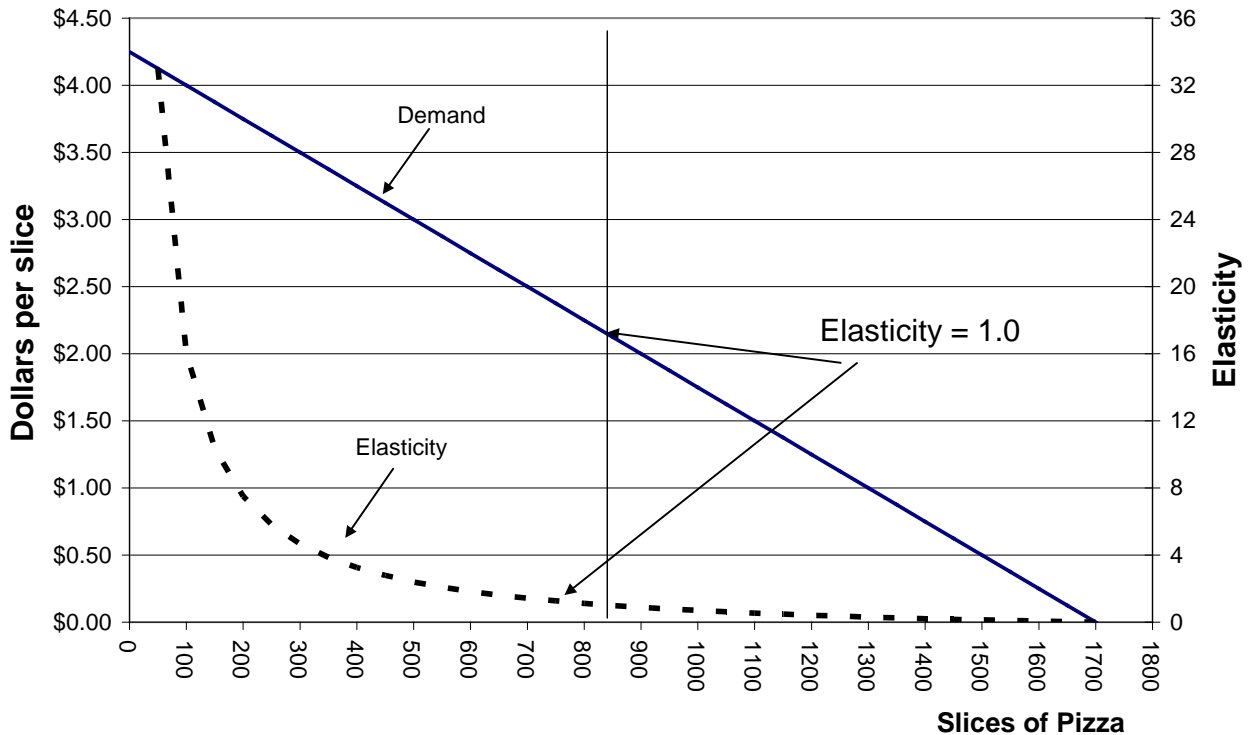


**Class 9**  
**A Practical Approach to Elasticity**

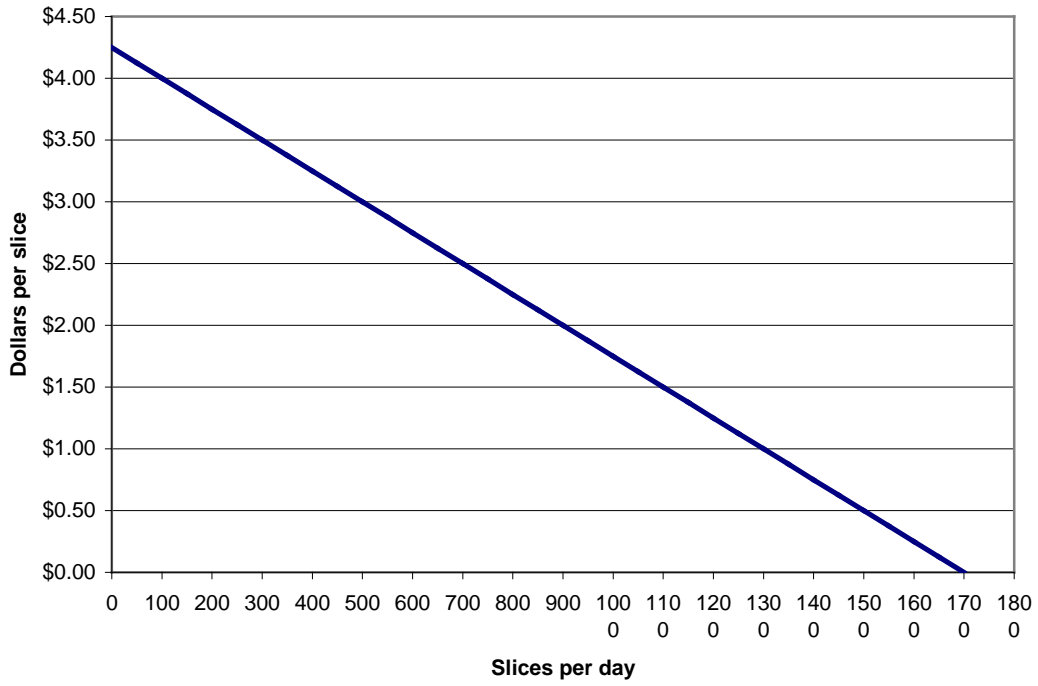
1. Exercises that motivate the importance of the concept of elasticity and provide opportunities to apply the concept.
  - a. Professor Salemi has agreed to sell Oreo cookies to raise money for his daughter's class trip. Because the class teacher has not yet told him the price of the Oreos, Professor Salemi is handing out a conditional order form. Please fill out the order form. Please behave in a personally rational way and remember that all orders are binding. Professor Salemi will deliver Oreos during class in late February and will accept payment in cash or check.
  - b. It is 6:00 am in Sicily. Agostino, the fisher, has had a very productive night, catching nearly three times as much Tuna as he normally does. As always, Agostino transfers his catch to a live well on his boat as soon as he brings in his net. As he sails back to the docks adjacent to the Palermo fish market, Agostino listens to the sounds the fish make in his live well and contemplates his market strategy. Suddenly, he stops his boat and releases a third of his catch. Is Agostino behaving in an irrational way or is there an economic rationale for his decision?
  - c. Many in the U.S. favor strong drug interdiction policies because they believe that reducing the supply of drugs will reduce the amount of property crimes committed by drug users. Does this belief make economic sense? Write down your thoughts in the space provided.
  - d. Recently, a number of health experts have proposed taxing sugary soft drinks in order to reduce their consumption. Health experts are particularly interested in reducing soft-drink consumption by children. What are soft drink experts assuming about the elasticity of demand for soft drinks?

2. **Price elasticity of demand** measures the responsiveness of the quantity demanded of a good to a change in the price of that good.
- The price elasticity is defined as the percent change in quantity demanded that occurs as the result of a one percent change in price. It is defined as a positive number.
  - Elastic** (elasticity greater than one) means that quantity is more price-responsive. **Inelastic** (elasticity less than one) means that quantity is less price-responsive.
  - Elasticity is not the same thing as the slope of the function. A straight line demand schedule has a constant slope but a varying elasticity across the relevant range of prices.
  - The revenue from the sale of a good is the price at which the good is sold times the quantity (Revenue = Price x Quantity).
  - If demand is inelastic, raising the price raises revenue. If demand is elastic, raising the price lowers revenue.**
  - The following diagrams depict the relationship between demand and elasticity in a variety of ways.

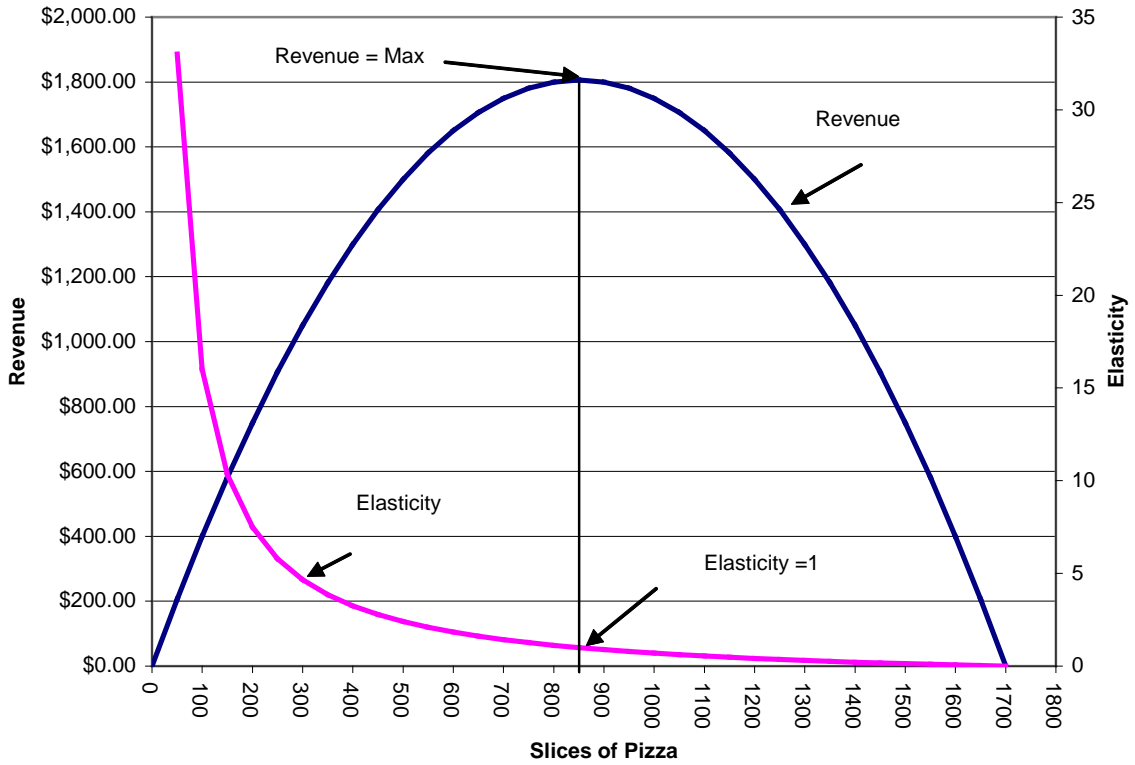
### Demand and Elasticity



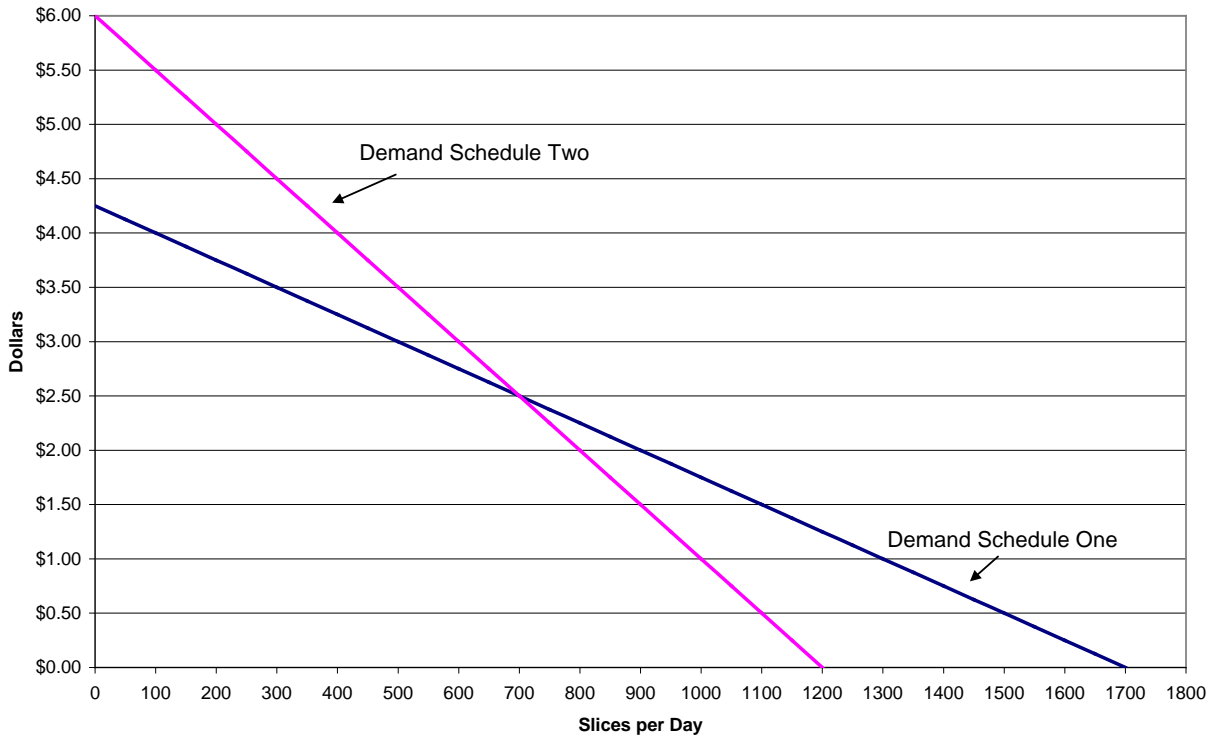
### Demand for Pizza



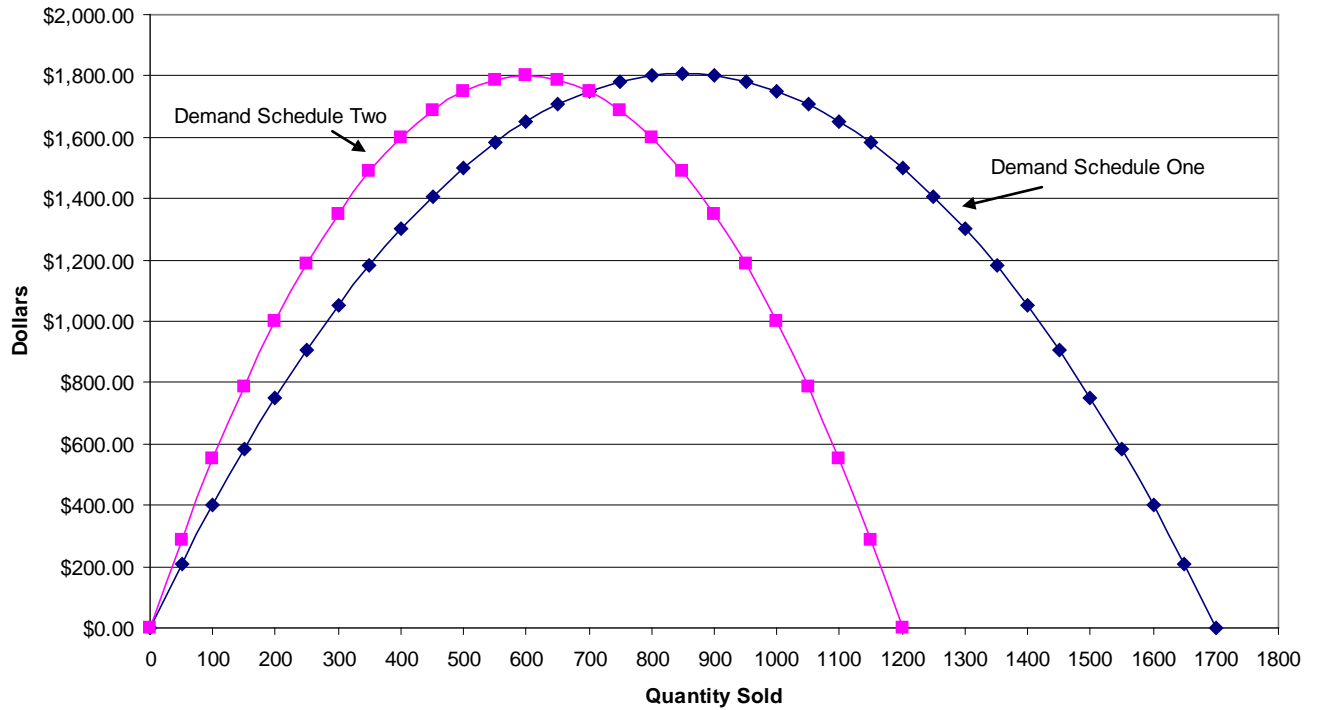
### Revenue from Pizza Sales



**Two Demand Schedules for Pizza**



**Revenue as a Function of Quantity Sold**



3. Three Factors Determine the Elasticity of Demand
  - a. The most important factor determining the elasticity of demand is whether or not good substitutes for the good in question are available. If good substitutes are available, demand is likely to be more elastic (price responsive) than if they are not.
  - b. A second factor determining the elasticity of demand is the share of the budget of the typical consumer accounted for by the good in question. If the budget share is larger, demand is likely to be more elastic.
  - c. A third factor determining the elasticity of demand is the time frame allowed for consumers to respond to a change in price. The longer the time frame, the more elastic demand is likely to be.
  
4. The term **price elasticity of supply** is used by economist to measure the responsiveness of the quantity supplied to a change in the price.
  - a. The price elasticity of supply is defined as the percent change in quantity supplied that occurs as the result of a one percent change in price. It is defined as a positive number.
  - b. Elastic (elasticity greater than one) means that quantity is more price-responsive. Inelastic (elasticity less than one) means that quantity is less price-responsive.
  - c. Elasticity is not the same thing as the slope of the function. A straight line supply schedule has a constant slope but a varying elasticity across the relevant range of prices.
  
5. There are three important determinants of the elasticity of supply.
  - a. If it is easy to produce the good in question with a variety of different inputs, then supply is likely to be more elastic than when only highly specialized inputs can be used.
  - b. If inputs used to produce the good in question are highly mobile from one place to another, then supply is likely to be more elastic.
  - c. The longer the time frame allowed for suppliers to respond to a change in price, the more elastic supply is likely to be.



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 fizz 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.

The group, which includes the New York City health commissioner, Thomas Farley, and Joseph W. Thompson, Arkansas surgeon general, estimates that a tax of a penny an ounce on sugary beverages would raise \$14.9 billion in its first year, which could be spent on health care initiatives. The tax would apply to soft drinks, energy drinks, sports beverages and many juices and iced teas — but not sugar-free [diet](#) drinks.

The group's review of research on the topic, appearing in The [New England Journal of Medicine](#), was released on Wednesday, the same day that Senator [Max Baucus](#), the Montana Democrat, made public his health care reform plan, with an estimated cost of \$774 billion over 10 years. The Baucus plan would be paid for by an array of taxes and fees on high-end group insurance plans, drug and medical device makers, and other sources, with no mention of any tax on sugary beverages.

The scientific paper found that a beverage tax might not only raise revenue but have significant health effects, lowering consumption of soda and other sweet drinks enough to lead to a small weight loss and reduced health risks among many Americans.

The study cited research on price elasticity for soft drinks that has shown that for every 10 percent rise in price, consumption declines 8 to 10 percent.

John Sicher, the publisher of Beverage Digest, a trade publication, said that a two-liter bottle of soda sells for about \$1.35. At 67.6 ounces, if the full tax was passed on to consumers, that would add 50 percent to the price. A 12-can case, which sells today for about \$3.20, could rise by \$1.44, a 45 percent increase.

"A one cent per ounce tax would create serious problems and potentially adversely impact sales for the American beverage industry," Mr. Sicher said.

The proposed tax faces a formidable hurdle in Congress, where several members have voiced strong opposition and few if any have said more than that they would be willing to consider it.

The soft drink industry has adamantly resisted the notion that its products are responsible for a national increase in obesity or that a tax would help curb the problem.

And even a supporter of a beverage tax said it was not clear if it would have a direct effect on the waistlines of Americans.

“I think we should be satisfied that soda taxes would be having a modest effect on consumption but would generate billions of dollars that could be used to mount public health campaigns,” said Michael Jacobson, executive director of the [Center for Science in the Public Interest](#), an advocacy group that favors such a tax.

He said that if the tax was levied on the manufacturers of the sugary drinks they might be able to spread the cost among many of their products, from chips to granola bars to diet sodas, which would keep sugary drink users from feeling the full impact.

Nonetheless, discussion of the tax has the beverage industry on the defensive.

[Muhtar Kent](#), the chief executive of Coca-Cola, was asked about the tax on Monday during an appearance at the Rotary Club of Atlanta and he responded by calling it “outrageous.”

“I have never seen it work where a government tells people what to eat and what to drink,” Mr. Kent said, according to a [report](#) by Bloomberg News. “It if worked, the Soviet Union would still be around.”

The industry began to coordinate its response in June when it created an organization called [Americans Against Food Taxes](#).

On its Web site, [nofoodtaxes.com](#), the group calls itself “a coalition of concerned citizens” opposed to “the government’s proposed tax hike on food and beverages,” including soda and juice drinks. Calls to a media contact listed on the site reach the American Beverage Association, an industry organization whose board is made up of top executives from the major soft drink manufacturers.

Americans Against Food Taxes bought a full-page ad last Sunday in The Washington Post. It was fashioned as an open letter to Congress, saying “Don’t tax our groceries.” It has also been running commercials on cable networks, including CNN, MSNBC and Fox News, according to Kevin W. Keane, senior vice president for public affairs at the beverage association.

Mr. Keane said that the association was heading the antitax group and that the beverage industry was paying for its activities.

He took exception to any efforts to single out sugary drinks in the fight against obesity.

“When it comes to losing weight, all [calories](#) count, regardless of the food source,” Mr. Keane said. “The bottom line is that the tax isn’t going to make anybody healthier. It’s not going to make a dent in a problem as complex and serious as obesity, and we’re certainly not going to solve the complexities of the health care system with a tax on soda pop.”

Talk of a soda tax is just the latest [headache](#) for an industry that has been struggling with flat or declining sales for many products, from sodas to bottled water.

Across the country, many schools have removed soda vending machines saying they should not be plying children with sugary drinks.

Last month, the [American Heart Association](#) urged people to reduce their intake of sugary foods and beverages to lower the risk of conditions like obesity and [high blood pressure](#) — singling out soft drinks as a prime culprit.

Even President Obama has voiced a cautious openness to the tax.

“I actually think it’s an idea that we should be exploring,” he said, in a recent interview in Men’s Health magazine. “There’s no doubt that our kids drink way too much soda. And every study that’s been done about obesity shows that there is as high a correlation between increased soda consumption and obesity as just about anything else.”

But Mr. Obama acknowledged that there would be significant resistance to such a tax.

Kelly D. Brownell, the lead author of the study and director of the Rudd Center for Food Policy and Obesity at Yale, said in an interview that a penny-an-ounce tax would have an immediate and powerful impact on the nation’s elevated obesity rate.

He said that a tax was justified in part because conditions like obesity and [diabetes](#) are often treated with public funds through programs like [Medicaid](#) and [Medicare](#). Revenue from the tax could help pay for such care.

Acknowledging how difficult it would be to get a tax through Congress, he said state or local governments could take the first step.

That would follow tobacco, which has been heavily taxed by states in an effort to reduce [smoking](#) and defray the costs of smoking-related illnesses.

Representative [Bill Pascrell Jr.](#), a Democrat from northern New Jersey, who supports a soda tax said that House lawmakers had considered including it as part of their health reform bill but decided it was too divisive. “It didn’t look like we had the votes,” he said.

**Oreo Cookie Order Form**

Professor Salemi is selling Oreo cookie packs to raise funds for his daughter's class trip. He does not yet know the price. Please fill out the following order form so that Professor Salemi knows how many packages to order from his daughter's school once it announces the price. Professor Salemi will deliver the cookies at a class session in February. All orders are binding. Please make orders that are personally rational.

<b>Conditional Order Form for Class Cookie Sale</b>	
<b>Price</b>	<b>Number of Oreo packs I wish to buy.</b>
\$0.90	
\$0.85	
\$0.80	
\$0.75	
\$0.70	
\$0.65	
\$0.60	
\$0.55	
\$0.50	