

Demand: Shifters and Elasticities (10/06/09)

- Read Chapter 4 Schrimper and applicable sections of the (green) handout – Dr. Brown's lecture notes

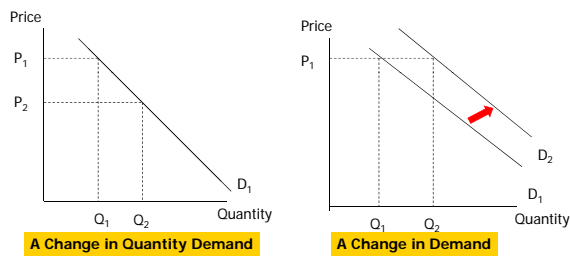
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Demand Theory Review from 10/1/09

- Define a Consumer and a Market Demand Schedule
- Recall that a demand schedule can be presented in tabular, graphical, or mathematical formats
- Understand the difference between a change in demand (shift) and a change in the quantity demanded (movement along a given demand schedule)

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Shifts vs Movements in the Demand Schedule



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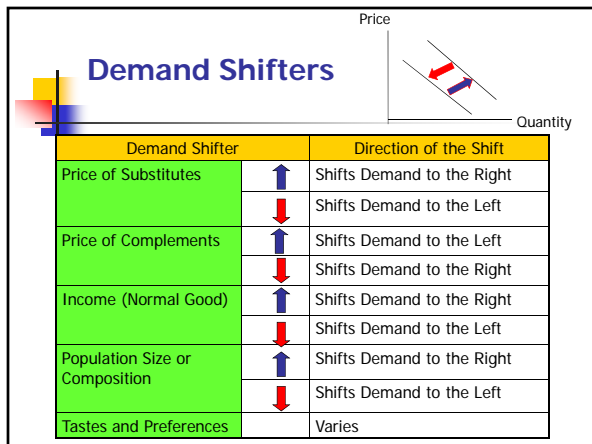
Demand Shifters

- Market Demand Shifters Include Changes in:
 - Price of a Substitutable Good (e.g. price of hamburgers or hot dogs when evaluating the demand for pizza)
 - Prices of a Complimentary Good (e.g., price of hot dogs when evaluating the the demand for hot dog buns)
 - Income
 - Taste and Preferences
 - Population

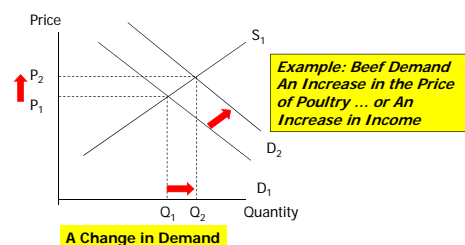
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Demand Shifters

Demand Shifter	Direction of the Shift
Price of Substitutes	↑ Shifts Demand to the Right
	↓ Shifts Demand to the Left
Price of Complements	↑ Shifts Demand to the Left
	↓ Shifts Demand to the Right
Income (Normal Good)	↑ Shifts Demand to the Right
	↓ Shifts Demand to the Left
Population Size or Composition	↑ Shifts Demand to the Right
	↓ Shifts Demand to the Left
Tastes and Preferences	Varies

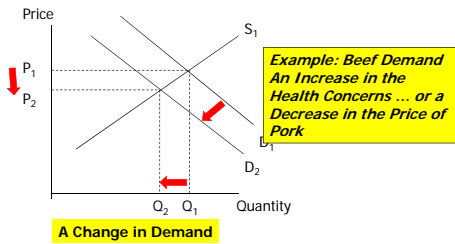


Shifts in the Demand Schedule



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Shifts in the Demand Schedule



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Journal Entry #9

- Read the article, *When Will Agricultural Demand Rebound?* The Main Street Economist, Federal Reserve Bank of Kansas City, 2009, www.kansascityfed.org/RegionalAffairs/MainStreet/MSE_0209.pdf
- Answer the questions for Journal Entry #9

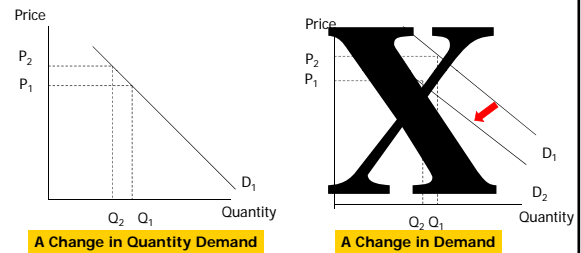
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Price Elasticity of Demand

- Measures the Responsiveness of Changes in the Quantity Demanded to Small Changes in Price, Holding All Other Factors Constant
- More specifically, the percentage change in quantity for a given percentage change in price, holding income, taste and preferences, prices of other goods, population, etc., constant

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Which Graph Are We Evaluating For Beef Demand if the Price of Beef Increases?

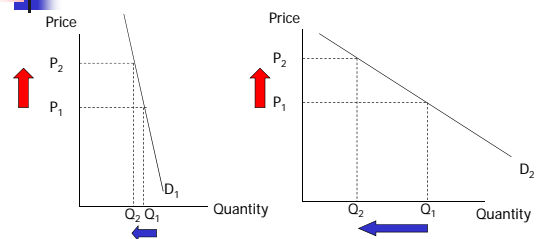


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Price Elasticity of Demand Applications

- Policymaker** – “How much will a tax increase on fast food reduce consumption, impact tax revenues?”
- Grocery Manager** -- “If I offer a buy one get one free sale on 12 packs of Pepsi, how many should I stock?”
- Fertilizer Dealer** – “How will higher fertilizer prices affect sales and my revenues?”
- Athletic Director** – “If we raise the price of football tickets 10%, will we still have a sell-out?”
- Farmer** – Will my total revenue be higher if I market my pumpkins at \$2.50, \$5.00, or \$10 each?

Quantity Response for a Given Price Change



Price Elasticity of Demand (cont.)

- Related to the sloped of the demand equation (i.e. demand elasticities will be negative ... which sometimes leads to one stating demand elasticities in absolute value)

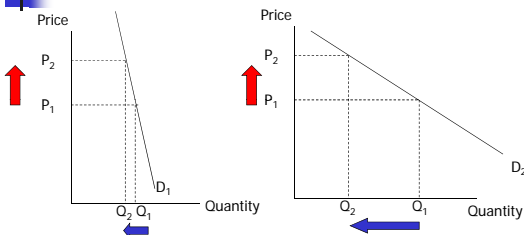
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Price Elasticity of Demand

- If the absolute value of the price elasticity of demand is equal to one – the demand schedule is said to be **unitary**
- If the absolute value of the price elasticity of demand is less than one – the demand schedule is said to be **inelastic**
- If the absolute value of the price elasticity of demand is greater than one – the demand schedule is said to be **elastic**

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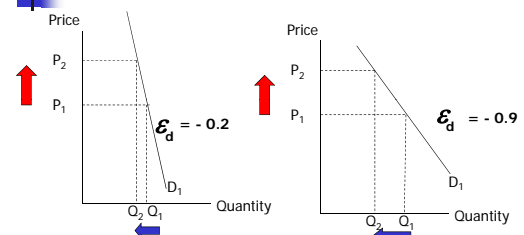
Quantity Response for a Given Price Change



Inelastic Demand: % change in quantity is less than the % change in price (quantity demanded is not very responsive to price changes)

Elastic Demand: % change in quantity is greater than the % change in price (quantity demanded is very responsive to price changes)

Agricultural Commodities and Food Items Generally Have Inelastic Price Elasticities of Demand



Which one of these demand schedules is more inelastic (or less elastic)?

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Own-Price Point Elasticity of Demand

$$\epsilon_D = \frac{\frac{\Delta Q}{Q}}{\frac{\Delta P}{P}} = \frac{\frac{Q_2 - Q_1}{Q_1}}{\frac{P_2 - P_1}{P_1}} = \frac{\% \text{ Change In } Q}{\% \text{ Change In } P}$$

Note: 3 different methods to calculate an elasticity of demand

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Own-Price Point Elasticity of Demand

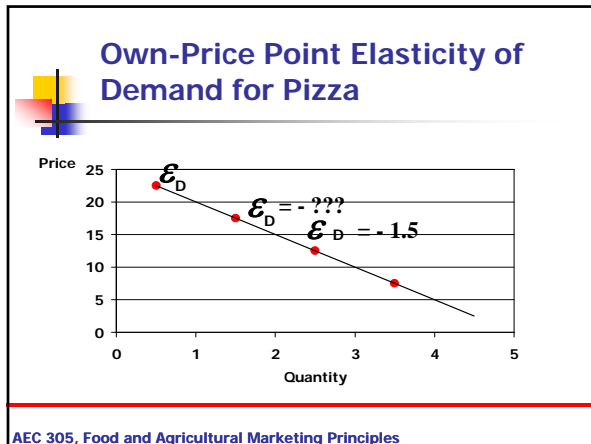
$$\epsilon_D = \frac{\frac{\Delta Q}{Q}}{\frac{\Delta P}{P}} = \frac{\frac{Q_2 - Q_1}{Q_1}}{\frac{P_2 - P_1}{P_1}}$$

Price (\$)	Quantity
5	4
10	3
15	2
20	1
25	0

Given a table, one can use the middle expression to estimate the Own-Price Point Elasticity of Demand?

What is the Own-Price Point Elasticity of Demand?

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Own-Price Arc Elasticity of Demand

$$\epsilon_D = \frac{Q_2 - Q_1}{P_2 - P_1} \cdot \frac{P_2 + P_1}{Q_2 + Q_1}$$

Price (\$)	Quantity
5	4
10	3
15	2
20	1
25	0

Calculate the Arc Elasticity of Demand for Pizza using prices and quantities in the middle of the demand schedule

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Price Elasticity Applications

A grocer wants to boost total sales of apples from 100 boxes to 110 boxes. If he drops prices by 20%, what is he assuming about the own price elasticity of demand, holding all other factors remained constant?

$$\epsilon_D = \frac{\frac{\Delta Q}{Q} \cdot P}{\frac{\Delta P}{P}} = \frac{\frac{Q_2 - Q_1}{Q_1} \cdot P}{\frac{P_2 - P_1}{P_1}} = \frac{\% \text{ Change In } Q}{\% \text{ Change In } P}$$

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Price Elasticity Applications

A policymaker wants to reduce cigarette consumption by 10%. Research has indicated that every 1% increase in the price of cigarettes via a tax increase will reduce cigarette consumption by 0.33%. What percentage increase in price must occur for the policymaker to achieve the desired effects, assuming all other factors remain constant.

$$\epsilon_D = \frac{\frac{\Delta Q}{Q} \cdot P}{\frac{\Delta P}{P}} = \frac{\frac{Q_2 - Q_1}{Q_1} \cdot P}{\frac{P_2 - P_1}{P_1}} = \frac{\% \text{ Change In } Q}{\% \text{ Change In } P}$$

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Own-Price Point Elasticity of Demand

$$\epsilon_D = \frac{\frac{\Delta Q}{Q} \cdot P}{\frac{\Delta P}{P}} = \frac{\frac{Q_1 - Q_2}{Q_1} \cdot P}{\frac{P_1 - P_2}{P_1}} = \frac{\% \text{ Change In } Q}{\% \text{ Change In } P}$$

Given a mathematical equation, use the first expression to estimate the elasticity of demand

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Demand for Pizza – Mathematical Form

$$Q_{\text{Pizza}} = 40 - 2.0P_{\text{Pizza}} + 5P_{\text{Hamburgers}} - 2P_{\text{Beer}} + 0.0008 \text{ Inc}$$

Interpret Each Coefficient

Assume:

- P_{pizza} = \$10.00
- $P_{\text{Hamburger}}$ = \$4.00
- P_{Beer} = \$5.00
- INC = \$25,000

What is Q ? and Estimate the Own-Price Elasticity of Demand

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Own Price Elasticity of Demand for Pizza

$$Q_{\text{Pizza}} = 40 - 2.0P_{\text{Pizza}} + 5P_{\text{Hamburger}} - 2P_{\text{Beer}} + 0.0008 \text{ Inc}$$

Assume:

P_{pizza}	=	\$10.00
$P_{\text{Hamburger}}$	=	\$4.00
P_{Beer}	=	\$5.00
INC	=	\$25,000

What is Q? and Estimate the Own-Price Elasticity of Demand

$$Q_{\text{Pizza}} = 50$$

$$P_{\text{pizza}} = \$10.00$$

$$\frac{\Delta Q_{\text{pizza}}}{\Delta P_{\text{pizza}}} = -2$$

$$\epsilon_D = \frac{\frac{\Delta Q_{\text{pizza}}}{Q_{\text{pizza}}}}{\frac{\Delta P_{\text{pizza}}}{P_{\text{pizza}}}} = -2 * \frac{\$10}{50} = -0.4 \quad \text{Interpret}$$

Interpret an own-price elasticity of demand which is equal to -0.4

- Each 1% increase in Price leads to a 0.4% decrease in Quantity Demanded, holding all other demand factors constant

Or

- Each 10% increase in Price leads to a ___% decrease in Quantity Demanded, holding all other demand factors constant

Or

- If the Price increases by 5% this will lead to a ___% decrease in Quantity Demanded, holding all other demand factors constant

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Exam I and Journal Entries I

- Exam I Average (75%)
 - Exam I Range (40-98)
 - 90-100 (7)
 - 80-89 (12)
 - 70-79 (14)
 - 60-69 (13)
 - <60 (4)
 - Journal Entries (40 points)
 - Average 32.6 (81%)

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