Who really pays the soda tax?

A tax of 20¢ a liter: how it moves supply, who bears it, what the state collects, and what Mexico saw.

1 Problem · tool

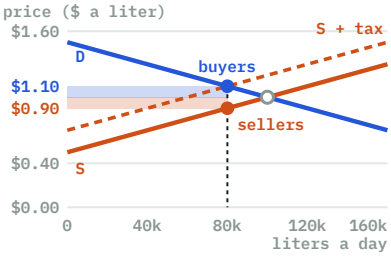
excise tax

- **Problem** → too much sugar ⇒ weight gain, tooth decay (WHO, World Health Organization: < 10% of daily calories) → part of the cost paid by all (**external cost**)
- **Tool** → **excise tax** = fixed amount per unit · 20¢ a liter · paid to the state by the **shops** · nobody sets the price
- Start: supply `P = 0.5 + 0.005Q` (P price $, Q liters) · equilibrium **$1.00**, **100,000** liters a day

2 Tax moves supply

up by the tax

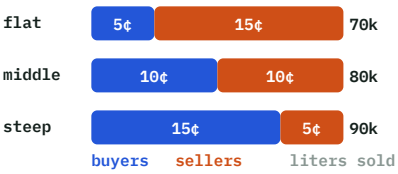
- Shop needs **+20¢** per liter to sell ⇒ supply curve **up** by 20¢ (dashed)
- New crossing with demand → buyers pay **$1.10** (+10¢) · sellers keep **$0.90** (−10¢) · sold **80,000**
- Buyers' price − sellers' price = **tax** (1.10 − 0.90 = 0.20) → tax is **split**



3 Who bears it

incidence · elasticity

- **Tax incidence** → who really bears a tax · the side that finds it **harder to walk away** pays more = **less elastic** side
- `STEEP DEMAND` (few substitutes = goods to switch to) ⇒ buyers pay more · `FLAT DEMAND` (easy switch) ⇒ sellers pay more
- Who hands the money to the state ≠ who bears the tax → shop or buyer at the checkout: **same split**
- Practice: salt, medicine, commute gas → buyers · one cola brand, holiday flights, fancy coffee → sellers



4 Tax revenue

tax × liters left

- `revenue = tax × liters sold after the tax` · not × 100,000 (the tax cut sales)
- Middle, 20¢ → 20¢ × 80,000 = **$16,000** · Middle, 10¢ → 10¢ × 90,000 = **$9,000**
- Steep, 20¢ → 20¢ × 90,000 = **$18,000** = buyers 15¢ × 90,000 **$13,500** + sellers 5¢ × 90,000 **$4,500**
- Tax on a good people keep buying ⇒ **more money**, **less change** in behavior · doubling the tax ≠ doubling revenue

5 Why tax it

Pigouvian · subsidy

- **Pigouvian tax** (Arthur Pigou, English, 1920) → tax = **external cost** per unit ⇒ price counts the hidden cost · 20¢ harm ⇒ 20¢ tax
- **Subsidy** = mirror → supply **down** · price ↓ · sales ↑ · 20¢ on water: buyers **$0.90** · sellers get **$1.10** · **120,000** liters · state pays **$24,000**

6 Evidence

Mexico 2014

- 1 Jan 2014 · **1 peso** (Mexican money) a liter (≈ a tenth of the price) · price ≈ **+1.08 pesos** (+11%) ⇒ **pass-through** (share of the tax in the price) ≈ **100%** → buyers bore nearly all
- Purchases of taxed drinks **−6%** (2014) · **−12%** (Dec 2014) · poorest households **−9%** · untaxed drinks (water) **+4%**
- `elasticity = % quantity ÷ % price` ≈ 6 ÷ 10 = **0.6** < 1 ⇒ **inelastic** · (Colchero and team, British Medical Journal 2016)

7 Trade-off

policy card

- **Regressive** tax → bigger **share of income** from small incomes · same 20¢ for all · but poorest cut back most (−9% vs −6%)
- `FOR` hidden health cost in the price, people did buy less · `AGAINST` weighs most on small incomes, chooses for adults
- Policy card: problem **sugar harm** → tool **20¢ tax** → model **buyers +10¢, sellers −10¢** → evidence **Mexico −6%** → trade-off **health vs small incomes**