4.3 Government Intervention in the Market: Price Floors and Price Ceilings

Explain the economic effect of government-imposed price floors and price ceilings.

One option a government has for affecting a market is the imposition of a **price ceiling** or a **price floor.**

- **Price ceiling**: A legally determined maximum price that sellers may charge.
- **Price floor**: A legally determined minimum price that sellers may receive.

Price ceilings and floors in the USA are uncommon, but include:

- Minimum wages
- Rent controls
- Agricultural price controls

Figure 4.8 The Economic Effect of a Price Floor in the Wheat Market (1 of 2)

The equilibrium price in the market for wheat is $\$6.50$ per bushel; 2.0 billion bushels are traded at this price.

If wheat farmers convince the government to impose a price floor of $\$8.00$ per bushel, quantity traded falls to 1.8 billion.

Area *A* is the surplus transferred from consumers to producers.

Economic surplus is reduced by area $B + C$, the deadweight loss.

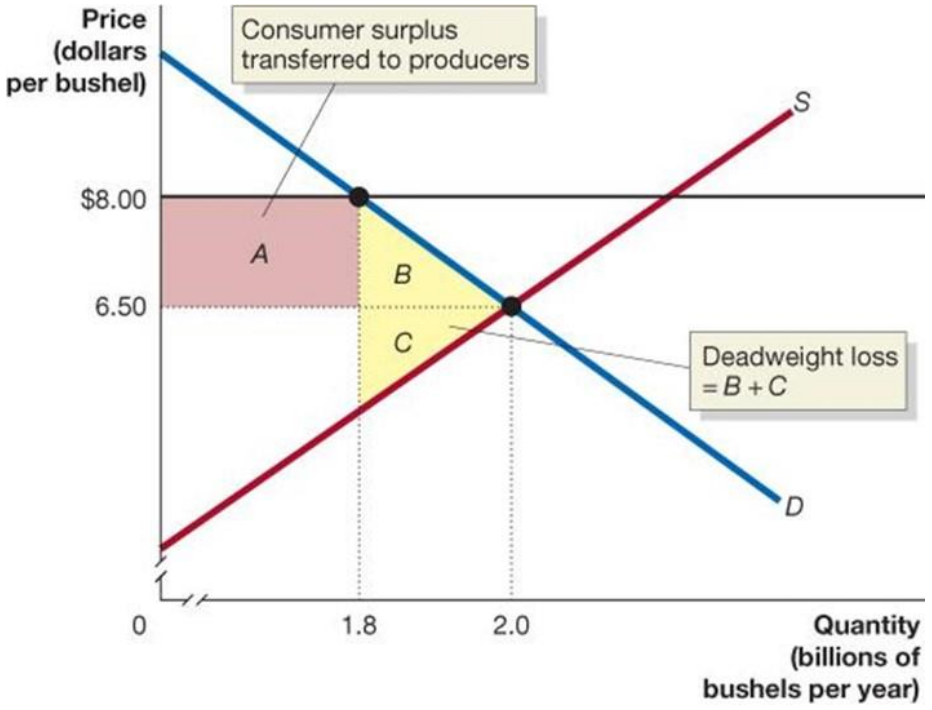
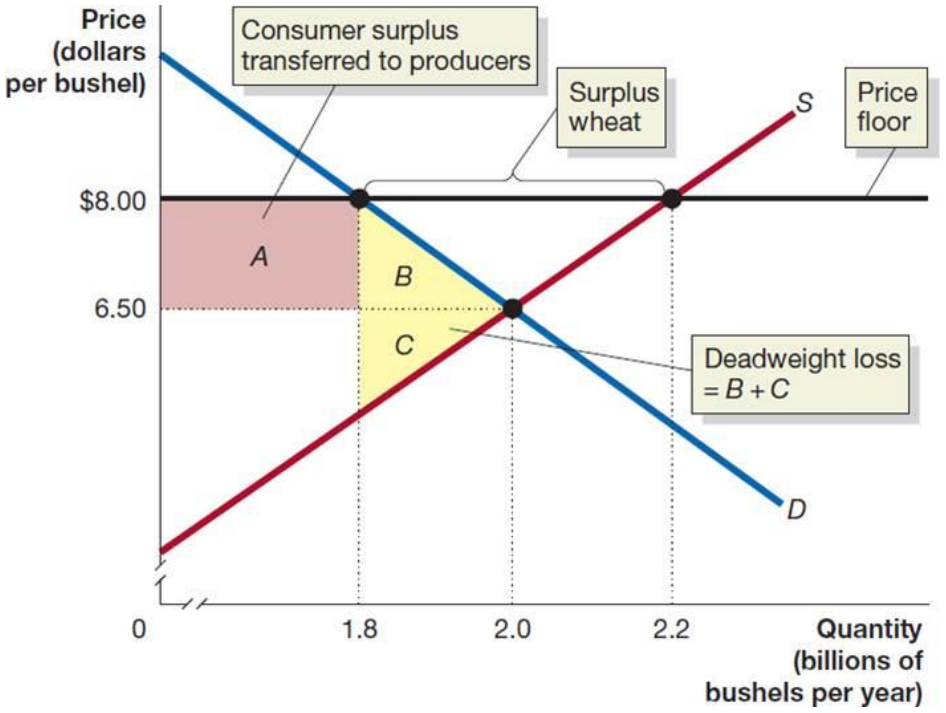


Figure 4.8 The Economic Effect of a Price Floor in the Wheat Market (2 of 2)

Unfortunately, the situation may be even worse:

- If farmers do not realize they will not be able to sell all of their wheat, they will produce 2.2 billion bushels.
- This results in a surplus, or excess supply, of 400 million bushels of wheat.



Apply the Concept: Price Floors in Labor Markets

Supporters of the minimum wage see it as a way of raising the incomes of low-skilled workers.

Opponents argue that it results in fewer jobs and imposes large costs on small businesses.

Assuming the minimum wage does decrease employment, it must result in a deadweight loss for society.

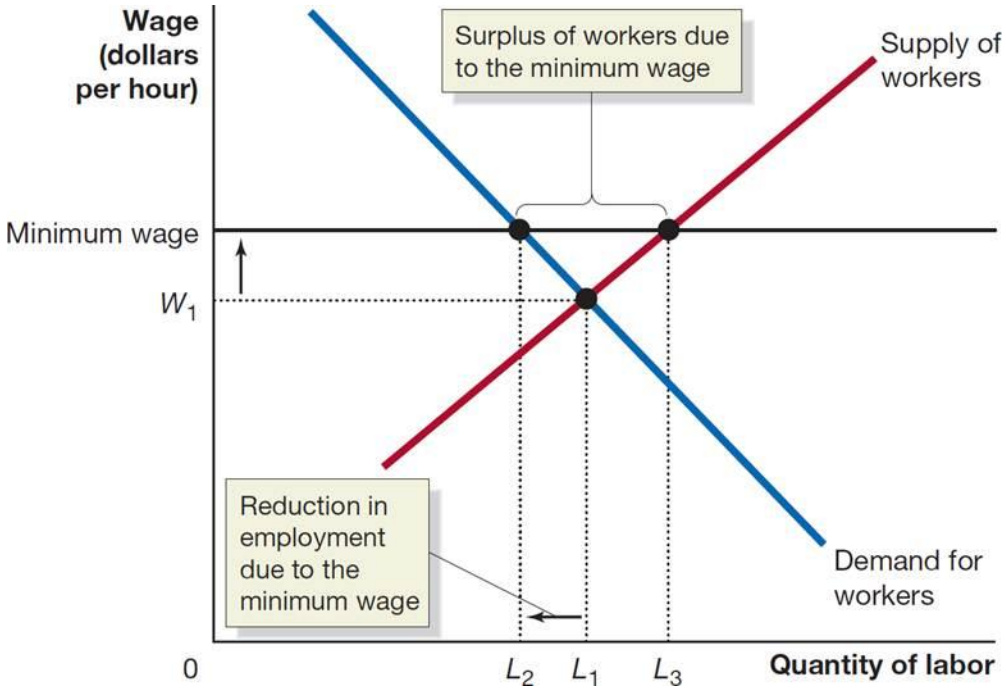


Figure 4.9 The Economic Effect of a Rent Ceiling (1 of 2)

Without rent control, the equilibrium rent is $2,500 per month.

At that price, 2,000,000 apartments would be rented.

If the government imposes a rent ceiling of $1,500, the quantity of apartments supplied falls to 1,900,000…

and the quantity of apartments demanded increases to 2,100,000…

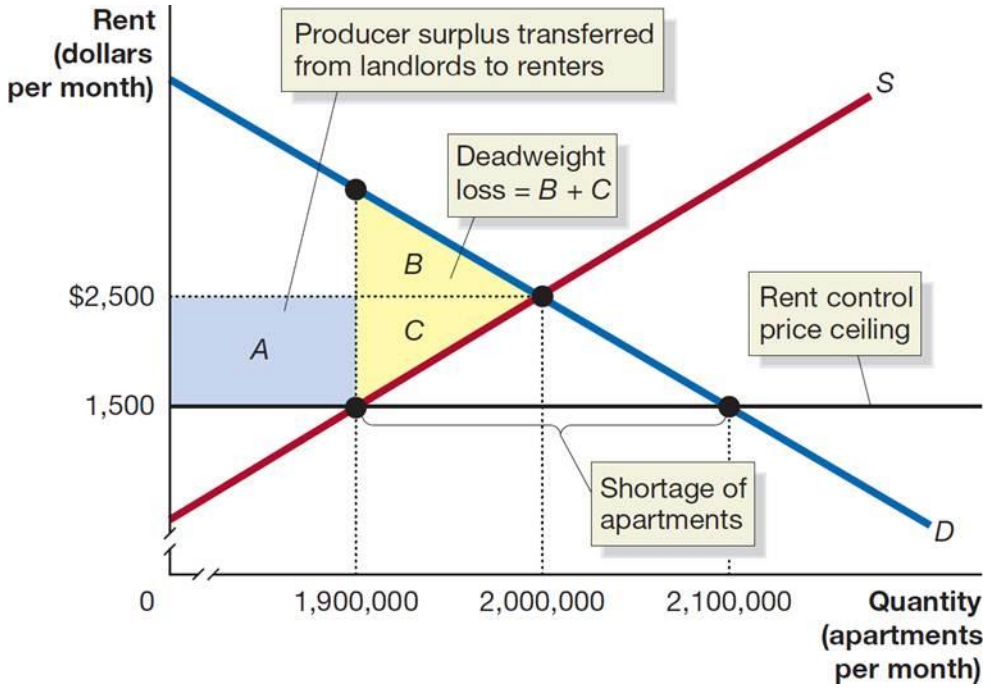
resulting in a shortage of 200,000 apartments.

Figure 4.9 The Economic Effect of a Rent Ceiling (2 of 2)

Producer surplus equal to the area of the blue rectangle *A* is transferred from landlords to renters.

There is a deadweight loss equal to the areas of yellow triangles *B* and *C*.

This deadweight loss corresponds to the surplus that would have been derived from apartments that are no longer rented.



Black Markets and Peer-to-Peer Sites

The shortage of apartments may lead to a **black market**—a market in which buying and selling take place at prices that violate government price regulations.

Alternatively, landlords might switch from long-term to short-term rentals in order to avoid rent controls; **peer-to-peer** rental sites such as Airbnb have facilitated this.

- These markets may alleviate some of the deadweight loss by allowing additional apartments to be rented, but buyers and sellers lose valuable legal protections.

The Results of Government Price Controls

It is clear that when a government imposes price controls:

- Some people are made better off,
- Some people are made worse off, and
- The economy generally suffers, as deadweight loss will generally occur.

Apply the Concept: Price Controls Lead to Economic Crisis in Venezuela (1 of 2)

Under former president Hugo Chavez, Venezuela seized land and “redistributed” it to low-income Venezuelans, many of whom had no experience in farming.

With the resulting dramatic decrease in food supply, upward pressure on food prices resulted.

This was unpopular with the increasingly poor Venezuelan citizens, who asked for help from the government.

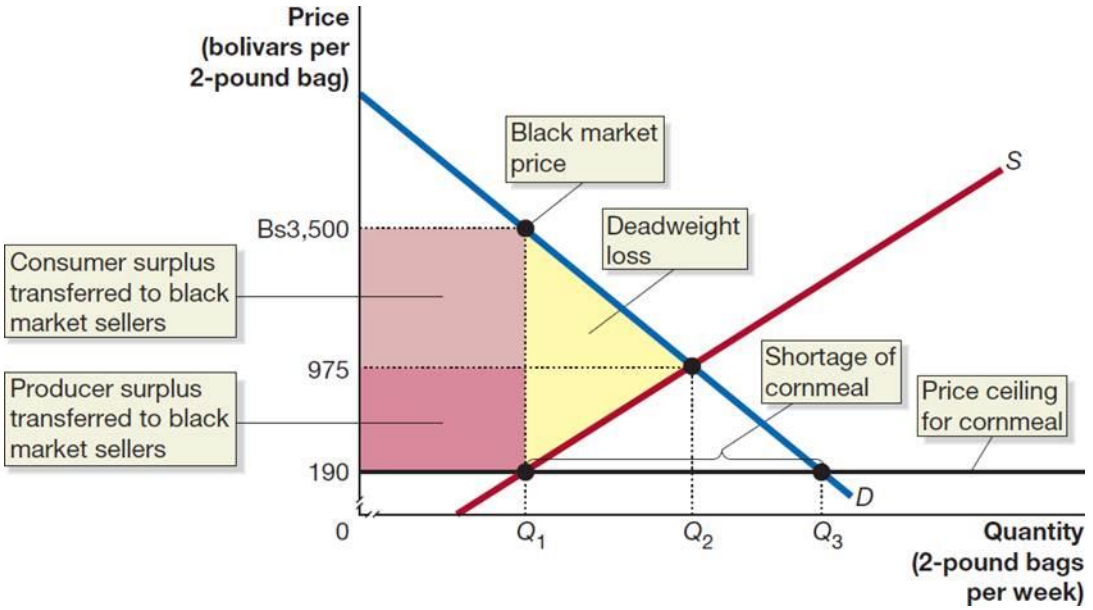
The government obliged with price controls (price ceilings) on food.

Apply the Concept: Price Controls Lead to Economic Crisis in Venezuela (2 of 2)

The price controls resulted in a thriving black market for many foods and groceries.

The graph shows the late 2016 market for cornmeal, with a controlled price of Bs190, and a black market price of Bs3,500.

The winners from the controlled price were the black market sellers; the losers were the consumers.



Positive and Normative Analysis of Price Ceilings and Price Floors

Economic analysis can demonstrate that price ceilings and price floors decrease economic efficiency. Does this mean they are bad?

- Because this is a normative question, it does not have a right or wrong answer; it depends on our values and judgments. It is possible to value the gains from these policies more than the losses.

4.4 The Economic Effect of Taxes

Analyze the economic effect of taxes.

Taxes are the most important method by which governments fund their activities.

We will concentrate on **per-unit** taxes: taxes assessed as a particular dollar amount on the sale of a good or service, as opposed to a **percentage** tax.

Example: The US Federal government imposes a 18.4 cents per gallon tax on gasoline sales, as of 2019.

Figure 4.10 The Effect of a Tax on the Market for Cigarettes (1 of 4)

Without the tax, market equilibrium occurs at point *A*.

The equilibrium price of cigarettes is $6.00 per pack, and 4 billion packs of cigarettes are sold per year.

A $1.00-per-pack tax on cigarettes will cause the supply curve for cigarettes to shift up by $1.00, from S_1 to S_2.

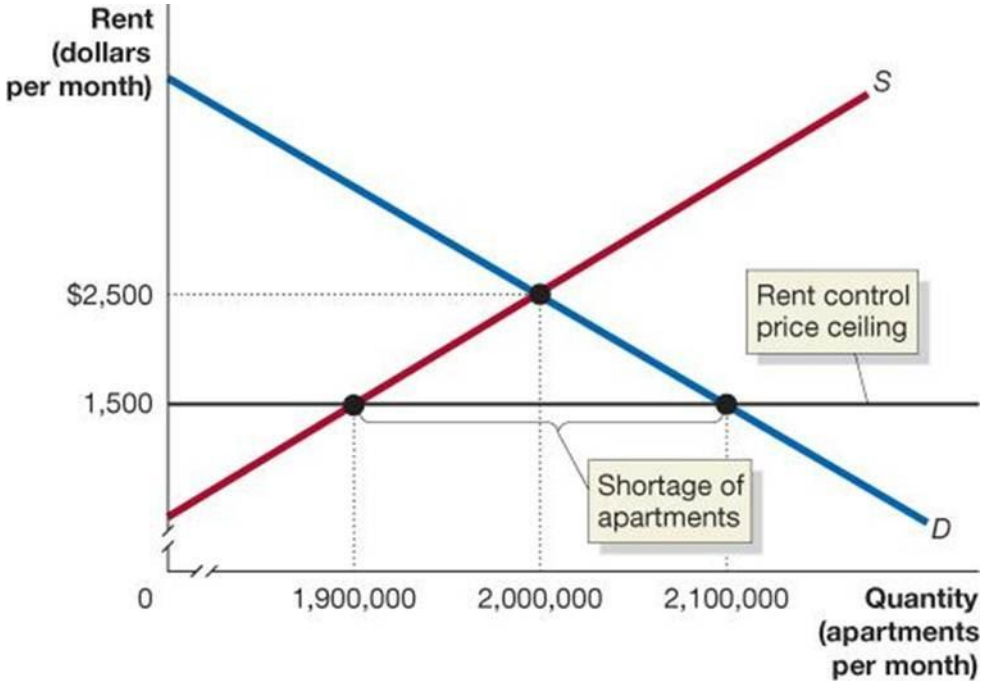


Figure 4.10 The Effect of a Tax on the Market for Cigarettes (2 of 4)

The supply curve shifted up by $1.00, the amount of the tax.

If firms were willing to sell 4 billion packs at a price of $6.00 before the tax, the price needs to be **exactly** $1.00 **higher** in order to convince them to still sell 4 billion packs.

- This is because firms' marginal costs effectively increased by $1.00 per unit, the value of the tax.

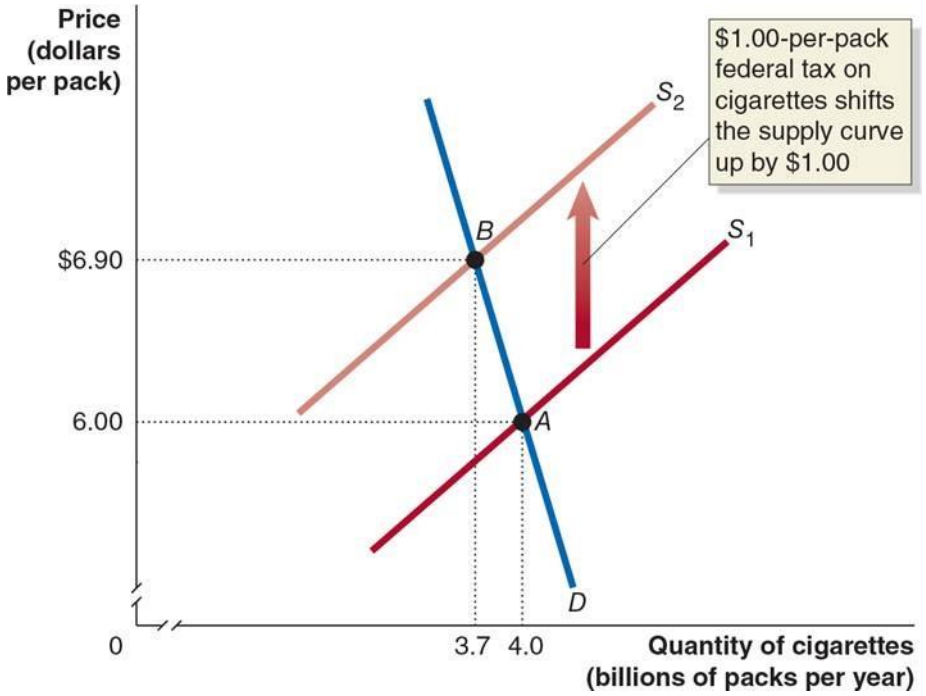


Figure 4.10 The Effect of a Tax on the Market for Cigarettes (3 of 4)

The new equilibrium occurs at point *B*; quantity sold falls to 3.7 billion packs.

The tax increases the price paid by consumers to $6.90 per pack.

Producers receive a price of $6.90 per pack (point *B*), but after paying the $1.00 tax, they are left with $5.90 (point *C*).

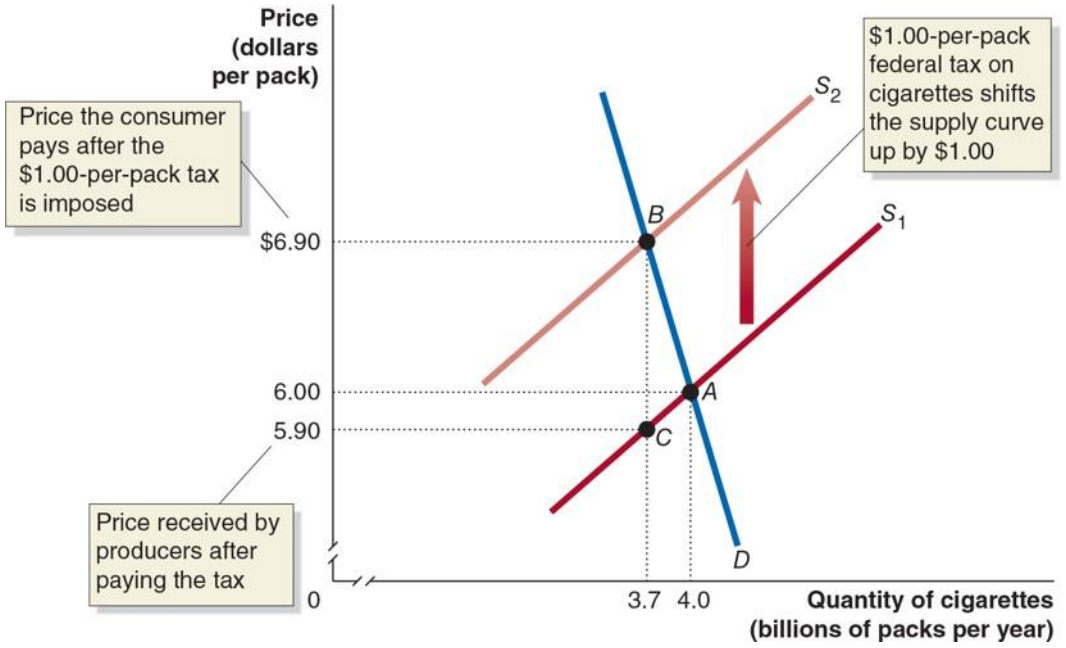
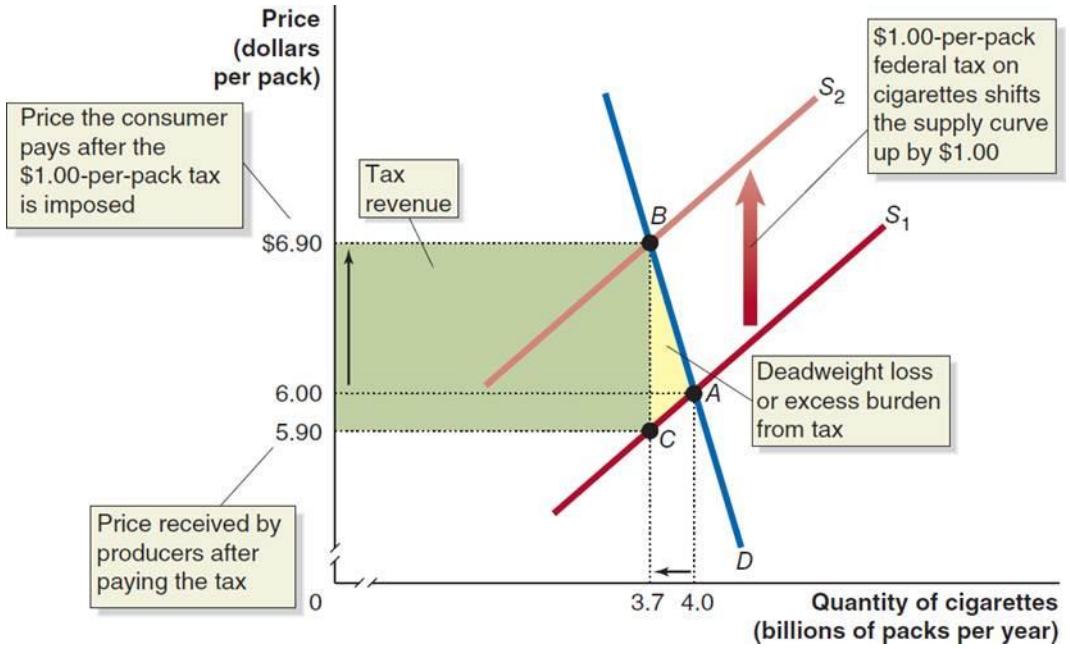


Figure 4.10 The Effect of a Tax on the Market for Cigarettes (4 of 4)

The government will receive tax revenue equal to the green shaded box.

Some consumer surplus and some producer surplus will become tax revenue for the government, and some will become deadweight loss, shown by the yellow-shaded area.



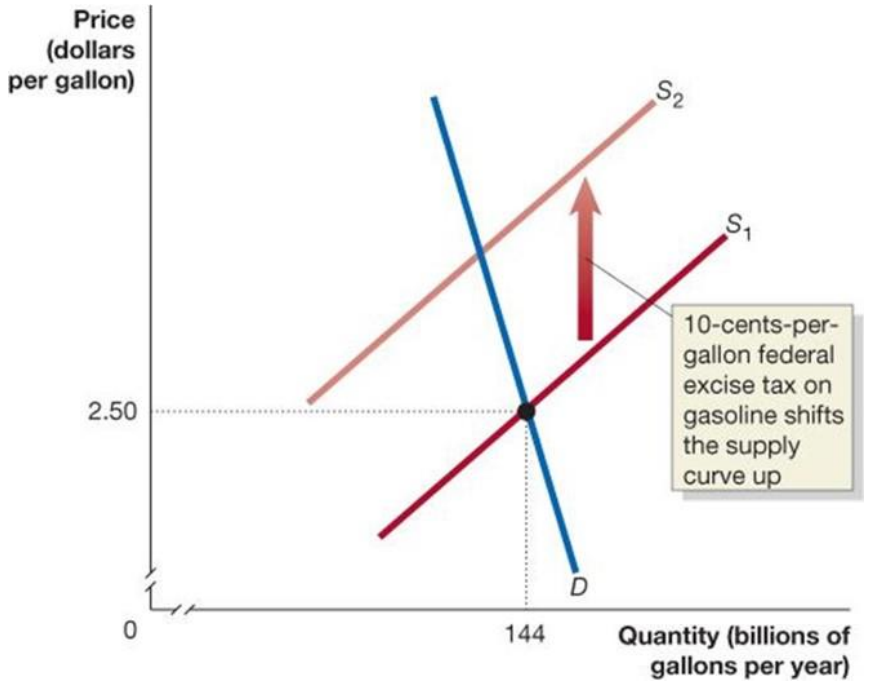
What Makes One Tax Better Than Another?

In the “public finance” literature, economists refer to the deadweight loss from a tax as its **excess burden**.

Given that we want to raise tax revenue, what makes one tax preferred over another?

- A tax is efficient if it imposes a small excess burden relative to the tax revenue it raises.
- Economists can advise policymakers about which taxes are the most efficient.

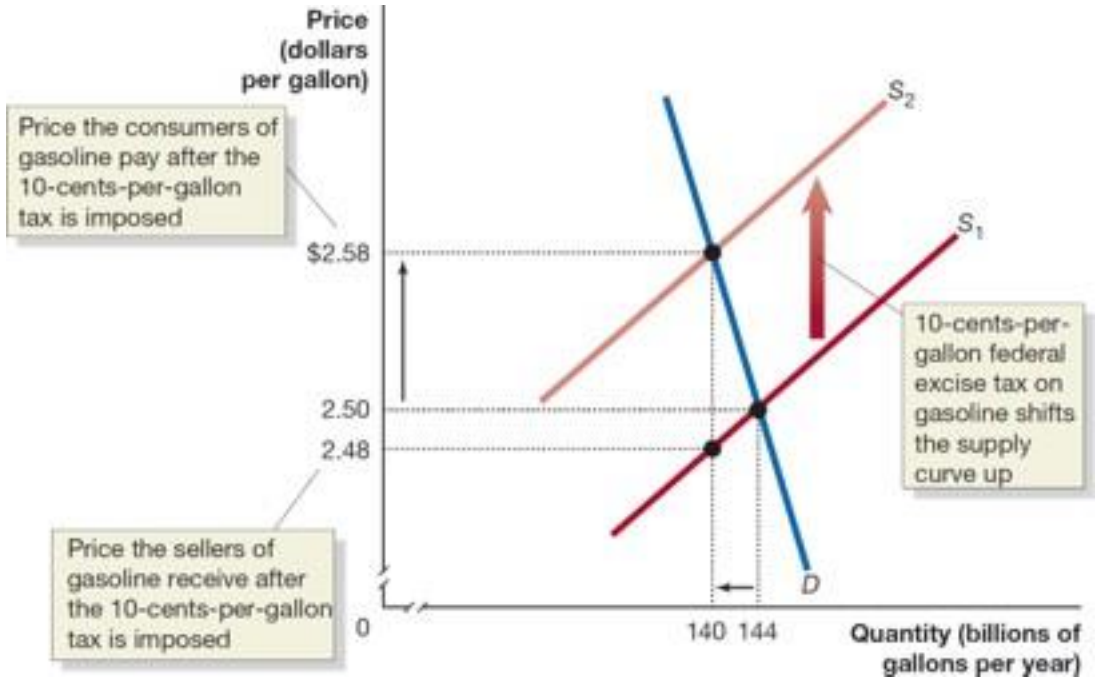
Figure 4.11 The Incidence of a Tax on Gasoline (1 of 2)



With no tax on gasoline, the price would be $\$2.50$ per gallon, and 144 billion gallons of gasoline would be sold each year.

- A 10-cents-per-gallon excise tax shifts up the supply curve from S_1 to S_2.

Figure 4.11 The Incidence of a Tax on Gasoline (2 of 2)



- The price consumers pay rises from $3.00 to $3.08.
- The price sellers receive falls from $3.00 to $2.98.

Therefore, consumers pay 8 cents of the 10-cents-per-gallon tax on gasoline, and sellers pay 2 cents.

Tax Incidence: Who Actually Pays for a Tax?

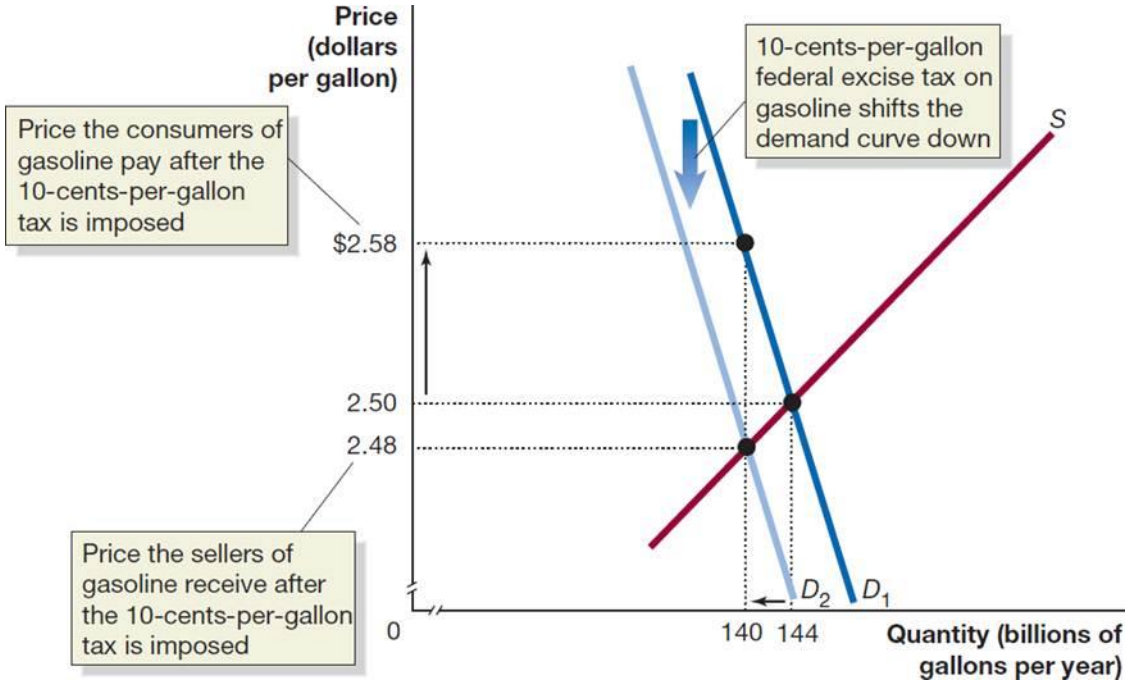
In the market for gasoline, the buyers effectively paid 80 percent of the 10-cents-per-gallon tax, and sellers paid 20 percent.

- This is referred to as the **tax incidence**: the actual division of the burden of a tax between buyers and sellers in a market.

What determines this tax incidence?

- Important observation: **not** “whoever has the legal obligation to pay the tax”…

Figure 4.12 The Incidence of a Tax on Gasoline Paid by Buyers



If buyers have the legal obligation to pay the 10 cent tax on gasoline, the price they pay, the price sellers receive, and the quantity traded all remain the same.

- The tax incidence does not depend on who has the legal obligation to pay the tax.

What Does Determine the Tax Incidence?

The incidence of the tax is determined by the relative slopes of the demand and supply curves.

A steep demand curve means that buyers do not change how much they buy when the price changes; this results in them taking on much of the burden of the tax.

A shallow demand curve means that buyers change how much they buy a lot when the price changes. Then they could not be forced to accept as much of the burden of the tax.

- Similar analysis applies for sellers.

Apply the Concept: The Burden of the Social Security Tax (1 of 2)

The Federal Insurance Contributions Act (FICA) tax is 15.3 percent of wages, and funds Social Security and Medicare. By law, employers pay half (7.65 percent), as do workers.

- Who really ends up with most of the burden of this tax?

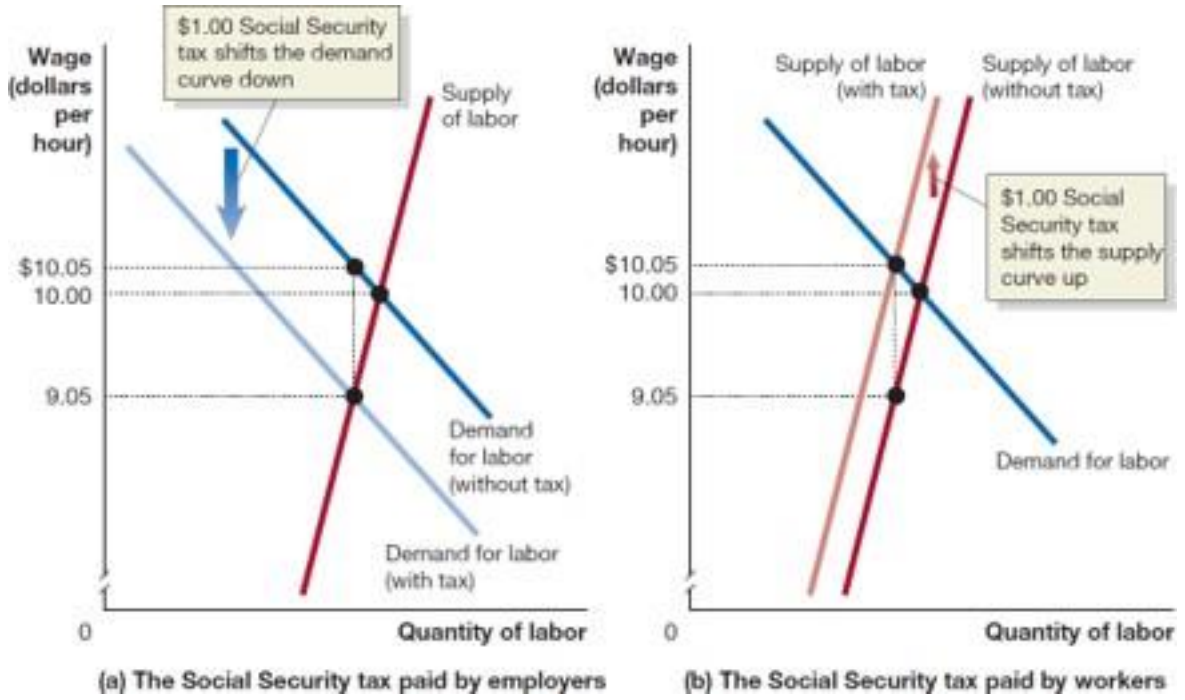
The answer depends on who is less sensitive to changes in wages: employers (buyers of labor) or workers (sellers of labor).

- Workers are relatively **insensitive** to their wages; that is, they don't change their hours-of-work decision much when their wages change.
- So workers end up with most of the burden of this tax.

Apply the Concept: The Burden of the Social Security Tax (2 of 2)

The panels illustrate an imaginary $1.00 per hour Social Security tax.

Whether firms or workers have the legal obligation to pay the tax, workers end up with most of the tax burden.



5.1 Externalities and Economic Efficiency

Identify examples of positive and negative externalities and use graphs to show how externalities affect economic efficiency.

No one sets out to create pollution; pollution is an unintended by-product of various activities.

- Pollution would not be a problem if pollution only affected the person who created it; people would create pollution only until its marginal cost equaled its marginal benefit.

But pollution is an example of an externality: a benefit or cost that affects someone who is not directly involved in the production or consumption of a good or service.

- Think of an externality like a **side-effect.**

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Cost of Electricity Production

When firms produce electricity, they bear certain costs of production:

- Buildings
- Equipment
- Fuel
- Labor, etc.

Those firms make their decisions about how much to produce based on these **private costs**.

But because of pollution the **social cost** is higher: the total cost to society of producing a good or service, including both the private cost and any external cost.

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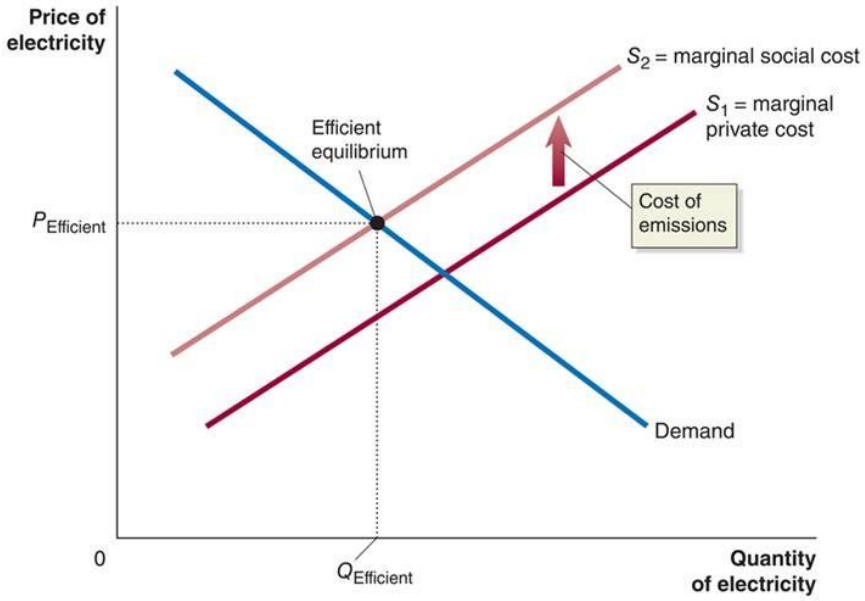
Figure 5.1 The Effect of Pollution on Economic Efficiency (1 of 3)

Supply curve S_1 represents just the marginal private cost that the electricity producer has to pay.

Supply curve S_2 represents the marginal social cost, which includes the costs to those affected by pollution.



The optimal level of production for society is $Q_{Efficient}$; at this quantity, the marginal cost to society is just equal to the marginal benefit.

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Figure 5.1 The Effect of Pollution on Economic Efficiency (2 of 3)

However the market equilibrium results from the decisions of producers, who see their cost of production given by

S_1.

Price (P_{Market}) is "too low" and

quantity (Q_{Market}) is "too high":

the cost to society of the additional electricity exceeds its benefit to society.

Deadweight loss results.

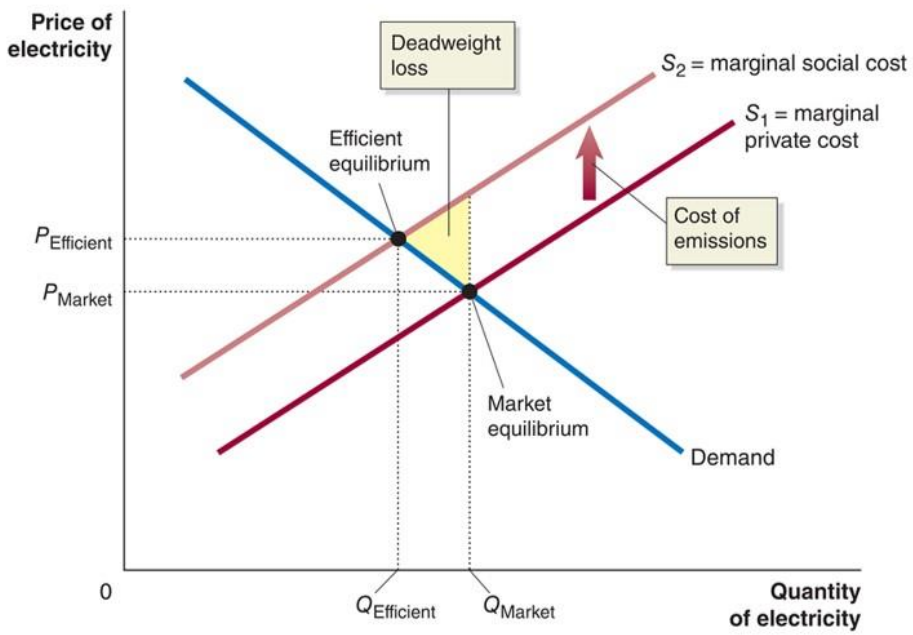

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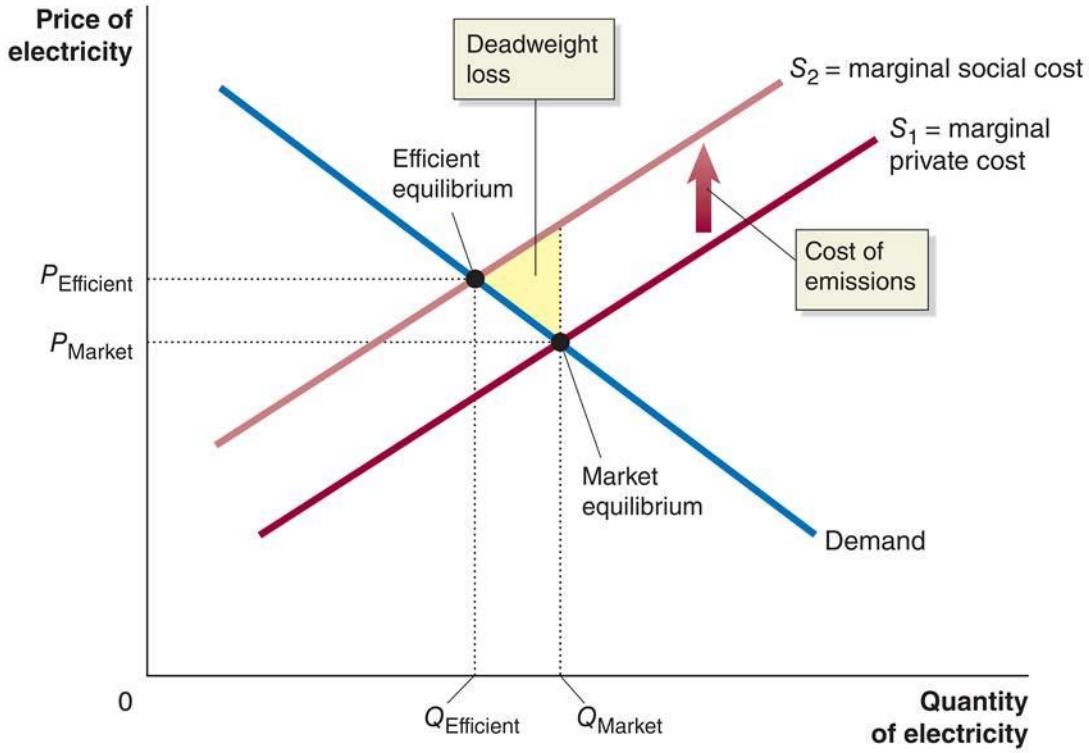
Figure 5.1 The Effect of Pollution on Economic Efficiency (3 of 3)

When there is a negative externality in producing or consuming a good or service, too much of the good or service will be produced at market equilibrium.



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Types of Externalities

Pollution is an example of a negative externality in production.

- Negative externalities might result from consumption.
- **Example: cigarette smoke.**

Externalities might also be positive when the **private benefit** (the benefit received by the consumer of a good or service) is less than the **social benefit** (the total benefit from consuming a good or service, including both the private benefit and any external benefit).

- **Example: college education**

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Figure 5.2 The Effect of a Positive Externality on Economic Efficiency (1 of 2)

College educations have positive externalities.

The marginal social benefit from a college education is greater than the marginal private benefit to college students.

Because only the marginal private benefit is represented in the market demand curve D_1, the quantity of collegez educations produced, Q_{Market}, is too low.

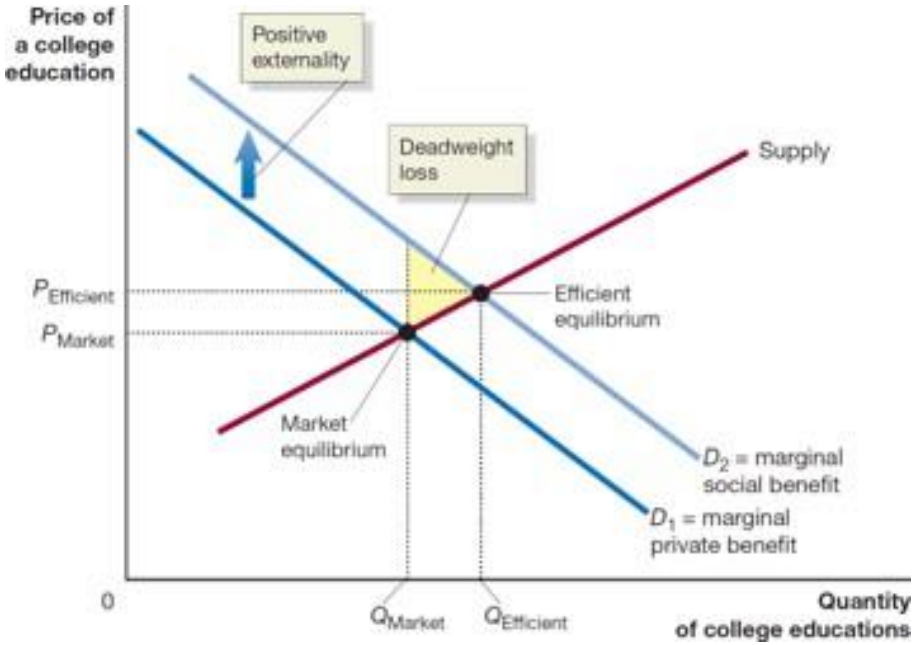

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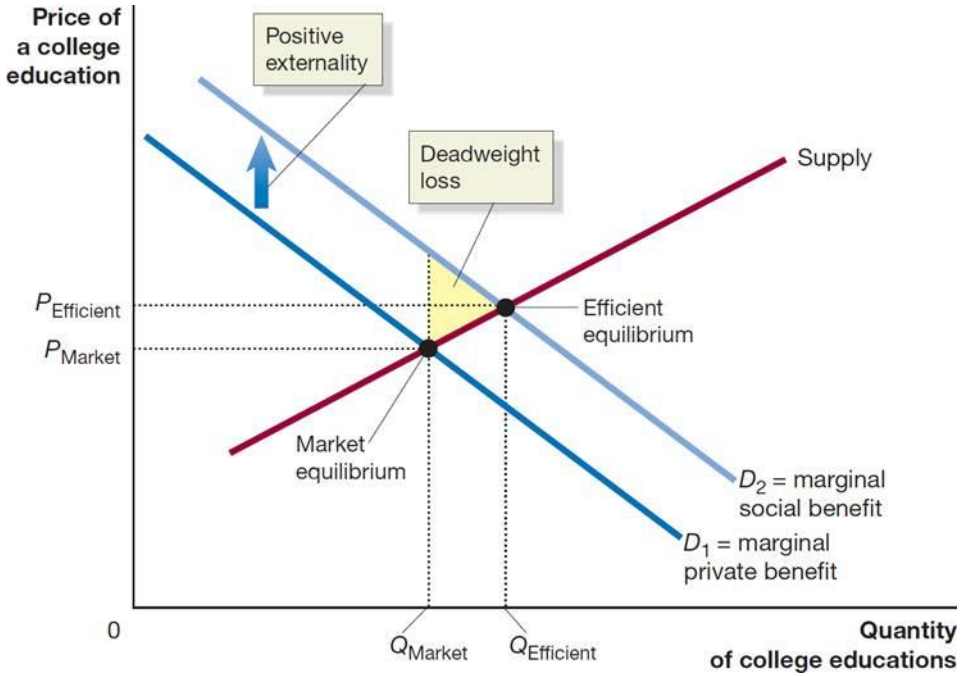
Figure 5.2 The Effect of a Positive Externality on Economic Efficiency (2 of 2)

When there is a positive externality in producing or consuming a good or service, too little of the good or service will be produced at market equilibrium.



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Externalities and Market Failure

If there are negative **or** positive externalities, the market equilibrium will not result in the efficient quantity being produced.

- Overproduction with negative externalities; underproduction with positive externalities.
- There will be deadweight loss.

This is an example of **market failure**: a situation in which the market fails to produce the efficient level of output.

- The larger the externality, the greater is likely to be the size of the deadweight loss—the extent of the market failure.

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5.3 Government Policies to Deal with Externalities

Analyze government policies to achieve economic efficiency in a market with an externality.
In Chapter 4, we learned that taxes caused inefficiency (deadweight loss) by moving the level of production away from the efficient level.

In this chapter, externalities cause inefficiency **for the same reason.**

- A tax of just the right size could cause these two effects to cancel out, returning us to the efficient level of production.

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Figure 5.5 When There Is a Negative Externality, a Tax Can Lead to the Efficient Level of Output (1 of 2)

Utilities do not bear the cost of pollution, so they produce too much.

If the government imposes a tax equal to the cost of the pollution, the utilities will internalize the externality.

- The supply curve will shift up, from S_1 to S_2.
- The market equilibrium quantity falls to the economically efficient level.

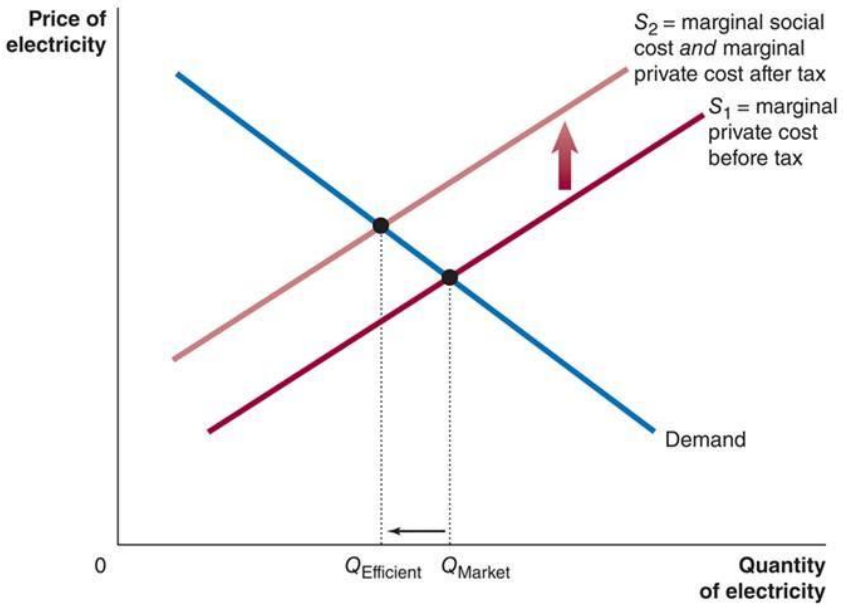

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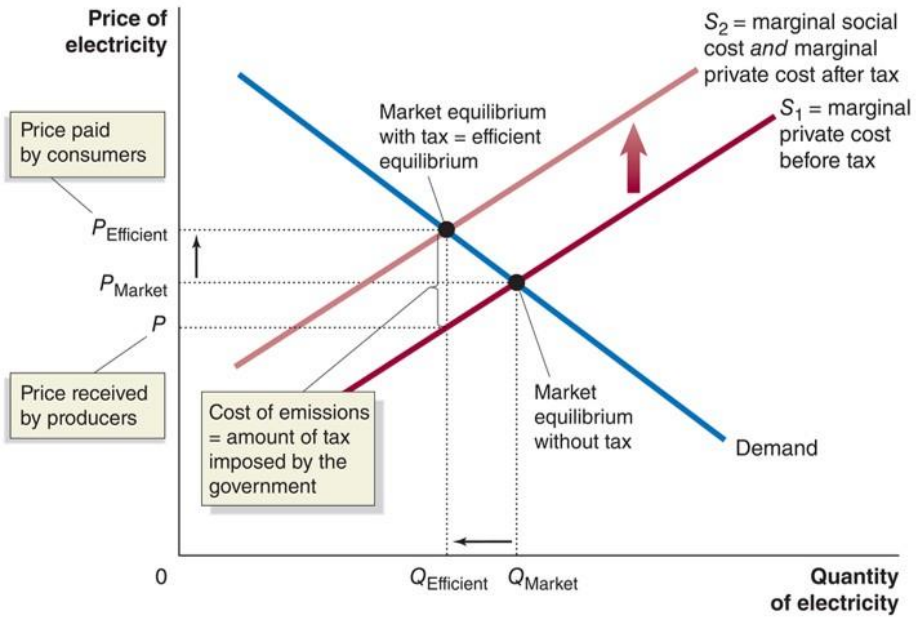
Figure 5.5 When There Is a Negative Externality, a Tax Can Lead to the Efficient Level of Output (2 of 2)

The price of electricity will rise from P_{Market}, which does not include the cost of acid rain, to $P_{\text{Efficient}}$, which does include the cost.

Consumers pay the price $P_{\text{Efficient}}$, while producers receive a price P, which is equal to $P_{\text{Efficient}}$ minus the amount of the tax.



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Can Taxes "Solve" Positive Externalities Too?

Taxes worked to solve the problem of negative externalities because:

- Negative externalities caused too much to be produced, while
- Taxes reduced the amount of output.

When there are positive externalities, **too little** will be produced.

- Taxes won't work; but **subsidies** might: amounts paid to producers or consumers to encourage the production or consumption of a good.

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Figure 5.6 When There is a Positive Externality, a Subsidy Can Bring about the Efficient Level of Output (1 of 2)

Individuals make decisions about whether or not to "consume" a college education, with a resulting market price and quantity.

But what if there are positive externalities to a college education?

- It is good for us all if **other people** are smart and make good decisions.
- This is an argument for a subsidy in the market for college education.

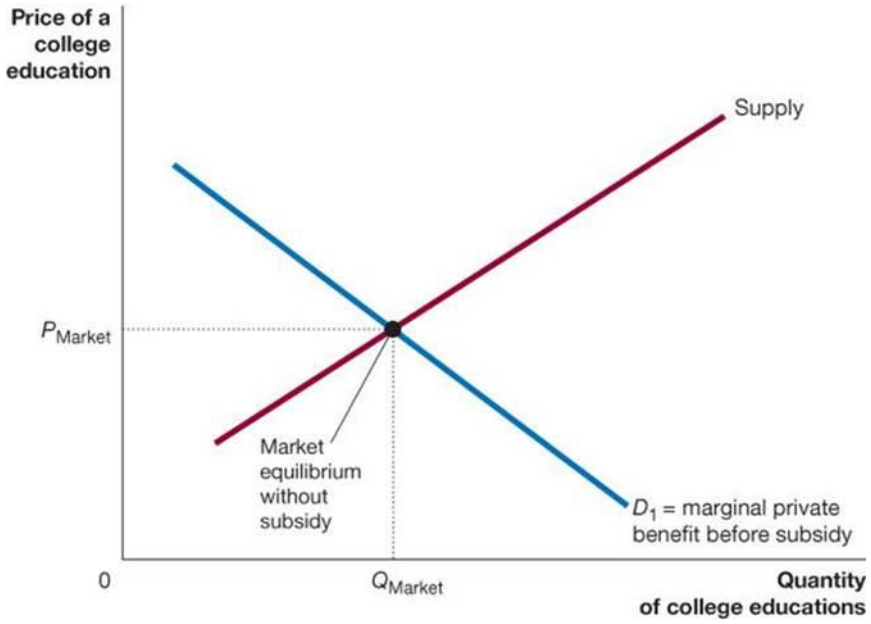

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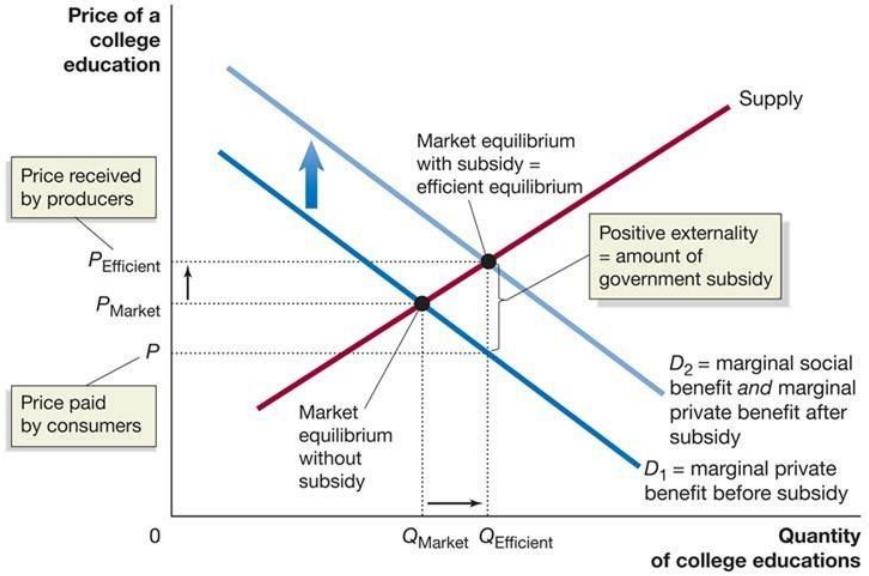
Figure 5.6 When There is a Positive Externality, a Subsidy Can Bring about the Efficient Level of Output (2 of 2)

The subsidy will cause the demand curve to shift up, from D_1 to D_2.

The market equilibrium quantity will shift from Q_{Market} to $Q_{\text{Efficient}}$, the economically efficient equilibrium quantity.



Producers receive the price $P_{\text{Efficient}}$ while consumers pay a price P, which is equal to $P_{\text{Efficient}}$ minus the amount of the subsidy.

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Corrective Taxes and Subsidies

The taxes and subsidies seen in the last few slides “correct” the externality problem.

They are known as **Pigovian taxes and subsidies**, after the English economist Arthur Cecil Pigou, who first demonstrated the use of government taxes and subsidies in bringing about an efficient level of output in the presence of externalities.

Pigovian taxes are especially popular with economists, because they increase efficiency while bringing in tax revenue; then (in theory) this allows inefficiency-causing taxes in other markets to be reduced, a **double dividend of taxation.**

Example: British Columbia enacted a Pigovian tax on carbon dioxide emissions, and uses the revenue to reduce personal income taxes.

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Apply the Concept: Should We Tax Cigarettes and Soda? (1 of 2)

The consumption of cigarettes and soda are thought to have negative externalities. Why?

- Both cigarettes and soda have negative health consequences.
- This by itself is not sufficient to be a negative externality.
- But people's medical expenses are shared with others, either via public or private health insurance.

Therefore we expect there to be too much consumption of cigarettes and soda, and they are candidates for Pigovian taxes.

In general, cigarettes are taxed much more heavily than soda. Is this appropriate?

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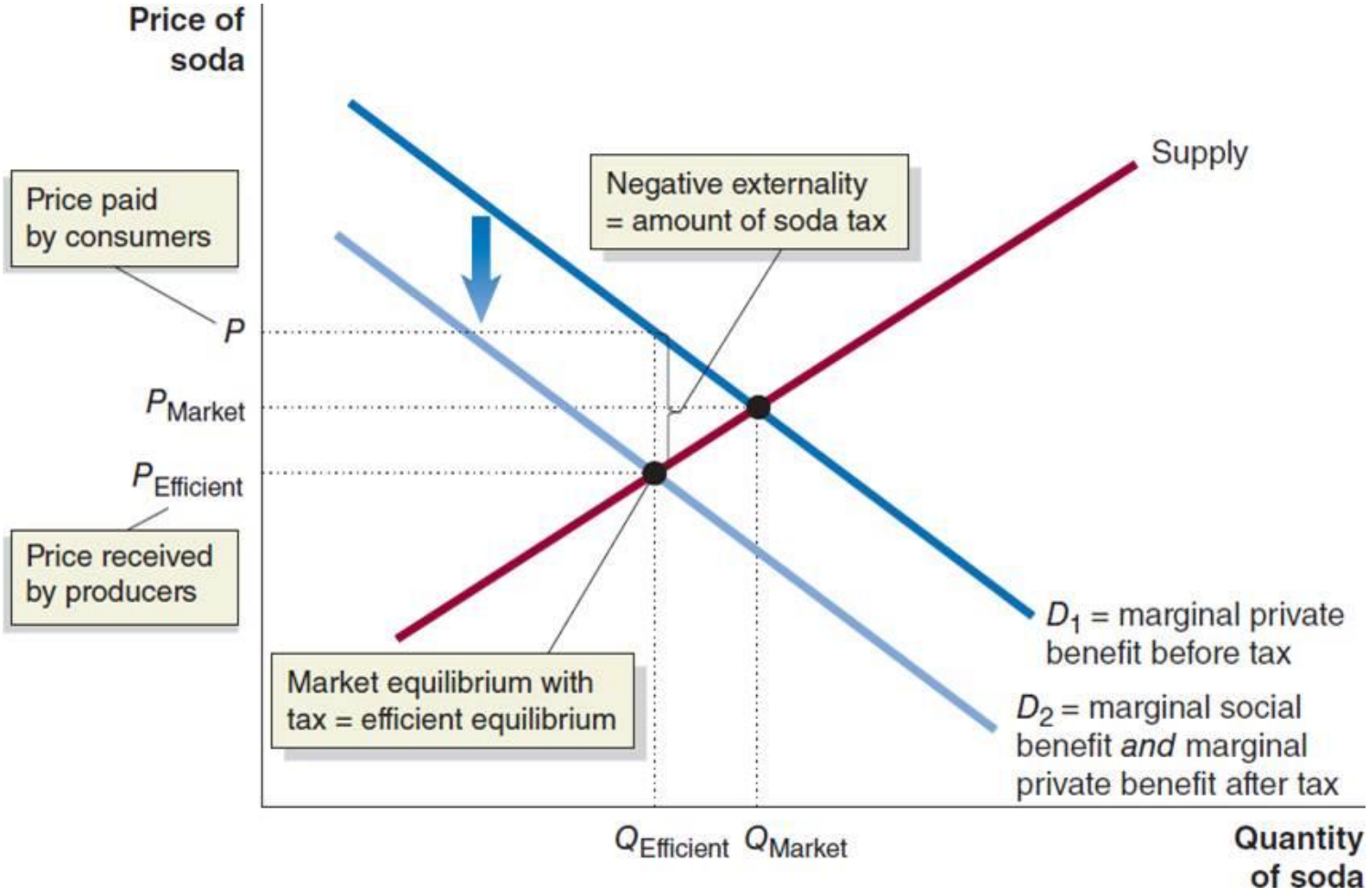
Apply the Concept: Should We Tax Cigarettes and Soda? (2 of 2)



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