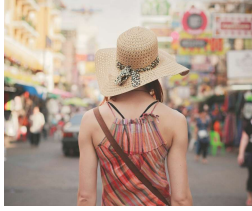


N. GREGORY MANKIW NINTH EDITION

PRINCIPLES OF ECONOMICS



CHAPTER 6

Supply, Demand, and Government Policies

Interactive PowerPoint Slides by:
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IN THIS CHAPTER

- 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?

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Government Policies

- **Economists as policy advisers**
 - Use theories to help change the world for the better.
- **Policies**
 - Often have effects that their architects did not intend or anticipate
 - Alter the private market outcome
 - Price controls
 - Taxes

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Controls on Prices

- **Price ceiling:**
 - Legal maximum on the price at which a good can be sold
 - Example: Rent-control laws
- **Price floor:**
 - Legal minimum on the price at which a good can be sold
 - Example: Minimum wage laws

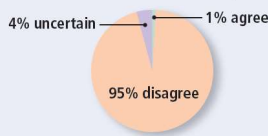
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ASK THE EXPERTS

Rent Control

“Local ordinances that limit rent increases for some rental housing units, such as in New York and San Francisco, have had a positive impact over the past three decades on the amount and quality of broadly affordable rental housing in cities that have used them.”

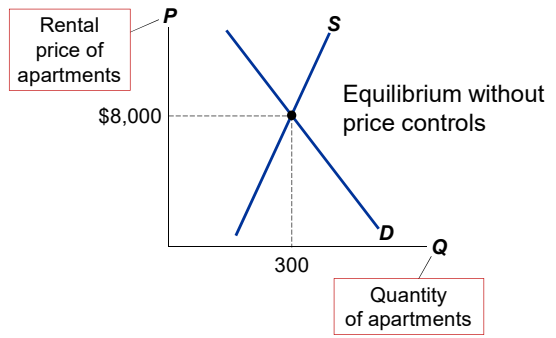
What do economists say?



Source: IGM Economic Experts Panel, February 7, 2012.

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EXAMPLE 1: The Market for Apartments

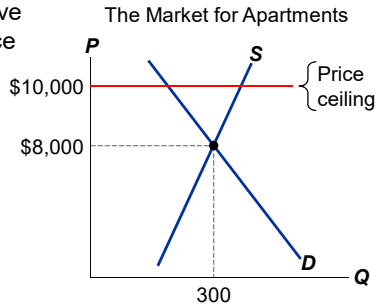


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EXAMPLE 1A: Not Binding Price Ceiling

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

$P = \text{NT}\$8,000$
 $Q = 300$

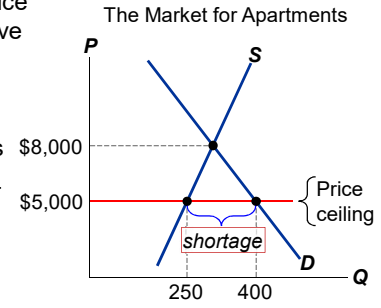


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EXAMPLE 1B: Binding Price Ceiling

The equilibrium price (NT\$8,000) is above the ceiling and therefore illegal.

The price ceiling is **binding, causes a shortage**.
 $P = \text{NT}\$5,000$
 $Q^d = 400$
 $Q^s = 250$

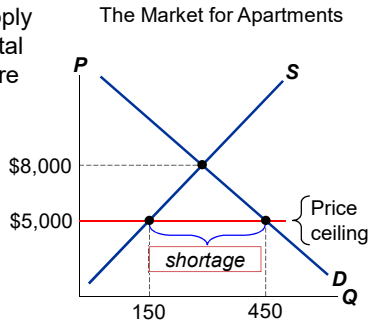


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EXAMPLE 1C: Binding Price Ceiling in Long Run

In the **long run**, supply and demand of rental apartments are more price-elastic.

So, the **shortage is larger**.



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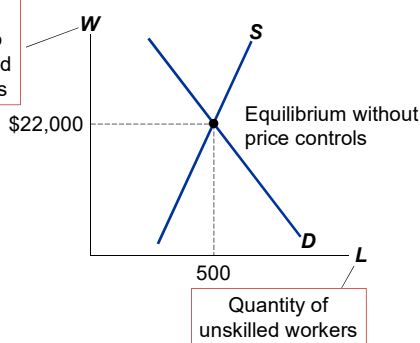
Shortages and Rationing

- **Because of shortage**
 - Sellers must ration the goods among buyers
- **Some rationing mechanisms:**
 - Long lines
 - Discrimination according to sellers' biases
 - Are often unfair and inefficient
 - The goods do not necessarily go to the buyers who value them most highly

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EXAMPLE 2: The Market for Unskilled Labor

Wage paid to unskilled workers

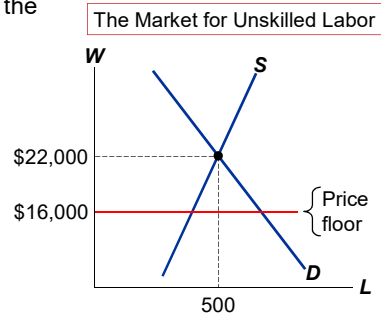


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EXAMPLE 2A: Not Binding Price Floor

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

$W = \text{NT}\$22,000$
 $Q = 500$



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EXAMPLE 2B: Binding Price Floor

The equilibrium wage (NT\$22k) is below the floor and therefore illegal.

The price floor is **binding**, causes a **surplus** (i.e., unemployment).

$W = \text{NT}\$30,235$
 $Q^d = 400$
 $Q^s = 550$

The Market for Unskilled Labor

labor surplus

Price floor

W

\$30,235

\$22,000

400 550

L

D

S

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ASK THE EXPERTS

The Minimum Wage

“If the federal minimum wage is raised gradually to \$15-per-hour by 2020, the employment rate for low-wage U.S. workers will be substantially lower than it would be under the status quo.”

What do economists say?

29% disagree

37% uncertain

34% agree

Source: IGM Economic Experts Panel, September 22, 2015.

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Minimum Wage Laws – 1

- The minimum wage has its greatest impact on the market for **teenage labor**.
 - Least skilled and least experienced
 - Willing to accept a lower wage in exchange for on-the-job training
 - A 10% increase in minimum wage decreases teenage employment by 1-3%
 - Focus on the effects in short-run
 - Long-run effects: harder to estimate, but more relevant and likely larger

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Minimum Wage Laws – 2

- Long-run effects:
 - Increase in quantity supplied of labor
 - Higher number of teenagers who choose to look for jobs
- Advocates of the minimum wage
 - One way to raise the income of working poor
 - Workers who earn the minimum wage can afford only a meager standard of living

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Minimum Wage Laws – 3

- Opponents of the minimum wage: **not the best way to combat poverty**
 - Causes unemployment, encourages teenagers to drop out of school, prevents some unskilled workers from getting on-the-job training
 - Minimum-wage workers
 - Less than a third of minimum-wage earners are in families with incomes below the poverty line
 - Many are teenagers from middle-class homes working at part-time jobs for extra spending money

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Active Learning 1: Price Controls

In the graph, the market for bike rentals is in equilibrium.

Determine the effects of:

- \$90 price ceiling
- \$90 price floor
- \$120 price floor

The market for bike rentals

P

130

120

110

100

90

80

70

60

50

0

60 70 80 90 100 110 120

Q

S

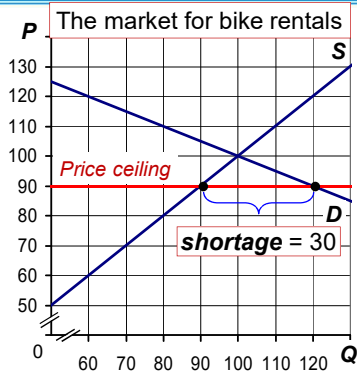
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Active Learning 1A: NT\$90 Price Ceiling

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

Buyers demand 120 bike rentals, sellers supply 90, leaving a shortage of $120 - 90 = 30$ bike rentals.

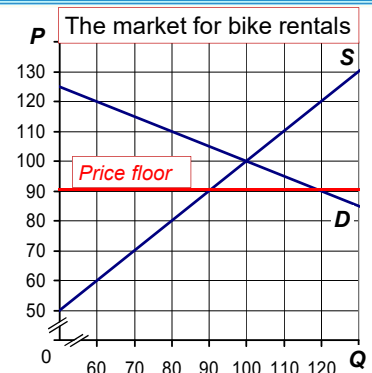


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Active Learning 1B: NT\$90 Price Floor

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

$P = NT\$100,$
 $Q = 100$ bike rentals

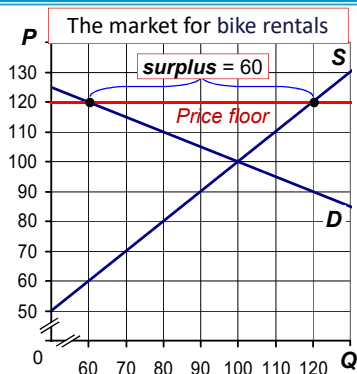


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Active Learning 1C: NT\$120 Price Floor

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

Buyers demand 60 bike rentals, sellers supply 120, causing a surplus of $120 - 60 = 60$ bike rentals.



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Evaluating Price Controls

- Markets are usually a good way to organize economic activity
 - Economists usually oppose price ceilings and price floors
 - Prices are not the outcome of some haphazard process
 - Prices have the crucial job of balancing supply and demand
 - Coordinating economic activity

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Evaluating Price Controls

- Governments can sometimes improve market outcomes
 - Want to use price controls
 - Because of unfair market outcome
 - Aimed at helping the poor
 - Often hurt those they are trying to help
 - Other ways of helping those in need
 - Rent subsidies
 - Wage subsidies (Earned Income Tax Credit)

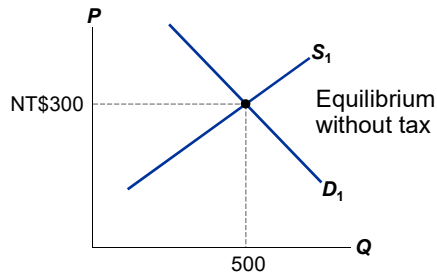
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Taxes

- 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

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EXAMPLE 3: The Market for Pizza



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EXAMPLE 3A: An NT\$45 Tax Imposed on Buyers

Effects of a NT\$45 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 NT\$45 higher than the market price P . P would have to fall by NT\$45 to make buyers willing to buy same Q as before. E.g., if P falls from NT\$300 to NT\$255, buyers are willing to purchase 500 pizzas.

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EXAMPLE 3B: The New Equilibrium

Effects of an NT\$45 per unit tax on buyers

New equilibrium: $Q = 450$

Sellers receive $P_S = NT\$285$

Buyers pay $P_B = NT\$330$

Difference between them = $P_B - P_S = NT\$45 = \text{tax}$

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EXAMPLE 3C: The Incidence of a Tax on Buyers

- Tax incidence:** how the burden of a tax is shared among market participants

In our example,

- buyers pay NT\$30 more, $P_B = NT\$330$
- sellers get NT\$15 less, $P_S = NT\$285$

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EXAMPLE 4A: An NT\$45 Tax Imposed on Sellers

Effects of an NT\$45 per unit tax on sellers

The tax effectively raises sellers' costs by NT\$45 per pizza. Sellers will supply 500 pizzas only if P rises to NT\$345, to compensate for this cost increase. Hence, a tax on sellers shifts the S curve up by the amount of the tax.

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EXAMPLE 4B: The New Equilibrium

Effects of an NT\$45 per unit tax on sellers

New equilibrium: $Q = 450$

Buyers pay $P_B = NT\$330$

Sellers receive $P_S = NT\$285$

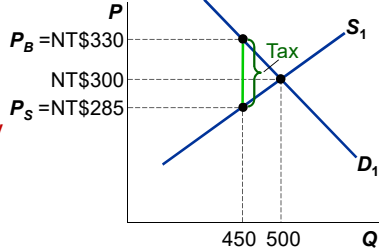
Difference between them = NT\$45 = tax

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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!

A tax drives a wedge between the price buyers pay and the price sellers receive.

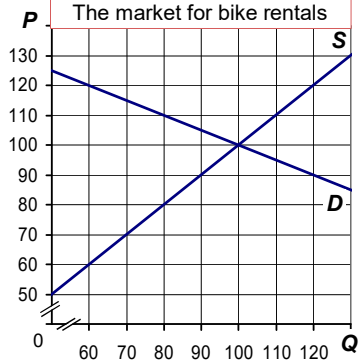


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Active Learning 2: Effects of a tax

In the graph, the market for bike rentals is in equilibrium, but now the government imposes a tax on buyers of \$30 per bike rental.

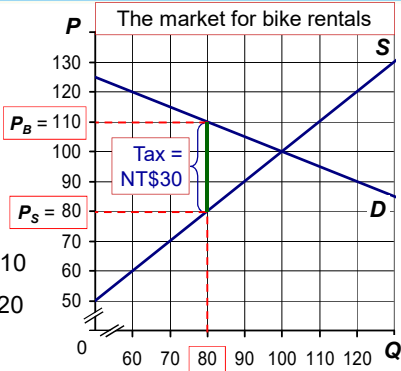
- Find the new Q , P_B , P_S , and incidence of tax.



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Active Learning 2: Answers

- $Q = 80$
- $P_B = NT\$110$
- $P_S = NT\$80$
- Incidence
 - buyers: $NT\$10$
 - sellers: $NT\$20$



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Elasticity and Tax Incidence

- When a good is taxed
 - Buyers and sellers of the good share the burden of the tax
 - But how exactly is the tax burden divided?
 - Depends on the elasticity of demand and elasticity of supply

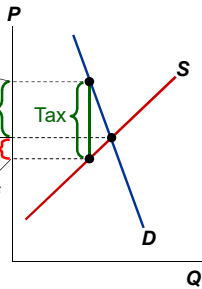
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CASE 1: Elastic Supply, Inelastic Demand

Buyers' share of tax burden

Price if no tax

Sellers' share of tax burden



It's easier for sellers than buyers to leave the market.

So buyers bear most of the burden of the tax.

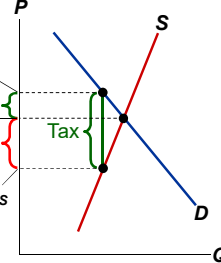
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CASE 2: Inelastic Supply, Elastic Demand

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.

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CASE STUDY Who Pays the Cigarette Tax?

- **2017, Taiwan's Legislative Yuan increased the cigarette tax by NT\$20.**
 - Goal: to raise revenue from those “evil” and wealthy cigarette companies
- Addictive goods
 - Demand is quite inelastic
 - Supply is relatively elastic

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CASE STUDY CASE STUDY: Who Pays the Cigarette Tax?

The market for cigarettes

In the short run, supply is elastic

Demand is price-inelastic

Hence, addicted smokers pay most of the tax.

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THINK-PAIR-SHARE

Suppose that Taiwan needs to raise more tax revenue. Premier Su proposes a tax on food because everyone must eat and, thus, a food tax would surely raise a great deal of tax revenue. He insists the tax should be placed on food sellers to protect the poor who spend a large proportion of their income on food.

A. Will the burden of a food tax fall only on the sellers of food as the Premier said? Explain.

B. Who will bear most of this tax burden? Explain.

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CHAPTER IN A NUTSHELL

- A **price ceiling** is a legal maximum on the price of a good or service. Example: rent control.
 - Binding if below the equilibrium price: shortage.
 - Sellers must in some way ration the good or service among buyers.
- A **price floor** is a legal minimum on the price of a good or service. Example: minimum wage.
 - Binding if above the equilibrium price: surplus.
 - Buyers' demands for the good or service must in some way be rationed among sellers.

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CHAPTER IN A NUTSHELL

- When the government levies a tax on a good, the equilibrium quantity of the good falls.
 - The tax places a wedge between the price paid by buyers and the price received by sellers.
 - Buyers pay more for the good and sellers receive less for it.
- **Buyers and sellers share the tax burden.**
 - The incidence of tax depends on the price elasticities of supply and demand.
 - Most of the burden falls on the side of the market that is less elastic.

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Chapter 6: Price Control and Taxation

- ▶ Markets are good? Price control is bad!
- ▶ Taxation forms a wedge between P_b and P_s
- ▶ Homework:
 - ▶ Mankiw, Ch. 6, Problem 3, 5, 7-10
- ▶ Additional Questions:
 - ▶ True or False. A price ceiling on wheat would cause the price of bread to fall.
 - ▶ True or False. iPhone 12 Pro contain A14 CPUs made by TSMC. If Apple made its own CPUs, iPhone 12 Pro would be cheaper.

2020/10/12 Price Control and Taxation Joseph Tao-yi Wang

Chapter 6: Price Control and Taxation

▶ Challenge Questions/ex-Midterm:

- ▶ OLD midterm (retired):
 - ▶ 2009 - (Multiple Choice Q11)
 - ▶ 2010 - (True/False Q6-Q8)
 - ▶ 2012 - (True/False Q3-Q4)
 - ▶ 2013 - (True/False Q6-Q7)
- ▶ 2016 - Part C
- ▶ 2017 - Part D
- ▶ 2018 - Part A1, A6
- ▶ 2019 - Part B1, B3

2020/10/12

Price Control and Taxation

Joseph Tao-yi Wang