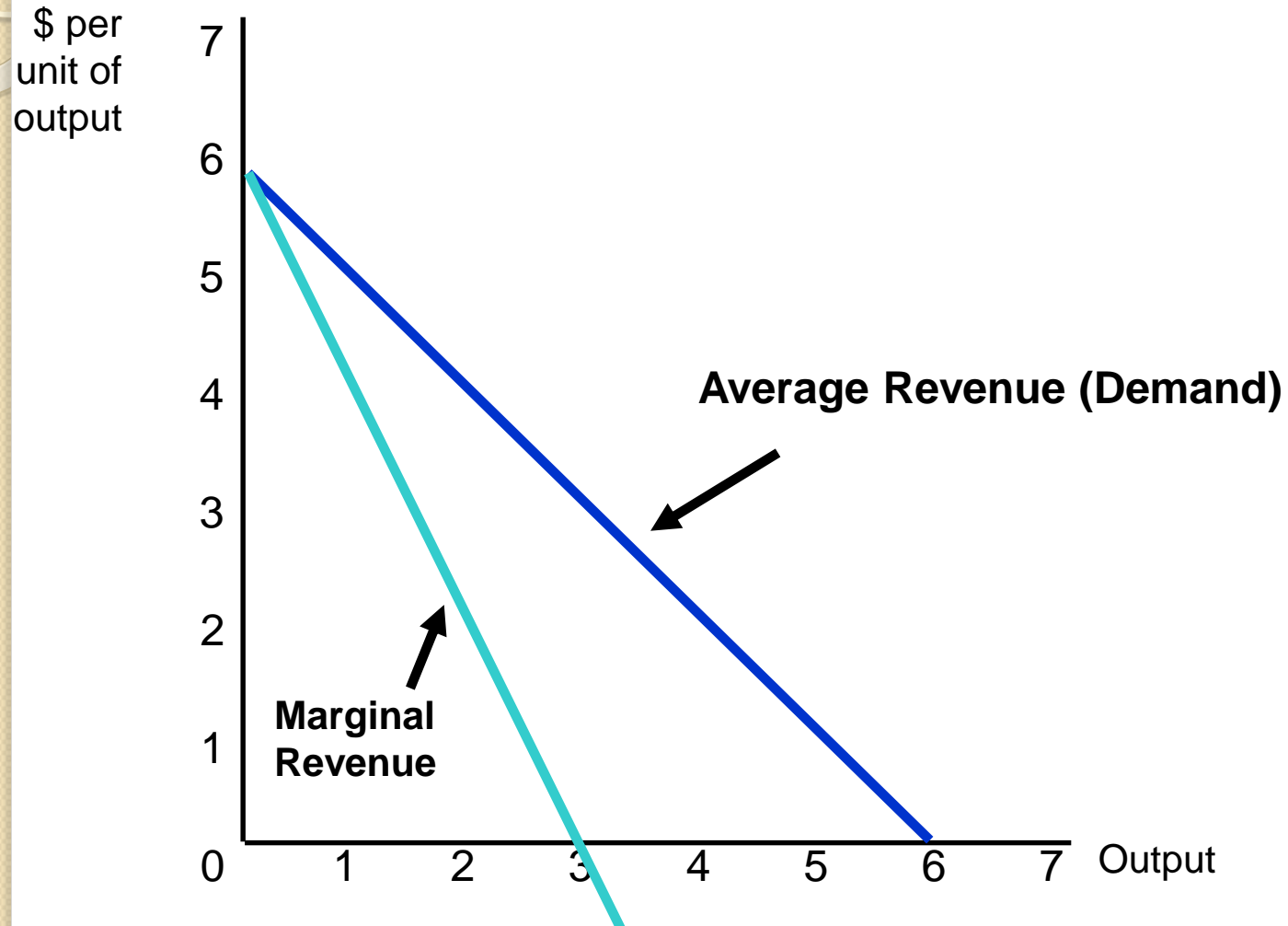
# Monopoly

- The monopolist is the supply-side of the market and has complete control over the amount offered for sale
- Monopolist controls price but must consider consumer demand
- Profits will be maximized at the level of output where marginal revenue equals marginal cost

# Average and Marginal Revenue

- The monopolist's **average revenue**, price received per unit sold, is the market demand curve
- Monopolist also needs to find **marginal revenue**, change in revenue resulting from a unit change in output
- MR is generally lower than AR. Why?

# Average and Marginal Revenue

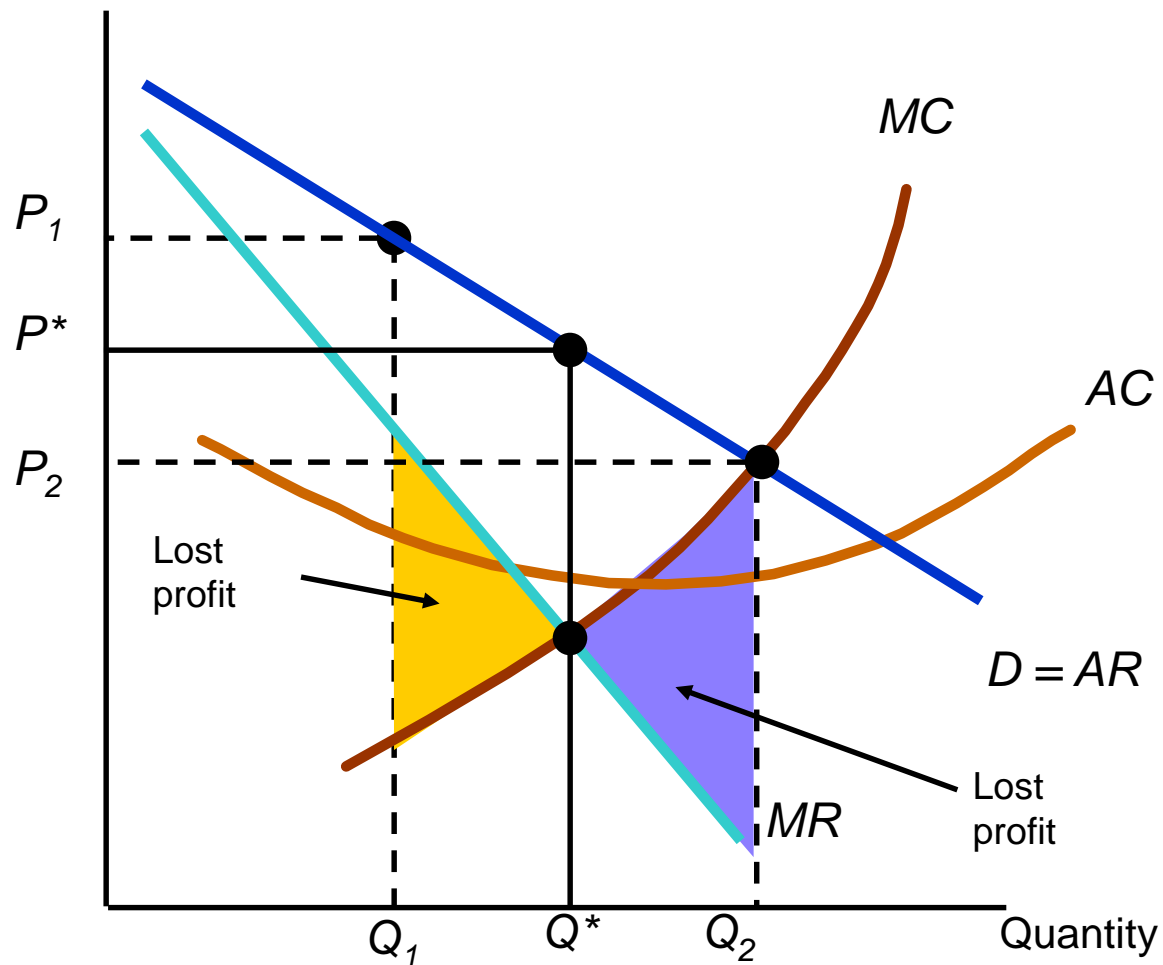


# Monopoly

- Observations
  1. To increase sales the price must fall
  2.  $MR < P$
  3. Compared to perfect competition
    - No change in price to change sales
    - $MR = P$

# Monopolist's Output Decision

\$ per  
unit of  
output



# Monopoly: An Example

$$\textit{Cost} = C(Q) = 50 + Q^2$$

$$MC = \frac{\Delta C}{\Delta Q} = 2Q$$

$$\textit{Demand} : P(Q) = 40 - Q$$

$$R(Q) = P(Q)Q = 40Q - Q^2$$

$$MR = \frac{\Delta R}{\Delta Q} = 40 - 2Q$$

# Monopoly: An Example

$$MC = MR$$

$$2Q = 40 - 2Q$$

$$4Q = 40$$

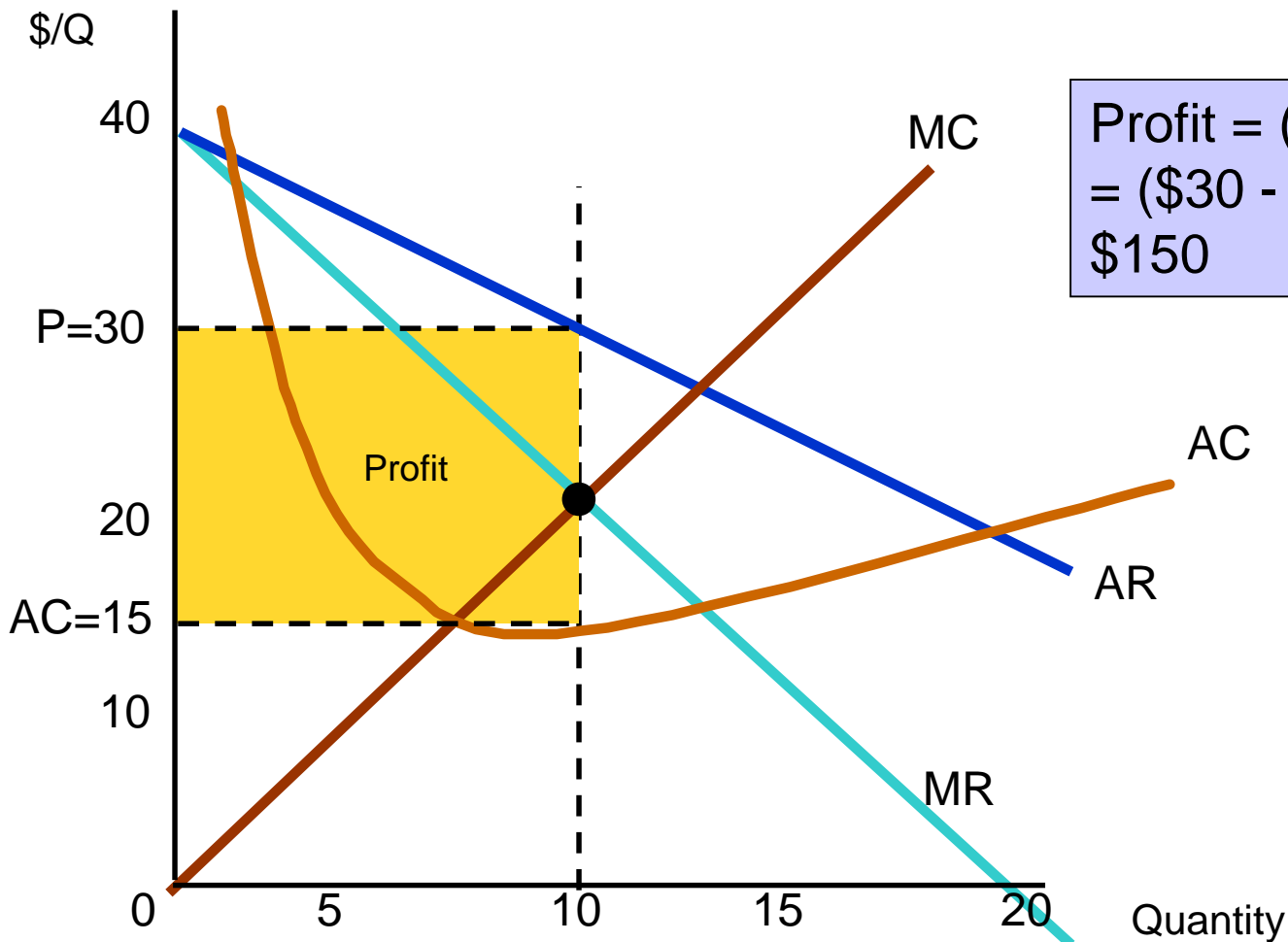
$$Q = 10$$

$$P(Q) = 40 - Q$$

$$P(Q) = 40 - 10$$

$$P(Q) = 30$$

# Example of Profit Maximization



$$\begin{aligned}\text{Profit} &= (P - AC) \times Q \\ &= (\$30 - \$15)(10) = \\ &= \$150\end{aligned}$$



# Monopoly

- A Rule of Thumb for Pricing
  - We want to translate the condition that marginal revenue should equal marginal cost into a rule of thumb that can be more easily applied in practice
  - Looking at Marginal Revenue we can see that it has two components

# A Rule of Thumb for Pricing

$$1. \textbf{MR} = \frac{\Delta \textbf{R}}{\Delta \textbf{Q}} = \frac{\Delta(\textbf{PQ})}{\Delta \textbf{Q}}$$

- Producing one more unit brings in revenue  $(1)(P) = P$
- With downward sloping demand, producing and selling one more unit results in small drop in price  $\Delta P/\Delta Q$ 
  - Reduces revenue from all units sold, change in revenue:  $Q(\Delta P/\Delta Q)$

# A Rule of Thumb for Pricing

$$MR = P(Q) + P'(Q)Q$$

$$MR = P(Q) \left[ 1 + \frac{1}{E_d} \right]$$

# A Rule of Thumb for Pricing

$\pi$  is maximized where  $MR = MC$

$$P + P \left[ \frac{1}{E_D} \right] = MC$$

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

$$P = \frac{MC}{1 + (1/E_D)}$$

# A Rule of Thumb for Pricing

- $(P - MC)/P$  is the markup over MC as a percentage of price
- The markup should equal the inverse of the elasticity of demand
- Price is expressed directly as the markup over marginal cost

# A Rule of Thumb for Pricing

$$9. P = \frac{MC}{1 + \left( \frac{1}{E_d} \right)}$$

*Assume*

$$E_d = -4 \quad MC = 9$$

$$P = \frac{9}{1 + \left( \frac{1}{-4} \right)} = \frac{9}{.75} = \$12$$

# Monopoly

- Monopoly pricing compared to perfect competition pricing:
  - Monopoly
    - $P > MC$
    - Price is larger than MC by an amount that depends inversely on the elasticity of demand
  - Perfect Competition
    - $P = MC$
    - Demand is perfectly elastic, so  $P=MC$

# Monopoly

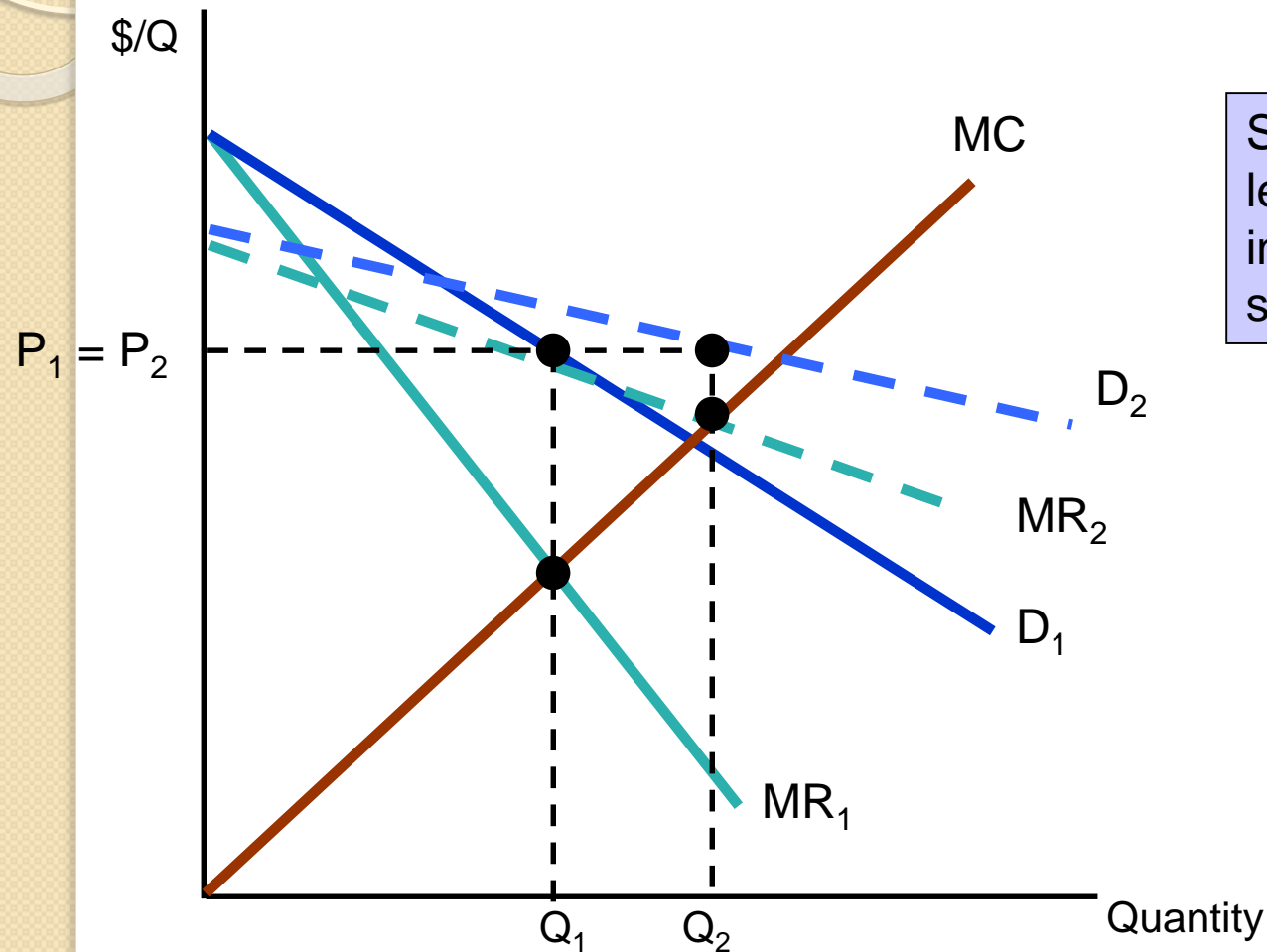
- If demand is very elastic, there is little benefit to being a monopolist
- The larger the elasticity, the closer to a perfectly competitive market
- Notice *a monopolist will never produce a quantity in the inelastic portion of demand curve*
  - In inelastic portion, can increase revenue by decreasing quantity and increasing price



# Shifts in Demand

- In perfect competition, the market supply curve is determined by marginal cost
- For a monopoly, output is determined by marginal cost and the shape of the demand curve
  - *There is no supply curve for monopolistic market*

# Shifts in Demand

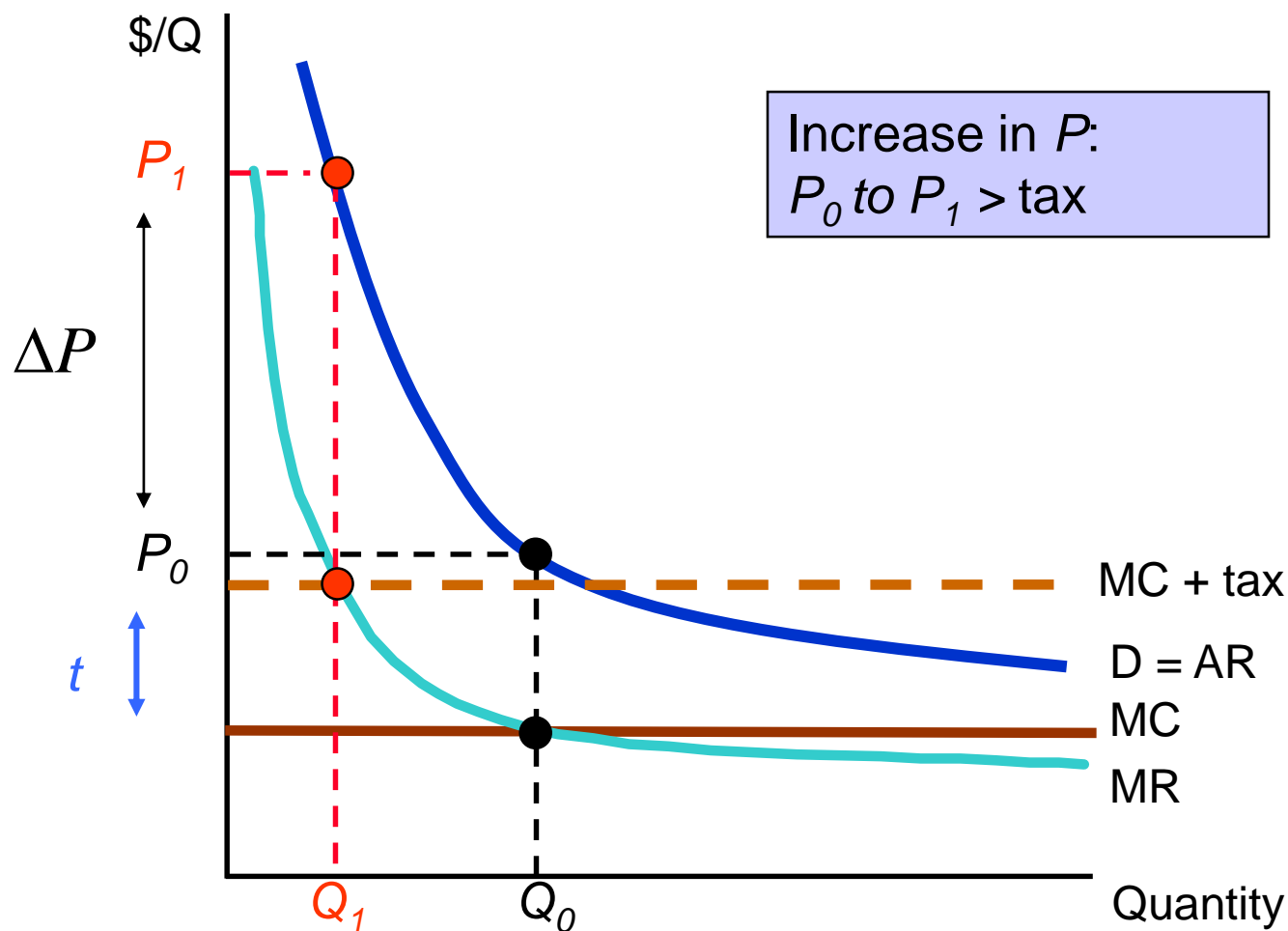


Shift in demand leads to change in quantity but same price

# The Effect of a Tax

- In competitive market, a per-unit tax causes price to rise by less than tax: burden is shared by producers and consumers
- Under monopoly, price can sometimes rise by more than the amount of the tax
- To determine the impact of a tax:
  - $t$  = specific tax
  - $MC = MC + t$

# Effect of Excise Tax on Monopolist



# Effect of Excise Tax on Monopolist

- The amount the price increases with implementation of a tax depends on elasticity of demand
- *Price may or may not increase by more than the tax*
- In a competitive market, the price cannot increase by more than tax
- Profits for monopolist will fall with a tax

# The Multi-plant Firm

- For some firms, production takes place in more than one plant, each with different costs
- Firm must determine how to distribute production between both plants
  1. Production should be split so that the MC in the plants is the same
  2. Output is chosen where  $MR=MC$ . Profit is therefore maximized when  $MR=MC$  at each plant.

# The Multi-plant Firm

- We can show this algebraically:
  - $Q_1$  and  $C_1$  is output and cost of production for Plant 1
  - $Q_2$  and  $C_2$  is output and cost of production for Plant 2
  - $Q_T = Q_1 + Q_2$  is total output
  - Profit is then:

$$\pi = P(Q_T) Q_T - C_1(Q_1) - C_2(Q_2)$$

# The Multi-plant Firm

- Firm should increase output from each plant until the additional profit from last unit produced at Plant 1 equals 0

$$\frac{\partial \pi}{\partial Q_1} = \frac{\partial(PQ_T)}{\partial Q_1} - \frac{\partial C_1}{\partial Q_1} = 0$$

$$MR - MC_1 = 0$$

$$MR = MC_1$$



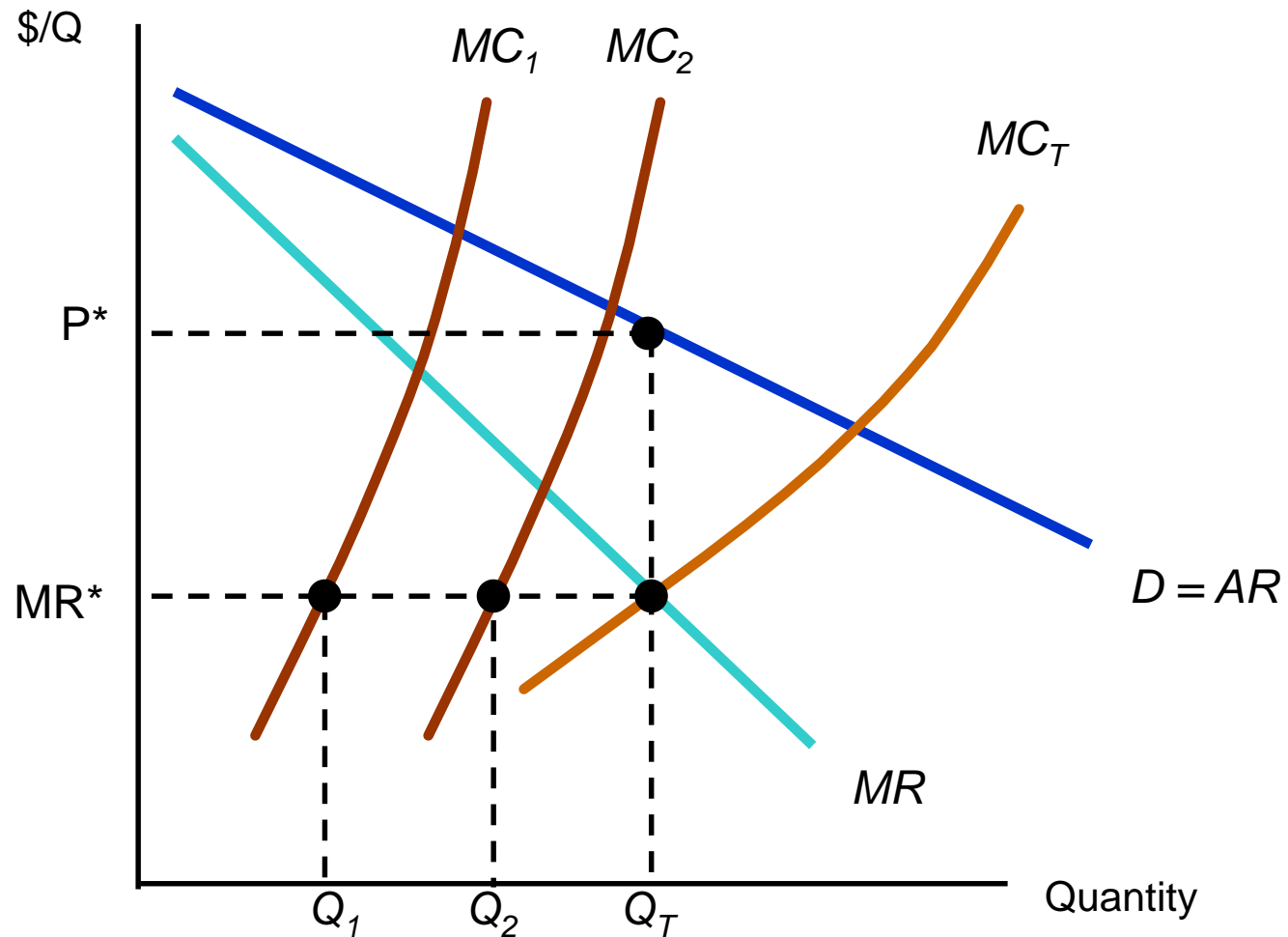
# The Multi-plant Firm

- We can show the same for Plant 2
- Therefore, we can see that the firm should choose to produce where

$$MR = MC_1 = MC_2$$

- We can show this graphically
  - $MR = MC_T$  gives total output
  - This point shows the MR for each firm
  - Where MR crosses  $MC_1$  and  $MC_2$  shows the output for each firm

# Production with Two Plants



# Measuring Monopoly Power

- Could measure monopoly power by the extent to which price is greater than MC for each firm
- Lerner's Index of Monopoly Power
  - $L = (P - MC)/P$ 
    - The larger the value of L (between 0 and 1) the greater the monopoly power
  - L is expressed in terms of  $E_d$ 
    - $L = (P - MC)/P = -1/E_d$
    - $E_d$  is elasticity of demand for a firm, not the market

# Monopoly Power

- Monopoly power, however, does not guarantee profits
- Profit depends on average cost relative to price
- One firm may have more monopoly power but lower profits due to high average costs

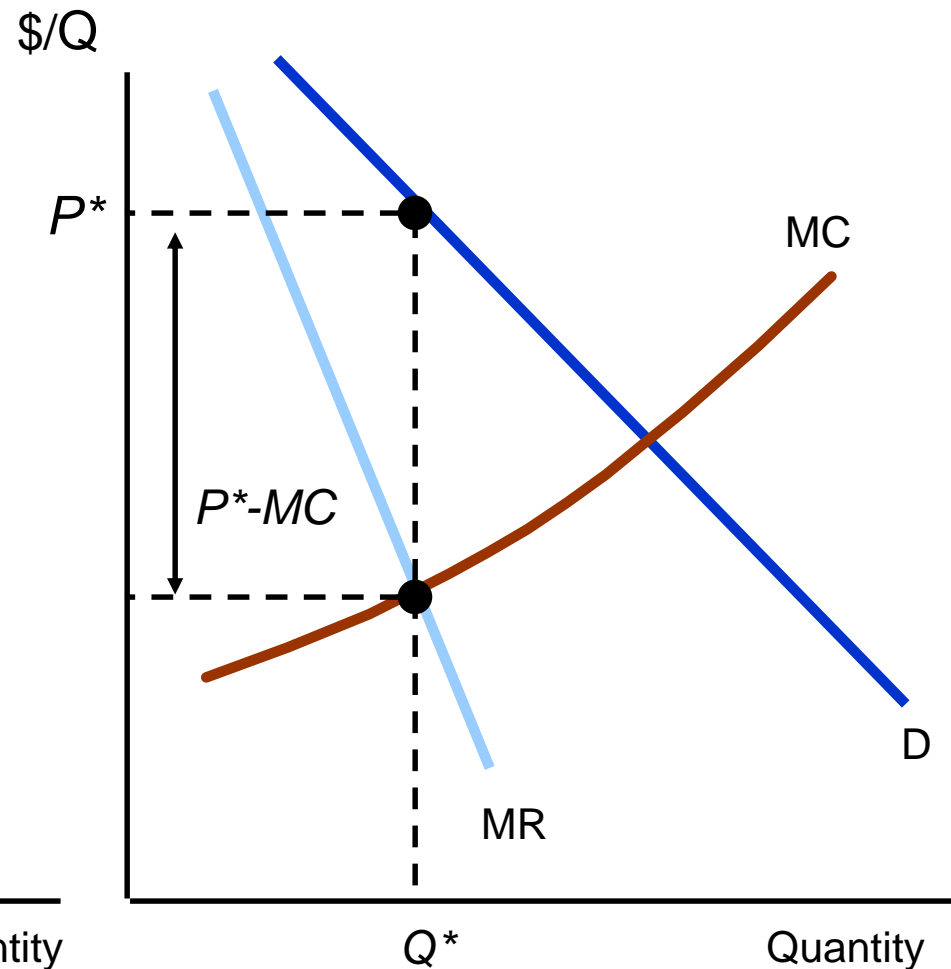
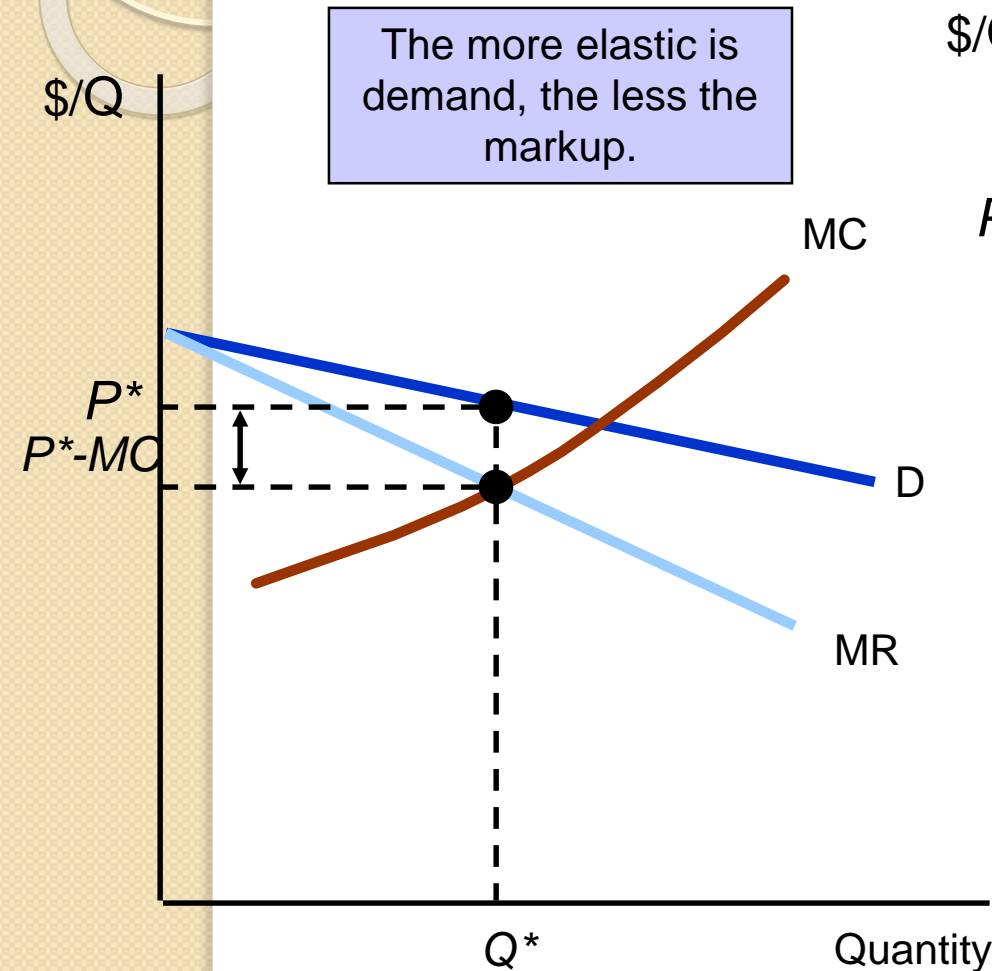
# Rule of Thumb for Pricing

- Pricing for any firm with monopoly power:
  - If  $E_d$  is large, markup is small
  - If  $E_d$  is small, markup is large

$$P = \frac{MC}{1 + (1/E_d)}$$

# Elasticity of Demand and Price Markup

The more elastic is demand, the less the markup.



# Markup Pricing: Supermarkets & Convenience Stores

- Supermarkets

1. Several firms

2. Similar product

3.  $E_d = -10$  for individual stores

4. 
$$P = \frac{MC}{1 + (1/-10)} = \frac{MC}{0.9} = 1.11(MC)$$

5. Prices set about 10-11% above MC.

# Markup Pricing: Supermarkets & Convenience Stores

- Convenience Stores

1. Higher prices than supermarkets

2. Convenience differentiates them

3.  $E_d = -5$

4. 
$$P = \frac{MC}{1 + (1/-5)} = \frac{MC}{0.8} = 1.25(MC)$$

5. Prices set about 25% above MC.



# Markup Pricing: Supermarkets & Convenience Stores

- Convenience stores have more monopoly power
- Convenience stores do have higher profits than supermarkets, however
  - ***Volume is far smaller and average fixed costs are larger***

# Sources of Monopoly Power

- Why do some firms have considerable monopoly power, and others have little or none?
- Monopoly power is determined by ability to set price higher than marginal cost
- A firm's monopoly power, therefore, is determined by the firm's elasticity of demand

# Sources of Monopoly Power

- The less elastic the demand curve, the more monopoly power a firm has
- The firm's elasticity of demand is determined by:
  - 1) Elasticity of market demand
  - 2) Number of firms in market
  - 3) The interaction among firms

# Elasticity of Market Demand

- With one firm, their demand curve is market demand curve
  - Degree of monopoly power is determined completely by elasticity of market demand
- With more firms, individual demand may differ from market demand
  - *Demand for a firm's product is more elastic than the market elasticity*

# Number of Firms

- The monopoly power of a firm falls as the number of firms increases; all else equal
  - More important are the number of firms with significant market share
  - Market is **highly concentrated** if only a few firms account for most of the sales
- Firms would like to create **barriers to entry** to keep new firms out of market
  - Patent, copyrights, licenses, economies of scale

# Interaction Among Firms

- If firms are aggressive in gaining market share by, for example, undercutting the other firms, prices may reach close to competitive levels
- If firms collude (violation of antitrust rules), could generate substantial monopoly power
- Markets are dynamic and therefore, so is the concept of monopoly power

# The Social Costs of Monopoly Power

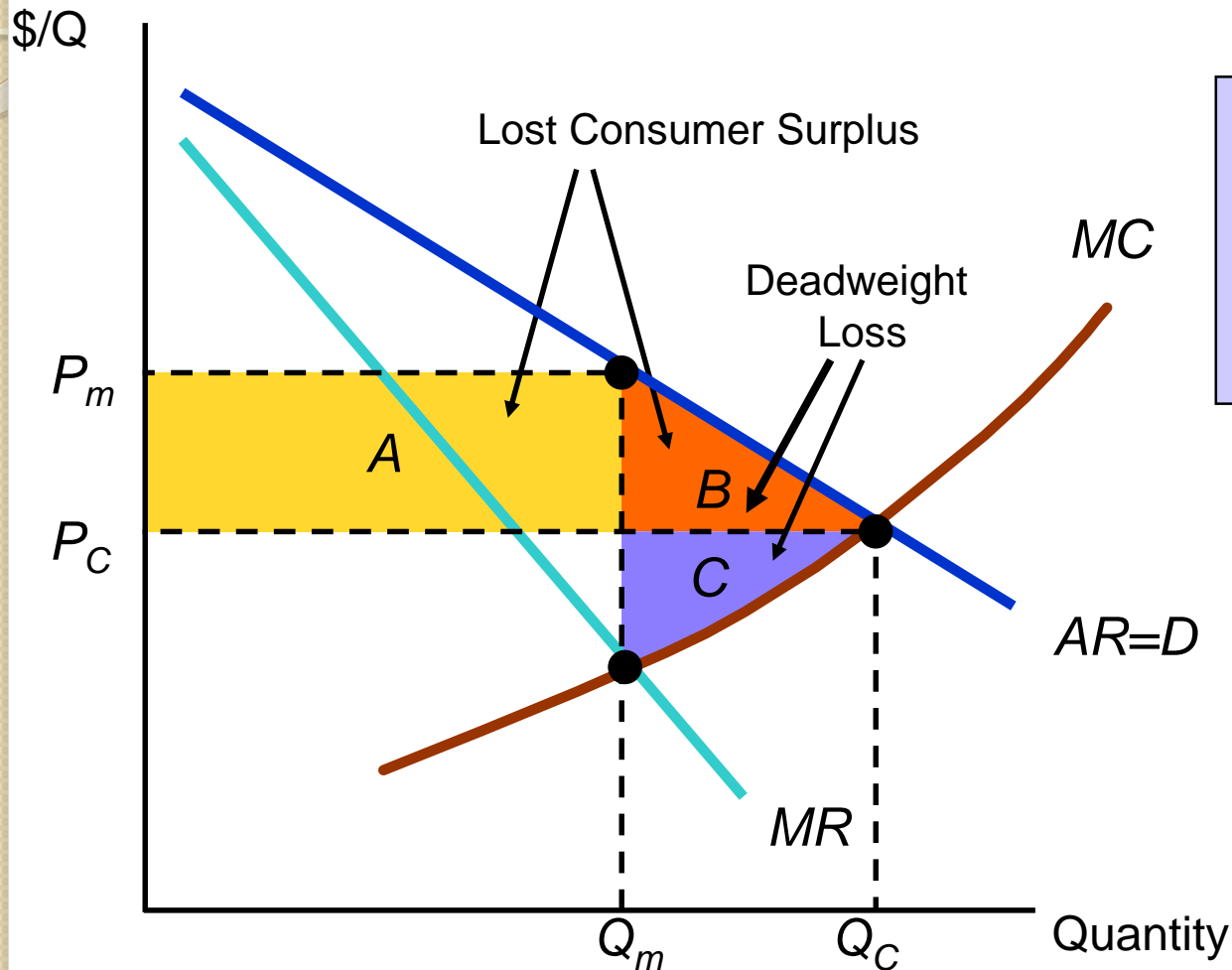
- Monopoly power results in higher prices and lower quantities
- However, does monopoly power make consumers and producers in the aggregate better or worse off?
- We can compare producer and consumer surplus when in a competitive market and in a monopolistic market

# The Social Costs of Monopoly

- Perfectly competitive firm will produce where  $MC = D \rightarrow P_C$  and  $Q_C$
- Monopoly produces where  $MR = MC$ , getting their price from the demand curve  $\rightarrow P_M$  and  $Q_M$
- There is a loss in consumer surplus when going from perfect competition to monopoly
- A deadweight loss is also created with monopoly



# Deadweight Loss from Monopoly Power



Because of the higher price, consumers lose  $A+B$  and producer gains  $A-C$ .

# The Social Costs of Monopoly

- Social cost of monopoly is likely to exceed the deadweight loss
- Rent Seeking
  - Firms may spend to gain monopoly power
    - Lobbying
    - Advertising
    - Building excess capacity

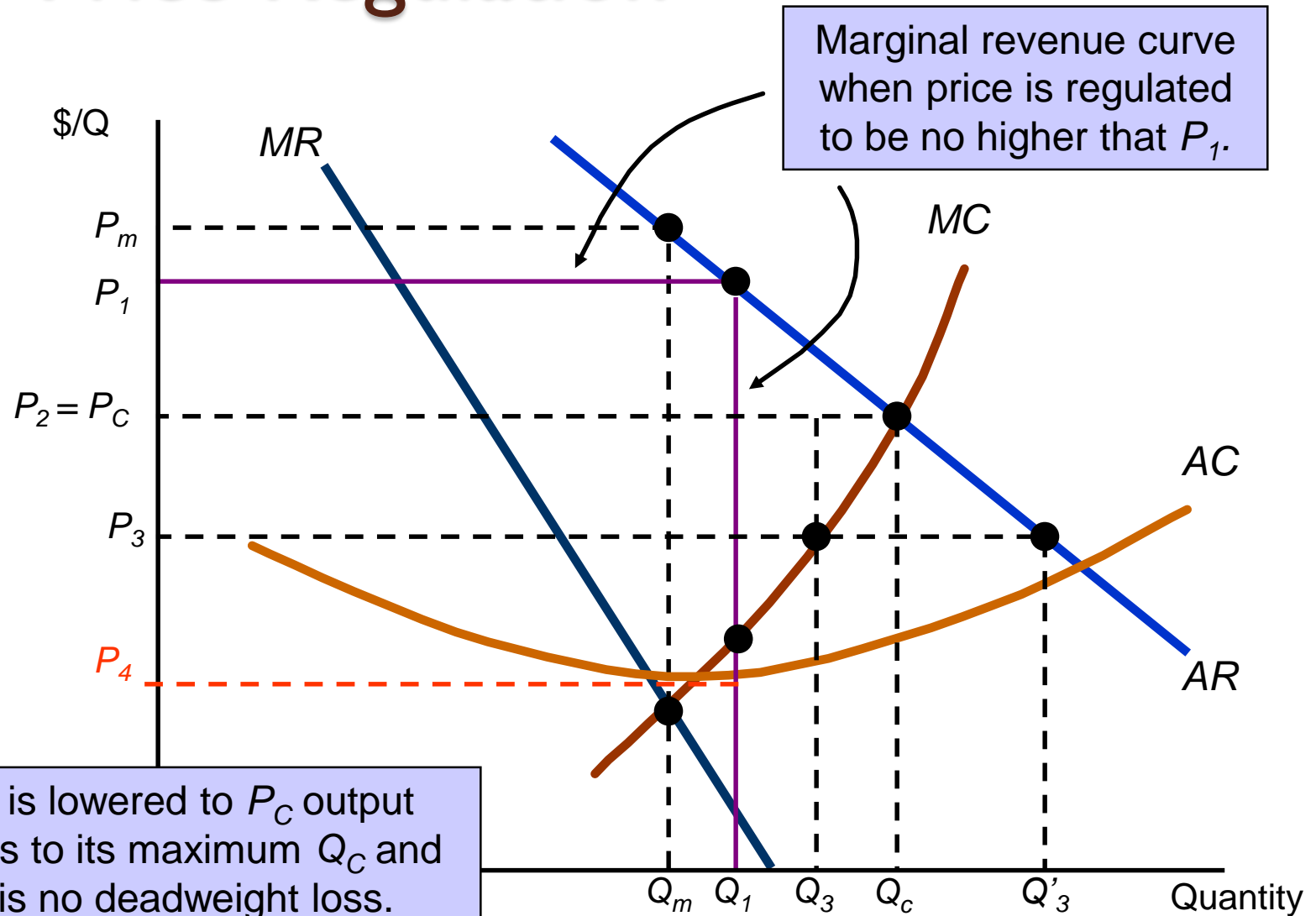
# The Social Costs of Monopoly

- The incentive to engage in monopoly practices is determined by the profit to be gained
- The larger the transfer from consumers to the firm, the larger the social cost of monopoly

# Government Regulation

- Government can regulate monopoly power through **price regulation**
  - Recall that in competitive markets, price regulation creates a deadweight loss
  - Price regulation can eliminate deadweight loss with a monopoly
  - The effect of the regulation can be shown graphically

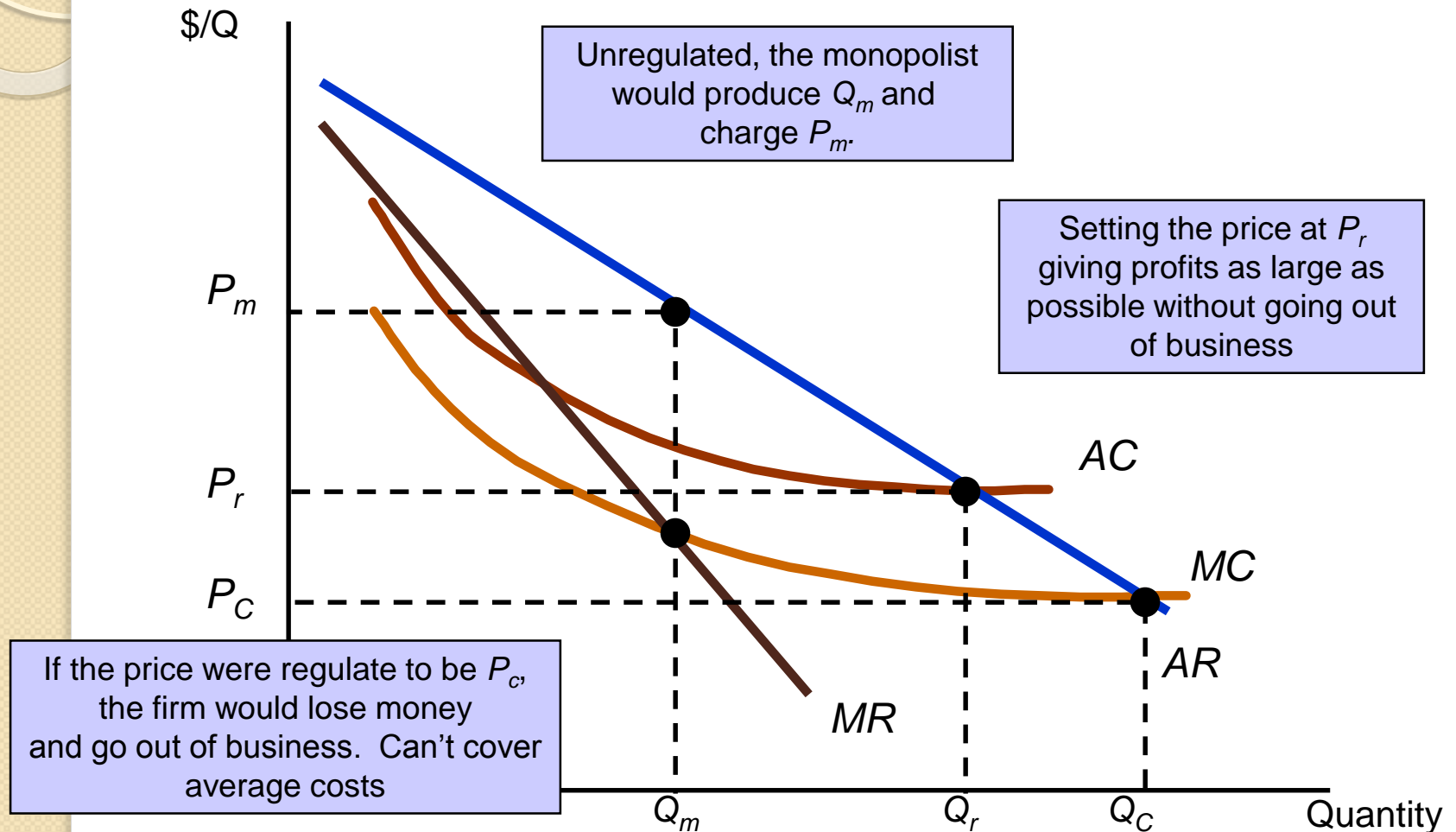
# Price Regulation



# Government Regulation

- Natural Monopoly
  - A firm that can produce the entire output of an industry at a cost lower than what it would be if there were several firms
  - Usually arises when there are large economies of scale
  - We can show that splitting the market into two firms results in higher AC for each firm than when only one firm was producing

# Regulating the Price of a Natural Monopoly



# Government Regulation

- Regulation in Practice
  - It is very difficult to estimate the firm's cost and demand functions because they change with evolving market conditions
  - An alternative pricing technique – **rate-of-return regulation** allows the firms to set a maximum price based on the expected rate or return that the firm will earn



# Regulation in Practice

- There are problems, however, with rate of return regulation
  1. Firm's capital stock is difficult to value
  2. “Fair” rate of return is based on actual cost of capital, that cost is based on regulatory behavior (and investor's perception of allowed rates in the future)

# Regulation in Practice

- Rate of return regulation leads to lags in regulatory response to changes in cost and other market conditions
- Leads to long and expensive regulatory hearings
- The hearing process creates a *regulatory lag* that may benefit producers (1950s & '60s) or consumers (1970s & '80s)

# Regulation in Practice

- Government may also set price caps based on firm's variable costs, past prices, and possibly inflation and productivity growth
- A firm is typically allowed to raise its price each year without approval from regulatory agency by amount equal to inflation minus expected productivity growth

# Factor Markets with Monopoly

- We have examined factor demand when a firm faces a competitive output market and a competitive factor demand
- Now we consider factor demands when markets are facing one-sided monopoly
- **Two cases to be discussed**
  - Monopoly in the output market but competition in the factor market
  - Competition in the output market but monopoly in the factor market

# A General Rule for Factor Demand

- When a firm determines a profit-maximizing demand for a factor, it will always want to choose a quantity such that the MR from hiring one more unit of that factor just equals the MC of doing so
- The above decision rule takes various forms depending on our assumptions about the environment in which the firm operates

# Monopoly in the Output Market

- Suppose that a firm has a monopoly for its output and it has a production function  $y = f(x)$
- $R(y) = p(y)y$  or  $R(x) = R(y(x))$
- $dR/dx = [dR/dy] [dy/dx] = MR * MP_x$
- $dR/dx$  represents the effect on revenue due to the marginal increase in the input, which is called ***marginal revenue product (MRP)***

# Marginal Revenue Product

- If a firm is facing a competitive market for the output,  $MRP_x = P \cdot MP_x$
- But if it is facing a monopolistic market, then

$$MRP_x = p(y) \left[ 1 - \frac{1}{|E_d|} \right] MP_x$$

$$MRP_x = p(y) \left[ 1 - \frac{1}{|E_d|} \right] MP_x \leq p MP_x$$

# Monopoly in the Output Market

- Suppose that the factor market is competitive
- If the firm is a competitive in the output market, then  $P \bullet MP(x_c^*) = w$
- If the firm is a monopolistic in the output market, then  $MRP(x_m^*) = w$
- The factor demand by a monopolist must be less than the factor demand by the same firm if it behaves competitively



# Monopsony

- A **monopsony** is a market in which there is a single buyer
- **Monopsony power** is the ability of the buyer to affect the price of the good and pay less than the price that would exist in a competitive market
- We suppose that the firm is a monopsony in the labor market but a price taker in the output market

# Monopsonist Buyer

- Buyer will buy until value from last unit equals expenditure on that unit
- The market supply curve is not the marginal expenditure curve
  - Market supply shows how much the firm must pay per unit as a function of total units purchased
  - Supply curve is **average** expenditure curve
  - Upward sloping supply implies the marginal expenditure curve must lie above it
  - Decision to buy extra unit raises price paid for *all* units

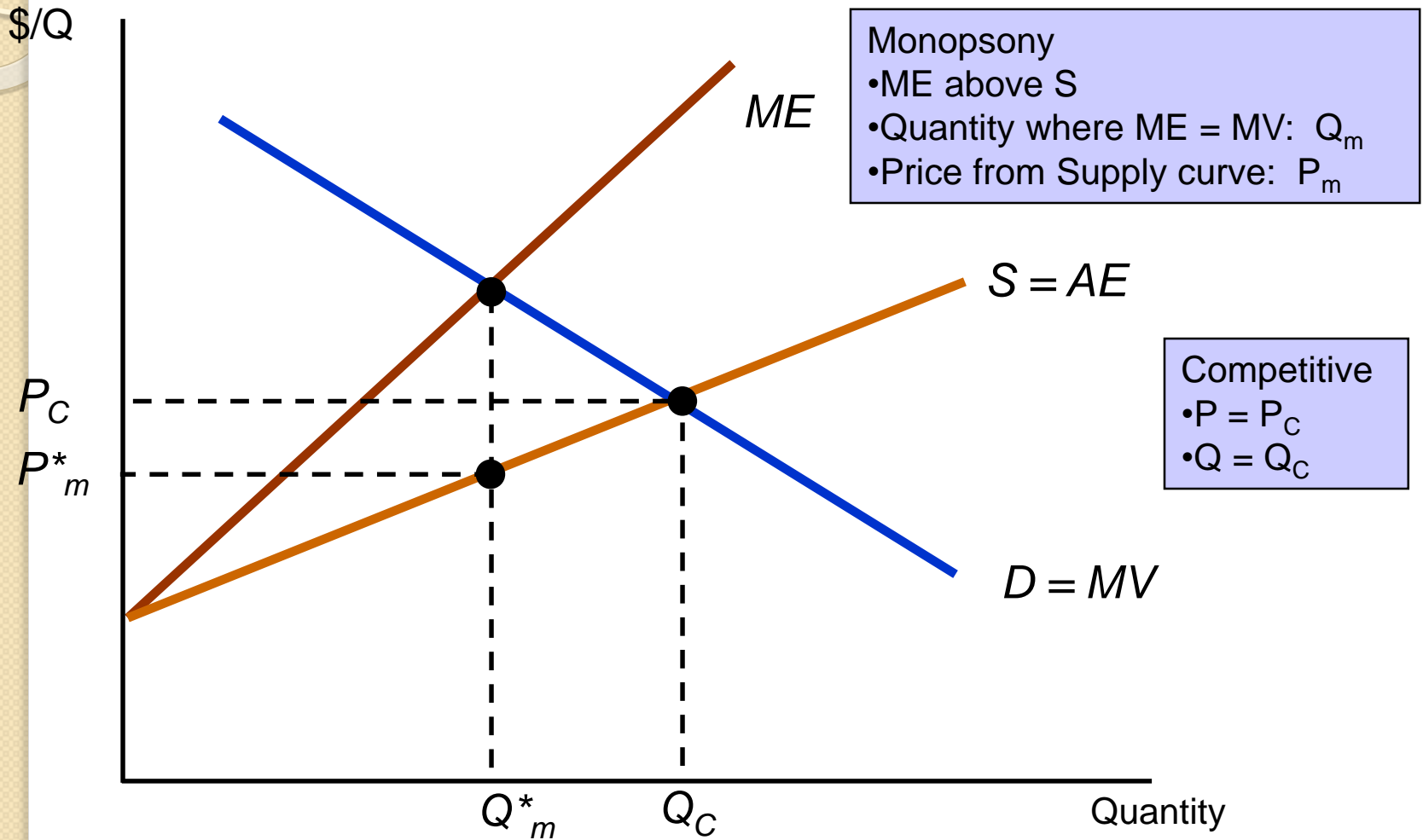
# Marginal vs. Average Expenditure

- We assume that the supply curve  $w(x)$  is upward sloping, i.e.,  $w'(x) > 0$

$$\text{Max } pf(x) - w(x)x$$

$$\underbrace{pf'(x)}_{\text{marginal revenue}} = w + w'(x)x = \underbrace{w \left[ 1 + \frac{1}{E_s} \right]}_{\text{marginal expenditure (cost)}}$$

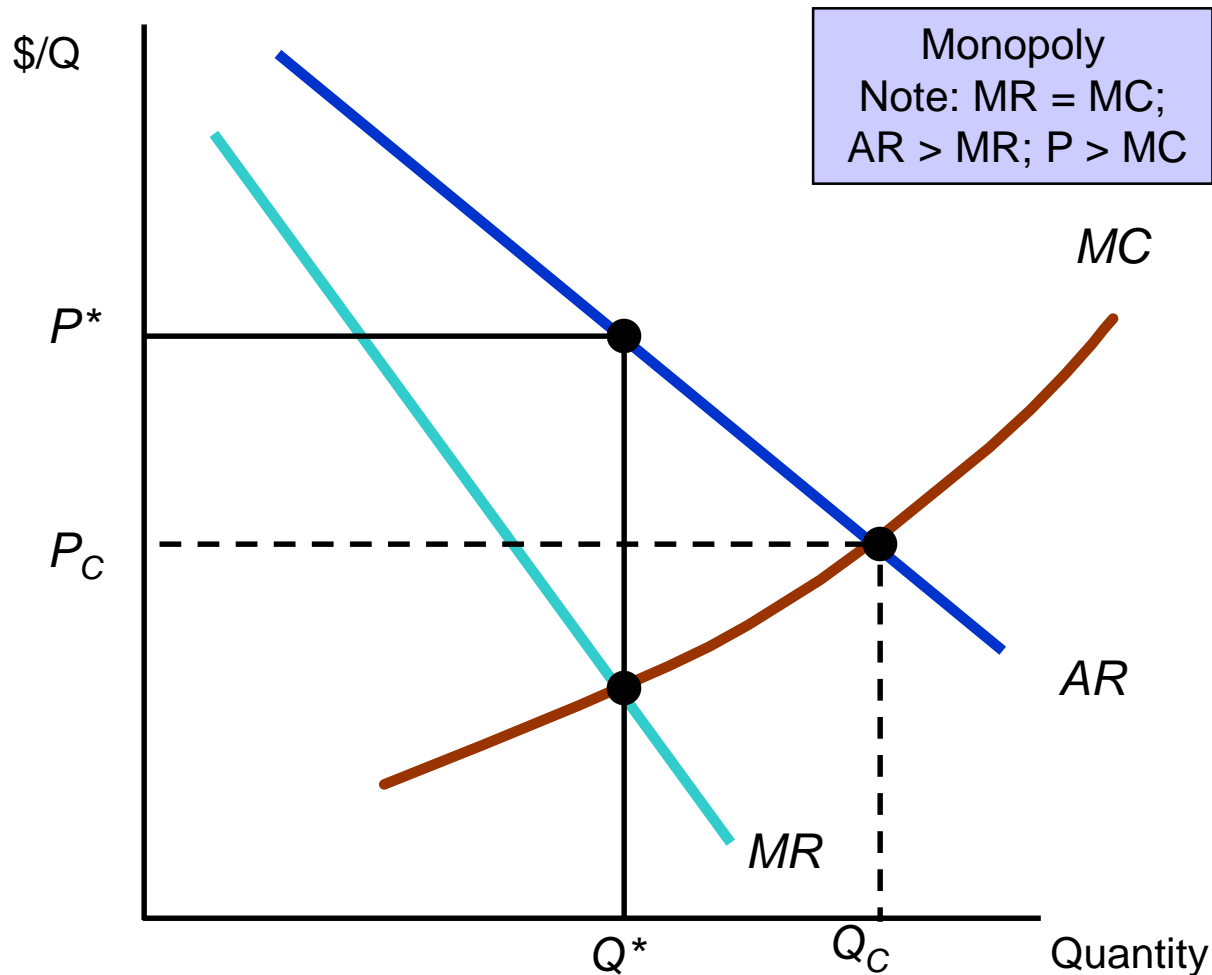
# Monopsonist Buyer



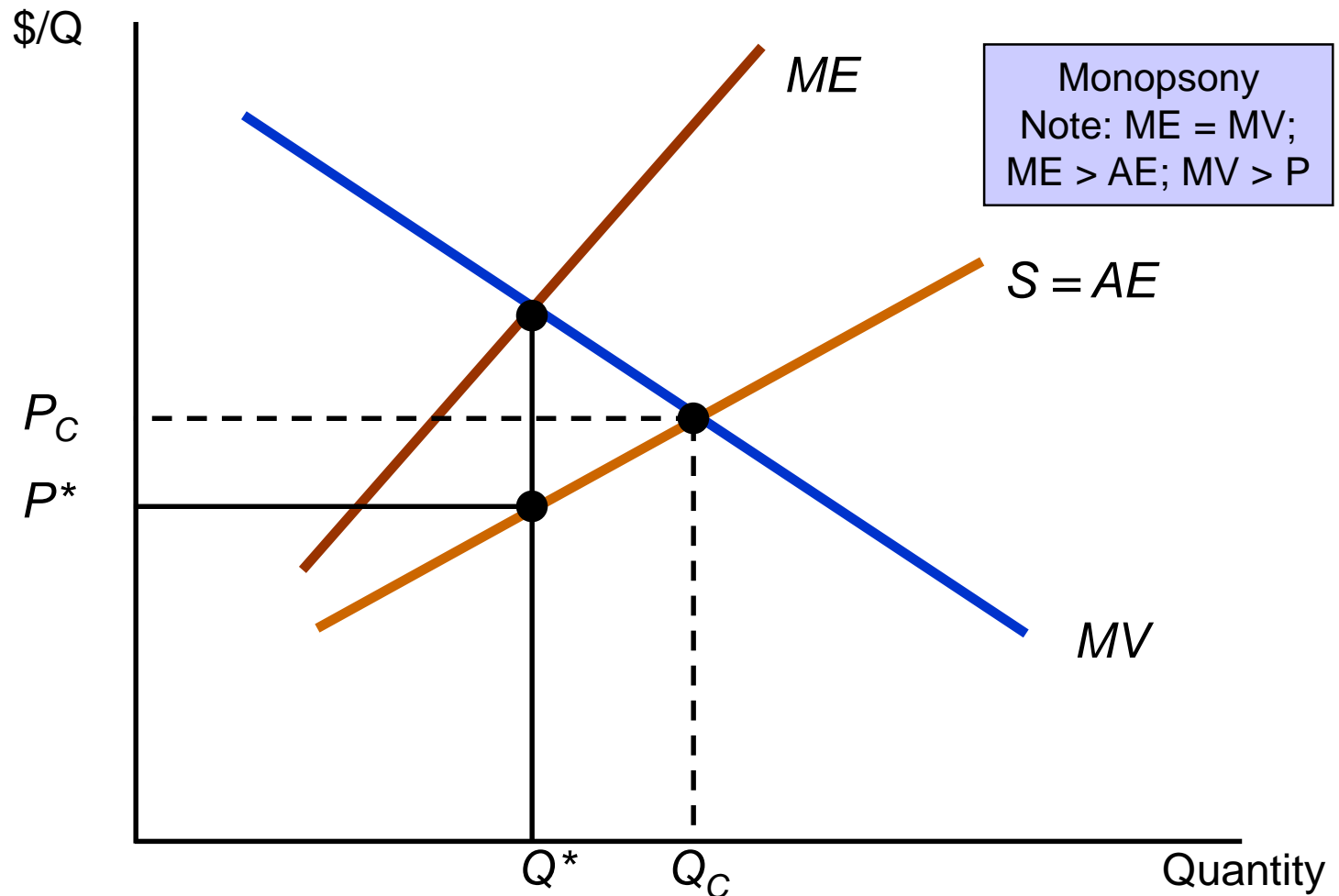
# Monopoly and Monopsony

- Monopsony is easier to understand if we compare to monopoly
- We can see this graphically
- Monopolist
  - Can charge price above MC because faces downward sloping demand (average revenue)
  - $MR < AR$
  - $MR = MC$  gives quantity less than competitive market and price that is higher

# Monopoly and Monopsony



# Monopoly and Monopsony



# Monopoly and Monopsony

- Monopoly

- $MR < P$
- $P > MC$
- $Q_m < Q_C$
- $P_m > P_C$

- Monopsony

- $ME > P$
- $P < MV$
- $Q_m < Q_C$
- $P_m < P_C$



# Monopsony Power

- More common than pure monopsony are a few firms competing among themselves as buyers so that each firm has some monopsony power
  - Automobile industry
- Monopsony power gives them the ability to pay a price that is less than marginal value

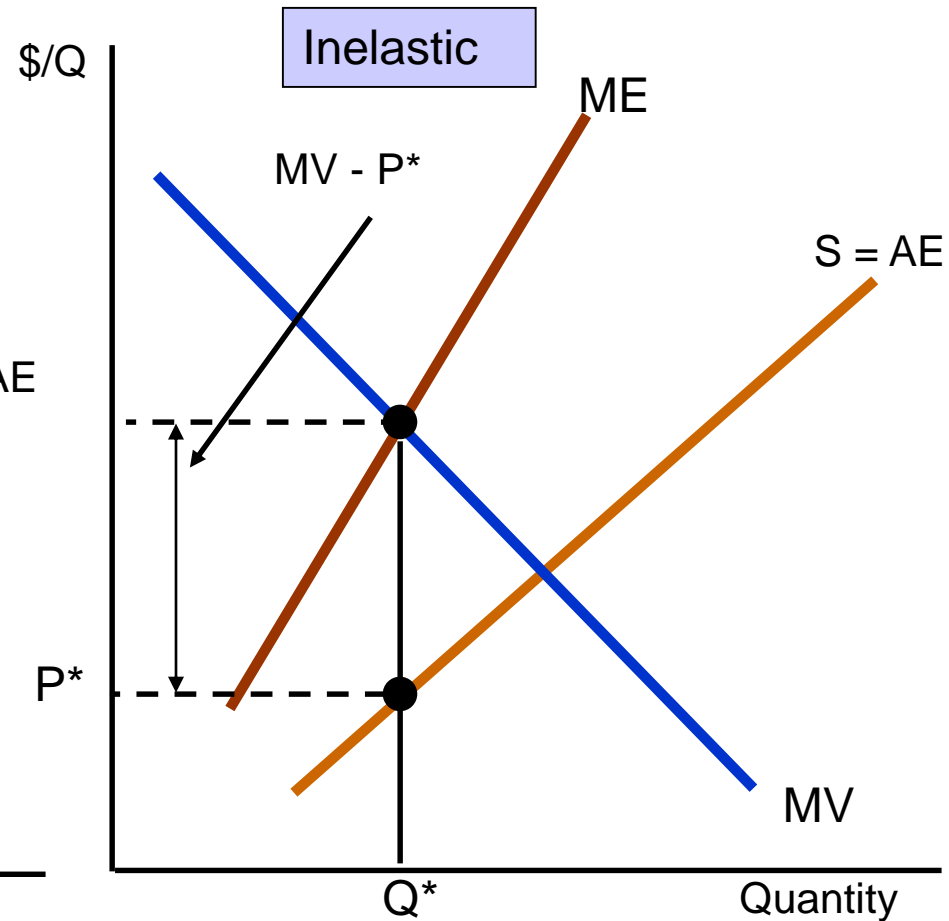
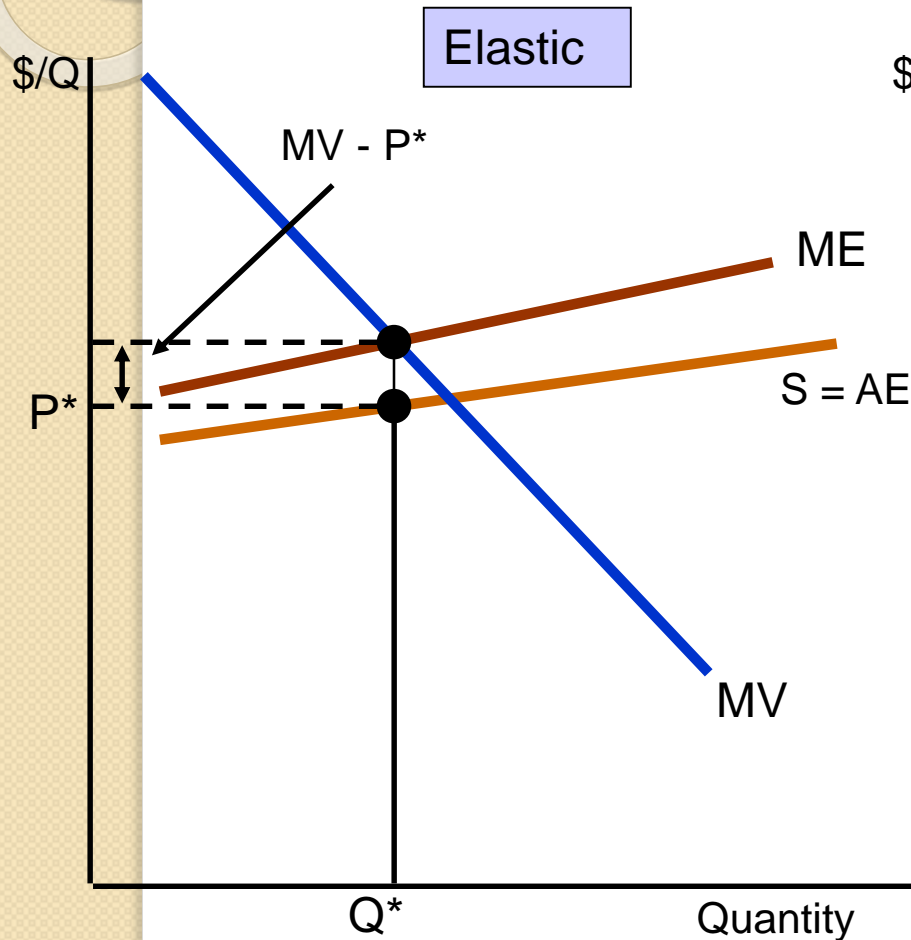
# Monopsony Power

- The degree of monopsony power depends on three factors:
  1. Number of buyers
    - The fewer the number of buyers, the less elastic the supply and the greater the monopsony power
  2. Interaction Among Buyers
    - The less the buyers compete, the greater the monopsony power

# Monopsony Power

- The degree of monopsony power depends on three factors (cont'd):
  3. Elasticity of market supply
    - Extent to which price is marked down below MV depends on elasticity of supply facing buyer
    - If supply is very elastic, markdown will be small
    - The more inelastic the supply, the more monopsony power

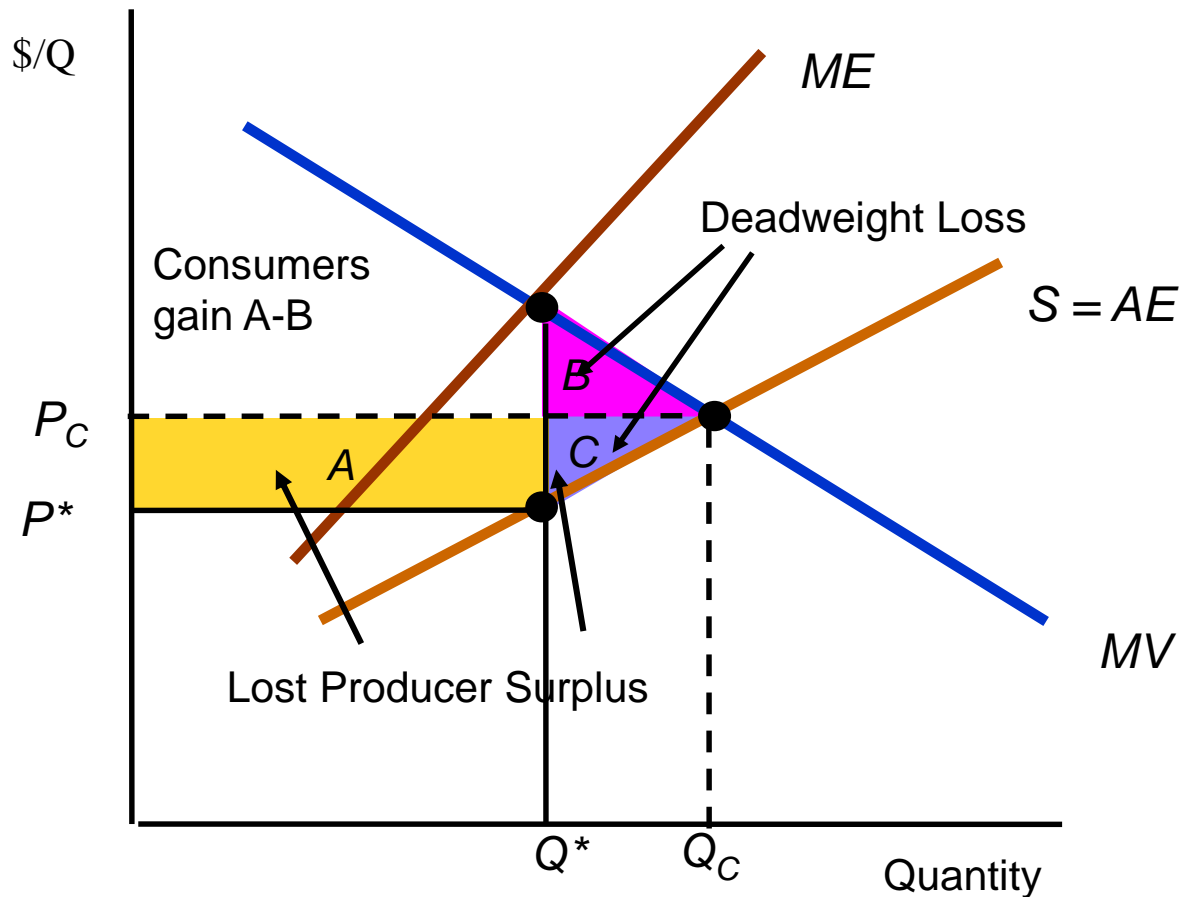
# Monopsony Power: Elastic Versus Inelastic Supply



# Social Costs of Monopsony Power

- Since monopsony power gives lower prices and lower quantities purchased, we would expect sellers to be worse off and buyers better off
- We can show the effects of monopsony power using producer and consumer surplus compared to competitive market
  - For sole monopsonist, quantity is where  $ME = MV$  and price is from demand
  - For competitive market, quantity and price where  $S = D$

# Deadweight Loss from Monopsony Power



# Monopsony Power

- Bilateral Monopoly
  - Market where there is only one buyer and one seller
  - Bilateral monopoly is rare, however, markets with a small number of sellers with monopoly power selling to a market with few buyers with monopsony power is more common
  - Even with bargaining, in general, monopsony and monopoly power will counteract each other



# Limiting Market Power: The Antitrust Laws

- Market power harms some players in the market – buyer or seller
- Market power reduces output, leading to deadweight loss
- Excessive market power could raise problems of equity and fairness



# Limiting Market Power: The Antitrust Laws

- What can we do to limit market power and keep it from being used anti-competitively?
  - Tax away monopoly profits and redistribute to consumers
    - Difficult to measure and find all those who lost
  - Direct price regulation of natural monopolies
  - Keep firms from acquiring excessive market power
    - Antitrust laws

# The Antitrust Laws

- Rules and regulations designed to promote a competitive economy by:
  - Prohibiting actions that restrain or are likely to restrain competition
  - Restricting the forms of allowable market structures
- Monopoly power arises in a number of ways, each of which is covered by the antitrust laws

# Limiting Market Power: The Antitrust Laws

- Sherman Act (1890) – Section 1
  - Prohibits contracts, combinations, or conspiracies in restraint of trade
    - Explicit agreement to restrict output or fix prices
    - Implicit collusion through **parallel conduct**
      - Form of implicit collusion in which one firm consistently follows actions of another
  - Example
    - In 1999, four of the world's largest drug and chemical companies were found guilty of fixing prices of vitamins sold in US

# Limiting Market Power: The Antitrust Laws

- Sherman Act (1890) – Section 2
  - Makes it illegal to monopolize or attempt to monopolize a market and prohibits conspiracies that result in monopolization
- Clayton Act (1914)
  - I. Makes it unlawful to require a buyer or lessor not to buy from a competitor

# Limiting Market Power: The Antitrust Laws

- Clayton Act (1914)
  2. Prohibits **predatory pricing**
    - The practice of pricing to drive current competitors out of business and to discourage new entrants in a market so that a firm can enjoy higher future profits
  3. Prohibits mergers and acquisitions if they “substantially lessen competition” or “tend to create a monopoly”

# Limiting Market Power: The Antitrust Laws

- Robinson-Patman Act (1936)
  - Amendment to the Clayton Act
  - Prohibits price discrimination if it causes buyers to suffer economic damages and competition is reduced

# Limiting Market Power: The Antitrust Laws

- Federal Trade Commission Act (1914, amended 1938, 1973, 1975)
  1. Created the Federal Trade Commission (FTC)
  2. Supplements the Sherman and Clayton Acts by fostering competition through a set of prohibitions against unfair and anticompetitive practices
    - Prohibitions against deceptive advertising, labeling, agreements with retailer to exclude competing brands

# Enforcement of Antitrust Laws

Antitrust laws are enforced three ways:

- I. Antitrust Division of the Department of Justice
  - A part of the executive branch – the administration can influence enforcement
  - Fines levied on businesses; fines and imprisonment levied on individuals



# Enforcement of Antitrust Laws

## 2. Federal Trade Commission

- Enforces through voluntary understanding or formal commission order

## 3. Private Proceedings

- Can sue for *treble* damages (threefold damages)
- Individuals or companies can also ask for injunctions to force wrongdoers to cease anticompetitive actions

# Enforcement of Antitrust Laws

- US antitrust laws are stricter and more far reaching than the rest of the world
  - Some have claimed this has hindered US competing in international markets
- With growth of European Union, methods of antitrust enforcement have evolved
  - Similar to US laws with some procedural and substantive differences
  - Europe only imposes civil penalties

# Limiting Market Power: The Antitrust Laws

- Two Examples
  - American Airlines
    - Early 80's president and CEO accused of attempting to price fix
  - Microsoft
    - Monopoly power
    - Predatory actions
    - Collusion