In this chapter, look for the answers to these questions

• What are price ceilings and price floors? What are some examples of each?
• How do price ceilings and price floors affect market outcomes?
• How do taxes affect market outcomes? How do the effects depend on whether the tax is imposed on buyers or sellers?
• What is the incidence of a tax? What determines the incidence?
Government Policies That Alter the Private Market Outcome

- Price controls
  - **Price ceiling**: a legal maximum on the price of a good or service. *Example: rent control*
  - **Price floor**: a legal minimum on the price of a good or service. *Example: minimum wage*

- Taxes
  - The govt can make buyers or sellers pay a specific amount on each unit.

We will use the supply/demand model to see how each policy affects the market outcome (the price buyers pay, the price sellers receive, and eq’m quantity).
EXAMPLE 1: The Market for Apartments

Rental price of apartments

Eq’m w/o price controls

P

$800

300

Q

S

D

Quantity of apartments

© 2015 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website for classroom use.
How Price Ceilings Affect Market Outcomes

A price ceiling above the equilibrium price is not binding—has no effect on the market outcome.
How Price Ceilings Affect Market Outcomes

The eq’m price ($800) is above the ceiling and therefore illegal. The ceiling is a binding constraint on the price, causes a shortage.
How Price Ceilings Affect Market Outcomes

In the long run, supply and demand are more price-elastic. So, the shortage is larger.

$\begin{align*}
\text{Supply} & \quad \text{Demand} \\
\text{Price} & \quad \text{Quantity} \\
\$500 & \quad 450 \\
\$800 & \quad 150
\end{align*}$

Price ceiling

shortage
Shortages and Rationing

- With a shortage, sellers must ration the goods among buyers.
- Some rationing mechanisms:
  1. First come first serve
  2. Discrimination according to sellers’ biases, like seniority or socio-economic class etc
  3. Lottery
  4. Equal shares for all
  5. Merit

- These mechanisms are often unfair, and inefficient: the goods do not necessarily go to the buyers who value them most highly.
Shortages and Rationing

- Linestanding.com

- “... meant frustration for some environmentalists. When a group of them showed up for the congressional hearing on climate change, they couldn’t get in. The lobbyists’ paid stand-ins had already staked out all the available seats in the hearing room.”


- Michael Sandel is a political philosopher at Harvard U, author of ‘Justice: What’s the right thing to do?’ Chapter 4: Markets and morals
EXAMPLE 2: The Market for Unskilled Labor

**Equilibrium without Price Controls**

- **Wage paid to unskilled workers**: $6.00
- **Quantity of unskilled workers**: 500

The graph illustrates the market equilibrium for unskilled labor with no price controls, where the demand (D) and supply (S) curves intersect at a wage of $6.00 and a quantity of 500 unskilled workers.
How Price Floors Affect Market Outcomes

A price floor below the eq’m price is not binding – has no effect on the market outcome.
How Price Floors Affect Market Outcomes

The eq’m wage ($6) is below the floor and therefore illegal.
The floor is a binding constraint on the wage, causes a surplus (i.e., unemployment).
Min wage laws do not affect highly skilled workers. They do affect low-skilled workers.
The Minimum Wage

In January 2014, Over 600 Economists Sign Letter In Support of $10.10 Minimum Wage
Economist Statement on the Federal Minimum Wage

Dear Mr. President, Speaker Boehner, Majority Leader Reid, Congressman Cantor, Senator McConnell, and Congresswoman Pelosi:

July will mark five years since the federal minimum wage was last raised. We urge you to act now and enact a three-step raise of 95 cents a year for three years—which would mean a minimum wage of $10.10 by 2016—and then index it to protect against inflation. Senator Tom Harkin and Representative George Miller have introduced legislation to accomplish this. The increase to $10.10 would mean that minimum-wage workers who work full time, full year would see a raise from their current salary of roughly $15,000 to roughly $21,000. These proposals also usefully raise the tipped minimum wage to 70% of the regular minimum.
The Minimum Wage

In January 2014, 
**Over 600 Economists Sign Letter In Support of $10.10 Minimum Wage**

Economist Statement on the Federal Minimum Wage

This policy would directly provide higher wages for close to 17 million workers by 2016. Furthermore, another 11 million workers whose wages are just above the new minimum would likely see a wage increase through “spillover” effects, as employers adjust their internal wage ladders. The vast majority of employees who would benefit are adults in working families, disproportionately women, who work at least 20 hours a week and depend on these earnings to make ends meet. At a time when persistent high unemployment is putting enormous downward pressure on wages, such a minimum-wage increase would provide a much-needed boost to the earnings of low-wage workers.
The Minimum Wage

In January 2014, 
**Over 600 Economists Sign Letter In Support of $10.10 Minimum Wage**
Economist Statement on the Federal Minimum Wage

In recent years there have been important developments in the academic literature on the effect of increases in the minimum wage on employment, with the weight of evidence now showing that increases in the minimum wage have had little or no negative effect on the employment of minimum-wage workers, even during times of weakness in the labor market. Research suggests that a minimum-wage increase could have a small stimulative effect on the economy as low-wage workers spend their additional earnings, raising demand and job growth, and providing some help on the jobs front.

Sincerely,
The Minimum Wage

‘An estimated 27.8 million people would earn more money under the proposal to lift the hourly minimum from $7.25 to $10.10 by 2016. And most of them do not fit the low-wage stereotype of a teenager with a summer job. Their average age is 35; most work full time; more than one-fourth are parents; and, on average, they earn half of their families’ total income.

..An hourly minimum of $10.10, for example, as Democrats have proposed, would reduce the number of people living in poverty by 4.6 million, according to widely accepted research without requiring the government to tax, borrow or spend.’

From a New York Times article: The Case for a Higher Minimum Wage.
The Minimum Wage

ANNUAL EMPLOYMENT GROWTH RATE, MINIMUM WAGE STATES VERSUS NON-MINIMUM WAGE STATES
Price controls

Determine effects of:

A. $90 price ceiling
B. $90 price floor
C. $120 price floor

The market for hotel rooms
The price falls to $90.

Buyers demand 120 rooms, sellers supply 90, leaving a shortage.
ACTIVE LEARNING 1

B. $90 price floor

Eq’m price is above the floor, so floor is not binding.

\[ P = $100, \quad Q = 100 \text{ rooms.} \]
The price rises to $120.

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

- The govt levies taxes on many goods & services to raise revenue to pay for national defense, public schools, etc.

- The govt can make buyers or sellers pay the tax.

- The tax can be a % of the good’s price, or a specific amount for each unit sold.
  - For simplicity, we analyze per-unit taxes only.
EXAMPLE 3: The Market for Pizza

Eq’m w/o tax

$10.00

500
A Tax on Buyers

Hence, a tax on buyers shifts the $D$ curve down by the amount of the tax.

$P$ 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 still willing to purchase 500 pizzas.
A Tax on Buyers

New eq’m:

\[ Q = 450 \]

Sellers receive

\[ P_S = $9.50 \]

Buyers pay

\[ P_B = $11.00 \]

Difference between them

\[ = $1.50 = \text{tax} \]

Effects of a $1.50 per unit tax on buyers

\[ P_B = $11.00 \]

\[ P_S = $9.50 \]

$10.00

$10.00

450

500
The **Incidence** of a Tax:
how the burden of a tax is shared among market participants

In our example, buyers pay $1.00 more, sellers get $0.50 less.

\[
P_B = \$11.00 \\
P_S = \$9.50
\]
A Tax on Sellers

The tax effectively raises sellers’ costs by $1.50 per pizza. Sellers will supply 500 pizzas only if $P$ rises to $11.50, to compensate for this cost increase.

Hence, a tax on sellers shifts the $S$ curve up by the amount of the tax.
A Tax on Sellers

**New eq’m:**

\[ Q = 450 \]

Buyers pay

\[ P_B = $11.00 \]

Sellers receive

\[ P_S = $9.50 \]

Difference between them

\[ = $1.50 = \text{tax} \]

Effects of a $1.50 per unit tax on sellers
The Outcome Is the Same in Both Cases!

The effects on $P$ and $Q$, and the tax incidence are the same whether the tax is imposed on buyers or sellers!

What matters is this:
A tax drives a wedge between the price buyers pay and the price sellers receive.

$P_B = \$11.00$
$P_S = \$9.50$

$Q = 500$
Suppose govt imposes a tax on buyers of $30 per room.

Find new $Q$, $P_B$, $P_S$, and incidence of tax.
The market for hotel rooms

\( Q = 80 \)

\( P_B = $110 \)

\( P_S = $80 \)

Incidence

buyers: $10

sellers: $20
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.

 Buyers’ share of tax burden

Sellers’ share of tax burden

Price if no tax

© 2015 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part, except for use as permitted in a license distributed with a certain product or service or otherwise on a password-protected website for classroom use.
Elasticity and Tax Incidence

CASE 2: Demand is more elastic than supply

 Buyers’ share of tax burden

Price if no tax

Sellers’ share of tax burden

It’s easier for buyers than sellers to leave the market. Sellers bear most of the burden of the tax.
CASE STUDY: Who Pays the Luxury Tax?

- 1990: Congress adopted a luxury tax on yachts, private airplanes, furs, expensive cars, etc.
- Goal: raise revenue from those who could most easily afford to pay—wealthy consumers.
- But who really pays this tax?
CASE STUDY: Who Pays the Luxury Tax?

The market for yachts

Demand is price-elastic.

In the short run, supply is inelastic.

Hence, companies that build yachts pay most of the tax.

Buyers' share of tax burden

Sellers' share of tax burden

Demand

Supply

Tax

P

Q
ACTIVE LEARNING 3

The 2011 payroll tax cut

Prior to 2011, the Social Security payroll tax was 6.2% taken from workers’ pay and 6.2% paid by employers (total 12.4%).

The Tax Relief Act (2010) reduced the worker’s portion from 6.2% to 4.2% in 2011, but left the employer’s portion at 6.2%.

QUESTION:

Should this change have increased the typical worker’s take-home pay by exactly 2%, more than 2%, or less than 2%? Do any elasticities affect your answer? Explain.
As long as labor supply and labor demand both have price elasticity > 0, the tax cut will be shared by workers and employers, i.e., workers’ take-home pay will rise less than 2%.

The answer does NOT depend on whether labor demand is more or less elastic than labor supply.

**FOLLOW-UP QUESTION:**
Who gets the bigger share of this tax cut, workers or employers? How do elasticities determine the answer?
Answers to follow-up question

- If labor demand is more elastic than labor supply, workers get more of the tax cut than employers.

- If labor demand is less elastic than labor supply, employers get the larger share of the tax cut.
Summary

• A price ceiling is a legal maximum on the price of a good. An example is rent control. If the price ceiling is below the eq’m price, it is binding and causes a shortage.

• A price floor is a legal minimum on the price of a good. An example is the minimum wage. If the price floor is above the eq’m price, it is binding and causes a surplus. The labor surplus caused by the minimum wage is unemployment. But this analysis is too simplistic. Recent literature shows that increases in the minimum wage have had little or no negative effect on the employment of minimum-wage workers.
Summary

• A tax on a good places a wedge between the price buyers pay and the price sellers receive, and causes the eq’m quantity to fall, whether the tax is imposed on buyers or sellers.

• The incidence of a tax is the division of the burden of the tax between buyers and sellers, and does not depend on whether the tax is imposed on buyers or sellers.

• The incidence of the tax depends on the price elasticities of supply and demand.