Supply, demand, and equilibrium:

Neoclassical price theory

Market Exchange

- For any market transaction to take place there has to be both a buyer and a seller.
- Actually each wants what the other has.
- The focus here is on the market for a particular good—cheese, chalk, chairs, widgets.

Law of Supply

- Law of supply states that there is a positive relation between price and quantity supplied.
- If price goes up, quantity supplied goes up; if price goes down, quantity supplied goes down.

Law of Demand

- The law of demand states that there is a negative or inverse relation between price and quantity demanded.
- If price goes up, quantity demanded goes down; if price goes down, quantity demanded goes up.

Laws of supply and demand versus the “theory of supply and demand”

- Theory of supply and demand includes the laws of supply and demand, but the theory of supply and demand claims more than the laws do.
- The theory of supply and demand states that *price itself is determined by supply and demand forces*.

Laws can be in effect without theory—e.g., a command system

- In a Soviet-style command system, the central planning board announces one week that oranges are $.25 a pound.
- The next week they announce oranges are $2 a pound.
- What will happen to the demand for oranges?

Laws vs. Theory of Supply and Demand

- It will probably fall.
- So the law of demand is in effect.
- But how was price determined in the example?
- Not by the theory of supply and demand—price was determined by the central planning board, by command.
- So we have the laws without the theory.

Different types of demand

- Aggregate demand, aggregate consumption demand, aggregate investment demand—we will see these and others later.
- We can speak of one individual's demand for a particular good, or individual demand.
- And all individuals' demand for a particular good, or market demand.

market demand

- Demand is willingness and ability to buy specific quantities of a good at alternative prices in a given time period (ceteris paribus).

market demand

- If we don't include *ability* then it's not real demand, it's called…

  …wishing for something.

- And it is not enough to be able to afford something, you have to want it as well—willingness.

Market demand

- I wish I had a Lamborghini, but if I can't afford it, it is not demand.
- I can afford a set of teenage mutant ninja turtle pillowcases, but if I don't want them, it is not demand.

Market demand

- It has to be in a given time period, otherwise it is not clear what we are talking about—demand for something forever into the future?

market demand

- We say *ceteris paribus* because the willingness and ability may change depending on other factors, but for now we just want to focus on what happens to demand when price changes, so we have to hold these other things constant.

market demand

- Otherwise, if we don't make the *ceteris paribus* assumption, and price changes, and quantity demanded changes, we won't know if the change in demand is due to the price change or if it is due to one of the other factors that affect willingness or ability.

assumptions behind the market demand curve

- In particular, we want to hold constant these factors that affect willingness or ability to buy:

assumptions behind the market demand curve

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  - Income (affects ability to buy)

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  - Income (affects ability to buy)
  - Tastes or preferences (affects willingness to buy)
  - availability and price of related goods

Related goods

-

Related goods

- substitutes

Related goods

- substitutes (coffee and tea)

Related goods

- substitutes (coffee and tea)
- complements

Related goods

- substitutes (coffee and tea)
- complements (coffee and cream)

assumptions behind the market demand curve

- expectations of price, income and tastes

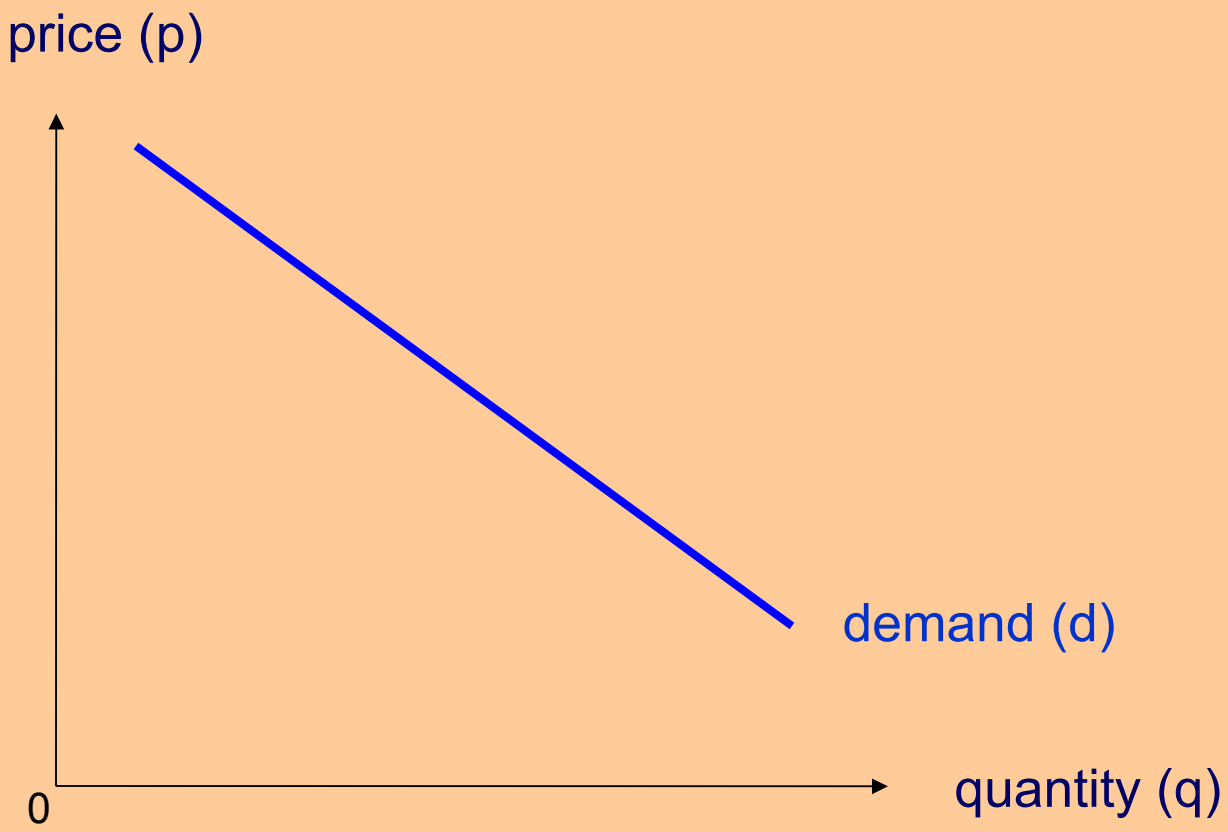
assumptions behind the market demand curve

- expectations of price, income and tastes
- number of buyers in the market

individual and market demand

- Market demand is the total quantities of a good or service that people are willing and able to buy at alternative prices in a given time period, ceteris paribus (or simply the sum of individual demands).

market demand Curve



market supply

- everything we said about market demand is also applies to market supply (except the relation between price and quantity supplied and the factors that affect willingness and ability)

market supply

- Market supply is the total quantities of a good that sellers are willing and able to sell at alternative prices in a given time period (*ceteris paribus*), or simply the combined willingness and ability of all market suppliers to sell.

market supply

- must be both *willingness* and *ability* to sell
- not a statement of actual sales, that will depend on the actual price
- given time period
- ceteris paribus

Assumptions behind the market supply curve

Assumptions behind the market supply curve

- cost of production

Assumptions behind the market supply curve

- cost of production
  - input prices

Assumptions behind the market supply curve

- cost of production
  - input prices
  - technology

Assumptions behind the market supply curve

- cost of production
  - input prices
  - Technology
- expectations (of future price)

Assumptions behind the market supply curve

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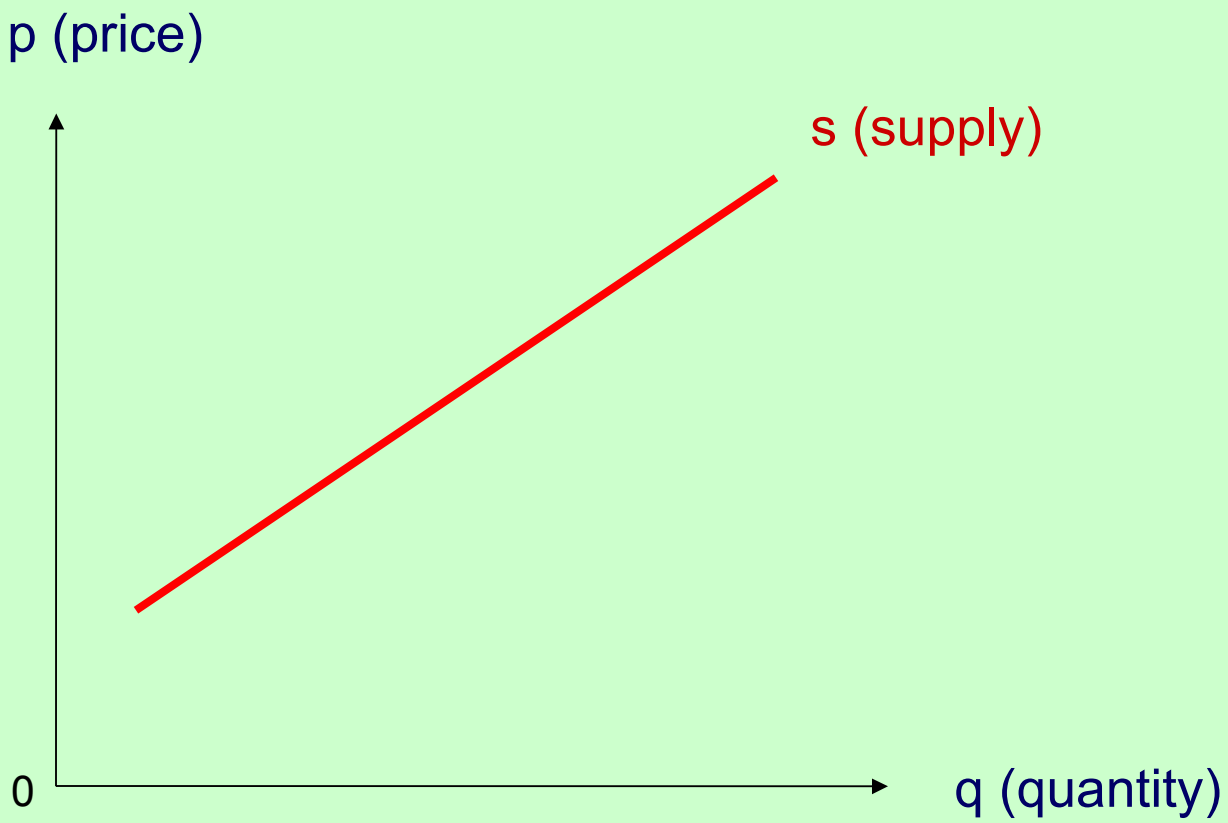
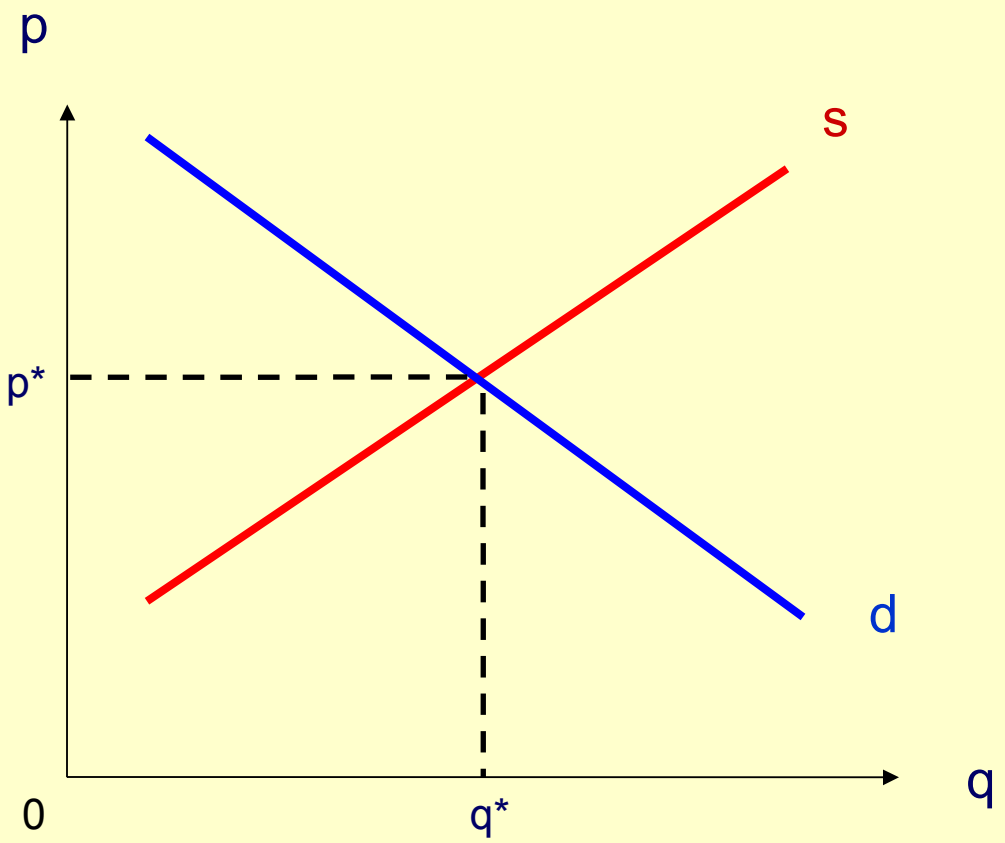
market supply curve



market supply and demand curves



market equilibrium

market equilibrium

- unique equilibrium of market supply and demand

market equilibrium

- unique equilibrium of market supply and demand
- equilibrium price (p*) is price at which

quantity supplied = quantity demanded

$(q_s = q_d)$

market equilibrium

- unique equilibrium of market supply and demand
- equilibrium price (p*) is price at which

quantity supplied = quantity demanded

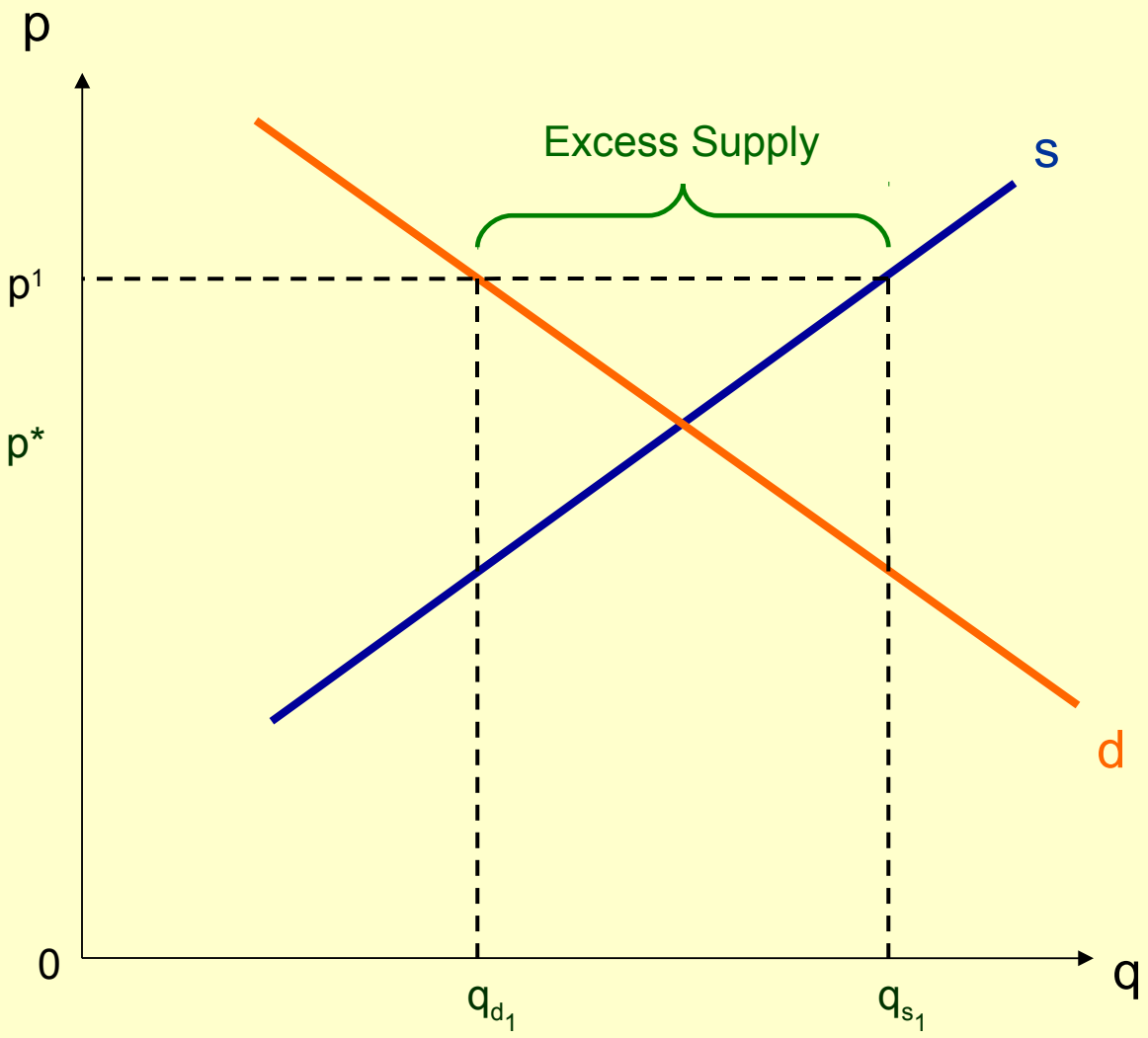
$(q_s = q_d)$

- equilibrium quantity (q*) is quantity corresponding to equilibrium price

Disequilibrium—price p_1 above equilibrium price $p^* \rightarrow q_s > q_d$

- excess supply or market surplus

excess supply or market surplus



equilibrating process

equilibrating process

- competition between and among buyers and sellers sets off equilibrium process

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- Firms with excess inventories cut prices to try to undersell their competition

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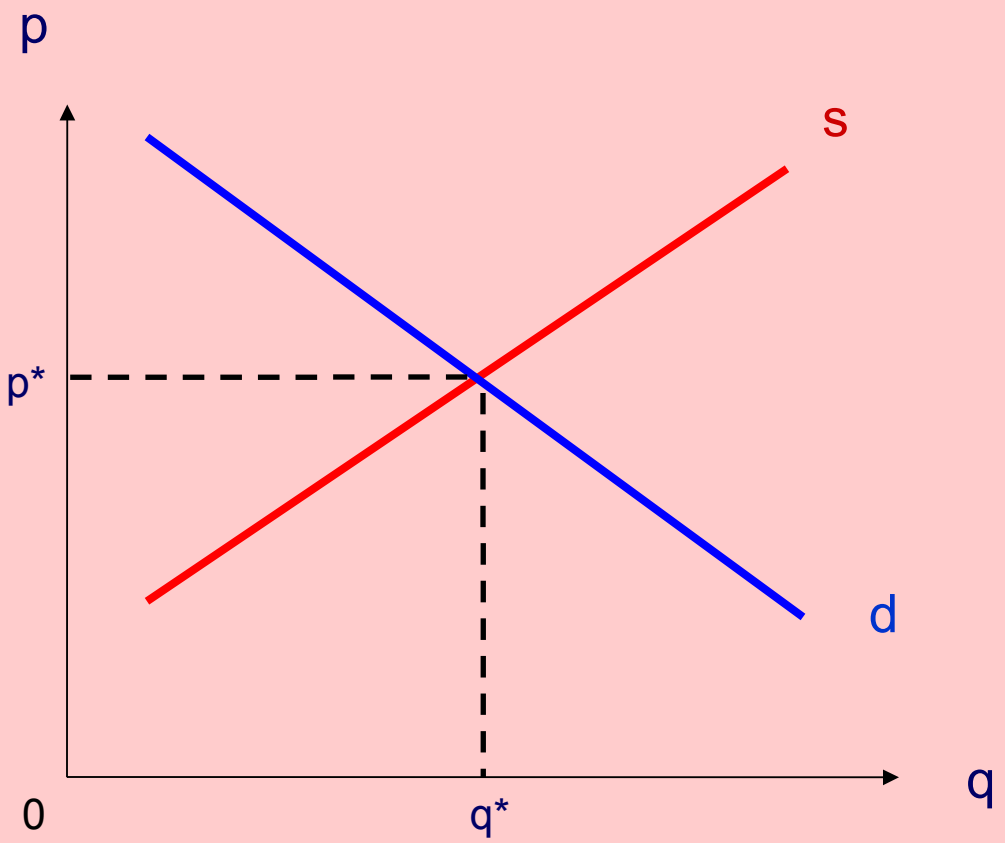
- As price falls, quantity demanded rises, and quantity supplied falls

equilibrating process

- competition between and among buyers and sellers sets off equilibrium process
- Firms with excess inventories cut prices to try to undersell their competition
- As price falls, quantity demanded rises, and quantity supplied falls
- Process continues until $p = p^*$ and

  $(q_s = q_d)$

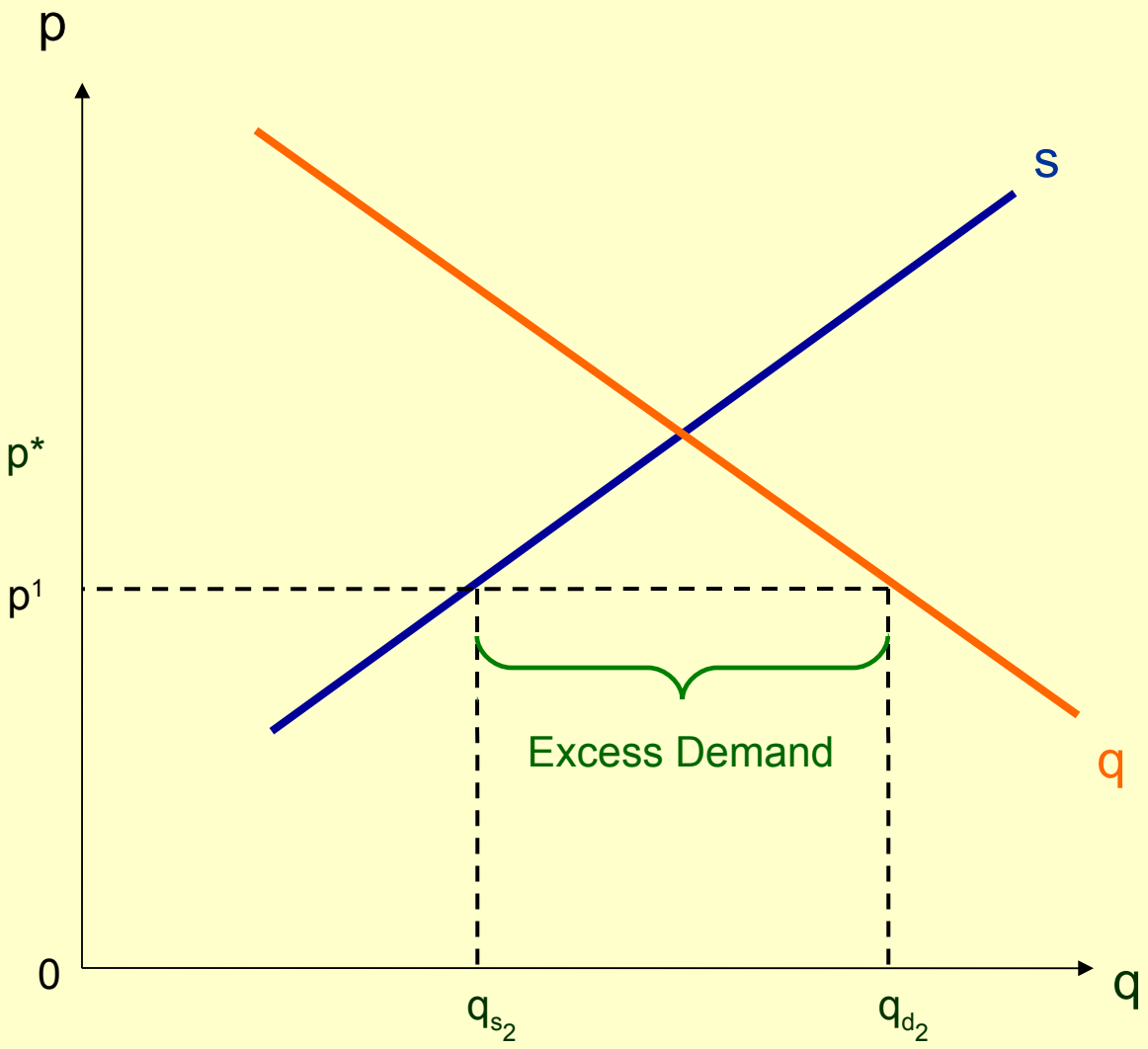
market returns to equilibrium



Disequilibrium—price p_1 below equilibrium price $p^* \rightarrow q_s < q_d$

- excess demand or market shortage

excess demand or market shortage



equilibrating process

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- buyers competing with one another for goods in short supply bid up price to try to capture some of the good

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- competition between and among buyers and sellers sets off equilibrium process
- buyers competing with one another for goods in short supply bid up price to try to capture some of the good
- as price goes up, demand falls and supply rises
- Process continues until $p = p^*$ and $q_s = q_d$

the role of competition in a market economy

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two necessary aspects for competition:

the role of competition in a market economy

two necessary aspects for competition:

1) competition between buyers and sellers

the role of competition in a market economy

two necessary aspects for competition:

1) competition between buyers and sellers

buyers and sellers have conflicting interests. One side wants the price up, the other side wants the price down, and a competitive bargaining process must occur to determine an agreement.

the role of competition in a market economy

two necessary aspects for competition:

2) competition *among* buyers and *among* sellers.

the role of competition in a market economy

two necessary aspects for competition:

2) competition *among* buyers and *among* sellers.

Sellers compete with other sellers to gain market share and profit. And buyers may try to outbid one another for goods that they want to purchase.

competition

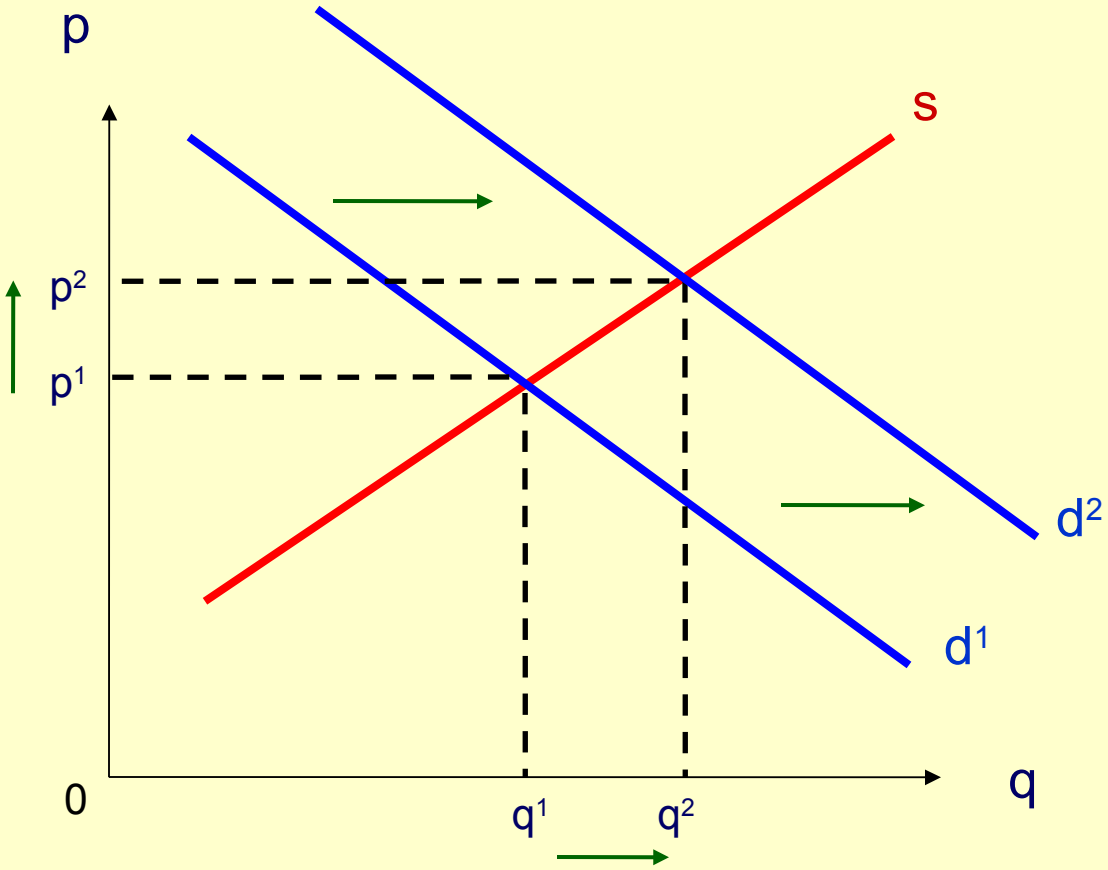
competition forces buyers and sellers to do just the opposite of what they seem to want—it forces sellers to cut price and it forces buyers to bid up the price. This dual struggle—between and among buyers and sellers—is the competitive market mechanism that pushes and pulls the market back to equilibrium price and quantity from any disequilibrium position.

movement from:
disequilibrium to equilibrium
versus
movement from:
old equilibrium to a new equilibrium

disequilibrium vs. new equilibrium

- movement along the curves from changes in variables measured along the axes
- shift in curves from changes in assumptions behind the curves

shift out of demand curve



shift of demand curve

- shifts out from:

shift of demand curve

- shifts out from:
  - increased income

shift of demand curve

- shifts out from:
  - increased income
  - stronger tastes or preferences

shift of demand curve

- shifts out from:
  - increased income
  - stronger tastes or preferences
  - increased price of substitutes

shift of demand curve

- shifts out from:
  - increased income
  - stronger tastes or preferences
  - increased price of substitutes
  - decreased price of complements

shift of demand curve

- shifts out from:
  - increased income
  - stronger tastes or preferences
  - increased price of substitutes
  - decreased price of complements
  - expectations of above

shift of demand curve

- shifts out from:
  - increased income
  - stronger tastes or preferences
  - increased price of substitutes
  - decreased price of complements
  - expectations of above
  - more buyers in market

shift of demand curve

- shifts in from:

shift of demand curve

- shifts in from:
  - decreased income

shift of demand curve

- shifts in from:
  - decreased income
  - weaker tastes or preferences

shift of demand curve

- shifts in from:
  - decreased income
  - weaker tastes or preferences
  - decreased price of substitutes

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- shifts in from:
  - decreased income
  - weaker tastes or preferences
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  - decreased income
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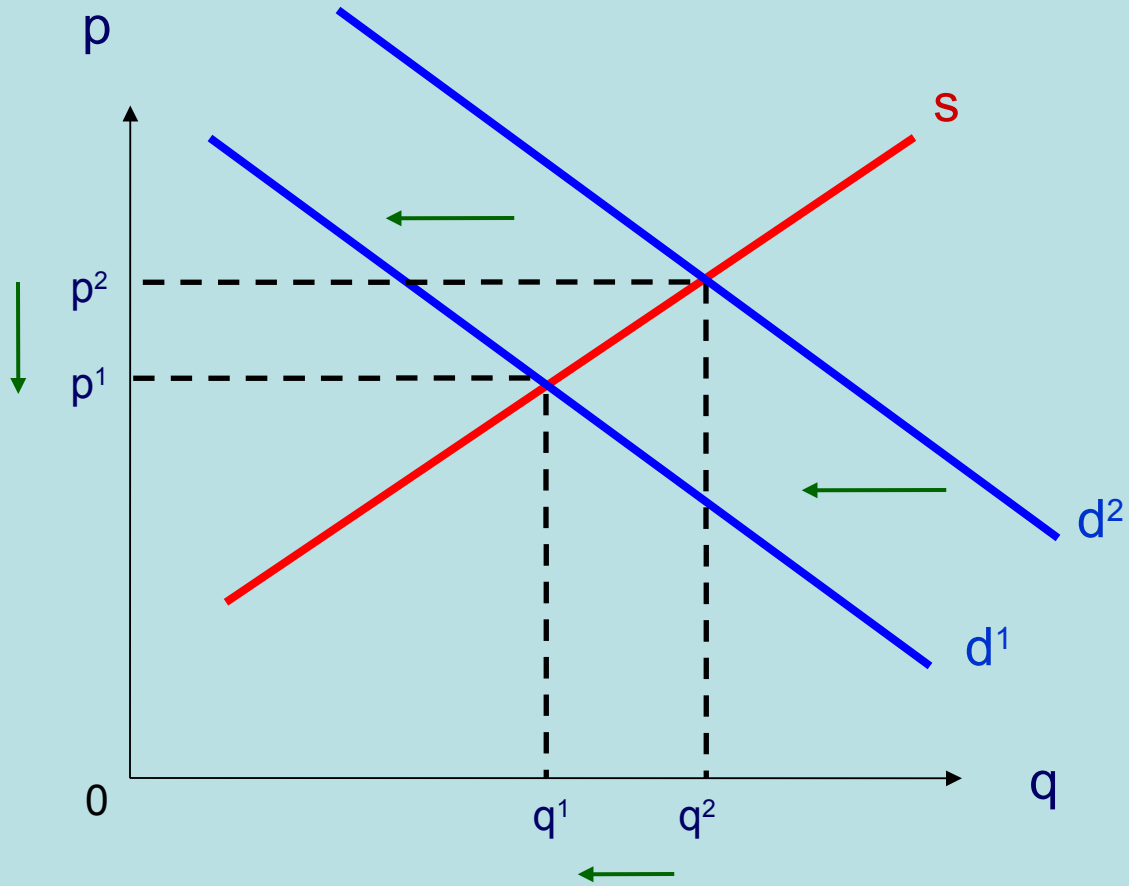
shift of demand curve

- shifts in from:
  - decreased income
  - weaker tastes or preferences
  - decreased price of substitutes
  - increased price of complements
  - expectations of above
  - fewer buyers in market

demand curve shifts in



shift of supply curve

shift of supply curve

- shifts in from:

shift of supply curve

- shifts in from:
  - higher costs of production

shift of supply curve

- shifts in from:
  - higher costs of production
    - higher input prices

shift of supply curve

- shifts in from:
  - higher costs of production
    - higher input prices
    - technological decline

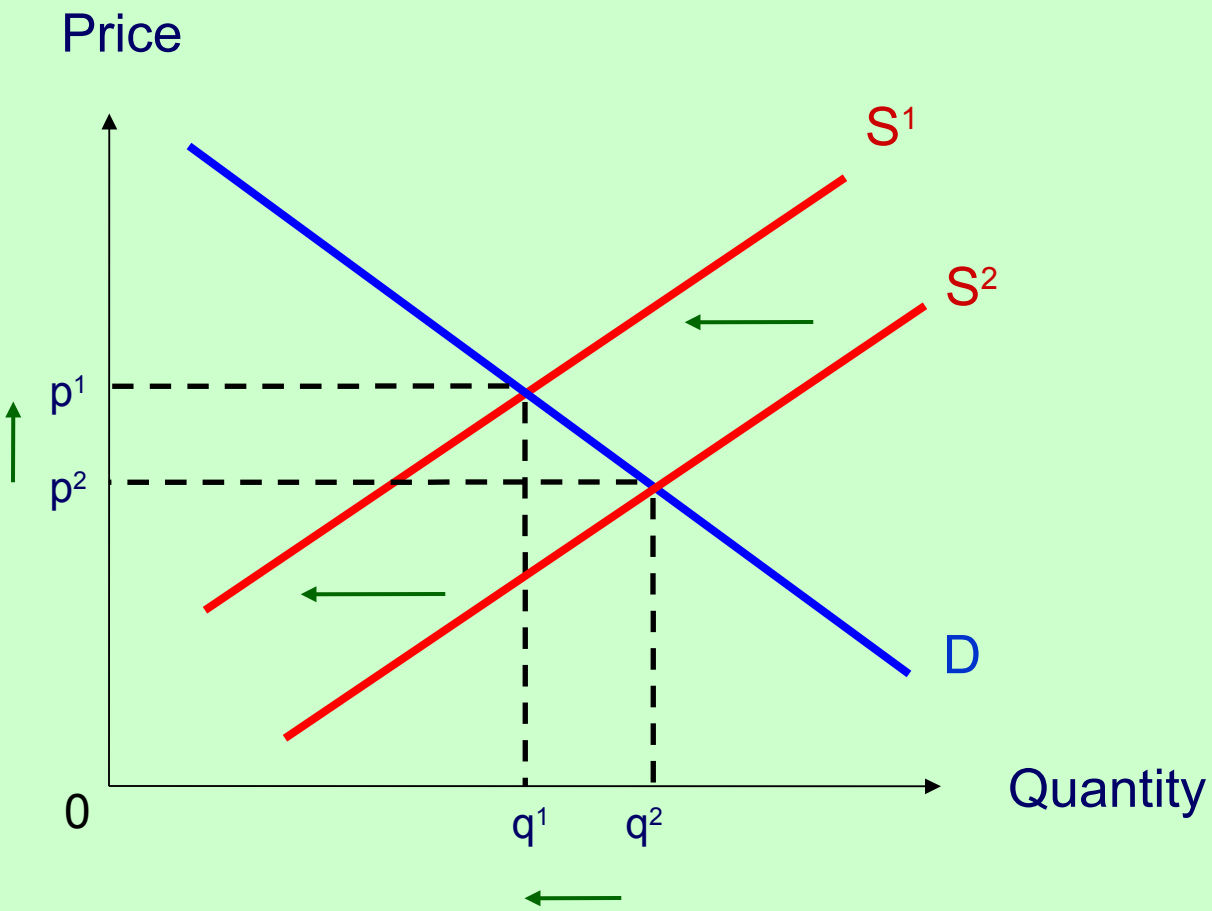
shift of supply curve

- shifts in from:
  - higher costs of production
    - higher input prices
    - technological decline
  - dimmer expectations

shift of supply curve

- shifts in from:
  - higher costs of production
    - higher input prices
    - technological decline
  - dimmer expectations
  - fewer sellers in the market

supply curve shifts in



shift of supply curve

- shifts out from:

shift of supply curve

- shifts out from:
  - lower costs of production

shift of supply curve

- shifts out from:
  - lower costs of production
    - lower input prices

shift of supply curve

- shifts out from:
  - lower costs of production
    - lower input prices
    - technological advance

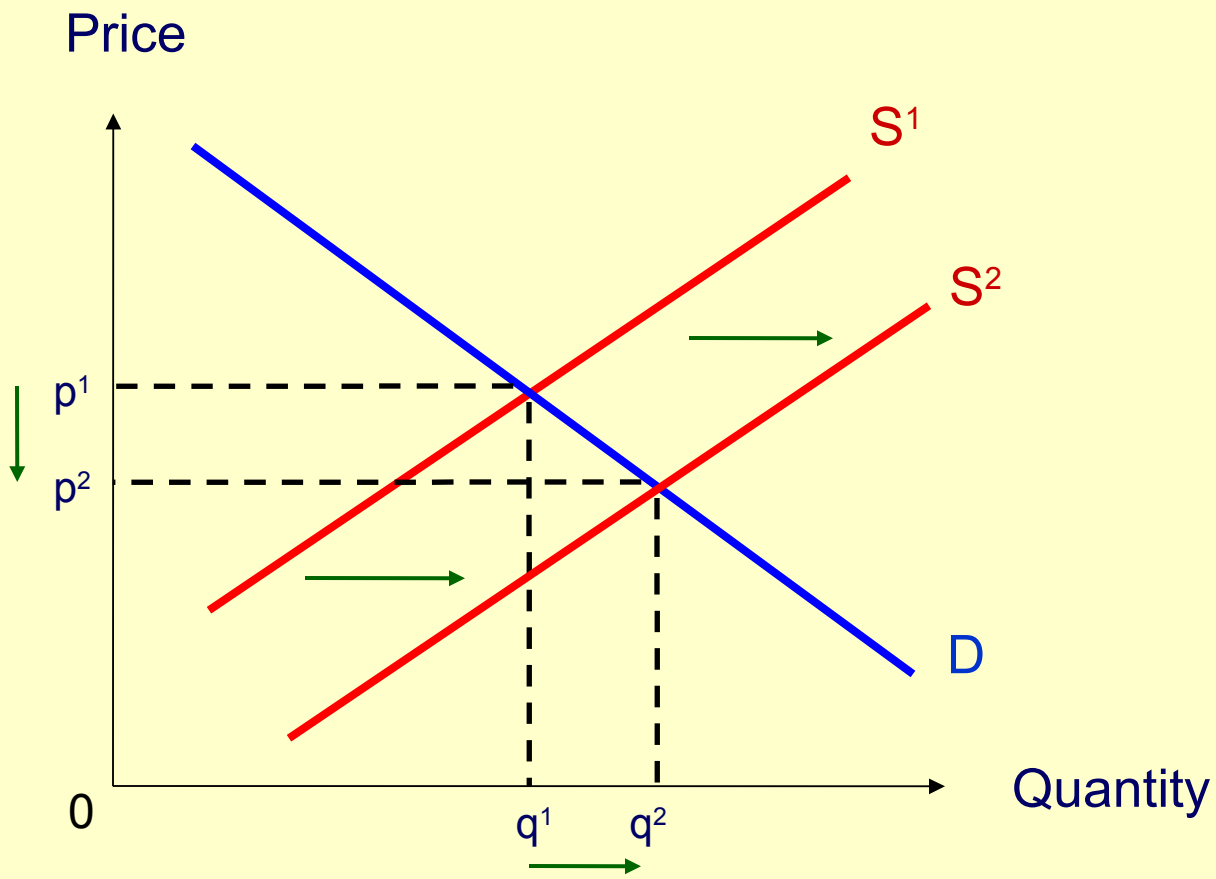
shift of supply curve

- shifts out from:
  - lower costs of production
    - lower input prices
    - technological advance
  - brighter expectations

shift of supply curve

- shifts out from:
  - lower costs of production
    - lower input prices
    - technological advance
  - brighter expectations
  - more sellers in the market

supply curve shifts out



law of demand

- the law of demand *usually* holds, but it can be violated on occasion.
- usually if price goes up, demand goes down, and if price goes down demand goes up.
- But there are exceptional cases where when price goes up, demand actually goes up!

“Giffen goods”

- Case in Ireland during the potato famine, when price of potatoes went up, demand for potatoes went up.

(hint: the average family ate potatoes for dinner six nights a week and one night a week they ate meat.)

Giffen goods

- Reason: meat was still much more expensive than potatoes, so when the price of potatoes went up, families had to stop eating meat the one night and eat potatoes seven nights a week.

violations of law of demand

- Also, the demand curve can be upward sloping in the case of goods that people value more when the price is higher—they think that price is an indicator of quality! Think of the situation where a price is low, so you think there must be something wrong with it.

consumer theory

- A number of interesting tendencies along these lines:

consumer theory

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1) bandwagon effect: you buy something to be part of the crowd

consumer theory

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2) Snob effect: you buy something to distinguish yourself from the crowd (can be designer jeans, or ripped up jeans!)

consumer theory

- A number of interesting tendencies along these lines:

1) bandwagon effect: you buy something to be part of the crowd
2) Snob effect: you buy something to distinguish yourself from the crowd (can be designer jeans, or ripped up jeans!)
3) Veblen effect: you buy something to show you can afford it

law of demand

but normally, the law of demand is said to hold in neoclassical economics:

when price goes up, quantity demanded goes down; when price goes down, quantity demanded goes up.

But how much does quantity demanded change when price changes?

Elasticity

- In economics, we use the concept of elasticity to measure the sensitivity or responsiveness of one variable to another.

Own price elasticity of demand

- Is the sensitivity or responsiveness of a change in the demand for a good to a change in its own price.
- Measure as:

$$\frac{\%\Delta q_{dx}}{\%\Delta p_x}$$

Own price elasticity of demand

- Factors that determine:

1) Availability and price of close substitutes
   (many—elastic; few—inelastic)
2) % of budget devoted to the good
   (small—inelastic; large—elastic)
3) Time
   (short run—inelastic; long run--elastic

Own price elasticity of demand

Who cares?

Firms want to know how a price change will affect total revenue

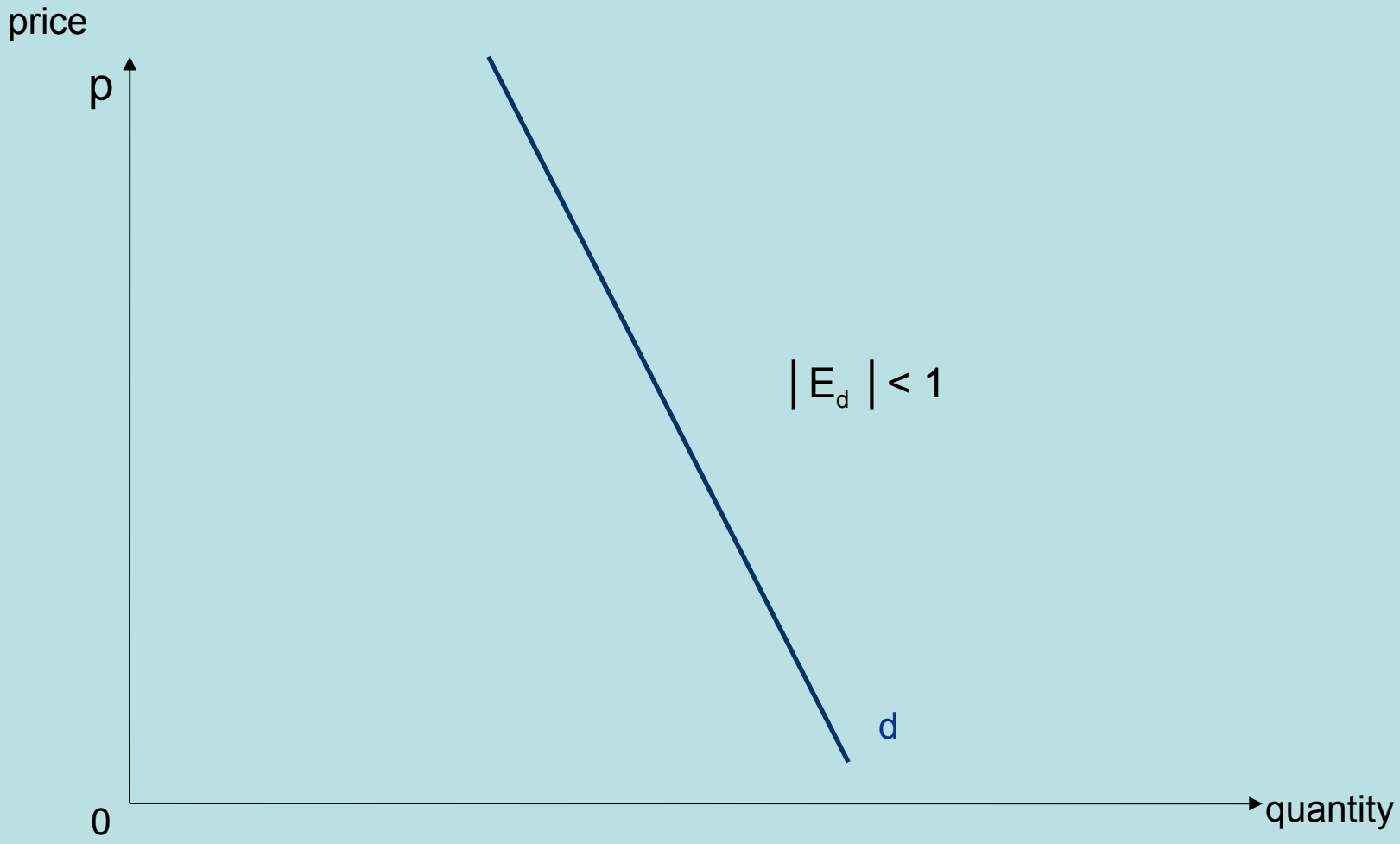
Elastic price goes down—total revenue goes up
Elastic price goes up—total revenue goes down
Inelastic price goes up—total revenue goes up
Inelastic price goes down—total revenue goes down
Unitary elastic price goes up or down—total revenue stays the same

Own price elasticity of demand

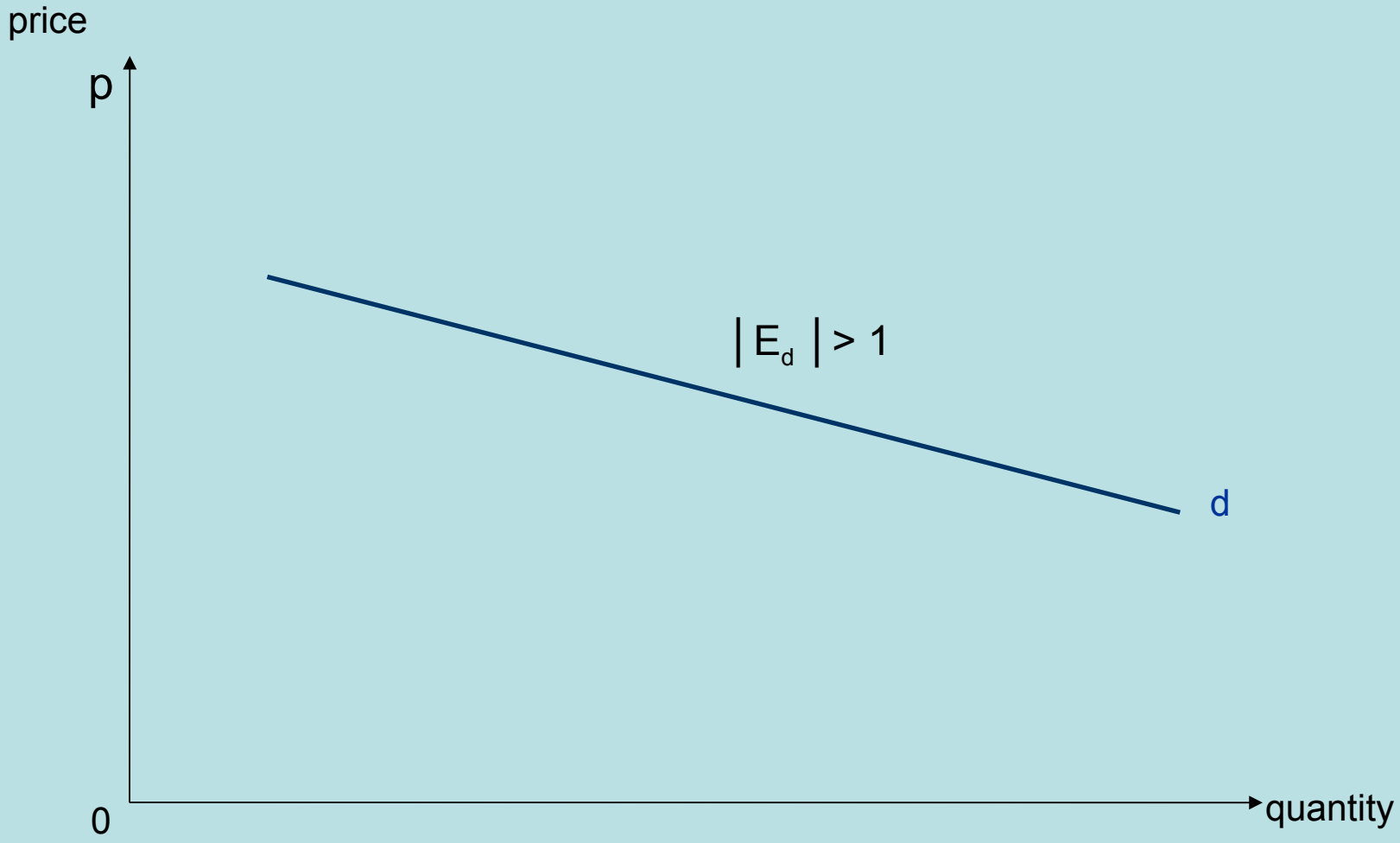
- If the absolute value of the elasticity is:

> 1	elastic
< 1	inelastic
= 1	unitary elastic
= 0	perfectly inelastic
= infinity	perfectly elastic

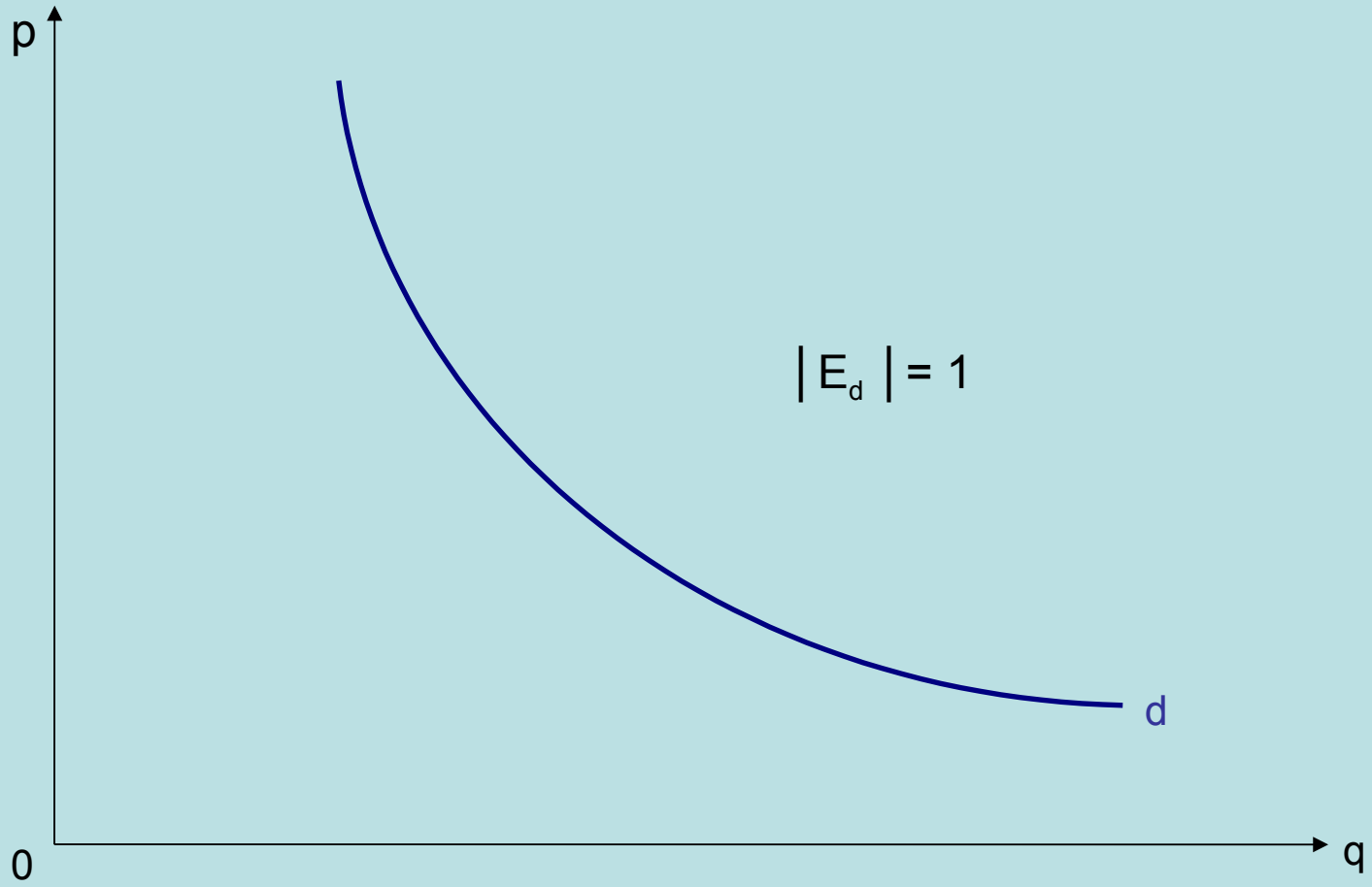
Inelastic demand curve



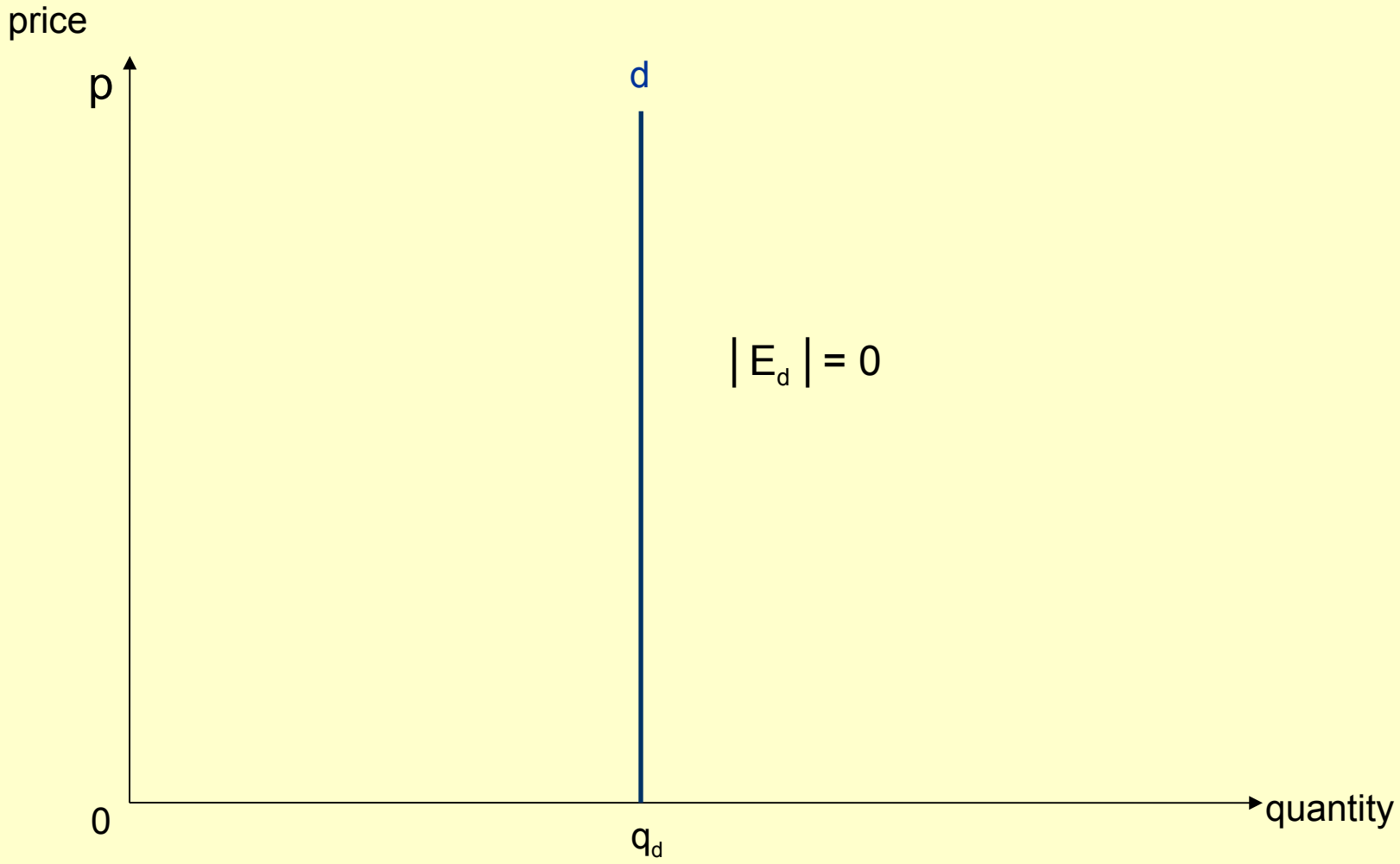
Elastic demand curve



Unitary Elastic Demand Curve



Perfectly inelastic demand curve



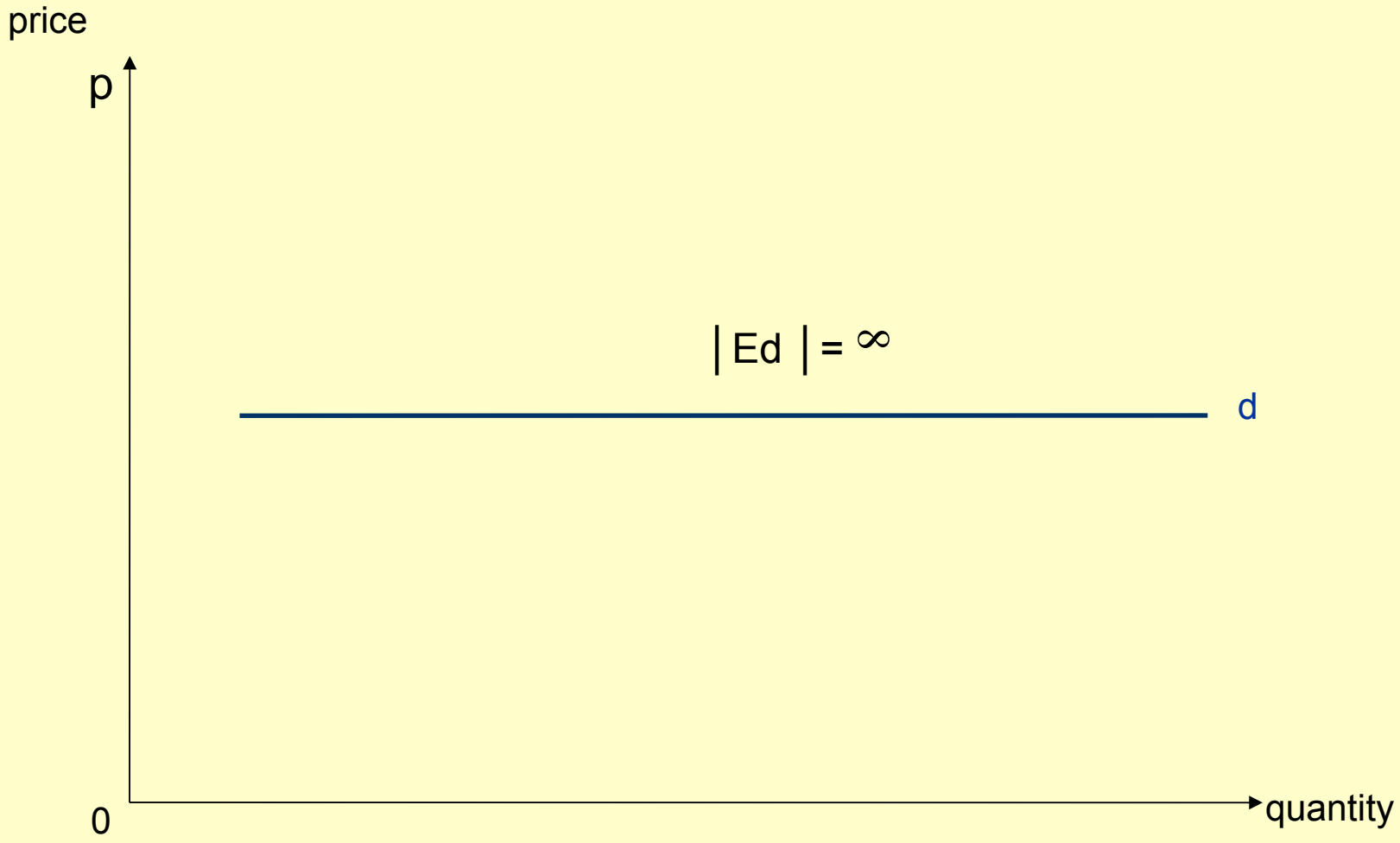
Example of perfectly inelastic demand?

- What kind of good will the demand stay constant whether price goes up or down?

Example of perfectly inelastic demand?

- What kind of good will the demand stay constant whether price goes up or down?
- Insulin—diabetics cannot buy less even if price goes up, and if I walk into the pharmacy and see there is a sale on insulin, as a non-diabetic I don't buy any!

Perfectly elastic demand curve



Perfectly elastic demand curve

- Demand curve facing a firm in a perfectly competitive market—each firm is so small and there are so many firms that none can affect price—they are price takers.

Income elasticity of demand

- Sensitivity or responsiveness of demand for a good to a change in income

$$\frac{\%\Delta q_{dx}}{\%\Delta \text{income}}$$

Income elasticity of demand

- For normal goods income elasticity of demand is positive (if income goes up, demand goes up)
- For inferior goods, if income goes up, demand goes down. Example?

Income elasticity of demand

- For normal goods income elasticity of demand is positive (if income goes up, demand goes up)
- For inferior goods, if income goes up, demand goes down. Example?
- RAMEN NOODLES
- POWDERED MILK

Cross price elasticity of demand

- Sensitivity or responsiveness of demand for good x to a price change in good y

$$\frac{\%\Delta q_{dx}}{\%\Delta p_y}$$

Cross price elasticity of demand

- Substitutes—price of coffee goes up, demand for tea goes up—cross price elasticity is positive
- Complements—price of coffee goes up, demand for cream goes down—cross price elasticity is negative

Own price elasticity of supply

- Sensitivity or responsiveness of supply for good x to a change in its own price

$$\frac{\%\Delta q_{Sx}}{\%\Delta p_x}$$

Wage elasticity of labor demand

- Sensitivity or responsiveness of demand for labor to a change in the wage

$$\frac{\%\Delta L_d}{\%\Delta w}$$

Interest elasticity of investment

- Sensitivity or responsiveness of investment to a change in the rate of interest

$$\frac{\%\Delta I}{\%\Delta i}$$

Interest elasticity of the money supply

- Sensitivity or responsiveness of the money supply to a change in the rate of interest

$$\frac{\%\Delta Ms}{\%\Delta i}$$

Elasticity and The Demand Curve

- As you move down the demand curve, goods become more inelastic.

Elasticity and Total Revenue

- The point along the demand curve where goods become more elastic is the point where businesses maximize total revenue