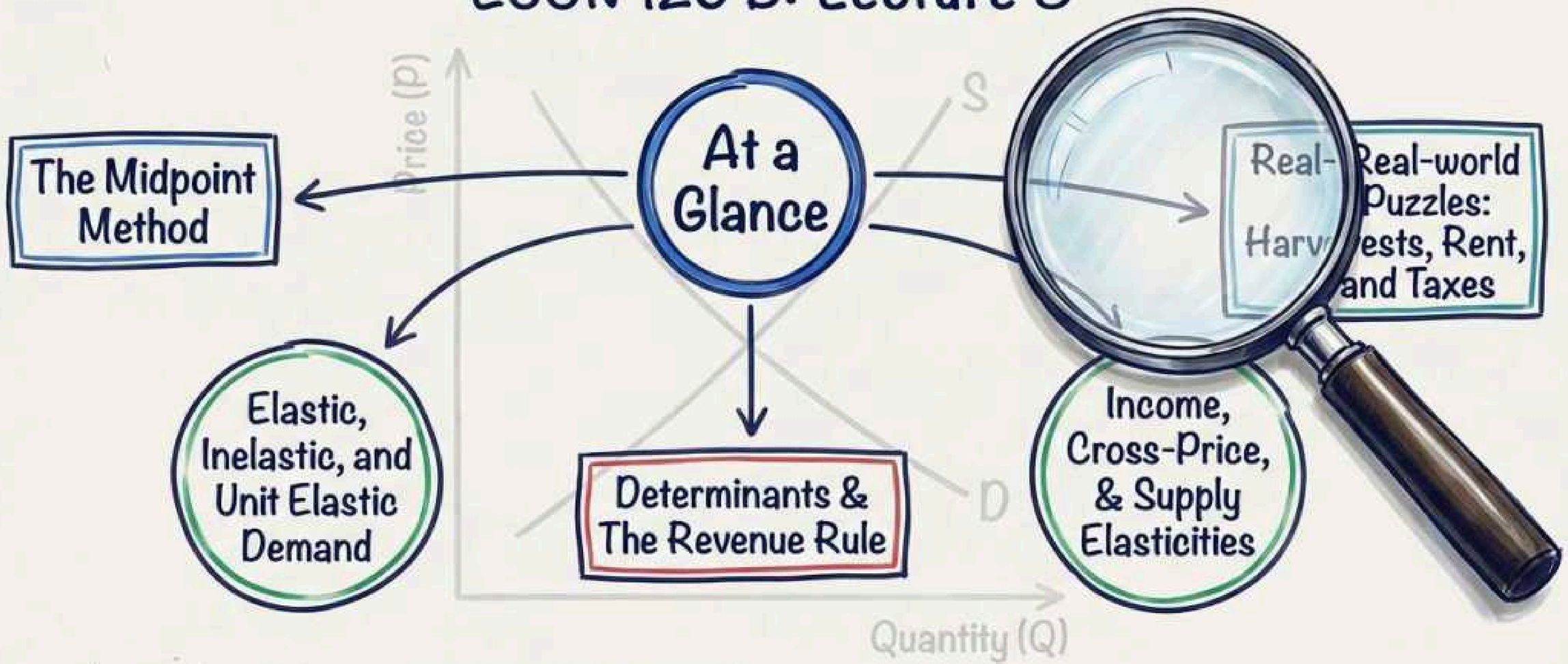
¶ 3.1

Elasticity and Its Uses

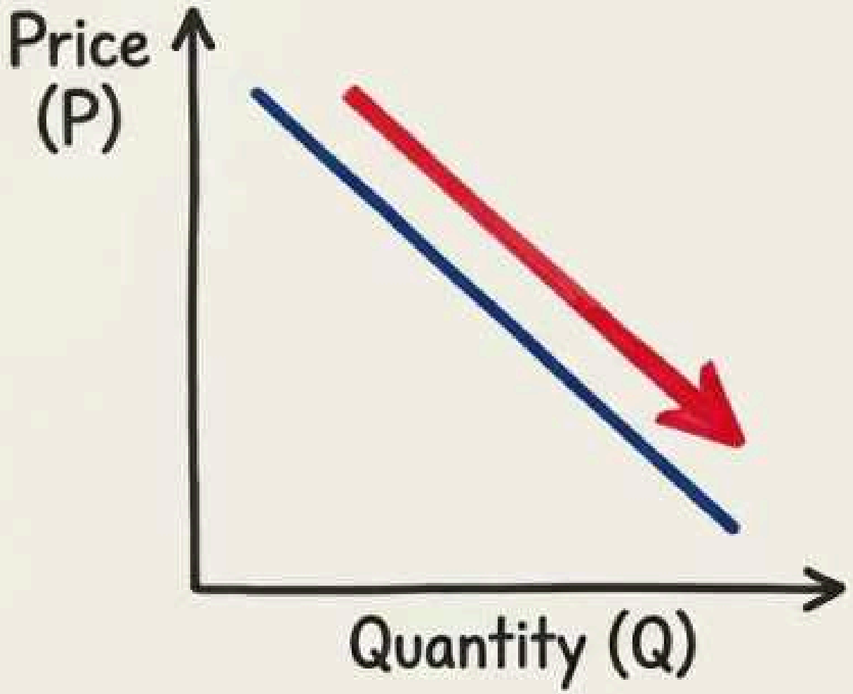
ECON 120 B: Lecture 3



Direction vs. Size

¶ 3.2

The Law of Demand



Direction: Price ↑ = Quantity ↓

(Tells us the market moves, but not by how much)

Elasticity

Size: How big is the response?



Salt: Small price rise → Buying habits hardly change.



Cereal Brand: Small price rise → Shelf empties entirely.

The Core Formula: Price Elasticity of Demand

¶ 3.3

The percentage change in quantity demanded divided by the percentage change in price.

$$\varepsilon = \left| \frac{\%\Delta Q_d}{\%\Delta P} \right|$$

Price and quantity move in opposite (negative ratio).

By custom, we drop the sign to report pure size.

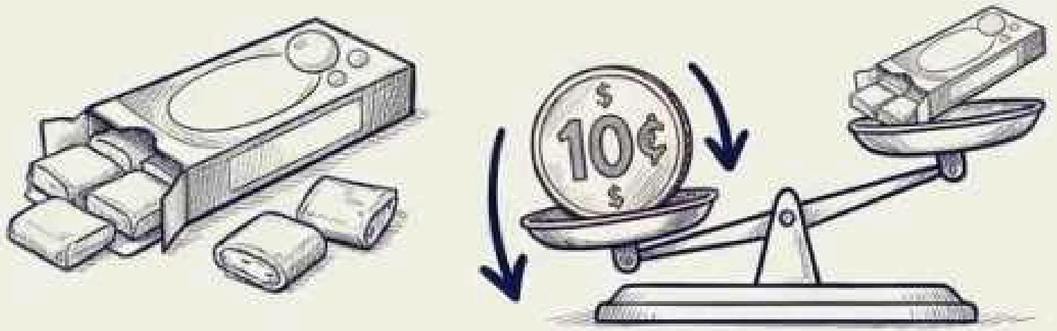
Larger Number = Higher Responsiveness.

Corcital imr der = Higher no Responsiveness.

Why Use Percentages?

¶ 3.4

The Problem with Absolute Units: A $0.10 price change...

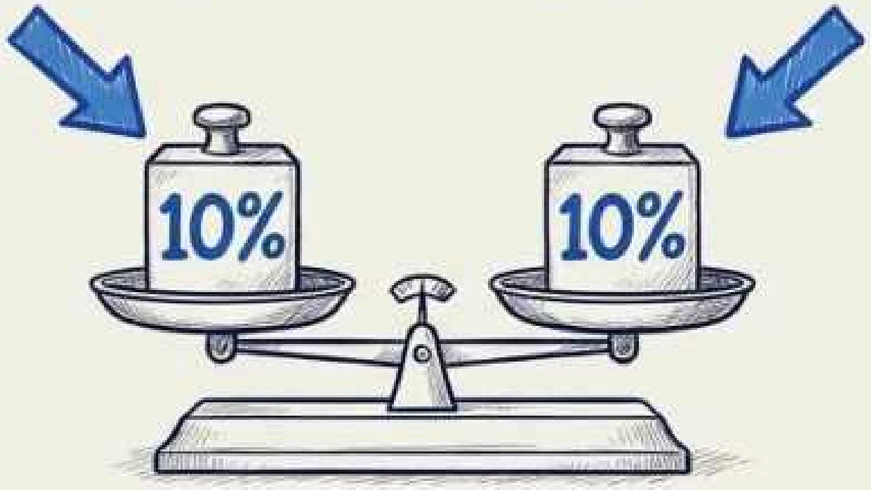


...is massive for a pack of gum



...but completely unnoticeable for a car.

The Percentage Solution:



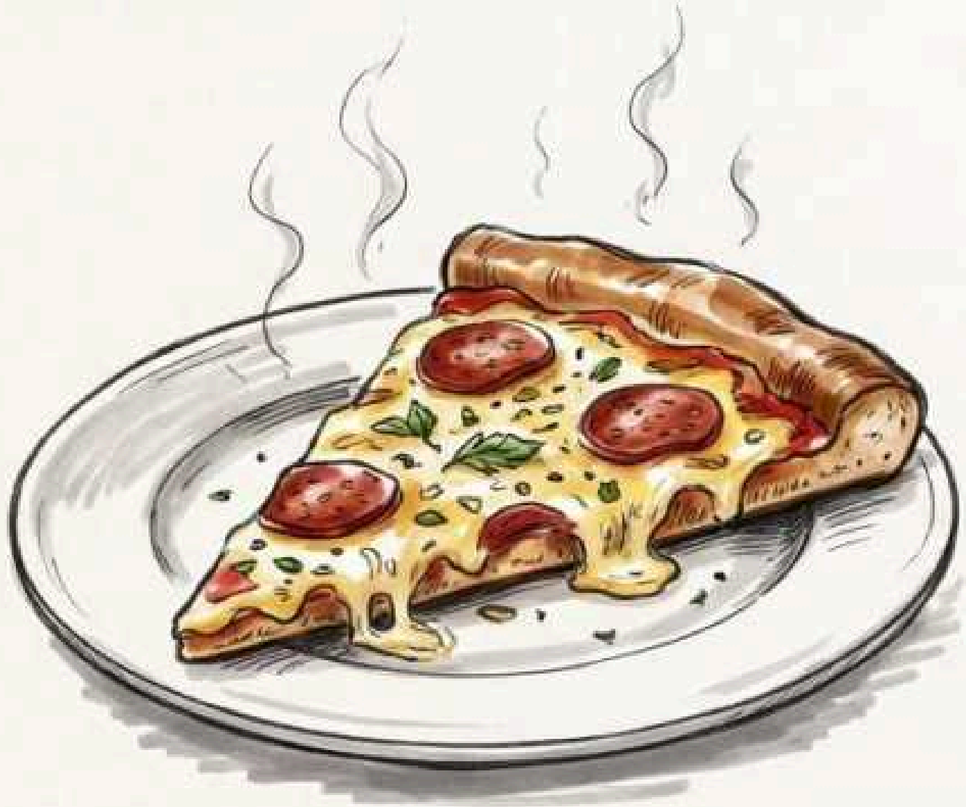
A 10% price change means the exact same relative shift in both cases. Percentages do not depend on units, allowing us to compare the responsiveness of vastly different goods.

The Midpoint Method: Establishing a Base

¶ 3.5

The Problem: Standard percentage changes yield different results depending on whether the price is rising or falling. Which starting point do we use?

The Solution: Divide each change by the average (midpoint) of the old and new values.



Market Scenario (Pizza):

State A (Old)	$4.00 Price	60 Slices
State B (New)	$5.00 Price	50 Slices

Calculating the Midpoint

Step 1: Price Change

$$\frac{\$1 \text{ change}}{\$4.50 \text{ average}} \approx 22\%$$

Step 2: Quantity Change

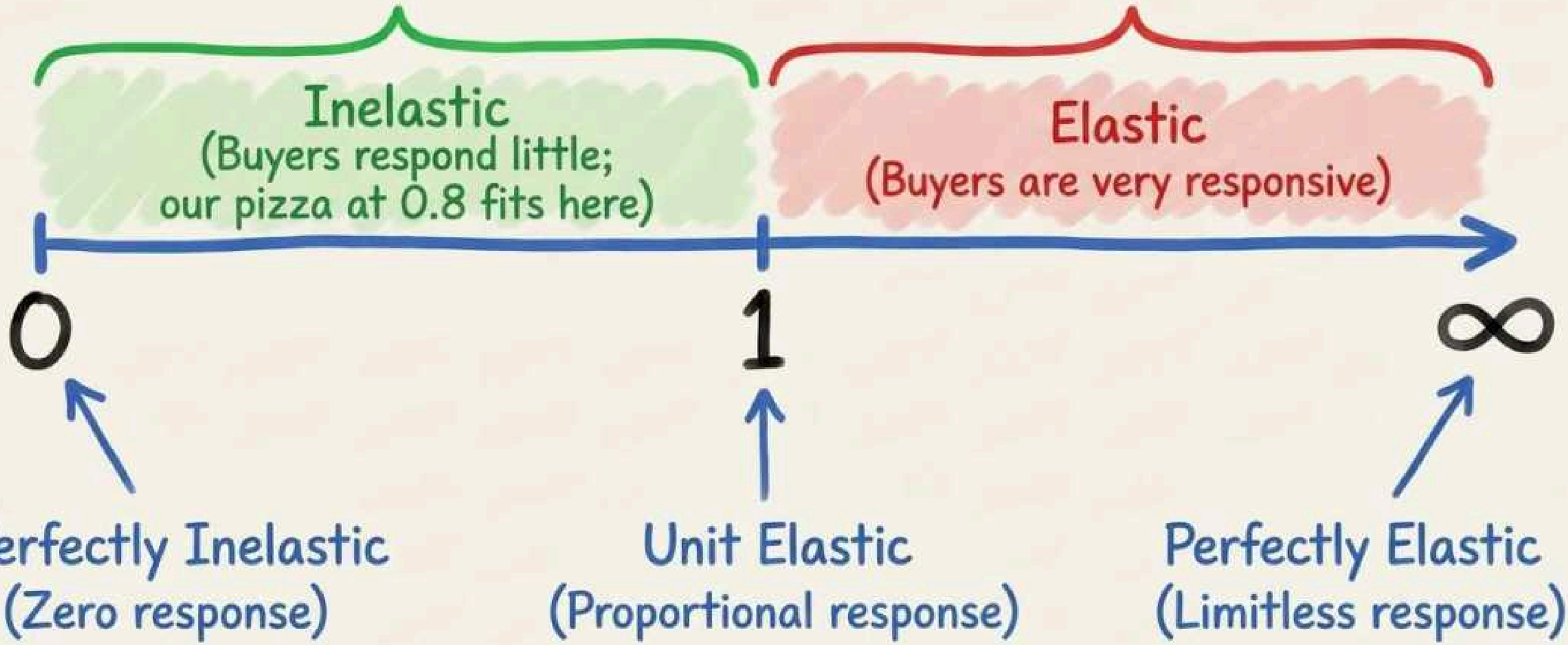
$$\frac{10 \text{ slices change}}{55 \text{ average}} \approx 18\%$$

Step 3: Elasticity

$$\frac{18\%}{22\%} \approx 0.8$$

The Elasticity Spectrum

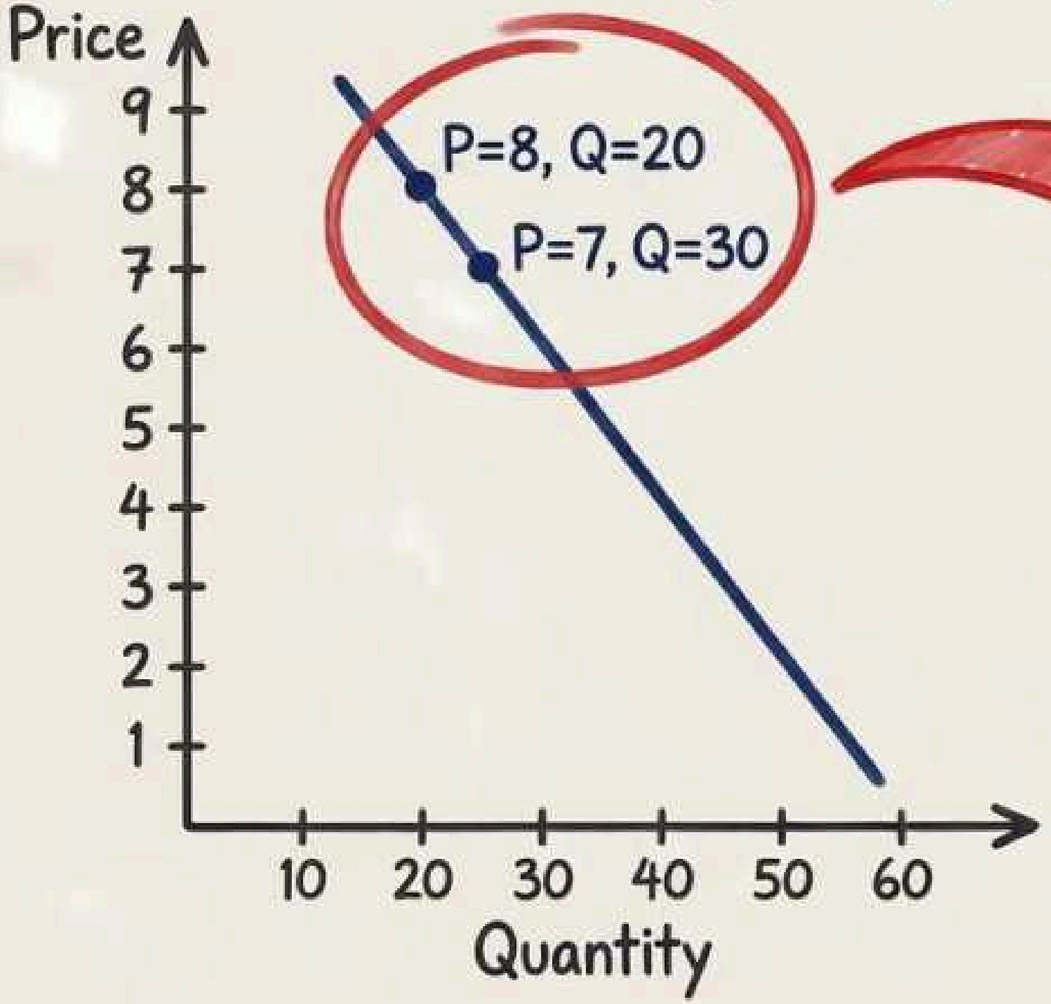
¶ 3.7



Moving Up the Demand Line

¶ 3.8

Core Insight: The line has the same slope, but the elasticity is very different.



Scenario (Higher up the curve):

Price: \$7 → \$8 (Change: ~13%)

Quantity: 30 → 20 slices (Change: 40%)

Calculation: $\varepsilon = \frac{40\%}{13\%} \approx 3.0$

The Pattern of a Straight Demand Line

¶ 3.9



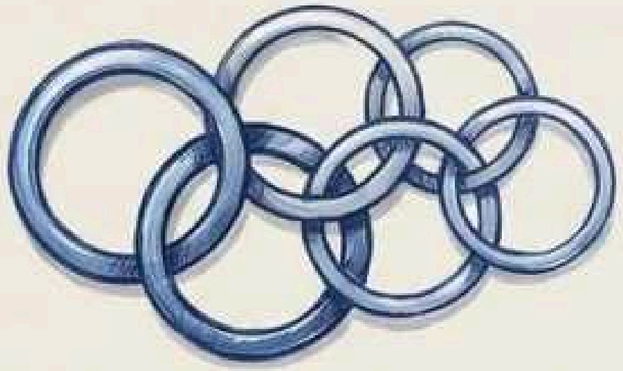
Top Half (Elasticity is large): Demand is Elastic.
Seller Strategy: Gain revenue by cutting the price.

Exact Midpoint: Unit Elastic ($\varepsilon = 1$)
Our Market: $5 price, 50 slices.

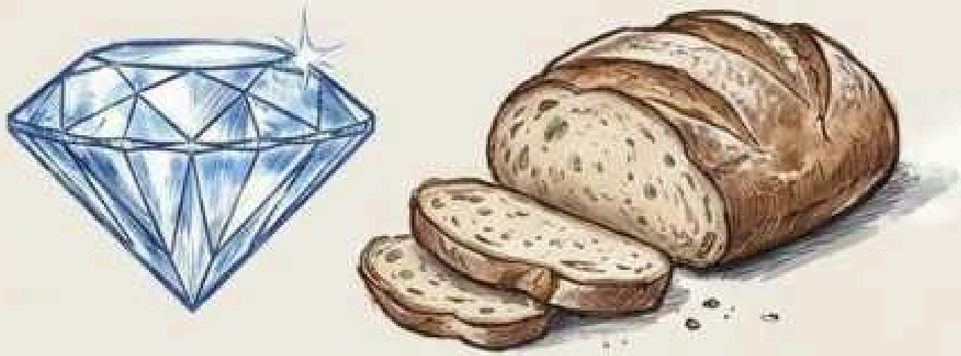
Bottom Half (Elasticity is small):
Demand is Inelastic.
Seller Strategy: Gain revenue by raising the price.

Four Determinants of Elasticity

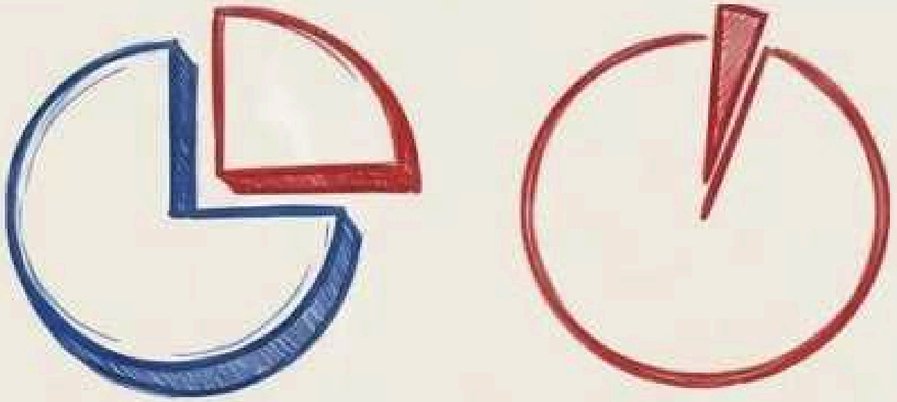
¶ 3.10



1. **Substitutes:** Many close alternatives mean buyers can switch easily.



2. **Necessity vs. Luxury:** Luxuries are highly elastic; necessities are not.



3. **Budget Share:** We notice a price rise on a car much more than on a pencil.



4. **Time:** Over months, people find alternatives they cannot find in a week.

Elasticity in the Real World

¶3.11



Insulin (Very Inelastic): No substitutes exist, and and the medical need is urgent.



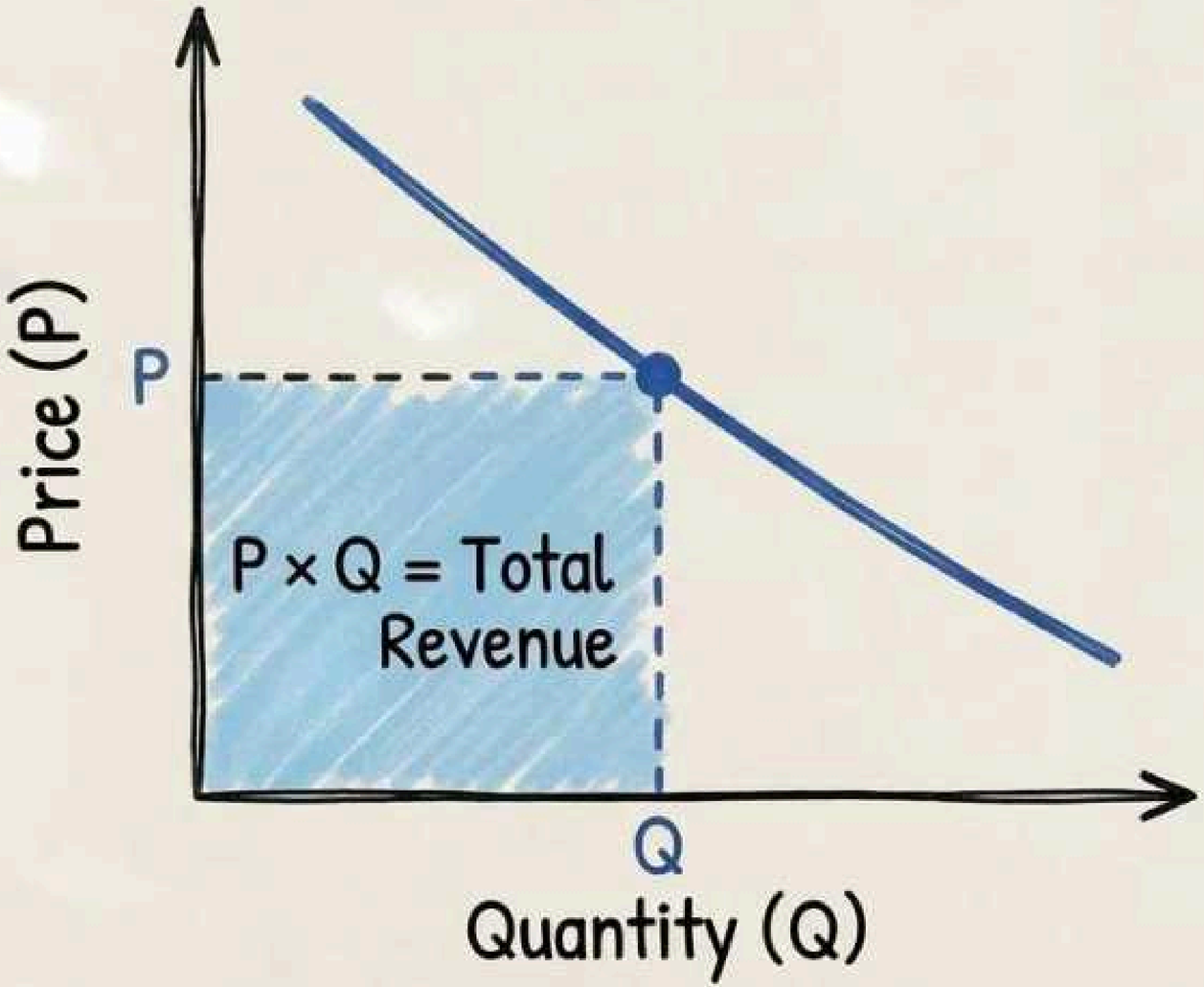
One Brand of Soft Drink (Highly Elastic): Other brands on the shelf are nearly identical (perfect substitutes).



Petrol (Time-Dependent):
Short Run: Inelastic (hard to change commutes instantly).
Long Run: More elastic over years as people buy different cars or move homes.

Total Revenue

Total Revenue (TR) = Price × Quantity



Revenue at Different Price Points (Our Market):

$4 → $240 / hr

$5 → $250 / hr

$7 → $210 / hr

$8 → $160 / hr

The Revenue Rule

¶ 3.13

Inelastic Demand: → Raising price ↑ Raises Revenue

(The quantity falls by a smaller percentage than the price rises)

Elastic Demand: → Raising price ↓ Lowers Revenue

(The higher price loses more in sales than it gains)

Unit Elastic: → ★ Revenue is Maximized

(Highest at $5 in our market; beyond this, higher prices destroy revenue)

Expanding the Framework: Other Elasticities

¶ 3.14

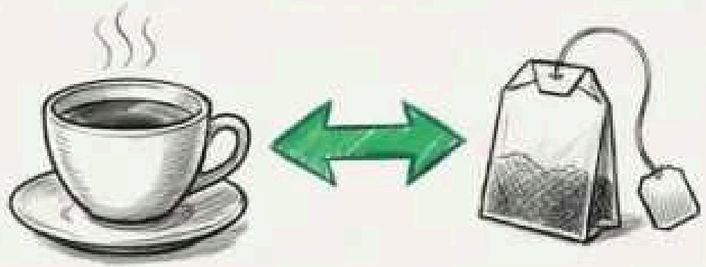
Income Elasticity:
(Response to income changes)



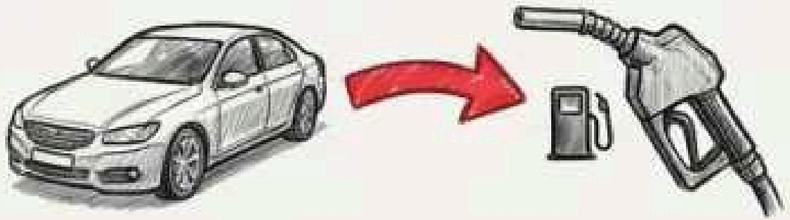


- Positive: Normal goods
- Negative: Inferior goods
- > 1: Luxuries

Cross-Price Elasticity:
(Response to the price of another good)



Positive: Substitutes



Positive: Substitutes
Negative: Complements

Elasticity of Supply

¶ 3.15

Definition: How much the quantity supplied responds to the price.

Short Run (Inelastic):

Factories, farms, and workforces cannot change capacity instantly. A farmer cannot grow more wheat this month just because the price rose.



Time

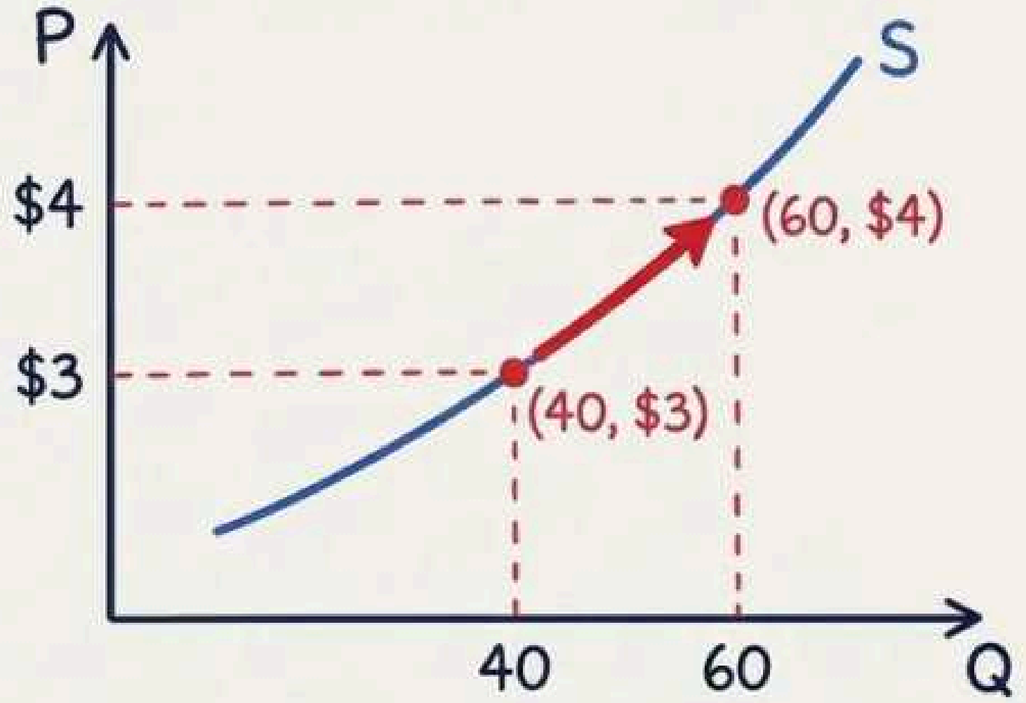
Long Run (More Elastic):

Over longer periods, suppliers can scale facilities up or down.



Calculating Supply Elasticity

¶ 3.16

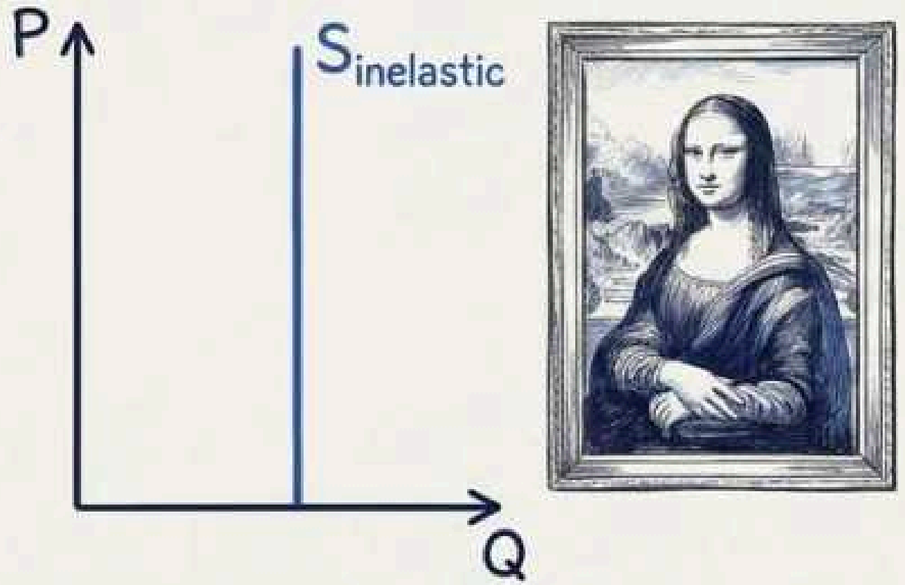


Market Scenario:

Price rises: $3 → $4 (29% change)

Quantity supplied: 40 → 60 slices (40% change)

The Math: $\mathcal{E}_s = \frac{40\%}{29\%} \approx 1.4$ (Supply is Elastic)

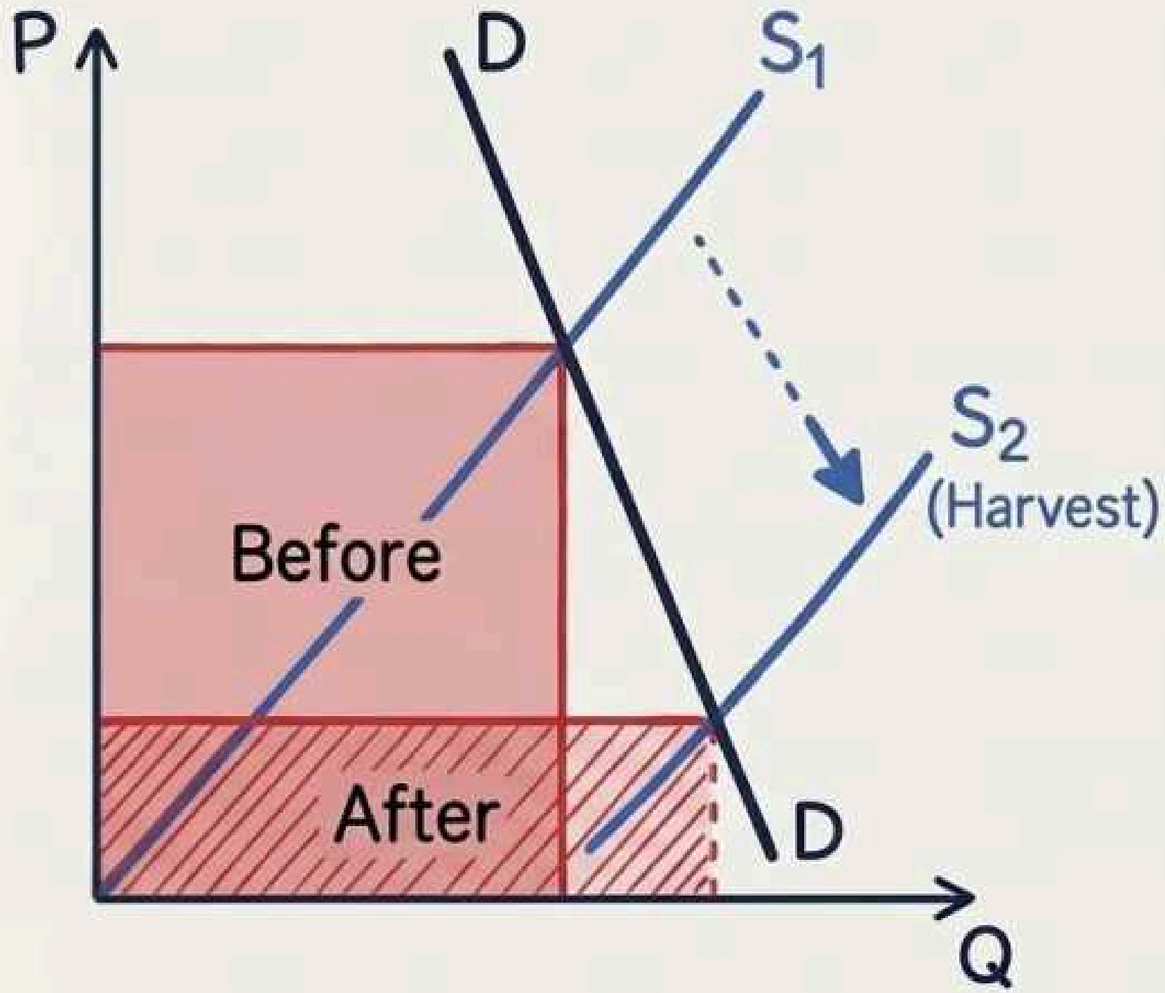


The Extreme Case: If sellers cannot change output at all (e.g., a famous painting), supply is perfectly inelastic—a strictly vertical line.

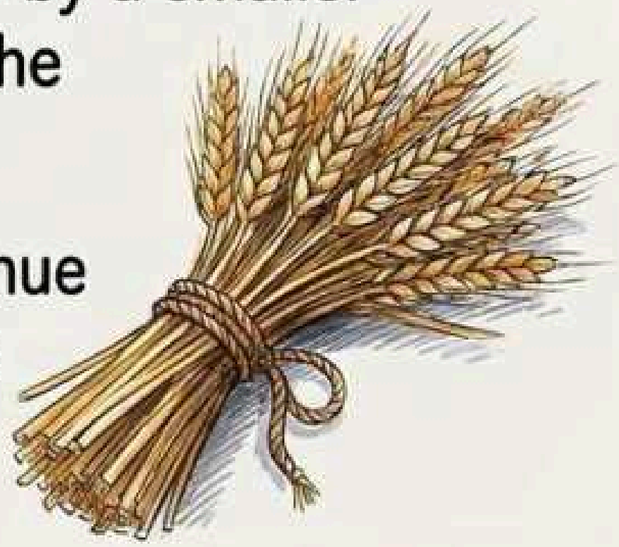
The Bumper Harvest Puzzle

¶ 3.17

The Paradox: Farmers grow more crop, but their overall incomes fall.



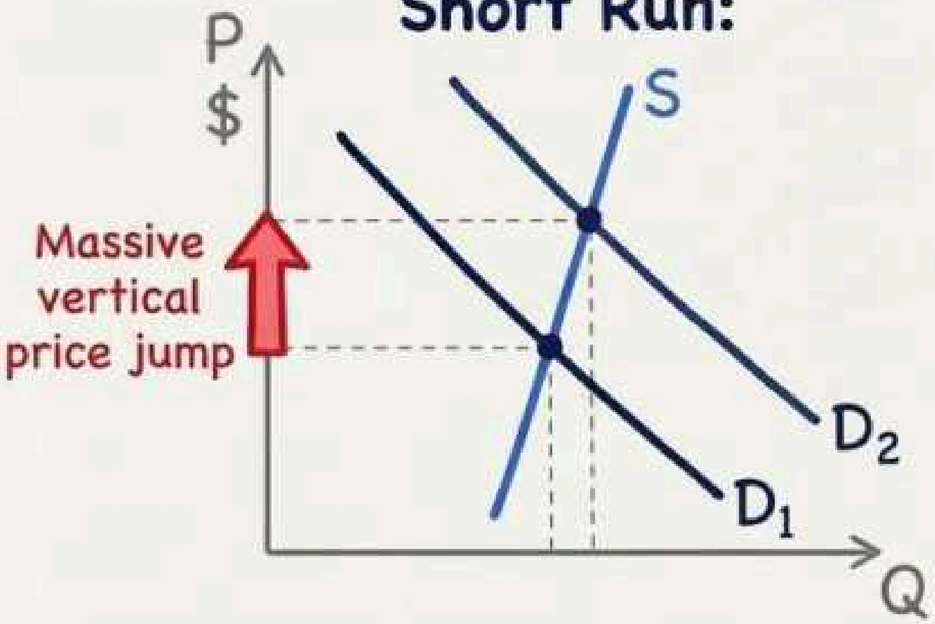
1. Demand for food is highly inelastic.
2. A large harvest shifts supply, pushing prices down sharply.
3. Because demand is inelastic, the quantity sold rises by a smaller percentage than the price falls.
4. Result: Total revenue drops, despite the abundance.



Rent and Time

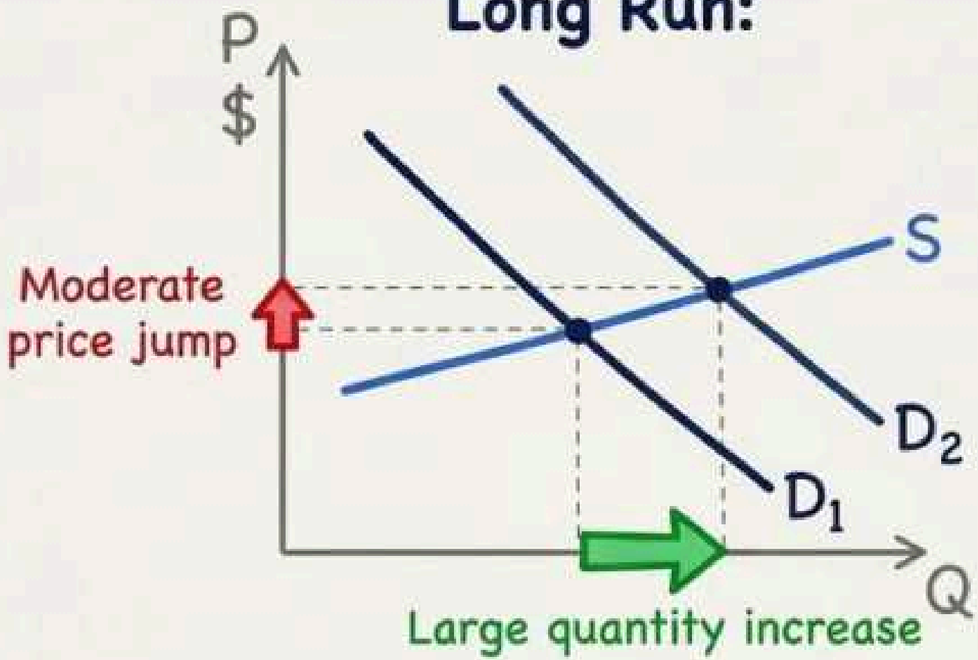
¶ 3.18

Short Run:



The number of flats is fixed (nearly vertical supply). A rise in demand pushes rents sharply upward.

Long Run:



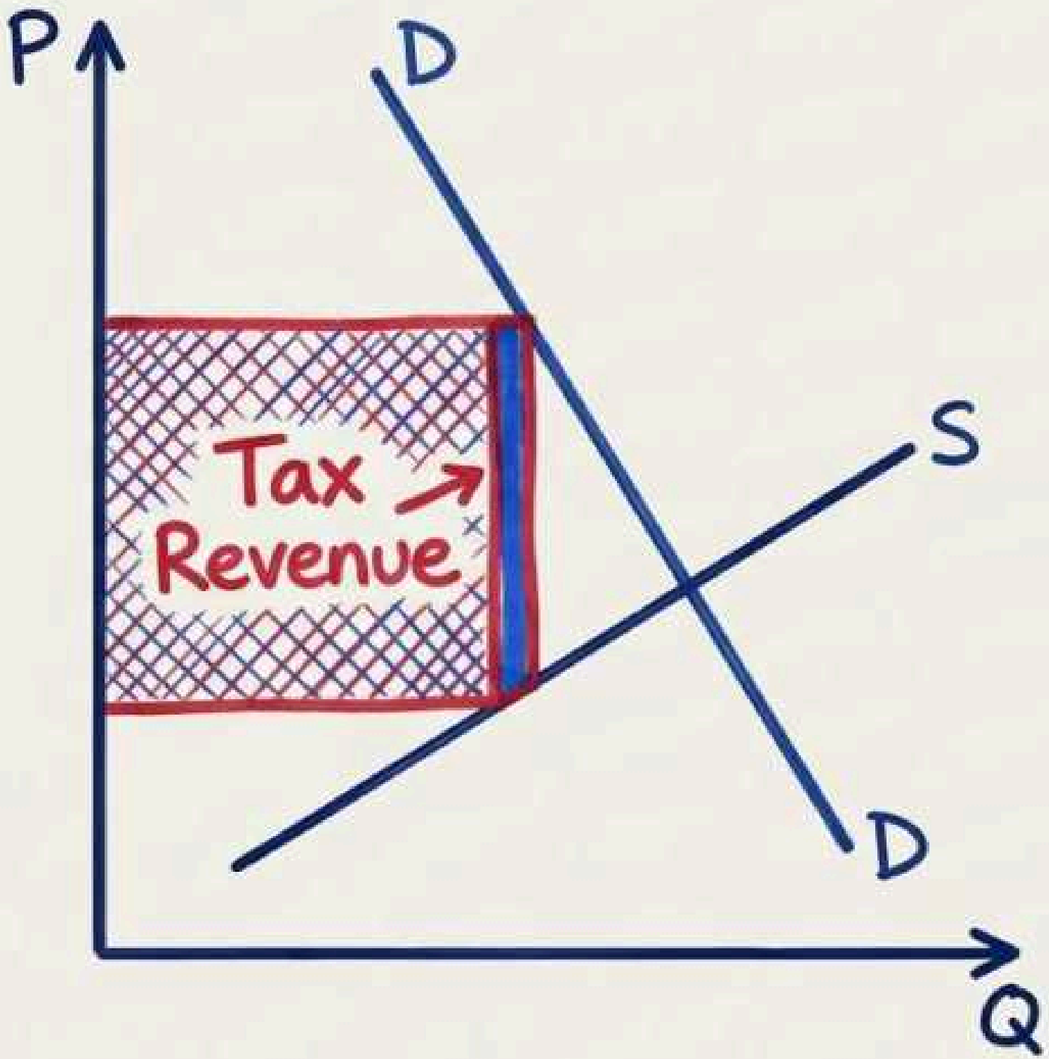
Builders respond, making supply more elastic. The same demand rise adds more flats and raises rents by much less.



Note: Rules that block building artificially force supply to remain inelastic.

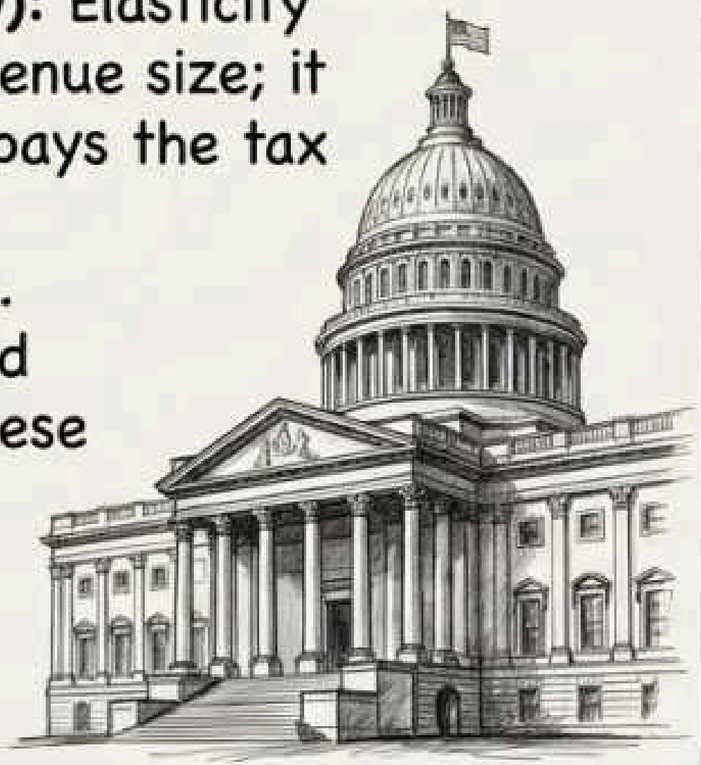
Elasticity and Taxes

¶ 3.19



Revenue Generation: A tax on a good with inelastic demand raises substantial government revenue, because buyers will cut back very little despite the higher price.

Tax Incidence (Preview): Elasticity doesn't just dictate revenue size; it determines who really pays the tax (the ultimate burden).
Elasticity hardrement.
Governments, firms, and campaigners rely on these estimates to predict policy effects.



A Warning About Words

¶ 3.20



Elastic ≠ Good or Bad: It is a neutral term describing responsiveness.

Elastic Demand:
Seller has little power over price (buyers will easily leave).



Inelastic Demand:
Seller has more power over price.
(Critical for understanding monopolies in Lecture 6).

Rule of thumb: Always specify which curve you mean, and at which price.

The Lecture Question

¶ 3.21



Apply this to your life:

1. Think of a product you buy often.
2. If its price rose by 20%, how much less would you buy?
3. Which of the four determinants (Substitutes, Necessity, Budget Share, Time) explain your answer?
4. What would make your demand more elastic?