

Supply, Demand and Government Policies

Chapter 6

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Introduction

Does government matter?

The government can intervene in all types of markets

Economists study and analyze the effects of these policies

Examples of government policies are rent controls, minimum wage, taxes, etc.

Controls on Prices

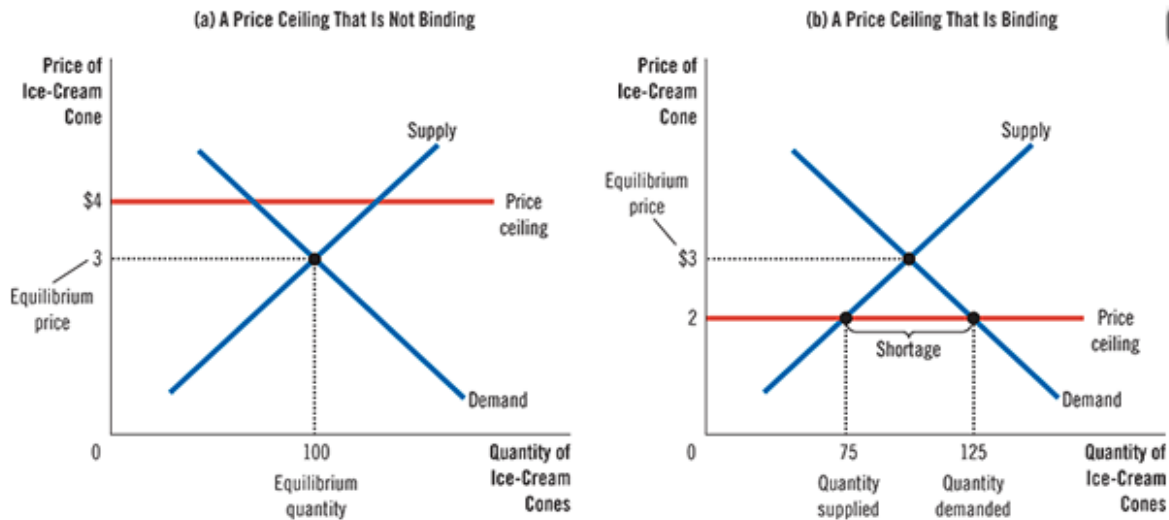
How price controls affect markets

- In a free market, prices and quantities clear at the equilibrium
- Prices adjust to balance supply and demand
- Let's consider the ice cream example from the last lecture
- The price of ice cream at equilibrium is \$3 per cone
- Buyers might find the \$3 to be a high price and pressure the government to control the price of ice cream
- Sellers might find the to be a low price and pressure the government to control the price of ice cream
- *Price ceiling* is a legislated maximum in which the price of a good cannot rise above
- *Price floor* is a legislated minimum in which the price of a good cannot fall below

Price ceilings and the market

Figure 1 A Market with a Price Ceiling

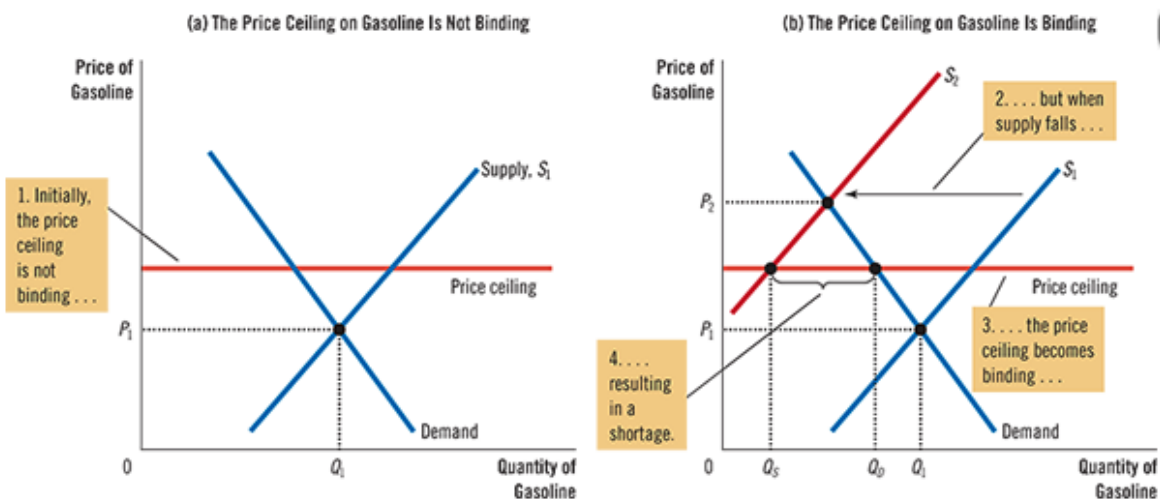
In panel (a), the government imposes a price ceiling of \$4. Because the price ceiling is above the equilibrium price of \$3, it has no effect, and the market can reach the equilibrium of supply and demand. In this equilibrium, quantity supplied and quantity demanded both equal 100 cones. In panel (b), the government imposes a price ceiling of \$2. Because the price ceiling is below the equilibrium price of \$3, the market price equals \$2. At this price, 125 cones are demanded and only 75 are supplied, so there is a shortage of 50 cones.



The gasoline market

Figure 2 The Market for Gasoline with a Price Ceiling

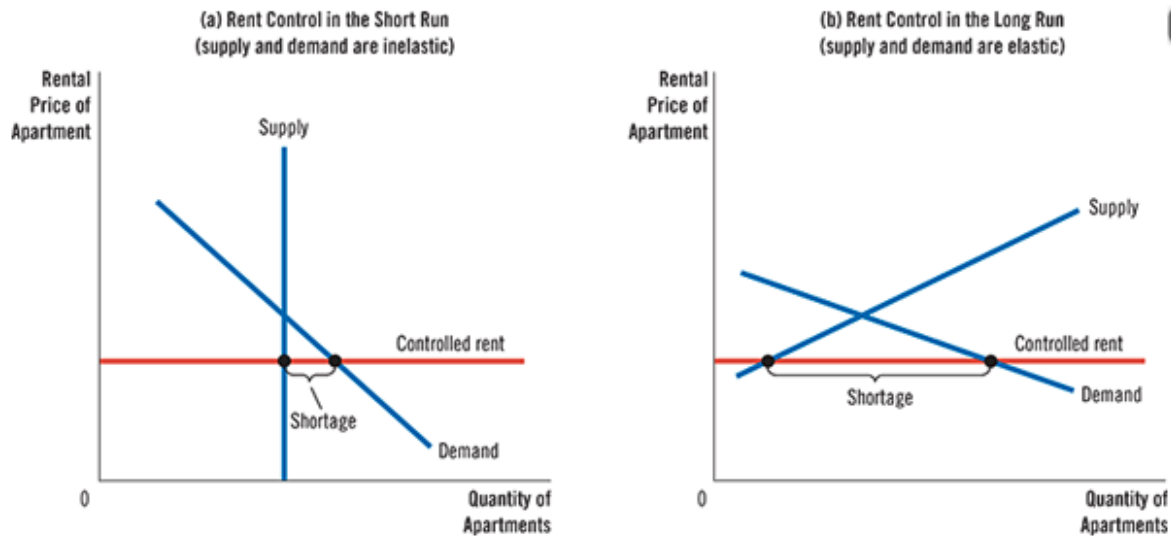
Panel (a) shows the gasoline market when the price ceiling is not binding because the equilibrium price, P_1 , is below the ceiling. Panel (b) shows the gasoline market after an increase in the price of crude oil (an input into making gasoline) shifts the supply curve to the left from S_1 to S_2 . In an unregulated market, the price would have risen from P_1 to P_2 . The price ceiling, however, prevents this from happening. At the binding price ceiling, consumers are willing to buy Q_D , but producers of gasoline are willing to sell only Q_S . The difference between quantity demanded and quantity supplied, $Q_D - Q_S$, measures the gasoline shortage.



Rent control

Figure 3 Rent Control in the Short Run and in the Long Run

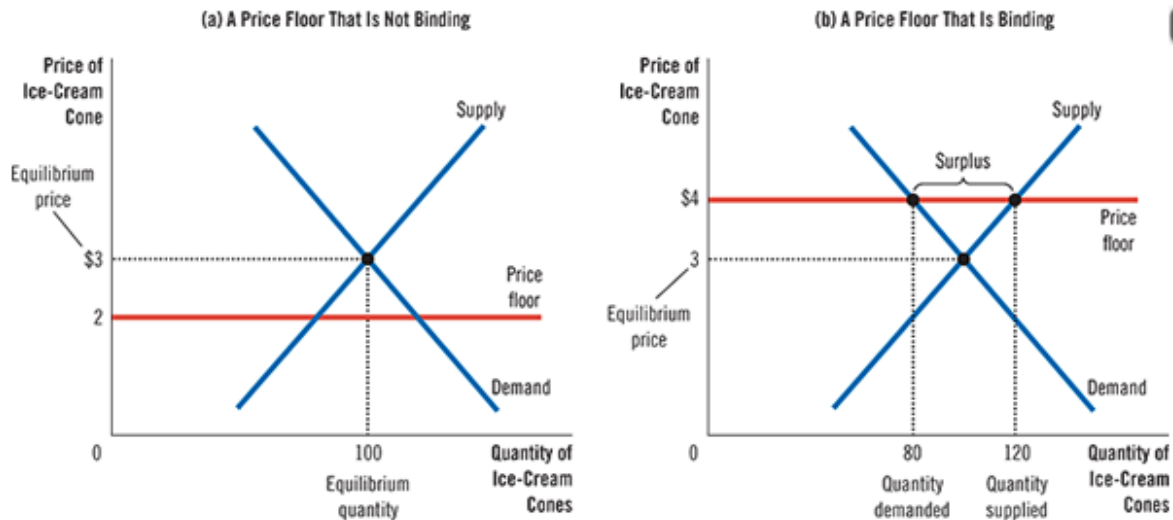
Panel (a) shows the short-run effects of rent control: Because the supply and demand curves for apartments are relatively inelastic, the price ceiling imposed by a rent-control law causes only a small shortage of housing. Panel (b) shows the long-run effects of rent control: Because the supply and demand curves for apartments are more elastic, rent control causes a larger shortage.



Price floors and markets

Figure 4 A Market with a Price Floor

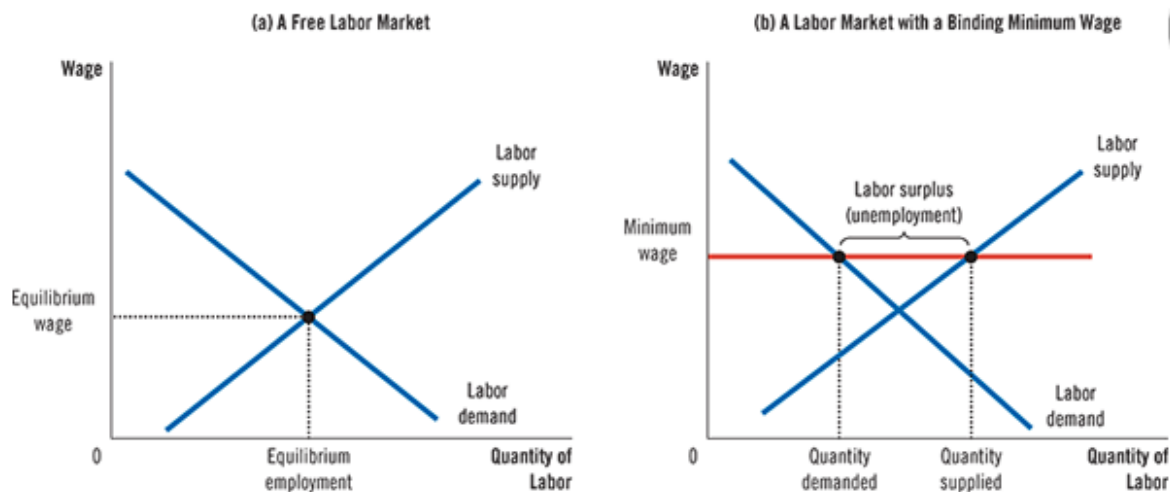
In panel (a), the government imposes a price floor of \$2. Because the price floor is below the equilibrium price of \$3, it has no effect. The market price adjusts to balance supply and demand. At the equilibrium, quantity supplied and quantity demanded both equal 100 cones. In panel (b), the government imposes a price floor of \$4, which is above the equilibrium price of \$3. Therefore, the market price equals \$4. Because 120 cones are supplied at this price and only 80 are demanded, there is a surplus of 40 cones.



Minimum wage

Figure 5 How the Minimum Wage Affects the Labor Market

Panel (a) shows a labor market in which the wage adjusts to balance labor supply and labor demand. Panel (b) shows the impact of a binding minimum wage. Because the minimum wage is a price floor, it causes a surplus: The quantity of labor supplied exceeds the quantity demanded. The result is unemployment.



Taxes

What is a tax?

- All governments use taxes to raise revenue

We need to address important questions to analyze a tax When the government imposes a tax on a good

Who bears the burden of the tax, buyers or sellers?

If buyers and sellers share the tax burden, what determines how the burden is divided?

Can the government legislate how the burden is divided or is the division determined by the market forces?

Tax incidence refers to how the burden of a tax is distributed

How do taxes on sellers affect market outcomes?

- Suppose a tax of \$0.5 per ice cream cone is levied on ice cream sellers
- To analyze how this law would affect the buyers and sellers of ice cream, we need to follow the following steps:
 1. We decide whether the law affects the supply curve or the demand curve
 2. We decide which way the curve shifts
 3. We examine how the shift affects the equilibrium price and quantity

Step one

A tax on sellers would affect the supply curve

A tax on buyers would affect the demand curve

Step two

A tax on sellers would affect the supply curve \Rightarrow
supply would shift to the left

A tax on buyers would affect the demand curve \Rightarrow
demand curve shifts downward

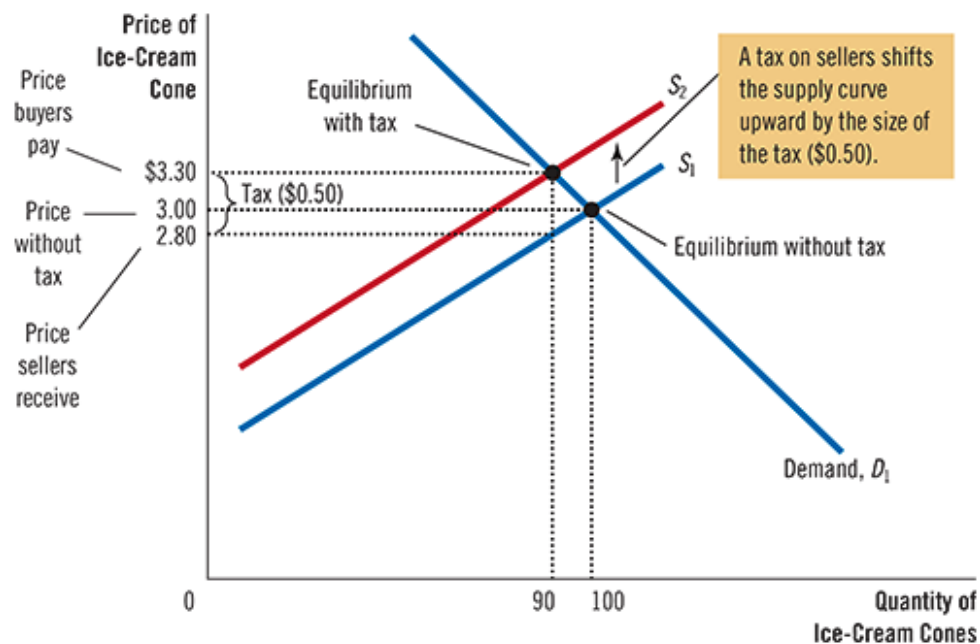
Step three

After determining whether the demand or supply was affected (step 1) and in which direction are they going to shift (step 2), we will be able to analyze the new equilibrium

A tax on sellers

Figure 6 A Tax on Sellers

When a tax of \$0.50 is levied on sellers, the supply curve shifts up by \$0.50 from S_1 to S_2 . The equilibrium quantity falls from 100 to 90 cones. The price that buyers pay rises from \$3.00 to \$3.30. The price that sellers receive (after paying the tax) falls from \$3.00 to \$2.80. Even though the tax is levied on sellers, buyers and sellers share the burden of the tax.



Tax implications

Who pays the tax?

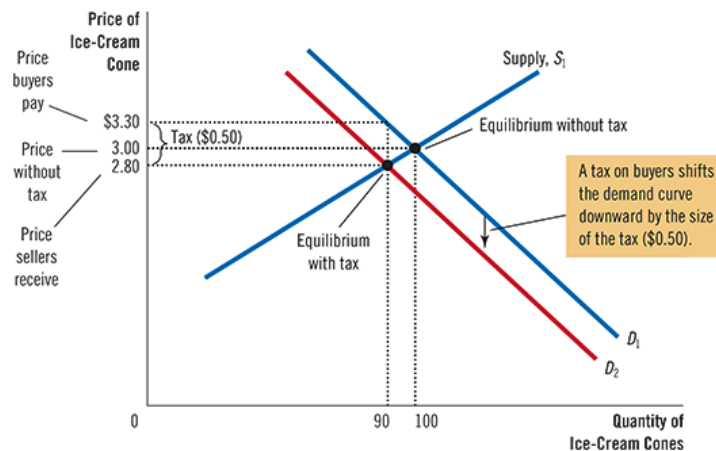
- To answer the question we should go back to tax incidence
- In the previous graph, buyers are paying \$0.3 more and sellers get to keep \$2.8
- The tax in the previous case makes the buyers and sellers worse off
- Taxes discourage market activity
- Buyers and sellers share the burden of taxes

Effect of taxes on buyers

- The government imposes a \$0.5 per cone tax on ice cream
- This tax affects demand and shifts it downward

Figure 7 A Tax on Buyers

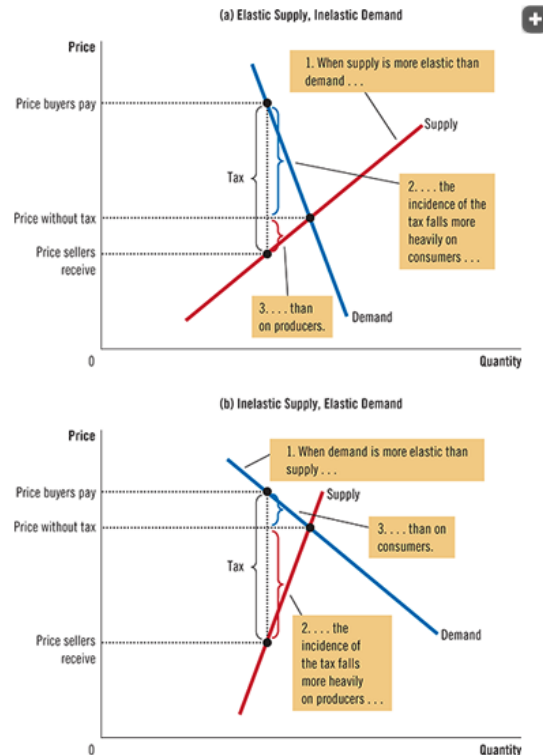
When a tax of \$0.50 is levied on buyers, the demand curve shifts down by \$0.50 from D_1 to D_2 . The equilibrium quantity falls from 100 to 90 cones. The price that sellers receive falls from \$3.00 to \$2.80. The price that buyers pay (including the tax) rises from \$3.00 to \$3.30. Even though the tax is levied on buyers, buyers and sellers share the burden of the tax.



Elasticity and tax incidence

Figure 9 How the Burden of a Tax Is Divided

In panel (a), the supply curve is elastic, and the demand curve is inelastic. In this case, the price received by sellers falls only slightly, while the price paid by buyers rises substantially. Thus, buyers bear most of the burden of the tax. In panel (b), the supply curve is inelastic, and the demand curve is elastic. In this case, the price received by sellers falls substantially, while the price paid by buyers rises only slightly. Thus, sellers bear most of the burden of the tax.



Problems and Applications

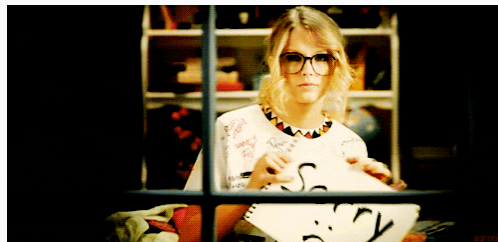
Question 1

Lovers of Taylor Swift music persuade Congress to impose a price ceiling of \$40 per concert ticket. As a result of this policy, do more or fewer people attend Taylor Swift concerts? Explain.

If \$40 is less than the equilibrium price, then Taylor Swift will sell less ticket

If \$40 is less than the equilibrium price, then Taylor Swift fans will demand more tickets

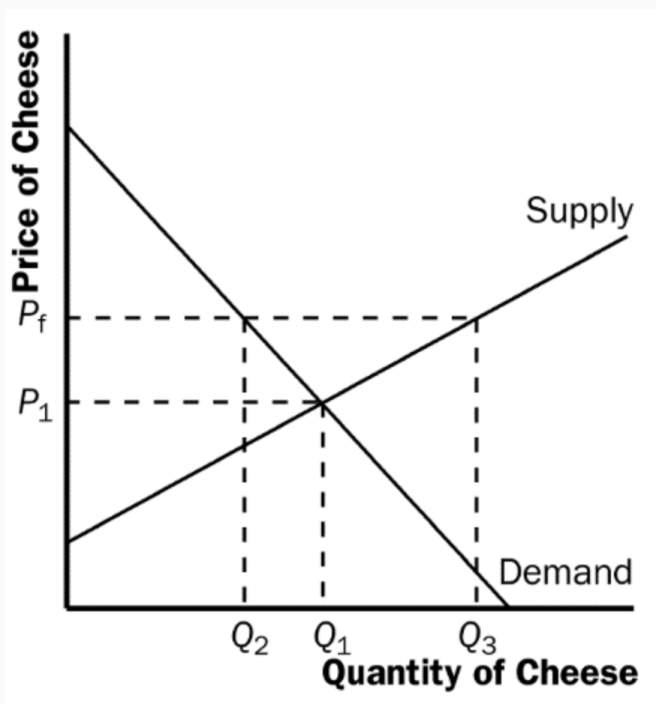
Quantity demanded > Quantity supplied \Rightarrow there will be a shortage and less people will attend



Question 2

The government has decided that the free-market price of cheese is too low.

a. Suppose the government imposes a binding price floor in the cheese market. Draw a supply-and-demand diagram to show the effect of this policy on the price of cheese and the quantity of cheese sold. Is there a shortage or surplus of cheese?



Question 2

The government has decided that the free-market price of cheese is too low.

b. Producers of cheese complain that the price floor has reduced their total revenue. Is this possible? Explain.

- **If demand is elastic, then the producers' complaint correct**
- **With elastic demand, quantity demanded will respond substantially in response to a price change**

c. In response to cheese producers' complaints, the government agrees to purchase all the surplus cheese at the price floor. Compared to the basic price floor, who benefits from this new policy? Who loses?

- **Producers win, taxpayers lose**
- **Producers would produce quantity Q_3 of cheese, and their total revenue would increase substantially**
- **consumers would buy only quantity Q_2 of cheese, so they are in the same position as before**
- **Taxpayers lose because they would be financing the purchase of the surplus cheese through higher taxes**



Question 3

A recent study found that the demand-and-supply schedules for Frisbees are as follows:

Price per Frisbee	Quantity Demanded	Quantity Supplied
\$11	1 million Frisbees	15 million Frisbees
10	2	12
9	4	9
8	6	6
7	8	3
6	10	1

a. What are the equilibrium price and quantity of Frisbees?

$$P = 8 \text{ and } Q = 6,000,000$$

b. Frisbee manufacturers persuade the government that Frisbee production improves scientists' understanding of aerodynamics and thus is important for national security. A concerned Congress votes to impose a price floor \$2 above the equilibrium price. What is the new market price? How many Frisbees are sold?

The price floor of \$10 is binding, thus, new equilibrium price is \$10 and only two million Frisbees are sold, because that is the quantity demanded

Question 3

A recent study found that the demand-and-supply schedules for Frisbees are as follows:

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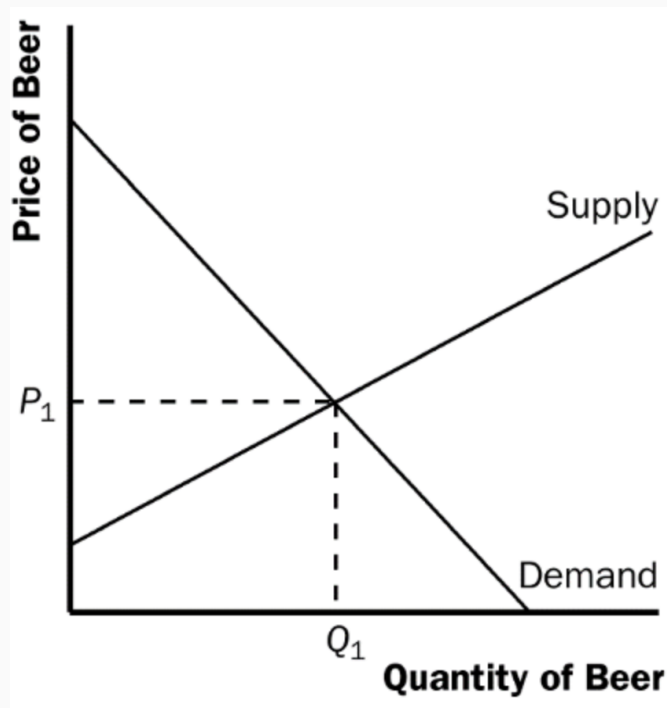
c. Irate college students called their reps to demand a reduction in the price of Frisbees. An even more concerned Congress votes to repeal the price floor and impose a price ceiling \$1 below the former price floor. What is the new market price? How many Frisbees are sold?

$P = 9$ which has no effect on the market since $P^* = 8$. So $P = 8$ and $Q = 6,000,000$

Question 4

Suppose the federal government requires beer drinkers to pay a \$2 tax on each case of beer purchased. (In fact, both the federal and state governments impose beer taxes of some sort.)

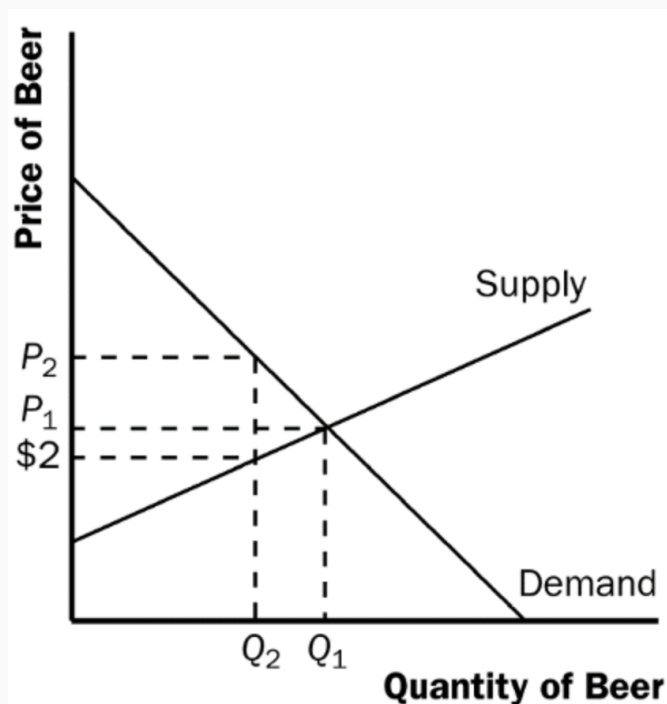
a. Draw a supply-and-demand diagram of the market for beer without the tax. Show the price paid by consumers, the price received by producers, and the quantity of beer sold. What is the difference between the price paid by consumers and the price received by producers?



Question 4

Suppose the federal government requires beer drinkers to pay a \$2 tax on each case of beer purchased. (In fact, both the federal and state governments impose beer taxes of some sort.)

b. Now draw a supply-and-demand diagram for the beer market with the tax. Show the price paid by consumers, the price received by producers, and the quantity of beer sold. What is the difference between the price paid by consumers and the price received by producers? Has the quantity of beer sold increased or decreased?



Question 5

A senator wants to raise tax revenue and make workers better off. A staff member proposes raising the payroll tax paid by firms and using part of the extra revenue to reduce the payroll tax paid by workers. Would this accomplish the senator's goal? Explain.

- Raising the payroll tax paid by firms and using part of the extra revenue to reduce the payroll tax paid by workers would not make workers better off
- Division of the burden of a tax depends on the elasticity of supply and demand and not on who must pay the tax
- Because the tax wedge would be larger, it is likely that both firms and workers, who share the burden of any tax, would be worse off

Question 6

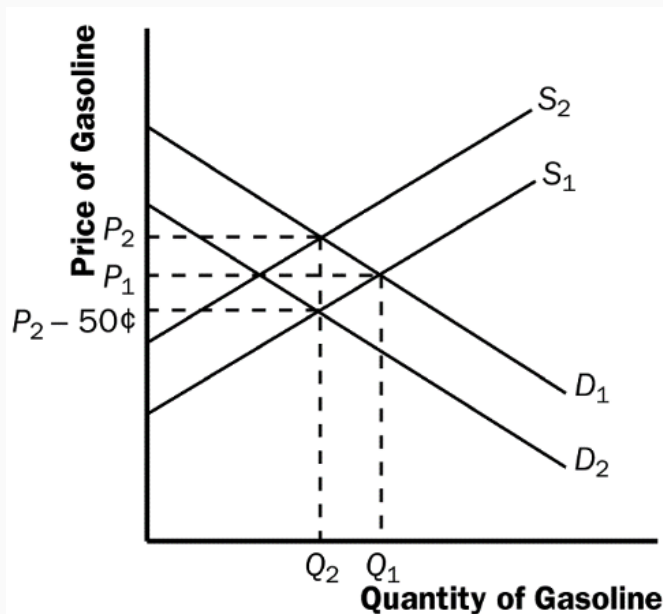
If the government places a \$500 tax on luxury cars, will the price paid by consumers rise by more than \$500, less than \$500, or exactly \$500? Explain.

- The price will rise by less than \$500
- The burden of any tax is shared by both producers and consumers the price paid by consumers rises and the price received by producers falls, with the difference between the two equal to the amount of the tax
- The only exceptions would be if the supply curve were perfectly elastic or the demand curve were perfectly inelastic, in which case consumers would bear the full burden of the tax and the price paid by consumers would rise by exactly \$500

Question 7

Congress and the president decide that the United States should reduce air pollution by reducing its use of gasoline. They impose a \$0.50 tax on each gallon of gasoline sold.

a. Should they impose this tax on producers or consumers? Explain carefully using a supply-and-demand diagram.



Question 7

Congress and the president decide that the United States should reduce air pollution by reducing its use of gasoline. They impose a \$0.50 tax on each gallon of gasoline sold.

b. If the demand for gasoline were more elastic, would this tax be more effective or less effective in reducing the quantity of gasoline consumed? Explain with both words and a diagram.

Question 7

Congress and the president decide that the United States should reduce air pollution by reducing its use of gasoline. They impose a \$0.50 tax on each gallon of gasoline sold.

c. Are consumers of gasoline helped or hurt by this tax? Why?

The consumers of gasoline are hurt by the tax because they get less gasoline at a higher price.

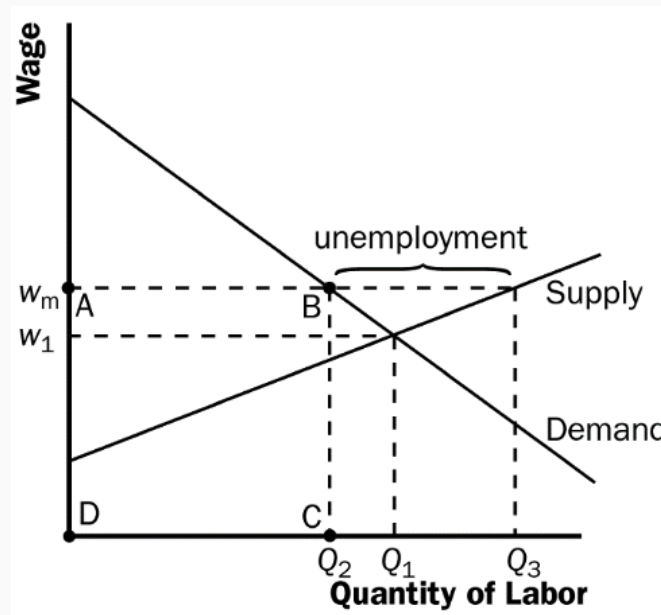
d. Are workers in the oil industry helped or hurt by this tax? Why?

Workers in the oil industry are hurt by the tax as well. With a lower quantity of gasoline being produced, some workers may lose their jobs. With a lower price received by producers, wages of workers might decline.

Question 8

A case study in this chapter discusses the federal minimum-wage law.

a. Suppose the minimum wage is above the equilibrium wage in the market for unskilled labor. Using a supply-and-demand diagram of the market for unskilled labor, show the market wage, the number of workers who are employed, and the number of workers who are unemployed. Also show the total wage payments to unskilled workers.



Question 8

A case study in this chapter discusses the federal minimum-wage law.

b. Now suppose the secretary of labor proposes an increase in the minimum wage. What effect would this increase have on employment? Does the change in employment depend on the elasticity of demand, the elasticity of supply, both elasticities, or neither?

An increase in the minimum wage would decrease employment. The size of the effect on employment depends only on the elasticity of demand. The elasticity of supply does not matter, because there is a surplus of labor.

c. What effect would this increase in the minimum wage have on unemployment? Does the change in unemployment depend on the elasticity of demand, the elasticity of supply, both elasticities, or neither?

The increase in the minimum wage would increase unemployment. The size of the rise in unemployment depends on both the elasticities of supply and demand. The elasticity of demand determines the change in the quantity of labor demanded, the elasticity of supply determines the change in the quantity of labor supplied, and the difference between the quantities supplied and demanded of labor is the amount of unemployment.

Question 8

A case study in this chapter discusses the federal minimum-wage law.

d. If the demand for unskilled labor were inelastic, would the proposed increase in the minimum wage raise or lower total wage payments to unskilled workers? Would your answer change if the demand for unskilled labor were elastic?

If the demand for unskilled labor were inelastic, the rise in the minimum wage would increase total wage payments to unskilled labor. With inelastic demand, the percentage decline in employment would be lower than the percentage increase in the wage, so total wage payments increase. However, if the demand for unskilled labor were elastic, total wage payments would decline, because then the percentage decline in employment would exceed the percentage increase in the wage.