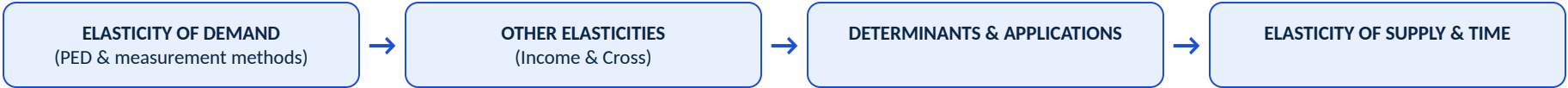


1 CHAPTER ROADMAP



Theme: the law of demand tells us direction (price ↑ ⇒ Qd ↓) but not magnitude. Elasticity measures HOW MUCH quantity responds to a change in price, income, or the price of another good – this drives real business decisions on pricing, taxation, and trade.

2 KEY DEFINITIONS

Elasticity of Demand (PED) Degree of responsiveness of quantity demanded to a change in the good's own price.	Elastic Demand % change in Qd > % change in price – demand is sensitive to price.
Inelastic Demand % change in Qd < % change in price – demand is insensitive to price.	Unit Elastic Demand % change in Qd = % change in price – total revenue stays unchanged.
Perfectly Elastic (E=∞) Smallest price change causes an infinitely large change in demand – horizontal demand curve.	Perfectly Inelastic (E=0) Demand totally unaffected by price change – vertical demand curve.
Income Elasticity of Demand Responsiveness of Qd to a change in consumer income; positive for normal goods, negative for inferior goods.	Cross Elasticity of Demand Responsiveness of Qd for good A to a change in the price of good B; positive = substitutes, negative = complements.

3 DEGREES OF ELASTICITY & EFFECT ON REVENUE

Coefficient	Degree	Effect of a Price FALL on Total Revenue
E = 0	Perfectly inelastic	Qd unaffected – revenue falls in same proportion as price
0 < E < 1	Relatively inelastic	Revenue FALLS (Qd rise fails to offset price fall)
E = 1	Unit elastic	Revenue UNCHANGED (offsetting effects exactly cancel)
E > 1	Relatively elastic	Revenue RISES (Qd rise more than offsets price fall)
E = ∞	Perfectly elastic	Infinitely responsive – any price rise takes Qd to zero

Exam clue: Elastic → Price and Revenue move in OPPOSITE directions. Inelastic → Price and Revenue move in the SAME direction. Unit elastic → Revenue does not change with price.

4 METHOD 1: TOTAL EXPENDITURE (TOTAL REVENUE) METHOD

RULE (ALFRED MARSHALL)

- Total expenditure ↑ when price falls → demand is **relatively elastic**
- Total expenditure ↓ when price falls → demand is **relatively inelastic**
- Total expenditure unchanged when price falls → demand is **unit elastic**

Case	Price (Rs.)	Qty (litres)	Total Expenditure	Result
Inelastic ($\eta < 1$)	200 → 400	30 → 25	6,000 → 10,000 (↑)	Expenditure rises with price → Inelastic
Elastic ($\eta > 1$)	200 → 400	30 → 10	6,000 → 4,000 (↓)	Expenditure falls with price rise → Elastic
Unit elastic ($\eta = 1$)	200 → 400	30 → 15	6,000 → 6,000 (no change)	Expenditure constant → Unit elastic

5 METHOD 2: PERCENTAGE (PROPORTIONATE) METHOD

PRICE ELASTICITY OF DEMAND

$$\eta = [(Q_2 - Q_1) \div ((Q_2 + Q_1) / 2)] \div [(P_2 - P_1) \div ((P_2 + P_1) / 2)]$$

Uses AVERAGE price & quantity so η is the same moving either direction along the curve | Take the ABSOLUTE value to compare against 1

ELASTIC EXAMPLE

- Qd: 30→10, P: 200→400
- $\eta = -1.5 \rightarrow |1.5| > 1$ - Elastic

INELASTIC EXAMPLE

- Qd: 30→25, P: 200→400
- $\eta = -0.27 \rightarrow |0.27| < 1$ - Inelastic

UNIT ELASTIC EXAMPLE

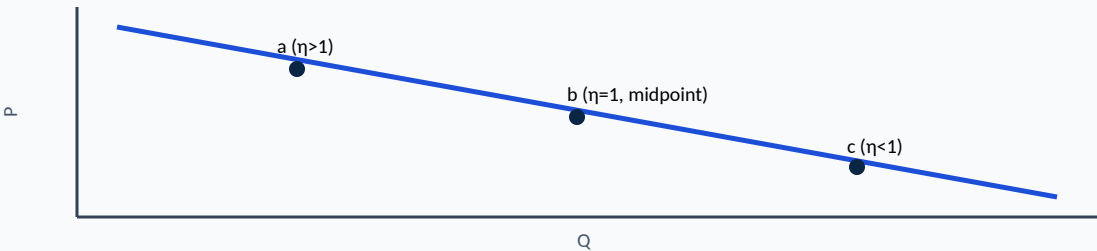
- Qd: 30→15, P: 200→400
- $\eta = -1 \rightarrow |1| = 1$ - Unit elastic

6 POINT ELASTICITY VS ARC ELASTICITY

	Point Elasticity	Arc Elasticity
When used	Very small/nominal price change (e.g. petroleum)	Significant/large price change (e.g. poultry, dairy, crops)
Formula	$\eta = (\Delta Q / Q_o) \div (\Delta P / P_o)$	$\eta = [(Q_1 - Q_o) / (Q_1 + Q_o)] \times [(P_1 + P_o) / (P_1 - P_o)]$
Worked example	P: 12→11.75, Q: 100→101 $\Rightarrow \eta = -0.48$ (Inelastic)	P: 8→12, Q: 300→100 $\Rightarrow \eta = -2.5$ (Elastic)

7 METHOD 3: GEOMETRIC METHOD

Measures elasticity at any point on a straight-line demand curve using: η = Lower part of the demand curve (below the point) ÷ Upper part of the demand curve (above the point).



Along a straight-line demand curve: points near the TOP (price-axis end) are elastic ($\eta > 1$); the MIDPOINT is unit elastic ($\eta = 1$); points near the BOTTOM (quantity-axis end) are inelastic ($\eta < 1$).

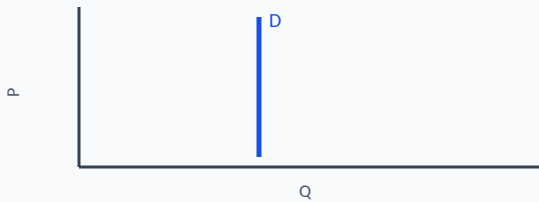
8 TWO EXTREMES OF PRICE ELASTICITY OF DEMAND

Perfectly Elastic Demand (E=∞)



Horizontal demand curve – minuscule price change causes infinite change in Qd.

Perfectly Inelastic Demand (E=0)



Vertical demand curve – Qd stays at Q0 regardless of price (P1 or P2).

9 INCOME ELASTICITY OF DEMAND (YED)

INCOME ELASTICITY OF DEMAND

$\eta = \% \text{ change in } Q_d \div \% \text{ change in Income} = (\Delta D/D) \div (\Delta I/I)$

Positive coefficient = Normal good | Negative coefficient = Inferior good

NORMAL GOODS (YED > 0)

- Qd rises as income rises
- **Superior/luxury goods:** Qd rises MORE than proportionately (e.g. luxury cars – elastic)
- **Necessities:** Qd rises but inelastically

INFERIOR GOODS (YED < 0)

- Qd FALLS as income rises – consumers switch to superior alternatives
- Examples: inexpensive/frozen food, long-route bus tickets, reconditioned cars

Worked example: Income Rs.10,000→15,000 (+40%); Demand 50→40 units (–22.2%) ⇒ YED = –22.2% ÷ 40% = **–0.56** ⇒ Negative & |value| < 1 ⇒ Inferior good, income-inelastic.

Applied use: products with HIGH income elasticity get hit hardest during a recession (e.g. cars fell more than food demand during COVID-19); firms use YED to plan future product ranges as incomes grow.

10 CROSS ELASTICITY OF DEMAND (XED)

CROSS ELASTICITY OF DEMAND FOR GOOD A W.R.T. PRICE OF GOOD B

$E_c = (\Delta Q_a \div Q_a) \div (\Delta P_b \div P_b)$

Unlike PED, the coefficient can be POSITIVE or NEGATIVE

Sign of E _c	Relationship	Example
Positive	Substitutes – demand for A moves SAME direction as price of B	Lipton tea price ↑ → demand for Supreme tea ↑ (E _c = +3.01, elastic)
Negative	Complements – demand for A moves OPPOSITE direction to price of B	Shoe price ↑ → demand for shoelaces ↓ (E _c = -3.01, elastic)
Zero / near zero	Independent (unrelated) goods – no relationship	Price of butter has no effect on demand for notebooks

Larger positive coefficient = closer substitutes; larger negative coefficient = stronger complementarity.

11 DETERMINANTS OF ELASTICITY OF DEMAND

Close substitutes available	→	Demand MORE elastic
Complementary good's price rises	→	Demand for THIS good MORE inelastic
Good is a necessity	→	Demand MORE inelastic (luxuries → more elastic)
Strong brand loyalty/habit	→	Demand MORE inelastic
Small % of income spent on good	→	Demand MORE inelastic
Longer time period allowed	→	Demand becomes MORE elastic (time to adjust/switch)

12 APPLICATIONS OF ELASTICITY OF DEMAND

PRICE DETERMINATION - Elastic goods: keep price low (else lose sales to substitutes) - Inelastic goods: price can be high (necessities)	TAXATION (FINANCE MINISTER) - Tax inelastic goods (tobacco, electricity) → high revenue - Tax on elastic goods → demand falls sharply, revenue falls	MONOPOLIST'S GUIDANCE - Inelastic goods: high price, low quantity - Elastic goods: low price + promos to keep buyers
TRANSPORT FARES - Elastic transport (bus/taxi): fares kept LOW - Inelastic transport (airways, no alternative): fares HIGH	BALANCE OF TRADE - Elastic export demand → low earnings, unfavourable trade balance - Countries want inelastic demand abroad to raise price & boost exports	RECESSION PLANNING - High-YED products hit hardest when income falls - Firms reallocate resources accordingly

13 ELASTICITY OF SUPPLY (ES)

PRICE ELASTICITY OF SUPPLY

$$Es = [(Q_2 - Q_1) \div ((Q_2 + Q_1) / 2)] \div [(P_2 - P_1) \div ((P_2 + P_1) / 2)]$$

Direct/positive relationship between price & quantity supplied ⇒ Es is ALWAYS positive

Case	Price	Quantity	Es	Result
Inelastic supply	100→200	50→60	0.27	Es < 1 – Inelastic
Elastic supply	100→200	50→150	1.5	Es > 1 – Elastic
Unit elastic supply	100→200	50→100	1.0	Es = 1 – Unit elastic

14 GEOMETRIC SHORTCUTS FOR LINEAR SUPPLY CURVES

INTERSECTS PRICE AXIS

- Elastic (Es>1) at ALL points

INTERSECTS QUANTITY AXIS

- Inelastic (Es<1) at ALL points

PASSES THROUGH ORIGIN

- Unit elastic (Es=1) at ALL points

These shortcut rules apply only to LINEAR (straight-line) supply curves – not valid for non-linear curves.

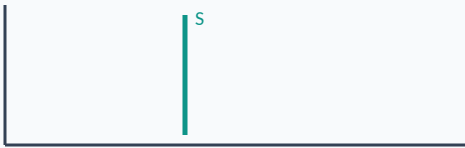
15 TWO EXTREMES OF SUPPLY ELASTICITY

Perfectly Elastic Supply (Es=∞)



Horizontal supply curve – supply is infinite at a given price, zero just below it.

Perfectly Inelastic Supply (Es=0)



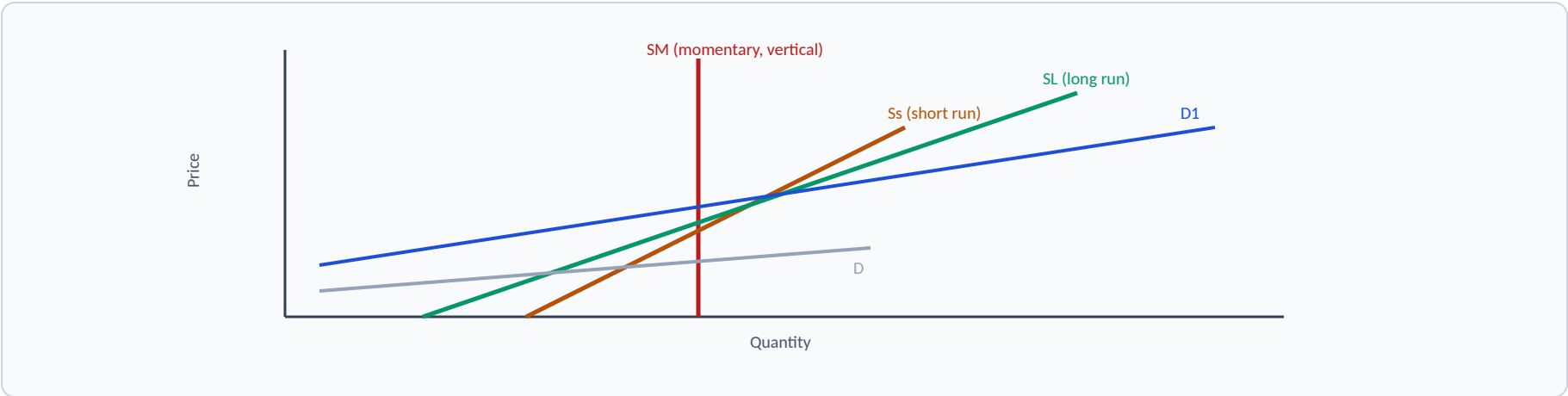
Vertical supply curve – quantity supplied fixed at Q* regardless of price.

16 DETERMINANTS OF ELASTICITY OF SUPPLY

More firms in the industry	→	Supply MORE elastic
Stocks/inventory available	→	Supply MORE elastic (can meet demand from stock)
Spare capacity exists	→	Supply MORE elastic; full capacity → MORE inelastic
Resources easily switched to other goods	→	Supply MORE elastic
Longer time period allowed	→	Supply becomes MORE elastic

17 ELASTICITY OF SUPPLY & TIME

Time Period	Ability to Adjust	Elasticity
Momentary/Immediate market period	Insufficient time to change output at all	Perfectly inelastic
Short run	Plant capacity fixed; minor efficiency/technique tweaks only	Relatively inelastic
Long run	All adjustments possible (plant size, structure, new capacity)	Highly/relatively elastic



Demand rises from D to D1 at price P0. In the *momentary* period price jumps to PM (Qty fixed); in the *short-run* price settles lower at PS as supply adjusts a little; in the *long run* price falls further to PL as supply becomes fully elastic. Conclusion: *the longer the time allowed, the more elastic supply becomes.*

18 EXAM PATTERNS & MCQ QUICK CLUES

"Price & revenue move in opposite directions"	→	Elastic demand ($E > 1$)
"Price & revenue move in the same direction"	→	Inelastic demand ($E < 1$)
"Coefficient is negative"	→	Inferior good (YED) OR complements (XED)
"Coefficient is positive" (income/related-price context)	→	Normal good (YED) OR substitutes (XED)
"Nominal/very small price change"	→	Use Point Elasticity
"Significant/large price change"	→	Use Arc Elasticity
"Supply curve is vertical / no time to adjust"	→	Momentary period – perfectly inelastic supply

⚠ ECONOMICS EXAM TRAPS

Trap: Forgetting to take the ABSOLUTE value of PED before comparing to 1 (PED is naturally negative due to the law of demand).
Trap: Confusing YED sign rules (normal=positive/inferior=negative) with XED sign rules (substitutes=positive/complements=negative) – they look similar but classify different things.
Trap: Elasticity of supply coefficient is ALWAYS positive (direct relationship) – unlike PED, never take its negative sign as meaningful.
Trap: Reversing the geometric supply-curve rule – intersecting the PRICE axis is ELASTIC, intersecting the QUANTITY axis is INELASTIC.
Trap: Assuming elasticity of supply is fixed – it INCREASES over time (momentary → short run → long run).
Trap: Mixing up Point Elasticity (small change) with Arc Elasticity (large change) formulas.

19 COMPLETE CHAPTER DECISION TREE

QUESTION GIVEN → Which elasticity is asked (PED / YED / XED / Es)? → Is the price/income change small (point) or large (arc)? → Apply the relevant formula → Calculate & take absolute value where relevant (PED, Es) → Compare to 1 (or check sign for YED/XED) → Interpret (elastic/inelastic/normal/inferior/substitute/complement) → Select final answer

PRC-3 ECONOMICS – CHAPTER 3 IN 60 SECONDS

- **PED:** $\% \Delta Q_d \div \% \Delta P$; elastic if > 1 , inelastic if < 1 , unit if $= 1$.
 - **TR method:** price ↓ & TR ↑ = elastic; price ↓ & TR ↓ = inelastic; TR same = unit.
 - **Point elasticity:** tiny price change. **Arc elasticity:** large price change.
 - **Geometric method:** lower part ÷ upper part of demand curve at a point.
 - **YED:** positive = normal good; negative = inferior good.
- **XED:** positive = substitutes; negative = complements; ~ 0 = independent.
 - **PED determinants:** substitutes, necessity/luxury, brand loyalty, % of income, time.
 - **Es:** always positive; rises with more firms, stock, spare capacity, resource mobility, time.
 - **Linear supply curve:** hits price-axis=elastic; hits quantity-axis=inelastic; through origin=unit elastic.
 - **Time & supply:** momentary=perfectly inelastic; short run=relatively inelastic; long run=elastic.

20 CHAPTER MEMORY MAP

