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PRINCIPLES OF

ECONOMICS

Eight Edition

CHAPTER

8

Application: The Costs of Taxation

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Deadweight Loss of Taxation, Part 1

- Tax on a good levied on buyers
  - Demand curve shifts downward
    - By the size of tax
- Tax on a good levied on sellers
  - Supply curve shifts upward
    - By the size of tax

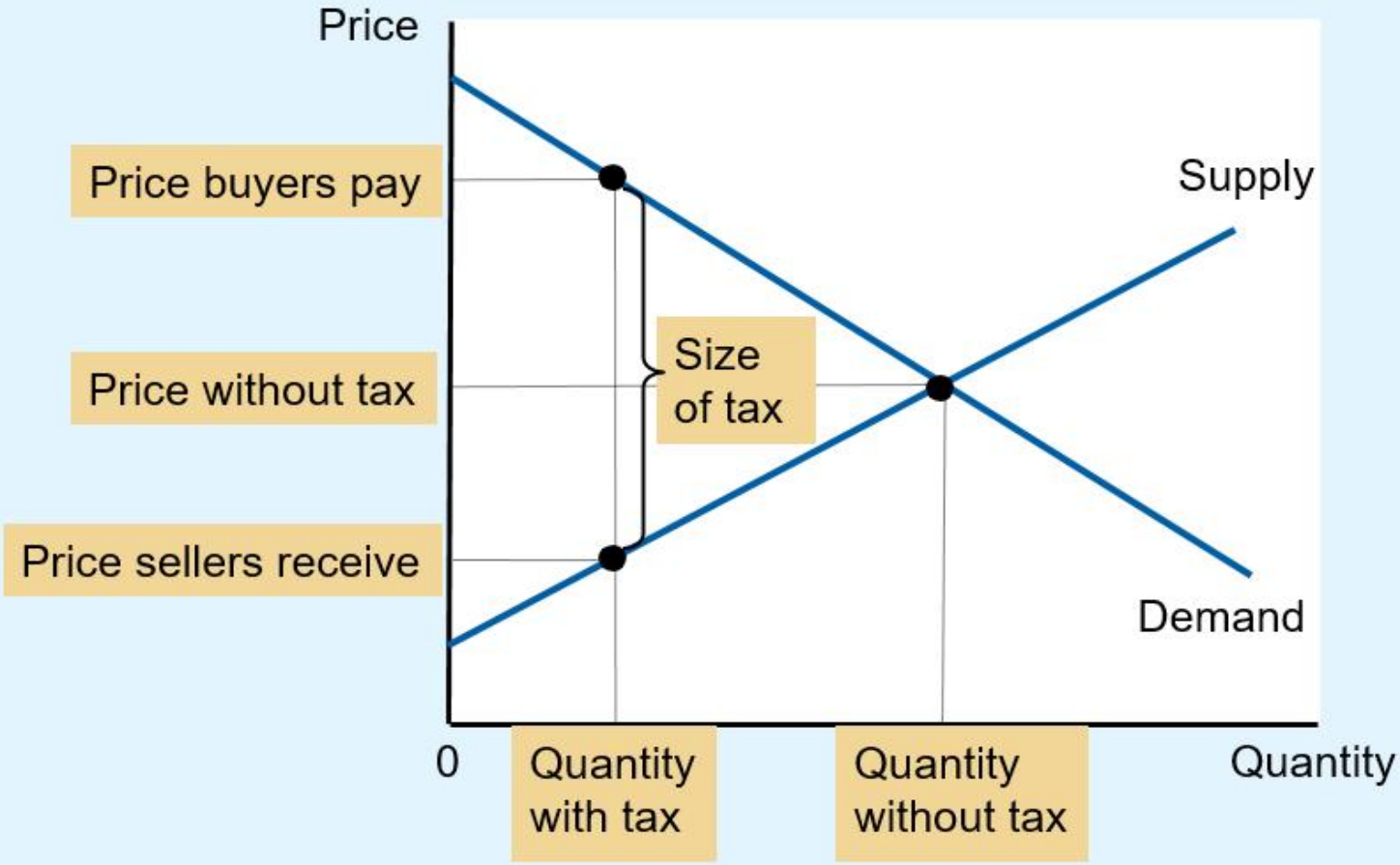
Deadweight Loss of Taxation, Part 2

- Tax on a good levied on buyers or on sellers
  - Same outcome: a price wedge
  - Price paid by buyers rises
  - Price received by sellers falls
  - Lower quantity sold

Deadweight Loss of Taxation, Part 3

- Tax burden
  - Distributed between producers and consumers
  - Determined by elasticities of supply and demand
- Market for the good
  - Smaller

Figure 1 The Effects of a Tax



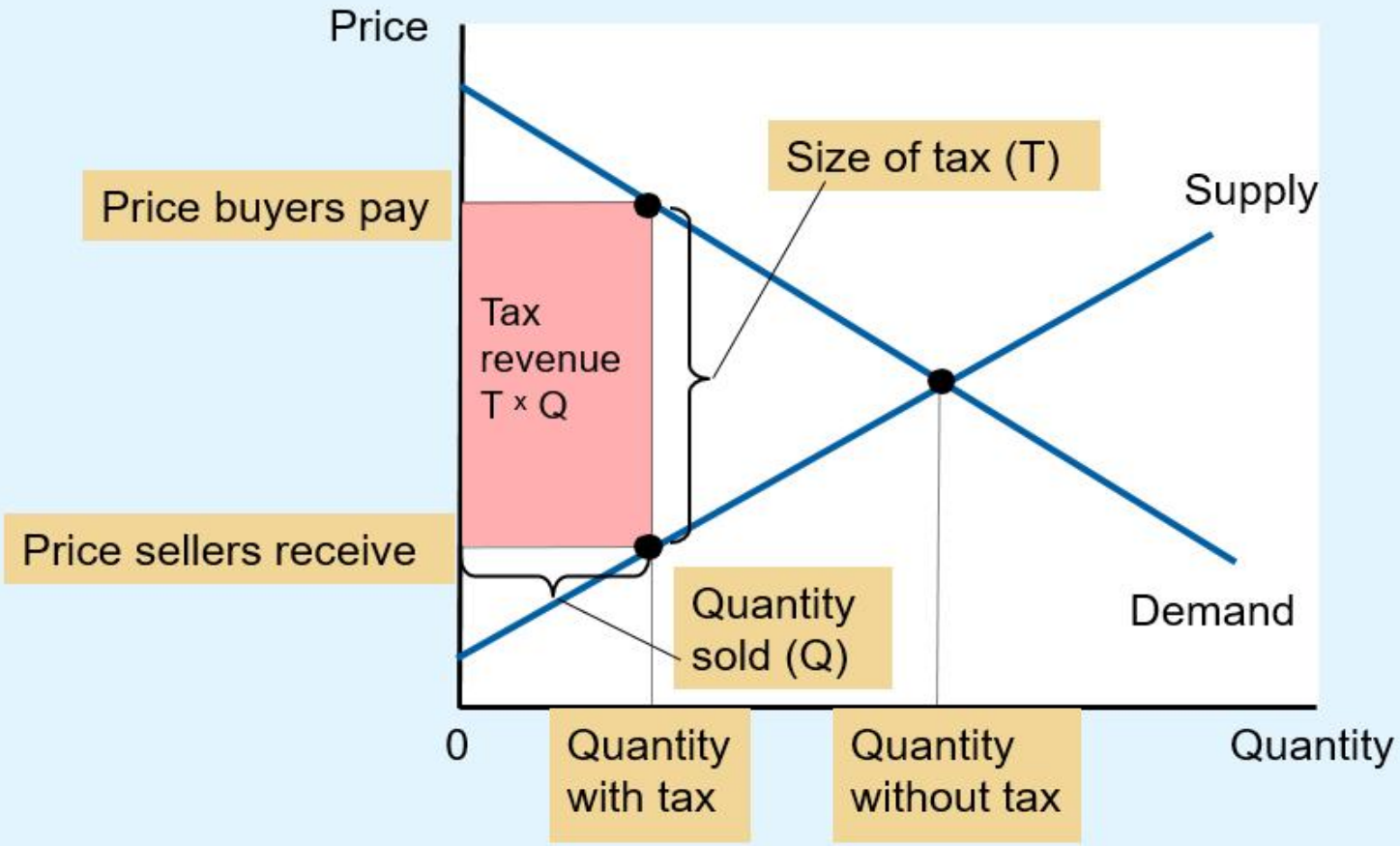
A tax on a good places a wedge between the price that buyers pay and the price that sellers receive.
The quantity of the good sold falls.

Deadweight Loss of Taxation, Part 4

- Economic welfare
  - Buyers: consumer surplus
  - Sellers: producer surplus
  - Government: total tax revenue
    - Tax times quantity sold
    - Public benefit from the tax

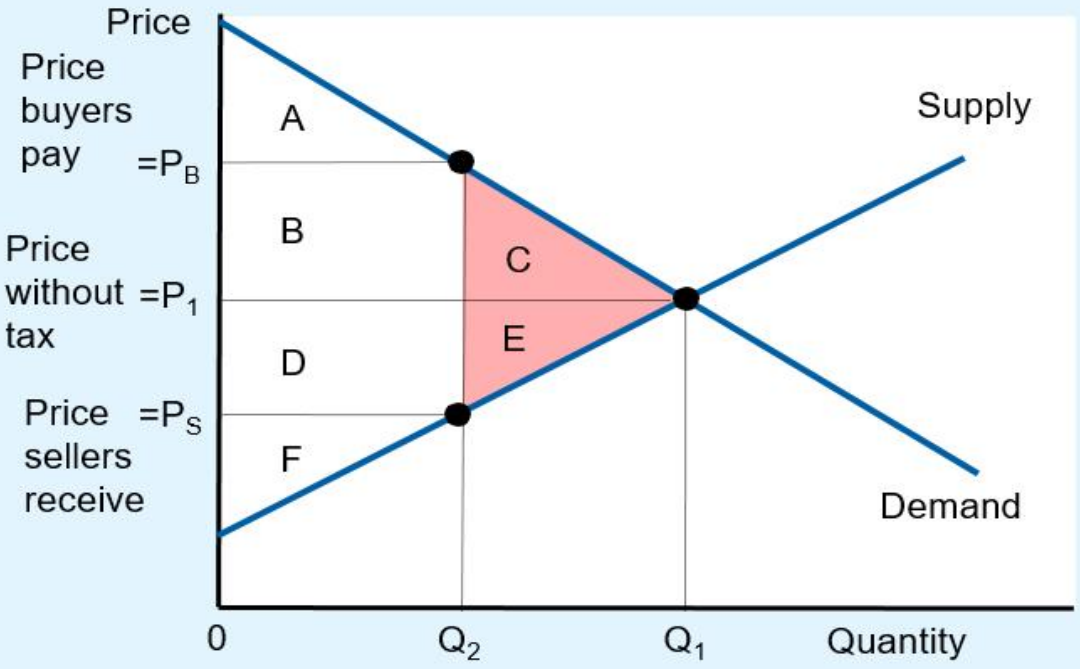
"You know, the idea of taxation with representation doesn't appeal to me very much, either."

Figure 2 Tax Revenue



The tax revenue that the government collects equals T × Q, the size of the tax T times the quantity sold Q. Thus, tax revenue equals the area of the rectangle between the supply and demand curves.

Figure 3 How a Tax Affects Welfare



A tax on a good reduces consumer surplus (by the area B + C) and producer surplus (by the area D + E). Because the fall in producer and consumer surplus exceeds tax revenue (area B + D), the tax is said to impose a deadweight loss (area C + E).

	Without Tax	With Tax	Change
Consumer Surplus	A + B + C	A	− (B + C)
Producer Surplus	D + E + F	F	− (D + E)
Tax Revenue	None	B + D	+ (B + D)
Total Surplus	A + B + C + D + E + F	A + B + D + F	− (C + E)

The area C + E shows the fall in total surplus and is the deadweight loss of the tax.

Deadweight Loss of Taxation, Part 5

- Welfare without a tax
  - Consumer surplus, areas A, B, and C
  - Producer surplus, areas D, E, and F
  - Total tax revenue = 0
- Welfare with tax
  - Smaller consumer surplus, area A
  - Smaller producer surplus, area F
  - Total tax revenue, areas B and D
  - Smaller overall welfare

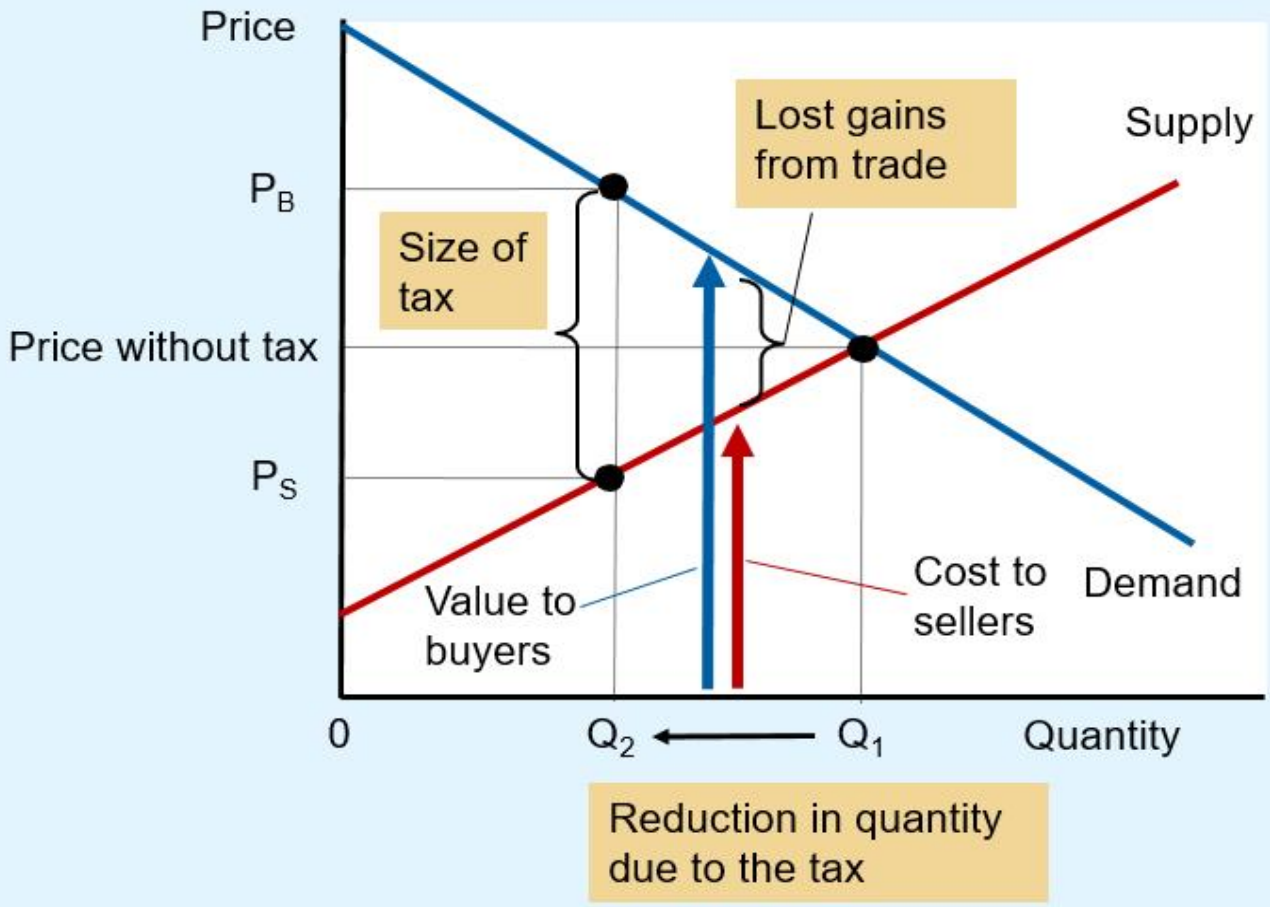
Deadweight Loss of Taxation, Part 6

- Losses of surplus to buyers and sellers, from a tax
  - Exceed the revenue raised by the government
- Deadweight loss
  - Fall in total surplus that results from a market distortion, such as a tax
- Taxes distort incentives
  - Markets allocate resources inefficiently

Deadweight Loss of Taxation, Part 7

- Deadweight losses and gains from trade
  - Taxes cause deadweight losses
    - Prevent buyers and sellers from realizing some of the gains from trade
  - The gains from trade
    - Difference between buyers' value and sellers' cost are less than the tax
    - Once the tax is imposed some trades are not made: deadweight loss

Figure 4 The Source of a Deadweight Loss

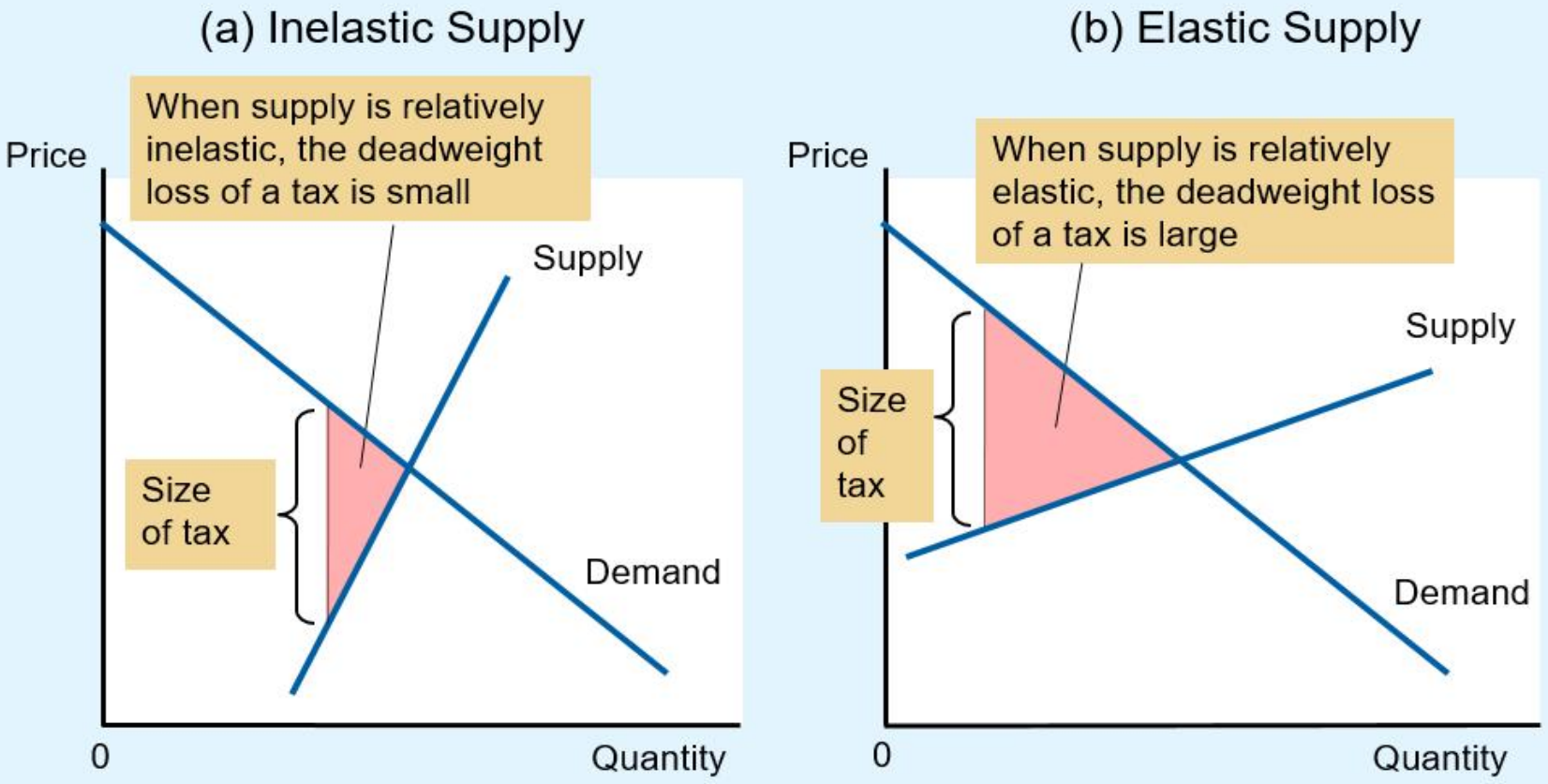


When the government imposes a tax on a good, the quantity sold falls from Q_1 to Q_2. At every quantity between Q_1 and Q_2, the potential gains from trade among buyers and sellers are not realized. These lost gains from trade create the deadweight loss.

Determinants of Deadweight Loss

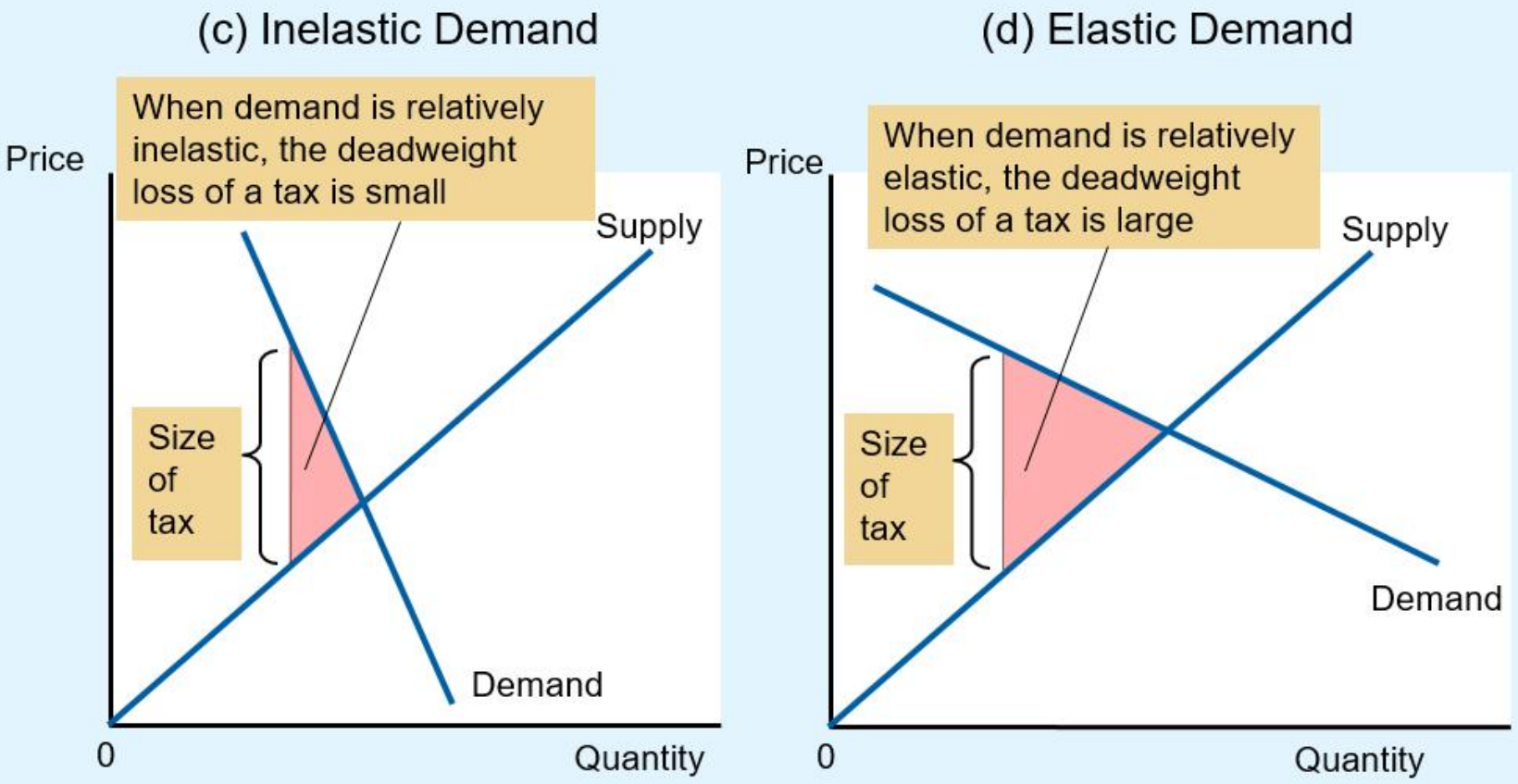
- Price elasticities of supply and demand
  - More elastic supply curve
    - Larger deadweight loss
  - More elastic demand curve
    - Larger deadweight loss
- The greater the elasticities of supply and demand
  - The greater the deadweight loss of a tax

Figure 5 Tax Distortions and Elasticities (a, b)



In panels (a) and (b), the demand curve and the size of the tax are the same, but the price elasticity of supply is different. Notice that the more elastic the supply curve, the larger the deadweight loss of the tax.

Figure 5 Tax Distortions and Elasticities (c, d)



In panels (c) and (d), the supply curve and the size of the tax are the same, but the price elasticity of demand is different. Notice that the more elastic the demand curve, the larger the deadweight loss of the tax.

CASE STUDY

The deadweight loss debate, Part 1

- How big should the government be?
  - The larger the deadweight loss of taxation
    - The larger the cost of any government program
  - If taxes impose large deadweight losses
    - These losses are a strong argument for a leaner government that does less and taxes less
  - If taxes impose small deadweight losses
    - Government programs are less costly

CASE STUDY

The deadweight loss debate, Part 2

- How big are the deadweight losses of taxation?
  - Economists disagree
  - Tax on labor (the labor tax)
    - Social Security tax, Medicare tax, much of federal income tax
    - Places a wedge between the wage that firms pay and the wage that workers receive
    - *Marginal tax rate* on labor income is 40% (tax rate on the last dollar of earnings)

CASE STUDY

The deadweight loss debate, Part 3

- 40% labor tax: Small or large deadweight loss?

- Some believe labor supply is fairly inelastic
  - Almost vertical
    - Most people would work full-time regardless of wage
  - Tax on labor: small deadweight loss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"What's your position on the elasticity of labor supply?"

CASE STUDY

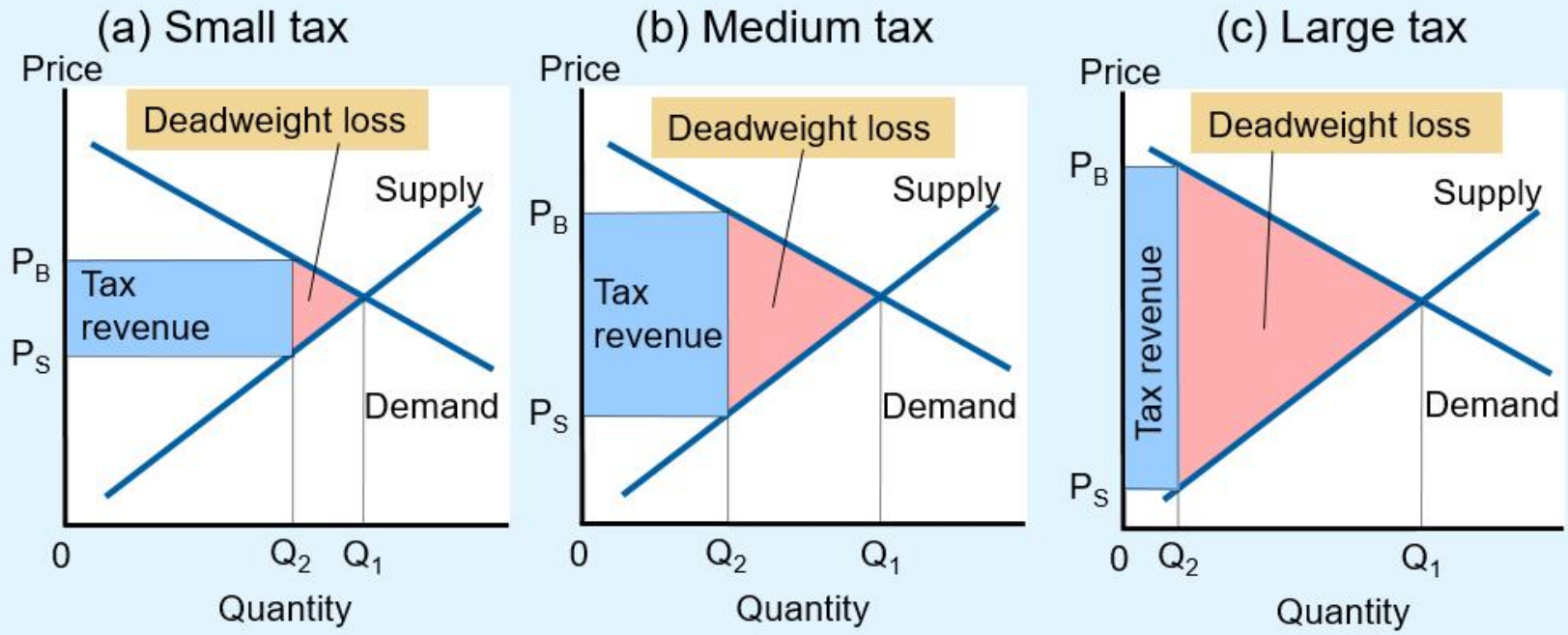
The deadweight loss debate, Part 4

- Others: labor supply is more elastic
  - Tax on labor: greater deadweight loss
    - Many workers can adjust the number of hours they work (overtime)
    - Some families have second earners; some discretion over whether to do unpaid work at home or paid work in the marketplace
    - Many of the elderly can choose when to retire
    - Some people consider engaging in illegal economic activity (underground economy)

Deadweight Loss & Tax Revenue

- As the tax increases
  - Deadweight loss increases
    - Even more rapidly than the size of the tax
  - Tax revenue
    - Increases initially
    - Then decreases
    - The higher tax: drastically reduces the size of the market

Figure 6 How Deadweight Loss and Tax Revenue Vary with the Size of a Tax (a, b, c)



The deadweight loss is the reduction in total surplus due to the tax. Tax revenue is the amount of the tax multiplied by the amount of the good sold.

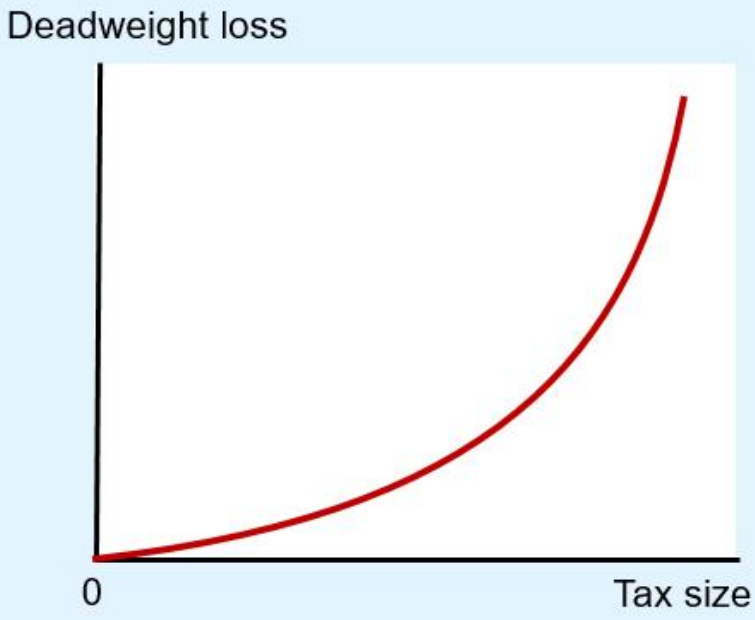
In panel (a), a small tax has a small deadweight loss and raises a small amount of revenue.

In panel (b), a somewhat larger tax has a larger deadweight loss and raises a larger amount of revenue.

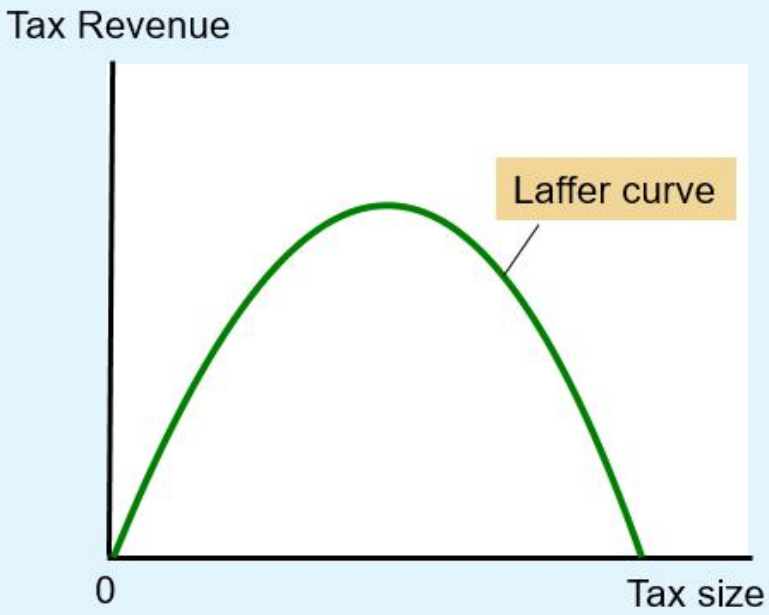
In panel (c), a very large tax has a very large deadweight loss, but because it has reduced the size of the market so much, the tax raises only a small amount of revenue.

Figure 6 How Deadweight Loss and Tax Revenue Vary with the Size of a Tax (d, e)

(d) From panel (a) to panel (c), deadweight loss continually increases



(e) From panel (a) to panel (c), tax revenue first increases, then decreases



Panels (d) and (e) summarize these conclusions.
Panel (d) shows that as the size of a tax grows larger, the deadweight loss grows larger.
Panel (e) shows that tax revenue first rises and then falls. This relationship is called the Laffer curve.

CASE STUDY

The Laffer curve and supply-side economics, Part 1

- 1974, economist Arthur Laffer
  - Laffer curve
  - Supply-side economics
  - Tax rates were so high that reducing them would actually raise tax revenue
- Ronald Reagan's experience in film industry
  - High tax rates caused less work
  - Low tax rates caused more work

CASE STUDY

The Laffer curve and supply-side economics, Part 2

- Ronald Reagan ran for president in 1980
  - Platform: cutting taxes
  - Argument
    - Taxes were so high that they were discouraging hard work
    - Lower taxes would give people the proper incentive to work
  - Raise economic well-being
  - Perhaps increase tax revenue

CASE STUDY

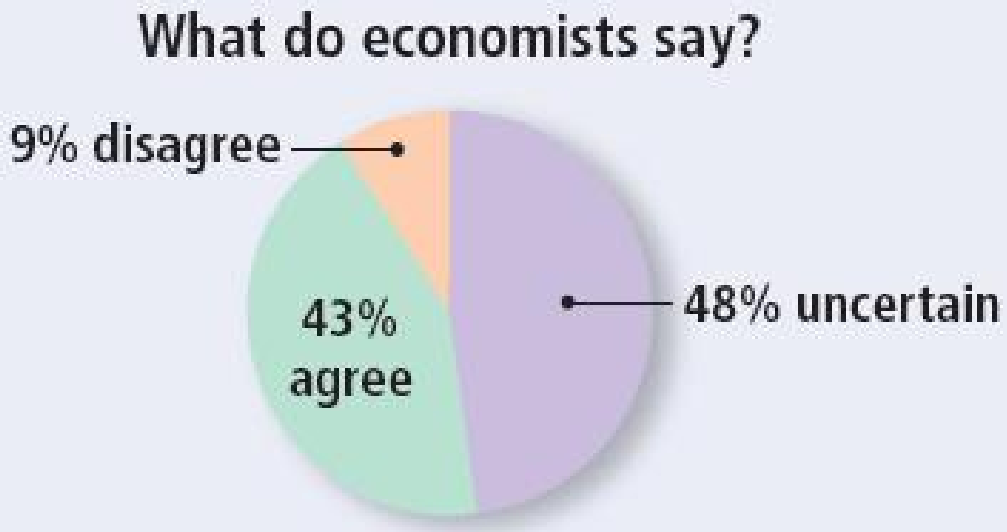
The Laffer curve and supply-side economics, Part 3

- Economists
  - Continue to debate Laffer's argument
  - No consensus about the size of the relevant elasticities
- General lesson:
  - Change in tax revenue from a tax change depends on how the tax change affects people's behavior

ASK THE EXPERTS, Part 1

The Laffer Curve

"A cut in federal income tax rates in the United States right now would lead to higher national income within five years than without the tax cut."



ASK THE EXPERTS, Part 2

The Laffer Curve

"A cut in federal income tax rates in the United States right now would raise taxable income enough so that the annual total tax revenue would be higher within five years than without the tax cut."