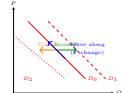


Week 1: Intro



Demand Shifters



Move along: Only own-price change.
Shift: Non-price factors:

1. Income ↑: Normal good → D Right.
2. Related prices: Sub P ↑ → D Right; Comp P ↑ → D Left.
3. Tastes. 4. Expectations. 5. # Buyers.

Coinsurance ↑: OOP price ↑ → D Left (provider-price axis) or move along (OOP axis). **Draw graph!**

Elasticity

Own-Price: $E_d = \frac{\% \Delta Q}{\% \Delta P}$.

- |E| > 1 Elastic P ↑ ⇒ TR ↓
- |E| < 1 Inelastic P ↑ ⇒ TR ↑
- |E| = 1 Unit TR max/unchanged

Cross: $E_{xy} = \frac{\% \Delta Q_x}{\% \Delta P_y} > 0$ Subs; < 0 Comps.

Income: $E_I = \frac{\% \Delta Q}{\% \Delta I}$. < 0 Inferior; 0-1 Necessity; > 1 Luxury.

Indiv vs Market: Single firm $|E_d|$ HIGH (subs exist); whole category $|E_d|$ LOW (no subs, necessity).

TR Test Calculation

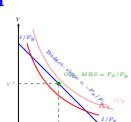
$$TR_{new} = (1 + \% \Delta P)(1 + E_d \cdot \% \Delta P) \cdot TR_{old}$$

E.g. $\% \Delta P = 15\%$, $E_d = -0.12$: $TR_{new} = 1.15 \times 0.982 = 1.129 \cdot TR$ ($\uparrow 12.9\%$).
E.g. $E_d = -1.6$: $TR_{new} = 1.15 \times 0.76 = 0.874 \cdot TR$ ($\downarrow 12.6\%$).

Moral Hazard & RAND

- **Ex-ante:** Less prevention (insured → less careful).
- **Ex-post:** More care use (OOP price low).
- **RAND HIE:** RCT. $E_d \approx -0.2$ (inelastic but ≠ 0). Higher copay → less use. Poor/sick harmed by high cost-sharing.

Week 2: Demand



PPF (Production Possibility Frontier)

1. Derived Demand: Want health, not care itself.
2. Uncertainty: When sick? Treatment works?
3. Gov't Involvement: Largest payer & regulator.
4. Externalities: Vaccination → herd immunity.
5. Non-profit Firms: Many hospitals non-profit.
6. Equity: Fairness in resource distribution.
7. Asymmetric Info: Dr knows more → principal-agent; weakens "shopping".
8. Insurance: Effective price ≪ true cost → moral hazard.

Utility & Consumer Choice

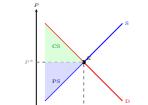
- **Utility:** Satisfaction. **Diminishing MU:** Extra unit → less satisfaction.
- **Demand Curve** = WTP = Marginal Benefit curve.
- IC: Same-utility bundles. Downward sloping, Convex, Never cross. Far = higher U.
- **MRS** = |Slope of IC| = MU_x/MU_y . Diminishing.
- **Budget:** $I = P_x X + P_y Y$. Slope = $-P_x/P_y$.
- **Optimum:** Tangency. $MRS_{xy} = \frac{P_x}{P_y} \iff \frac{MU_x}{P_x} = \frac{MU_y}{P_y}$ (equal "bang per buck").

Grossman Model



- People demand **Health**, not care. Care is **derived demand**.
- Health: 1. **Consumption good** (feel good); 2. **Investment good** (healthy time H_t).
- $H_t = H_{t-1}(1 - \delta) + I_{t-1}$. Optimal: $MEC = r + \delta$.
- Age ↑ → δ ↑ → H^* ↓. Wage/Edu ↑ → MEC right → H^* ↑.

Week 4: Markets



Equilibrium & Welfare

- Eq: $Q_d = Q_s$. Max Total Surplus.
- CS: Below D, above P^* . PS: Above S, below P^* .
- TS = CS + PS. DWL: Triangle pointing to eq.
- **Comp Statics:** D↑: $P \uparrow Q \uparrow$. S↑: $P \downarrow Q \uparrow$. D↑ + S↓: $P \uparrow$, Q ambig.

Gov't Interventions

- **Ceiling:** Binding if < P^* . Shortage, black markets, queues, quality ↓.
- **Floor:** Binding if > P^* . Surplus (e.g. unemployment).
- **Tax:** Inelastic side pays more. DWL = $\frac{1}{2} \cdot \text{Tax} \cdot \Delta Q$.

Key Calculations

Ex 1: VMP_L vs Wage

Hire if $VMP_L = P \cdot MP_L \geq W$.

L	Q	MP	VMP	Hire?	(P = 6, W = 100).
5	250	30	180	Yes	
6	260	10	60	No	

Stop at L = 5.

Ex 2: Cobb-Douglas

$$Q = K^{0.4} L^{0.6}, w = r = 1, \text{Budget} = 200.$$

1. $MP_L = 0.6Q/L$, $MP_K = 0.4Q/K$.
2. $MRTS = 1.5K/L$. Set = $w/r = 1 \Rightarrow L = 1.5K$.
3. $L + K = 200 \Rightarrow 2.5K = 200$. $K^* = 80$, $L^* = 120$.

Ex 3: Cost Inference

$$w = 100/h, L = 10h, Q = 20, \text{TFC} = 50000.$$

- AP = 2 pts/hr. Avg time = 30 min/pt.
- AVC = $1000/20 = \$50$. ATC = $51000/20 = \$2550$.
- Diminishing MP ⇒ MP < AP ⇒ last pt > 30 min; MC > \$50.

Ex 4: Equilibrium

$$Q_d = 100 - 2P, Q_s = 2P \Rightarrow P^* = 25, Q^* = 50. CS = \frac{1}{2}(50 - 25)(50) = 625. PS = \frac{1}{2}(25)(50) = 625. TS = 1250.$$

Exam Traps

1. Price Δ = **move along**. Non-price = **shift**.
2. Coinsurance ↑: D Left (provider-price axis) or move along (OOP axis).
3. 100% insurance ≠ perfectly inelastic. D still slopes down; at $P = 0$.
4. Optimal health ≠ max health. Optimal: $MB = MC$.
5. Indiv $|E_d| \gg$ Market $|E_d|$: firm has subs; category doesn't.
6. "Compare A vs B": explain **both sides**.
7. Graph Qs: **ALWAYS draw**. Label axes, curves, shifts, eq points.
8. Budget slope = $-P_x/P_y$. IC slope = $-MU_x/MU_y$.

More Key Concepts

Supply Shifters

Move along S: Only own-price. **Shift S:**

1. Input prices ↑: S Left (costlier to produce).
2. Technology improves: S Right (cheaper/more output).
3. # Sellers ↑: S Right.
4. Expectations: Expect future $P \uparrow \rightarrow$ S Left now.
5. Gov't policy: Subsidies → S Right; Regulations → S Left.

Determinants of Elasticity

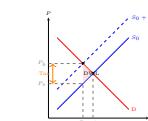
Why is $|E_d|$ higher for some goods?

- **Substitutes available:** More subs → more elastic.
- **Necessity vs Luxury:** Necessities inelastic (insulin).
- **Budget share:** Large share → more elastic (housing).
- **Time horizon:** Longer time → more elastic (can adjust).
- **Market definition:** Narrower → more elastic (Pepsi vs "soda").

Shutdown & Profit Rules

- **Profit:** $\pi = TR - TC = (P - ATC) \times Q$.
- $P > ATC$: Positive profit (economic profit).
- $AVC < P < ATC$: Negative profit, but still operate (covers variable costs; loss < TFC).
- $P < AVC$: **Shut down** (SR). Loss from operating exceeds TFC.
- $P < ATC$: **Exit** (LR). No fixed costs in long run.

Tax Incidence



- Tax creates wedge: Buyer pays P_b , seller gets $P_s = P_b - \text{Tax}$.
- **Inelastic side bears more burden** (can't escape).
- Q falls from Q^* to Q_t . DWL = triangle between old and new Q .

Arc (Midpoint) Elasticity

$$E_d = \frac{\Delta Q/\bar{Q}}{\Delta P/\bar{P}} = \frac{(Q_2 - Q_1)/[(Q_1 + Q_2)/2]}{(P_2 - P_1)/[(P_1 + P_2)/2]}$$

Use midpoint to avoid direction-dependence.

Cross-Price Calc Example

$E_{xy} = 1.2$ (Coke & Pepsi). Coke $P \uparrow 10\%$: $\% \Delta Q_{pepsi} = 1.2 \times 10\% = 12\% \uparrow$.

$E_{xy} > 0 \rightarrow$ Substitutes. Coke expensive → buy Pepsi.

$E_{xy} = -0.5$ (physician & hospital). Physician $P \downarrow$: $\% \Delta Q_{hosp} = -0.5 \times (\text{neg}) = \text{positive} \rightarrow D \text{ Right}$.

$E_{xy} < 0 \rightarrow$ Complements. Cheaper doctor → more hospital use.