NO PREP

# Measuring Welfare

## Consumer Surplus & Producer Surplus

**Includes:** Student reading, case study, differentiated questions, teacher key

Name: Period: Date:

### Measuring Welfare: Consumer Surplus & Producer Surplus

**Defining Surpluses**

Consumer surplus is the gap between what consumers are willing to pay (their maximum willingness) and what they actually pay (market price). Graphically, it's the area below the demand curve and above the price line. Producer surplus is the difference between the market price and the suppliers' minimum acceptable price (their marginal cost), depicted as the area above the supply curve and below the price line. Together, these surpluses measure the total economic welfare generated in a market.

**Visualizing Welfare on a Graph**

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### Defining Surpluses

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### Visualizing Welfare on a Graph

A standard supply–demand diagram illustrates how consumer and producer surplus change with price. When a market is in equilibrium, the sum of consumer surplus (triangle above price) and producer surplus (triangle below price) is maximized. Any policy or shock that shifts supply or demand or imposes a tax/subsidy alters these areas, creating deadweight loss—the lost welfare from trades that no longer occur. This table clarifies how to locate each welfare component on the graph and interpret its meaning.

### Impact of Taxes and Subsidies

A per-unit tax on sellers shifts the supply curve upward by the tax amount, raising prices and reducing quantity. Consumers pay higher prices, shrinking consumer surplus; producers receive lower net prices, shrinking producer surplus; and the government collects tax revenue (a rectangle between price paid and price received). However, some potential trades vanish, creating deadweight loss. Conversely, a subsidy shifts supply downward, expanding quantity and increasing total surplus, though at the taxpayer's expense.

**Policy and Price Controls**

Price ceilings (e.g., rent control) increase consumer surplus for those lucky enough to obtain the good but reduce total surplus by creating shortages and deadweight loss. Price floors (e.g., minimum wage) bolster producer (worker) surplus for those employed but reduce consumer surplus and create unemployment surplus (wasted resources). Mapping these effects helps students evaluate trade-offs in policy debates.

**Key Information**

| Welfare Measure | Area on Graph | Economic Meaning |
|---|---|---|
| Consumer Surplus | Below demand curve, above price | Benefit to buyers from paying less than willing |
| Producer Surplus | Above supply curve, below price | Benefit to sellers from receiving more than cost |
| Deadweight Loss | Triangular gaps from lost trades | Net welfare loss from market distortions |

**Case Study Excerpt: Taxing Sugary Drinks**

**In 2021, SweetBrew City instituted a $0.50 per-can tax on sugary beverages to curb consumption. Before the tax, the equilibrium price was $1.50, and equilibrium quantity was 100 million cans annually. After the tax, the supply curve shifted up by $0.50, raising the consumer price to $1.80 and lowering producer net revenue to $1.30 per can. Annual sales dropped to 80 million cans. The government collected $40 million in tax revenue (80 million cans × $0.50). Consumer surplus shrank by $25 million, producer surplus fell by $20 million, and deadweight loss—the lost benefit from 20 million fewer cans—amounted to $5 million. Health researchers later estimated that reduced consumption prevented 2,000 obesity-related hospitalizations, assigning an approximate societal benefit of $10 million. When weighing economic welfare and public health, policymakers must consider both deadweight loss and external benefits from improved health outcomes.**

1. Calculate the deadweight loss from the sugary-drink tax and explain its origin.

2. How did health benefits alter the overall welfare assessment?

**Multiple Choice**

1. Consumer surplus is represented by the area:
    a) Below the supply curve, above cost
    b) Above the supply curve, below price
    c) Above the demand curve, below price
    d) Below the demand curve, above price

2. A per-unit tax on sellers shifts the supply curve:
    a) Downward by tax amount
    b) Upward by tax amount
    c) Leftward horizontally
    d) Rightward horizontally

3. Deadweight loss occurs because:
    a) Consumers receive more surplus than producers
    b) Government intervention always improves efficiency
    c) Some mutually beneficial trades no longer happen
    d) Tax revenue exceeds welfare loss

**Matching**

Write the letter of the correct definition on the line next to each term.

| Term | Definition |
|---|---|
| 1. ___ Consumer surplus | A) Increases producer and consumer surplus at taxpayer expense |
| 2. ___ Producer surplus | B) Net welfare loss from unrealized trades |
| 3. ___ Deadweight loss | C) Benefit to sellers from price minus cost |
| 4. ___ Tax revenue | D) Area below demand curve above price |
| 5. ___ Per-unit subsidy | E) Government receipts from tax × quantity |

**Fill-in-the-Blank**

1. A tax shifts the supply curve _____ by the tax amount.

2. _____ loss measures the welfare lost from reduced trades.

3. Producer surplus is the area _____ the supply curve and _____ the price.

**Short Answer**

Answer each question in 2-4 complete sentences.

1. Explain why producer surplus falls when a per-unit tax is imposed.

2. Describe how the sugary-drink tax both reduced welfare and generated health benefits.

3. In your own words, contrast the effects of a subsidy with the effects of a tax on market welfare.