

Lecture 2: Supply, Demand & Market Equilibrium

1

ECONOMICS

MICROECONOMICS

- Basic Economic concepts
- Supply, Demand and Market
- Elasticity
- **Supply, Demand & Government Policies**
- Production and Cost
- Market structures

MACROECONOMICS

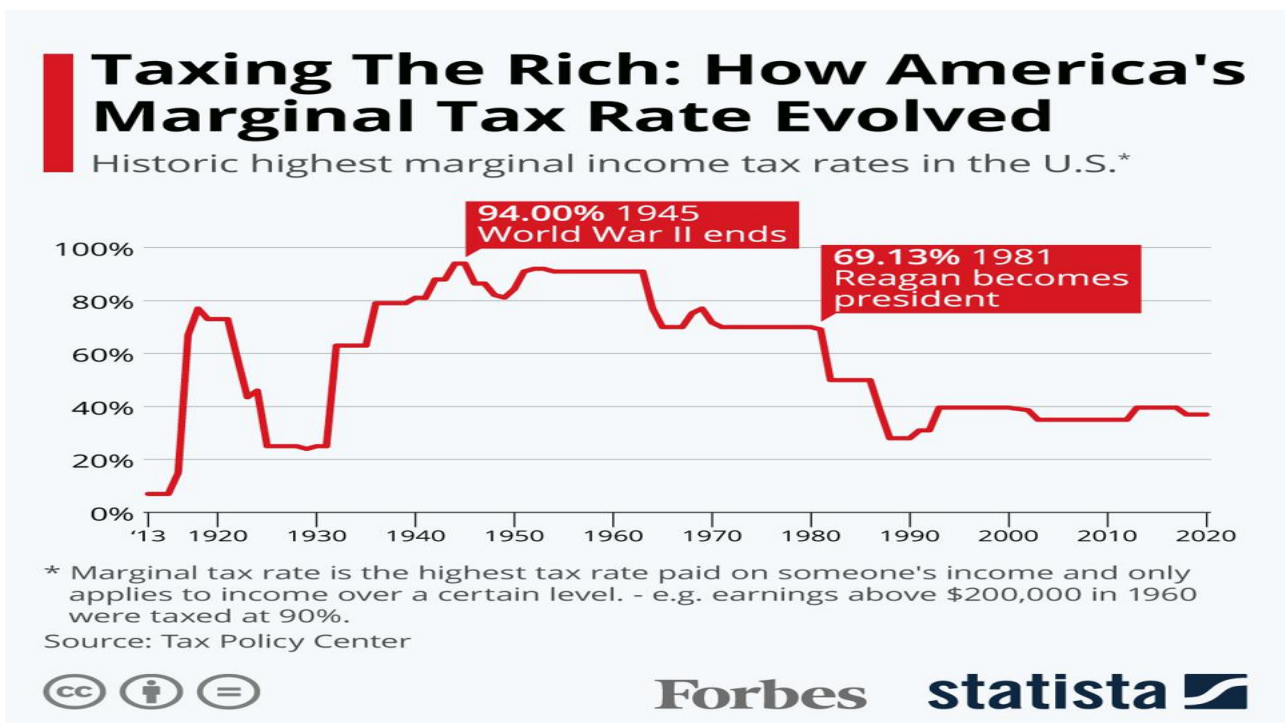
- National Income accounting
- ASAD
- Inflation and Unemployment
- Financial, Monetary and Banking system
- Macroeconomics Policies

2

SUPPLY, DEMAND & GOVERNMENT POLICIES

- Consumer's surplus and Producer's surplus
- **Price control: Price Ceiling and Price Floor**
- Market based policy: Tax

3



4

Evaluating the Market Equilibrium

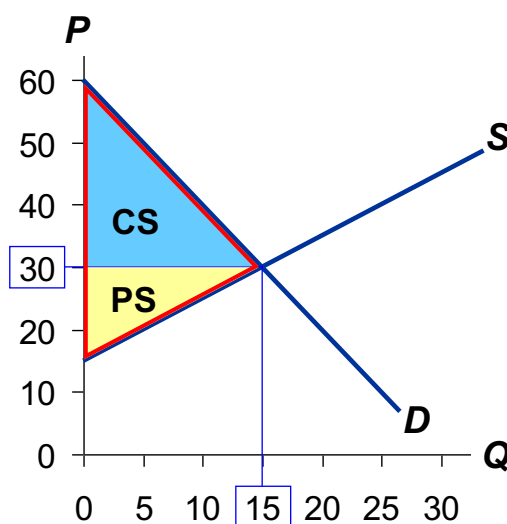
Market equilibrium:

$$P = \$30$$

$$Q = 15 \text{ (thousand)}$$

Total surplus

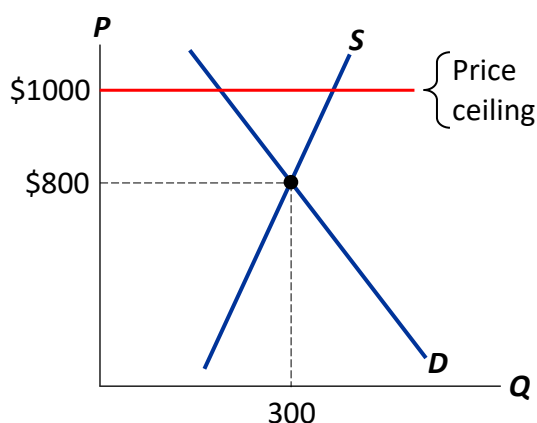
$$= CS + PS$$



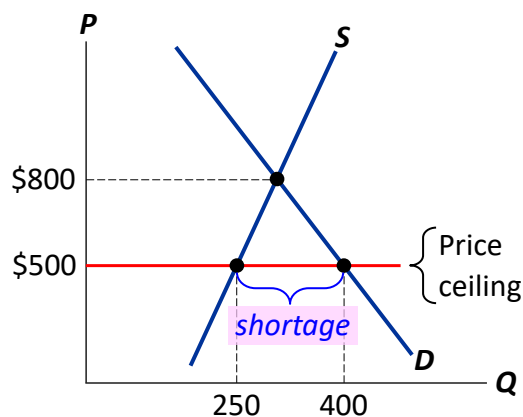
5

5

How Price Ceilings Affect Market Outcomes



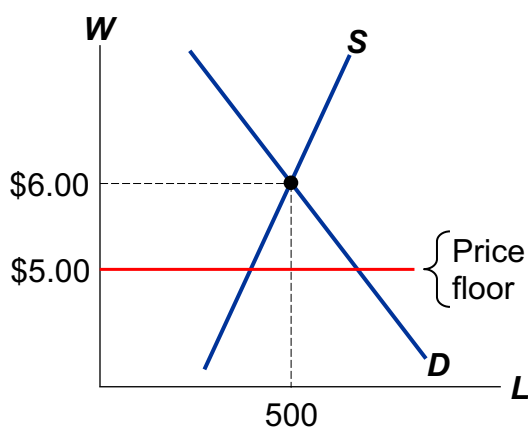
A price ceiling above the equilibrium price is **not binding**—has no effect on the market outcome.



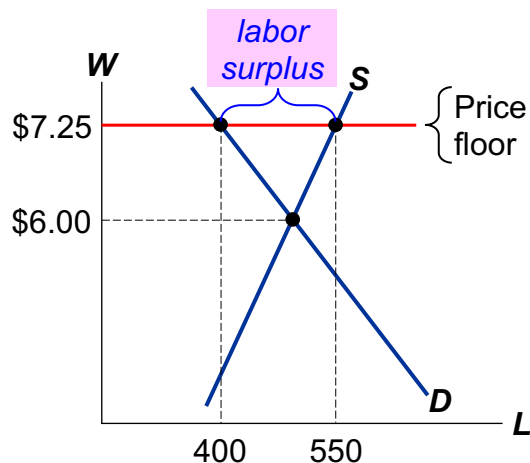
The equilibrium price (\$800) is above the ceiling and therefore illegal. The price ceiling is **binding**, causes a shortage.

6

How Price Floors Affect Market Outcomes

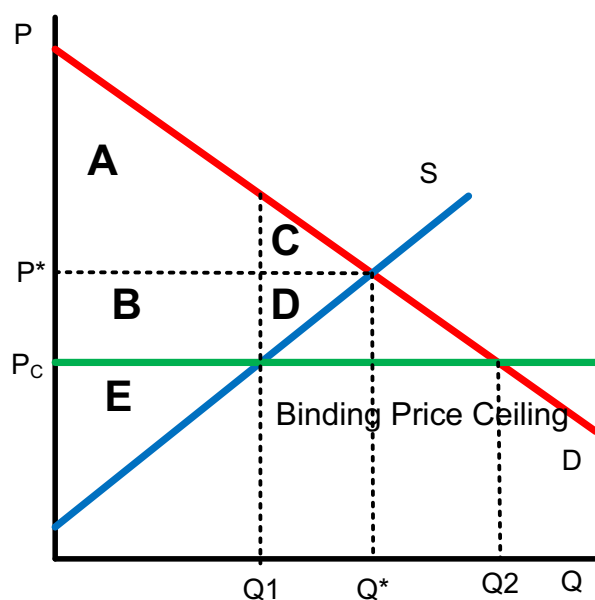


A price floor below the equilibrium price is **not binding** – has no effect on the market outcome.



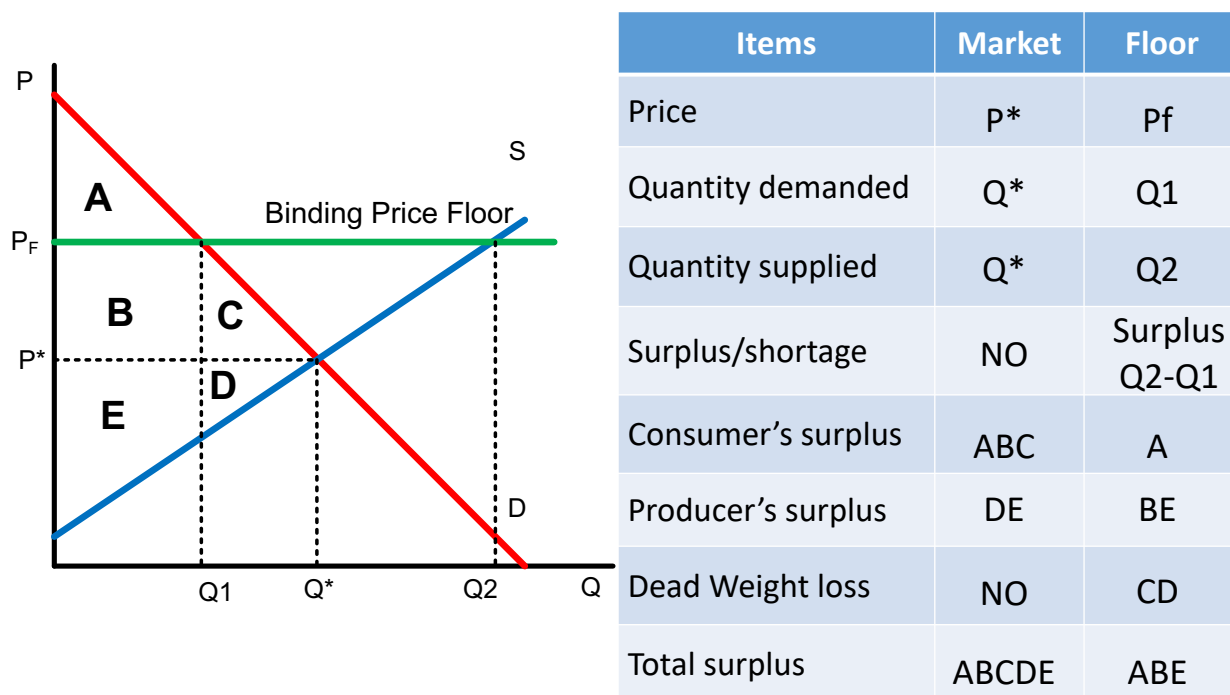
The equilibrium wage (\$6) is below the floor and therefore illegal. The price floor is **binding**, causes a surplus.

7



Items	Market	Ceiling
Price	P^*	P_c
Quantity demanded	Q^*	Q_2
Quantity supplied	Q^*	Q_1
Surplus/shortage	NO	Shortage $Q_2 - Q_1$
Consumer's surplus	AC	AB
Producer's surplus	BDE	E
Dead weight loss	NO	CD
Total surplus	ABCDE	ABE

8

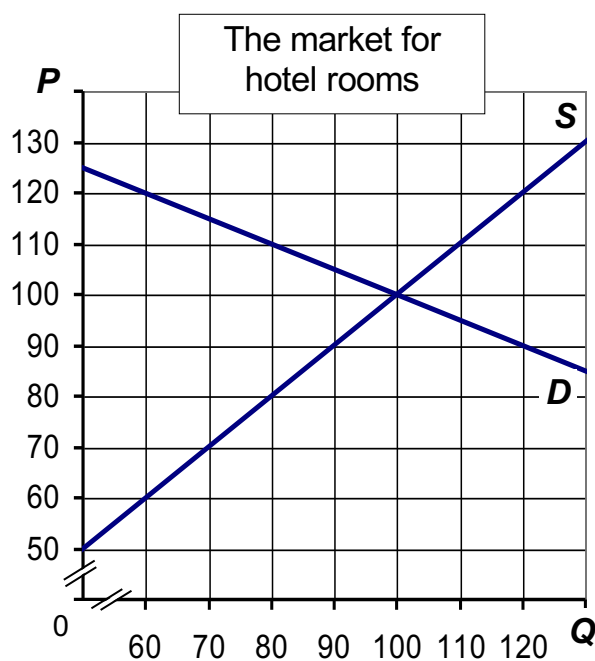


9

Price controls

The market for hotel rooms is in equilibrium as in the graph.

- Determine the effects of:
 - A. \$90 price ceiling
 - B. \$90 price floor
 - C. \$120 price floor
- Find the dead weight loss (if any)



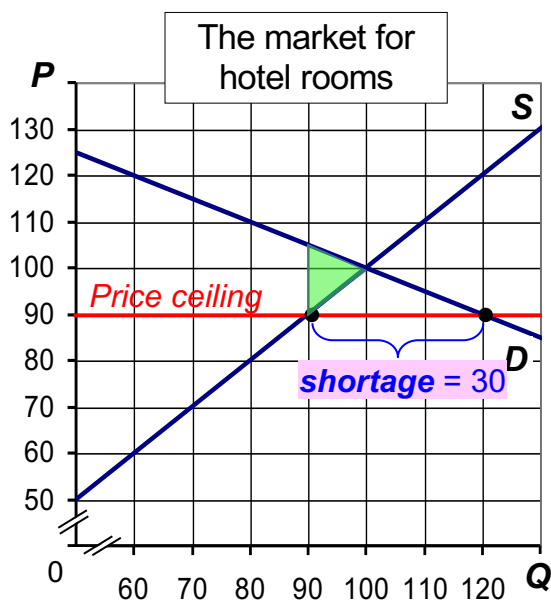
10

A. \$90 price ceiling

The price falls to \$90.
(binding price ceiling below the equilibrium)

Buyers demand 120 rooms, sellers supply 90, leaving a shortage.

$$DWL = 10 \times 15 / 2 = 75$$



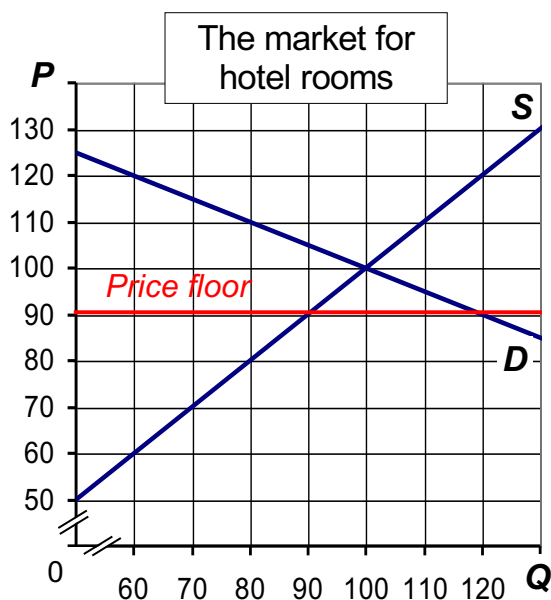
11

11

B. \$90 price floor

Equilibrium price is above the \$90 price floor, so the price floor is **not binding**.

P = \$100,
Q = 100 rooms.



12

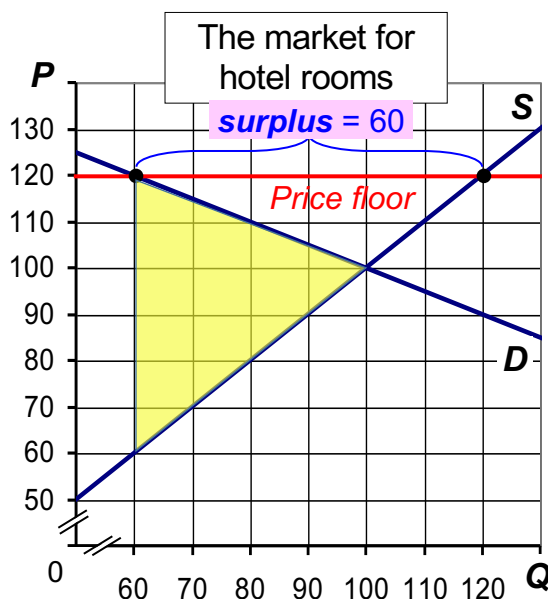
12

C. \$120 price floor

The price rises to \$120.
(**binding price floor**
above the equilibrium)

Buyers demand
60 rooms, sellers supply
120, causing a surplus.

$$DWL = 40 \times 60 / 2 = 1200$$



13

13



1. Starting in equilibrium, a new maximum legal price of P_3 for Whopper Slushees will create:

- (a) excess demand.
- (b) excess supply.
- (c) pressure for a higher price.
- (d) no pressure for any change.

2. A government price ceiling at P_1 for Whopper Slushees results in a:

- (a) shortage of roughly $Q_3 - Q_1$.
- (b) demand price equal to P_2 .
- (c) surplus of $Q_1 - Q_3$.
- (d) supply price equal to P_3 .

3. A government price floor for Whopper Slushees at P_3 yields a:

- (a) shortage of $Q_1 - Q_3$.
- (b) surplus of $Q_3 - Q_1$.
- (c) supply price of P_1 .
- (d) quantity demanded of Q_2 .

14

Supply, demand and Market equilibrium

Given market demand and supply as follows:

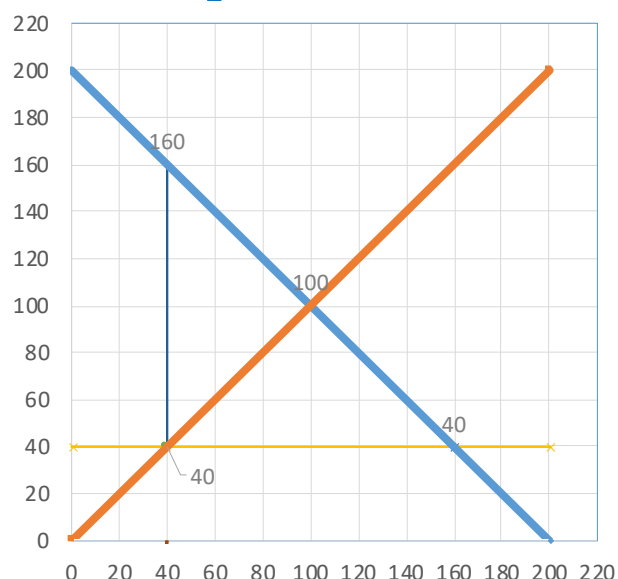
Demand $Q_d = 200 - P$, Supply $Q_s = P$.

- Draw the supply and demand curves
- Find the equilibrium quantity and price.
- If government imposes ceiling price at 40, what will happen, find the deadweight loss (if any). What if the price ceiling is 120?
- If government imposes floor price at 140, what will happen, find the dead weight loss (if any). What if the price floor is 40?

15

Supply, demand and Market equilibrium

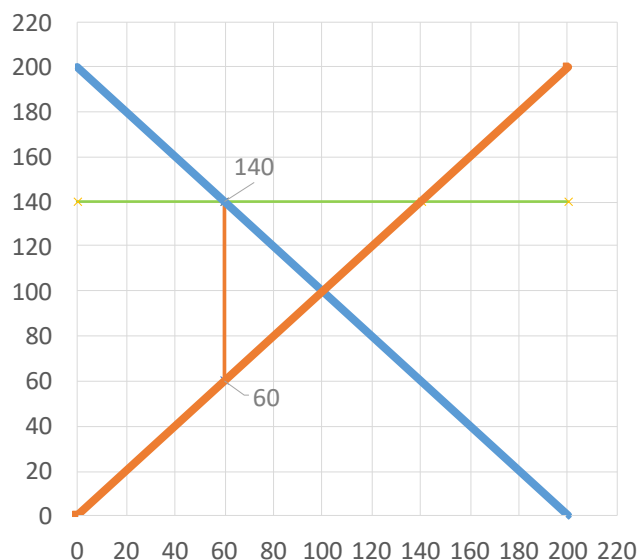
- Demand: $Q_d = 200 - P$
- Supply: $Q_s = P$
- Market Equilibrium:
 - $P = 100$
 - $Q = 100$
- **Price Ceiling: 40 (binding)**
 - $Q_d = 160$
 - $Q_s = 40$
 - Shortage = 120
 - $DWL = 60 \times 120 / 2 = 3600$
- **Price ceiling: 120 non-binding**



16

Supply, demand and Market equilibrium

- Demand: $Q_d = 200 - P$
- Supply: $Q_s = P$
- Market Equilibrium:
 - $P = 100$
 - $Q = 100$
- **Price floor: 140 (binding)**
 - $Q_d = 60$
 - $Q_s = 140$
 - Shortage = 80
 - $DWL = 80 \times 40 / 2 = 1600$
- **Price floor: 40 non-binding**



17

SUPPLY, DEMAND & GOVERNMENT POLICIES

- Consumer's surplus and Producer's surplus
- Price Control: Price Ceiling and Price Floor
- **Market based policies: Tax**

18

Taxes

- Government uses taxes
 - To raise revenue for public projects
 - Roads, schools, and national defense
- Tax incidence
 - Manner in which the burden of a tax is shared among participants in a market
 - The government can make the seller or the buyer to pay the tax

19

Taxes

How **taxes on buyers** affect market outcomes

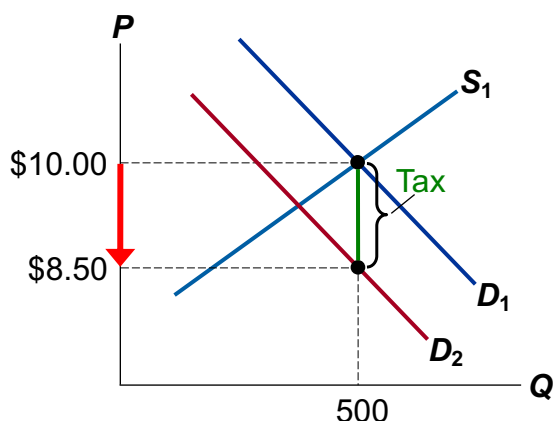
- Initial impact on the demand
- Demand curve shifts left
- Lower equilibrium price
- Lower equilibrium quantity
- The tax reduces the size of the market

20

20

A Tax on Buyers

Effects of a \$1.50 per unit tax on buyers



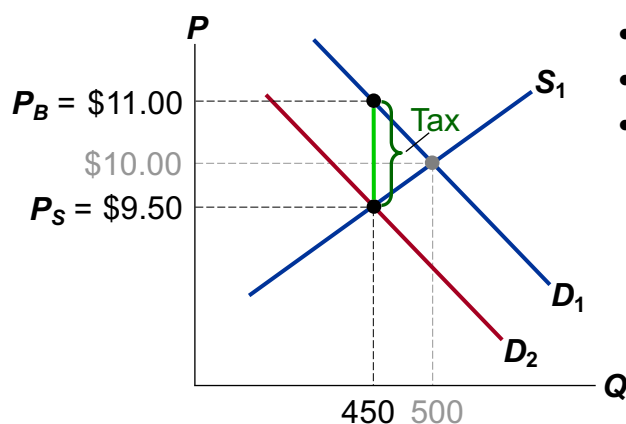
- Hence, a tax on buyers shifts the D curve down by the amount of the tax.
- The price buyers pay is now \$1.50 higher than the market price P .
- P would have to fall by \$1.50 to make buyers willing to buy same Q as before.
- E.g., if P falls from \$10.00 to \$8.50, buyers are still willing to purchase 500 pizzas.

21

21

A Tax on Buyers

Effects of a \$1.50 per unit tax on buyers



- New equilibrium:
- $Q = 450$
- Sellers receive $P_S = \$9.50$
- Buyers pay $P_B = \$11.00$
- Difference between them = \$1.50 = tax

how the burden of a tax is shared among market participants

22

22

Taxes

How **taxes on sellers** affect market outcomes

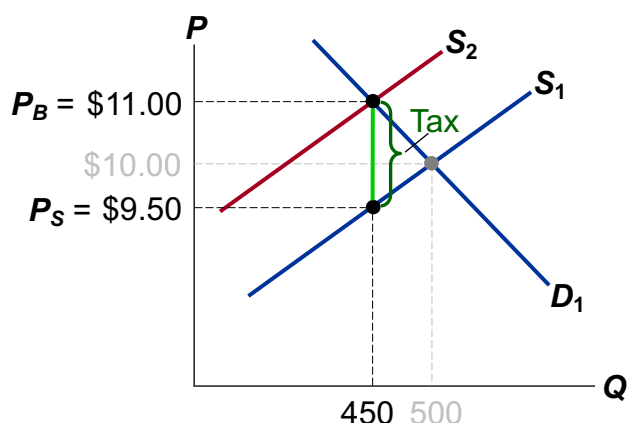
- Immediate impact on sellers: shift in supply
- Supply curve shifts left
- Higher equilibrium price
- Lower equilibrium quantity
- The tax reduces the size of the market

23

23

A Tax on Sellers

Effects of a \$1.50 per unit tax on sellers

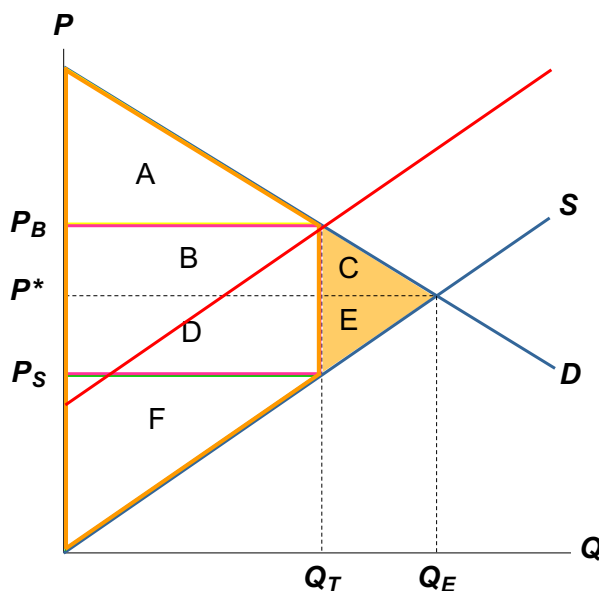


- New equilibrium:
- $Q = 450$
- Buyers pay $P_B = \$11.00$
- Sellers receive $P_S = \$9.50$
- Difference between them
= \$1.50 = tax

24

Items	Market	Tax
Quantity	QE	QT
Buyer's price	P*	Pb
Seller's price	P*	Ps
Consumer's surplus	ABC	A
Producer's surplus	DEF	F
Dead weight loss	NO	CE
Tax	NO	BD
Total surplus	ABCDEF	ABDF

The Effects of a Tax



25

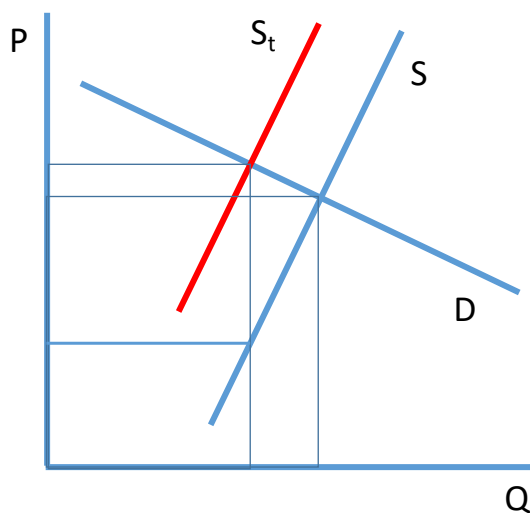
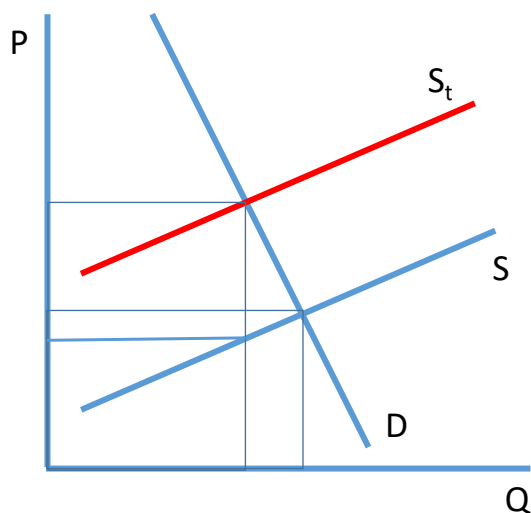
- When a tax is placed on the sellers of a product, buyers pay
 - more, and sellers receive more than they did before the tax.
 - more, and sellers receive less than they did before the tax.
 - less, and sellers receive more than they did before the tax.
 - less, and sellers receive less than they did before the tax.
- Suppose sellers of perfume are required to send \$1.00 to the government for every bottle of perfume they sell. Further, suppose this tax causes the price paid by buyers of perfume to rise by \$0.60 per bottle. Which of the following statements is correct?
 - The effective price received by sellers is \$0.40 per bottle less than it was before the tax.
 - Sixty percent of the burden of the tax falls on sellers.
 - This tax causes the demand curve for perfume to shift downward by \$1.00 at each quantity of perfume.
 - All of the above are correct.
- A tax levied on the sellers of blueberries
 - increases sellers' costs, reduces profits, and shifts the supply curve up.
 - increases sellers' costs, reduces profits, and shifts the supply curve down.
 - decreases sellers' costs, increases profits, and shifts the supply curve up.
 - decreases sellers' costs, increases profits, and shifts the supply curve down.
- When a tax is placed on the sellers of cell phones, the size of the cell phone market and the effective price received by sellers both increase.
 - increases, but the effective price received by sellers decreases.
 - decreases, but the effective price received by sellers increases.
 - and the effective price received by sellers both decrease.

26

Tax incidence: who bear the tax burden

CASE 1: Supply is more elastic than demand

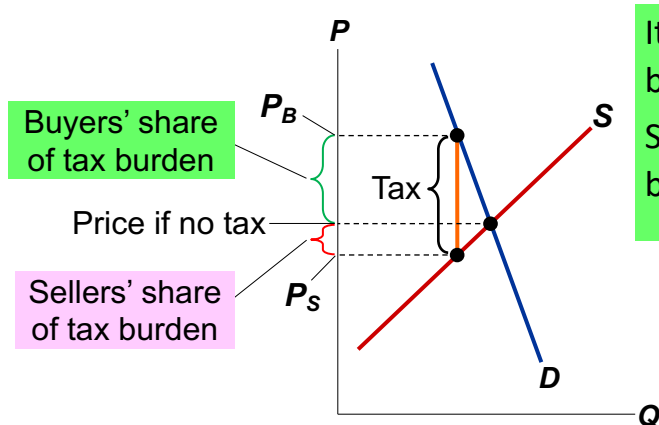
CASE 2: Demand is more elastic than supply



27

Elasticity and Tax Incidence

CASE 1: Supply is more elastic than demand

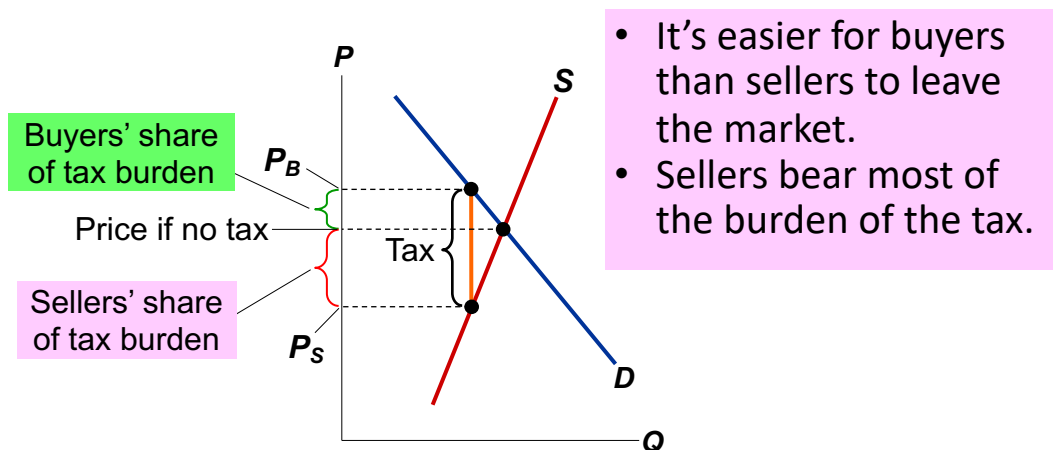


It's easier for sellers than buyers to leave the market. So buyers bear most of the burden of the tax.

28

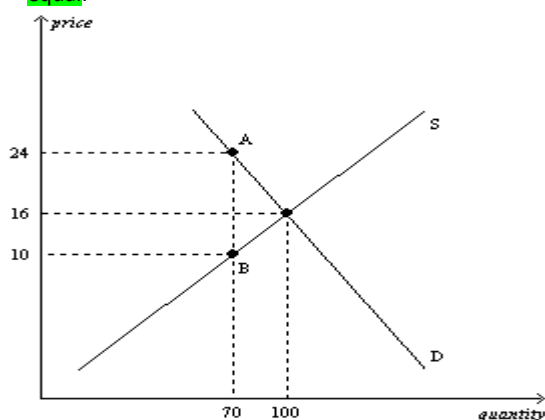
Elasticity and Tax Incidence

CASE 2: Demand is more elastic than supply



29

5. When a tax is placed on the buyers of lemonade, the
- sellers bear the entire burden of the tax.
 - buyers bear the entire burden of the tax.
 - burden of the tax will be always be equally divided between the buyers and the sellers.
 - burden of the tax will be shared by the buyers and the sellers, but the division of the burden is not always equal.



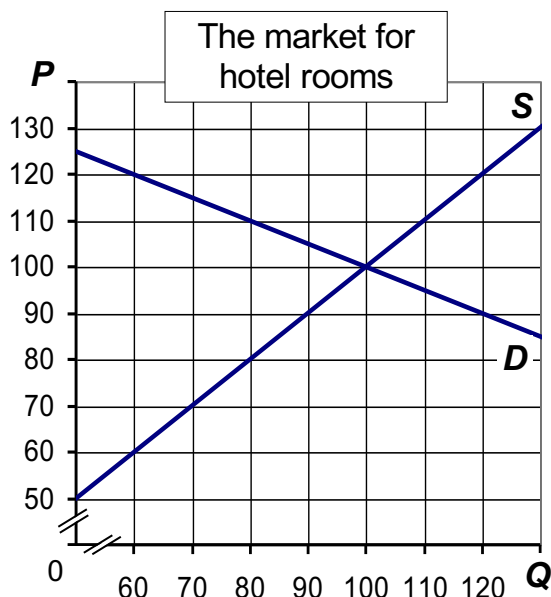
6. The per-unit burden of the tax on buyers is
- \$6.
 - \$8.
 - \$14.
 - \$24.
7. The per-unit burden of the tax on sellers is
- \$6.
 - \$8.
 - \$10.
 - \$14.
8. The tax revenue is
- \$210.
 - \$420.
 - \$980.
 - \$1680.
9. The Dead weight loss of the tax is
- \$420.
 - \$210.
 - \$510.
 - \$980.

30

Effects of a tax

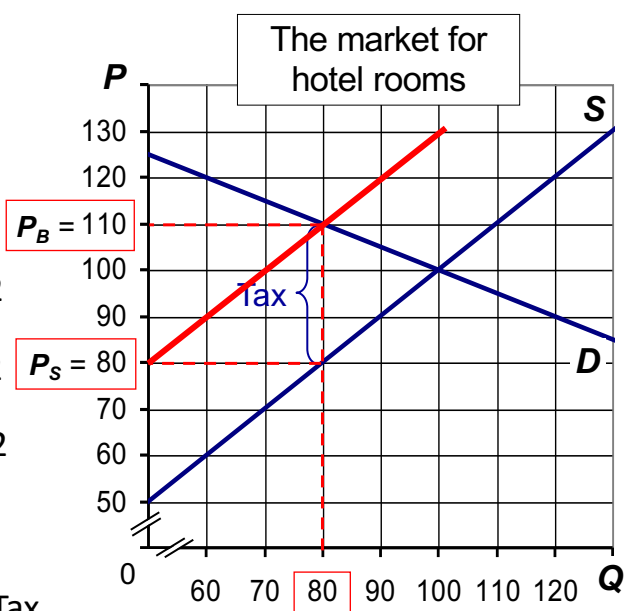
The market for hotel rooms is in equilibrium as in the graph.

- Suppose the government imposes a tax on buyers of \$30 per room
- Find the new Q , P_B , P_S , and incidence of tax.



31

Items	Market	Tax
Quantity	100	80
Buyer's price	100	110
Seller's price	100	80
Consumer's surplus	$25 \times 100 / 2$	$15 \times 80 / 2$
Producer's surplus	$50 \times 100 / 2$	$30 \times 80 / 2$
Dead weight loss	NO	$20 \times 30 / 2$
Tax	NO	30×80
Total surplus	CS+PS	CS+PS+Tax



32

Supply, demand and Government policy

Given market demand and supply as follows: $Q_d = 180 - P$, $Q_s = P$.

- Government imposes tax on the sellers, new supply curve is $Q_s = P - T$. Find the new market equilibrium, seller price, buyer price, tax revenue, dead weight loss by T.
- If $T = 40$, find the new equilibrium price and quantity, consumer's surplus, producer's surplus, total surplus, tax revenue, dead weight loss (if any) before and after tax.
- Find the tax burden for the parties.
- If government wants to maximize tax revenue, what is T?

33

Supply, demand and Government policy

- Demand $Q_d = 180 - P$,
- Supply: $Q_s = P$
- Supply with tax $Q_s = P - T$.

Equilibrium $180 - P = P - T$

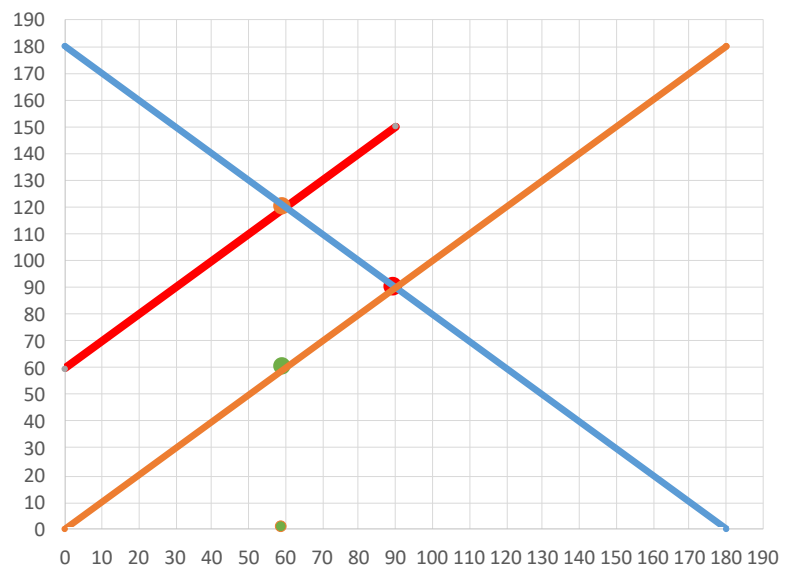
- Buyer price: $P_B = \frac{180+T}{2}$

Replace P_B to demand

- Quantity: $Q_t = \frac{180-T}{2}$

Replace Q_t to supply

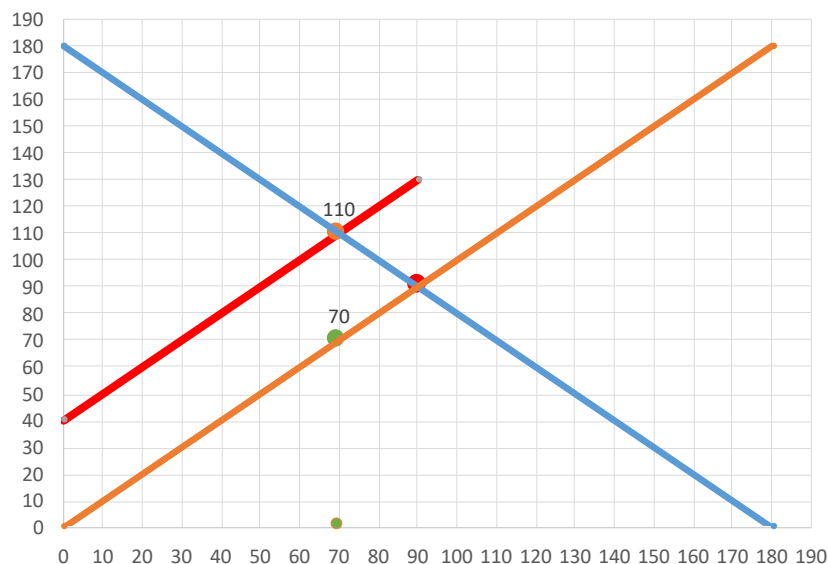
- Seller price: $P_S = \frac{180-T}{2}$



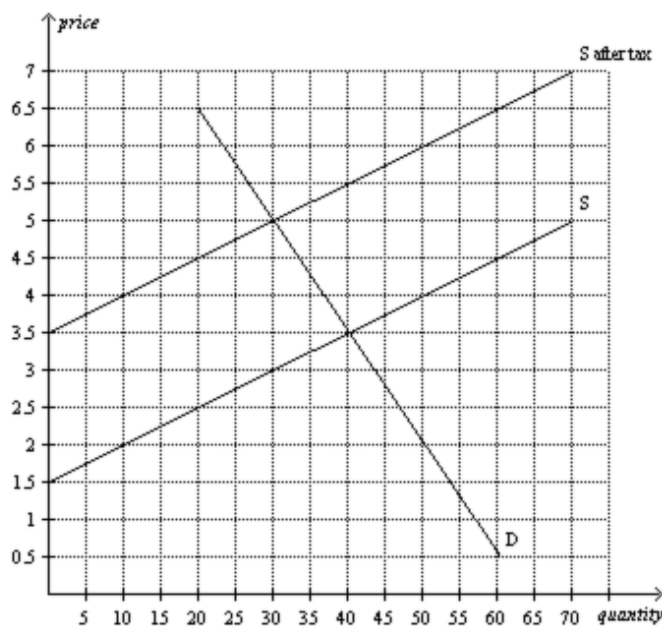
34

Supply, demand and Government policy

- Demand $Q_d = 180 - P$
- Supply $Q_s = P$
- $T=40$
- Buyer price?
- Seller price?
- Quantity?



35



10 As the figure is drawn, who sends the tax payment to the government?

- The buyers send the tax payment.
- The sellers send the tax payment.
- A portion of the tax payment is sent by the buyers, and the remaining portion is sent by the sellers.
- The question of who sends the tax payment cannot be determined from the graph.

11. Buyers pay how much of the tax per unit?

- \$0.50.
- \$1.50.
- \$3.00.
- \$5.00.

12 How much tax revenue does this tax generate for the government?

- \$80.
- \$60.
- \$15.
- \$45.

36