

Chapter 4: Elasticity



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Elasticity in Beyonce's "Irreplaceable"

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Price Elasticity of Demand

- Elasticity:
 - Responsiveness of buyers and sellers to changes in market conditions.
 - Think _____ when you see the word elasticity.

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1. Existence of Substitutes

- Determines the options consumers have when the price changes
 - Many substitutes → _____ demand
 - Few substitutes → _____ demand

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2. Share of the budget spent on the good

- Determines how much the price change affects the consumer
 - “Big-ticket items” → demand
 - Inexpensive items → demand

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3. Necessities v Luxuries

- Affects the options the consumer faces
 - Luxuries → **elastic** demand
 - Necessities → **inelastic** demand

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Johnny Drama Sucks at Negotiating: Stick to your budget

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4. Is the market broadly or narrowly defined?

- Affects the options the consumer faces
 - Broadly defined → demand
 - Narrowly defined → demand

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5. Time and Adjustment Process

- Affects the ability of consumers to respond to changes in prices
 - Short time horizon → demand
 - Long time horizon → demand

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Review Question: Examples of Demand Elasticity

1. Surgery to remove cancer
2. Buying a new 51 inch plasma TV
3. Electricity to power your home
4. When you decide to have a pizza delivered by Uber Eats rather than pick it up in person. Assume you live within walking distance of the restaurant.

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Which of the following has the most elastic demand?

- A Umbrella**
- B Pet**
- C Battery**
- D Diesel**

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**Pricing in *South Park*,
“Something Wall-Mart This
Way Comes”**

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Computing the Price Elasticity of Demand

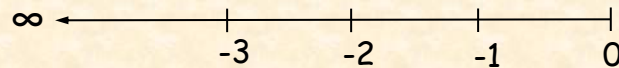
- Elasticity can help answer questions such as:
 - How should a firm set _____ ?
 - How much _____ will an excise tax generate?

$$E_d = \frac{\% \Delta Q_d}{\% \Delta P}$$

Δ = change

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Terminology



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Example

- University parking pass prices increase by %.
- As a result, % less people demand a parking pass.

↓
Plug in
numbers
↓

$$E_d = \frac{\% \Delta Q_d}{\% \Delta P}$$

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Midpoint Method

- The formula is:

$$E_d = \frac{(\Delta Q_d) / (\text{average of } Q_d)}{(\Delta P) / (\text{average of } P)}$$

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

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Example

- Example:

- “Old” price = $P_1 = \$6$; $Q_1 = 15$
- “New” price = $P_2 = \$4$; $Q_2 = 25$

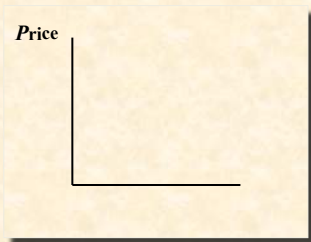
$$E_D = \frac{(Q_2 - Q_1) / [(Q_1 + Q_2) / 2]}{(P_2 - P_1) / [(P_1 + P_2) / 2]}$$

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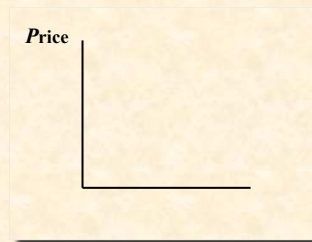
Fast Fact: 70% of pet owners say they would pay any amount of \$\$ to save their pal's life!

Elasticity of Demand

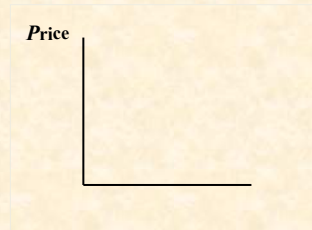
Perfectly inelastic



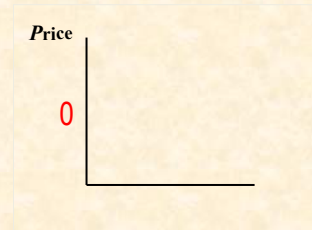
Relatively inelastic



Relatively elastic



Perfectly elastic



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Computing Price Elasticity of Demand

Coefficient	Elasticity	Interpretation	Example
E_D		Price does not matter	Life-Saving Medication
E_D		Price is less important than the quantity purchased.	Gasoline
$E_D =$		Price and quantity are equally important	
E_D		Price is more important than the quantity purchased	An Orange
$E_D \rightarrow$		Price is everything	\$100 Bill

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Poll Everywhere Question

- Suppose a manager raises the price of bottled water from \$2.50 to \$5 and finds that consumption drops from 100 to 55 bottles per week. Is the price elasticity of demand for Hotel H₂O?
Elastic
Inelastic

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Answer

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Time, Elasticity, and Demand Curve

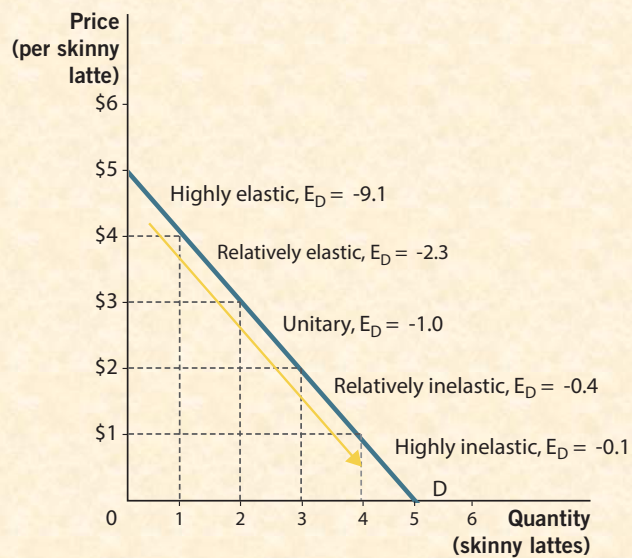


Slope and Elasticity

- Elasticity and the slope of the demand curve are NOT the same.
- In fact, with a linear demand curve:
 - The slope will be the same at all points
 - Elasticity will be _____ at all points
 - Elasticity _____ (gets more _____) as we move down and right along a linear demand curve

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Difference between Slope and Elasticity



Elasticity and Total Revenue

- Total revenue (TR) = $P \times Q$
- P & Q move in opposite directions.
- For elastic goods, $\downarrow$ price would $\uparrow$ TR.
- For inelastic goods, $\uparrow$ the price would $\uparrow$ TR.
- Think of which side moves more!

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Example

$$E_D = \frac{\% \Delta Q_D}{\% \Delta P}$$

P	Q_D	TR = (P) $\times$ (Q_D)	$\% \Delta P$	$\% \Delta Q_D$	E_D	Interpretation
\$5	0	\$0	-22%	200%	-9.1	Highly elastic
\$4	1	\$4	-29%	67%	-2.3	Relatively elastic
\$3	2	\$6	-40%	40%	-1.0	Unitary
\$2	3	\$6	-67%	29%	-0.4	Relatively inelastic
\$1	4	\$4	-200%	22%	-0.1	Highly inelastic
\$0	5	\$0				

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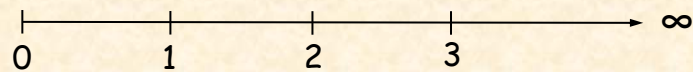
Pricing Strategy in *The Simpsons*, “Bart Gets an Elephant”

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Price Elasticity of Supply

- Responsiveness of Q_S to a change in price

$$E_S = \frac{\% \Delta Q_S}{\% \Delta P}$$



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Price Elasticity of Supply Determinants

- Flexibility of Producers
- A firm will have more production flexibility if it is able to:

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Price Elasticity of Supply Determinants

- Time and adjustment process
 - Immediate Run
 - Suppliers are stuck with what they have on hand.
 - Short Run v Long Run
 - Supply becomes more over time.

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South Park “Butters Bottom...”

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Supply Elasticity over Time

Price

0

Quantity

Income Elasticity

- Income elasticity of demand: measures the response of Q_d to a change in consumer income.

$$E_I = \frac{\% \Delta Q_d}{\% \Delta I}$$

- Inferior good: E_I
- Normal good (necessity): E_I
- Normal good (luxury): E_I

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More Practice

- State whether you think the following goods are inferior, necessity, or luxury goods:
 - Steak
 - Toothpaste
 - Fast food
 - Pedicures
 - New vehicles
 - Used vehicles
 - Laptop computers
 - Lawn-care service
 - Milk
 - Gasoline
 - Cigarettes
 - Lottery tickets

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More Practice

Suppose that Doug receives a pay increase at work, and his income increases by 20 percent. As a result, Doug decides to buy 12 percent less ground beef. For Doug, ground beef is a(n) _____.

- A. luxury good
- B. necessity good
- C. normal good
- D. inferior good

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Cross-Price Elasticity

- Measures the responsiveness of the quantity demanded of one good to a change in the price of _____ good.

- E_C can be positive or negative:
 - Substitute goods: $E_C > 0$
 - Complementary goods: $E_C < 0$

$$E_C = \frac{\% \Delta Q_d(A)}{\% \Delta P(B)}$$

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More Practice

Economists have studied that when the price of chicken increases, people purchase less rice. With these two goods, which of the following is true?

- A. $E_C < 0$, chicken and rice are complements
- B. $E_C > 0$, chicken and rice are complements
- C. $E_C < 0$, chicken and rice are substitutes
- D. $E_C > 0$, chicken and rice are substitutes

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How Do We Decrease Illegal Drug Use?

- Is the demand for illegal drugs relatively elastic or inelastic. Why?
- Relatively inelastic.
 1. No
 2. Addiction may willingness to pay.
 3. Purchases often made in the

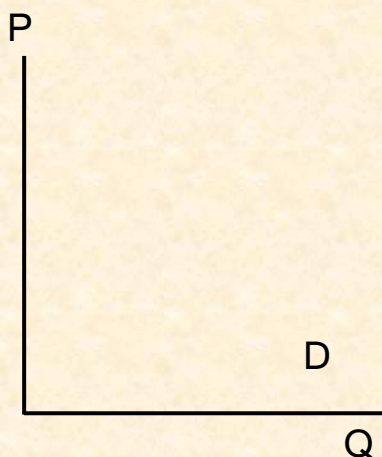
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How Do We Decrease Illegal Drug Use?

- Suppose that we wanted to enact a policy with the following goals:
 - Greatly decrease drug consumption
 - Make drug-dealing a less attractive business
- Should we try to:
 - Decrease the supply of drugs?
 - Decrease the demand for drugs?

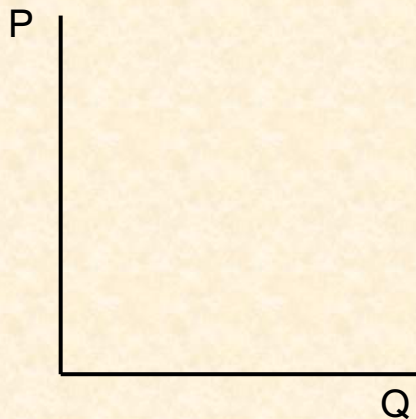
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Decrease Supply



- Only a small decrease in drug transactions
- Increase in drug price
- Increase in drug profit
- This may actually make drug-dealing more attractive (and dangerous)

Decrease Demand



- Larger in drug
transactions
- Decrease in drug
- Decrease in drug
- Drug dealing is now
attractive

Summary

- If we want to accomplish our two goals . . .
 - Policy of decreasing drug demand will be better than trying to decrease drug supply
 - Better to use resources on education and offering legal substitutes rather than increasing penalties and police enforcement