



Consumer Choice and the Law of Demand



Law of Demand

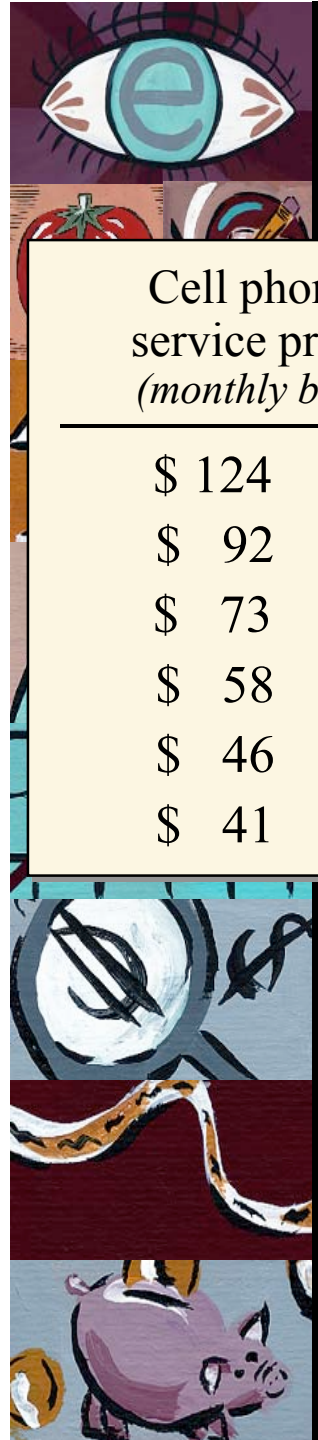
- ***Law of Demand***: the inverse relationship between the price of a good and the quantity consumers are willing to purchase.
 - As price of a good rises, consumers buy less.
 - The availability of ***substitutes*** (*goods with similar functions*) explains this negative relationship.



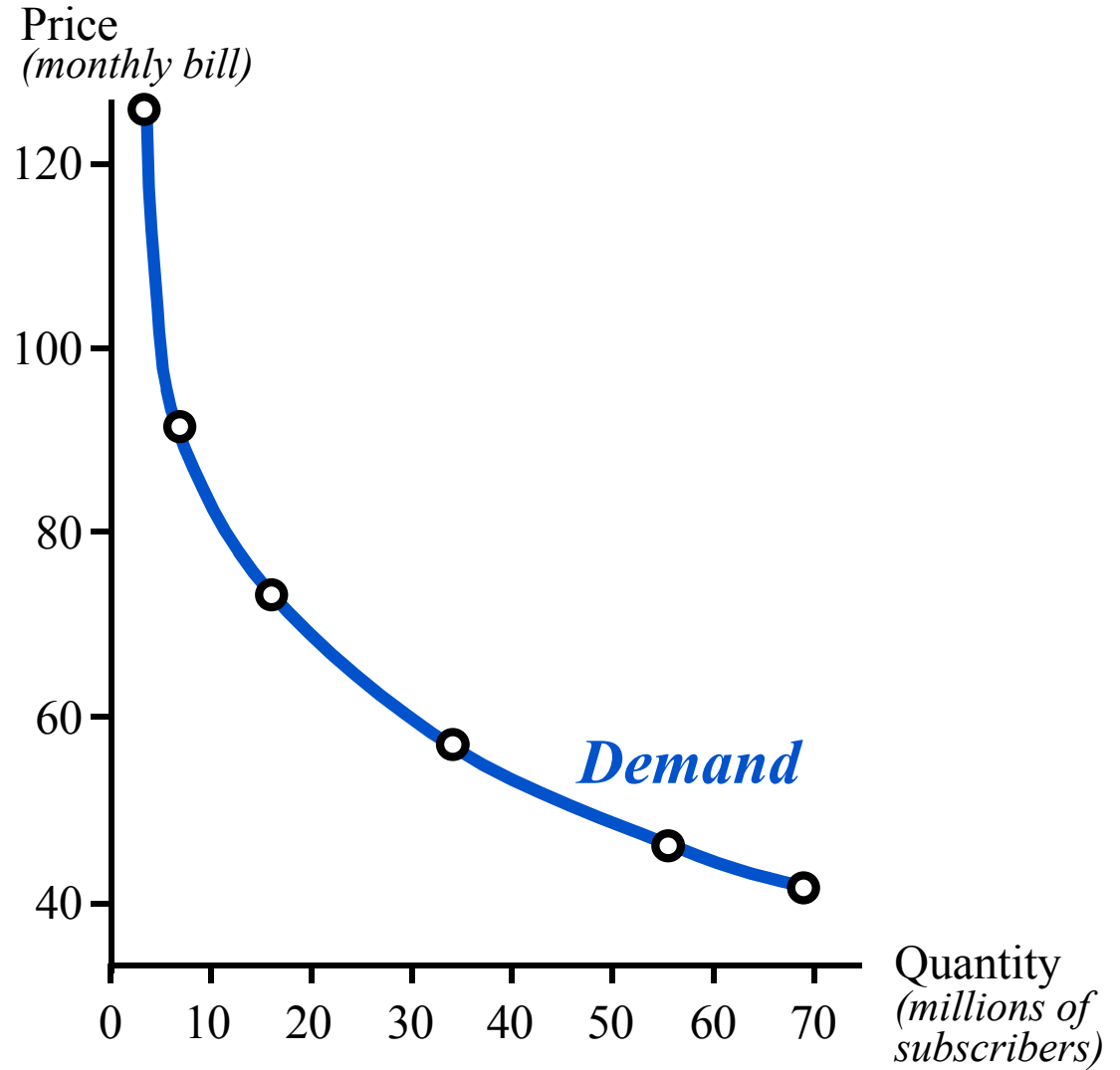
Market Demand Schedule

- A *market demand schedule* is a table that shows the quantity of a good people will demand at varying prices.
- Consider the market for cellular phone service. A *market demand schedule* lays out the quantity of cell phone service demanded in the market at various prices.
- We can graph these points (*the different prices and respective quantities demanded*) to make a *demand curve* for cell phone service.

Market Demand Schedule

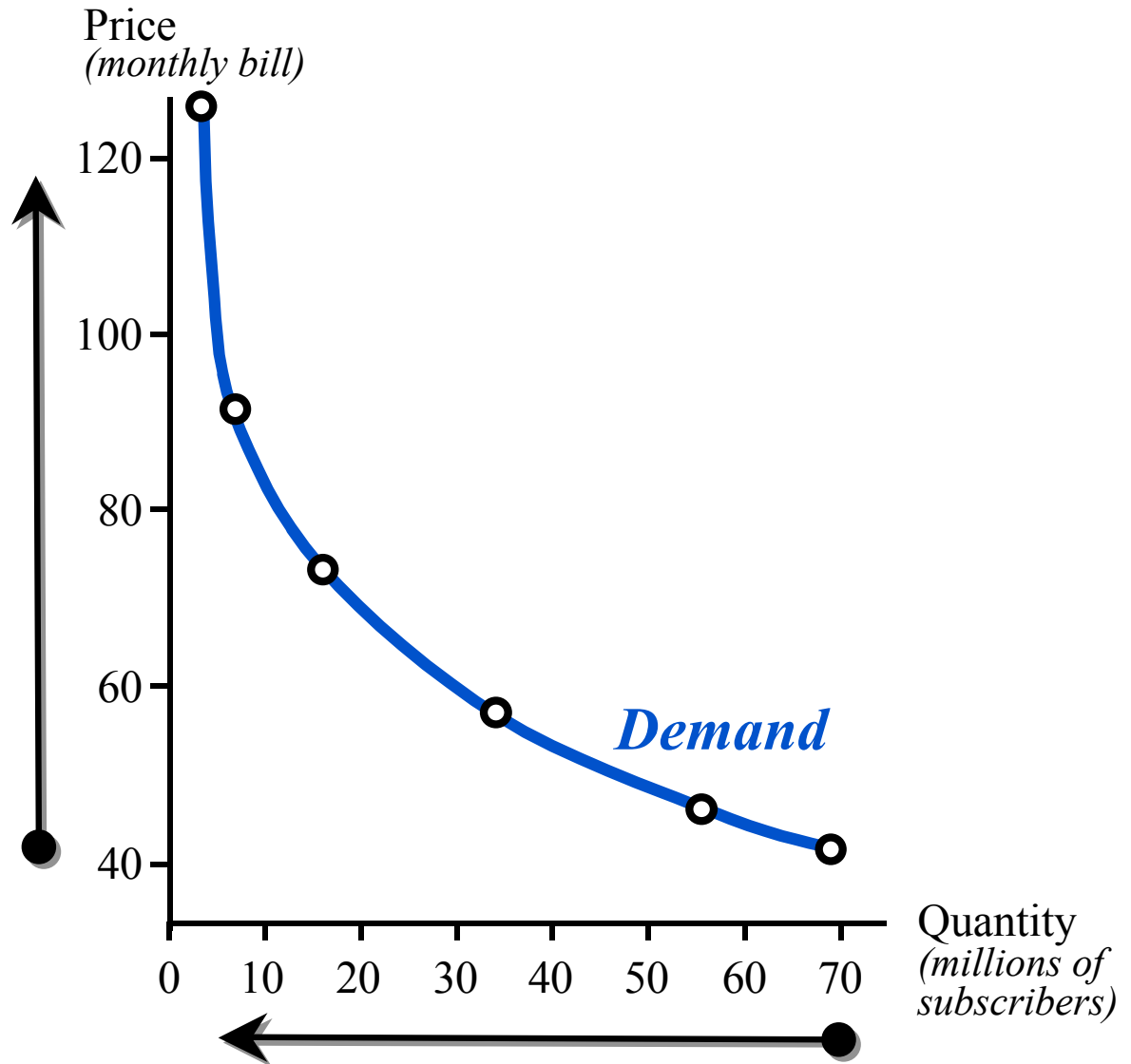


Cell phone service price (monthly bill)	Cell phone subscribers (millions)
\$ 124	3.5
\$ 92	7.6
\$ 73	16.0
\$ 58	33.7
\$ 46	55.3
\$ 41	69.2



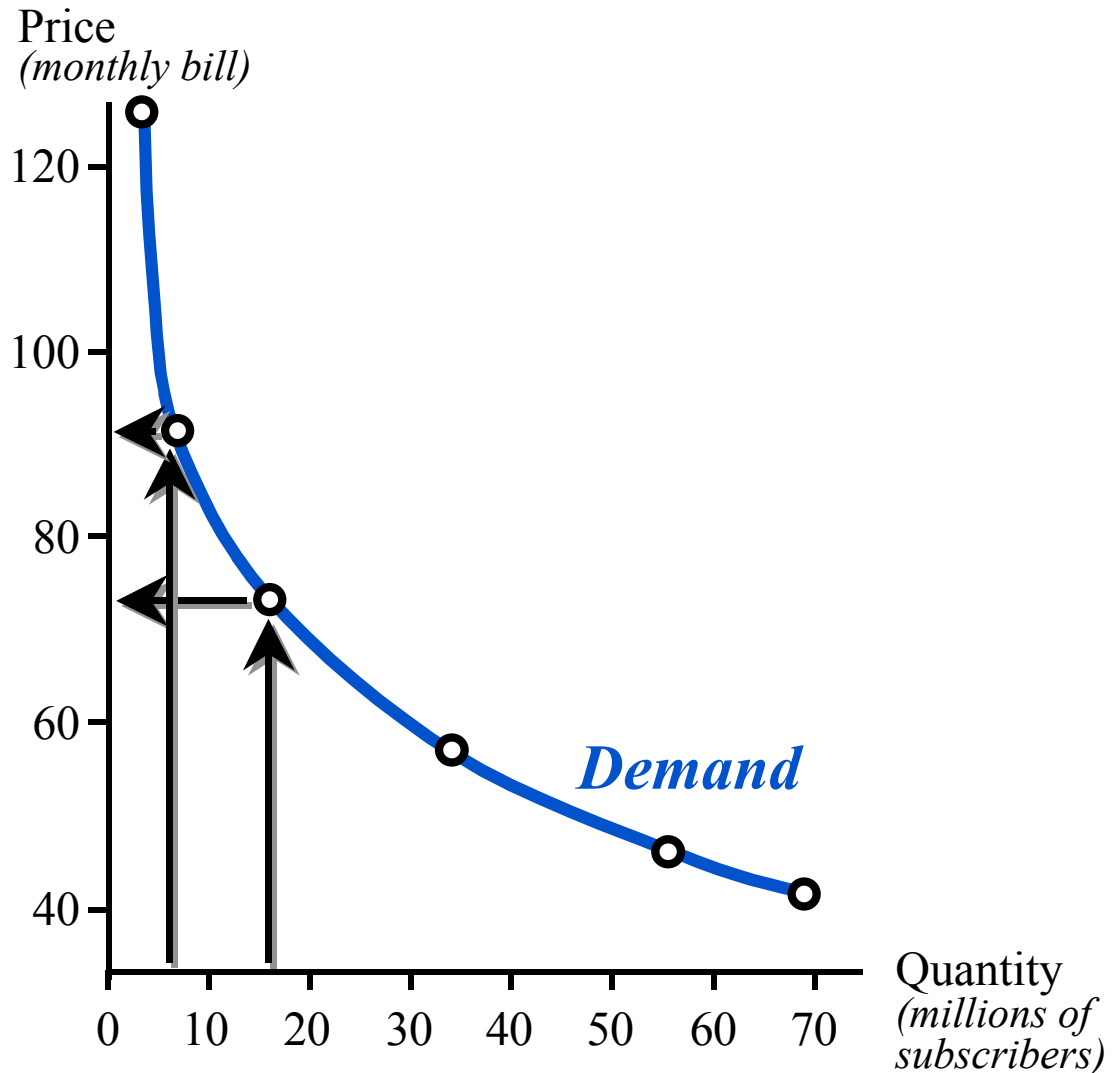
Market Demand Schedule

- Notice how the *law of demand* is reflected by the shape of the demand curve.
- As the price of a good rises ...consumers buy less.



Market Demand Schedule

- The height of the *demand curve* at any quantity shows the *maximum price* that consumers are willing to pay for that additional unit.
- Here, for the 16th unit ... consumers are only willing to pay up to \$73 for it.
- While they would be willing to pay up to \$92 for the 7.6 (millionth) unit.



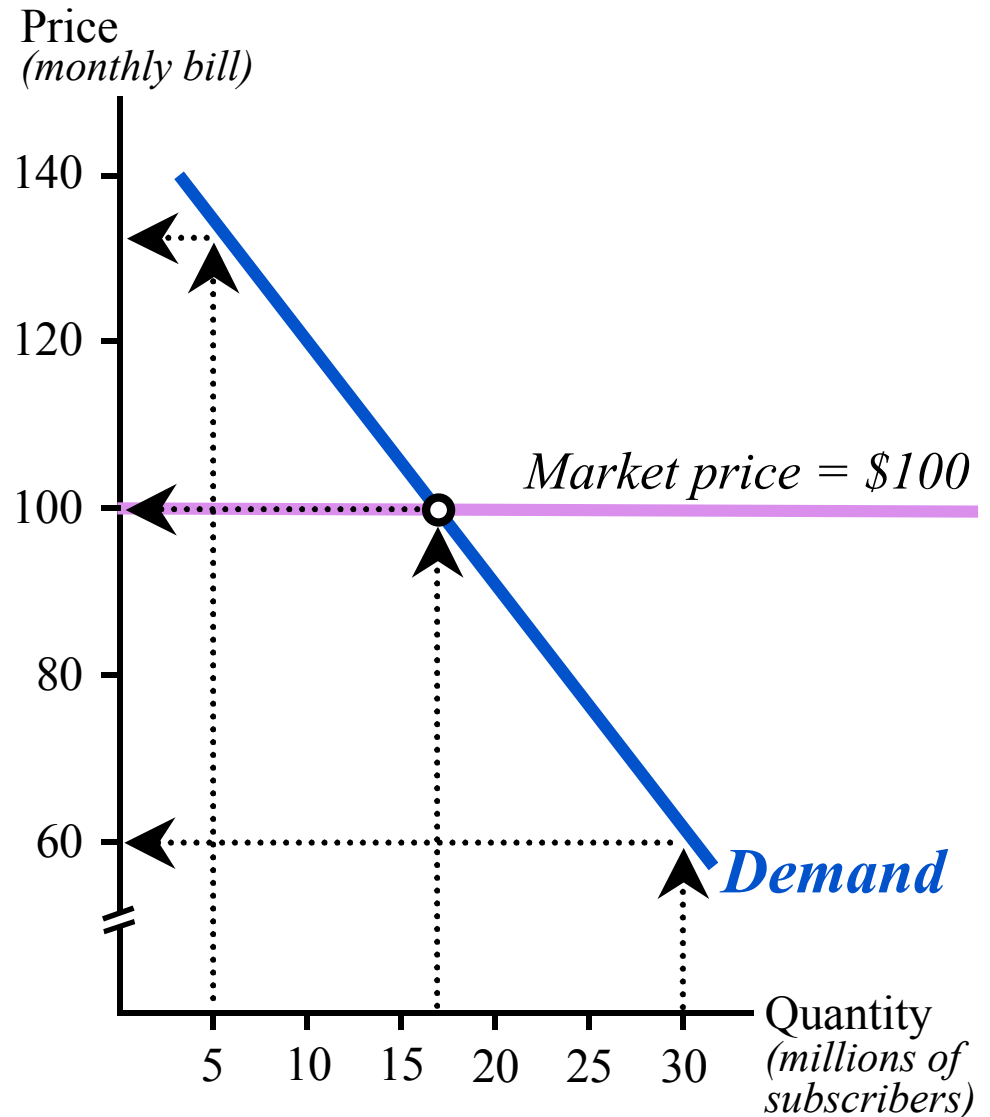


Consumer Surplus

- ***Consumer Surplus:***
the area below the demand curve but above the actual price paid.
 - Consumer surplus is the difference between the amount consumers are willing to pay and the amount they have to pay for a good.
- Lower market prices increase the amount of consumer surplus in the market.

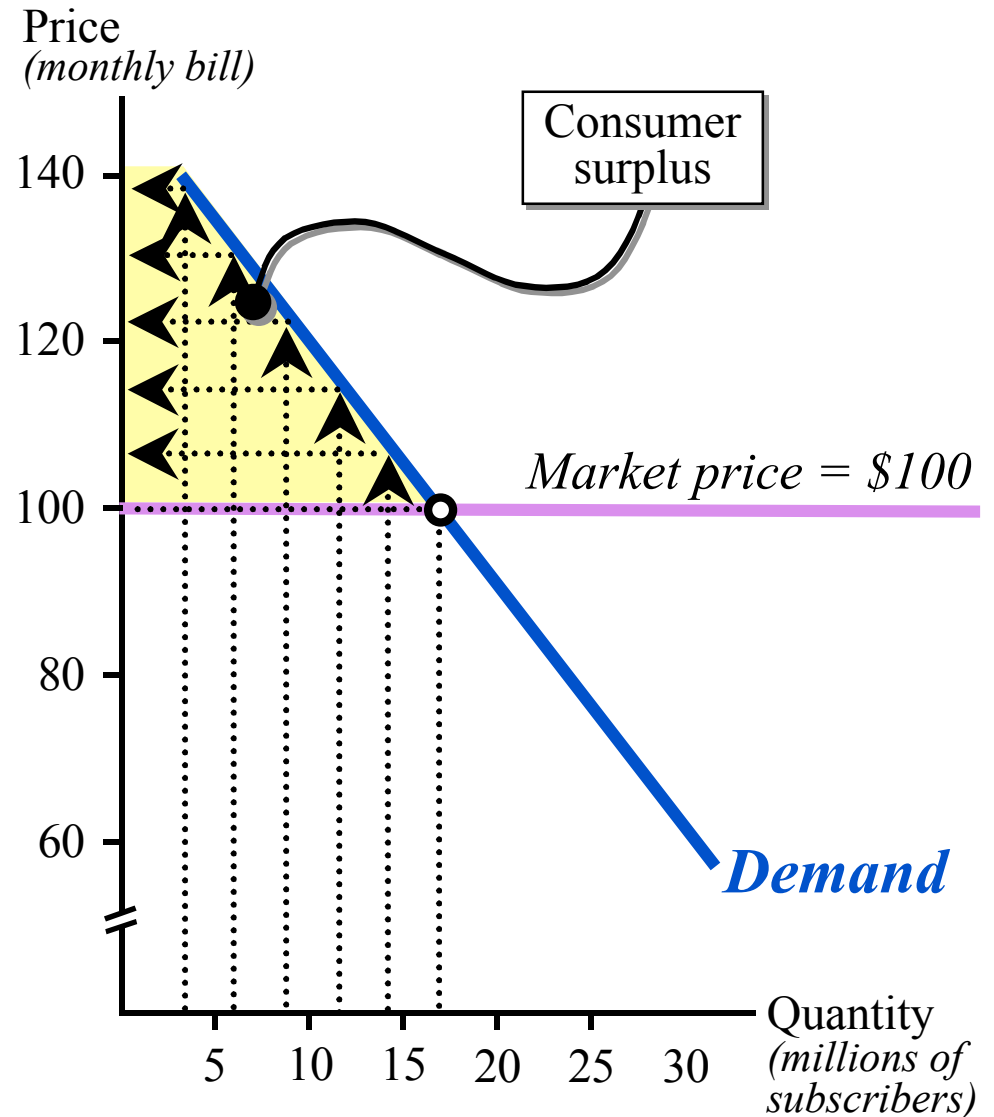
Market Demand Schedule

- Consider the market for cellular phones service again. This time we will assume that the demand for cell service is more *linear* and that the market price is \$100.
- If the market price is \$100, then the 30th unit will **not sell** because those who demand it are only willing to pay \$60 for cellular phone service.
- At \$100, the 17th unit **will sell** because those who demand it are willing to pay up to \$100 for cellular phone service.
- At \$100, the 5th unit **will sell** because those who demand it are willing to pay up to \$137 for cellular phone service.



Market Demand Schedule

- For all those goods under 17 units, people are willing to pay more than \$100 for service.
- The area, represented by the distance above the actual price paid and below the demand curve, is called *consumer surplus*.
- This area represents the net gains to buyers from market exchange.



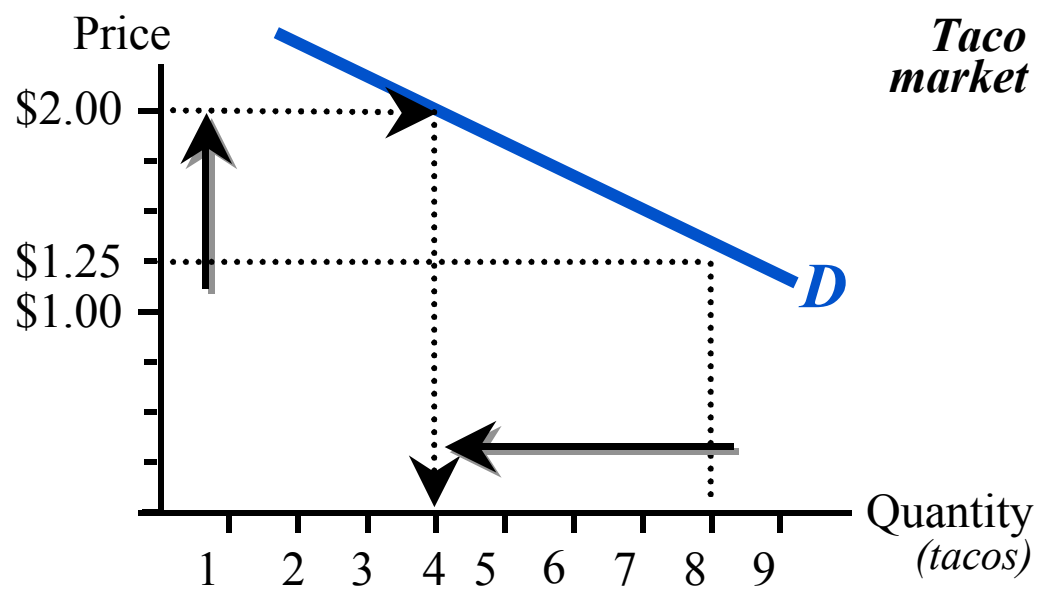
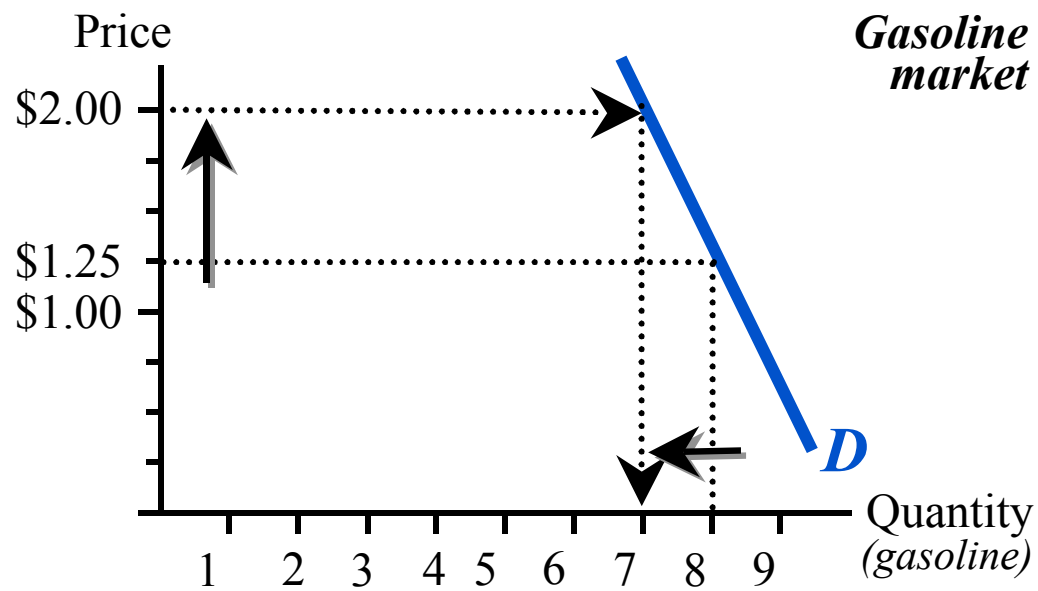


Elastic and Inelastic Demand Curves

- **Elastic demand**
 - *quantity demanded is sensitive to small changes in price.*
 - Easy to substitute away from good.
- **Inelastic demand**
 - *quantity demanded is not sensitive to changes in price.*
 - Difficult to substitute away from good.

Elastic and Inelastic Demand Curves

- When the market price for gasoline rises from \$1.25 to \$2.00 a gallon, the quantity demanded in the market falls insignificantly from 8 to 7 million units per week.
- In contrast, when the market price for tacos rises from \$1.25 to \$2.00, quantity demanded in the market falls significantly from 8 to 4 million units per week.
- As taco demand is highly sensitive to price changes, taco demand is described as *elastic*; as petrol demand is relatively insensitive to price changes, gasoline demand is described as *inelastic*.





Questions for Thought:

1. Are prices an accurate reflection of a good's total value? Are prices an accurate reflection of a good's marginal value? What is the difference?
 - (a) Consider diamonds and water. Which of these goods provides the most total value? Which provides the most marginal value?
 - (b) Does price reflect total or marginal value?



Changes in Demand Versus Changes in the Quantity Demanded

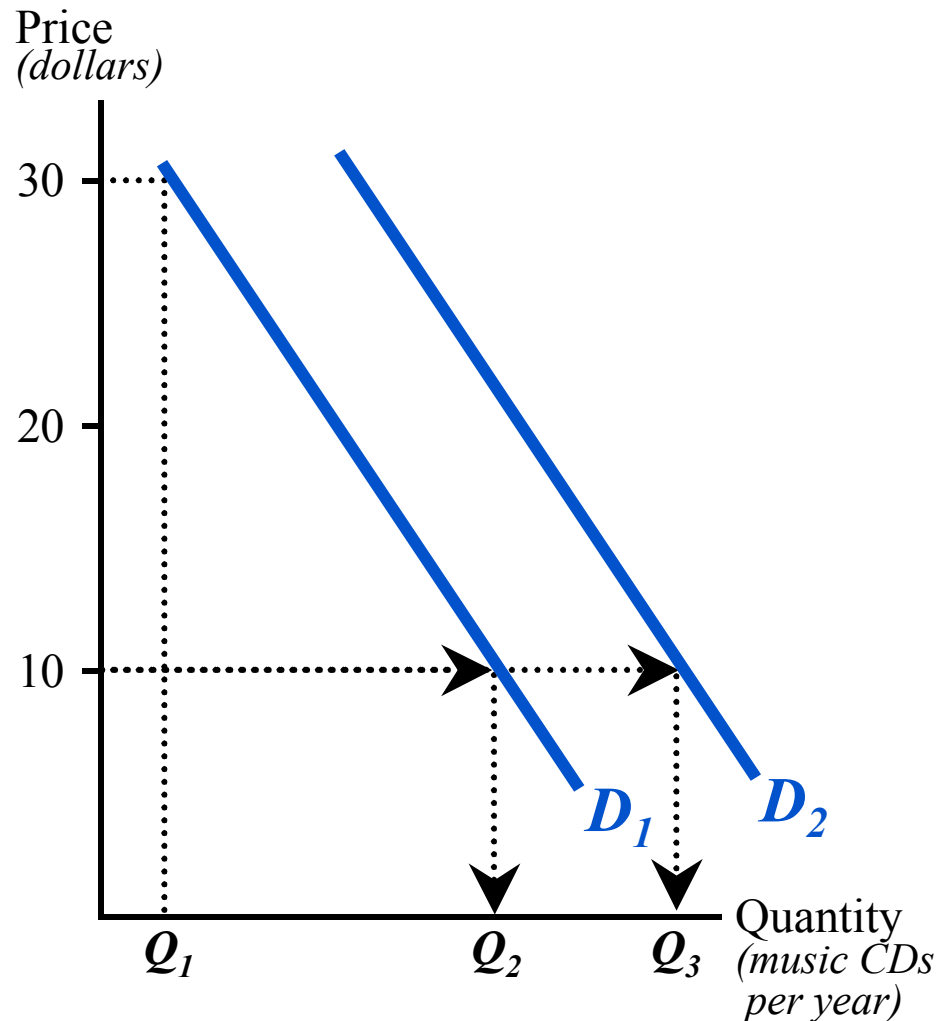


Changes in Demand and Quantity Demanded

- ***Change in Demand***
 - *a shift in the entire demand curve.*
- ***Change in Quantity Demanded***
 - *a movement along the same demand curve in response to a change in price.*

A Change in Demand

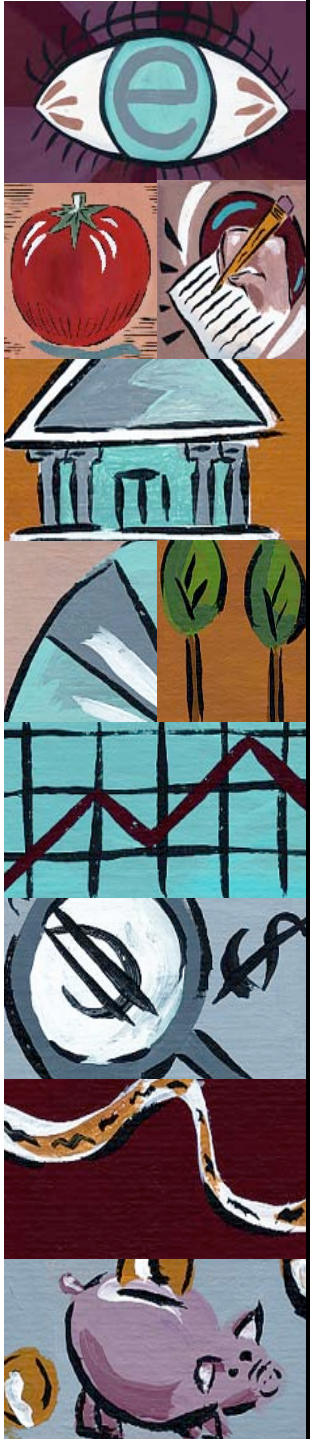
- If music compact discs cost \$30 each, the demand curve for CDs D_1 indicates that Q_1 units would be demanded.
- If the price of CDs fell to \$10, the *quantity demanded* of CDs would increase to Q_2 units (where $Q_2 > Q_1$).
- If, somehow, the preferences for CDs changed then the *demand* for CDs may *change*.
- Consider the case where consumer income increases. Demand for CDs at all price levels increases. Now, at \$10 Q_3 units are demanded (where $Q_3 > Q_2 > Q_1$).





Demand Curve Shifters

- Changes in consumer income
- Change in the number of consumers
- Change in the price of a related good
- Changes in expectations
- Demographic changes
- Changes in consumer tastes and preferences



Questions for Thought:

1. Which of the following do you think would lead to an increase in the demand for beef:
 - (a) higher pork prices,
 - (b) higher incomes,
 - (c) higher feed grains prices used to feed cows,
 - (d) widespread outbreak of mad-cow or hoof-and-mouth disease,
 - (e) an increase in the price of beef?
2. What is being held constant when a demand curve for a product (like shoes or apples, for example) is constructed? Explain why the demand curve for a product slopes downward and to the right.



Producer Choice and the Law of Supply



Producers

- ***Opportunity Cost of Production:***
the sum of the producer's cost of employing each resource required to produce the good.
- Firms will not stay in business for long unless they are able to cover the cost of all resources employed, including the ***opportunity cost*** of those owned by the firm.



Economic & Accounting Costs

- ***Economic Cost:***
the cost of all resources used in production.
- ***Accounting Cost:***
generally ignore the opportunity cost of equity capital invested in firm.



Role of Profits and Losses

- **Profit** occurs when a firm's revenues are greater than their costs.
- Firms supplying goods for which consumers are willing to pay more than the opportunity cost of resources used will make a profit.
- Firms making a profit will expand and those with a loss will contract.



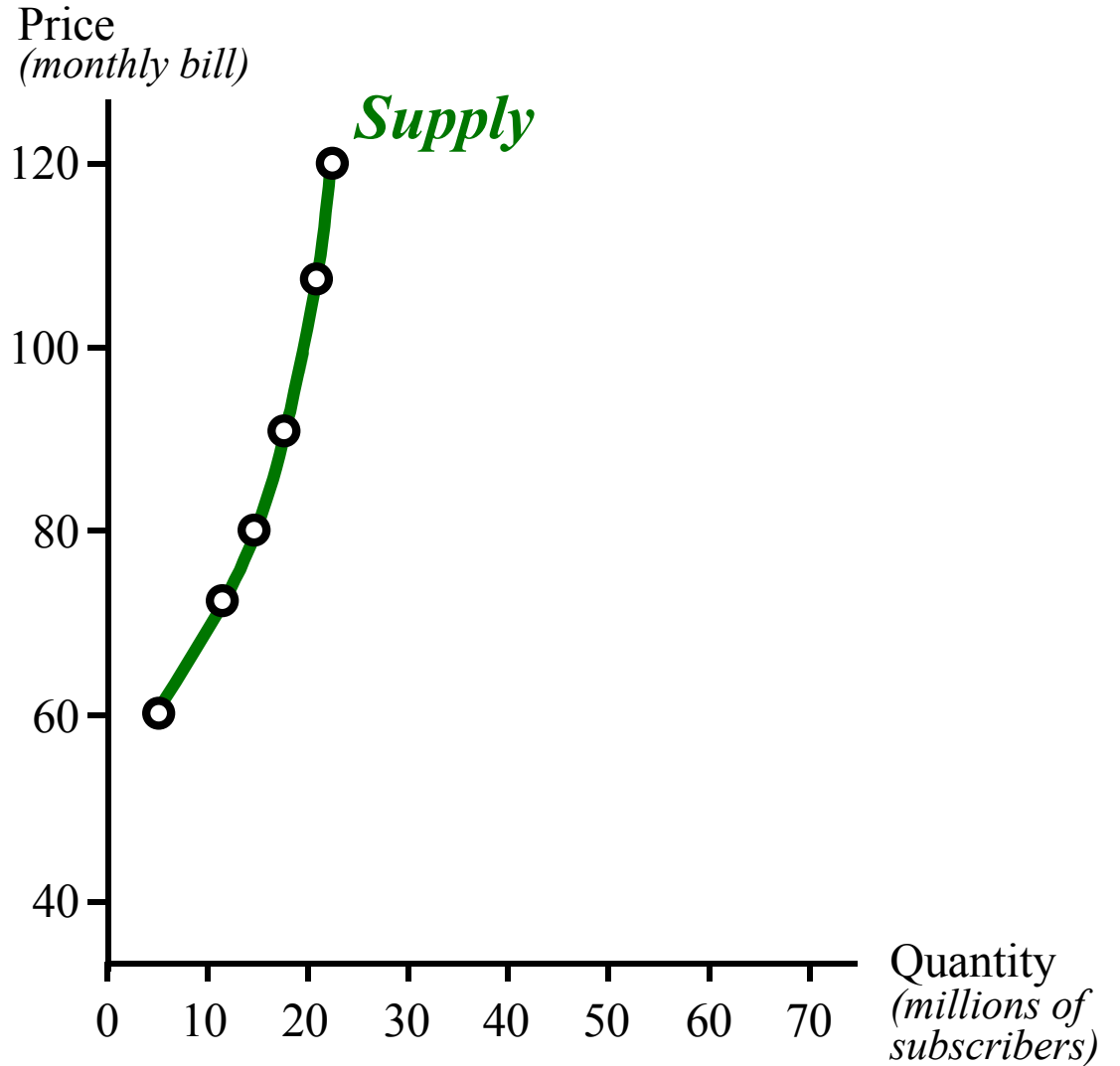
The Law of Supply

- *Law of Supply:*
there is a positive relationship between the price of a product and the amount of it that will be supplied.
 - As the price of a product rises, producers will be willing to supply a larger quantity.



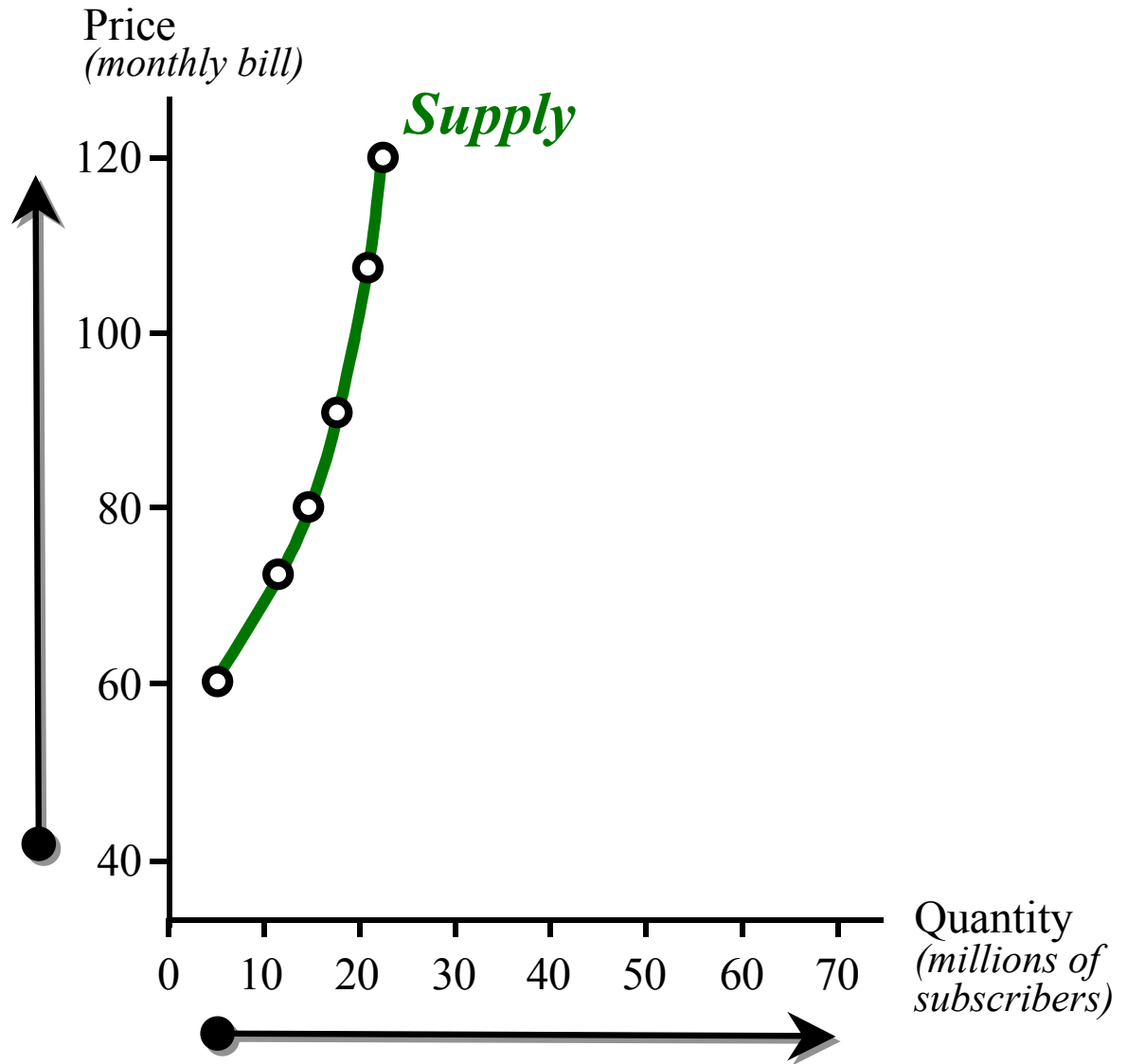
Market Supply Schedule

Cell phone service price (monthly bill)	Cell phone service supplied to market (millions)
\$ 60	5.0
\$ 73	11.0
\$ 80	15.1
\$ 91	18.2
\$ 107	21.0
\$ 120	22.5



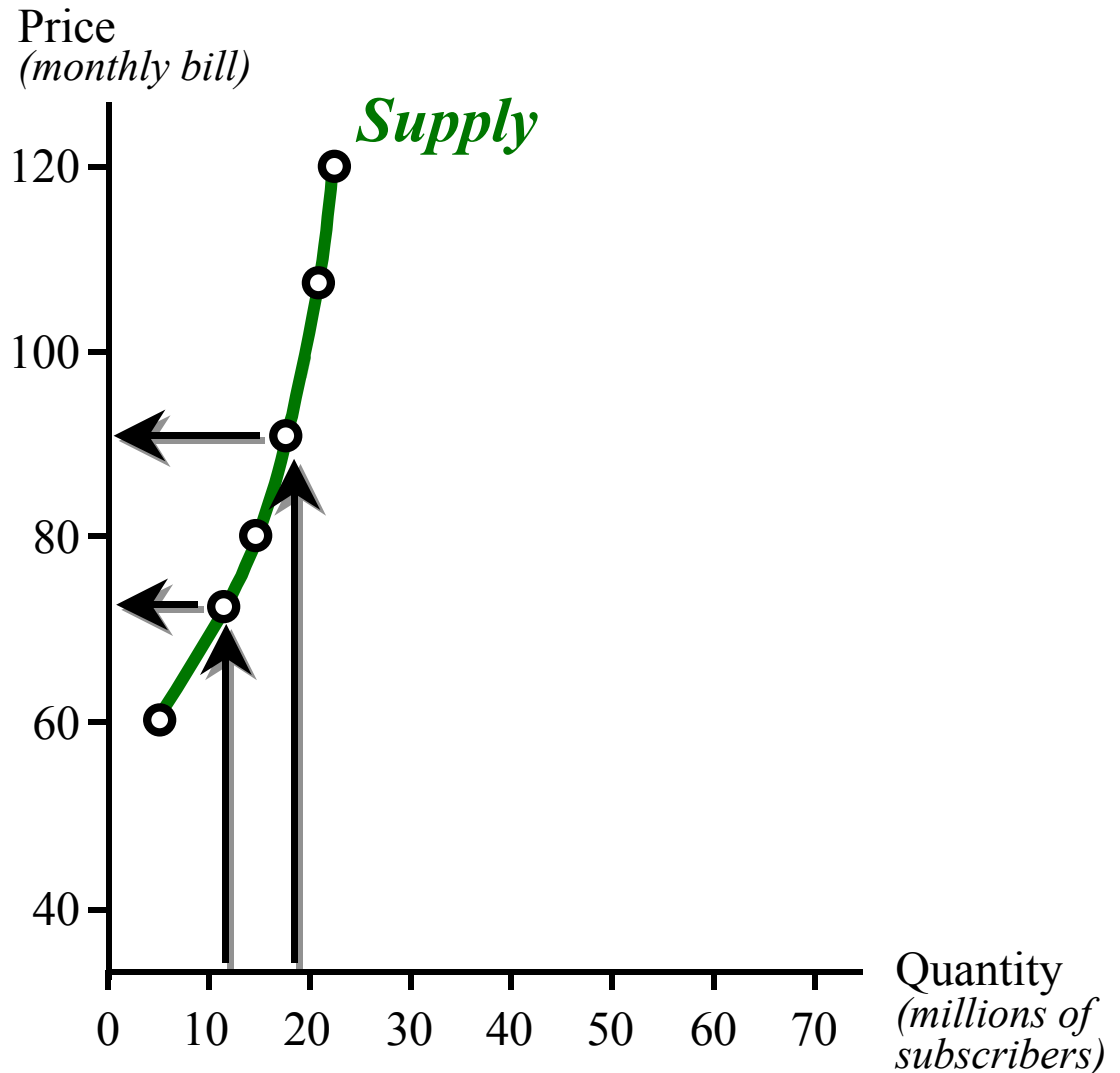
Market Supply Schedule

- Notice how the *law of supply* is reflected by the shape of the supply curve.
- As the price of a good rises ...producers supply more.



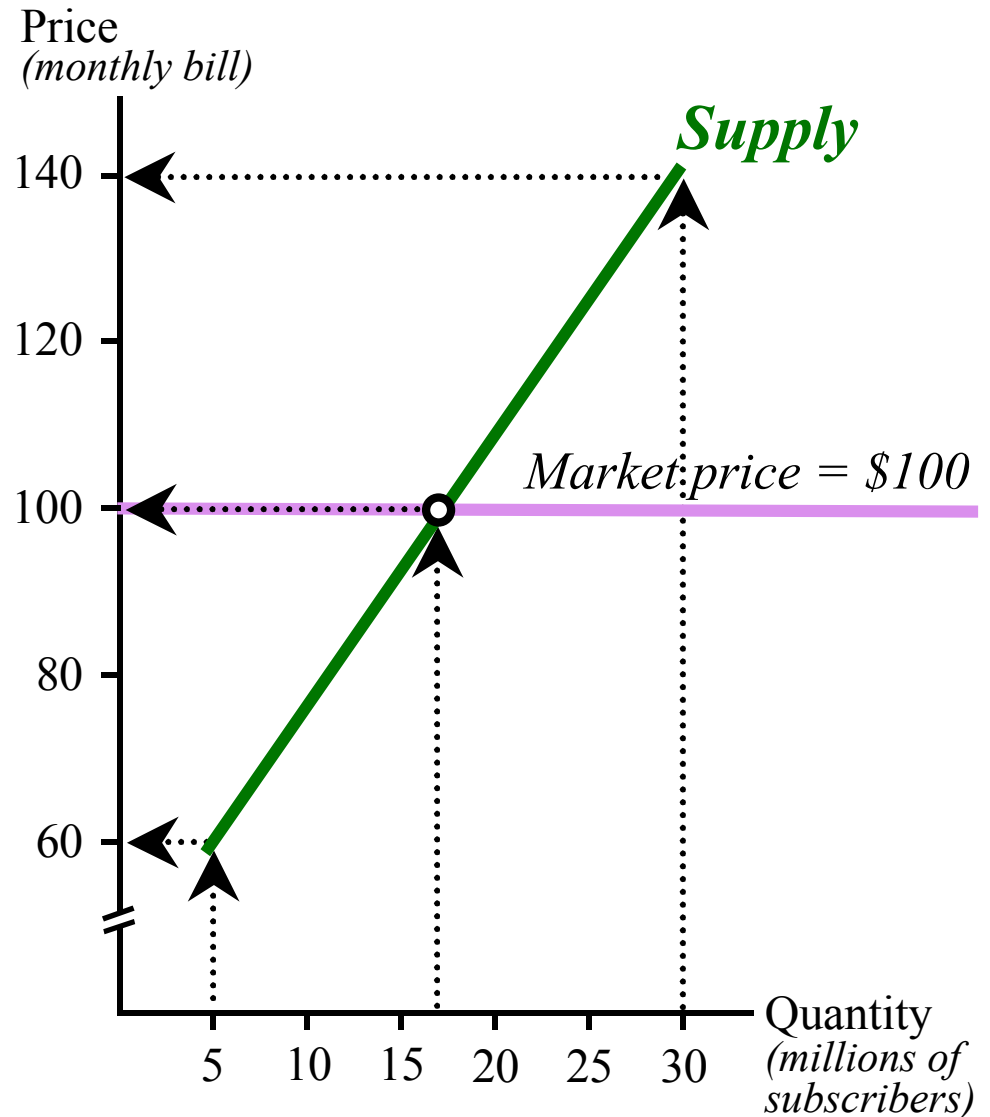
Market Supply Schedule

- The height of the **supply curve** at any quantity shows the **minimum price** necessary to induce producers to supply that next unit to market.
- Here, for the 11th unit ... producers require \$73 to induce them to supply it.
- While they would require \$91 to supply the 18.2 (millionth) unit.
- The height of the supply curve at any quantity also shows the **opportunity cost of producing** that **next unit** of the good.



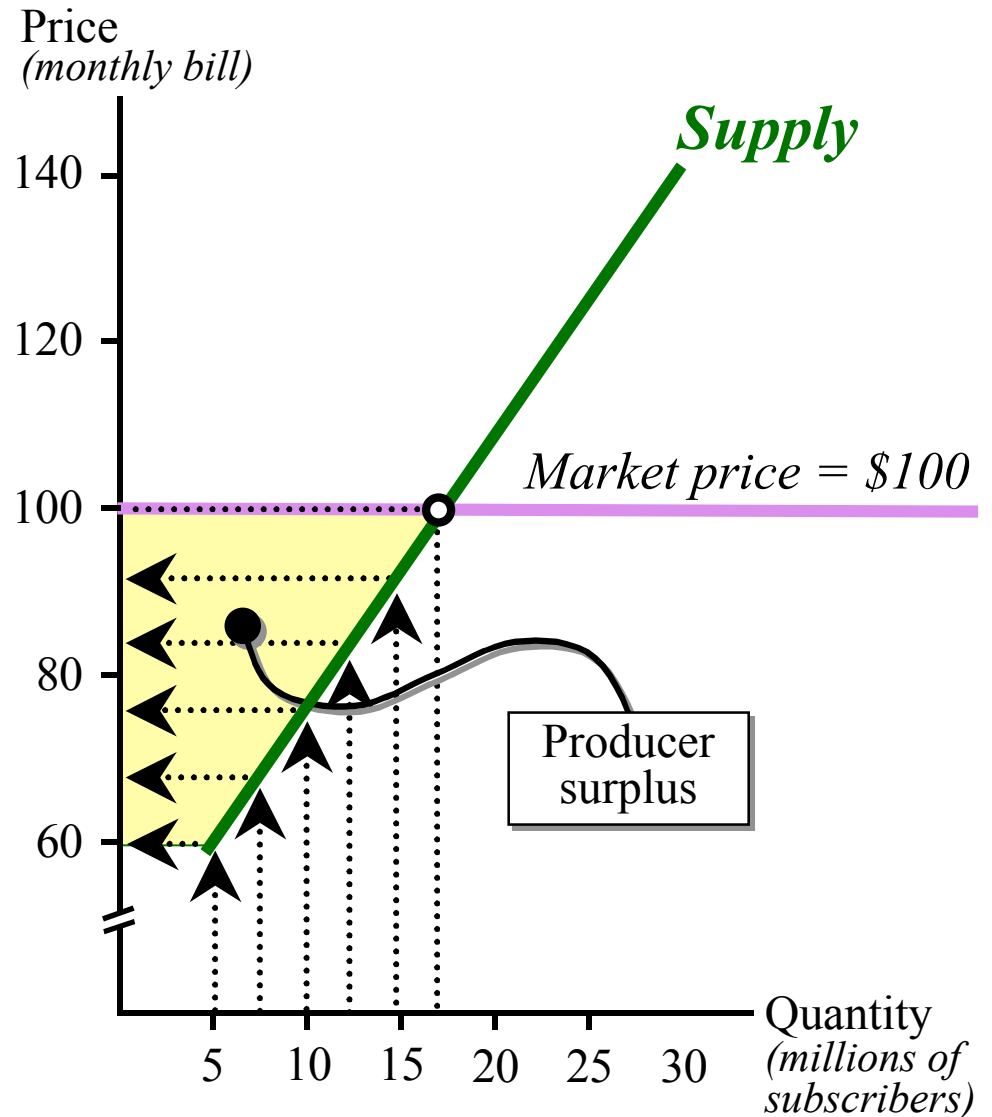
Market Supply Schedule

- Consider the market for cellular phones service again. This time we will assume that the supply for cell phones is more *linear* and that the market price is \$100.
- If the market price is \$100, then the 30th unit will ***not be produced*** because the cost of supplying it exceeds the market price of \$140.
- At \$100, the 17th unit ***will be produced*** because those who supply it are willing to do so for at least \$100.
- At \$100, the 5th unit ***will be produced*** because those who supply it are willing to do so for at least \$60.



Market Supply Schedule

- For market outputs of less than 17 units, producers are willing to supply the good for \$100.
- The area represented by the distance above the supply curve but below the actual sales price is called *producer surplus*.
- This area is the difference between the minimum amount required to induce producers to supply a good and the amount they actually receive.





Questions for Thought:

- What is being held constant when the supply curve for a specific good like pizza or automobiles is constructed?
 - Why does the supply curve for a good slope upward and to the right.
- What is producer surplus? Is producer surplus basically the same thing as profit?

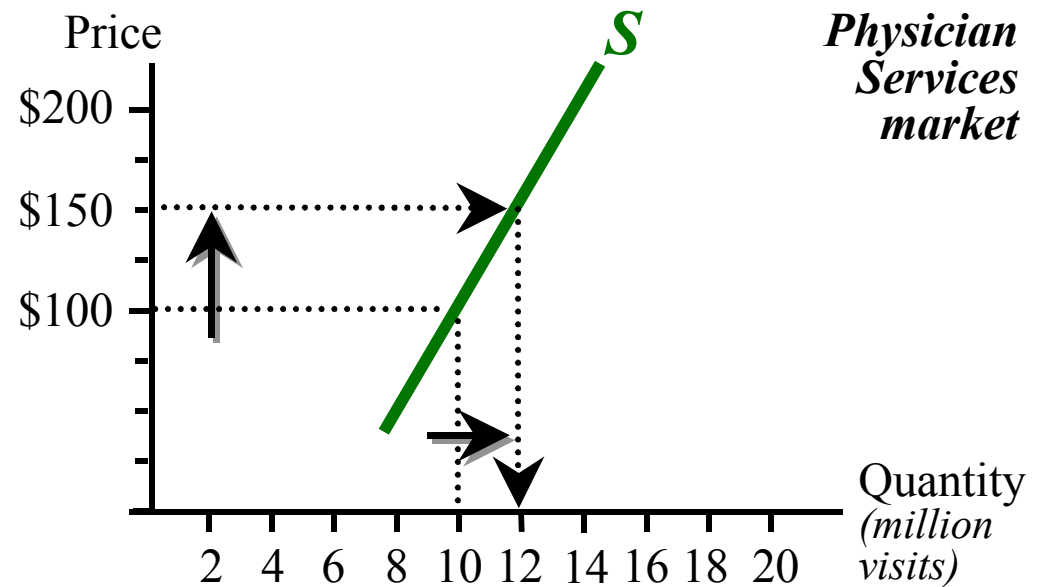
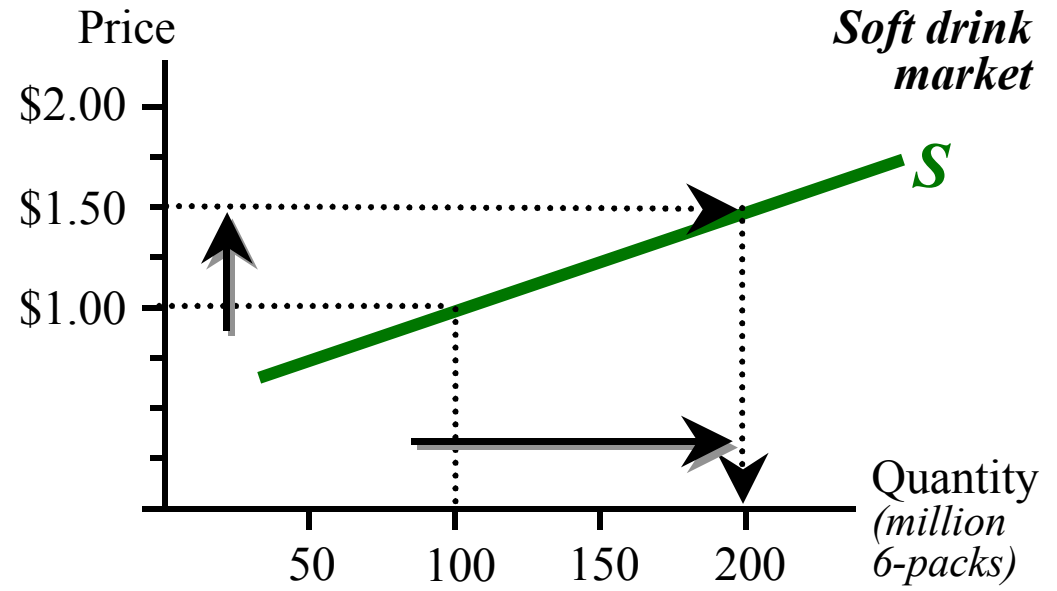


Elastic and Inelastic Supply Curves

- **Elastic supply**
 - quantity supplied is sensitive to price changes.
- **Inelastic supply**
 - quantity supplied is not sensitive to price changes.

Elastic and Inelastic Supply Curves

- When the market price for soft drinks increases from \$1.00 to \$1.50 a six-pack, the quantity supplied to the market rises from 100 to 200 million units per week.
- When the market price for physician services rises from \$100 to \$150 an office visit, the quantity supplied rises from 10 to 12 million visits per week.
- As soft drink supply is very sensitive to price changes, soft drink supply is described as *elastic*; as physician services supply is relatively insensitive to price changes, physician services supply is described as *inelastic*.





The Short and Long Run

- **Short Run**
 - *the period of time during which firms do not have sufficient time to change plant size.*
 - Supply tends to be **inelastic** in the short run.
- **Long Run**
 - *the period of time during which firms have enough time to change plant size.*
 - Supply tends to be much **more elastic** in the long run.



Changes in Supply Versus Changes in Quantity Supplied

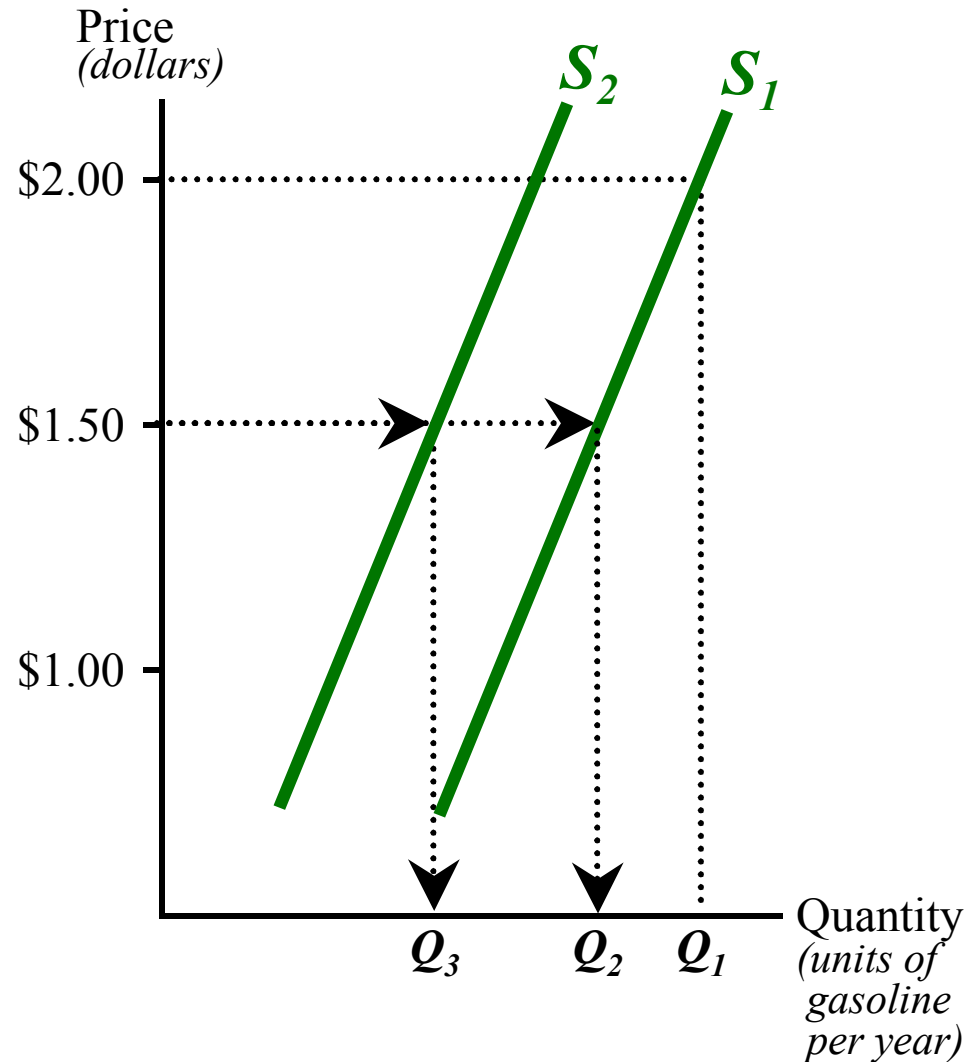


Changes in Supply and Quantity Supplied

- ***Change in Supply***
 - *a shift in the entire supply curve.*
- ***Change in Quantity Supplied***
 - *movement along the same supply curve in response to a change in price.*

A Change in Supply

- If the market price for gasoline is \$2.00 a gallon, the supply curve for gasoline S_1 indicates Q_1 units would be supplied.
- If the price fell to \$1.50, the **quantity supplied** would fall to Q_2 units (where $Q_2 < Q_1$).
- If, somehow, the **opportunity costs** for petrol manufacturers changed then the **supply** of gas may **change**.
- Consider the case where the cost of crude oil (an input in gasoline production) increases, the supply of gasoline at all potential market prices would fall. Now at \$1.50, Q_3 units are supplied (where $Q_3 < Q_2 < Q_1$).





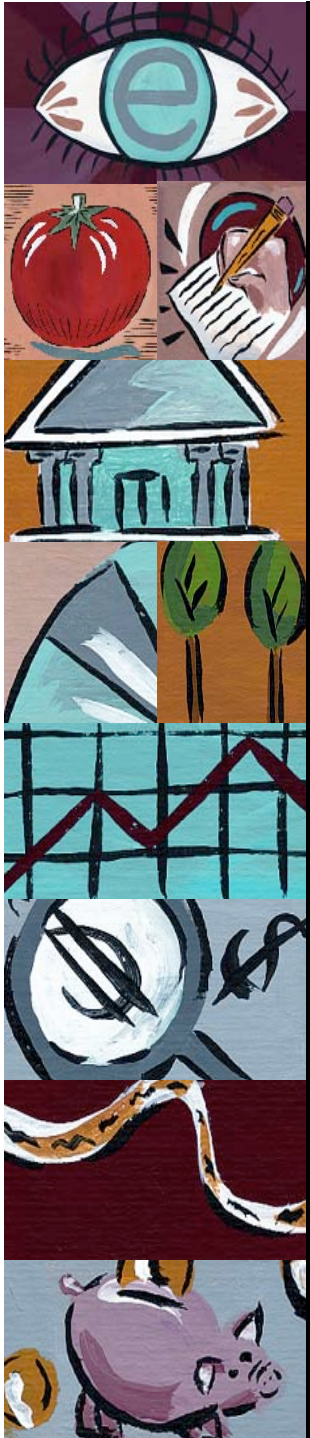
Supply Curve Shifters

- Changes in resource prices
- Change in technology
- Elements of nature and political disruptions
- Changes in taxes



Questions for Thought:

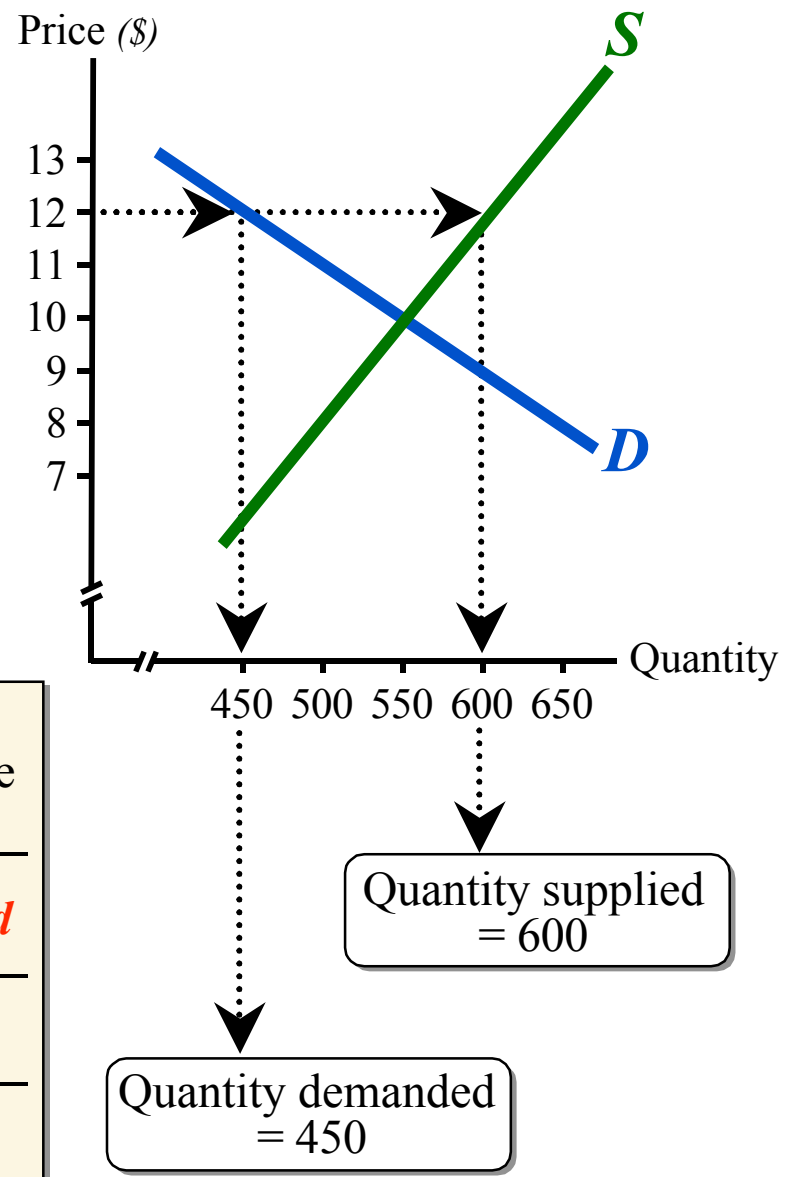
1. What must an entrepreneur do in order to earn a profit? How do the actions of firms earning a profit influence the value of resources? What happens to the value of resources when losses are present? What role do profits and losses play in a market economy?



How Market Prices are Determined

Market Equilibrium

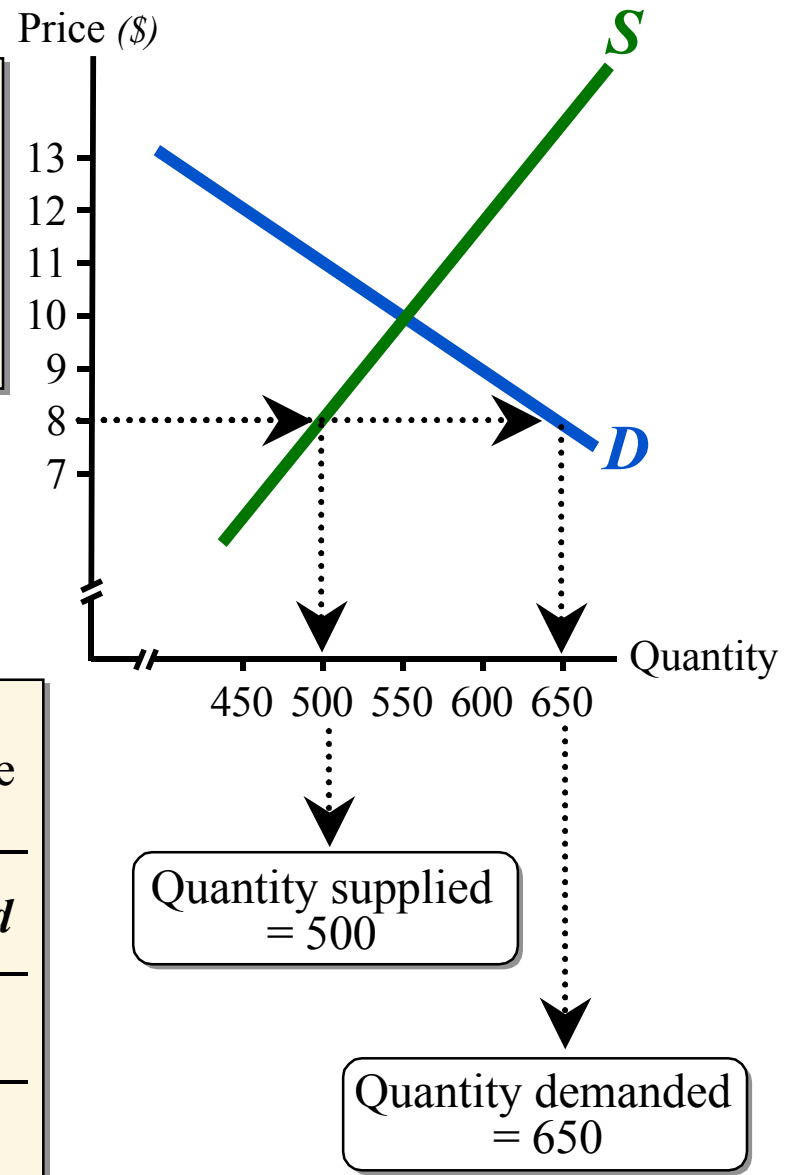
- This table & graph indicate demand and supply conditions of the market for *pocket calculators*.
- Equilibrium will occur where the quantity demanded equals the quantity supplied. If the price in the market differs from the equilibrium level, market forces will guide it to equilibrium.
- A price of \$12 in this market will result in a quantity demanded of 450 ... quantity supplied of 600 ... resulting in an *excess supply*.
- With an *excess supply* present, there will be *downward pressure* on price to clear the market.



Price (dollars)	Quantity supplied (per day)	Quantity demanded (per day)	Condition in the market	Direction of pressure on price
12	600 >	450	<i>Excess supply</i>	<i>Downward</i>
10	550	550		
8	500	650		

Market Equilibrium

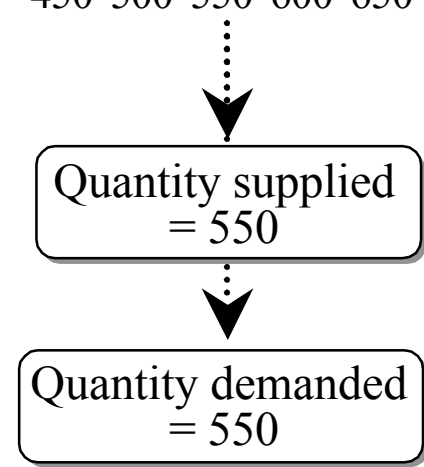
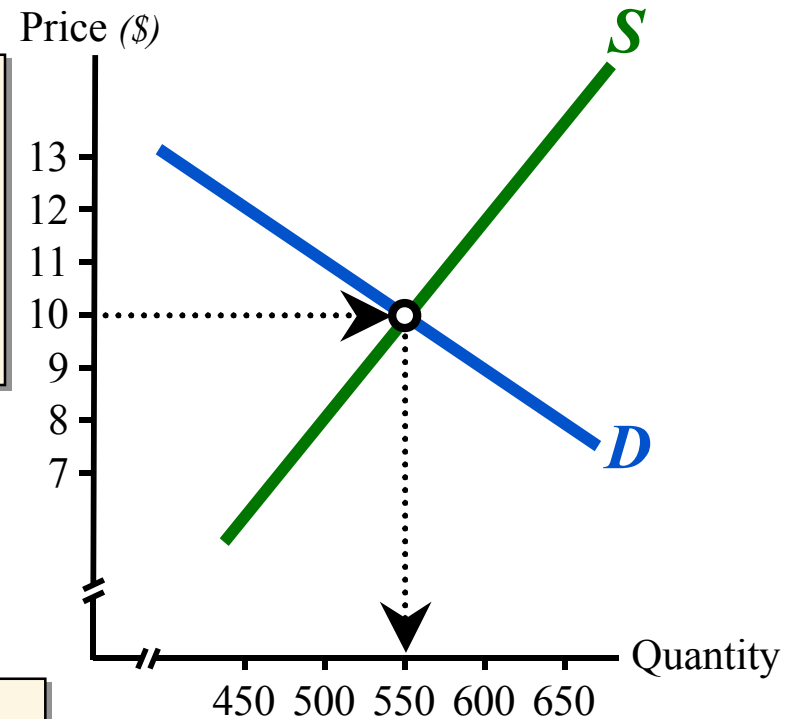
- A price of \$8 in this market will result in quantity supplied of 500 ... and quantity demanded of 650 ... resulting in *excess demand*.
- With an *excess demand* present, there will be *upward pressure* on price to clear the market.



Price (dollars)	Quantity supplied (per day)	Quantity demanded (per day)	Condition in the market	Direction of pressure on price
12	600 >	450	<i>Excess supply</i>	<i>Downward</i>
10	550	550		
8	500 <	650	<i>Excess demand</i>	<i>Upward</i>

Market Equilibrium

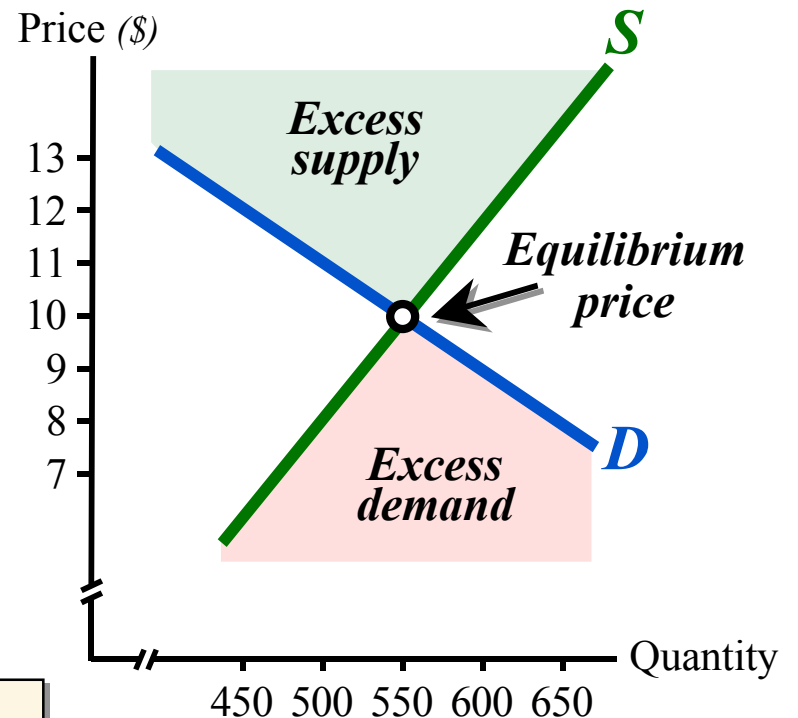
- A price of \$10 in this market results in a quantity supplied of 550 ... and quantity demanded of 550 ...resulting in *market balance*.
- With market *balance* present, there will be an *equilibrium* present and the market will clear.



Price (dollars)	Quantity supplied (per day)	Quantity demanded (per day)	Condition in the market	Direction of pressure on price
12	600 >	450	<i>Excess supply</i>	<i>Downward</i>
10	550 =	550	<i>Balance</i>	<i>Equilibrium</i>
8	500 <	650	<i>Excess demand</i>	<i>Upward</i>

Market Equilibrium

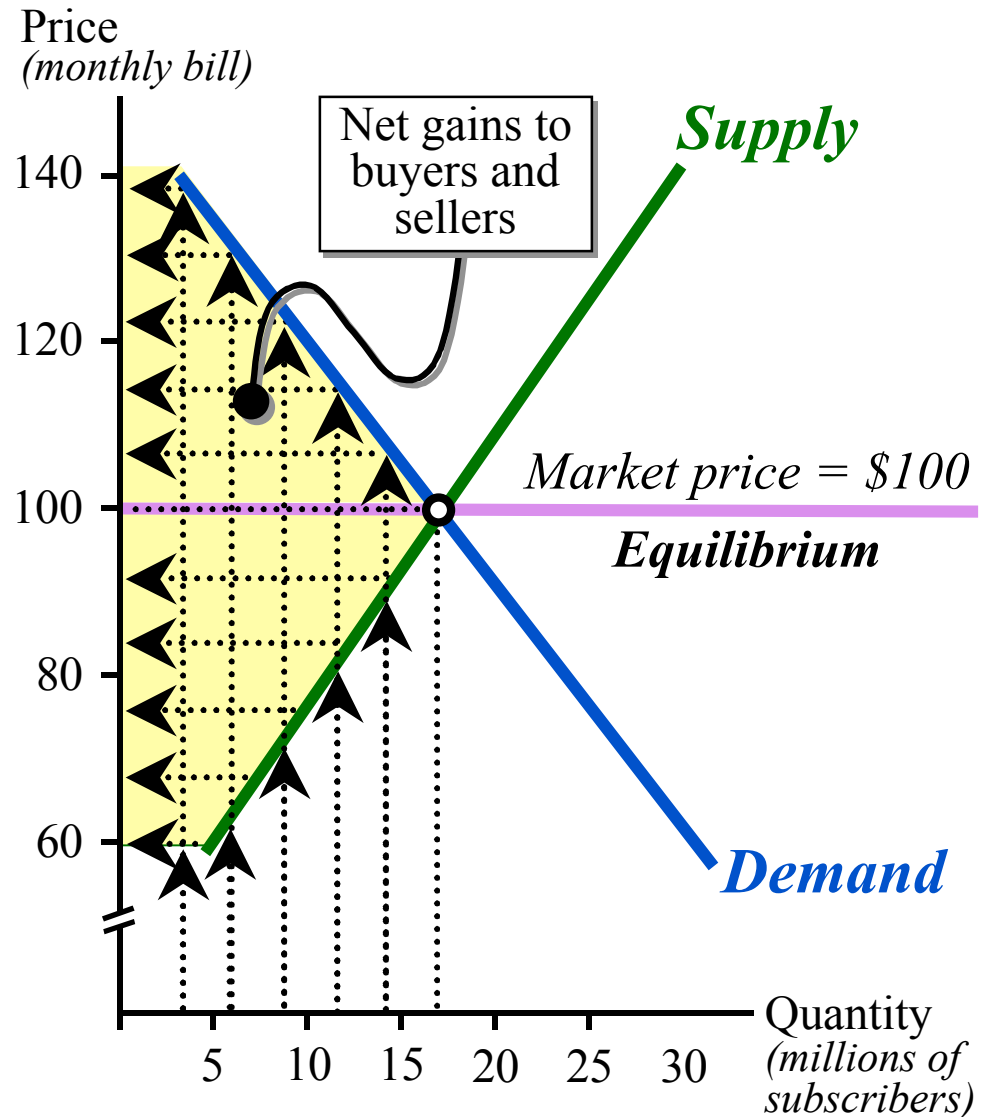
- At every price above market equilibrium there is **excess supply** and there will be downward pressure on the price level.
- At every price below market equilibrium there is **excess demand** and there will be upward pressure on the price level.
- It is at **equilibrium** that prices will rest.



Price (dollars)	Quantity supplied (per day)	Quantity demanded (per day)	Condition in the market	Direction of pressure on price
12	600	450	<i>Excess supply</i>	<i>Downward</i>
10	550	550	<i>Balance</i>	<i>Equilibrium</i>
8	500	650	<i>Excess demand</i>	<i>Upward</i>

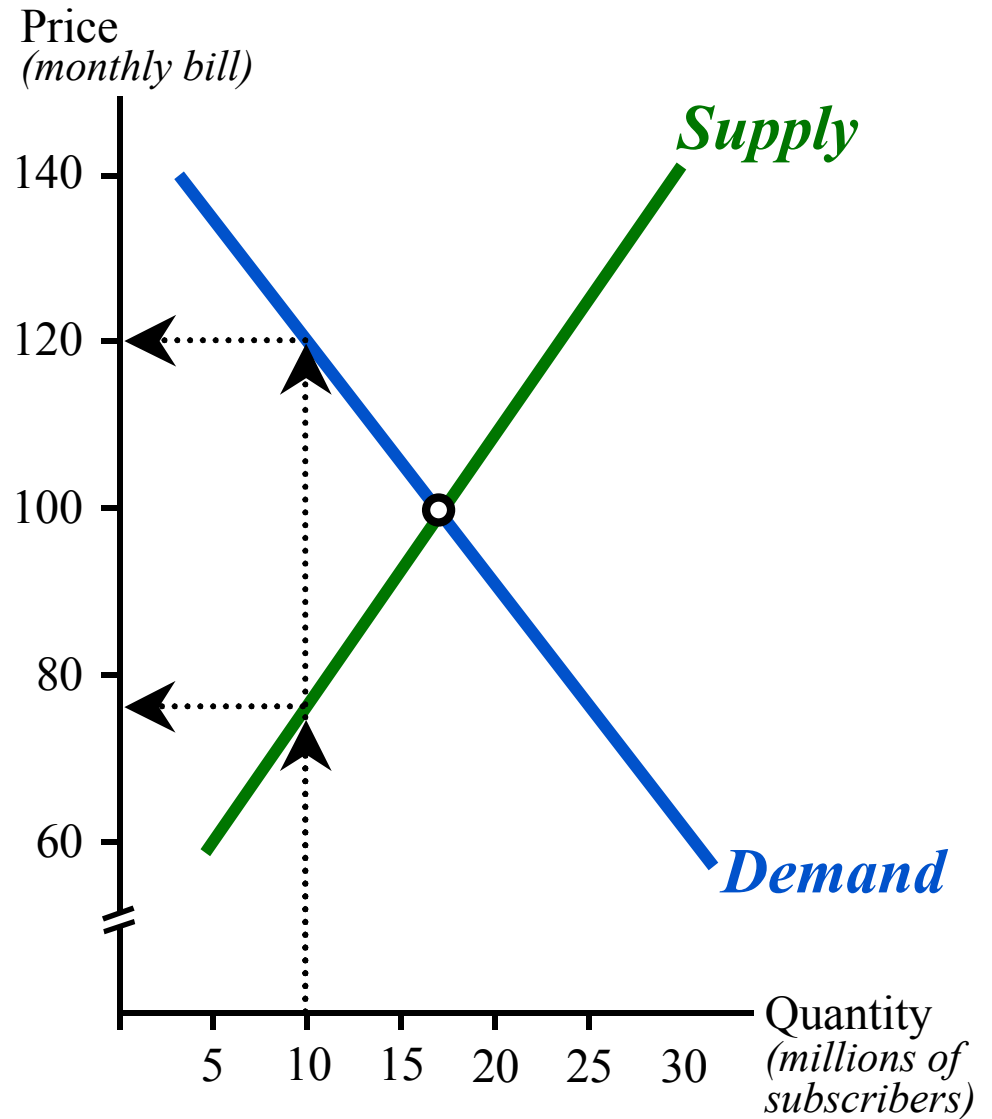
Net Gains to Buyers and Sellers

- Return again to the market for *cell phone service*. When the market is in equilibrium – where supply just equals demand – price equals \$100.
- If the area above the market price and below the demand curve is called *consumer surplus* ... and the area above the supply curve but below the market price is called *producer surplus* ... then the combined area is the *net gains to buyers and sellers*. It is here that all potential gains from production and exchange are realized.



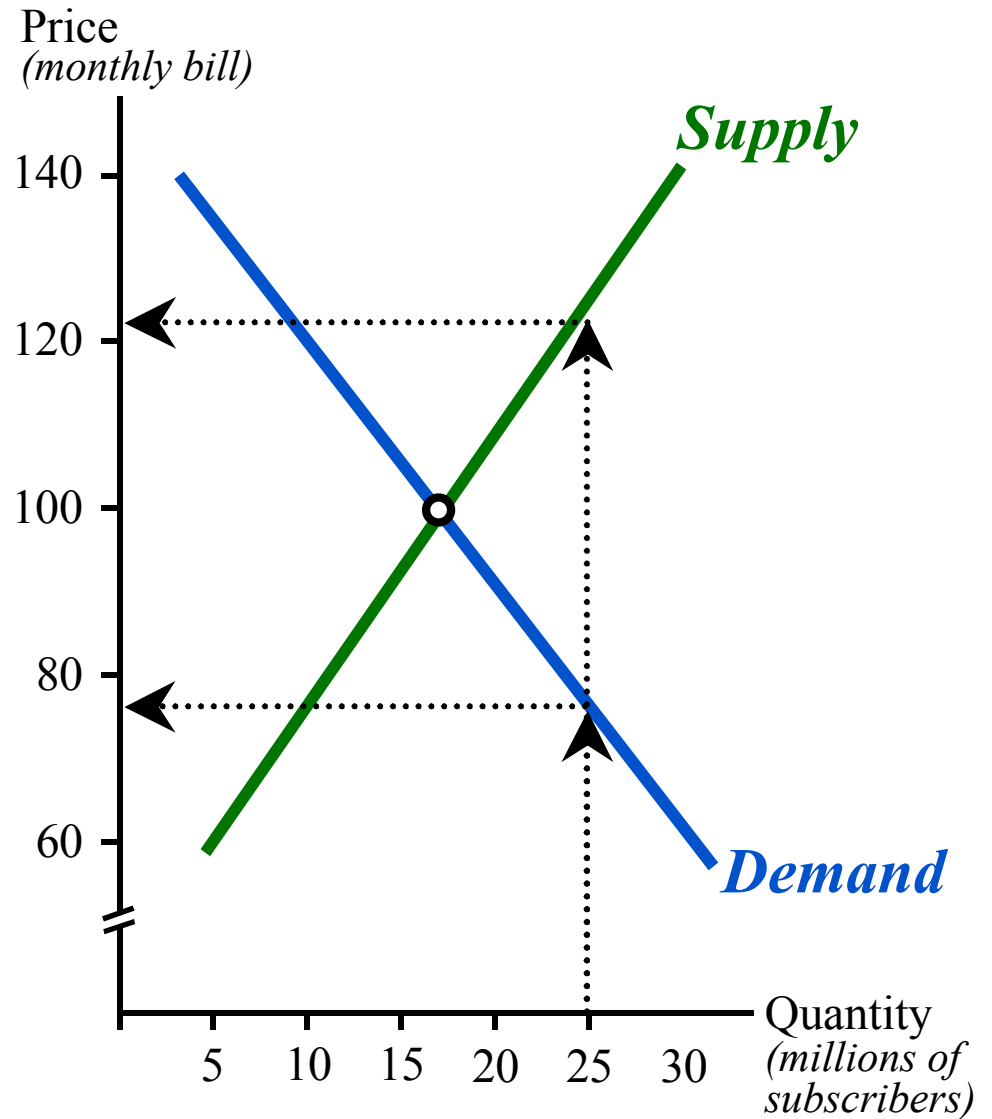
Equilibrium and Efficiency

- What is the consumer's valuation of the 10th unit brought to market?
- What is the opportunity cost of delivering the 10th unit to market?
- Does it make sense, from an efficiency standpoint, to bring the 10th unit to market?



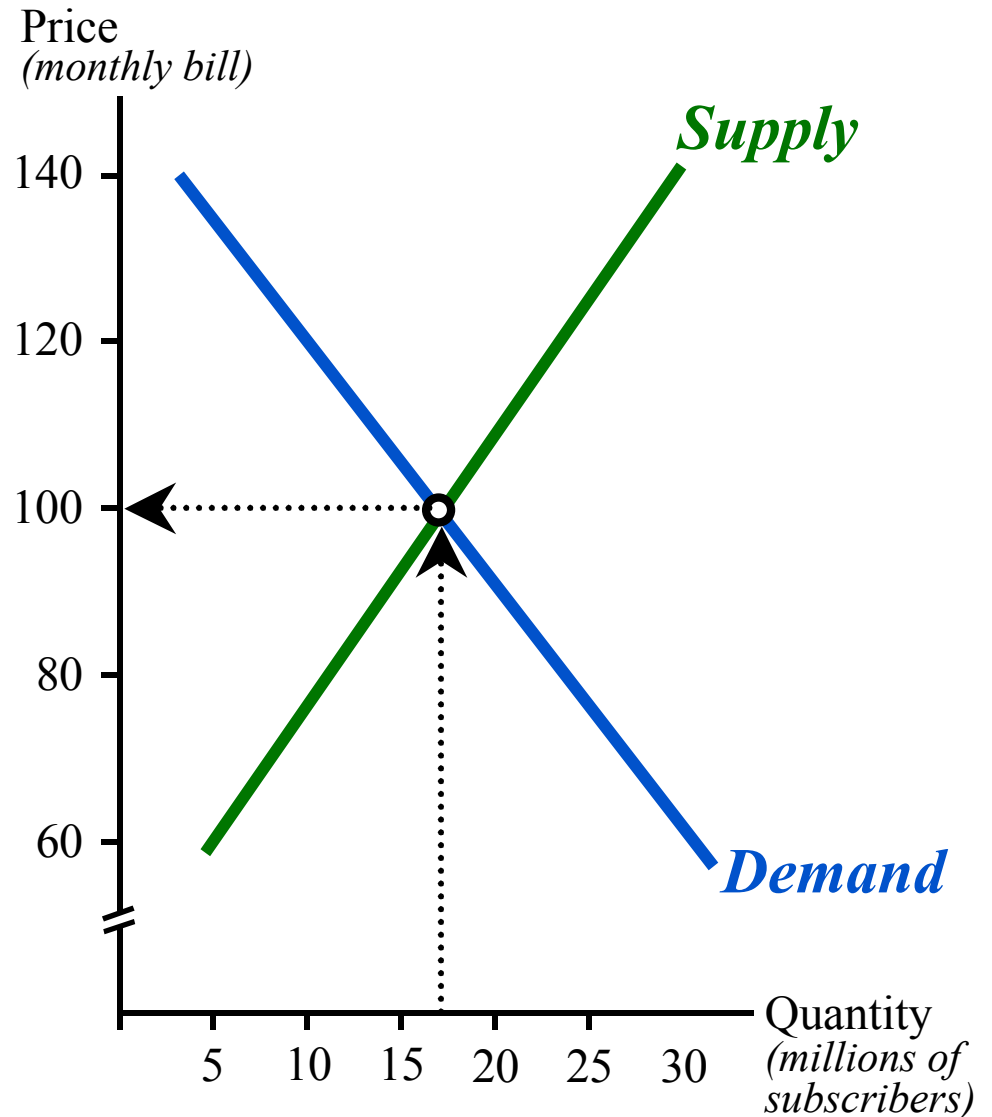
Equilibrium and Efficiency

- What is the consumer's valuation of the 25th unit brought to market?
- What is the opportunity cost of delivering the 25th unit to market?
- Does it make sense, from an efficiency standpoint, to bring the 25th unit to market?



Equilibrium and Efficiency

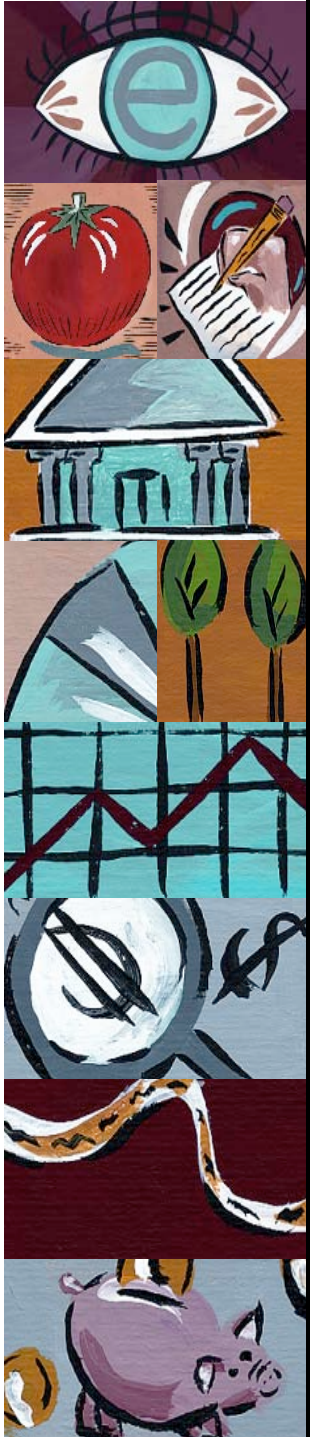
- At the *equilibrium output level*, the consumer's valuation of the marginal good and the producer's opportunity cost of the resources necessary to bring that marginal good to market are just equal.
- In this example, *equilibrium* occurs at 17 units.
- Does it make sense, from an efficiency standpoint, to bring the 17th unit to market?





Questions for Thought:

1. How is the market price of a good determined? When the market for a product is in equilibrium, how will the consumers evaluation of the marginal unit compare with the opportunity cost of producing the unit? Why is this important?
2. Is the equilibrium in a competitive market consistent with economic efficiency?

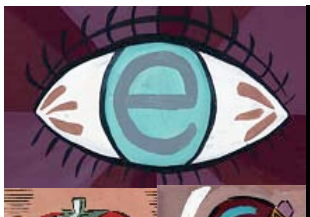


How Markets Respond to Changes in Supply and Demand



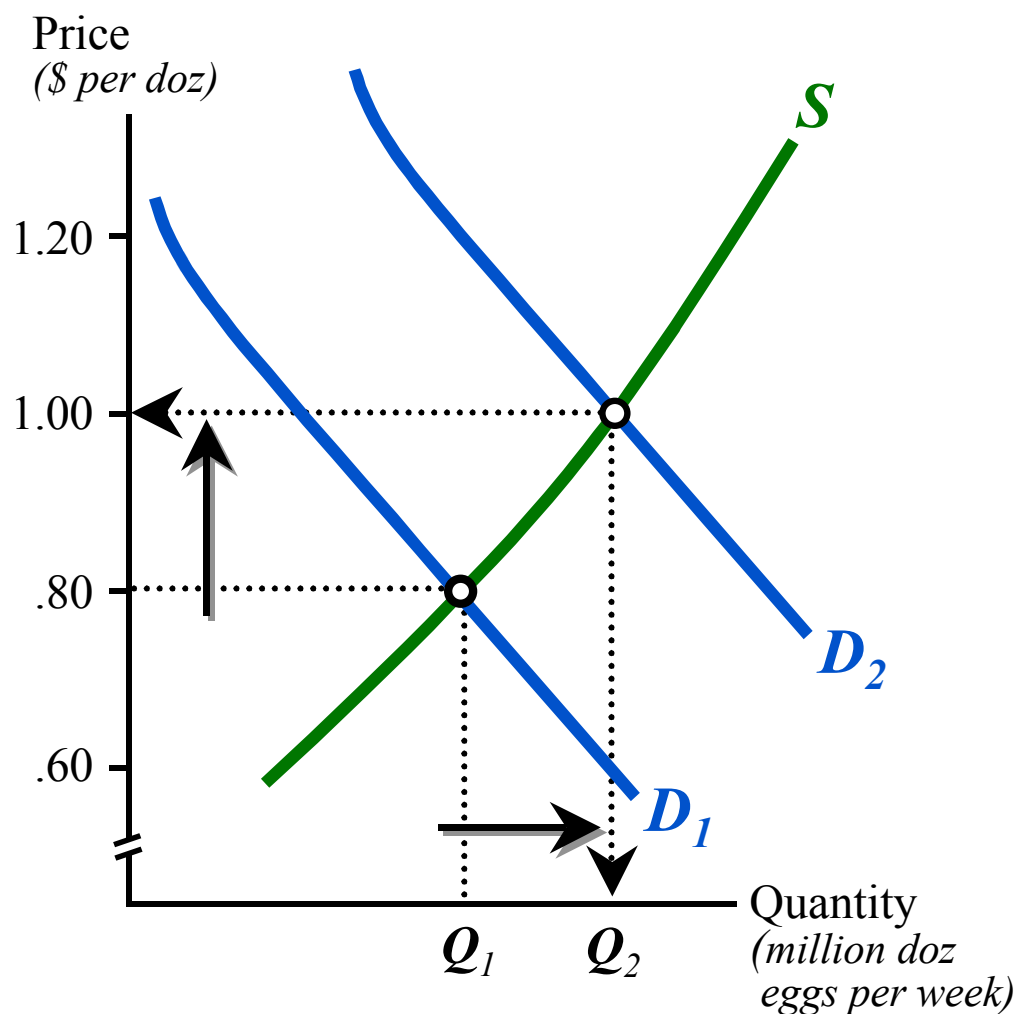
Effects of a Change in Demand

- If demand decreases
 - *the equilibrium price and quantity will fall.*
- If demand increases
 - *the equilibrium price and quantity will rise.*



Market Adjustment to an Increase in Demand

- Consider the market for *eggs*.
- Prior to the Easter season, the market for eggs produces an equilibrium where *supply* equals *Demand₁* at a market price of \$.80 a dozen and output of Q_1 .
- Every year during the Easter holiday the demand for eggs increases from D_1 to D_2 .
- What happens to the equilibrium price and output level?
- Now at \$.80, quantity demanded exceeds quantity supplied. An upward pressure on price induces existing suppliers to increase their quantity supplied. Equilibrium occurs at output level Q_2 , and price \$1.00.
- What happens to price and output after the Easter holiday?





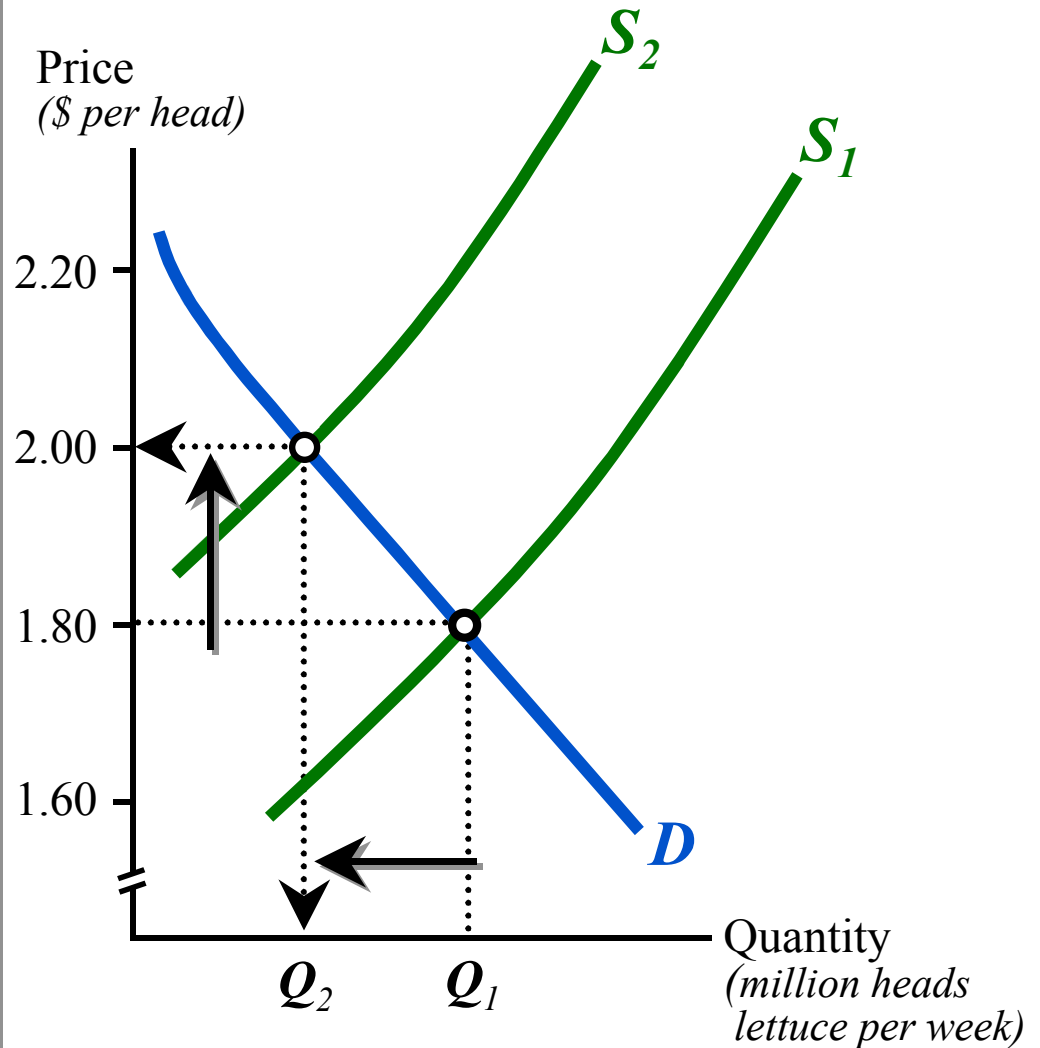
Effects of a Change in Supply

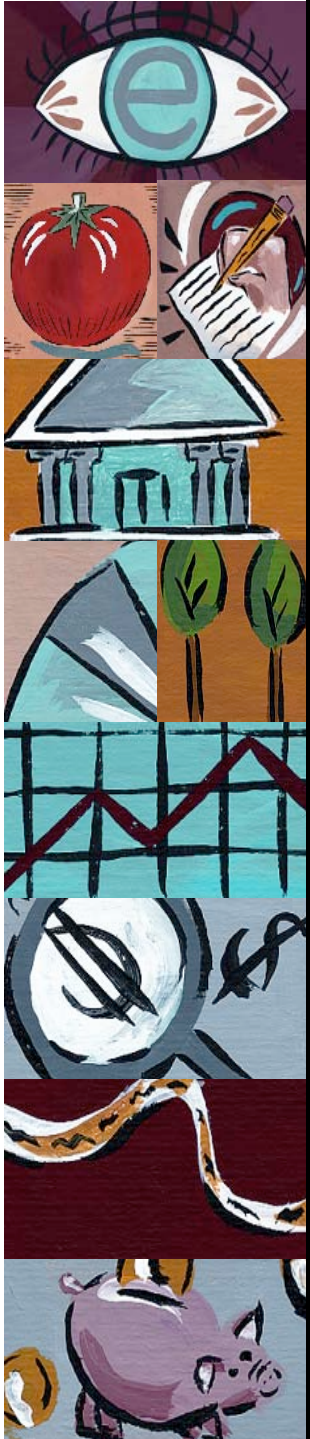
- If supply decreases
 - *equilibrium price will rise and the equilibrium quantity will fall.*
- If supply increases
 - *equilibrium price will fall and the equilibrium quantity will rise.*



Market Adjustment to a Decrease in Supply

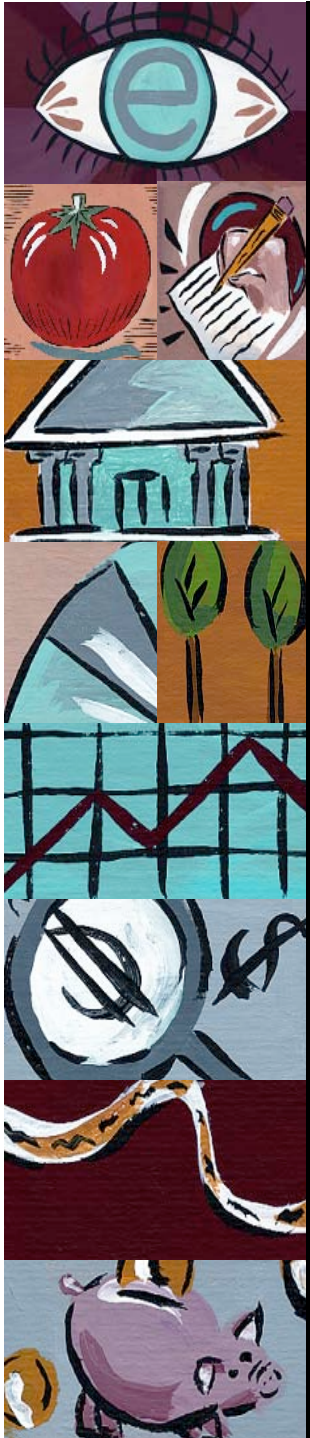
- Consider the market for *lettuce*.
- Prior to a season of bad weather affecting crop yield in the market, equilibrium exists where *Supply₁* equals *Demand* with a market price of \$1.80 and output of Q_1 .
- The adverse weather results in a reduction in the supply of lettuce, from S_1 to S_2 .
- What happens to both the price and output level in the market?
- Now at \$1.80, quantity demanded exceeds quantity supplied. An upward pressure on price reduces quantity demanded by consumers. Equilibrium occurs at output level Q_2 , and price \$2.00.
- What happens to price and output when weather returns to normal?





Questions for Thought:

1. How was supply and demand in the market for air travel affected by the events of September 11th, 2001?



Time and the Adjustment Process

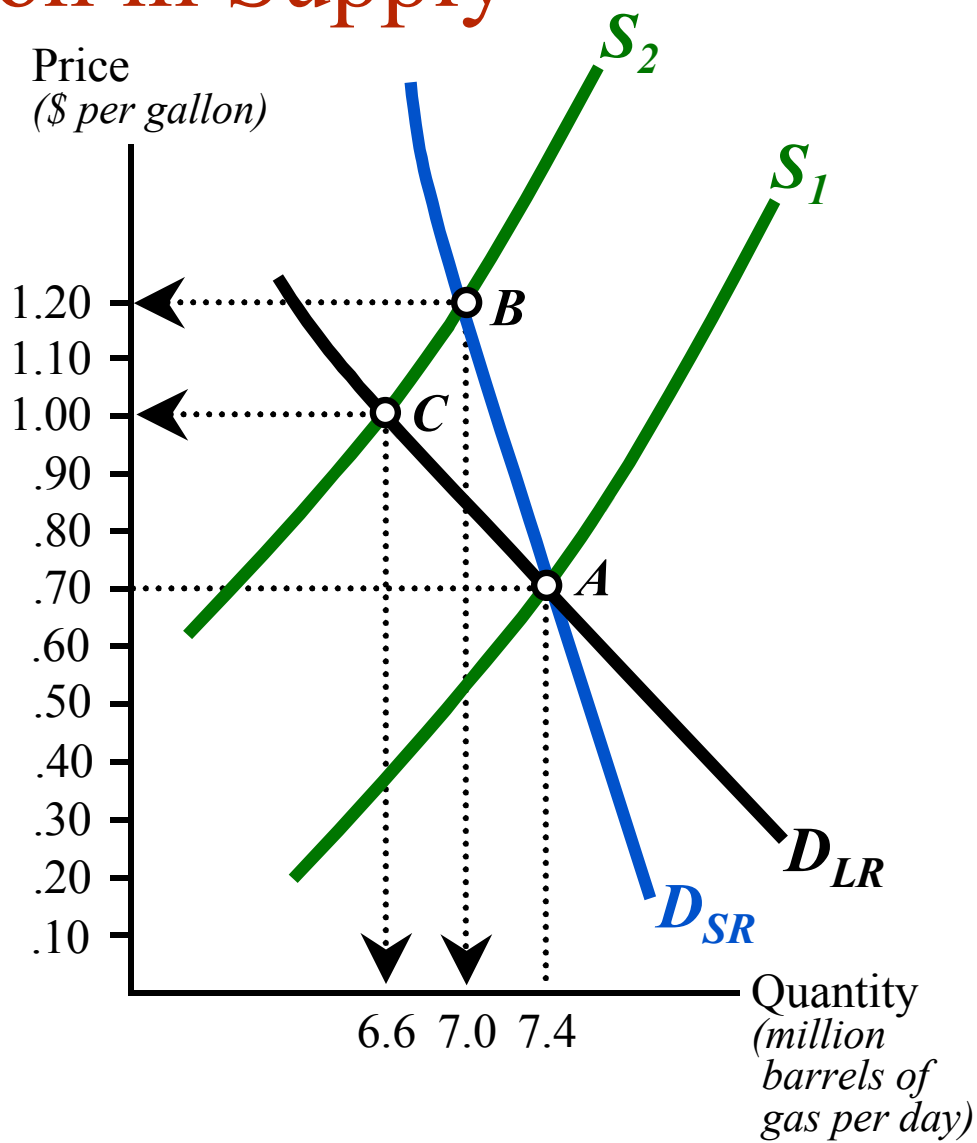


Time and the Adjustment Process

- With the passage of time, the market adjustments of both producers and consumers will be more complete.
 - Both demand and supply are more elastic in the long run than in the short run.

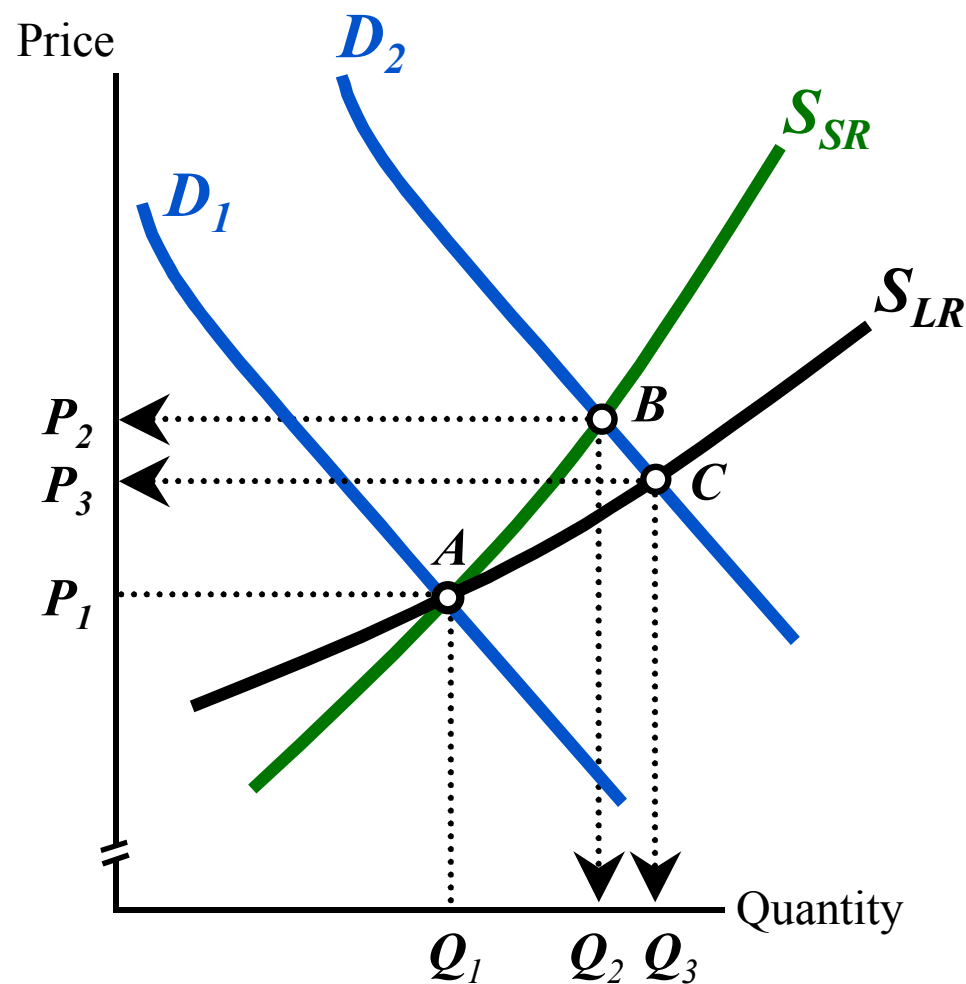
Time and Adjustment to an Reduction in Supply

- Consider the market for **gasoline** of the late 1970s and early 1980s.
- The price of a gallon of gasoline in 1978 was \$.70 (*point A*).
- When **supply** declined unexpectedly in the late 1970s, prices increased to \$1.20 and consumption fell to 7.0 million barrels per day (from 7.4) as consumers moved along their **short run demand curve** (to *point B*).
- Note how little quantity demanded fell due to this shock. In the **long run**, the **demand** for gasoline is more responsive to price changes
- By 1982, the market equilibrated at *point C*, with consumption of 6.6 million barrels a day and a market price of \$1.00 a gallon).



Time, Supply, and Adjustment to an Increase in Demand

- Consider the market for *laptop PCs*.
- We begin in the *short run* at output Q_1 and price level P_1 (*point A*).
- When demand for laptops increases unexpectedly from D_1 to D_2 , firms do their best to increase quantity supplied (output). The price level increases to P_2 (*point B*).
- What happens to price and output in the *long run* after suppliers have a chance to change their capacity?
- In time, suppliers retool and expand output, pivoting the supply curve to its *long run* representation S_{LR} . The new equilibrium is where *demand* equals *long run supply*. Output increases further to Q_3 , and the price level falls to P_3 (*point C*).





The Invisible Hand Principle



The Invisible Hand

- *Invisible hand:*
the tendency of market prices to direct individuals pursuing their own self interests into productive activities that also promote the economic well-being of society.

“ Every individual is continually exerting himself to find out the most advantageous employment for whatever capital [income] he can command. It is his own advantage, indeed, and not that of the society which he has in view. But the study of his own advantage naturally, or rather necessarily, leads him to prefer that employment which is most advantageous to society. . . . He intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was not part of his intention.

– Adam Smith, *The Wealth of Nations*



Communicating Information

- Product prices *communicate* up-to-date information about the consumers' valuation of additional units of each commodity.
- Without the information provided by market prices it would be impossible for decision-makers to determine how intensely a good was desired relative to its opportunity cost.



Coordinating Actions of Market Participants

- Price changes bring the decisions of buyers and sellers into harmony.
- Price changes create profits and losses which change production levels for products.



Motivating Economic Participants

- Suppliers have an incentive to produce efficiently.
- Entrepreneurs have an incentive to both innovate and produce goods that are highly valued relative to cost.
- Resource owners have an incentive both to develop and supply resources that producers value highly.



Market Order

- Market order is the result of market prices, not central planning.



Qualifications

- The efficiency of market organization is dependent upon:
 - The presence of competitive markets.
 - Well-defined and enforced private property rights.



Questions for Thought:

1. Consider a large business firm like Wal-Mart. Does it need to be regulated in order to assure that it produces efficiently? Is regulation needed to assure that it will supply goods and services that consumers want?
2. What is the *invisible hand principle*? Does it indicate that “good intentions” are necessary if one’s actions are going to be beneficial to others? What are the necessary conditions for the invisible hand to work well? Why are these conditions important?



How to Fix Exchange Rates

How can a government fix an exchange rate?

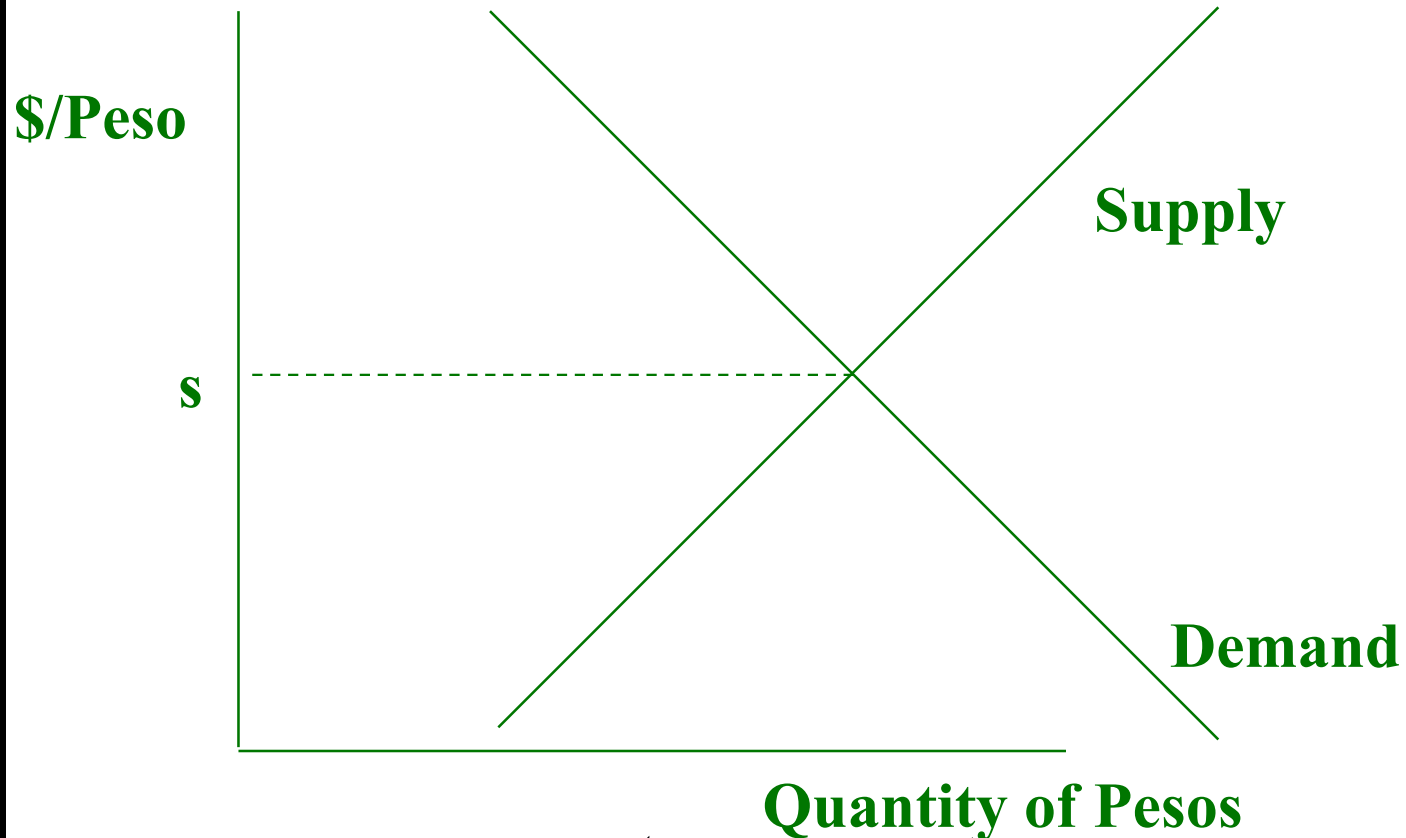
The same way a government fixes any other price:

1. By controls (much like U.S. price controls in early 1970s). Make trade at a different price illegal.
2. By intervention in the market (much like sugar). By committing to buy/sell at a certain price.

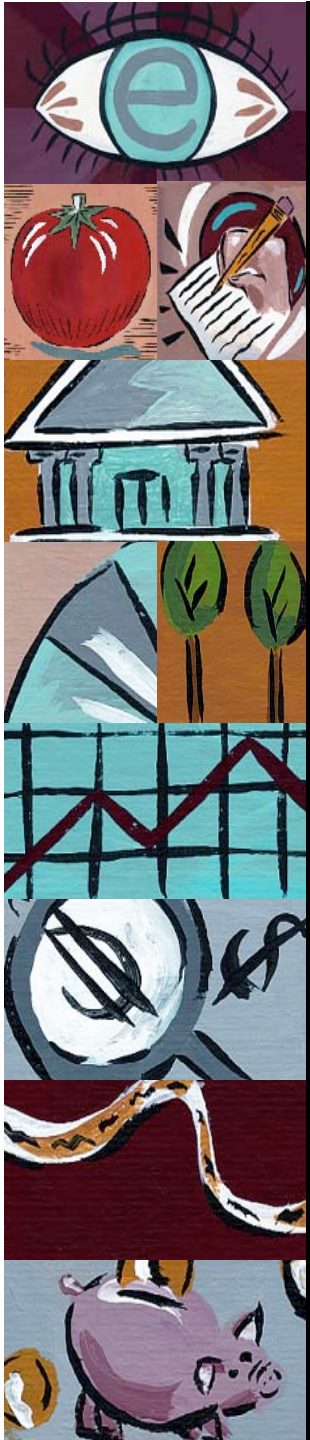


1. Exchange Rate Controls

Given a supply-demand graph for exchange rate determination...

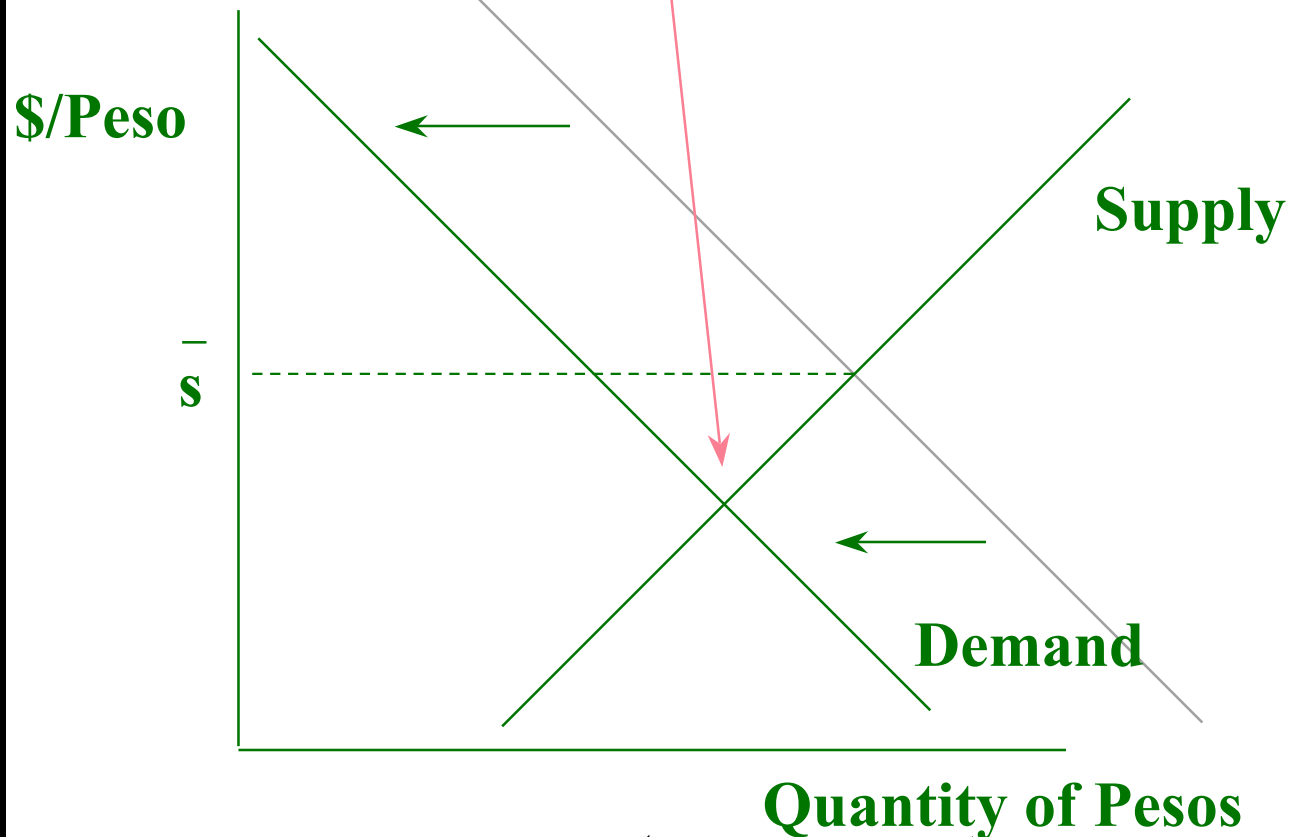


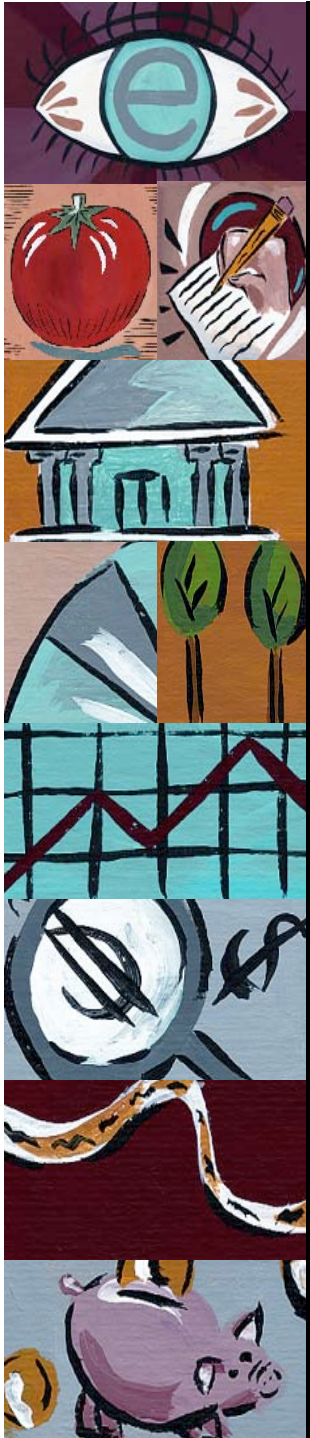
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1. Exchange Rate Controls

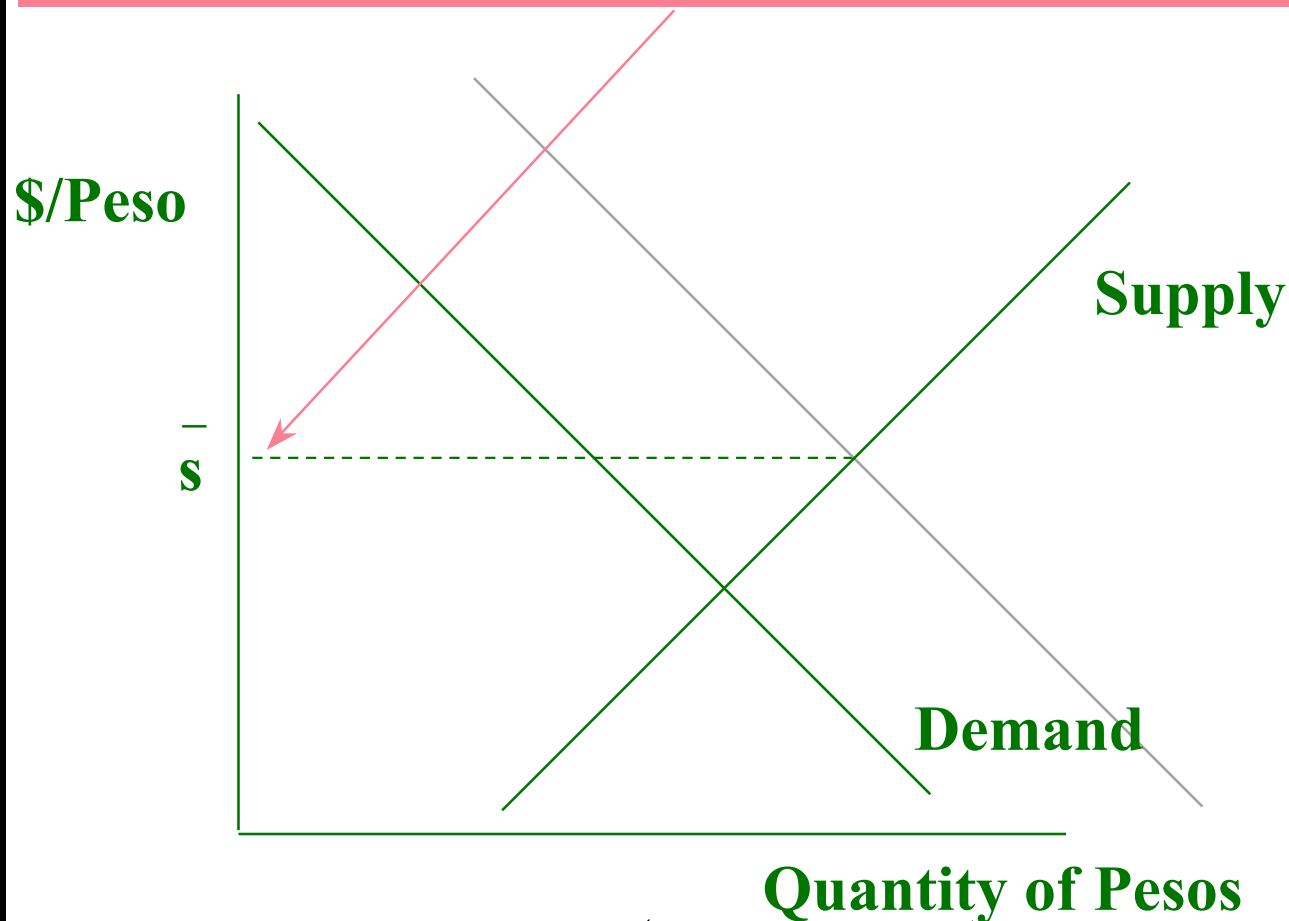
If demand for Argentine pesos decreases...





1. Exchange Rate Controls

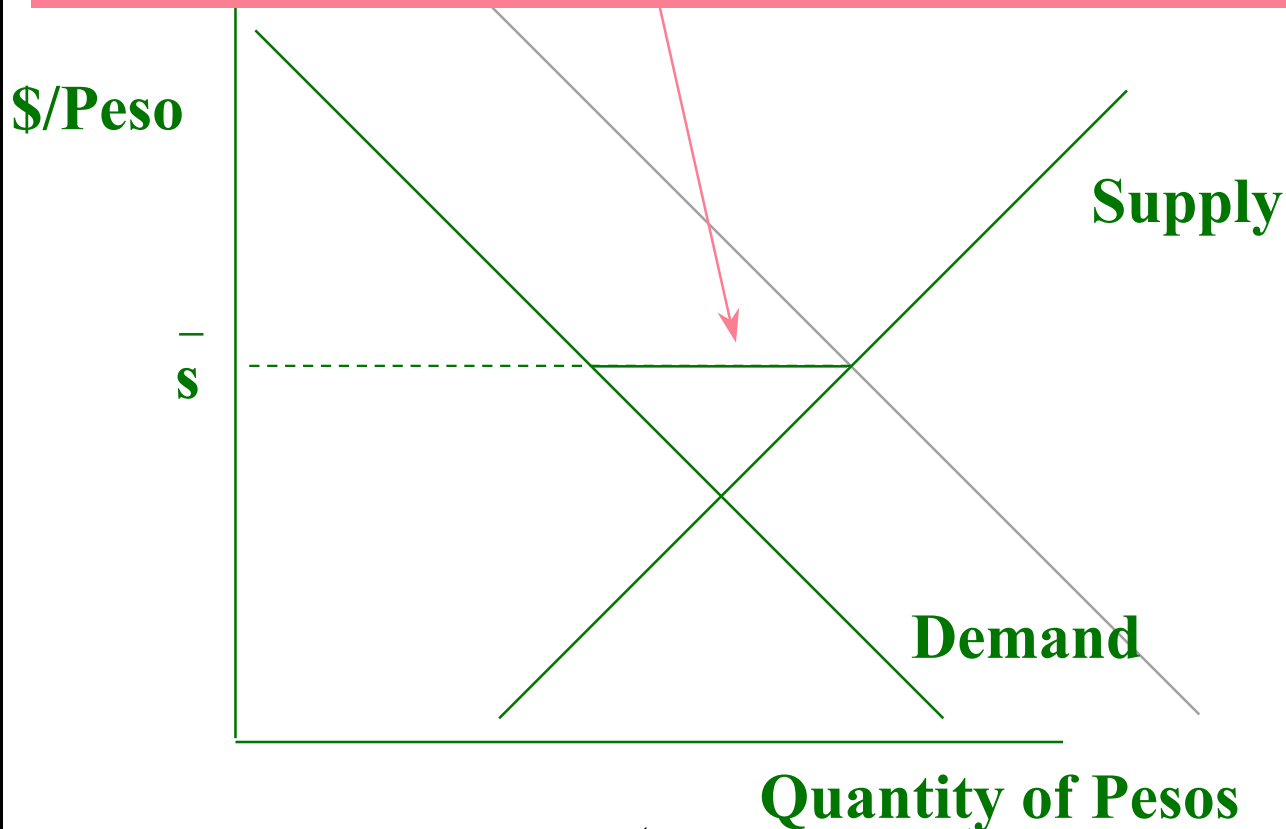
But the Argentine Banco Central makes exchanges of FX illegal at any rate other than s...





1. Exchange Rate Controls

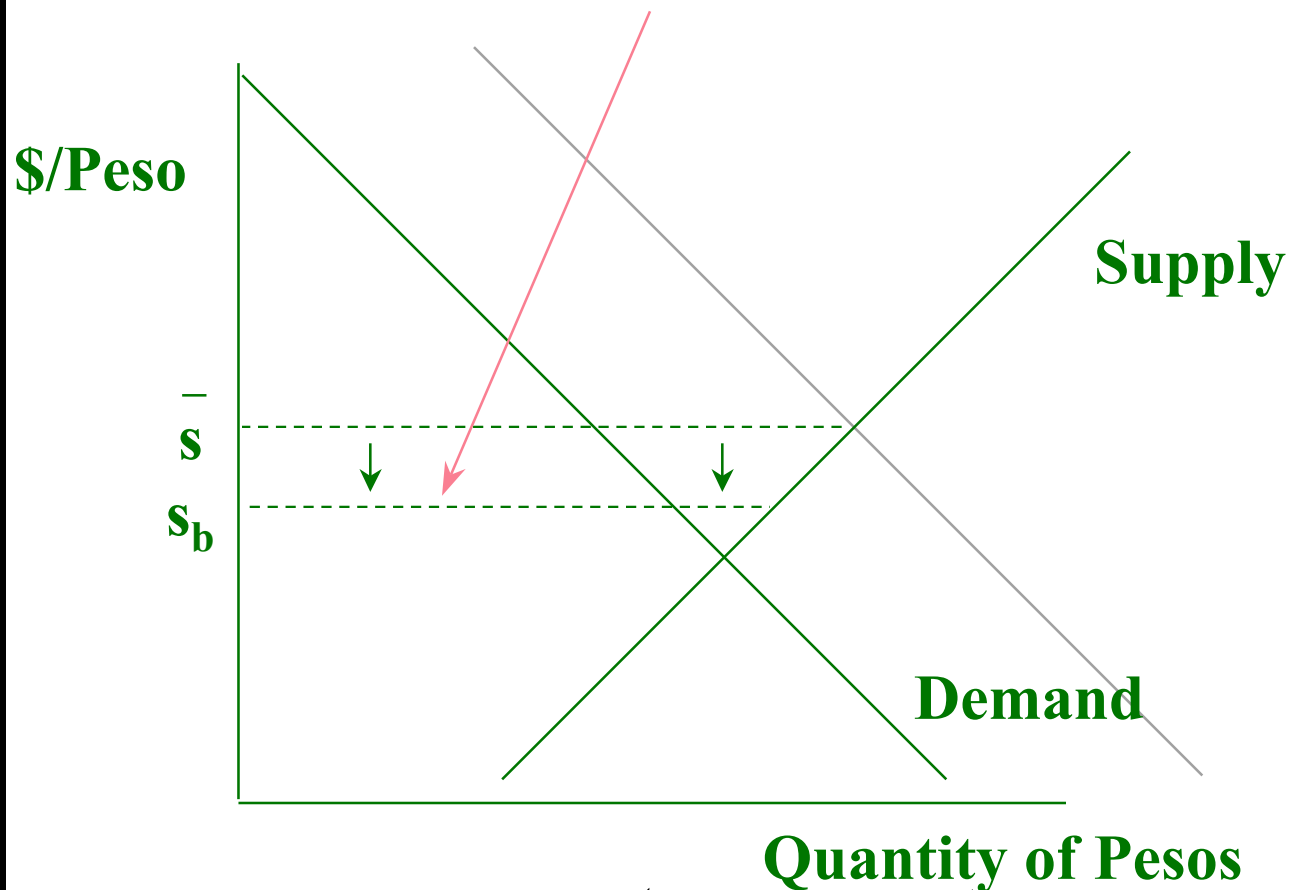
Dollars will be rationed - there will be excess supply of pesos (demand for \$) at the fixed exchange rate of \$...

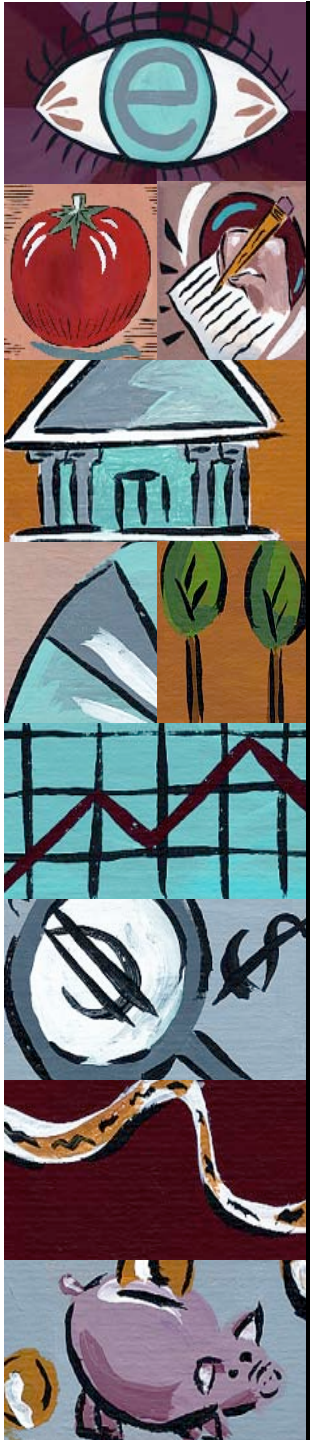




1. Exchange Rate Controls

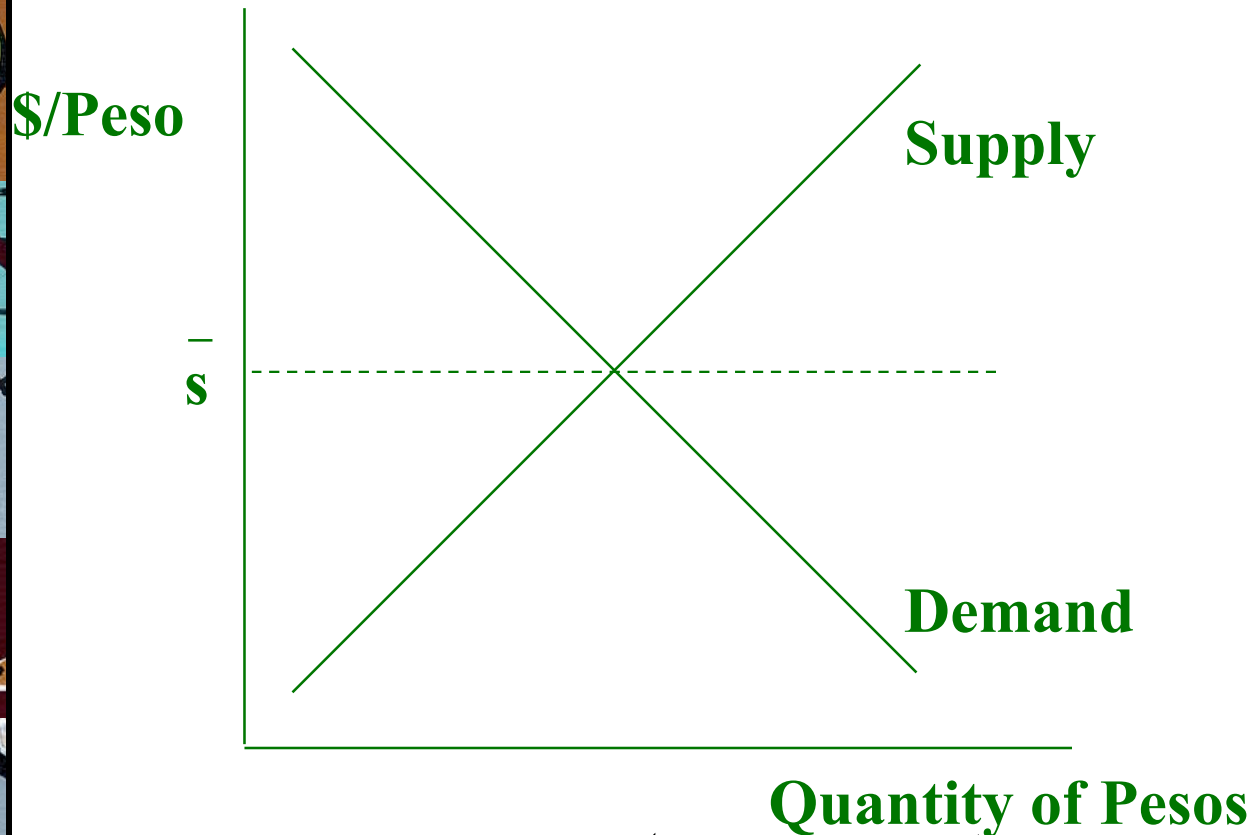
A black market will invariably emerge which trades pesos at a discount relative to the fixed rate.





2. Exchange Rate Intervention

To insure that the exchange rate remains at a constant level, the central bank must purchase/sell FX to ensure supply intersects demand at the appropriate price:

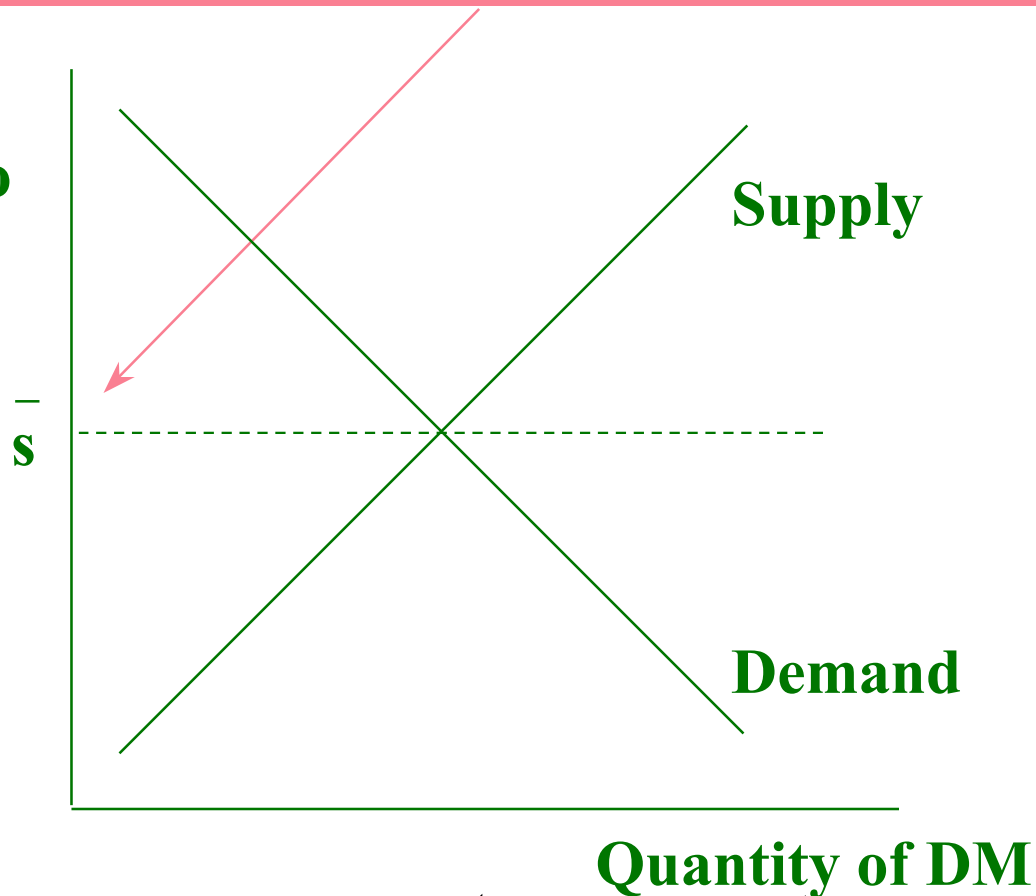




2. Exchange Rate Intervention

Suppose the central bank is trying to target an exchange rate of s .

$\$/\text{Peso}$

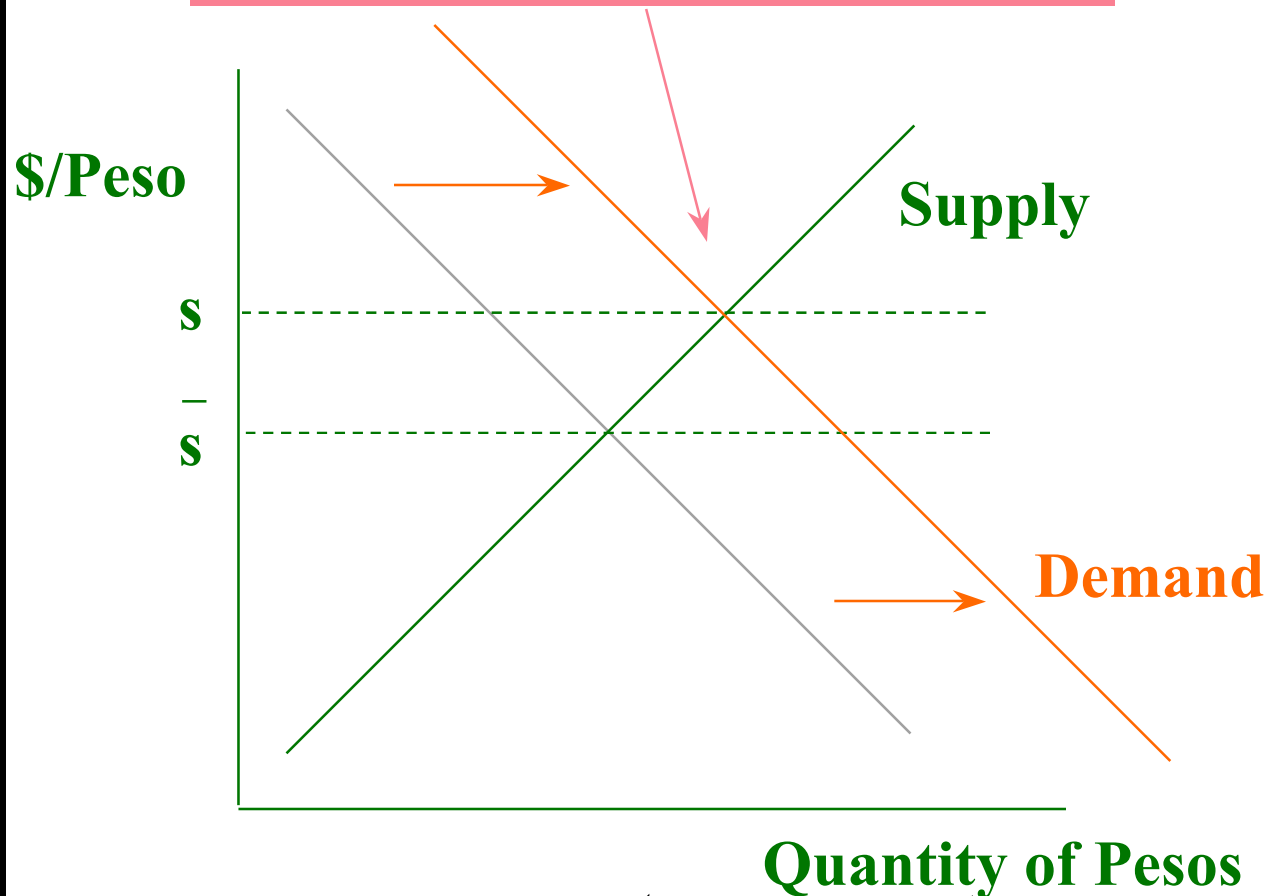


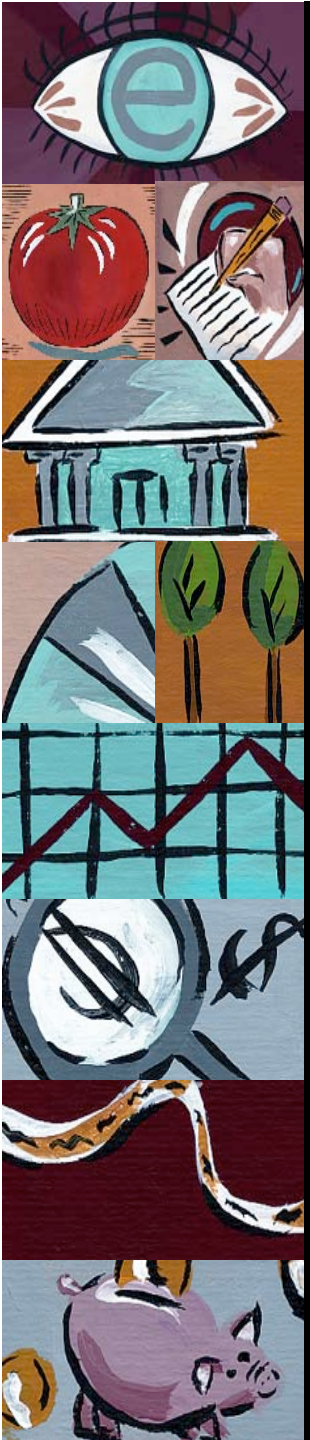
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2. Exchange Rate Intervention

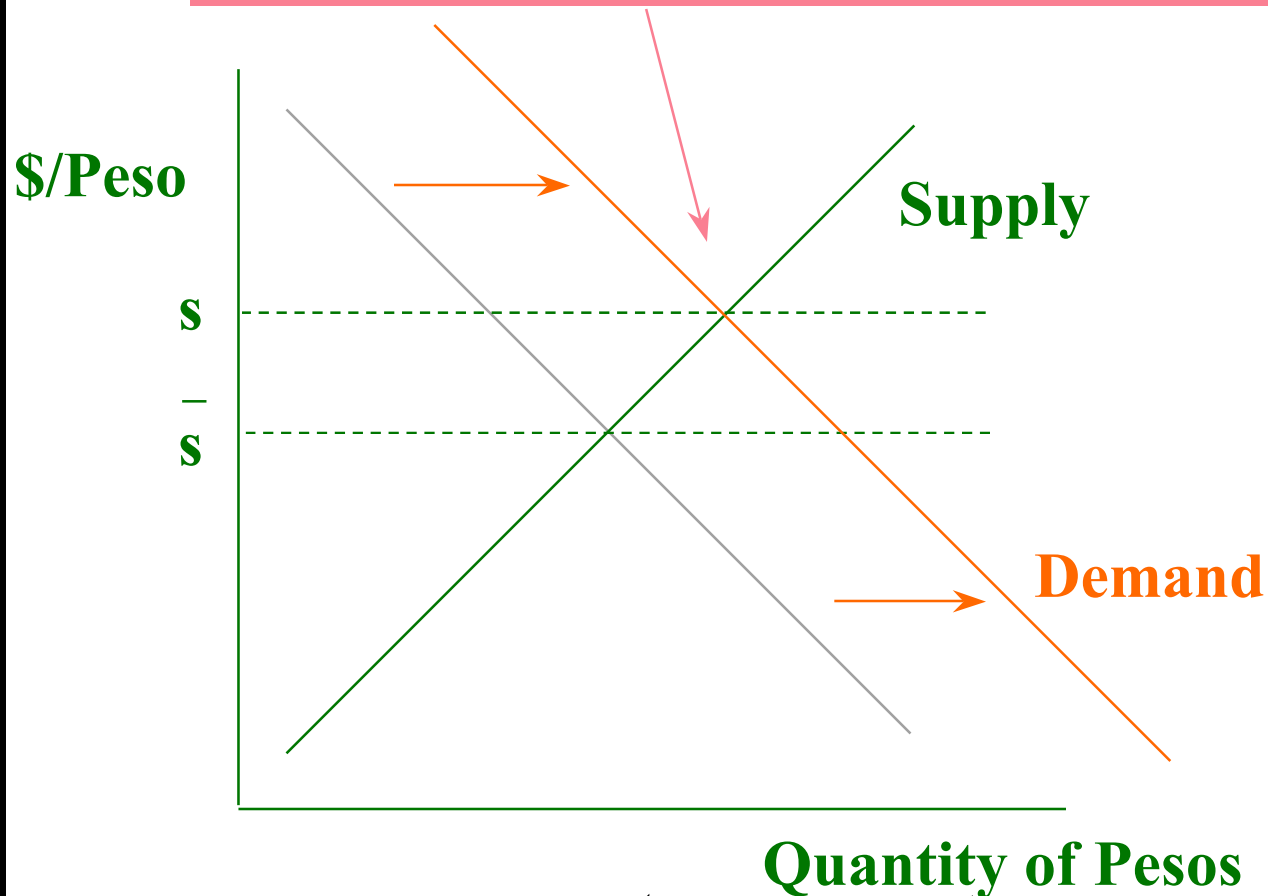
What happens if demand for Pesos increases?





2. Exchange Rate Intervention

Unless something is done, the exchange rate will appreciate to s .



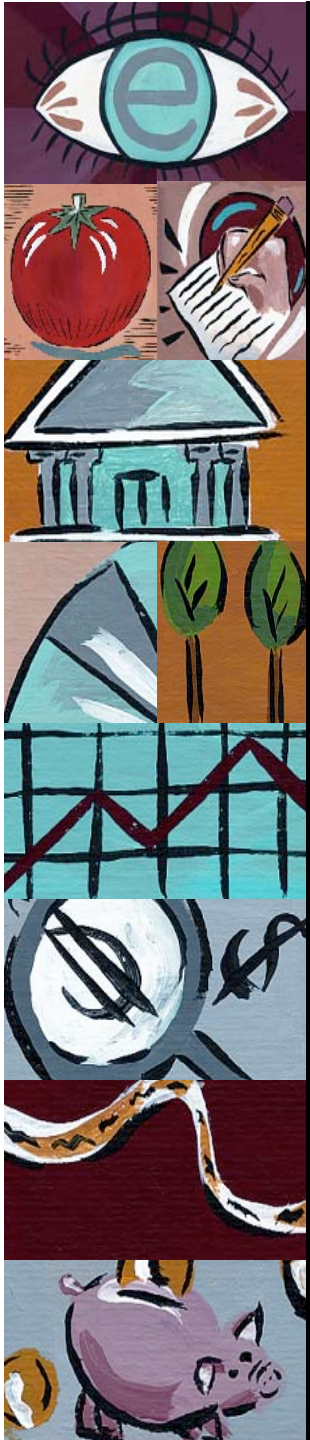


What should the Central Bank

Do?

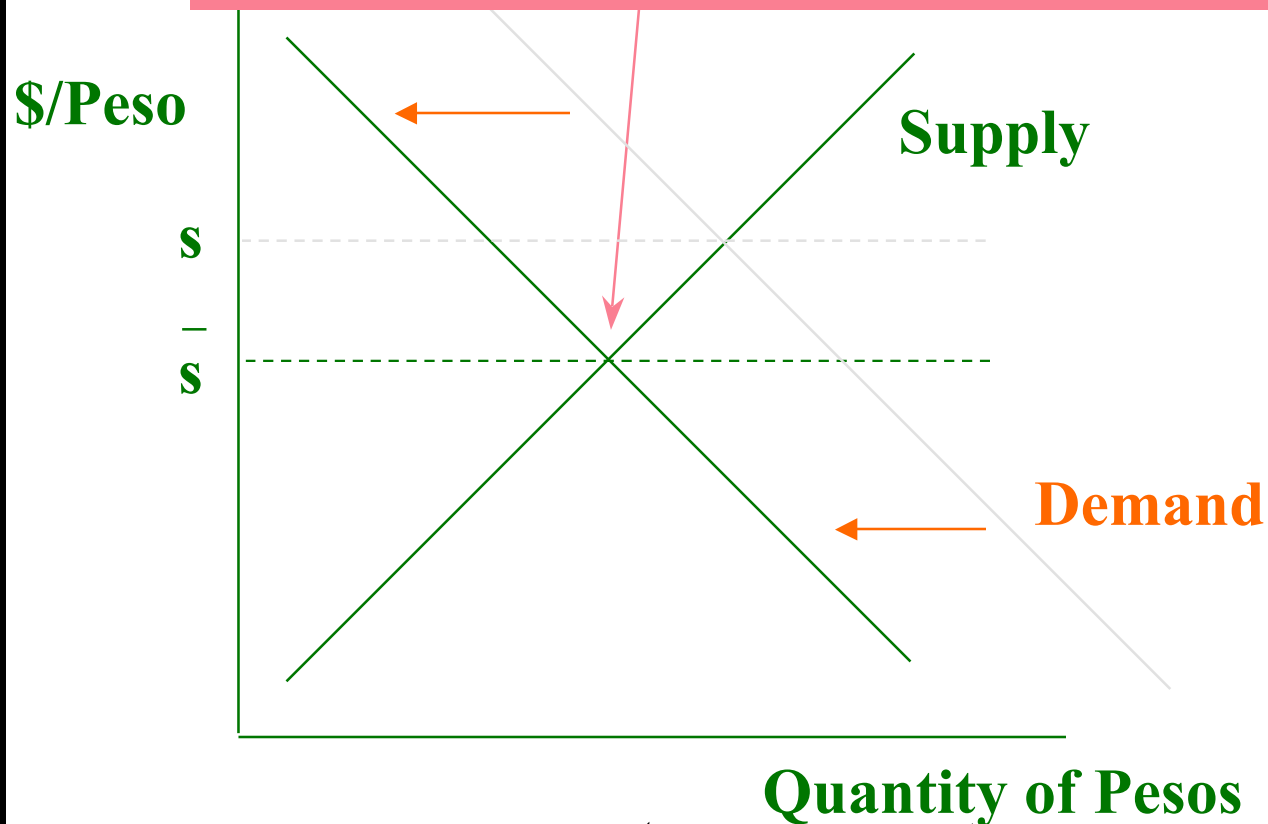
3 Options:

1. Discourage capital inflows. Curb demand.
Example: Chile.



Option 1. Discourage Inflows

Enact policies which curb demand for peso (i.e. 'Tobin Taxes') and push intersection back to original level.





What should the Central Bank Do?

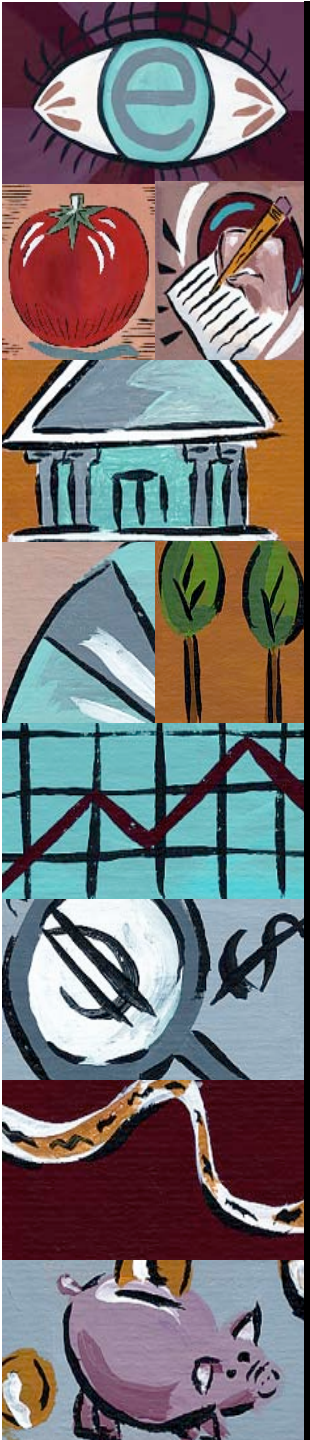
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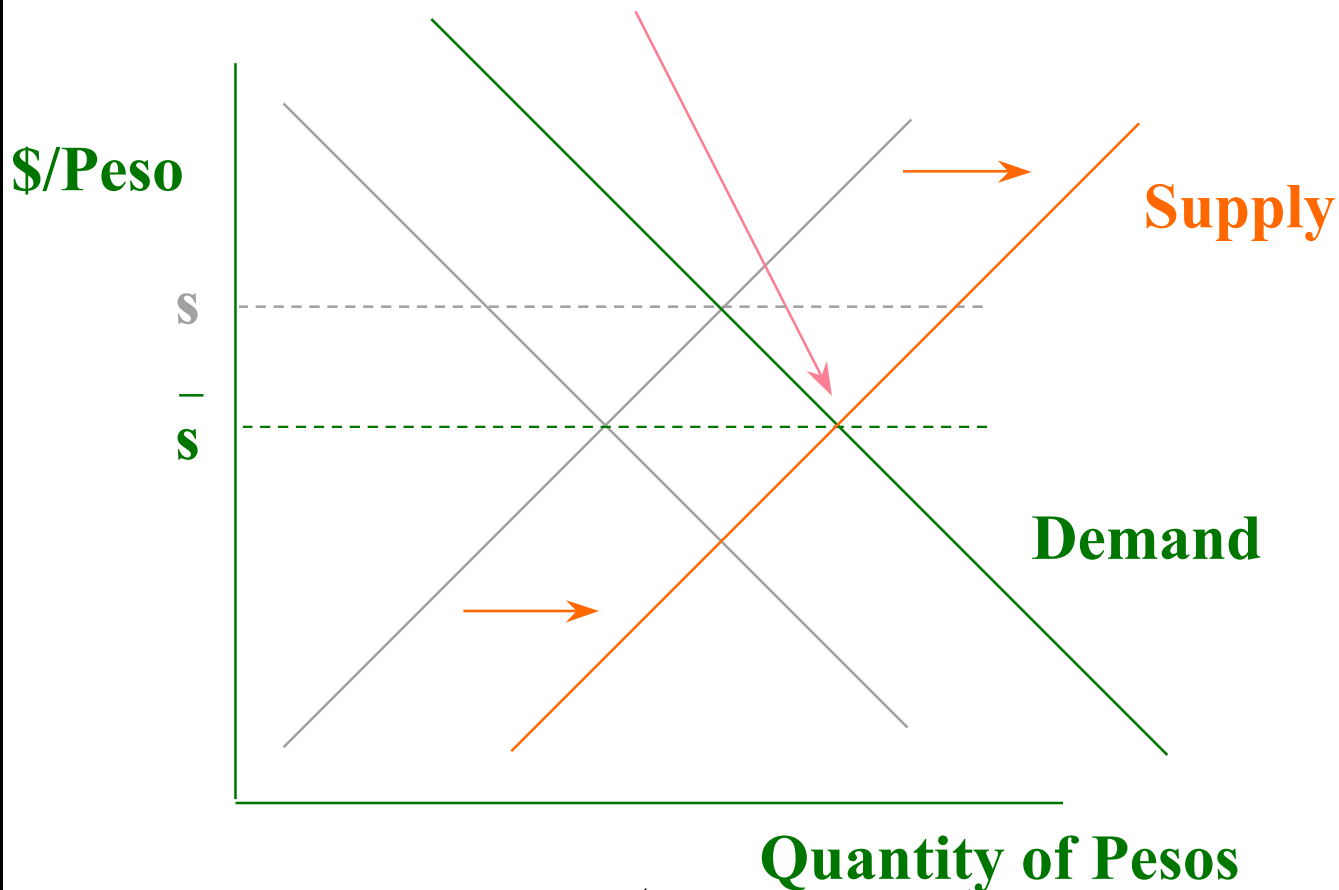
2. Print Money: Unsterilized Intervention

Supply as many Pesos as the market wants at the fixed exchange rate.



Option 2: Unsterilized Intervention

Banco Central offers sufficient peso supply in the FX market to meet demand at s





End Chapter 3