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The Efficiency of Markets and the Costs of Taxation: Consumer Surplus

Consumer and Producer Surplus

- Welfare economics
 - The study of how the allocation of resources affects economic well-being
- Recall that markets create value.
 - Economic welfare is composed of two measures of market value:
 - Consumer surplus
 - Producer surplus

Consumer Surplus

TABLE 6.1

Willingness to Pay for a New Economics Textbook

Buyer	Willingness to pay
Beanie	\$200
Mitch	\$150
Frank	\$100

- Intuition of willingness to pay?
- If the actual price of the textbook is \$151, which buyer(s) will purchase the book?

Consumer Surplus

TABLE 6.1

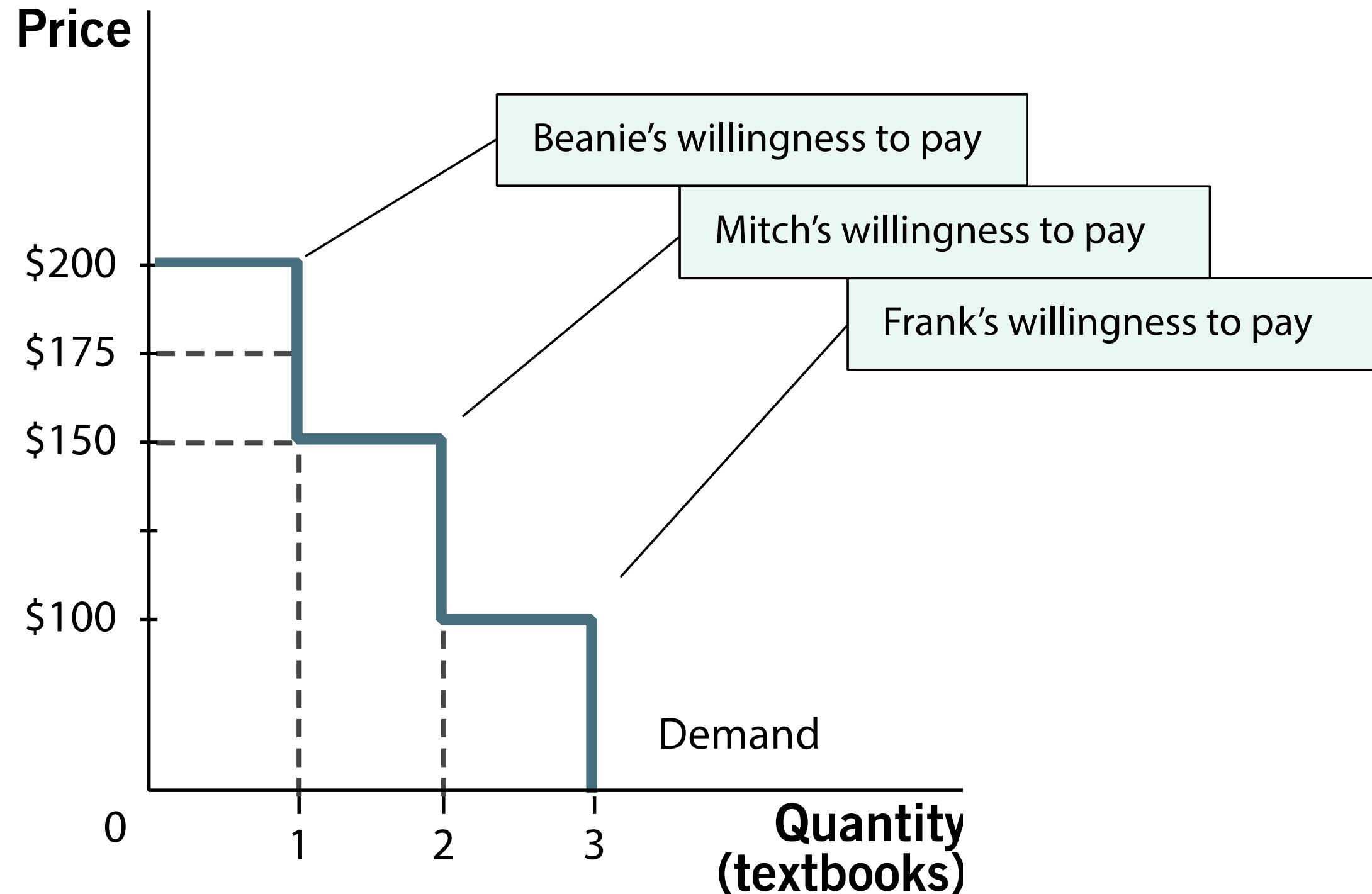
Willingness to Pay for a New Economics Textbook

Buyer	Willingness to pay
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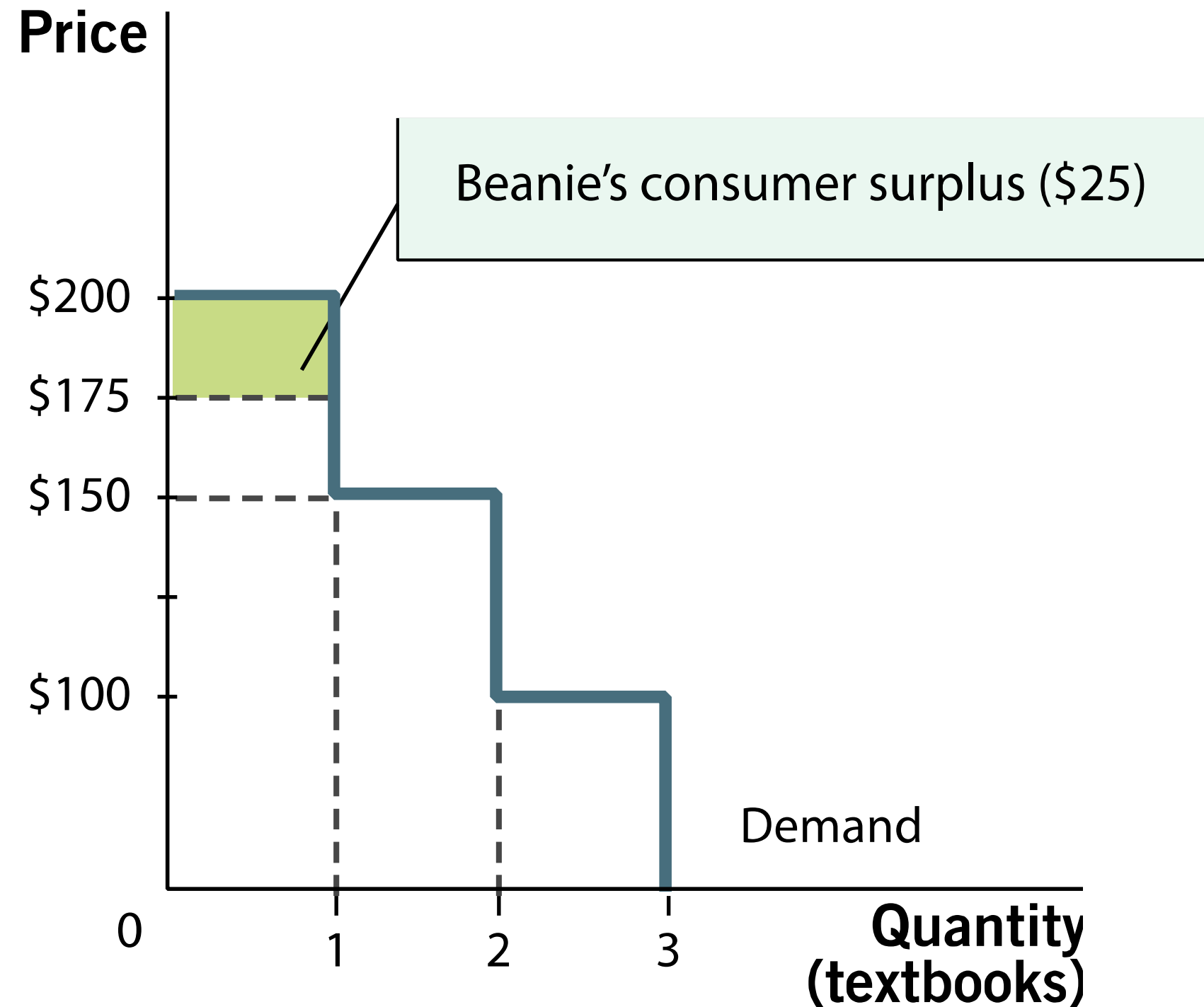


- Consumer surplus
 - Difference between *willingness to pay* for a good and the *price actually paid* to get the good
- At price = \$151
 - Only Beanie buys the book.
 - He gets \$49 worth of **consumer surplus**.
 - Why don't Mitch and Frank buy the book?

Using Demand to Illustrate Consumer Surplus

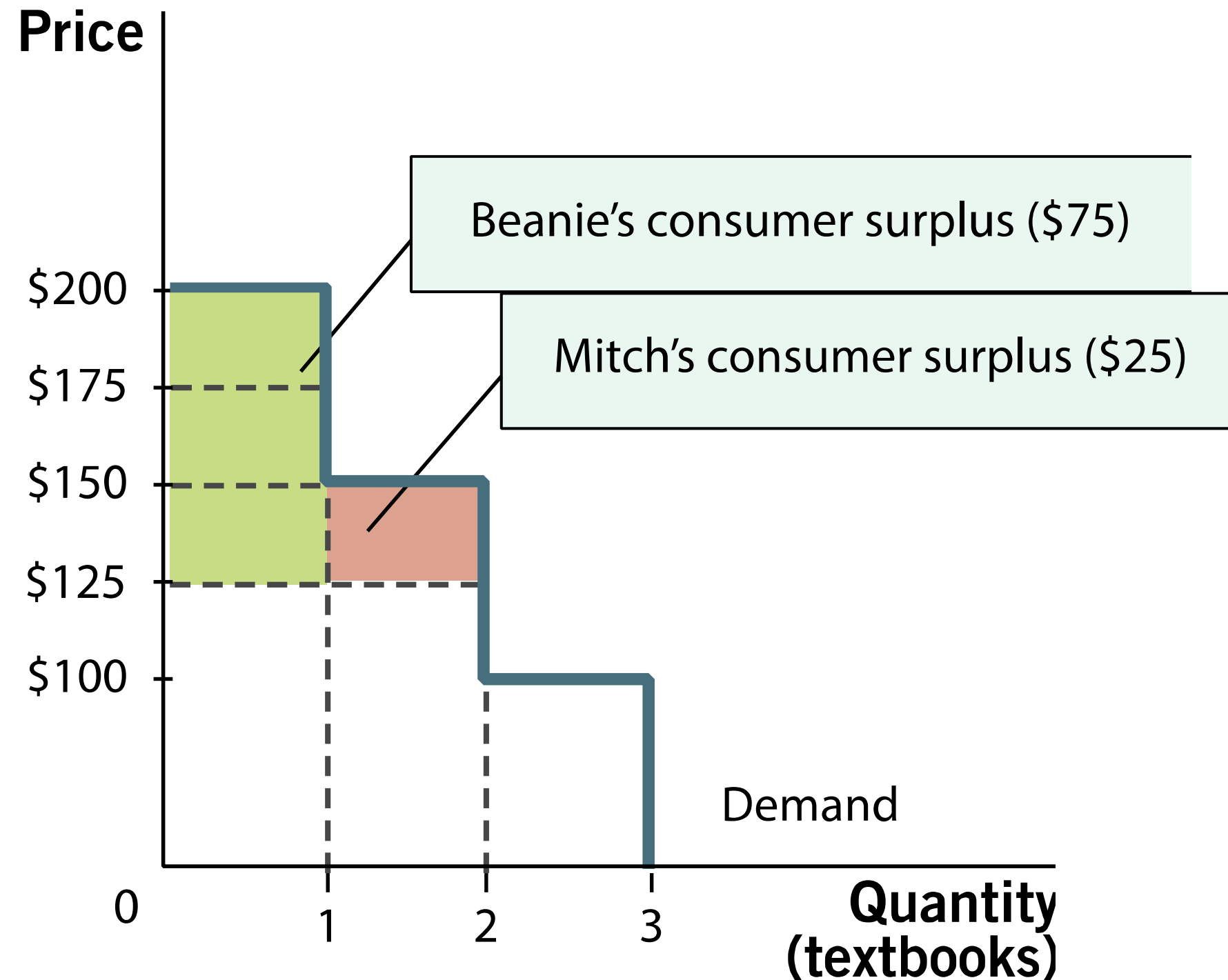


Consumer Surplus, Graphically



(a) \$175 per Book

Consumer Surplus, Graphically



(b) \$125 per Book

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The Efficiency of Markets and the Costs of Taxation: Producer Surplus

Producer Surplus



Seller	Willingness to sell tutoring services
Beanie	\$30 / hour
Mitch	\$20 / hour
Frank the Tank	\$10 / hour

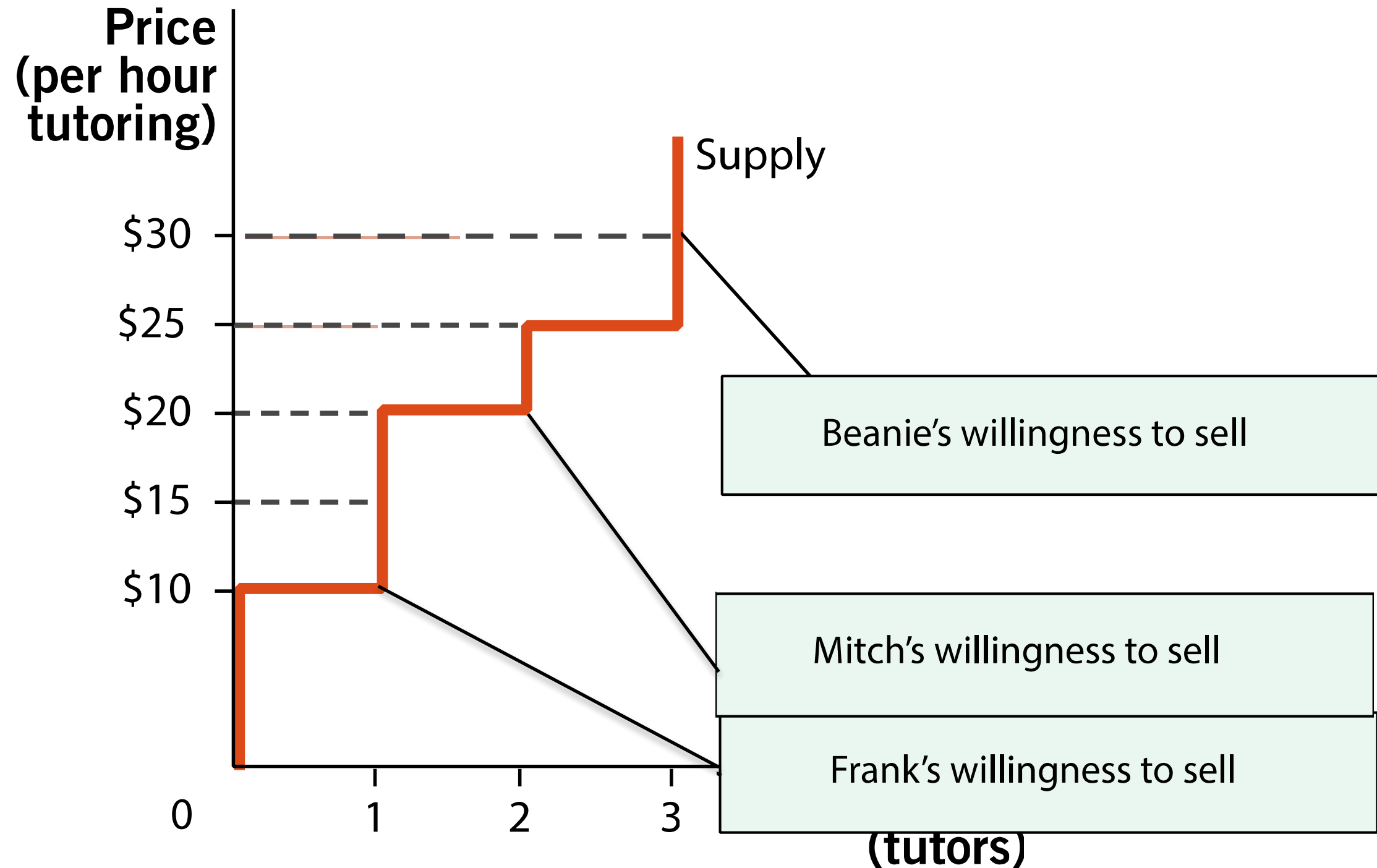
- Willingness to sell determined by:
 - Direct costs
 - Opportunity costs
- Question:
 - If the market price of tutoring is \$25, which sellers will choose to tutor?

Producer Surplus

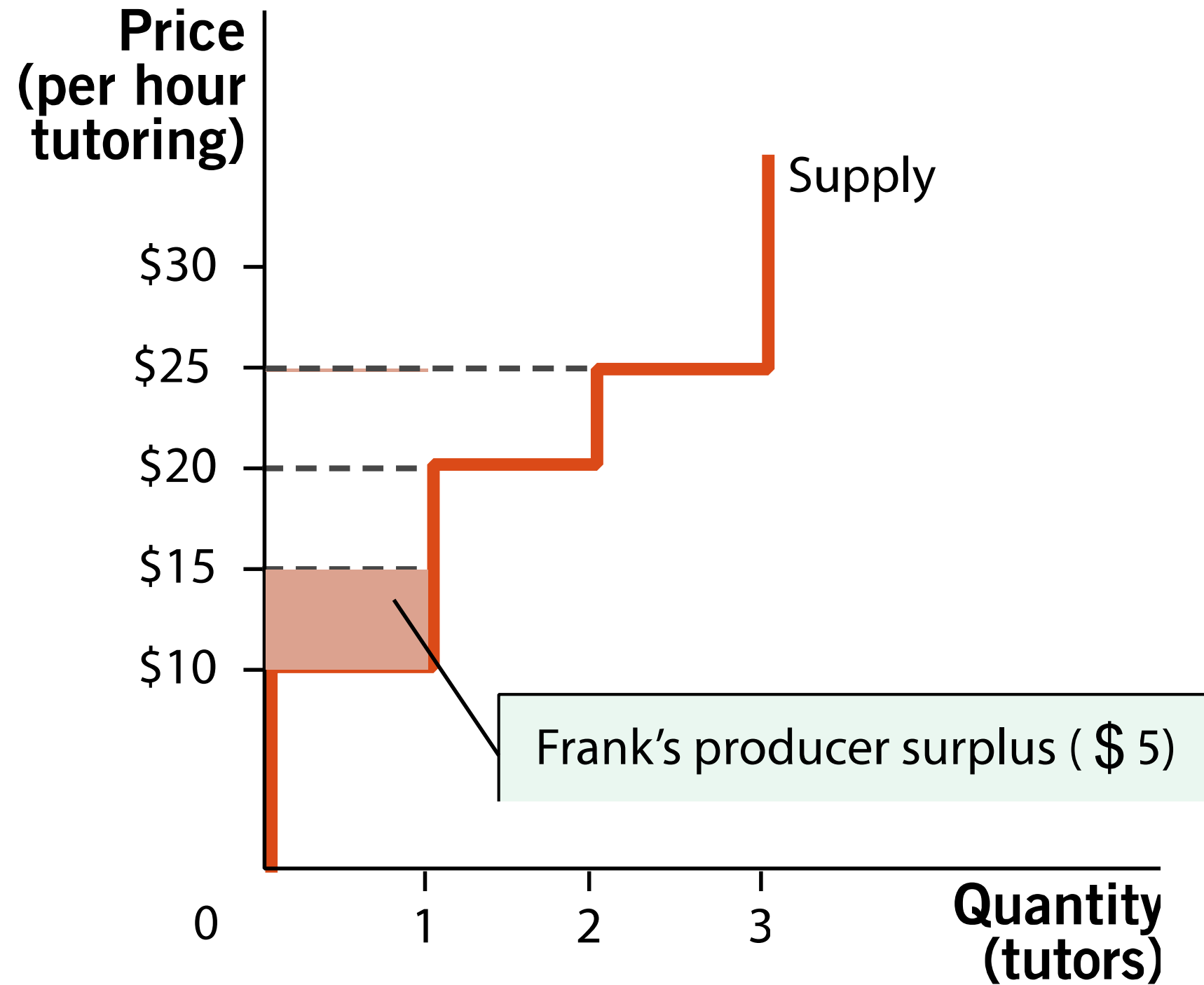
Seller	Willingness to sell tutoring services
Beanie	\$30 / hour
Mitch	\$20 / hour
Frank	\$10 / hour

- Producer surplus
 - Difference between *willingness to sell* a good and the *price actually received* for that good
- At price = \$25
 - Mitch and Frank decide to tutor.
 - Frank gets \$15 worth of **producer surplus** per hour.
 - Mitch gets \$5 worth of **producer surplus** per hour.
 - Why doesn't Beanie tutor?

Using Supply to Illustrate Producer Surplus

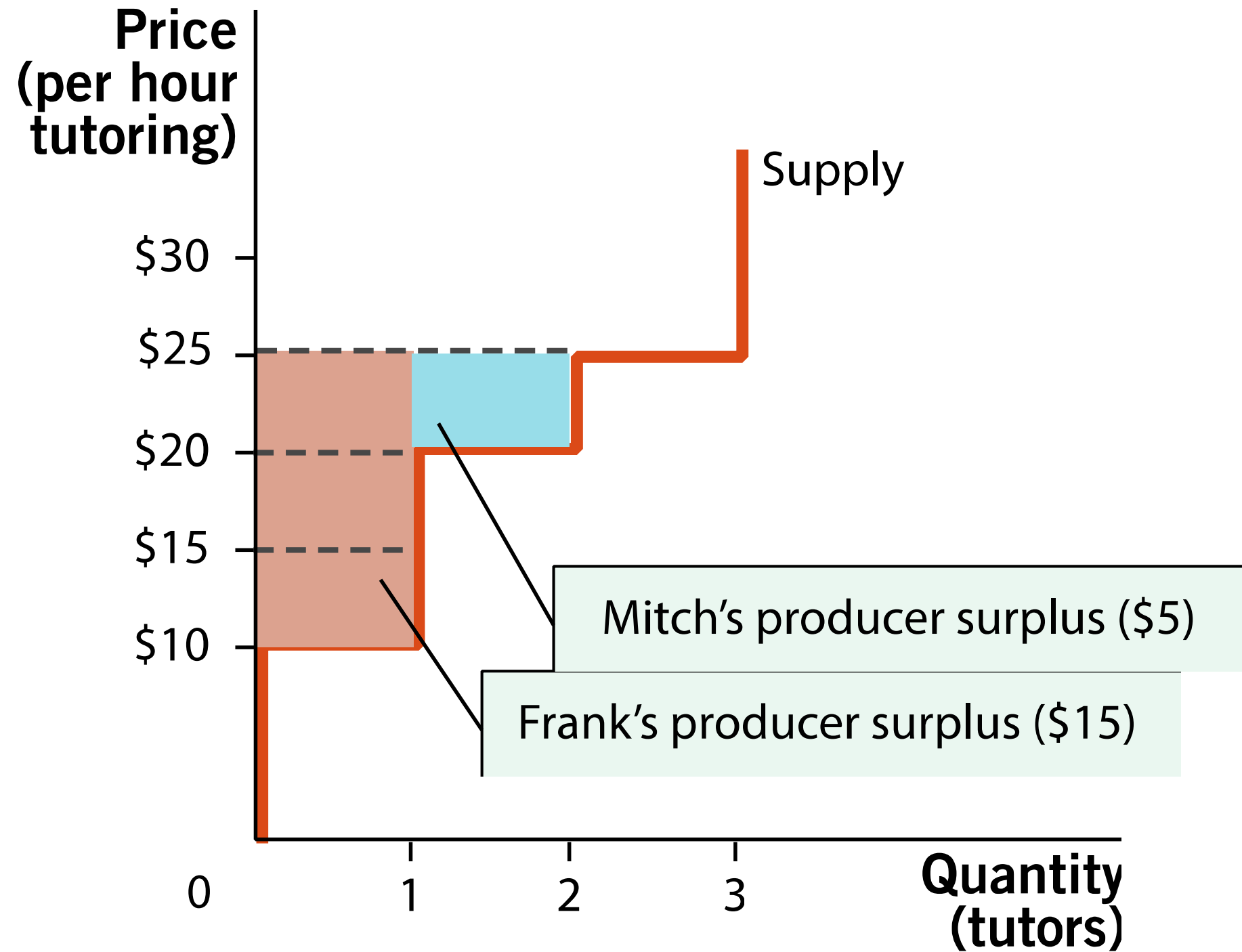


Producer Surplus, Graphically



(a) \$15 per Hour

Producer Surplus, Graphically



(b) \$25 per Hour

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The Efficiency of Markets and the Costs of Taxation: Consumer and Producer Surplus

Consumer and Producer Surplus

- Consumer surplus graphically:
 - The height of the demand curve is our maximum willingness to pay for that unit of the good.
 - Consumer surplus is the area below the demand curve and above the price, for all units purchased.
- Important concept:
 - You can only get consumer surplus on units that you actually buy!
 - CS is NOT the entire area under the demand curve.

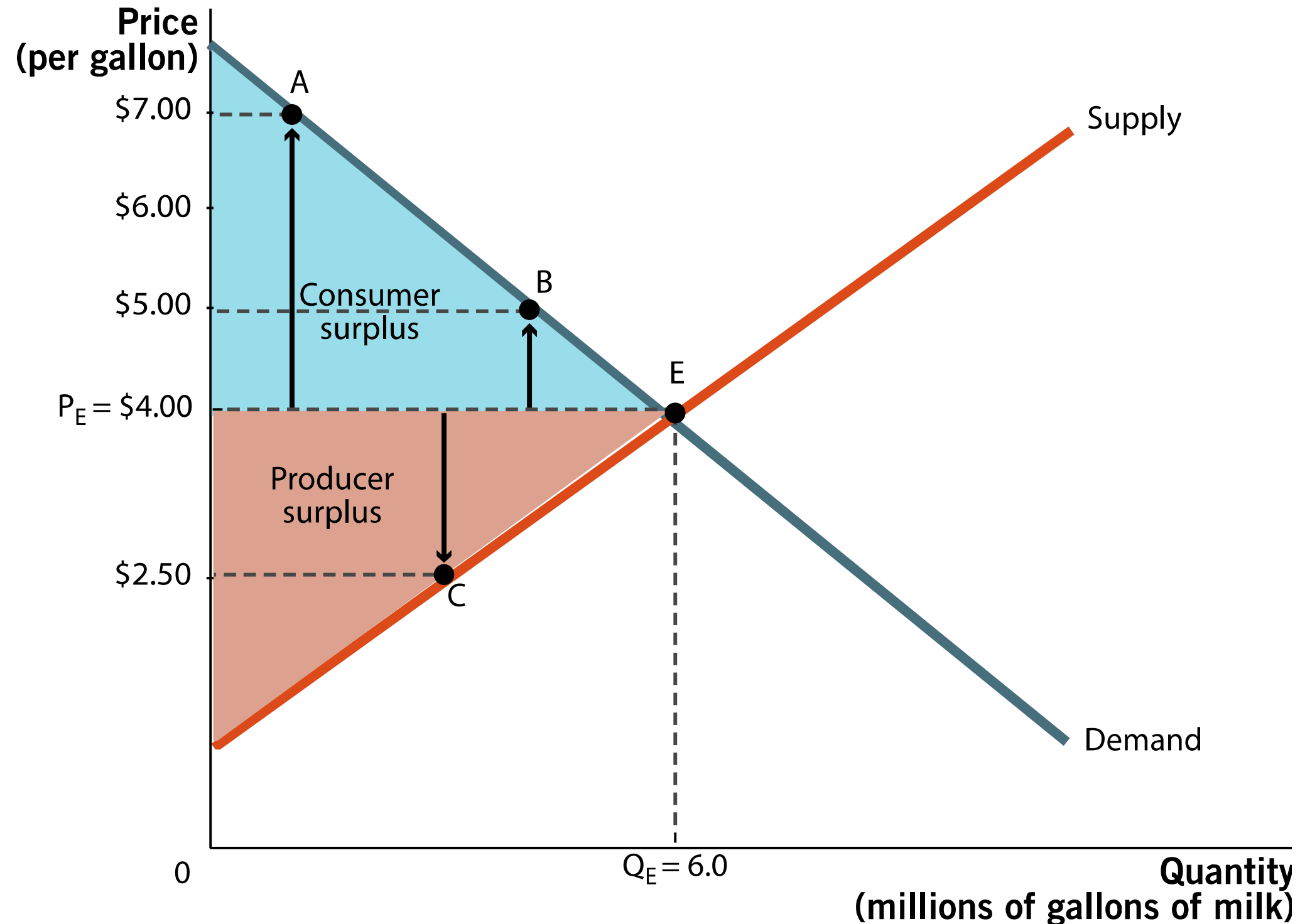
Consumer and Producer Surplus

- Producer surplus graphically:
 - The height of the supply curve is the firm's lowest price it is willing to accept to sell that unit of the good.
 - Producer surplus is the area above the supply curve and below the price, for all units sold.
- Important concept:
 - The firm can only get producer surplus on units that it actually sells!
 - PS is NOT the entire area above the supply curve.

Market Efficiency

- Total surplus (or social welfare) measures the overall welfare of the society.
 - Total surplus = CS + PS
- In free markets with voluntary trade:
 - Consumers buy until their willingness to pay is equal to the market price.
 - Suppliers sell until their willingness to sell is equal to the market price.
- Efficiency
 - Occurs when total surplus is maximized in a market

CS and PS for a Gallon of Milk



The Efficiency Equity Debate

- In free markets, both parties of self-interested individuals will benefit from trade.
- Benefits might not be equal. Is that a problem?
- Efficiency asks:
 - Are the gains from trade maximized? Is economic welfare maximized?
- Equity asks:
 - Are the benefits divided fairly?



Economics in *Just Go With It*

- This clip illustrates willingness to buy, willingness to sell, consumer surplus, and producer surplus.



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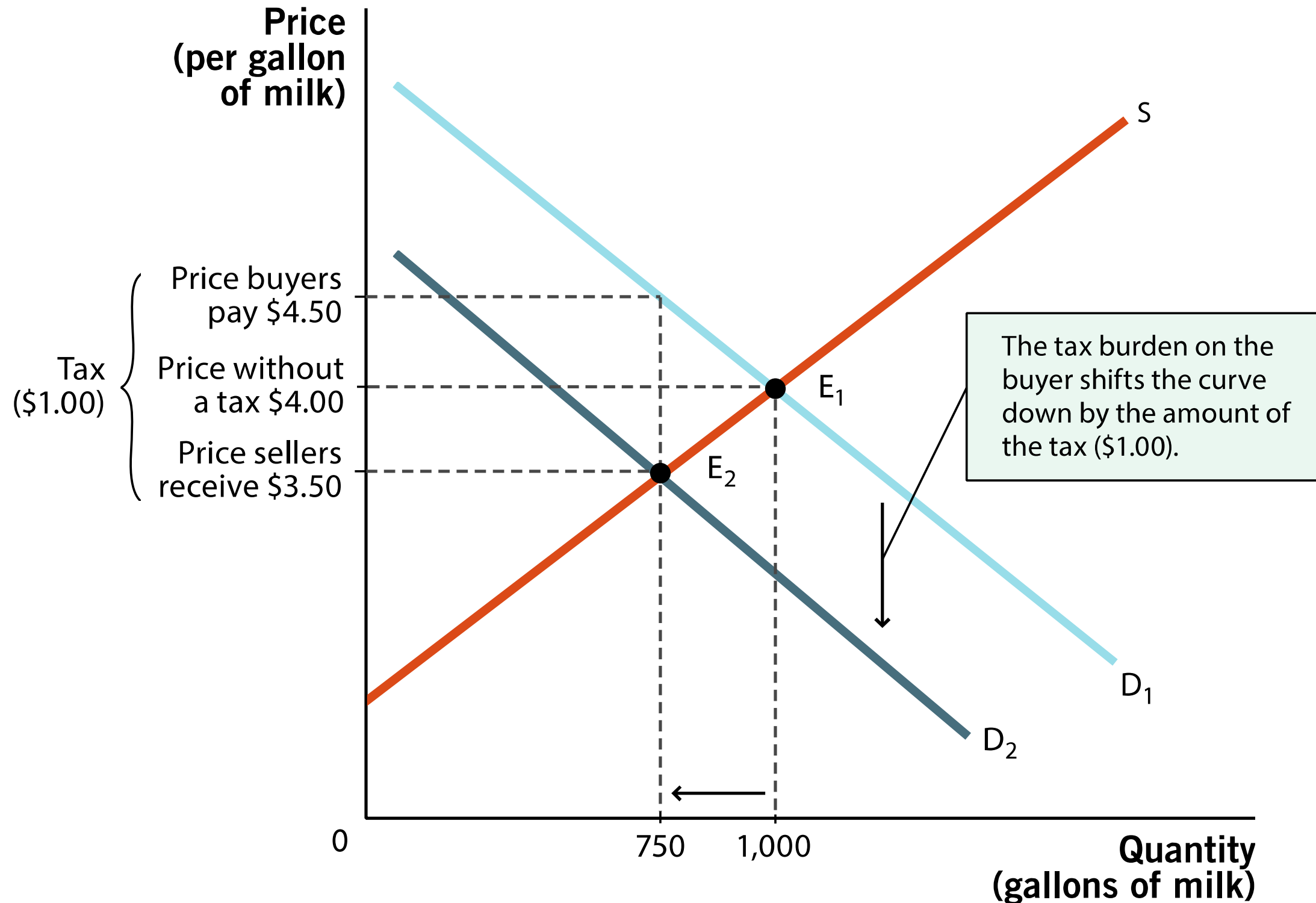
**The Efficiency of
Markets and the
Costs of Taxation:
The “incidence” of
a tax.**

Taxation

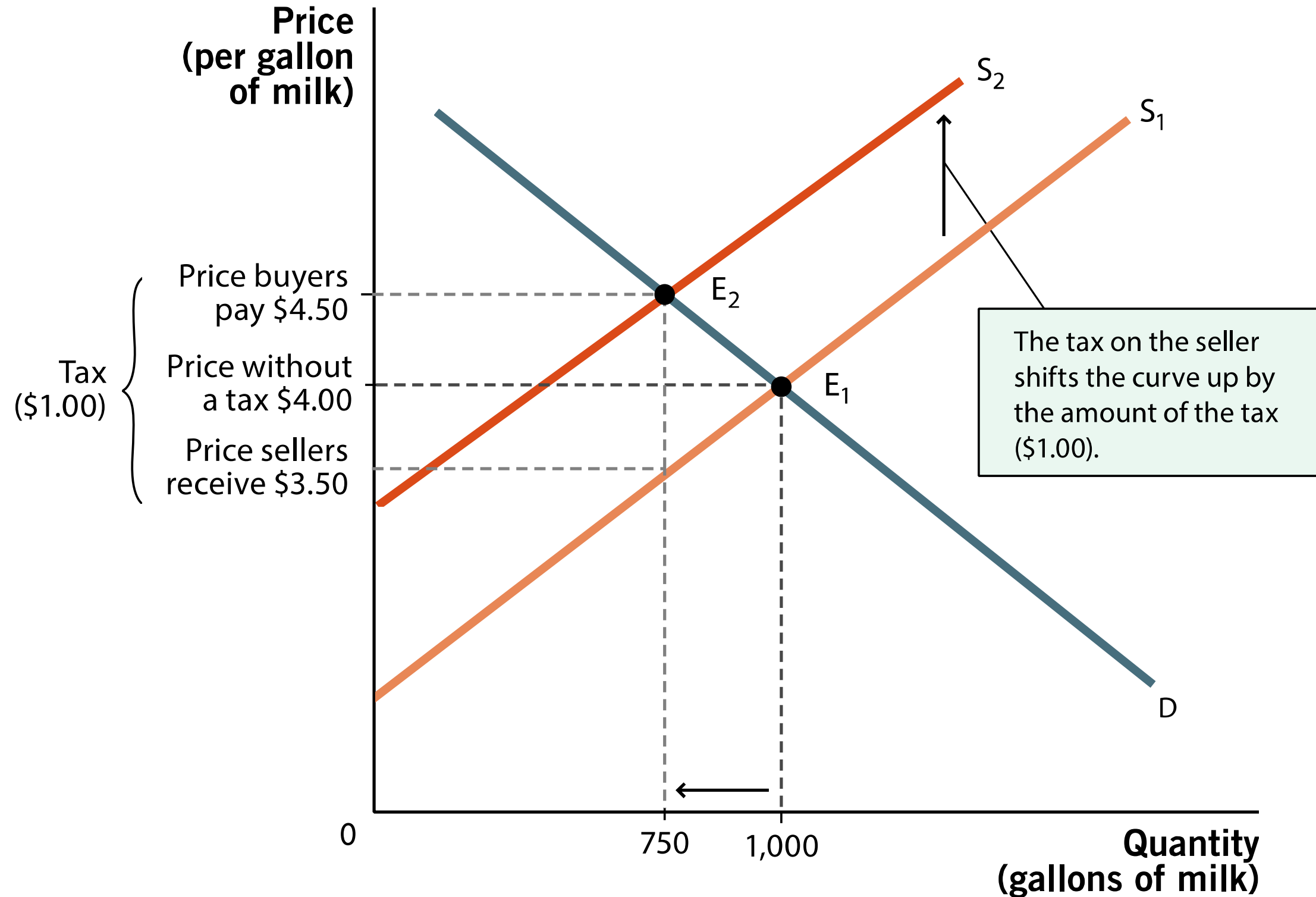
- Why do we pay taxes?
 - Pay for public goods, police, roads, schools, etc.
- Types of taxes
 - Income, payroll, corporate, sales, excise, estate
- Excise tax
 - A tax on a specific good; alcohol, tobacco, gasoline, for example
- Tax incidence
 - Refers to the party (consumers or producers) who bears the tax burden



Tax on Buyers



Tax on Sellers



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**The Efficiency of
Markets and the
Costs of Taxation:
Deadweight Loss
from Taxes.**

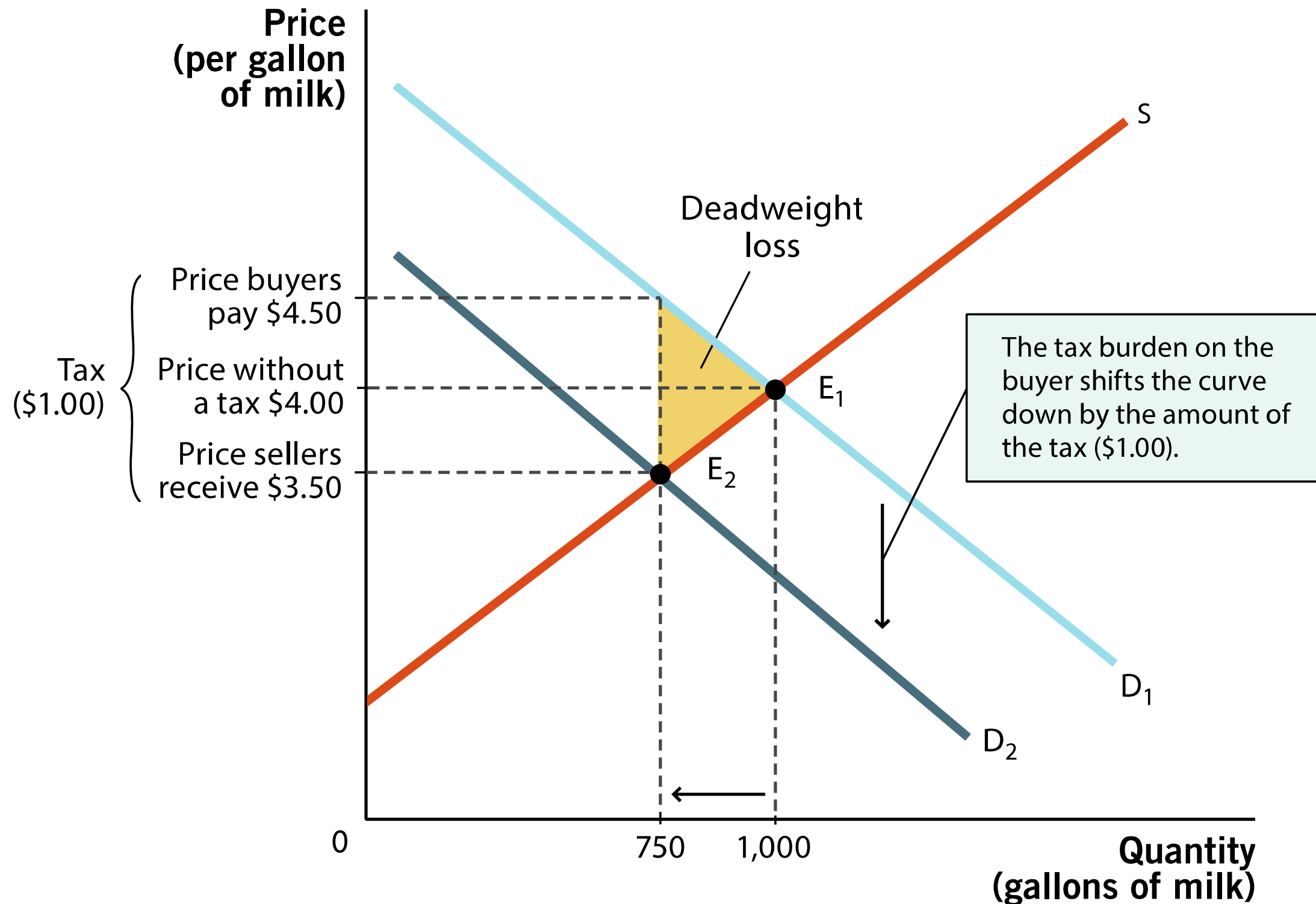
Tax Incidence Summary

- If a tax is levied on a business:
 - The firm will attempt to raise prices to pass some of the burden to consumers.
- If a tax is levied on consumers:
 - Some of the burden is passed to producers since the market price falls.
- Incidence
 - Whether the tax is levied on the producer or consumer, the end incidence result is the same!

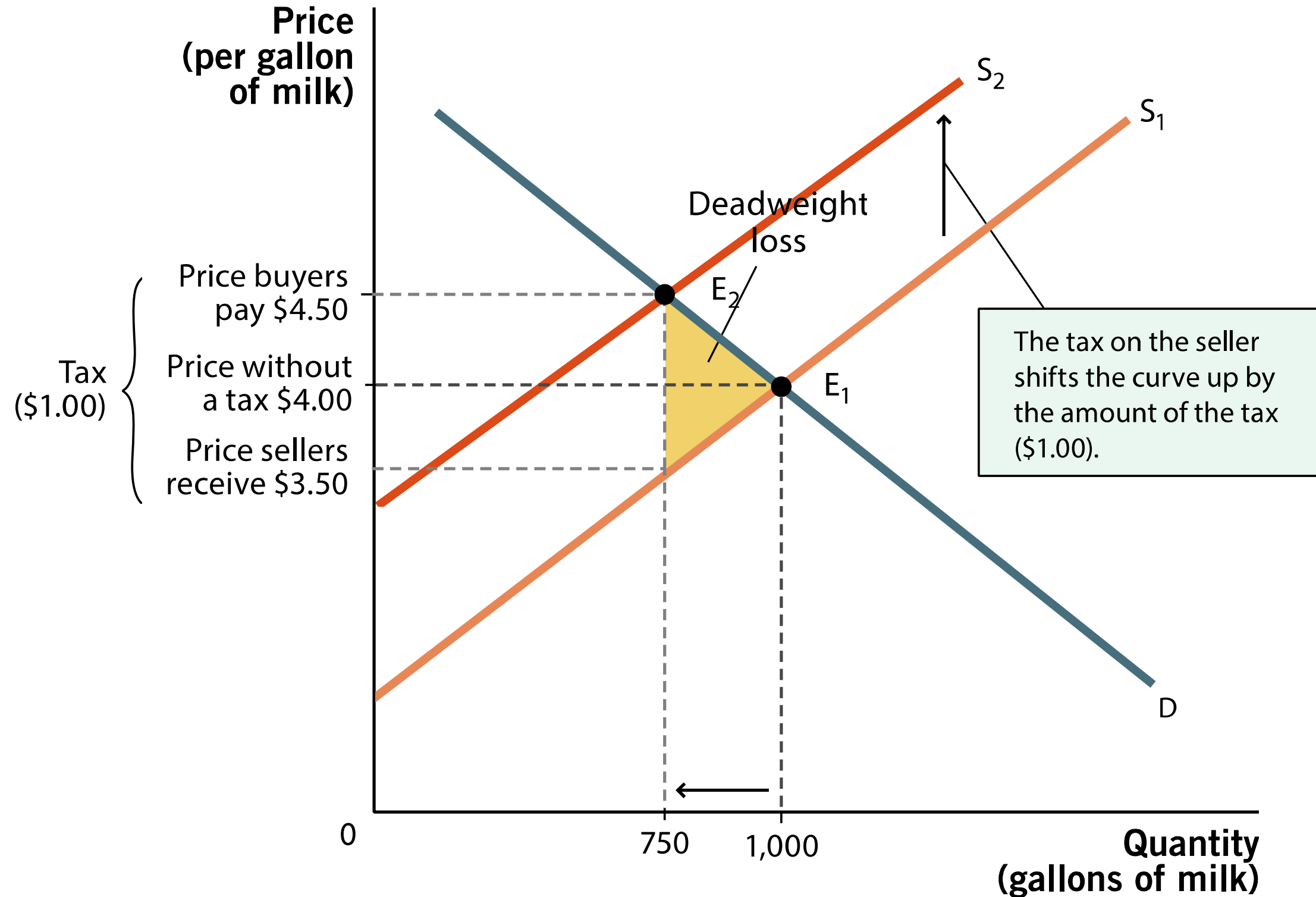
Deadweight Loss

- On the previous graphs, the tax had a price and quantity effect.
 - Prices increased.
 - Quantity traded decreased.
- Deadweight loss:
 - A cost to society in the form of less economic welfare resulting from the tax.
 - Caused by the decrease in the amount of trade that is occurring.

Tax on Buyers Deadweight Loss



Tax on Sellers Deadweight Loss



Elasticity and Tax Incidence

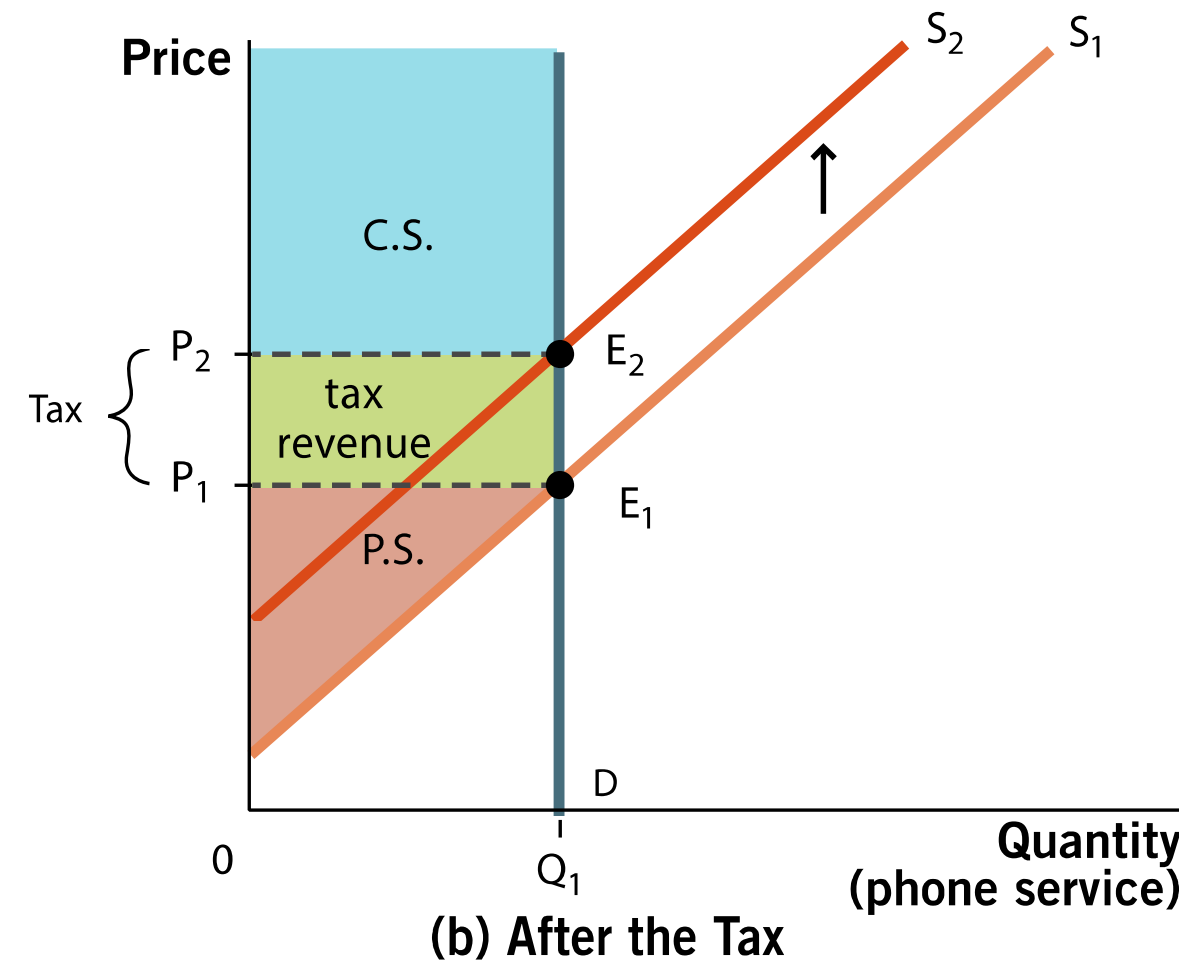
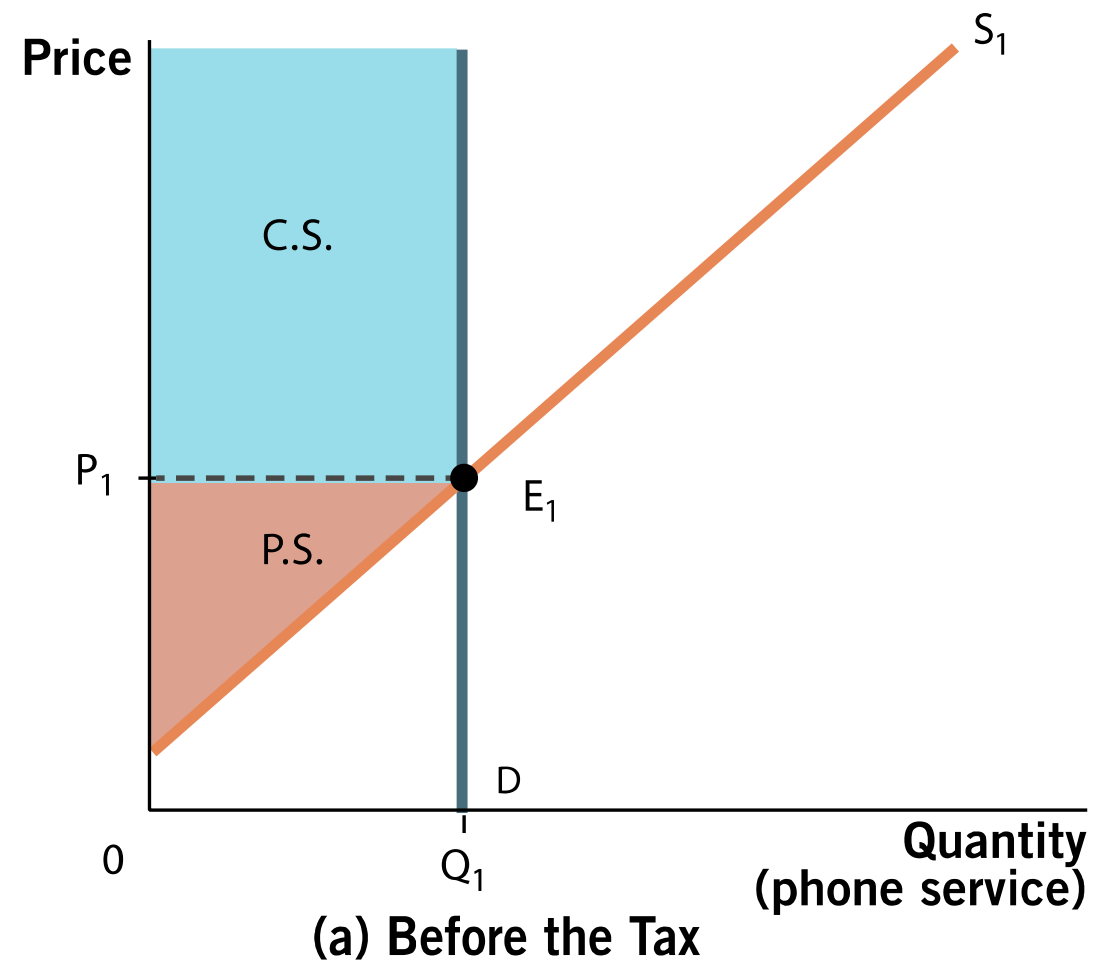
- Tax **incidence** is the same no matter who the tax is levied on.
- So what determines the **incidence**?
 - Elasticity of demand and supply determine the tax incidence, though.
 - The more inelastic side pays more of the tax.
 - So the **incidence** of a tax falls more heavily on the side of the market that is more inelastic.

Elasticity and Deadweight Loss

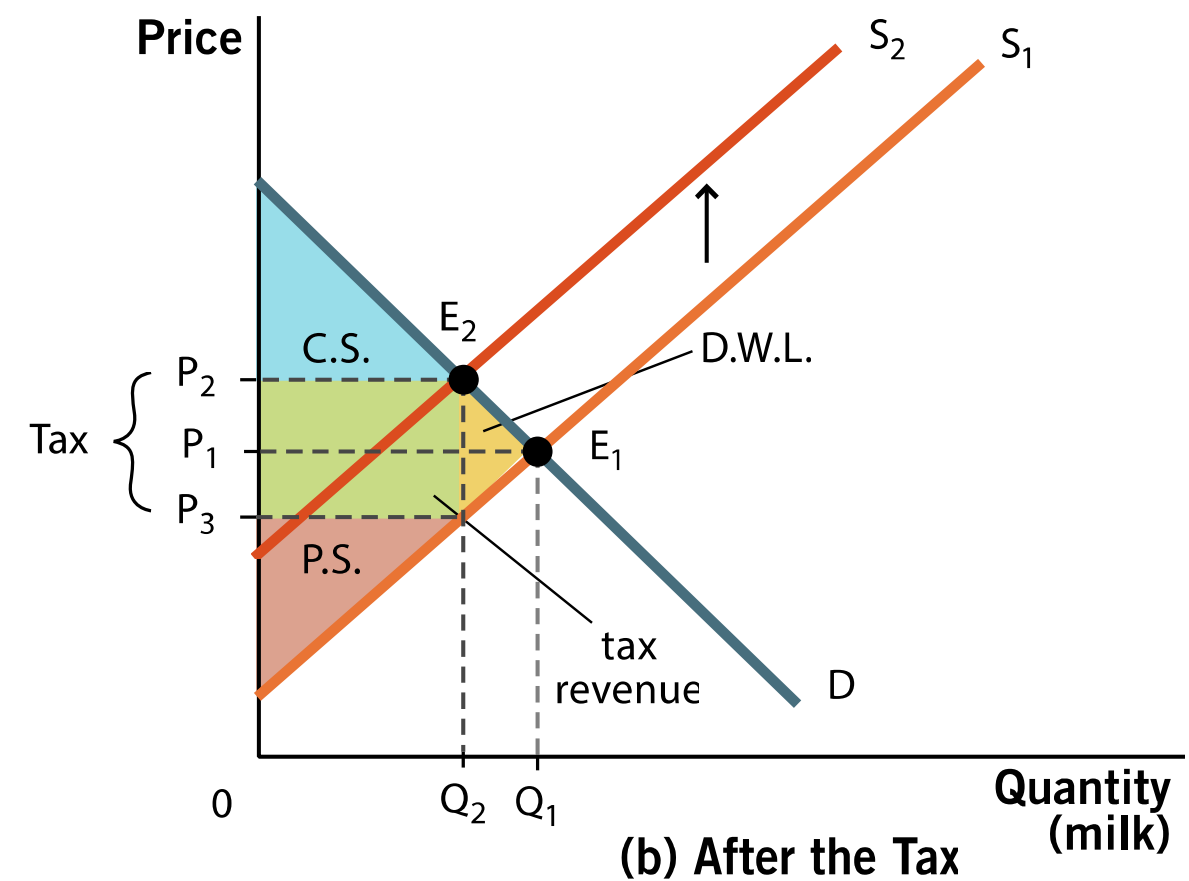
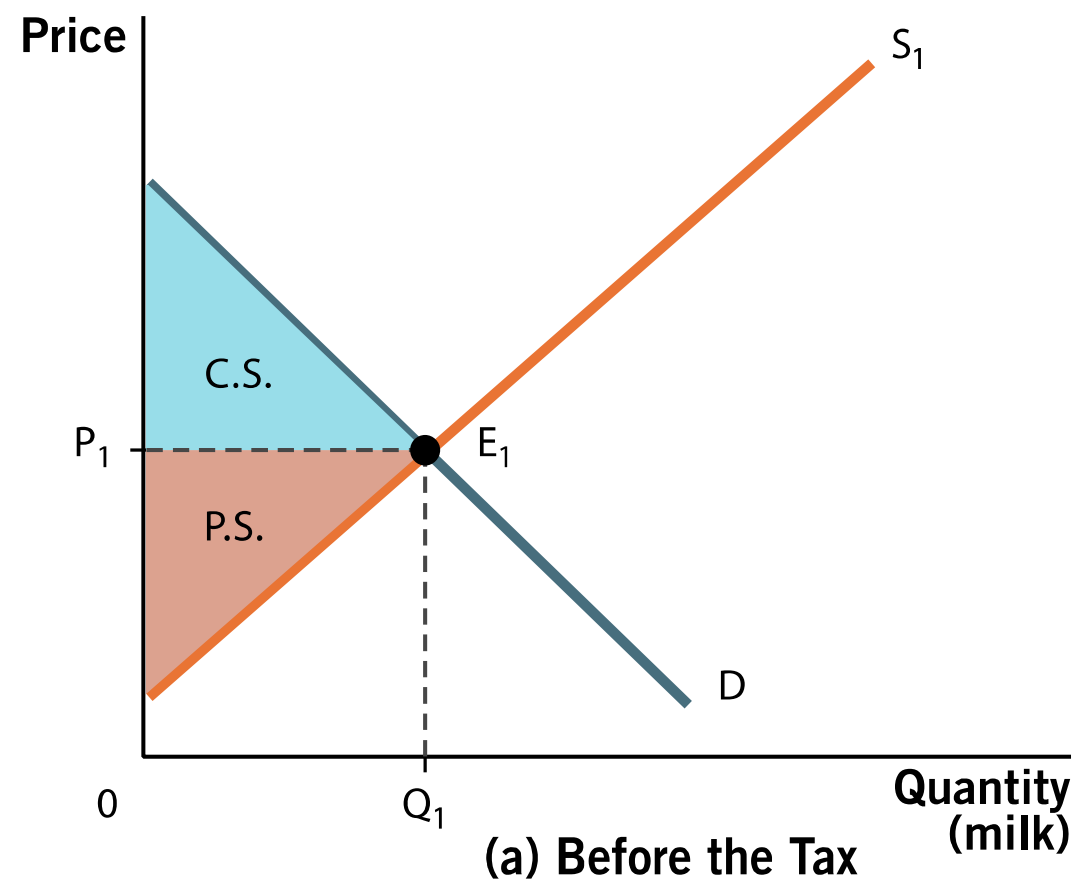
- Why would the government want to tax a good with very inelastic demand?
 - No substitutes (ensures steady tax revenue)
 - Amount of purchases will not change much (or not change at all if perfectly inelastic demand)
- The more elastic the suppliers and demanders are the more deadweight loss there is.
 - Own-Price Elasticity is how responsive QD and QS are to price changes.
 - A tax is an increase in price.



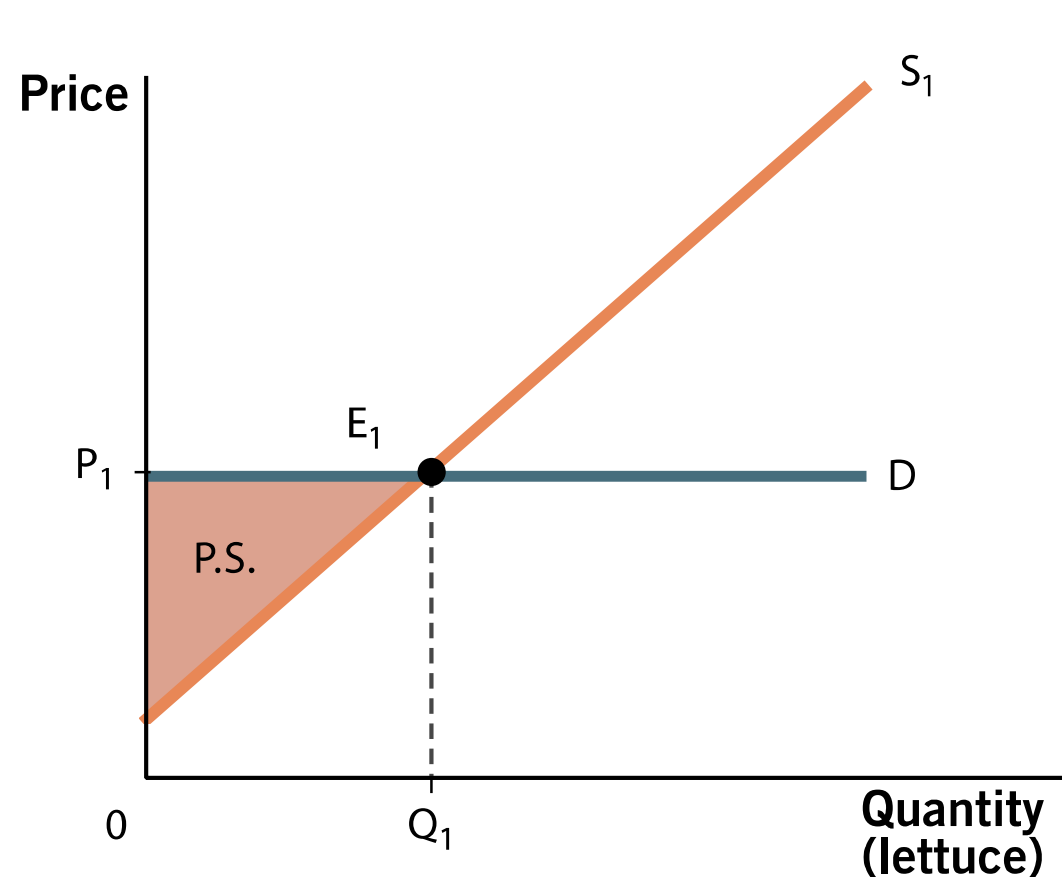
Tax and Deadweight Loss with Perfectly Inelastic Demand



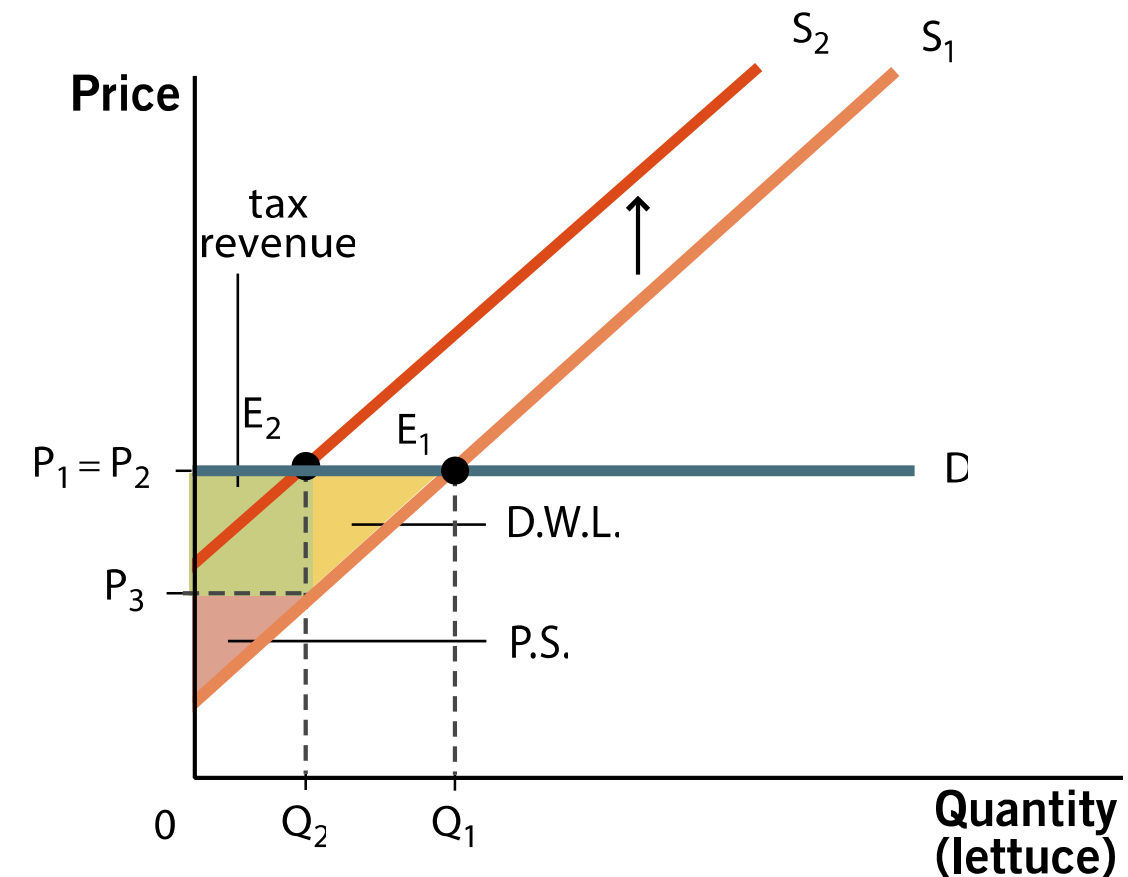
Tax and Deadweight Loss with Somewhat Elastic Demand



Tax and Deadweight Loss with Perfectly Elastic Demand



(a) Before the Tax



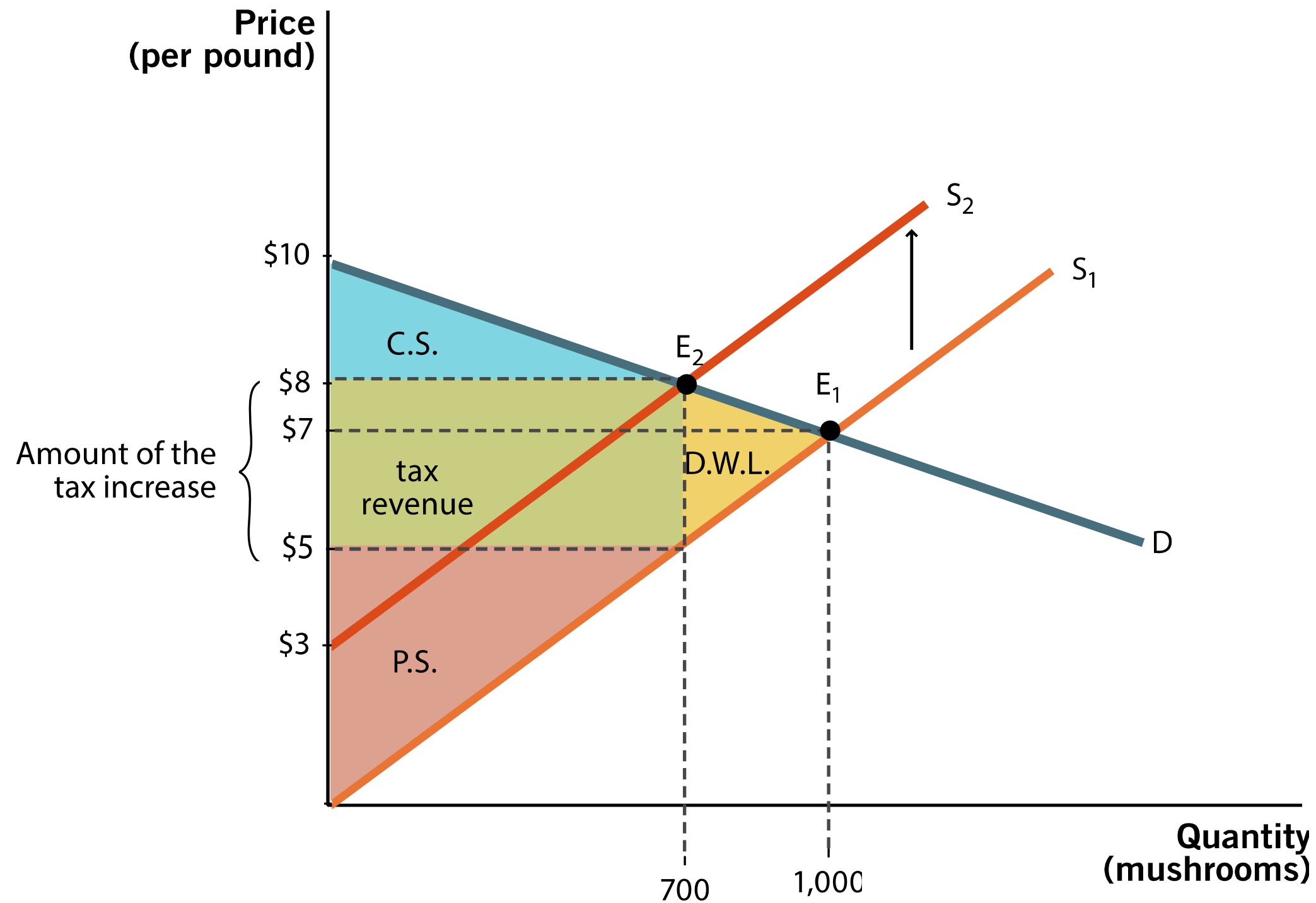
(b) After the Tax

Balancing Deadweight Loss and Tax Revenues

- Must ask: What is the purpose of tax?
 - Gain tax revenues?
 - Decrease production or consumption of good (perhaps to reduce negative externalities)?
- Ireland, 2002
 - 15 cent tax on plastic bags
 - Purpose was to curb litter, encourage recycling
 - Plastic bag use fell by 90%.



Realistic Example



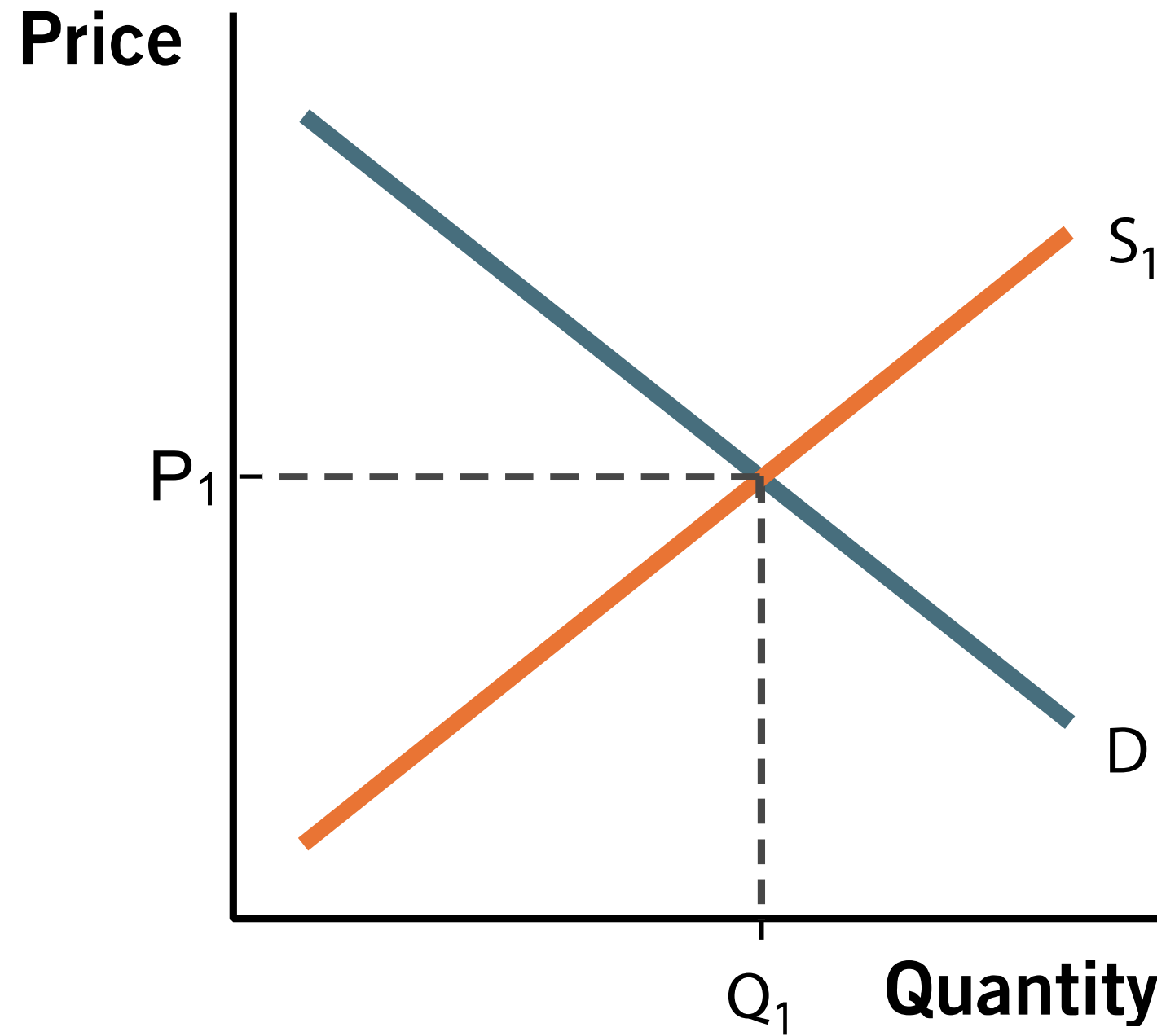
Excise Tax Summary

1. The total welfare is the same, whether a tax is levied on the consumer or the producer.
2. A tax on a good with inelastic demand or supply generates the maximum amount of revenue.
3. The deadweight loss of a tax is larger when demand and supply are more elastic.
4. The incidence of a tax is determined by the relative balance between the elasticity of supply and the elasticity of demand.

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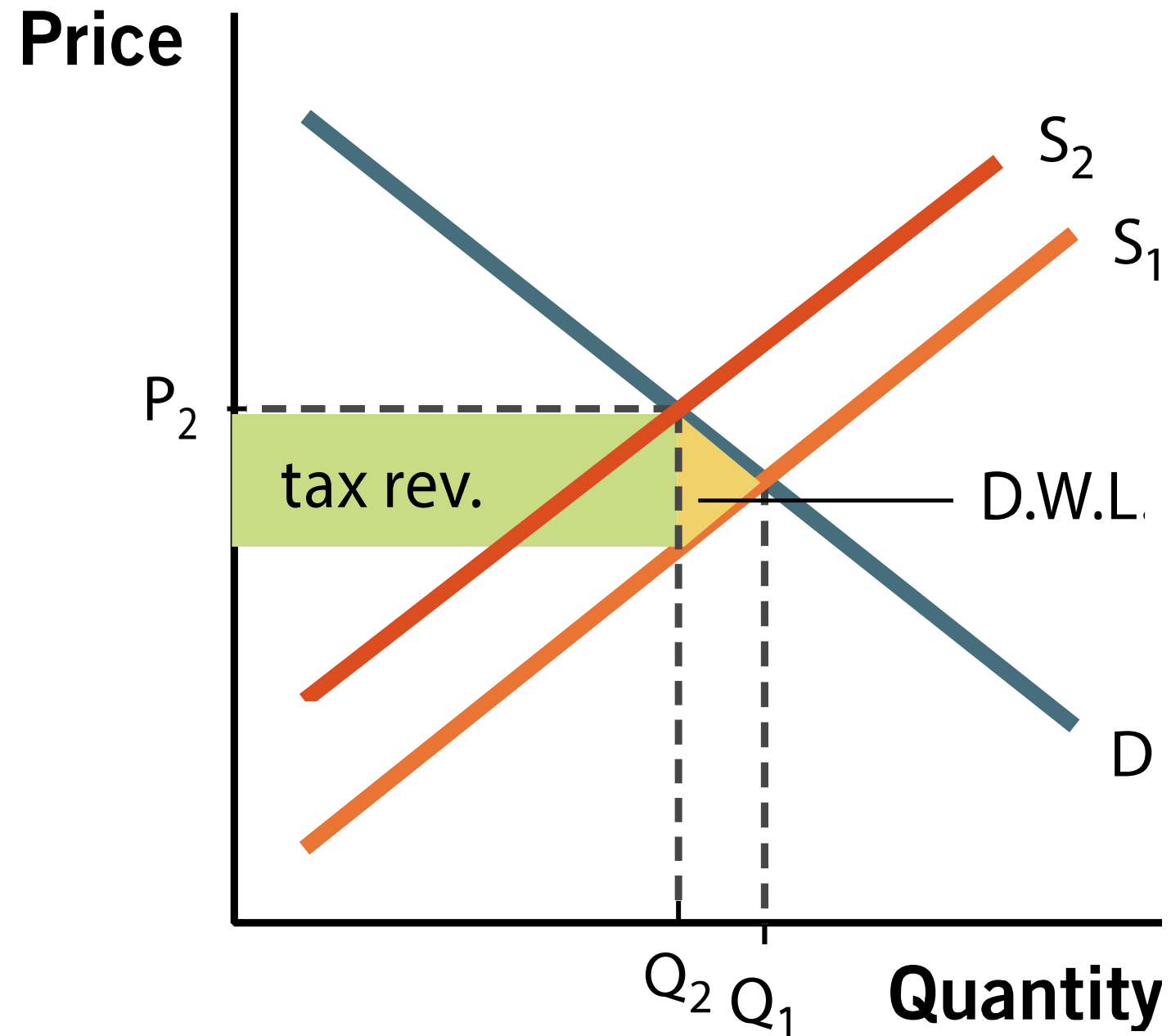
The Efficiency of Markets and the Costs of Taxation: Deadweight Loss v/s Government Revenue

Deadweight Loss and Tax Revenue



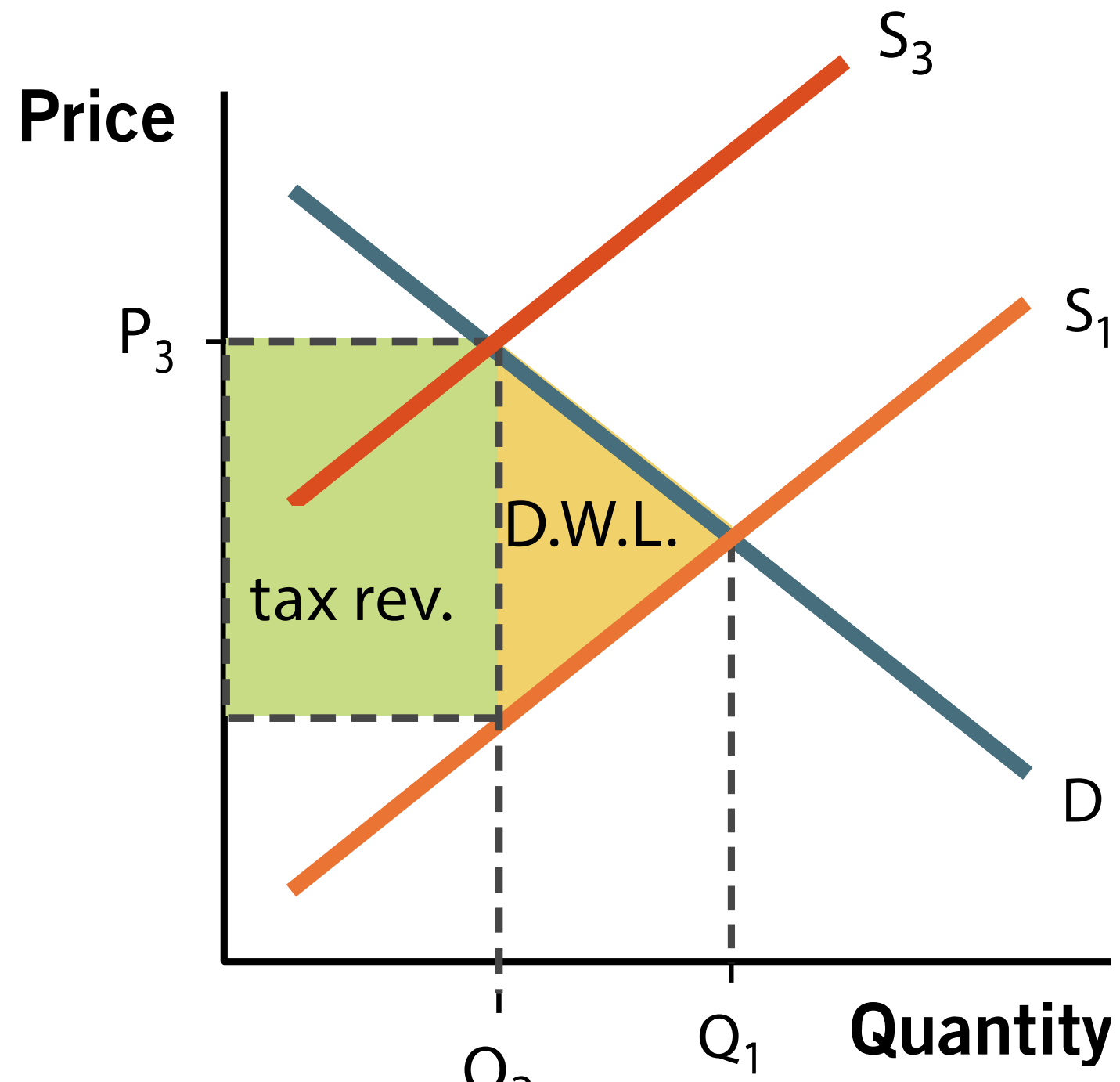
(a) No Tax

Deadweight Loss and Tax Revenue



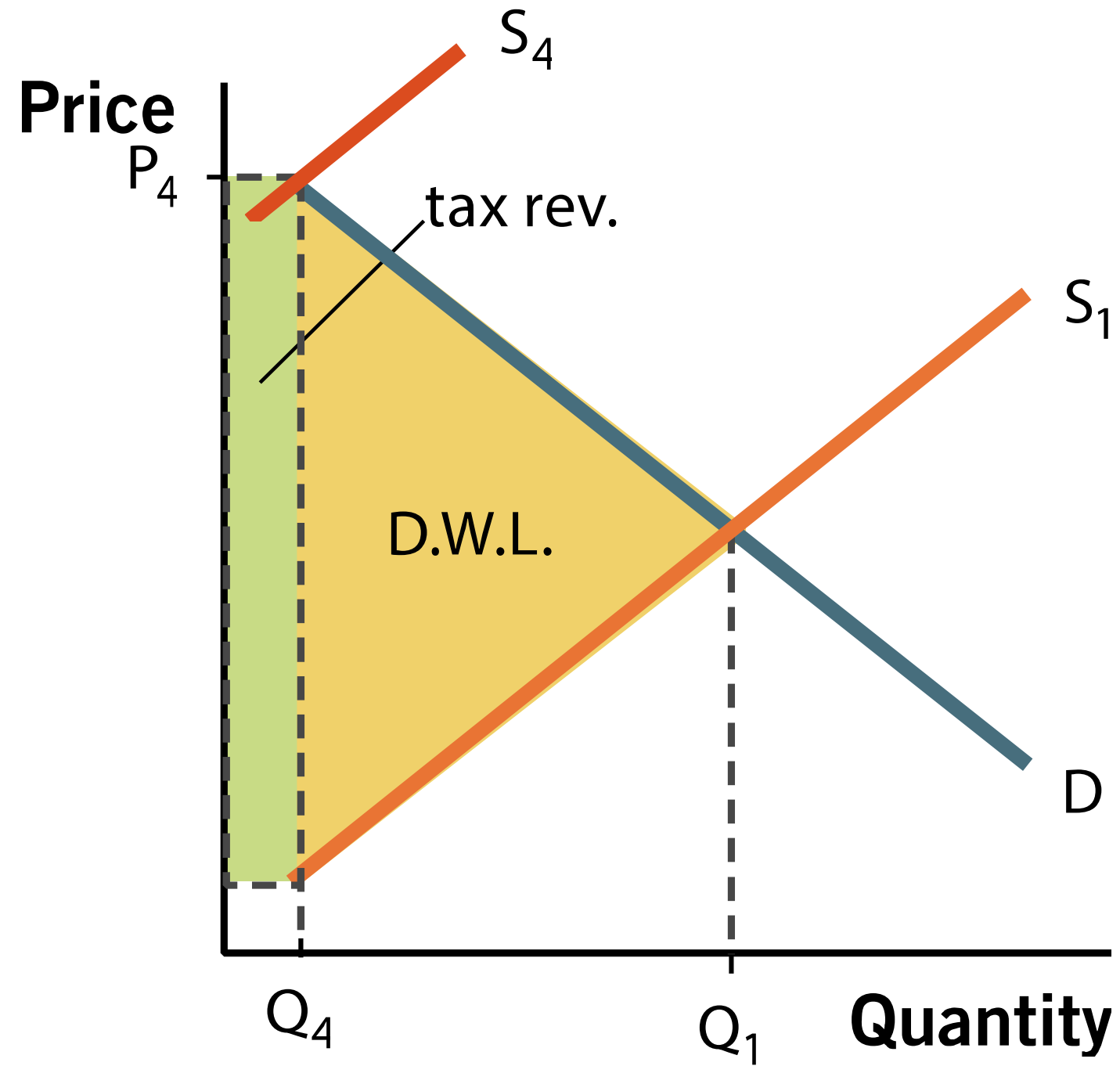
(b) Small Tax

Deadweight Loss and Tax Revenue



(c) Moderate Tax

Deadweight Loss and Tax Revenue



(d) Large Tax

Balancing DWL and Tax Revenues

- Intuition:
 - If tax rates are too low or too high, revenue will be low.
 - There is an optimal tax rate to be found.
- Later in the course:
 - The Laffer curve will be discussed.
 - This is the parabolic relationship between tax rates and tax revenue.

CS, PS, and Taxes: Conclusion

- Consumer and producer surplus can be used to examine any economic activity.
- Unregulated markets create the largest possible total surplus.
- Taxation is not a costless endeavor. The taxation of specific goods and services gives rise to deadweight loss, which results in the reduction of economic activity.
- Society must balance the need for tax revenues, the programs those revenues fund, and trade-offs this creates in the market.