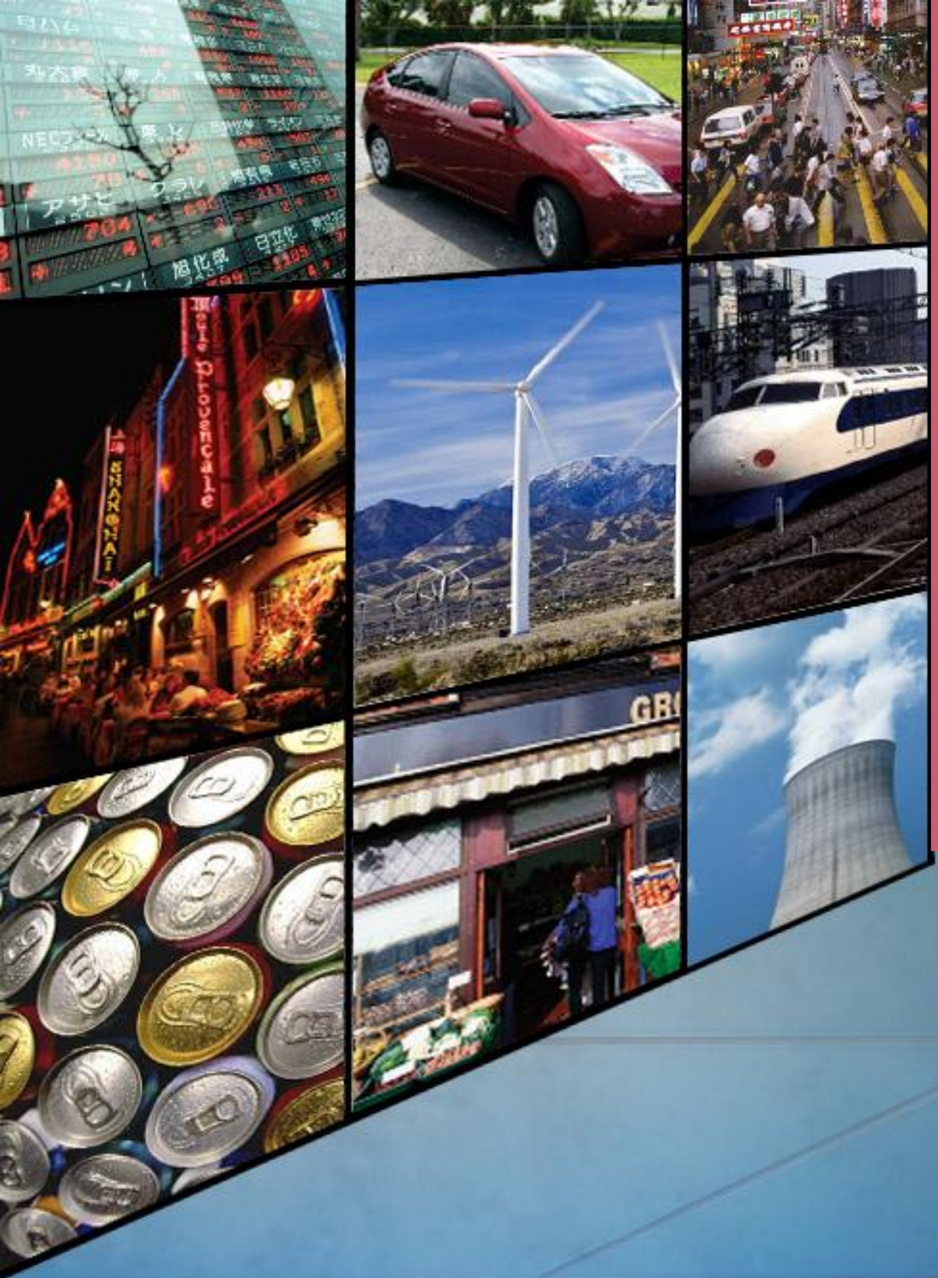


THIRD EDITION

ECONOMICS and MICROECONOMICS

Paul Krugman | Robin Wells

Chapter 7

Taxes

WHAT YOU WILL LEARN IN THIS CHAPTER

- The effects of taxes on supply and demand
- What determines who really bears the burden of a tax
- The costs and benefits of taxes, and why taxes impose a cost that is larger than the tax revenue they raise
- The difference between progressive and regressive taxes and the trade-off between tax equity and tax efficiency
- The structure of the U.S. tax system

The Economics of Taxes: A Preliminary View

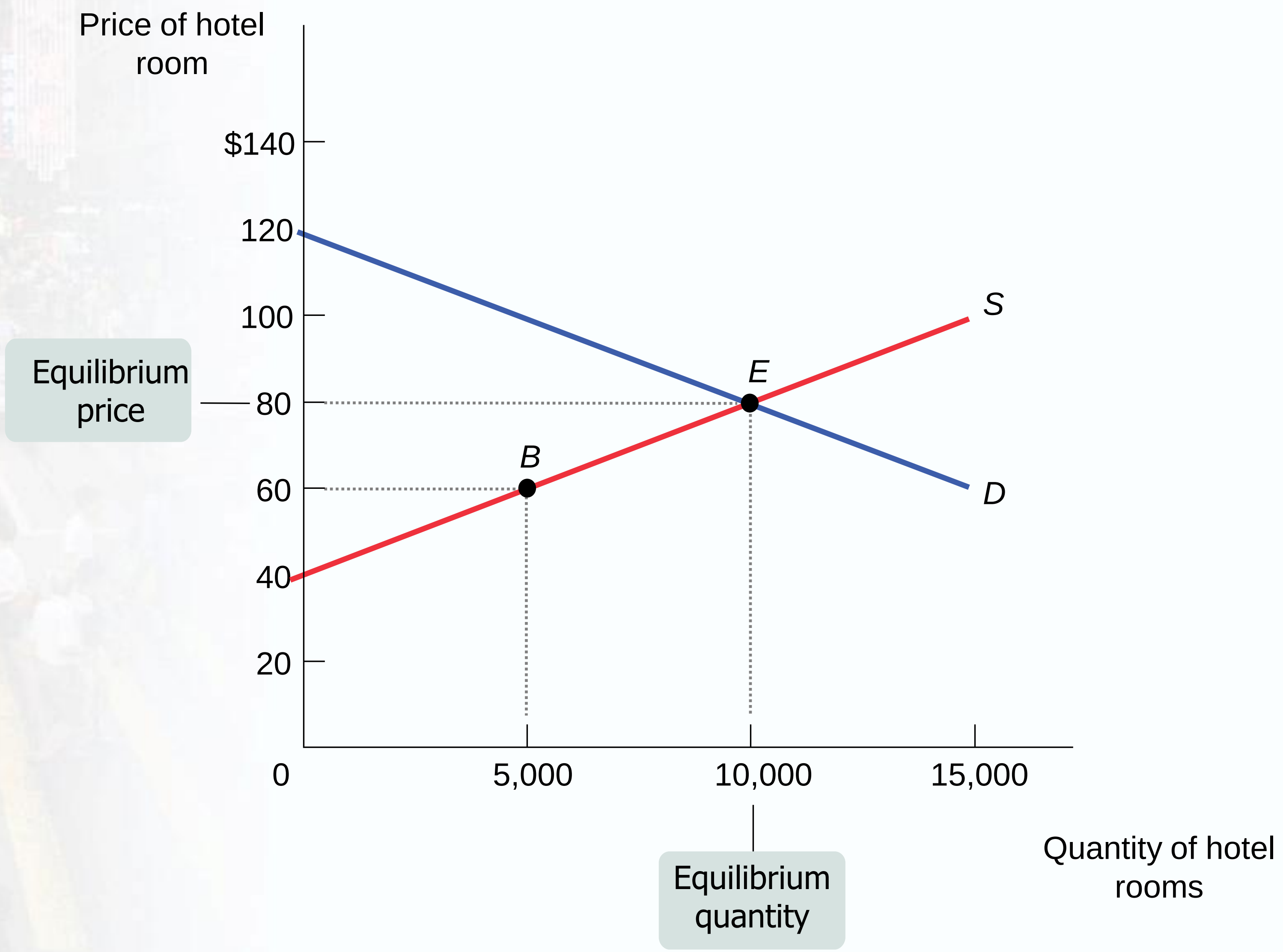
- An **excise tax** is a tax on sales of a good or service.

- Excise taxes:
  - raise the price paid by buyers
  - reduce the price received by sellers

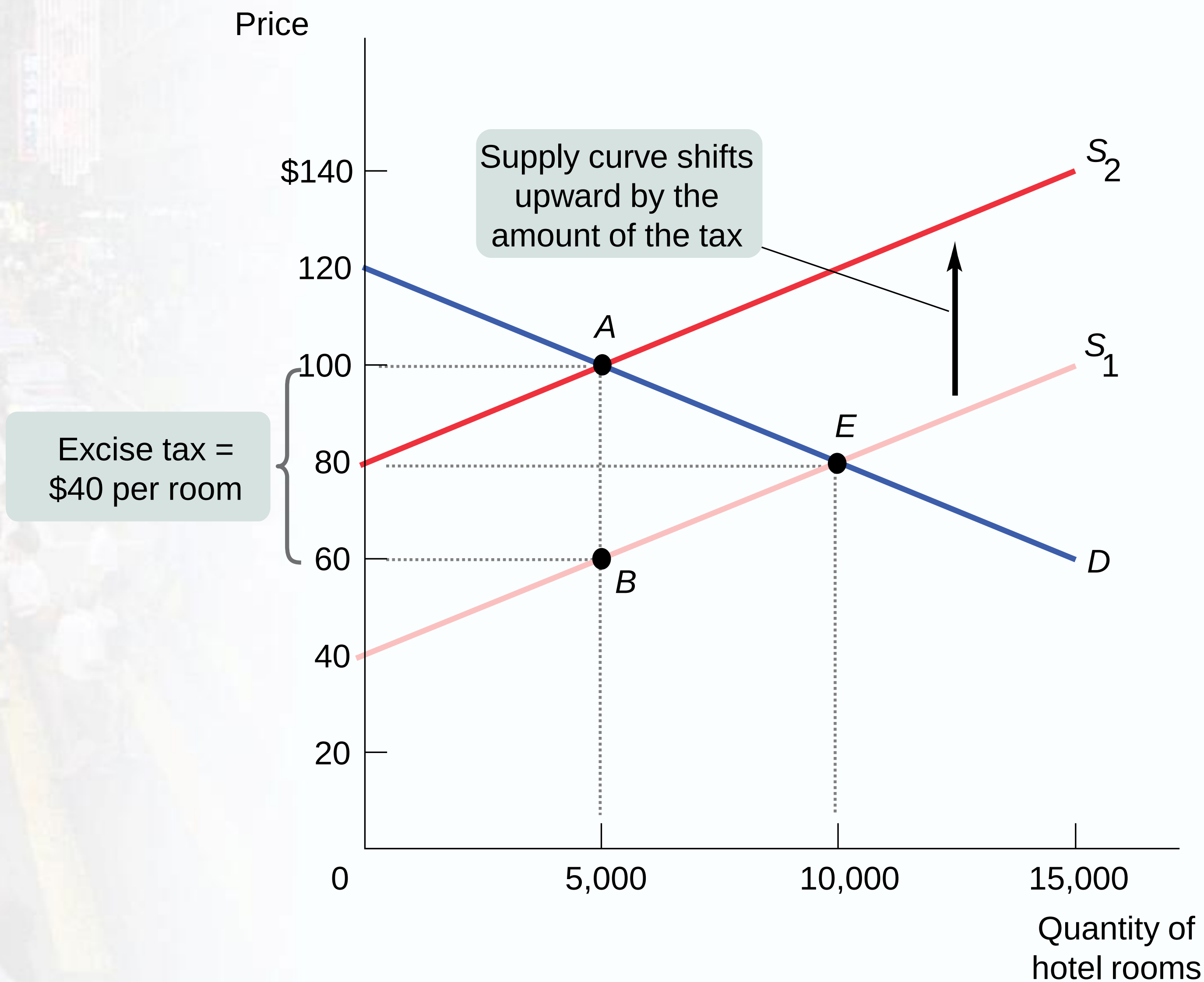
- Excise taxes also drive a ***wedge*** between the two prices.

  Examples: The excise tax levied on sales of taxi rides and the excise tax levied on purchases of taxi rides.

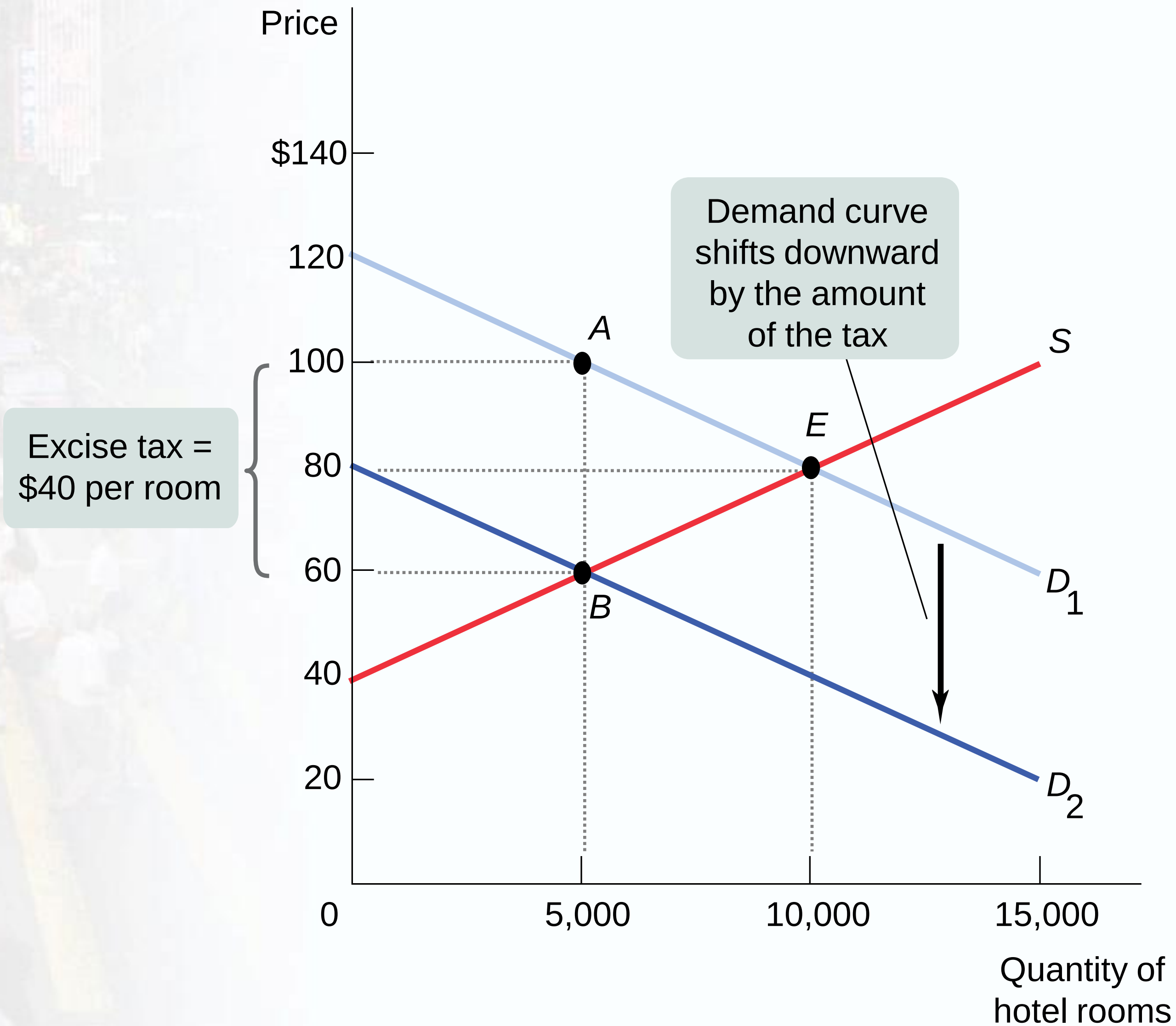
The Supply and Demand for Hotel Rooms in Potterville



An Excise Tax Imposed on Hotel Owners



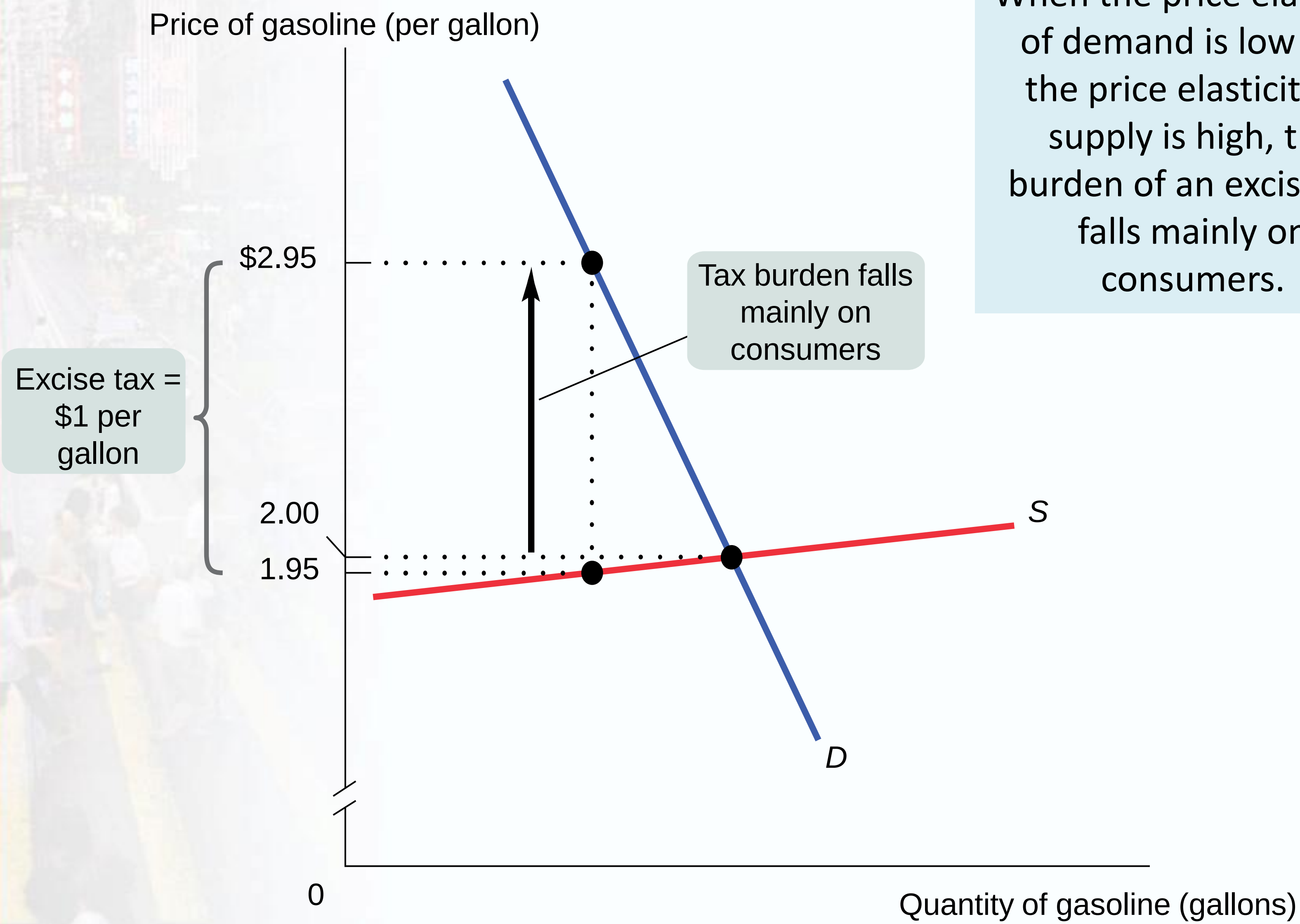
An Excise Tax Imposed on Hotel Guests



Tax Incidence

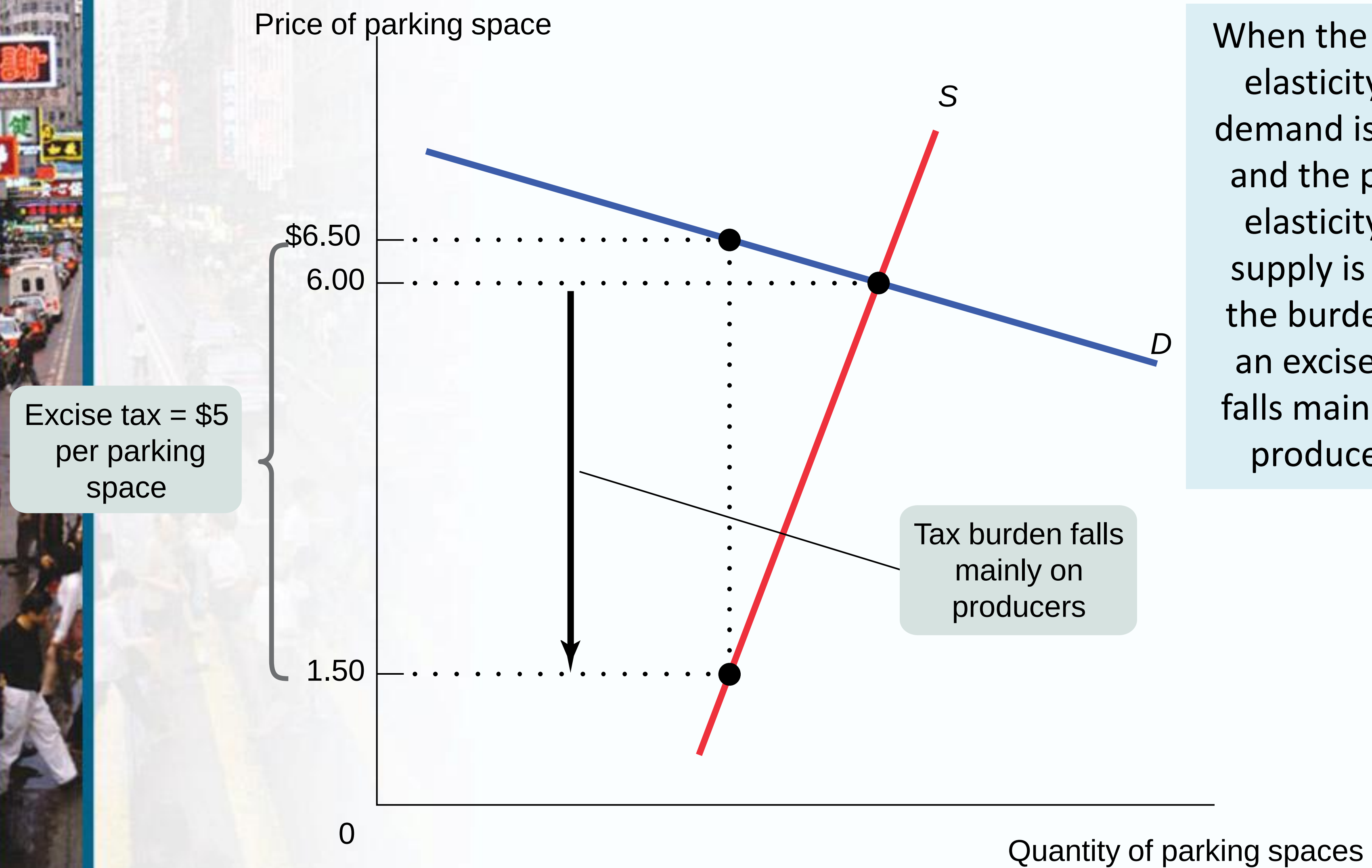
- The **incidence** of a tax is a measure of who really pays it.
- Who really bears the tax burden (in the form of higher prices to consumers and lower prices to sellers) does not depend on who officially pays the tax. Depending on the shapes of supply and demand curves, the incidence of an excise tax may be divided differently.
- The wedge between the demand price and supply price becomes the government's **tax revenue**.

An Excise Tax Paid Mainly By Consumers



When the price elasticity of demand is low and the price elasticity of supply is high, the burden of an excise tax falls mainly on consumers.

An Excise Tax Paid Mainly by Producers



When the price elasticity of demand is high and the price elasticity of supply is low, the burden of an excise tax falls mainly on producers.

Tax Incidence – Putting It Together

- When the price elasticity of demand is higher than the price elasticity of supply, an excise tax falls mainly on producers.
- When the price elasticity of supply is higher than the price elasticity of demand, an excise tax falls mainly on consumers.
- So elasticity—not who officially pays the tax—determines the incidence of an excise tax.

ECONOMICS IN ACTION

Who pays the FICA?

- *FICA* stands for the Federal Insurance Contributions Act.
  - It pays for the Social Security and Medicare systems — federal social insurance programs that provide income and medical care to retired and disabled Americans.
- Most American workers pay 7.65% of their earnings in FICA.
  - In addition, each employer is required to pay an amount equal to the contribution of his or her employee.

ECONOMICS IN ACTION

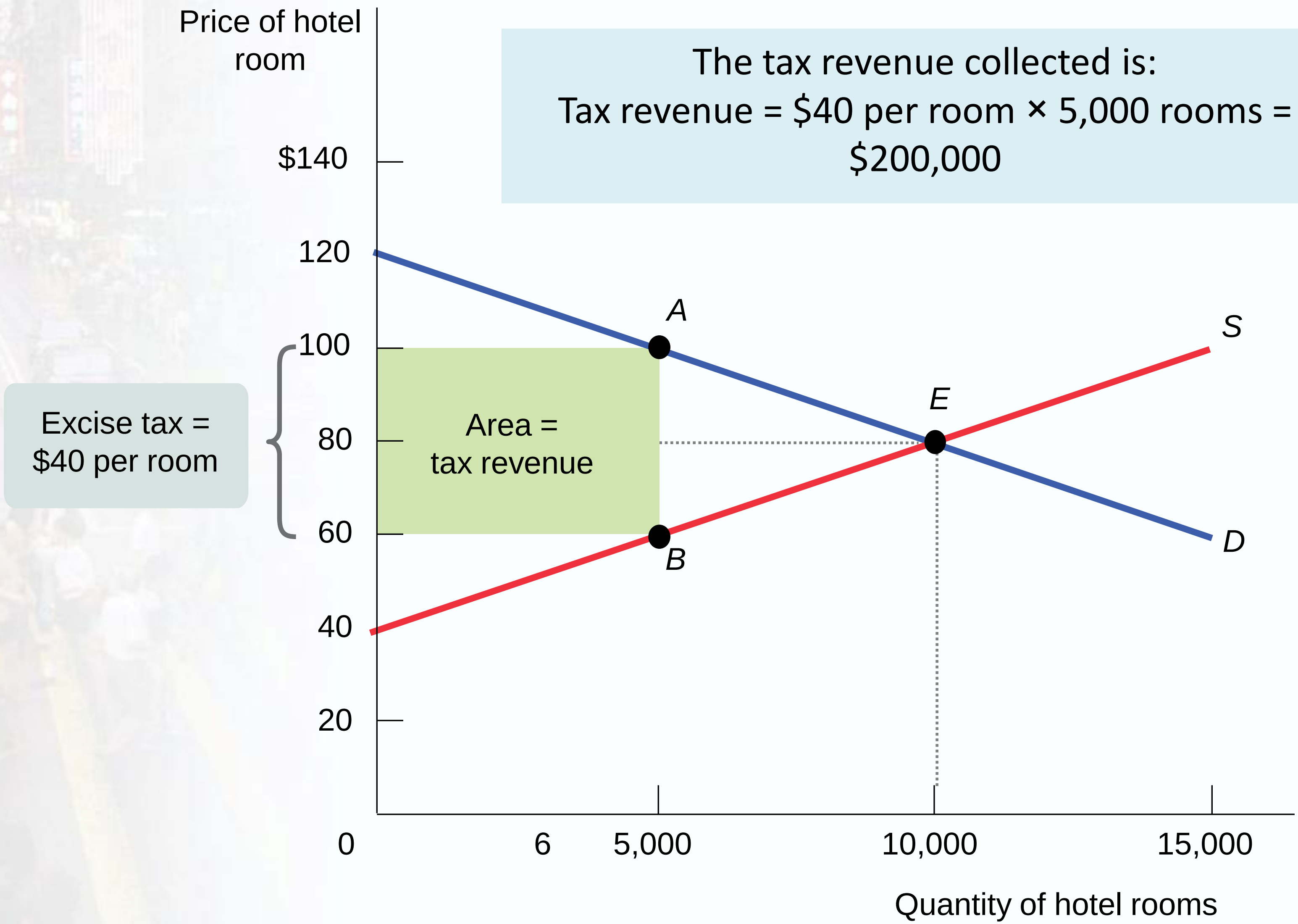
Who pays the FICA?

- Is FICA really shared equally by workers and employers?
  - No, FICA falls mainly on the suppliers of labor; that is, workers in the form of lower wages, rather than by employers in lower profits.

- Reason: When the price elasticity of demand is much higher than the price elasticity of supply, the burden of an excise tax falls mainly on the suppliers.

The Revenue from an Excise Tax

The tax revenue collected is:
Tax revenue = $40 per room × 5,000 rooms = $200,000



The Revenue from an Excise Tax

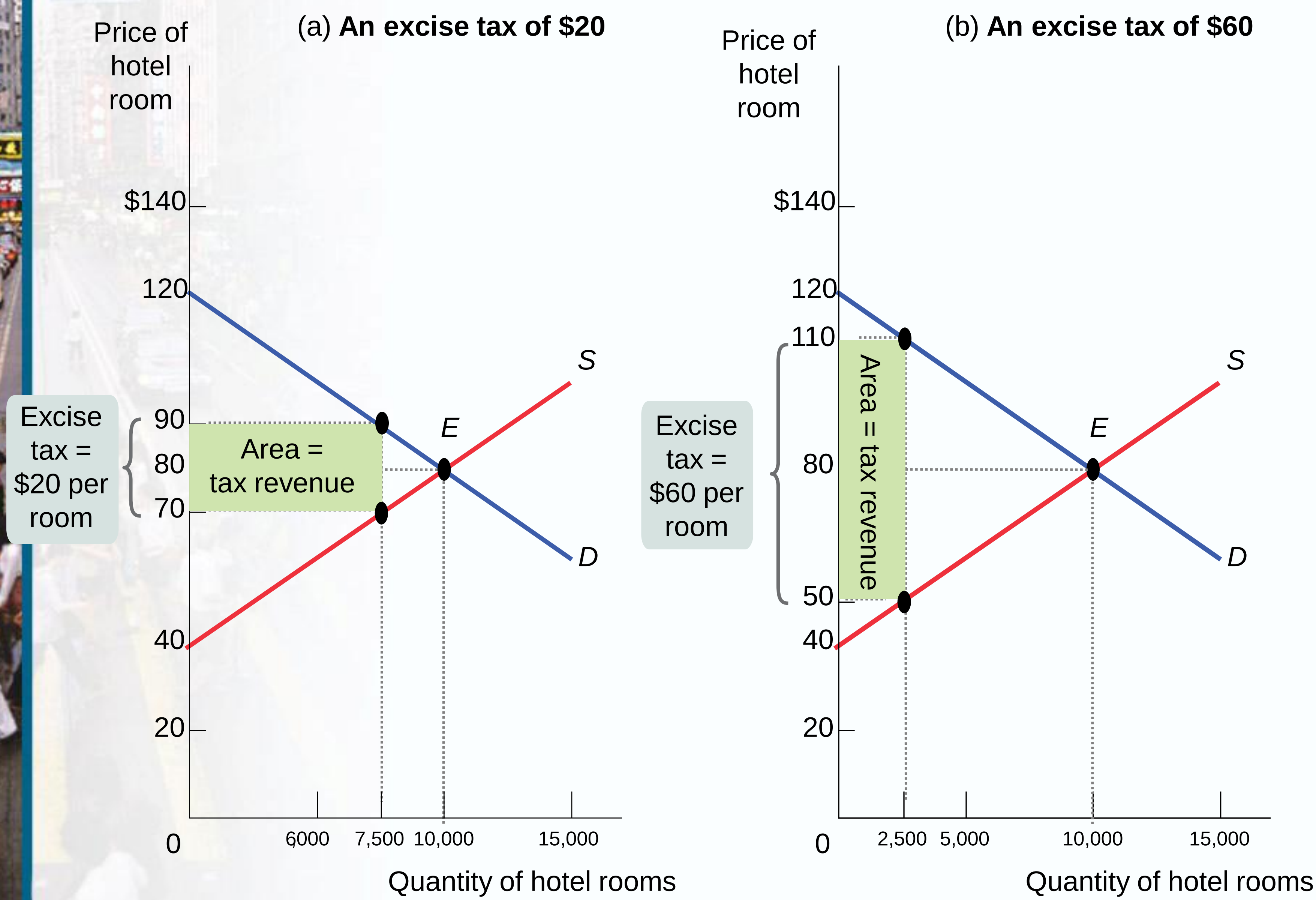
The general principle is:

- ***The revenue collected by an excise tax is equal to the area of the rectangle whose height is the tax wedge between the supply and demand curves and whose width is the quantity transacted under the tax.***

Tax Rates and Revenue

- A **tax rate** is the amount of tax people are required to pay per unit of whatever is being taxed.
- In general, doubling the excise tax rate on a good or service won't double the amount of revenue collected, because the tax increase will reduce the quantity of the good or service transacted.
- In some cases, raising the tax rate may actually reduce the amount of revenue the government collects.

Tax Rates and Revenue



FOR INQUIRING MINDS

The Laffer Curve

- According to Laffer’s diagram, raising tax rates initially increases revenue, but beyond a certain level revenue falls instead as tax rates continue to rise.
  - That is, at some point tax rates are so high and reduce the number of transactions so greatly that tax revenues fall.
  - When Ronald Reagan took office in 1981, he used the Laffer curve to argue that his proposed cuts in income tax rates would not reduce the federal government’s revenue.

FOR INQUIRING MINDS

The Laffer Curve

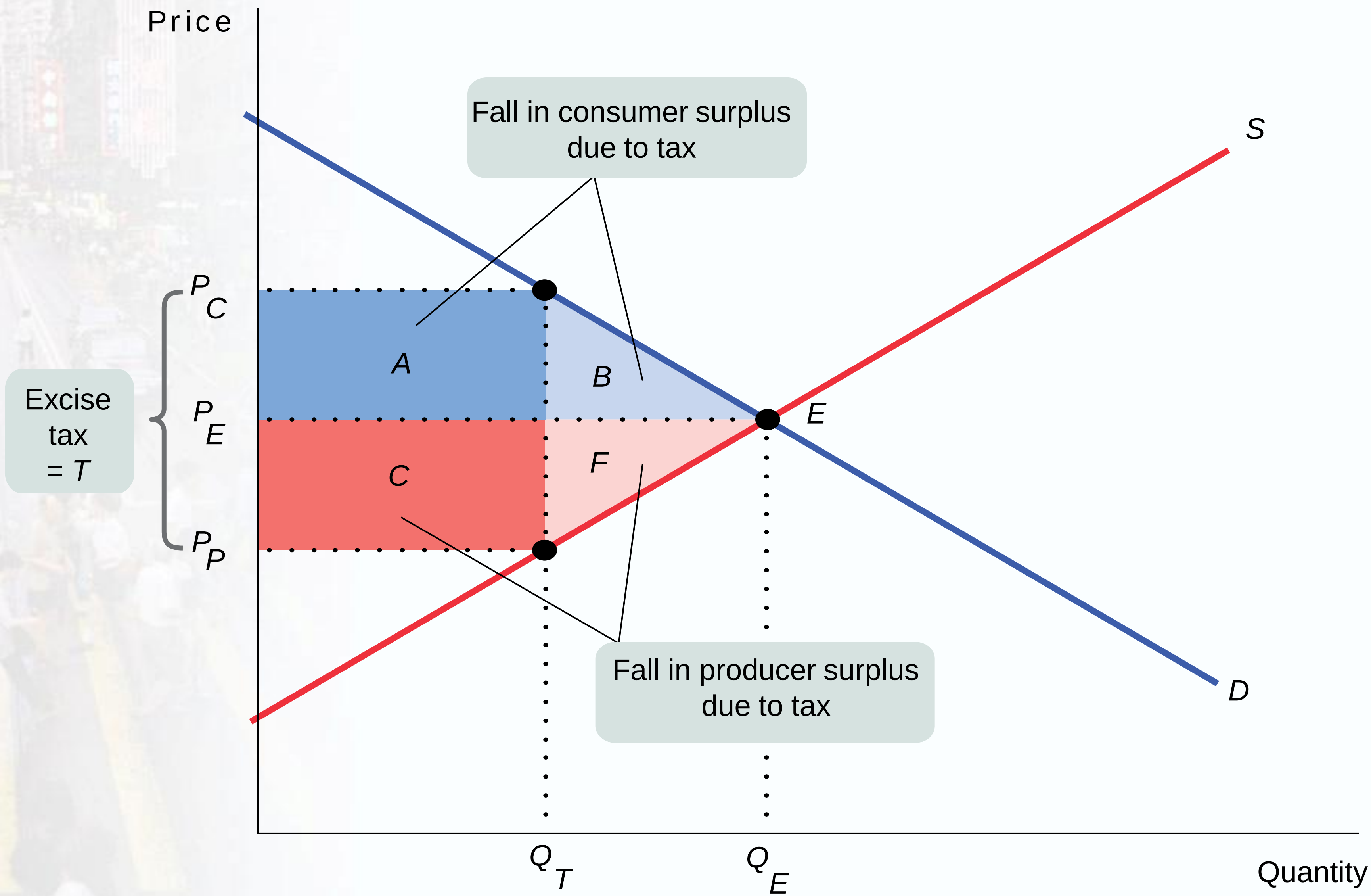
- So, *is* there a Laffer curve? Yes—as a theoretical proposition.
  - Very few economists now believe that Reagan's tax cuts actually increased revenue, and real-world examples in which revenue and tax rates move in opposite directions are very hard to find.
  - That's because it's rare to find an existing tax rate so high that reducing it leads to an increase in revenue.

A Tax Reduces Consumer and Producer Surplus

- A fall in the price of a good generates a gain in consumer surplus.
- Similarly, a price increase causes a loss to consumers.
- So it's not surprising that in the case of an excise tax, the rise in the price paid by consumers causes a loss.
- Meanwhile, the fall in the price received by producers leads to a fall in producer surplus.

→ A tax reduces both the consumer surplus and the producer surplus.

A Tax Reduces Consumer and Producer Surplus



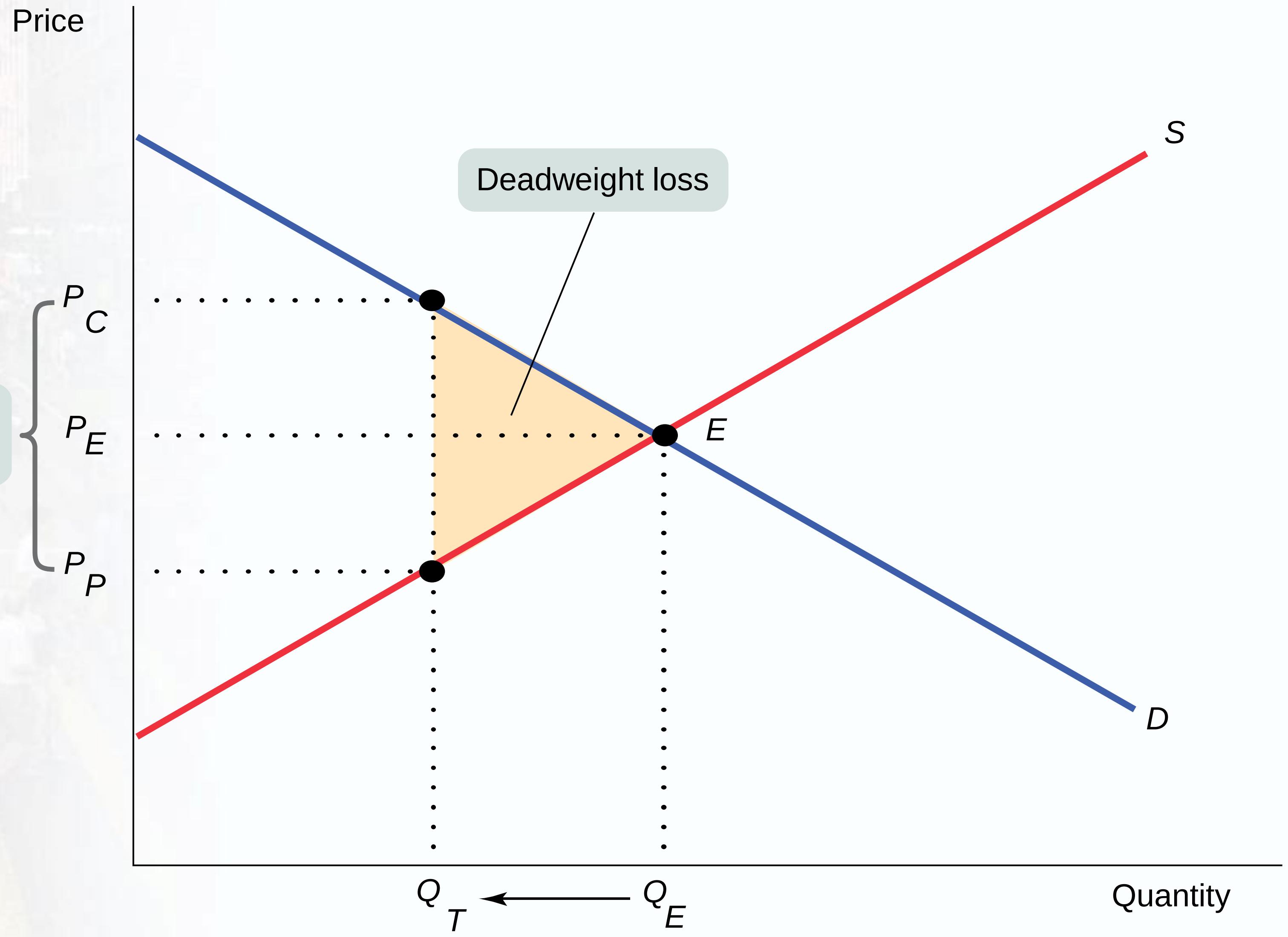
The Deadweight Loss of a Tax

- Although consumers and producers are hurt by the tax, the government gains revenue. The revenue the government collects is equal to the tax per unit sold, *T,* multiplied by the quantity sold, Q_T.

- But a portion of the loss to producers and consumers from the tax is not offset by a gain to the government.

- The deadweight loss caused by the tax represents the total surplus lost to society because of the tax—that is, the amount of surplus that would have been generated by transactions that now do not take place because of the tax.

The Deadweight Loss of a Tax



The Deadweight Loss of a Tax

- Using a triangle to measure deadweight loss is a technique used in many economic applications. For example, triangles are used to measure the deadweight loss produced by types of taxes other than excise taxes.

- They are also used to measure the deadweight loss produced by monopoly, another kind of market distortion.

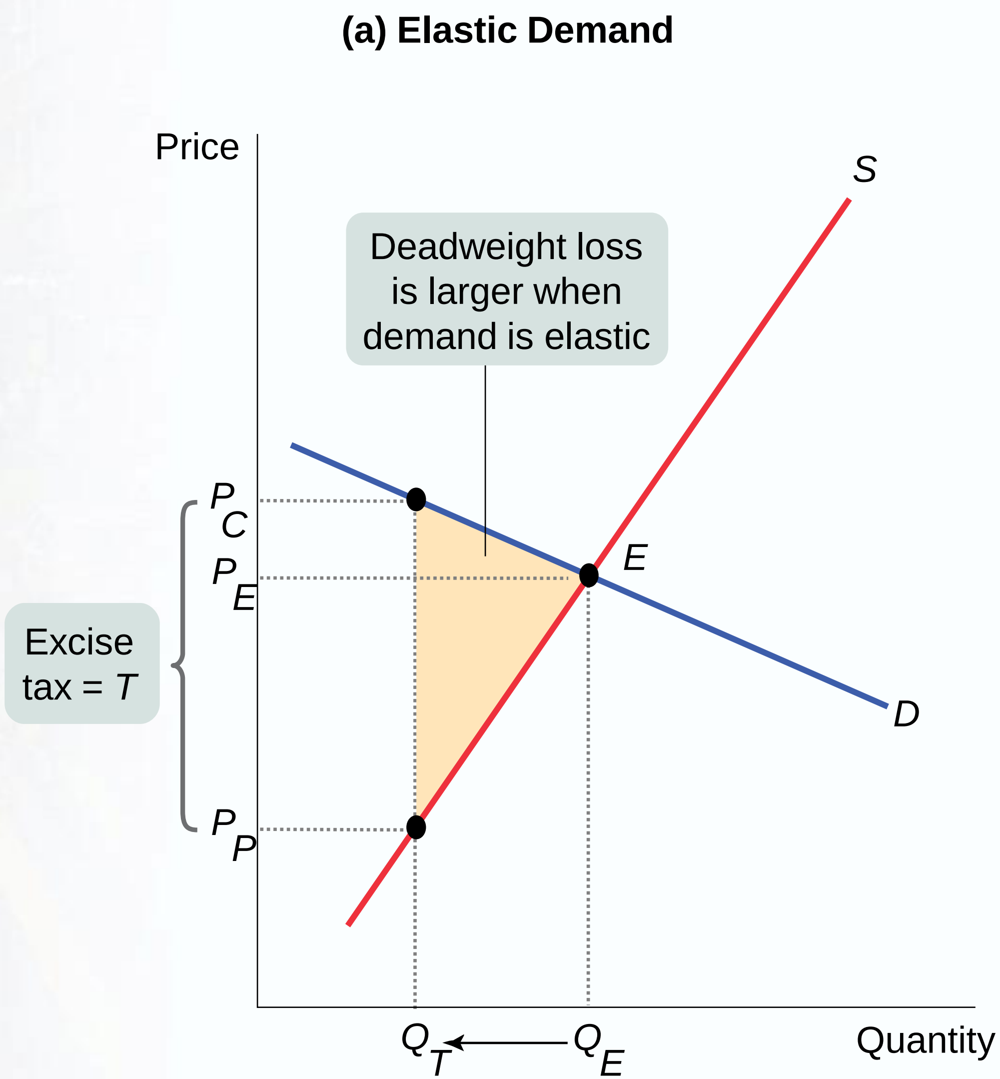
- Deadweight-loss triangles are often used to evaluate the benefits and costs of public policies besides taxation—such as whether to impose stricter safety standards on a product.

Cost of Collecting Taxes

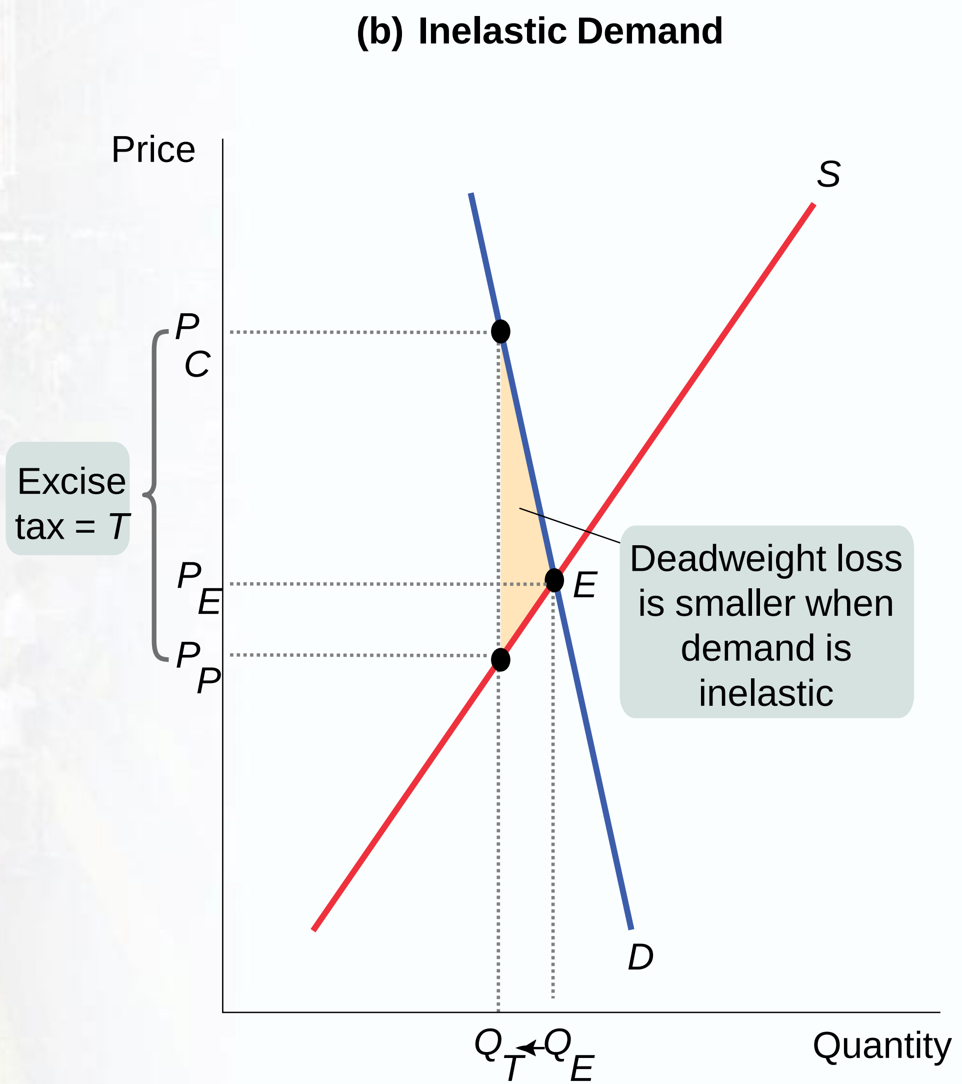
- The **administrative costs** of a tax are the resources used by government to collect the tax, and by taxpayers to pay it, over and above the amount of the tax, as well as to evade it.

- The total inefficiency caused by a tax is the **sum of its deadweight loss and its administrative costs**. The general rule for economic policy is that, other things equal, a tax system should be designed to minimize the total inefficiency it imposes on society.

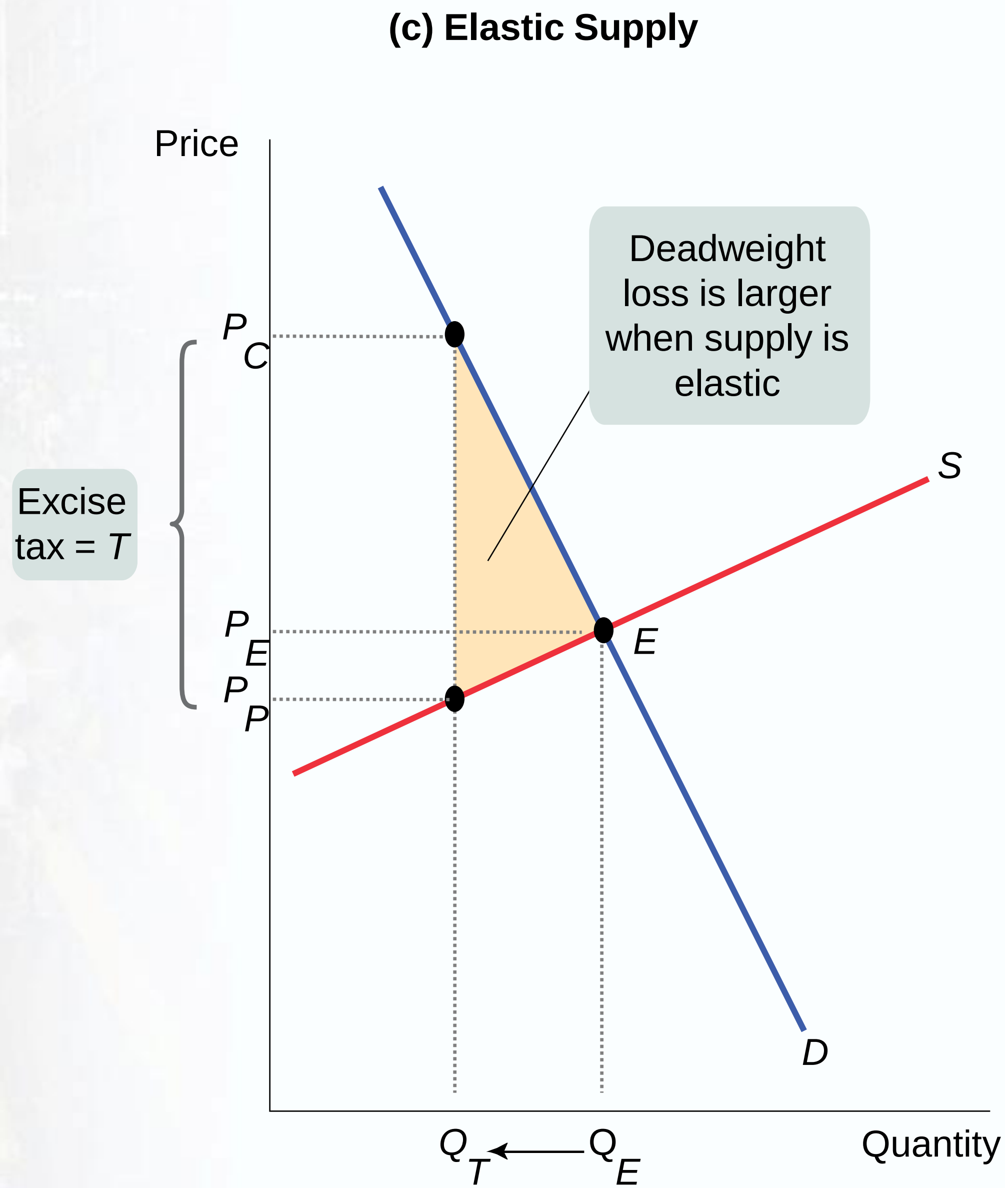
Deadweight Loss and Elasticities



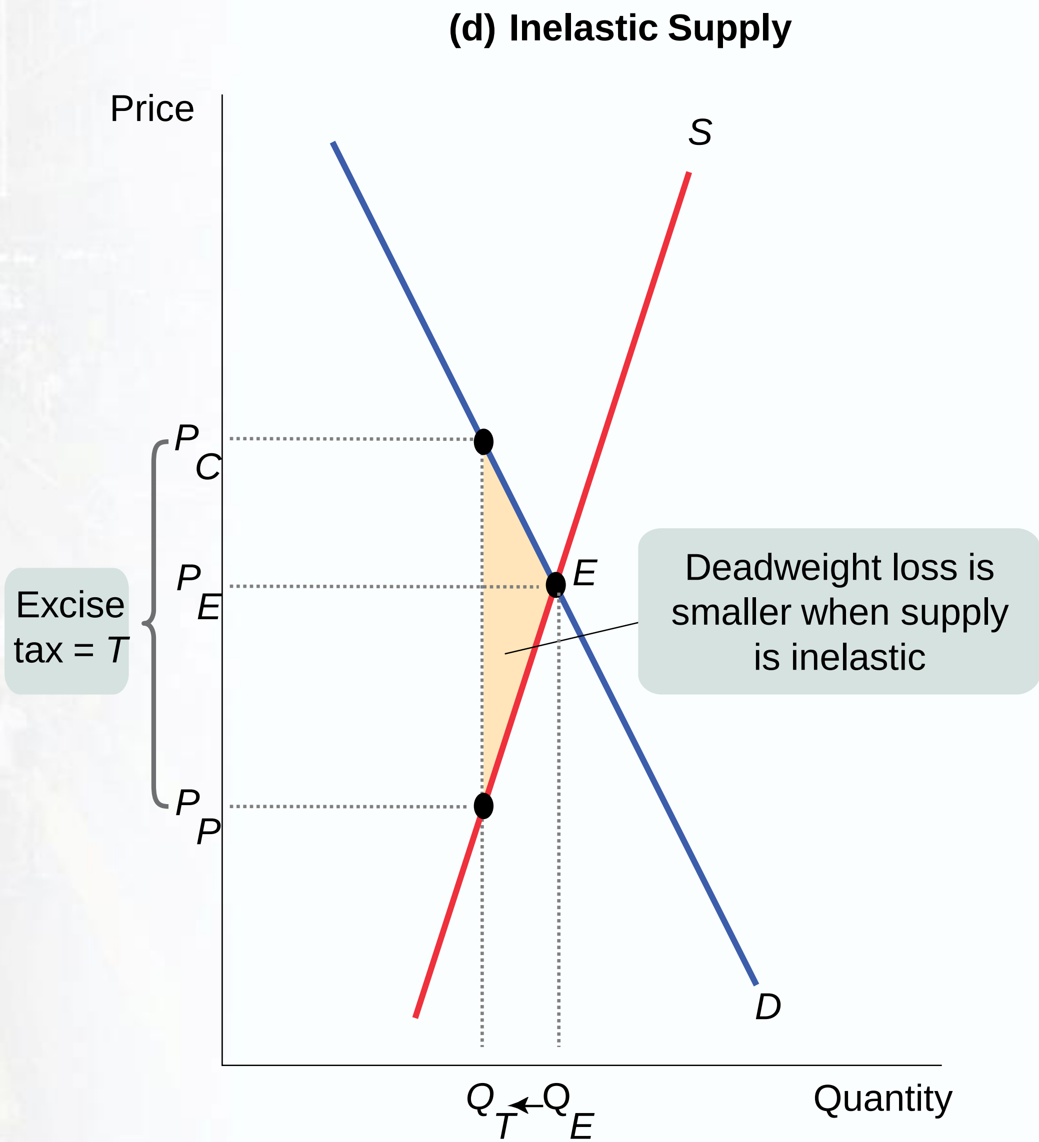
Deadweight Loss and Elasticities



Deadweight Loss and Elasticities



Deadweight Loss and Elasticities



Deadweight Loss and Elasticities

- To minimize the efficiency costs of taxation, one should **choose to tax only those goods for which demand or supply, or both, is relatively inelastic**.
- For such goods, a tax has little effect on behavior because behavior is relatively unresponsive to changes in the price.

Deadweight Loss and Elasticities

- In the extreme case in which demand is perfectly inelastic (a vertical demand curve), the quantity demanded is unchanged by the imposition of the tax. As a result, the tax imposes no deadweight loss.

- Similarly, if supply is perfectly inelastic (a vertical supply curve), the quantity supplied is unchanged by the tax and there is also no deadweight loss.

Deadweight Loss and Elasticities

- If the goal in choosing whom to tax is to **minimize deadweight loss**, then taxes should be imposed on goods and services that have **the most inelastic** response—that is, goods and services for which consumers or producers will change their behavior the least in response to the tax.

ECONOMICS IN ACTION

Taxing the Marlboro Man

- One of the most important excise taxes in the United States is the tax on cigarettes.

TABLE 7-1 Results of Increases in Cigarette Taxes

State	Year	Increase in tax (per pack)	New state tax (per pack)	Change in quantity transacted	Change in tax revenue
Utah	1997	$0.25	$0.52	−20.7%	+86.2%
Maryland	1999	0.30	0.66	−15.3	+52.6
California	1999	0.50	0.87	−18.9	+90.7
Michigan	1994	0.50	0.75	−20.8	+139.9
New York	2000	0.55	1.11	−20.2	+57.4

Source: M. C. Farrelly, C. T. Nimsch, and J. James, "State Cigarette Excise Taxes: Implications for Revenue and Tax Evasion," RTI International 2003.

ECONOMICS IN ACTION

Taxing the Marlboro Man

- The table above shows the results of big increases in cigarette taxes. In each case, sales fell, just as our analysis predicts.

- The tax revenue rose in each case because cigarettes have a low price elasticity of demand.

Tax Fairness and Tax Efficiency

- Two principles:
  - According to the **benefits principle** of tax fairness, those who benefit from public spending should bear the burden of the tax that pays for that spending.
  - According to the **ability-to-pay principle** of tax fairness, those with greater ability to pay a tax should pay more tax.
- A **lump-sum tax** is the same for everyone, regardless of any actions people take.

Tax Fairness and Tax Efficiency

- The fairest taxes, in terms of the ability-to-pay principle, distort incentives the most and perform badly on efficiency grounds.

- In a well-designed tax system, there is a **trade-off between equity and efficiency**: the system can be made more efficient only by making it less fair, and vice versa.

FOR INQUIRING MINDS

Killing the Lawyers

- The tripling of an existing poll tax set off the great English peasant rebellion of 1381.
- Peasants demanded a repeal of the tax.
- One of their slogans was “The first thing to do is to kill all the lawyers.” (Lawyers at that time were responsible for enforcing the tax.)

FOR INQUIRING MINDS

Killing the Lawyers

- The rebels did kill quite a few lawyers and tax collectors; they also burned part of London and came close to taking King Richard II hostage.
- They dispersed after the king promised some concessions—a promise he promptly broke.
- Revolting over unfair taxes is common in the history of many nations.

ECONOMICS IN ACTION

Federal Tax Philosophy

- What is the principle underlying the federal tax system?
- It depends on the tax:
  - Income tax accounts for about half of all federal revenue. The structure of the income tax reflects the ability-to-pay principle: families with low incomes pay little or no income tax. In fact, some families pay negative income tax.
  - The second most important federal tax is FICA.

ECONOMICS IN ACTION

Federal Tax Philosophy

TABLE 7-2 Share of Pre-Tax Income, Federal Income Tax, and Payroll Tax, by Quintile in 2007

Income group	Percent of total pre-tax income received	Percent of total federal income tax paid	Percent of total payroll tax paid
Bottom quintile	4.0%	−3.0%	4.8%
Second quintile	8.4	−0.3	10.8
Third quintile	13.1	4.6	16.6
Fourth quintile	19.3	12.7	24.7
Top quintile	55.9	86.0	42.9

Source: Congressional Budget Office.

ECONOMICS IN ACTION

Federal Tax Philosophy

- As you can see, low-income families actually paid negative income tax through the Earned Income Tax Credit program.
- Even middle-income families paid a substantially smaller share of total income tax collected than their share of total income.

ECONOMICS IN ACTION

Federal Tax Philosophy

- In contrast, the fifth (top) quintile, the richest 20% of families, paid a much higher share of total federal income tax collected compared with their share of total income.
- The fourth column shows the share of total payroll tax collected that is paid by each quintile, and the results are very different: the share of total payroll tax paid by the top quintile is substantially *less* than their share of total income.

U.S. Taxation

TABLE 7-5 Federal, State, and Local Taxes as a Percentage of Income, by Income Category, 2004

Income group	Federal	State and local	Total
Bottom quintile	7.9%	11.8%	19.7%
Second quintile	11.4	11.9	23.3
Third quintile	15.8	11.2	27.0
Fourth quintile	18.7	11.0	29.8
Next 15%	21.1	10.5	31.6
Next 4%	22.5	9.7	32.2
Top 1%	24.6	8.2	32.8
Average	19.8	10.3	30.1

Source: Institute on Taxation and Economic Policy.

Understanding the Tax System

- The **tax base** is the measure or value, such as income or property value, that determines how much tax an individual or firm pays.

- The **tax structure** specifies how the tax depends on the tax base.

- Once the tax base has been defined, the next question is how the tax depends on the base. The simplest tax structure is a **proportional tax**, also sometimes called a *flat tax,* which is the same percentage of the base regardless of the taxpayer's income or wealth.

Understanding the Tax System

TABLE 7-4 Major Taxes in the United States, 2010

Federal taxes ($ billion)		State and local taxes ($ billion)	
Income	$874.6	Income	$262.6
Payroll	986.3	Sales	429.9
Profits	304.3	Profits	87.6
		Property	436.3

Source: Bureau of Economic Analysis.

Understanding the Tax System

Some important taxes and their tax bases are as follows:

- **Income tax**: a tax that depends on the income of an individual or a family from wages and investments
- **Payroll tax**: a tax that depends on the earnings an employer pays to an employee
- **Sales tax**: a tax that depends on the value of goods sold (also known as an excise tax)

Understanding the Tax System

- **Profits tax**: a tax that depends on a firm's profits
- **Property tax**: a tax that depends on the value of property, such as the value of a home
- **Wealth tax**: a tax that depends on an individual's wealth

Understanding the Tax System

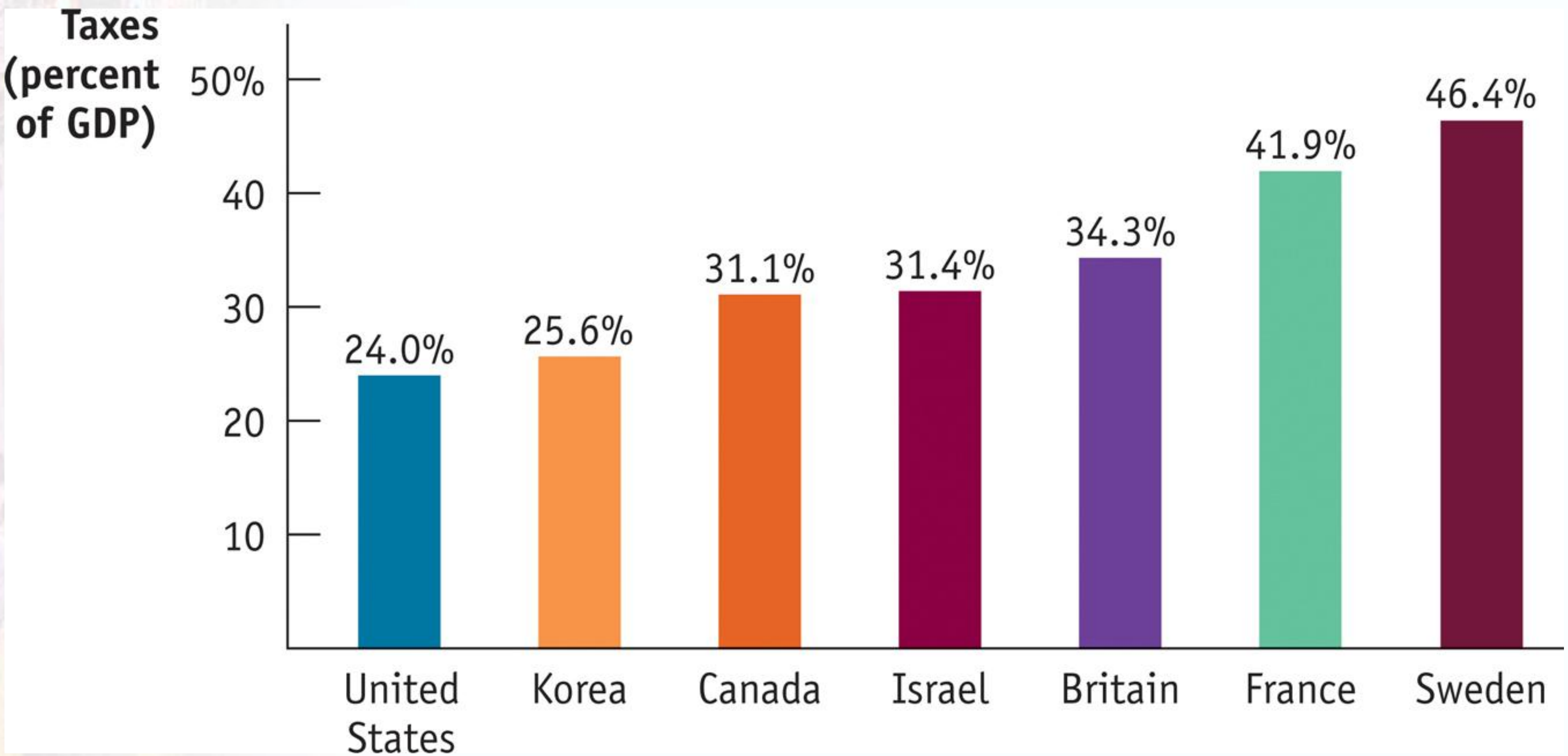
- Once the tax base has been defined, the next question is how the tax depends on the base. The simplest tax structure is a **proportional tax,** also sometimes called a *flat tax,* which is the same percentage of the base regardless of the taxpayer's income or wealth.

Understanding the Tax System

- A **progressive tax** takes a larger share of the income of high-income taxpayers than of low-income taxpayers.
- A **regressive tax** takes a smaller share of the income of high-income taxpayers than of low-income taxpayers.
- The **marginal tax rate** is the percentage of an increase in income that is taxed away.

GLOBAL COMPARISON

You think you pay high taxes?



Different Taxes, Different Principles

- There are two main reasons for the mixture of regressive and progressive taxes in the U.S. system: the difference between levels of government and the fact that different taxes are based on different principles.

- State governments and especially local governments generally do not make much effort to apply the ability-to-pay principle.
  - This is largely because they are subject to tax competition: a state or local government that imposes high taxes on people with high incomes faces the prospect that those people may move to other locations where taxes are lower.

FOR INQUIING MINDS

Taxing Income versus Taxing Consumption

- The U.S. government taxes people mainly on the money they *make,* not on the money they spend on consumption.
- A system that taxes income rather than consumption discourages people from saving and investing, instead providing an incentive to spend their income today.
- Americans tend to save too little for retirement and health expenses in their later years.

FOR INQUIING MINDS

Taxing Income versus Taxing Consumption

- Low savings and investing slow down economic growth.
- Moving from a system that taxes income to one that taxes consumption would solve this problem.
- Currently, the United States does not have a value-added tax because it is difficult to make a consumption tax progressive and a VAT typically has very high administrative costs.

ECONOMICS IN ACTION

The Top Marginal Income Tax Rate

- The amount of money an American owes in federal income taxes is defined in terms of marginal tax rates on successively higher "brackets" of income.

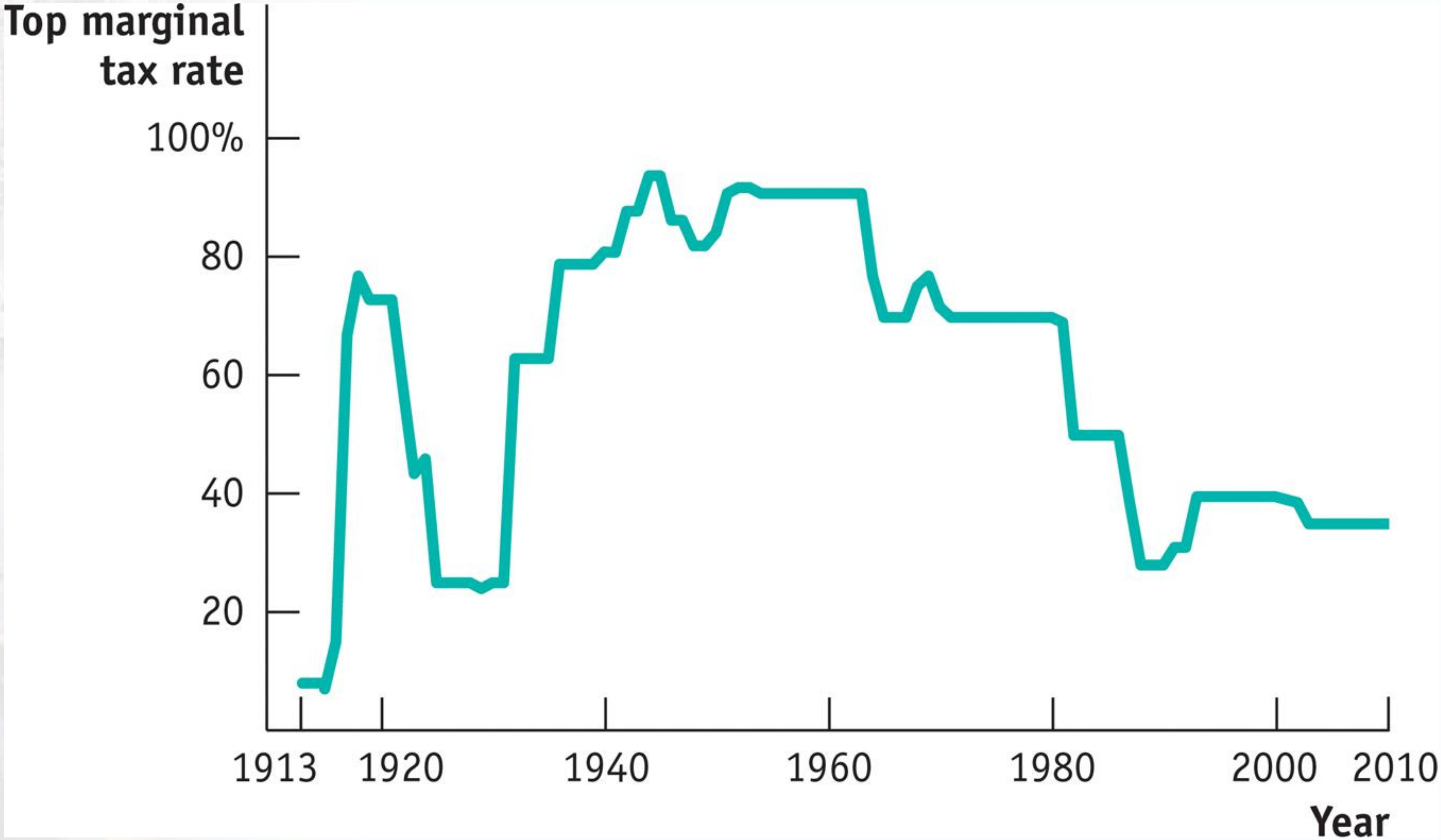
- In 2007 a single person paid:
  - 10% on the first $7,825 of taxable income (i.e., income after subtracting exemptions and deductions);
  - 15% on the next $24,050;
  - and so on up to a top rate of 35% on his or her income if over $349,700.

ECONOMICS IN ACTION

The Top Marginal Income Tax Rate

- Relatively few people (less than 1% of taxpayers) have incomes high enough to pay the top marginal rate.
- In fact, 72% of Americans pay no income tax or they fall into either the 10% or 15% bracket.

ECONOMICS IN ACTION



ECONOMICS IN ACTION

The Top Marginal Income Tax Rate

- The first big increase in the top marginal rate came during World War I (1914) and was reversed after the war ended (1918).
- A huge increase occurred in the top marginal rate during the administration of Franklin Roosevelt (1933–1945).

ECONOMICS IN ACTION

The Top Marginal Income Tax Rate

- There was a sharp reduction during the administration of Ronald Reagan (1981–1989).
- The top marginal income tax rate is often viewed as a useful indicator of the progressivity of the tax system — it shows just how high a tax rate the U.S. government is willing to impose on the very affluent.

Amazon versus BarnesandNoble.com

- Comparison-shop for a book on Amazon versus BarnesandNoble.com, and it's quite likely that the final price on Amazon is cheaper than on BarnesandNoble.com. Why?
- If you compare the final price of *Murder at the Margin* by Marshall Jevons, shipped to New Jersey, the Amazon price is $25.98 versus the BarnesandNoble.com price of $27.52.
    - The difference between the two prices is the $1.54 in NJ sales tax added to the final price by BarnesandNoble.com.
    - In contrast, Amazon doesn't collect the tax on its orders to NJ.

Amazon versus BarnesandNoble.com

- This difference between Amazon and BarnesandNoble.com is the result of interstate tax law.
  - According to the law, online retailers that don't have a physical presence in a given state can sell products in that state without collecting sales tax.

VIDEO

MAKING SEN$E WITH PAUL SOLMAN

- Taxes: How High Is Too High?: http://www.econedlink.org/interactives/index.php?iid=235

SUMMARY

SUMMARY

1. **Excise taxes** — taxes on the purchase or sale of a good—raise the price paid by consumers and reduce the price received by producers, driving a wedge between the two. The **incidence** of the tax—how the burden of the tax is divided between consumers and producers—does not depend on who officially pays the tax.

2. The incidence of an excise tax depends on the price elasticities of supply and demand. If the price elasticity of demand is higher than the price elasticity of supply, the tax falls mainly on producers; if the price elasticity of supply is higher than the price elasticity of demand, the tax falls mainly on consumers.

SUMMARY

SUMMARY

3. The tax revenue generated by a tax depends on the **tax rate** and on the number of units transacted with the tax. Excise taxes cause inefficiency in the form of deadweight loss because they discourage some mutually beneficial transactions. Taxes also impose **administrative costs** — resources used to collect the tax.

SUMMARY

SUMMARY

4. An excise tax generates revenue for the government, but lowers total surplus.

   The loss in total surplus exceeds the tax revenue, resulting in a deadweight loss to society. This deadweight loss is represented by a triangle, the area of which equals the value of the transactions discouraged by the tax.

   The greater the elasticity of demand or supply, or both, the larger the deadweight loss from a tax. If either demand or supply is perfectly inelastic, there is no deadweight loss from a tax.

SUMMARY

5. An efficient tax minimizes both the sum of the deadweight loss due to distorted incentives and the administrative costs of the tax. However, tax fairness, or tax equity, is also a goal of tax policy.

6. There are two major principles of tax fairness, the **benefits principle** and the **ability-to-pay principle**. The most efficient tax, a **lump-sum tax**, does not distort incentives but performs badly in terms of fairness. The fairest taxes in terms of the ability-to-pay principle, however, distort incentives the most and perform badly on efficiency grounds. So, in a well-designed tax system, there is a **trade-off between equity and efficiency**.

SUMMARY

SUMMARY

7. Every tax consists of a **tax base**, which defines what is taxed, and a **tax structure**, which specifies how the tax depends on the tax base.

   Different tax bases give rise to different taxes—the **income tax**, **payroll tax** , **sales tax**, **profits tax** , **property tax**, and **wealth tax**..

SUMMARY

SUMMARY

8. A tax is **progressive** if higher-income people pay a higher percentage of their income in taxes than lower-income people and **regressive** if they pay a lower percentage. Progressive taxes are often justified by the ability-to-pay principle.

   However, a highly progressive tax system significantly distorts incentives because it leads to a high **marginal tax rate**, the percentage of an increase in income that is taxed away, on high earners.

   The U.S. tax system is progressive overall, although it contains a mixture of progressive and regressive taxes.

KEY TERMS

KEY TERM

- Excise tax
- Incidence
- Tax rate
- Administrative costs
- Benefits principle
- Ability-to-pay principle
- Lump-sum tax
- Trade-off between equity and efficiency
- Tax base
- Tax structure
- Income tax
- Payroll tax
- Sales tax
- Profits tax
- Property tax
- Wealth tax
- Proportional tax
- Progressive tax
- Regressive tax
- Marginal tax rate