



Who gains, who loses?

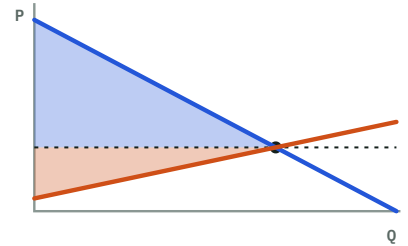
Consumer and producer surplus, deadweight loss, price controls, taxes and tariffs — festival tickets, city rent and milk.

1

Surplus

the gains from trade

- **Consumer surplus (CS)** → top price a buyer would pay, minus what they pay, summed over every buyer · Ben: top **\$120** – pays **\$50** = keeps **\$70**
- **Producer surplus (PS)** → price a seller gets, minus their minimum price, summed over every seller
- Tickets market: **Demand: $150 - 0.1Q$** · **Supply: $10 + 0.04Q$** → equilibrium **\$50, 1,000 tickets**
- On the chart: CS = area under demand, above price · PS = area above supply, below price
- At equilibrium: **$CS = \frac{1}{2} \times 1,000 \times \$100 = \$50,000$** · **$PS = \frac{1}{2} \times 1,000 \times \$40 = \$20,000$**

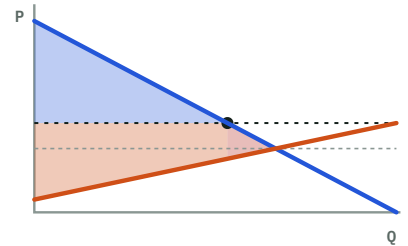


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Total surplus

largest at equilibrium

- **Total surplus = CS + PS** is largest exactly at the free-market price
- Move the price away (up or down) and some mutually beneficial trades stop happening
- **Deadweight loss (DWL)** → total surplus lost to those missing trades
- At \$70: **$CS = \$32,000$** · at \$30: **$PS = \$5,000$** — both below their equilibrium best
- Priced at \$40 by mistake: 750 sold (not 1,000) → **$CS \$54,375$** · **$PS \$11,250$** · **$DWL \$4,375$**

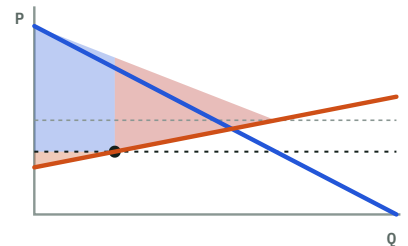


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Price ceiling

a legal maximum

- Rent market: **Demand: $2,400 - 2Q$** · **Supply: $600 + Q$** → equilibrium **\$1,200, 600 homes**
- City caps rent at **\$800** (below equilibrium) → **SHORTAGE**
- Renters want 800 homes, landlords offer only 200 → **600 homes short**
- Landlords' PS falls from \$180,000 to **\$20,000**; some of the loss is deadweight, some shifts to the renters lucky enough to get a home · **$DWL = \$240,000$**

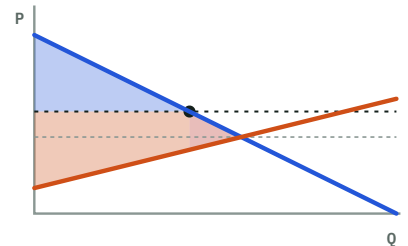


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Price floor

a legal minimum

- Milk market: **Demand: $7 - 0.01Q$** · **Supply: $1 + 0.005Q$** → equilibrium **\$3, 400 (thousand gallons)** → areas in thousands of dollars
- Government sets a floor at **\$4** (above equilibrium) → **UNSOLD SURPLUS**
- Farmers offer 600, buyers take only 300 → **300,000 gallons unsold**
- Farmers' PS still rises, from \$400,000 to **\$675,000**: fewer gallons sell, but each earns much more



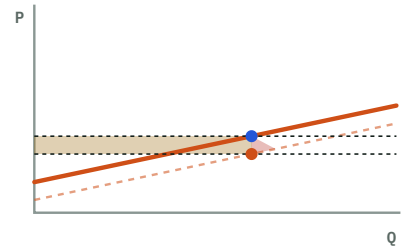
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A per-unit tax

the wedge, and a subsidy

- A **\$14 tax** on tickets shifts supply up by \$14 → a wedge between what buyers pay and sellers keep
- 900 tickets sell (down from 1,000): buyers pay **\$60**, promoters keep **\$46**
- **Tax revenue** = $14 \times 900 = \$12,600$
- **DWL** = \$700: the 100 tickets that stop trading · half the tax (\$7) → 950 sold, **$DWL \175** = $\frac{1}{4}$ → DWL grows with the **square** of the tax
- **Subsidy** = tax in reverse → supply shifts **down** · milk \$1.50 → 500,000 gallons, buyers \$2, farmers \$3.50 → cost **$1.50 \times 500,000 = \$750,000$** · **DWL \$75,000**: extra gallons cost more than buyers value them

Watch out: revenue (or subsidy cost) = amount × the **new** quantity · $14 \times 1,000 = \$14,000$ is wrong



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Who really pays?

incidence and tariffs

- **Tax incidence** → whichever side reacts less to price (the less elastic side) bears more of the tax, whoever is legally billed
- Fans' demand elasticity 0.5, promoters' supply elasticity 1.25 → fans absorb \$10 of the \$14, promoters only \$4
- **Tariff** → a tax on an imported good; world price \$80 + \$20 tariff → domestic price \$100
- Imports fall from 300 to 150 bikes; tariff revenue = $20 \times 150 = \$3,000$, not 20×300