

## Midterm Examination

Exam date is Tuesday, September 29.

Bring Blue "Scantron" sheet.

We strictly enforce the Honor Code.

The exam is closed books and notes.

Bring your UNC ID.

Once you receive the exam, you may not leave the room until you have finished.

Late students will be barred from exam.

You may bring a simple calculator.

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## A Practical Approach to Elasticity

The concept of elasticity can help resolve some interesting economic puzzles.

The price elasticity of demand is the percent change in quantity demanded per one percent change in price.

Using elasticity to resolve the first puzzle.

The price elasticity of supply is defined similarly.

What Have We Learned?

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## An Economic Puzzle

It is 8:00 a.m. in Trapani, Sicily. Agostino, the fisher, has had a very productive outing, catching nearly three times as much tuna as he normally does. As he motors toward the dock-side market where he will sell his fish, he becomes thoughtful.

Suddenly, he stops his boat and releases 1/3 of his catch. Has he gone mad?

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## Another Economic Puzzle

Many in the U.S. favor strong drug interdiction policies.

One of the reasons is the belief that reducing the supply of illegal drugs in the U.S. will reduce the amount of property crimes committed by drug users.

Is this belief rational?

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## A Third Puzzle: Will a Tax on Soft Drinks Have the Intended Effect?

September 17, 2009

### Proposed Tax on Sugary Beverages Debated

By WILLIAM NEUMAN

The debate over a tax on sugary soft drinks — billed as a way to fight obesity and provide billions for health care reform — is starting to firm over.

President Obama has said it is worth considering. The chief executive of Coca-Cola calls the idea outrageous, while skeptics point to political obstacles and question how much of an impact it would really have on consumers.

But a team of prominent doctors, scientists and policy makers says it could be a powerful weapon in efforts to reduce obesity, in the same way that cigarette taxes have helped curb smoking.

## Price Elasticity of Demand

Price Elasticity of Demand measures the **responsiveness** of the quantity demanded of a good or service to a change in the price of a good or service (other factors unchanged).

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## Price Elasticity of Demand

Price Elasticity of Demand is defined as the **percentage change** in quantity demanded that occurs as the result of a **one percent** change in price.

Elasticity is defined to be a positive number.

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## Price Elasticity of Demand

Elastic means

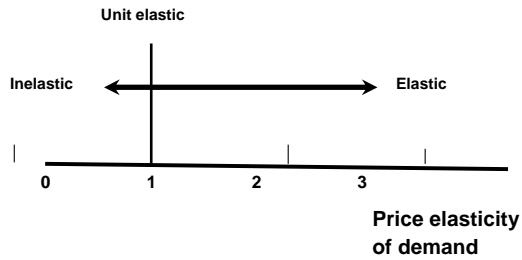
Elasticity greater than one ( $>1$ )  
Quantity is more responsive to price

Inelastic means

Elasticity less than one ( $<1$ )  
Quantity is less responsive to price

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## Elastic and Inelastic Demand



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## Price Elasticity Estimates for Selected Products

Good or service	Price elasticity
Green peas	2.80
Restaurant meals	1.63
Automobiles	1.35
Electricity	1.20
Beer	1.19
Movies	0.87
Air travel (foreign)	0.77
Shoes	0.70
Coffee	0.25
Theater, opera	0.18

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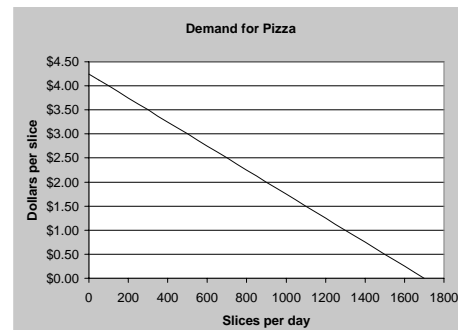
## Price Elasticity of Demand

Price elasticity is not the slope of the demand schedule.

A straight line demand schedule has a constant slope but varying elasticity along the schedule.

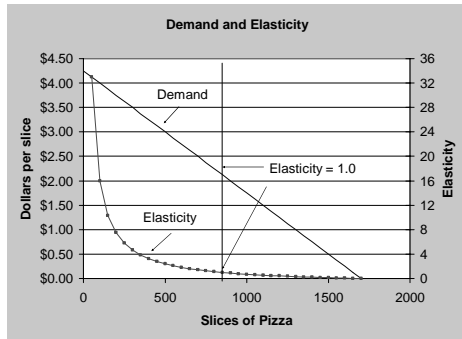
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## Demand for Pizza



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### How Demand and Demand Elasticity are Related



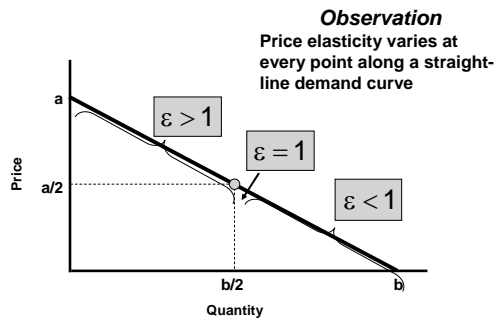
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### Let's Check

Price	Quantity	Change in P (Percent)	Change in Q (Percent)	Elasticity
\$4.13	50	3.0%	100%	33
\$4.00	100			
\$2.50	700	5.0%	7.1%	1.4
\$2.38	750			
\$1.25	1200	10%	4.2%	0.4
\$1.13	1250			

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### Price Elasticity along a Straight-Line Demand Curve



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### Revenue and Price Elasticity

The Revenue from the sale of a good is defined as the product of the price of the good and the quantity sold.

$$\text{Revenue} = \text{Price} \cdot \text{Quantity}$$

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## Revenue and Price Elasticity

$$\text{Revenue} = \text{Price} \cdot \text{Quantity}$$

Raising price by one percent has two opposing effects on revenue

- It raises the price paid by "loyal customers," thus raising revenue.
- It lowers the quantity sold thus lowering revenue.

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Elasticity tells us which of the opposing effects wins the tug of war



Price Effect

Quantity Effect

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Elasticity tells us which of the opposing effects wins the tug of war

When elasticity is greater than one ...

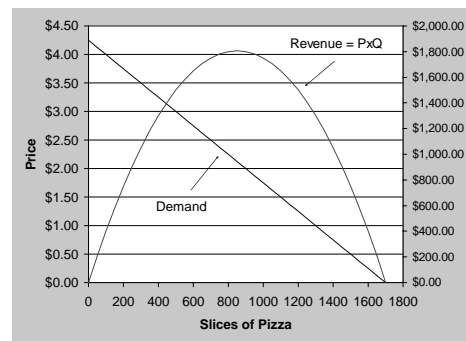
The quantity effect on revenue is larger.

When elasticity is less than one...

The price effect on revenue is larger.

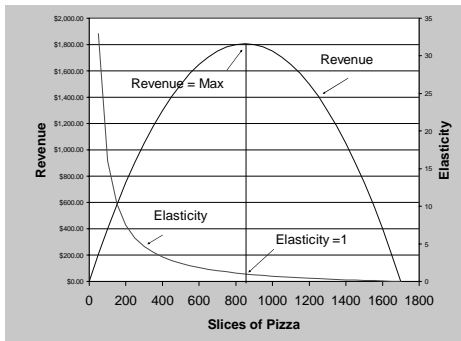
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The Relationship between Demand and Revenue



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### The Relationship between Elasticity and Revenue



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Use Your Clickers To Answer  
The Following  
Non-Graded Question

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Agostino released some of his catch because he believed that, at the quantity demanded associated with his total catch of Tuna, the demand schedule for Tuna was \_\_\_\_\_ and releasing some of his catch would \_\_\_\_\_ his revenue.

- A. Elastic, Raise
- B. Elastic, Lower
- C. Inelastic, Raise
- D. Inelastic, Lower

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What Determines Elasticity?  
Demand is more Elastic if ...

Good substitutes for the product exist.

The product accounts for a larger share of the budget of a typical consumer.

A longer period of time is allowed for consumers to adjust to the price change.

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Price Elasticity  
Estimates for Selected Products

Good or service	Price elasticity
Green peas	2.80
Restaurant meals	1.63
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Why is the price elasticity of demand more than 14 times larger for green peas than for theater and opera performances?

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Use Your Clickers To Answer  
The Following  
Graded Question

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The demand for a Saturn Ion is likely to be \_\_\_\_\_ elastic than the demand for an automobile because \_\_\_\_\_.

- A. More, There are good substitutes for an Ion.
- B. Less, There are good substitutes for an Ion.
- C. More, An auto accounts for a small part of a consumers budget.
- D. Less, An auto accounts for a small part of a consumers budget.

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## Price Elasticity of Supply

Price Elasticity of Supply measures the **responsiveness** of the quantity supplied of a good or service to a change in the price of a good or service (other factors unchanged).

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## Price Elasticity of Supply

Price Elasticity of Supply is defined as the **percentage change** in quantity supplied that occurs as the result of a **one percent** change in price.

Elasticity is defined to be a positive number.

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## What Determines Elasticity? Supply is more Elastic if ...

It is easy to produce the good with a variety of different inputs rather than with specific specialized inputs.

If inputs used to produce the good are easily moved from one place to another.

If a longer period of time is allowed for producers to adjust to the price change.

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Is a reduction in the supply of illegal drugs likely to lower property crime?

Is the demand for illegal drugs likely to be elastic or inelastic at current price?

What will be the effect of a reduction in supply of illegal drugs on the total payment by users for those drugs?

What conclusion have you reached on the impact of reduced supply on property crime?

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## What Have We Learned?

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## A Practical Approach to Elasticity

The concept of elasticity can help resolve some interesting economic puzzles.

The price elasticity of demand is the percent change in quantity demanded per one percent change in price.

The price elasticity of supply is defined similarly.

How can we connect drug policy and a tax on soft drinks to elasticity?

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