

Principles of Microeconomics: Elasticities

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	Number of Hours to Make One Rotid	Number of Hours to Make One Tauron
Mandovia	50	100
Ducennia	150	200

2. Using the information in the productivity table above, estimate the opportunity cost of making rotids and taurons in Mandovia and Ducennia (fill in the table below). Which country has a comparative advantage at manufacturing rotids? At making taurons?

	Opportunity Cost of Making One Rotid	Opportunity Cost of Making One Tauron
Mandovia	___ taurons	___ rotids
Ducennia	___ taurons	___ rotids

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	Number of Hours to Make One Rotid	Number of Hours to Make One Tauron
Mandovia	50	100
Ducennia	150	200

4. Now, allow specialization. If each country completely specializes in the product in which they hold the comparative advantage, what will global output of rotids be? Of taurons? Is total output of each product higher than before?

	Output of Rotids	Output of Taurons
Mandovia		
Ducennia		
Total output		

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1. Consider the productivity table below: Which country has an absolute advantage at making rotids? At making taurons?

	Number of Hours to Make One Rotid	Number of Hours to Make One Tauron
Mandovia	50	100
Ducennia	150	200

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	Number of Hours to Make One Rotid	Number of Hours to Make One Tauron
Mandovia	50	100
Ducennia	150	200

3. There are 1 billion hours of labor available for making products in Mandovia, and 2 billion hours of labor available for making products in Ducennia. In a no-trade world, let's assume that half the labor in each region gets used to make each product. Fill in the table.

	Output of Rotids	Output of Taurons
Mandovia		
Ducennia		
Total output		

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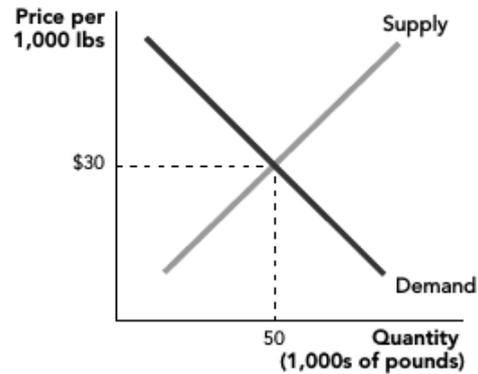
5. If the price in a market is above the equilibrium price, does this create a surplus or a shortage?

6. What's the best way to think about the rise in oil prices in the 1970s, when wars and oil embargoes wracked the Middle East? Was it a rise in demand, a fall in demand, a rise in supply, or a fall in supply?

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7. Consider the following supply and demand tables for bread. Draw the supply and demand curves for this market (as straight continuous lines). What is the equilibrium price and quantity?

Price of One Loaf	Quantity Supplied	Quantity Demanded
\$0.50	10	75
\$1	20	55
\$2	35	35
\$3	50	25
\$5	60	10



- 8a. What would happen to the equilibrium quantity and price if the wages of sugar cane harvesters increased?
 8b. What if a new study was published that emphasized negative health effects of consuming sugar?

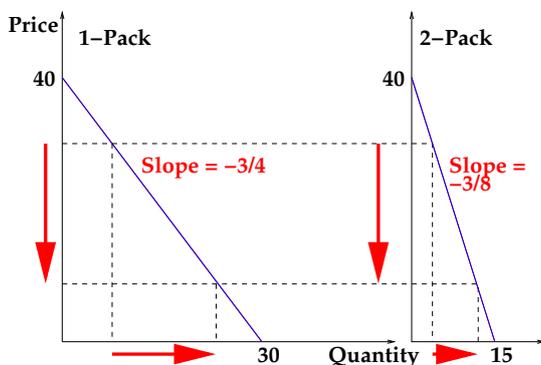
A Review of Changes in Supply and Demand

	No change in Supply	Supply shifts out	Supply shifts in
No change in Demand	No Change	Price falls, Quantity rises	Price rises, Quantity falls
Demand shifts out	Price rises, Quantity rises	Quantity rises, Price could rise or fall	Price rises, Quantity could rise or fall
Demand shifts in	Price falls, Quantity falls	Price falls, Quantity could rise or fall	Quantity falls, Price could rise or fall

The market for many goods changes in predictable ways according to the time of the year, in response to things such as religious holidays, vacation times etc. Using supply and demand (diagrams), explain the change in price in the following case.

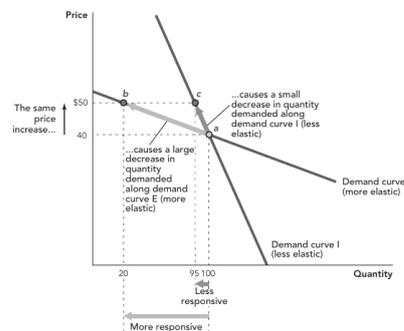
- A round trip air ticket to the south of France falls by over 100 Euro after the end of the school holidays in early September, despite airlines reducing the number of flights.

Slope and Price-Sensitivity



- In which case is the quantity demanded more sensitive to the price?

Slope and Elasticity



- A demand curve is elastic when an increase in price reduces the quantity demanded a lot (and vice versa).
- When the same increase in price reduces quantity demanded just a little, then the demand curve is inelastic.

Elasticity is not equal to the slope BUT: If two linear demand (or supply) curves run through a common point, then at any given quantity the curve that is FLATTER is MORE ELASTIC

Price Elasticity: Demand

- ▶ **Price elasticity of demand** is the percentage change in quantity demanded divided by the percentage change in price

$$E_D = \frac{\% \text{ change in Quantity Demanded}}{\% \text{ change in Price}}$$

- ▶ This tells us exactly how quantity demanded responds to a change in price
- ▶ Elasticity is independent of units
- ▶ Price elasticity of demand is always expressed as a positive number
- ▶ Demand is **elastic** if the percentage change in quantity is greater than the percentage change in price
Elastic demand is when $E_D > 1$
- ▶ Demand is **inelastic** if the percentage change in quantity is less than the percentage change in price
Inelastic demand is when $E_D < 1$

Price Elasticity: Supply

- ▶ **Price elasticity of supply** is the percentage change in quantity supplied divided by the percentage change in price

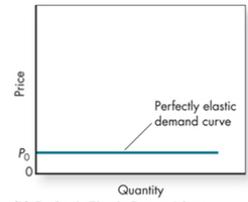
$$E_S = \frac{\% \text{ change in Quantity Supplied}}{\% \text{ change in Price}}$$

- ▶ This tells us exactly how quantity supplied responds to a change in price
- ▶ Elasticity is independent of units
- ▶ Supply is **elastic** if the percentage change in quantity is greater than the percentage change in price
Elastic supply is when $E_S > 1$
- ▶ Supply is **inelastic** if the percentage change in quantity is less than the percentage change in price
Inelastic supply is when $E_S < 1$

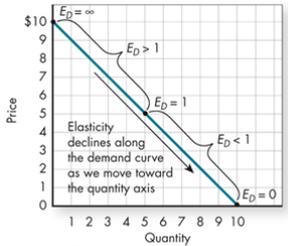
Elasticity and (straight-line) Supply and Demand Curves



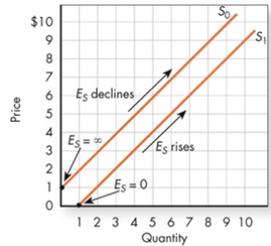
(a) Perfectly Inelastic Demand Curve



(b) Perfectly Elastic Demand Curve

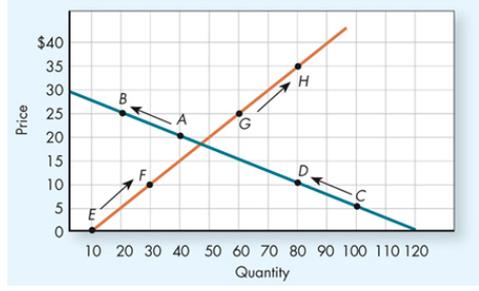


(c) Elasticity along a Demand Curve



(d) Elasticity along a Supply Curve

Calculating Elasticities



Elasticity

What makes supply or demand more or less elastic?

Elasticity and Substitution

What makes supply or demand more or less elastic?

Substitution

- ▶ A general rule is:
The more substitutes a good has, the more elastic its supply or demand
- ▶ If a good has substitutes, a rise in the price of that good will cause the consumer to shift consumption to those substitute goods

Product	Price Elasticity of Demand	
	Short – Run	Long – Run
Movies	0.87	3.67
Tobacco products	0.46	1.89
Electricity (households)	0.13	1.89
Air travel	0.80	—
Beer	0.56	1.39
Health Services	0.20	0.92
Wine	0.68	0.84
Gasoline	0.03	0.53

Substitution and Determinants of the Elasticity of Demand

Determinants of the Elasticity of Supply

- ▶ The number of substitutes a good has is affected by several factors
- ▶ Four of the most important factors:
 1. The time period being considered
 2. The degree to which a good is a luxury
 3. The market definition
 4. The importance of the good in one's budget

- ▶ The longer the time period considered, the more elastic the supply. There are three time periods relevant to supply:
 1. The **instantaneous period** where supply is fixed and is perfectly inelastic
 2. The **short run** where some changes are possible and supply is somewhat elastic
 3. The **long run** where significant changes are possible and supply is most elastic
- ▶ Change in per unit costs:

If increased production is very expensive, then the supply curve will be inelastic.
- ▶ Share of the market for the inputs:

Supply is elastic when the industry can be expanded without causing a big increase in the demand (and price) for the industry's inputs.
- ▶ The market definition / geographic scope:

The wider the scope of the market of a good, the less elastic its supply.

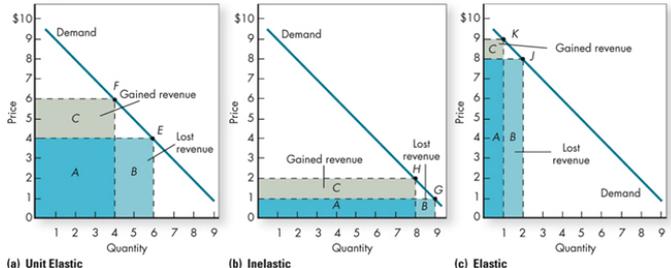
Advertising and Price Elasticity of Demand

I am Canadian

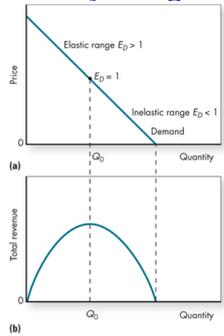
1. How can a successful advertising campaign reduce consumers' responsiveness to changes in price of a good like Molson beer?
2. Why is it in the interest of a firm like Molson to decrease the price elasticity of demand for its product?

Elasticity, Total Revenue, and Demand

- ▶ The elasticity of demand tells suppliers how their total revenue will change if their price changes
- ▶ Total revenue is price multiplied by quantity, $TR = P \times Q$

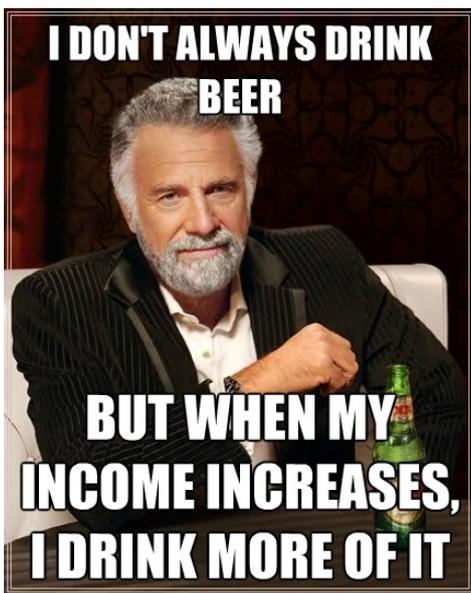


Elasticity along Straight-Line Curves: Revenues



- ▶ If $E_D > 1$, an increase in price decreases total revenue
- ▶ If $E_D = 1$, an increase in price leaves total revenue unchanged
- ▶ If $E_D < 1$, an increase in price increases total revenue

	Price Rise	Price Decline
Elastic ($E_D > 1$)	TR decreases	TR increases
Unit Elastic ($E_D = 1$)	TR constant	TR constant
Inelastic ($E_D < 1$)	TR increases	TR decreases



Other Elasticity Concepts – Income elasticity

▶ **Income elasticity** of demand measures the responsiveness of demand to changes in income

$$E_I = \frac{\% \text{ change in Demand}}{\% \text{ change in Income}}$$

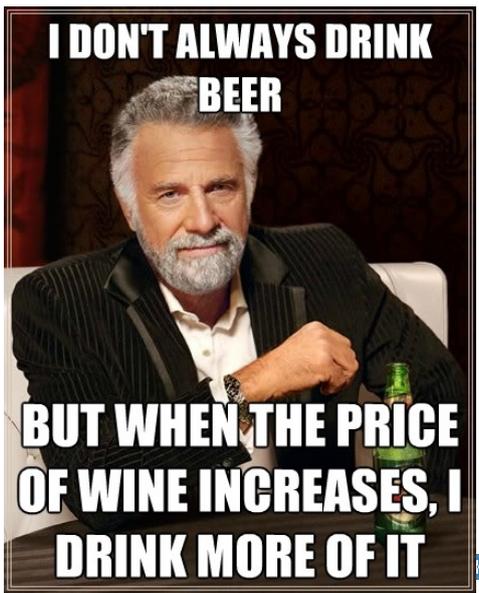
▶ **Normal goods** are those whose consumption increases with an increase in income

- ▶ **Necessity:** $0 < E_I < 1$
- ▶ **Luxury:** $E_I > 1$

▶ **Inferior goods** are those whose consumption decreases with an increase in income, $E_I < 0$

Product	Income Elasticity of Demand	
	Short – Run	Long – Run
Motion pictures	0.81	3.41
Foreign travel	0.24	3.09
Hard liquor	–	2.5
Jewelry and watches	1.00	1.64
Dental services	–	1.60
Tobacco products	0.21	0.86
Beer	–	0.84
Health care	–	0.82
Furniture	2.60	0.53

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Other Elasticity Concepts – Cross-price elasticity

▶ **Cross-price elasticity** of demand measures the responsiveness of demand to changes in prices of other goods

$$E_{\text{cross-price}} = \frac{\% \text{ change in Demand}}{\% \text{ change in P of related good}}$$

▶ **Substitutes** are goods that can be used in place of another, $E_{\text{cross-price}} > 0$

▶ **Complements** are goods that are used conjunction with other goods, $E_{\text{cross-price}} < 0$

Commodities	Cross-Price Elasticity
Beef in response to price changes in pork	0.11
Beef in response to price changes in chicken	0.02
U.S. cars in response to price changes in European and Asian cars	0.28
European cars in response to price changes in U.S. and Asian cars	0.61
Beer in response to price changes in wine	0.23
Hard liquor in response to changes in beer	-0.11

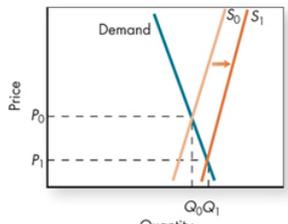
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Elasticity and Shifting Supply and Demand

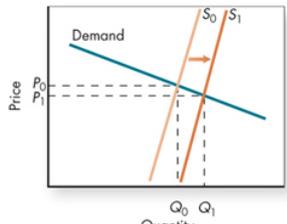
▶ The more elastic the demand (supply), the greater the effect of a supply (demand) shift on quantity and the smaller the effect on price

$$\% \text{ change in P} = \frac{\% \text{ change in Demand}}{E_D + E_S}$$

$$\% \text{ change in P} = \frac{\% \text{ change in Supply}}{E_D + E_S}$$



(a) Inelastic Supply and Inelastic Demand



(b) Inelastic Supply and Elastic Demand

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When the patent expires on a brand-name drug and 5 generic drugs come on the market, what happens to elasticity of demand?

1. It rises
2. It falls

The elasticity of demand for eggs has been estimated to be 0.1. If egg producers raised their prices by 10 percent, what will happen to their total revenue?

1. It will increase
2. It will decrease
3. It won't change

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If a fashionable clothing store raised its prices by 25 percent, what does that tell you about the store's estimate of the elasticity of demand for its products?

1. They think it's elastic
2. They think it's inelastic

The price of Good B increases by 4%, causing the quantity demanded of Good A to decrease by 6%. The cross-price elasticity of demand is ..., and the goods are

1. 1.5; substitutes
2. -1.5; complements
3. 0.67; complements
4. -2.4; substitutes

Essay 1: Due next week.

Evaluate the following:

"Although taxpayers foot the bill for federal water sold to farmers at subsidized prices, they also eat the crops grown with that water. Because the crops are cheaper due to the subsidized water, taxpayers get back exactly what they put in, so there is no waste from having subsidized water for farmers."

Use references (if any) according to the Chicago Manual of Style, author-year (aka APA style).

On academic writing see

<http://economicscience.net/content/academic-writing>

There is a brief extra chapter on my course web page that should help get started. It may also help you to do the reading assignment for next week before you start writing your essay.

- ▶ References/Quotes
 - ▶ everything referenced that should be?
 - ▶ Quality & Breath of references
 - ▶ Correctly referenced?
- ▶ Tables & Figures
 - ▶ Headings / Captions
 - ▶ Source
 - ▶ Mentioned in text
- ▶ Style
 - ▶ Rhetoric
 - ▶ Clarity
 - ▶ Coherence
 - ▶ Grammar
 - ▶ Spelling
 - ▶ Punctuation
- ▶ (Degree of difficulty)
- ▶ (Methodological soundness)
- ▶ Analytical sophistication
- ▶ Did I like this?

▶ Introduction

- ▶ (Well motivated topic?)
- ▶ Is there a hypothesis / research question?
- ▶ Is it clear what will follow?
- ▶ Do I want to read this?

▶ Main Body

- ▶ Is the structure supporting the thesis?
- ▶ Do claims follow logically from the reasoning?
- ▶ Are all claims supported?
- ▶ Are there factual errors?
- ▶ Are technical terms (correctly) defined?
- ▶ Is everything relevant for the hypothesis / research question?
- ▶ Is it clear why something is mentioned?

▶ Conclusion

- ▶ Is it clear what this was about?
- ▶ Is there an answer to the research question / hypothesis accepted or rejected?
- ▶ Is there a conclusion / bottom line?
- ▶ (Are limitations mentioned?)