



Application: The Costs of Taxation

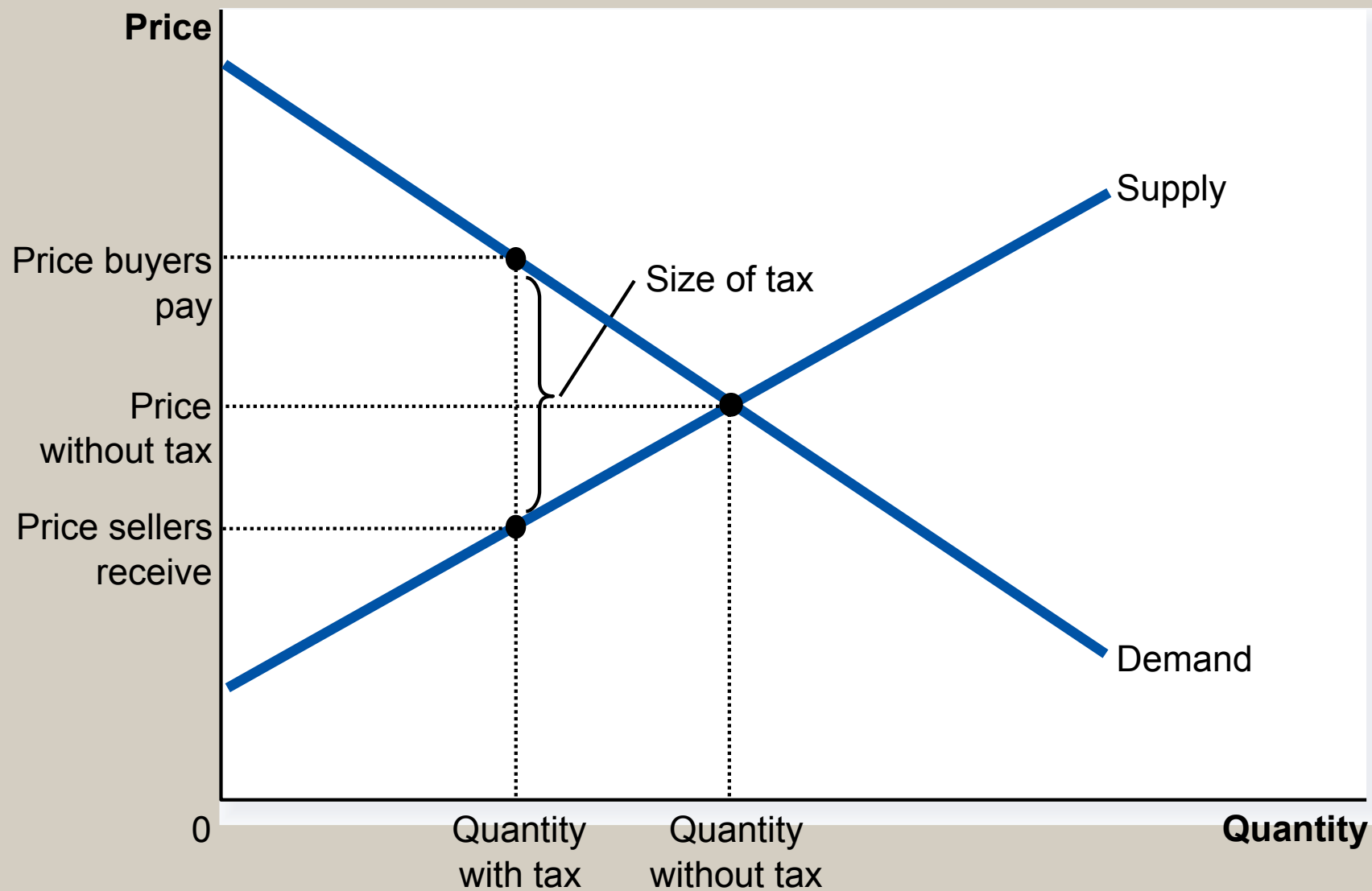
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THE DEADWEIGHT LOSS OF TAXATION

- How do taxes affect the economic well-being of market participants?



Figure 1 The Effects of a Tax



How a Tax Affects Market Participants

- A tax places a *wedge* between the price buyers pay and the price sellers receive.
- Because of this tax wedge, the quantity sold falls below the level that would be sold without a tax.
- The size of the market for that good shrinks.

How a Tax Affects Market Participants

- Tax Revenue

- T = the size of the tax
- Q = the quantity of the good sold

$T \times Q$ = the government's tax revenue

Figure 2 Tax Revenue

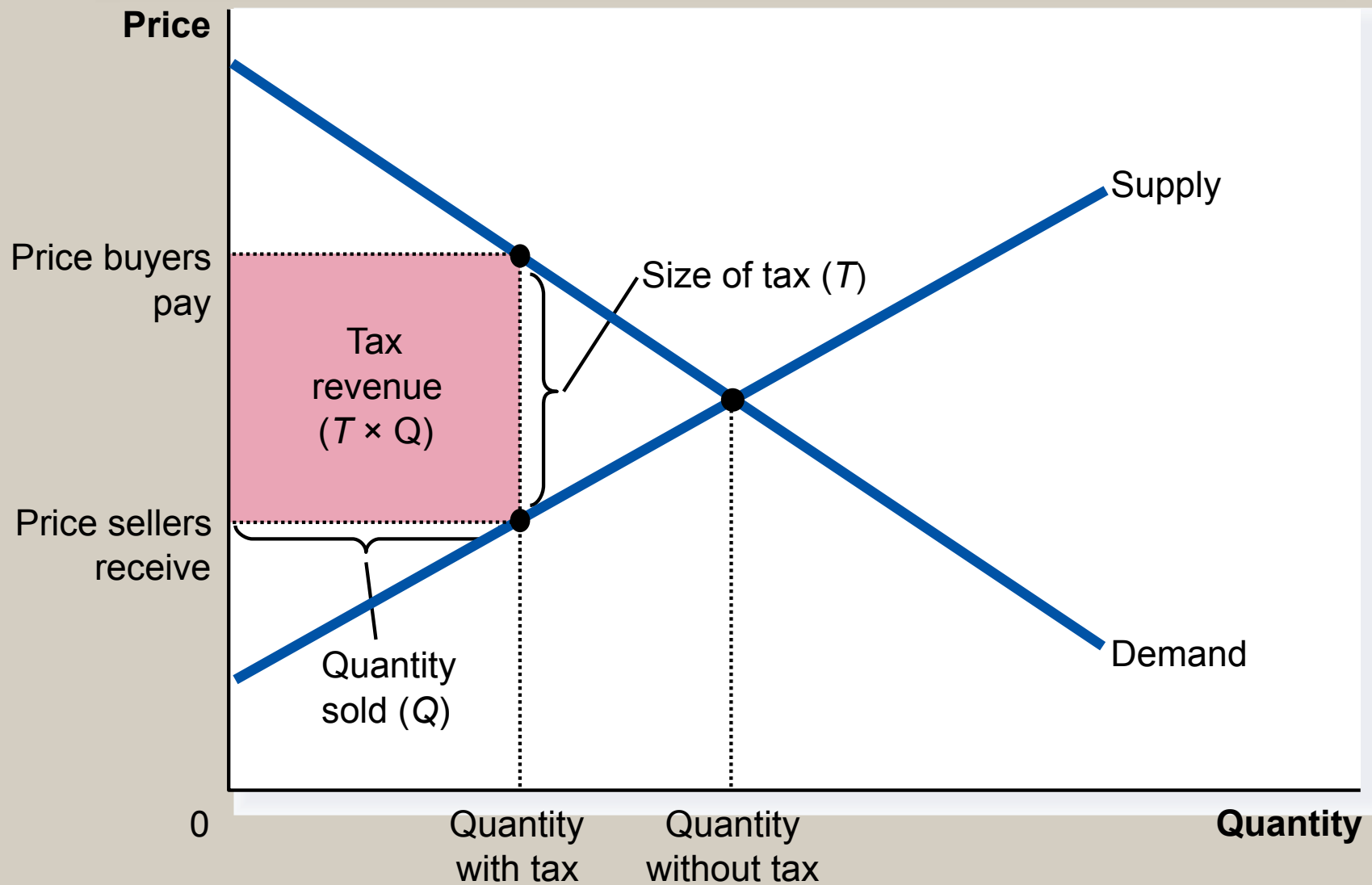
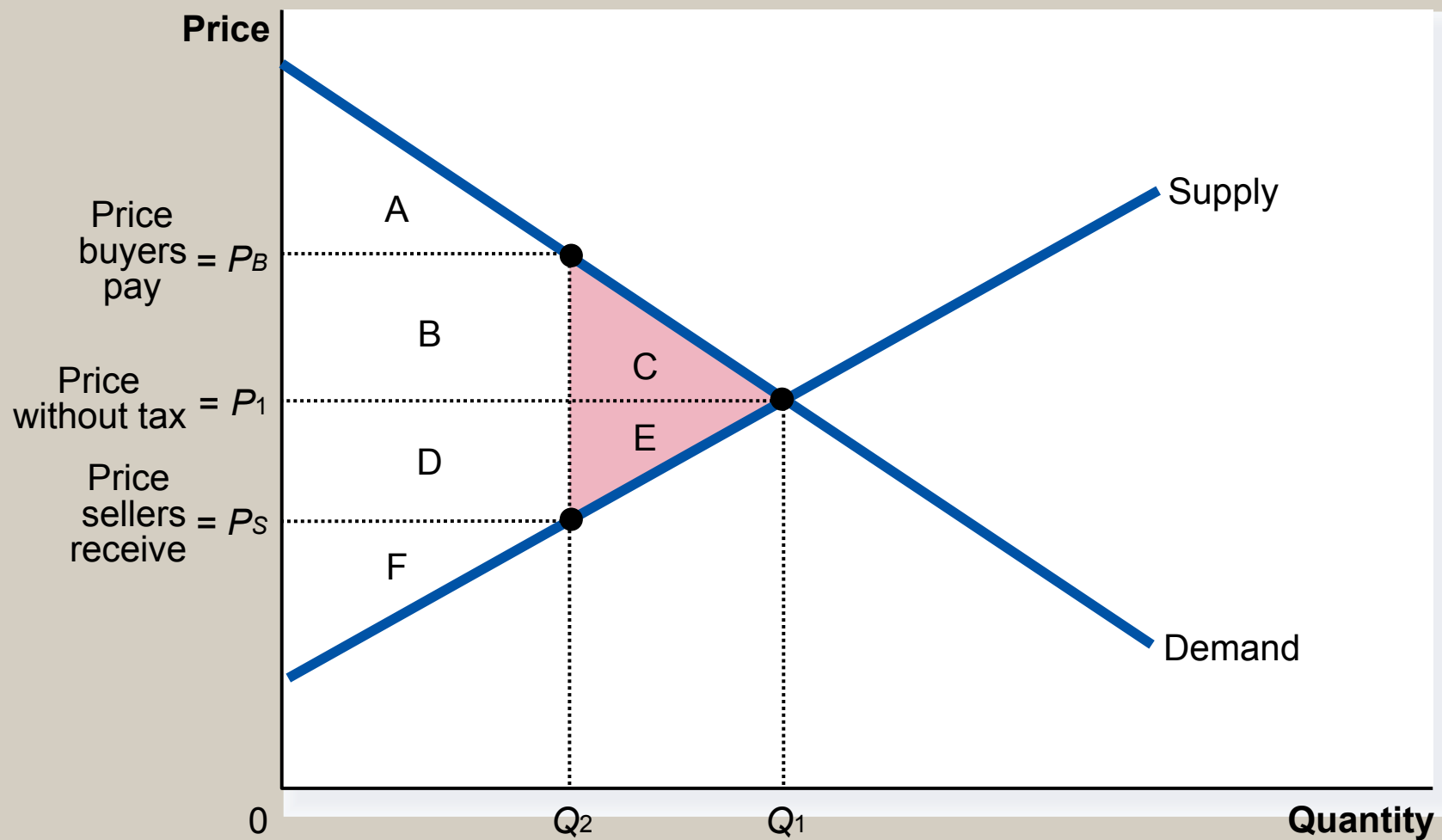


Figure 3 How a Tax Effects Welfare



How a Tax Affects Market Participants

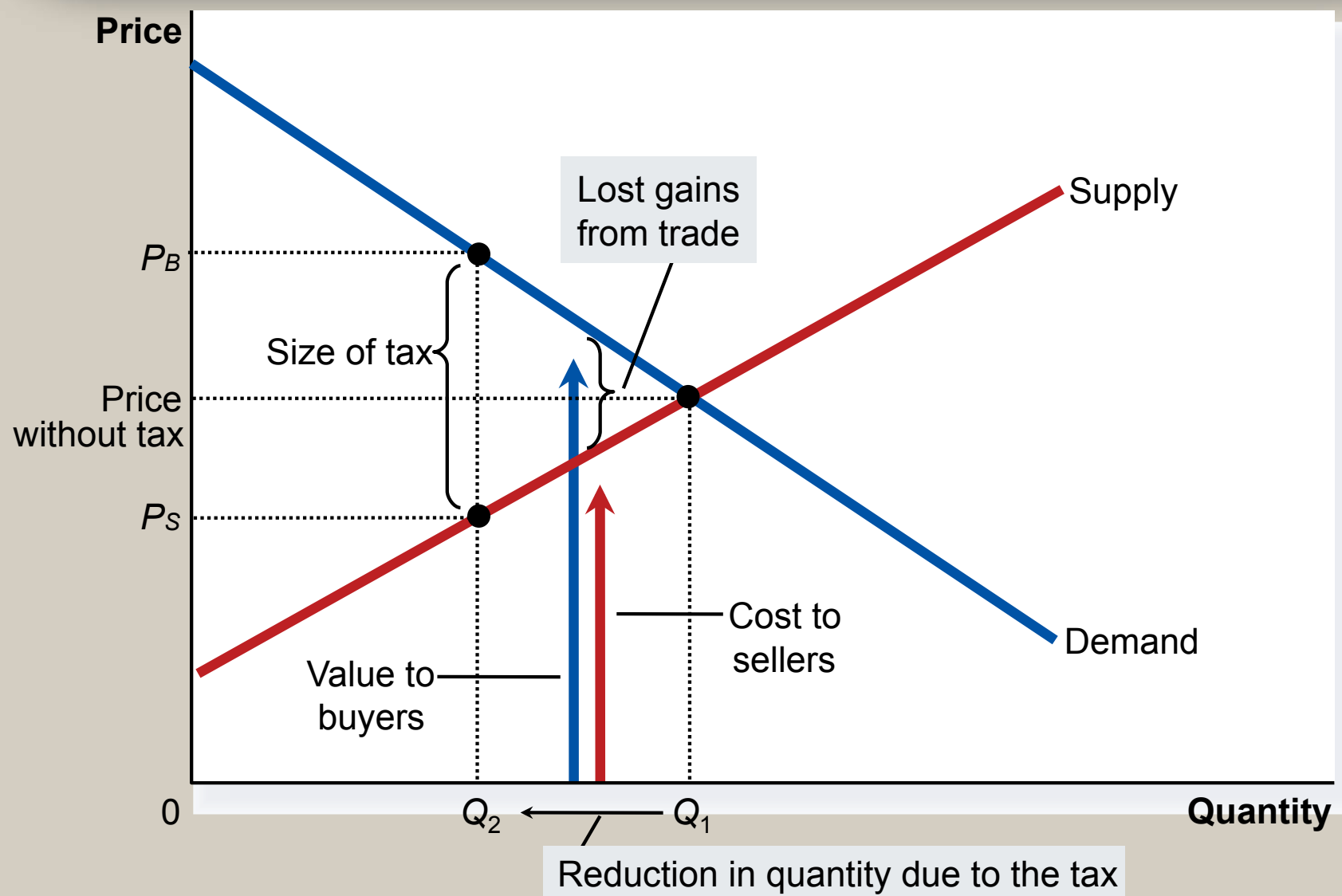
- Changes in Welfare
 - A *deadweight loss* is the fall in total surplus that results from a market distortion, such as a tax.

How a Tax Affects Welfare

	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.

Figure 4 The Deadweight Loss



DETERMINANTS OF THE DEADWEIGHT LOSS

- What determines whether the deadweight loss from a tax is large or small?
 - The magnitude of the deadweight loss depends on how much the quantity supplied and quantity demanded respond to changes in the price.
 - That, in turn, depends on the price elasticities of supply and demand.

Figure 5 Tax Distortions and Elasticities

(a) Inelastic Supply

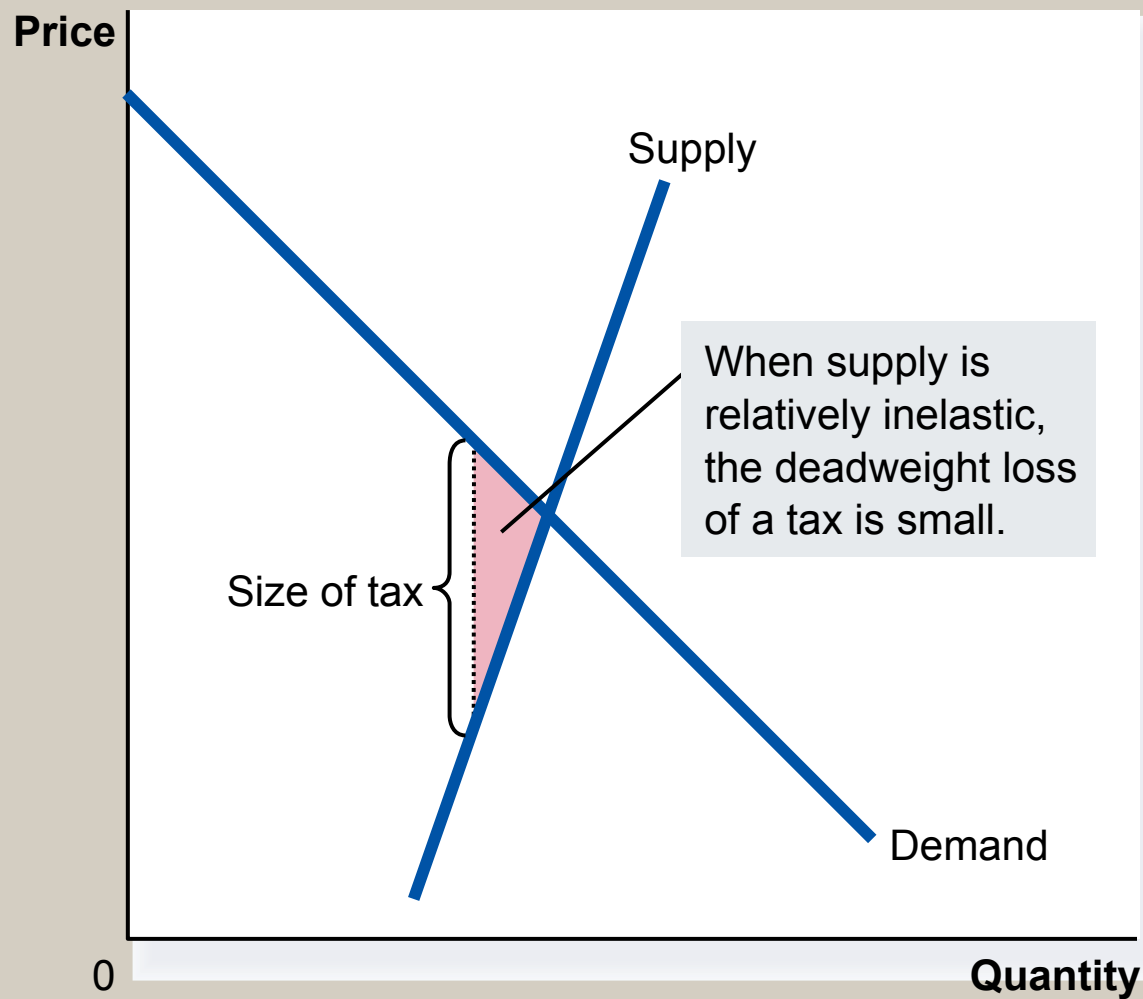


Figure 5 Tax Distortions and Elasticities

(b) Elastic Supply

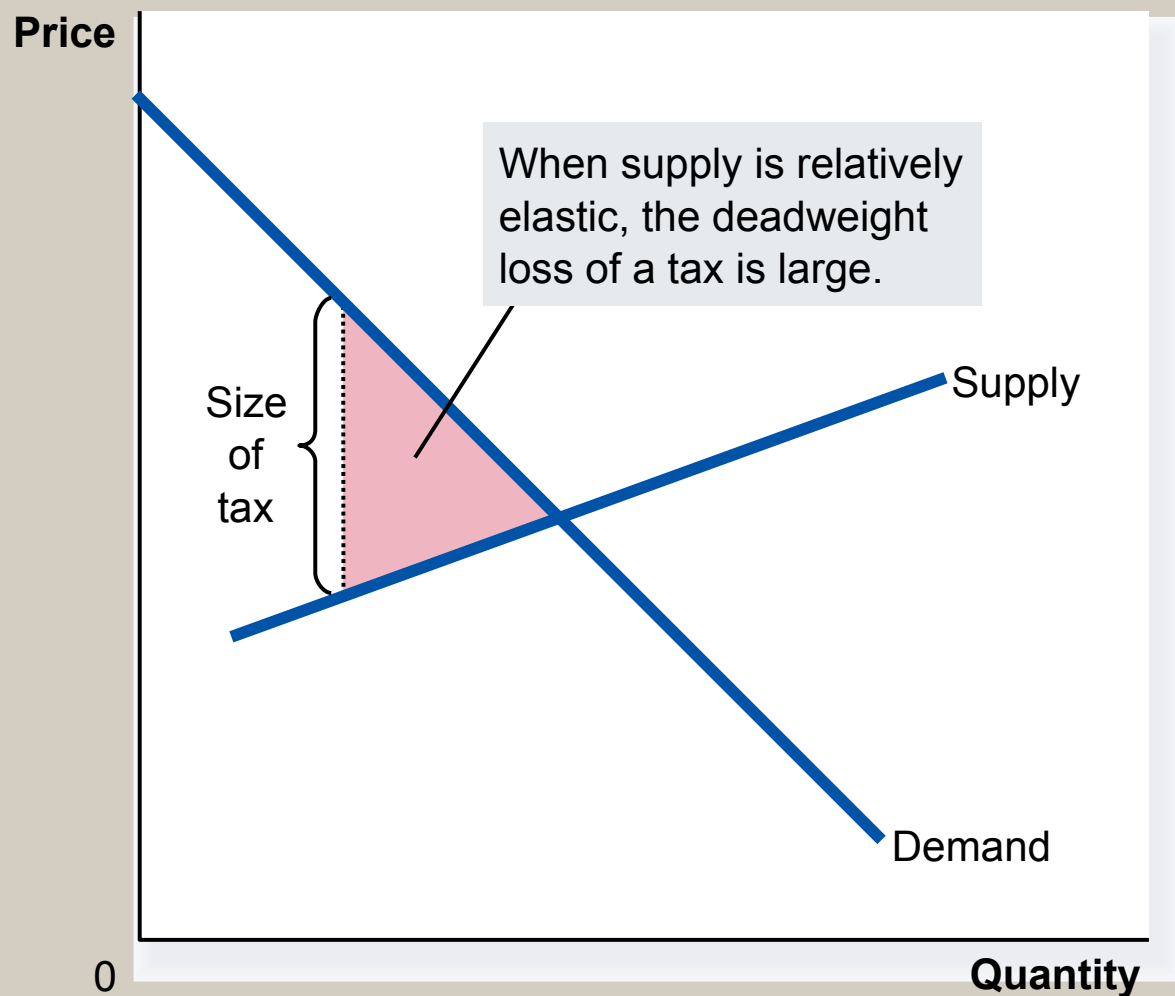


Figure 5 Tax Distortions and Elasticities

(c) Inelastic Demand

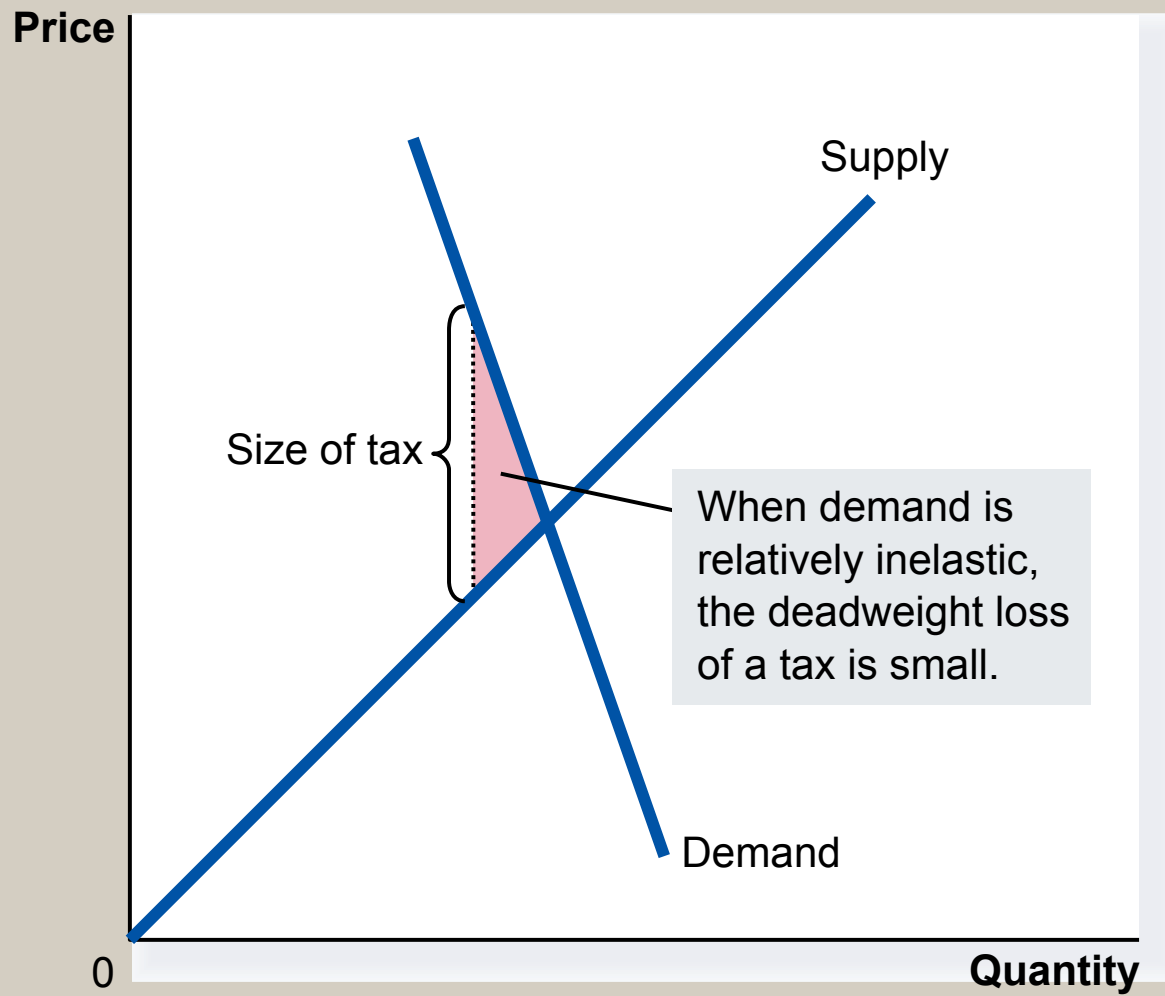
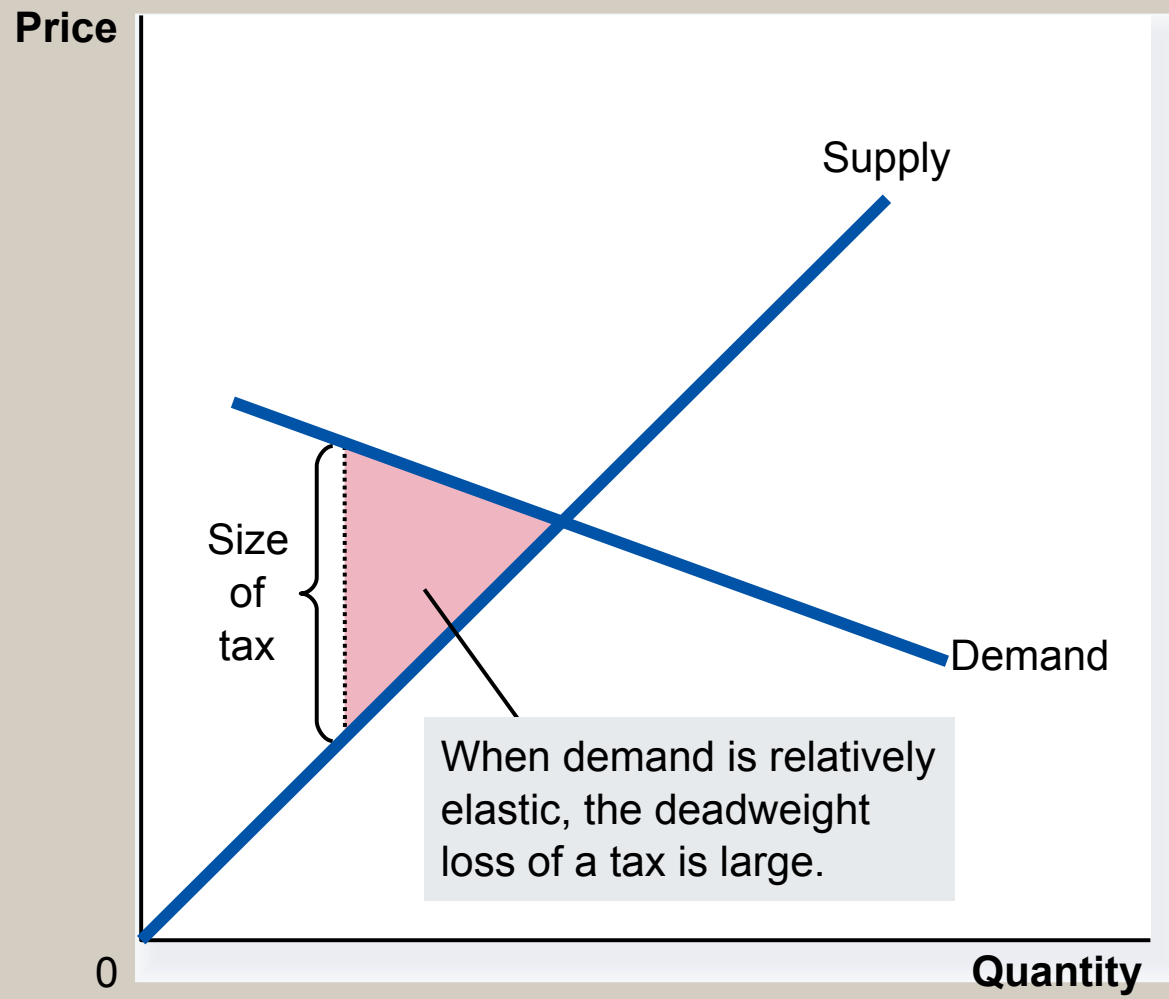


Figure 5 Tax Distortions and Elasticities

(d) Elastic Demand



DETERMINANTS OF THE DEADWEIGHT LOSS

- The greater the elasticities of demand and supply:
 - the larger will be the decline in equilibrium quantity and,
 - the greater the deadweight loss of a tax.

DEADWEIGHT LOSS AND TAX REVENUE AS TAXES VARY

- With each increase in the tax rate, the deadweight loss of the tax rises even more rapidly than the size of the tax.

Figure 6 Deadweight Loss and Tax Revenue from Three Taxes of Different Sizes

(a) Small Tax

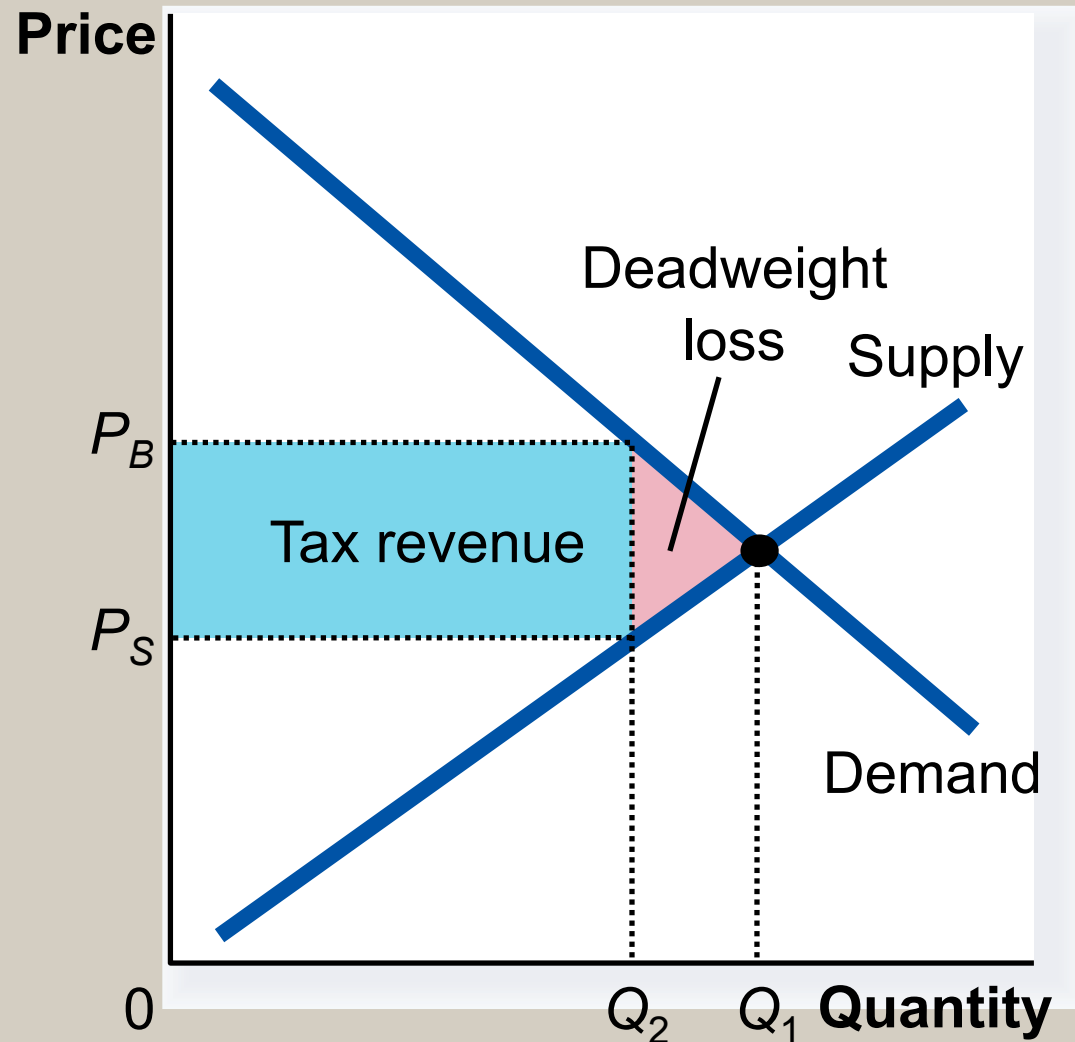


Figure 6 Deadweight Loss and Tax Revenue from Three Taxes of Different Sizes

(b) Medium Tax

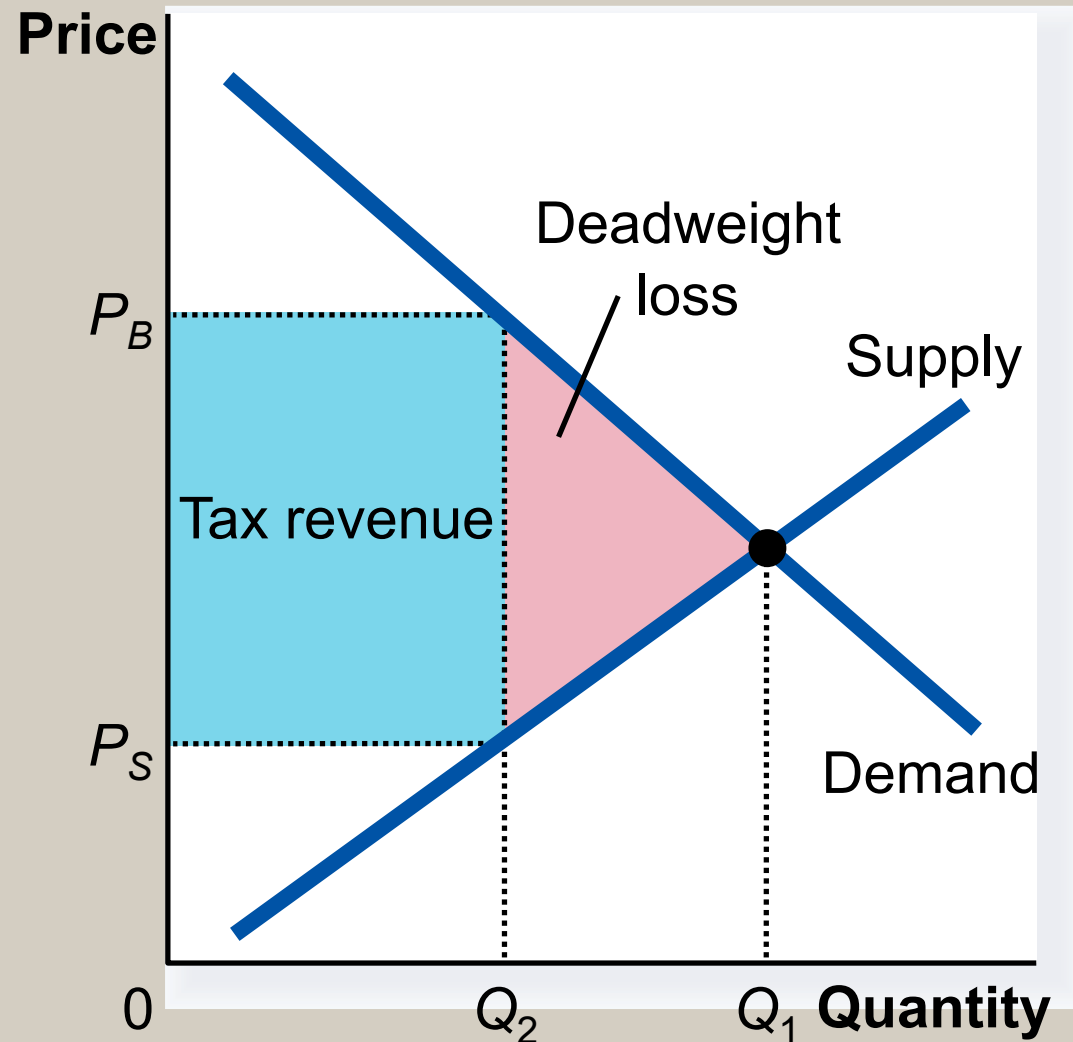
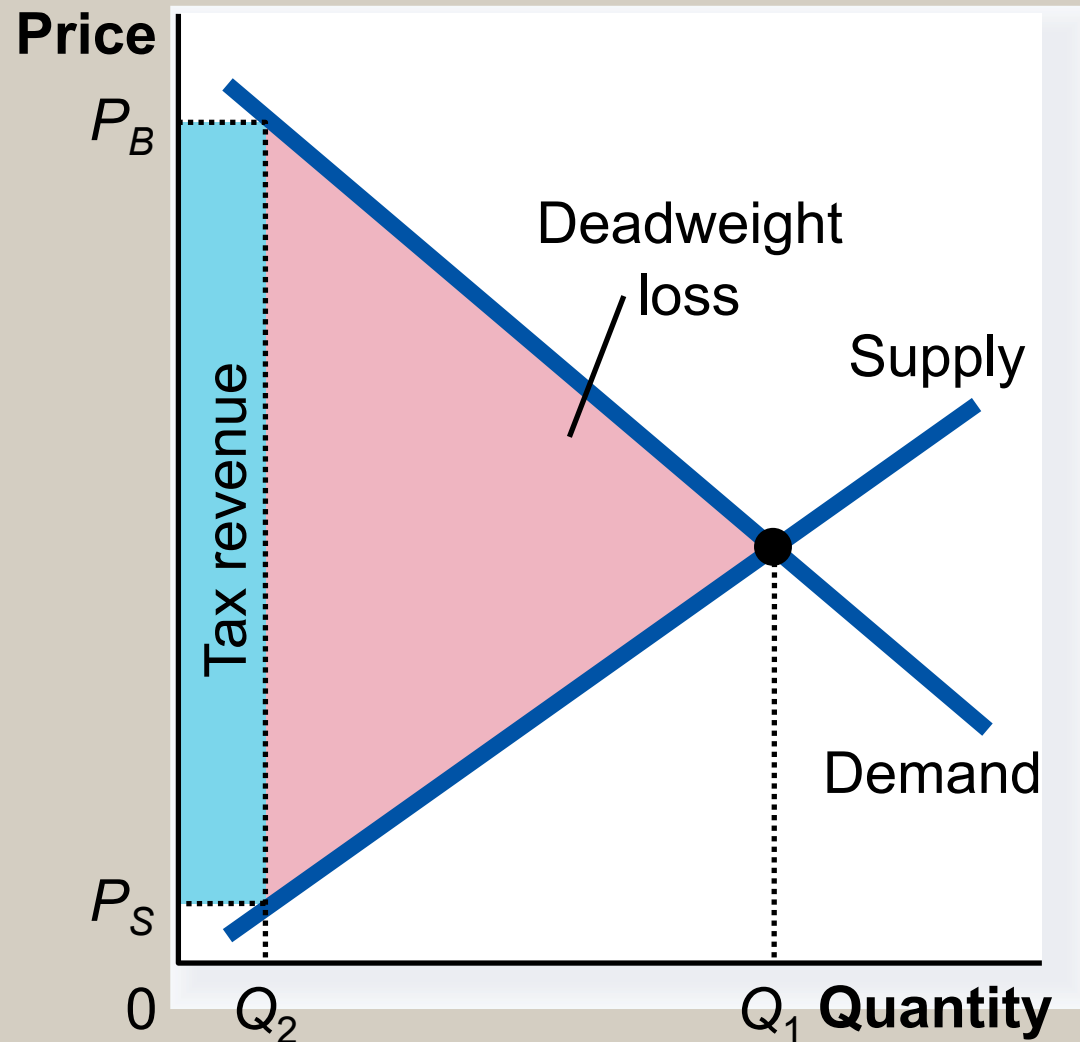


Figure 6 Deadweight Loss and Tax Revenue from Three Taxes of Different Sizes

(c) Large Tax



DEADWEIGHT LOSS AND TAX REVENUE AS TAXES VARY

- For the small tax, tax revenue is small.
- As the size of the tax rises, tax revenue grows.
- But as the size of the tax continues to rise, tax revenue falls because the higher tax reduces the size of the market.

Figure 7 How Deadweight Loss and Tax Revenue Vary with the Size of a Tax

(a) Deadweight Loss

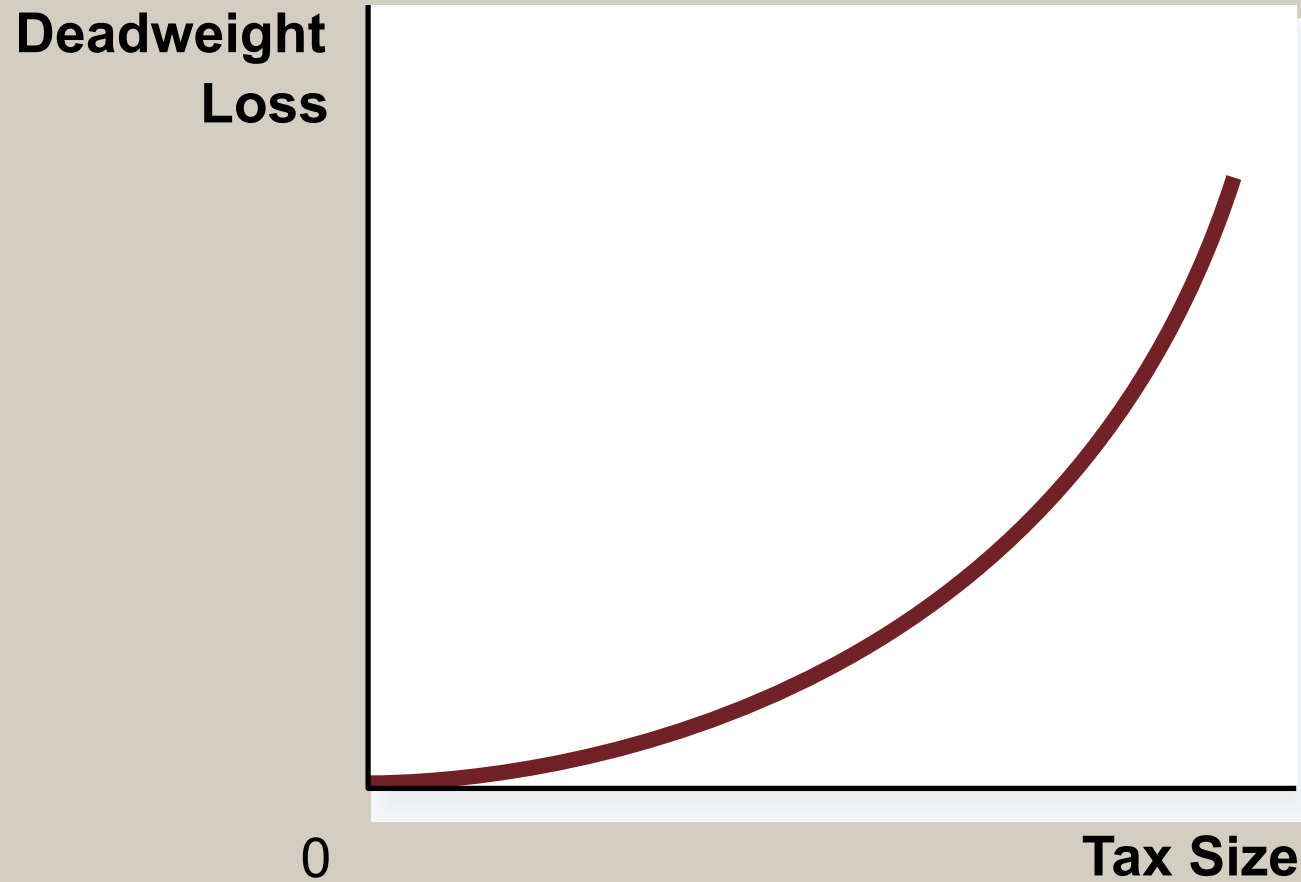
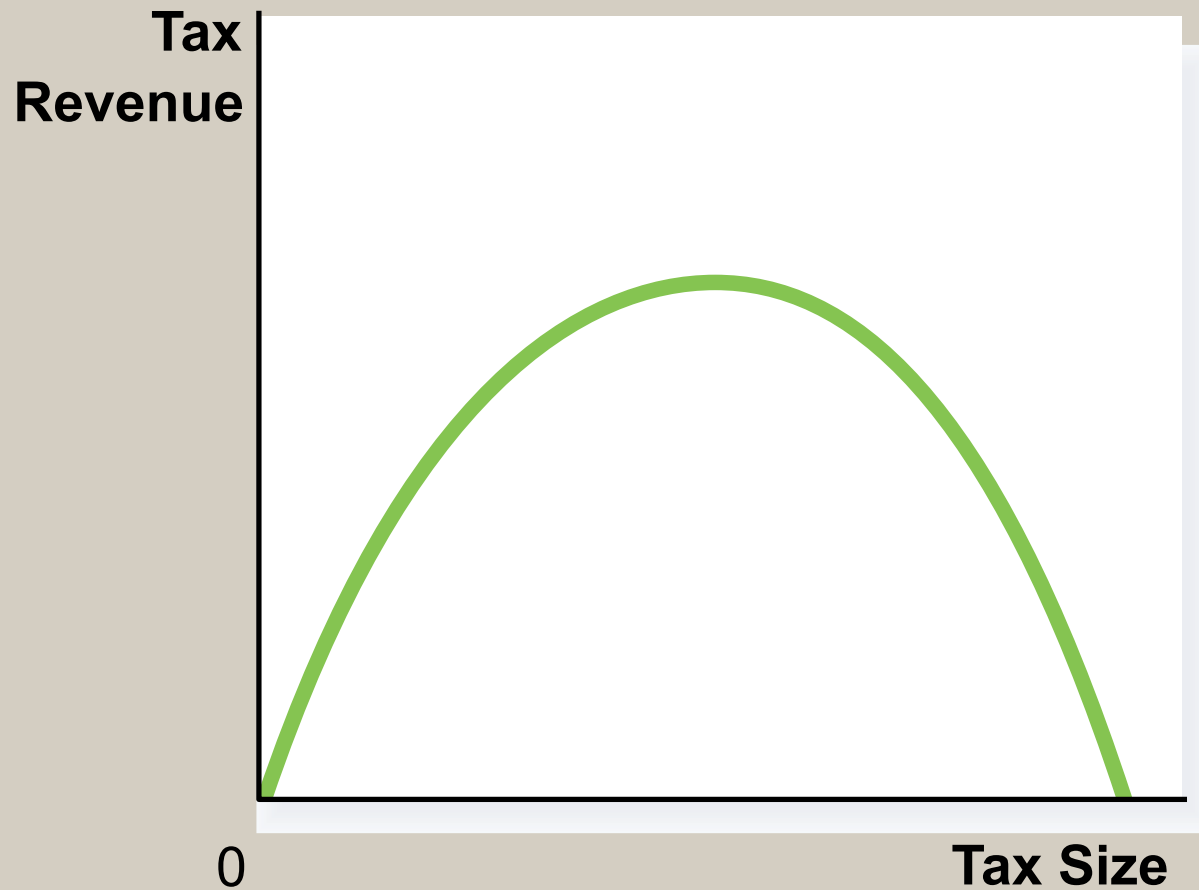


Figure 7 How Deadweight Loss and Tax Revenue Vary with the Size of a Tax

(b) Revenue (the Laffer curve)



CASE STUDY: The Laffer Curve and Supply-side Economics

- The *Laffer curve* depicts the relationship between tax rates and tax revenue.
- *Supply-side economics* refers to the views of Reagan and Laffer who proposed that a tax cut would induce more people to work and thereby have the potential to increase tax revenues.