Intro to Economic Analysis: Microeconomics

EC 201 - Day 5 Slides

Connor Wiegand

Department of Economics - University of Oregon

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Logistics

- Official homework 2 due this Saturday at 11:59pm, covering last week's material
- News assignments posted, first one due this Wednesday (October 13)
  - This includes doing 1 news analysis of your choice on Cengage, <u>and</u>
  - Submitting a 1-1.5 page write up on Canvas
- The outline must contain a brief summary of the article you read, as well as responses to the discussion questions that were at the end of your Cengage News Analysis

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- Specifically, suppose the market is in equilibrium, what effect does a change in demand bring? What about a change in supply? Will the effect always be the same?

Framework

- Suppose the market for pizza is in equilibrium, as shown in the diagram below:

Example 1

- Suppose that TotallyReliable Health Magazine announces that eating pizza every day reduces your chances of heart disease by 20%. What happens in the supply and demand graph? What happens to the equilibrium price and quantity?

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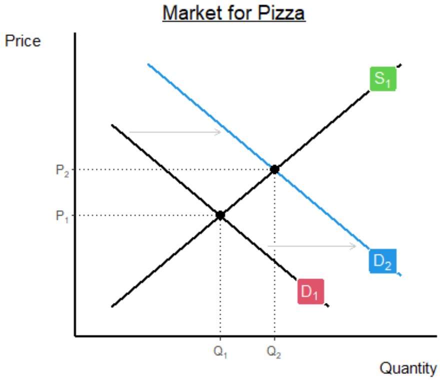
- Since pizza is believed to be healthier (taste and preferences) goes up, demand will shift right

Example 1 (cont.)



As we can see in the diagram, this will cause the price of pizza to rise in equilibrium, and will also increase the equilibrium amount of pizza being traded

Example 2

- Suppose instead that the price of ranch skyrockets, making it accessible to only the top 0.1% of Americans. Now what happens in equilibrium?

[1] like it or not

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- Since ranch is a complement to pizza[1], demand for pizza will fall

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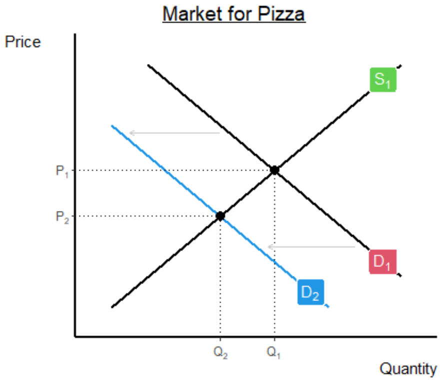
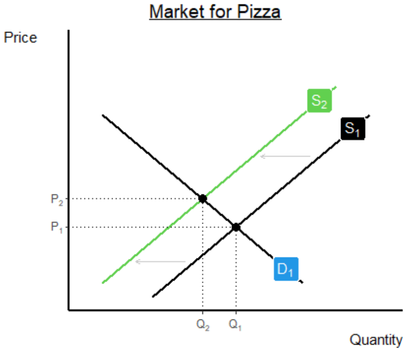


This causes the price of pizza to fall, as well as the equilibrium quantity

Example 3

- Now suppose that instead of either of these changes, the price of cheese increases. Now what happens in equilibrium?



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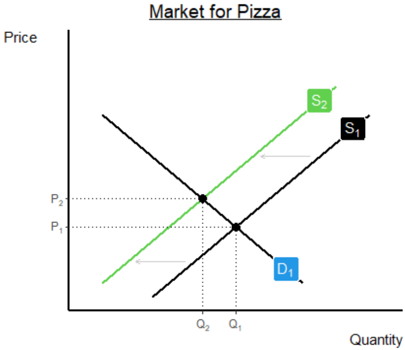

- The supply of pizza will shift left, and we can see that the price of pizza rises, while the quantity falls

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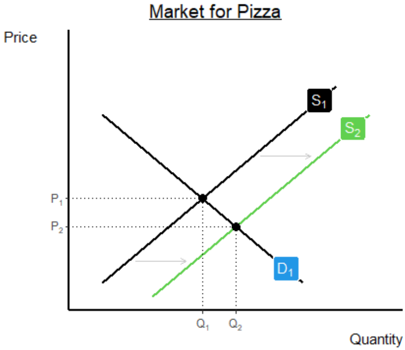

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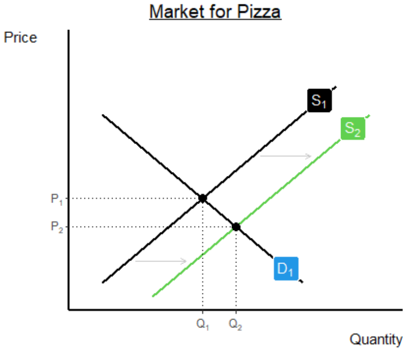

- Supply shifts right due to increased producers, and we can see that the price of pizza falls and equilibrium quantity rises

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- This can also have different welfare effects on both consumers and producers, which is the direction we will head in next week

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- What will happen to market equilibrium?

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- Let's visualize this

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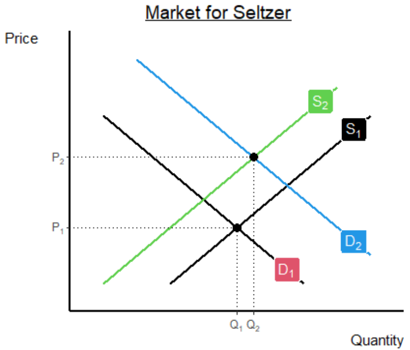

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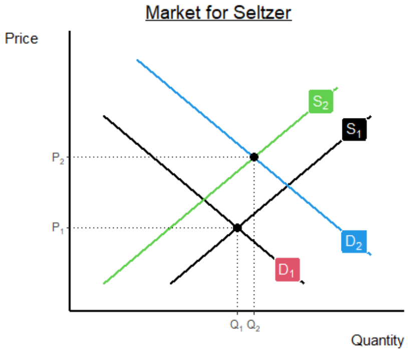

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- But recall that these are abstract shifts, i.e. without numbers. What happens if we were to draw it differently?

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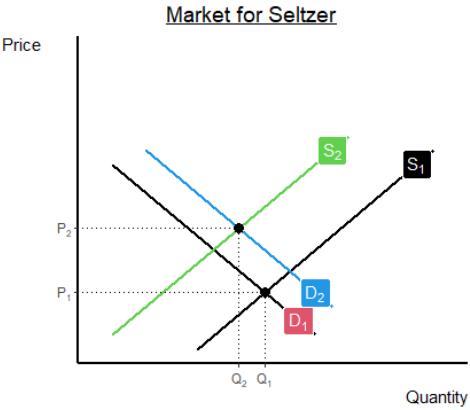

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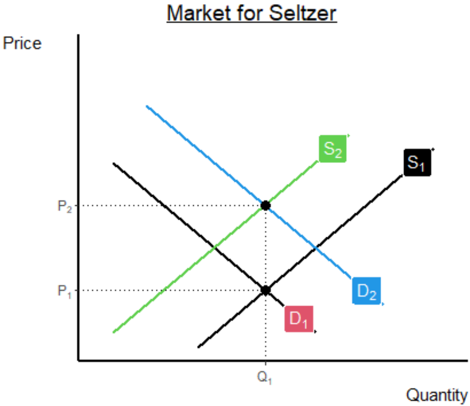

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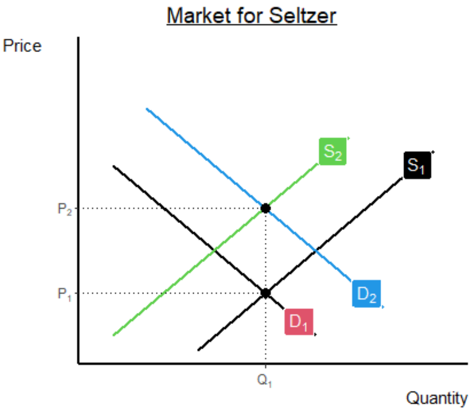

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- What's the deal?

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- You can draw the above diagram such that quantity rises, falls, or stays the same, but price will always rise, as long as you preserve shapes (you are welcome to try to draw it such that this isn't the case)

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- This may be a good idea if you forget which is which, but there is a more analytical way to determine which is which

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- Writing these down for any multi-shift example can help you determine which price/quantity moves

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- What impact does this have on equilibrium?

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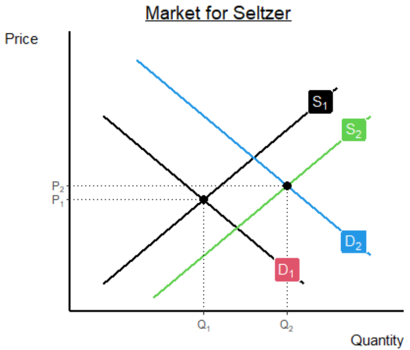

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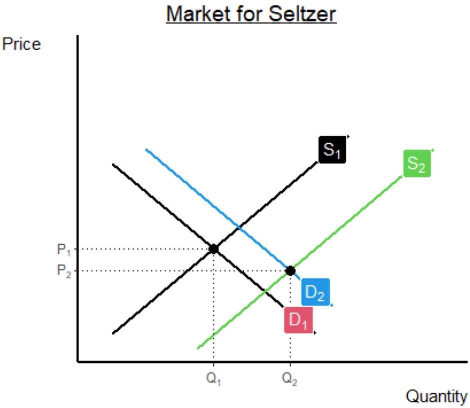

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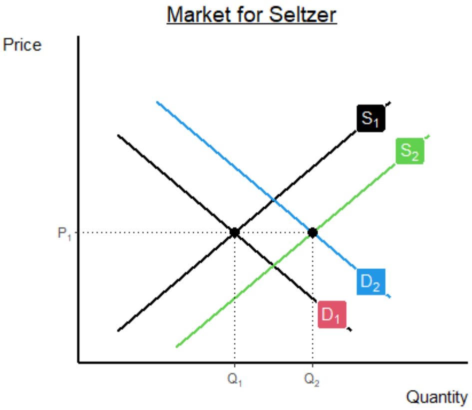

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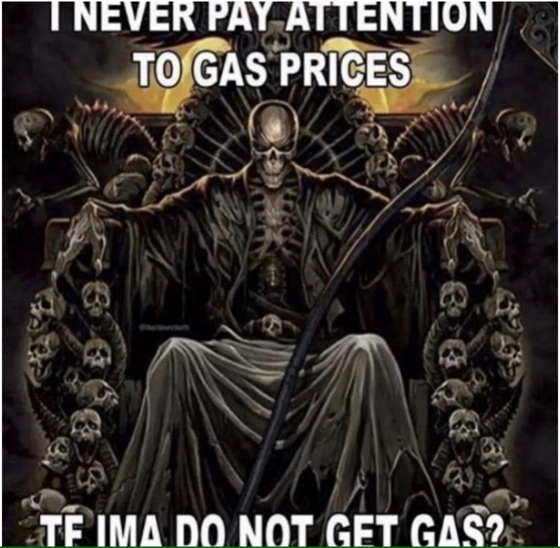
- Something to think about: what happens if we have more than two shifts?

Elasticity



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- Do we think a jump in the price of cereal causes the same loss in quantity demanded as a jump in the price of gas?

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Elasticity

- This though experiment gives rise to our next concept: *elasticity*
- Informally, elasticity is a measure of how much buyers and sellers respond to changes in market conditions
- We will start with types of elasticity of demand, starting with the *price elasticity of demand*
- The **price elasticity of demand** measures how much the quantity demanded responds to a change in price
  - A good is said to be *inelastic* if consumers are insensitive to changes in price
  - A good is said to be *elastic* if consumers are sensitive to changes in price
- Which do you think gas is?

Price Elasticity of Demand

- Formally, the price elasticity of demand, denoted e_d, E_d, or, as I will use, ε_D, is computed as

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- Before preceding, we have to make some important notes

The Sign of Price Elasticity of Demand

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- However, some[4] economists choose to convert and report ε_D as a positive term
- The book refers to this as "common" and simply says they "drop the negative" – I want you to know and demonstrate that you know that this is a negative value and we are taking the absolute value (which is the same as dropping a negative)

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Calculating Percentage Change

- The second order of business involves the ~~horrid~~ atypical way in which we as economists calculate percent change

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- This lack of symmetry bothered economists so much that they decided to do something completely different[5]

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The Midpoint Method

- So, while that way of calculating percentage change might be fine for your science class, here is the formula we will use for calculating percentage change in x, again using x_1 (initial) and x_2 (final):

$$\begin{aligned}\%\Delta x &= (x_2 - x_1) \big/ [(x_2 + x_1)/2] \cdot 100 \\ &= \frac{x_2 - x_1}{\left(\frac{x_2+x_1}{2}\right)} \cdot 100 \\ &= \frac{\text{final} - \text{initial}}{\text{midpoint}} \cdot 100\end{aligned}$$

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- This is called the midpoint method, because we divide the change in x by the midpoint between initial and final

Back to Elasticity

- So, the full formula for elasticity is given by

$$\varepsilon_D = \left| \frac{\%\Delta Q_D}{\%\Delta P} \right| = \left| \frac{(Q_2 - Q_1) / [(Q_1 + Q_2)/2]}{(P_2 - P_1) / [(P_1 + P_2)/2]} \right|$$

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- Example: Suppose that when the price of burritos rises from \$8 to \$12, the quantity demanded falls from 1500 to 700. What is the PED for burritos?

Elasticity Example

- When the price of burritos rises from \$9 to \$12, the quantity demanded falls from 1500 to 700

$$\begin{aligned}\varepsilon_D &= \left|\frac{(700-1500)\,/\,[(1500+700)\,/2]}{(12-8)\,/\,[(12+8)\,/2]}\right| \\ &= \left|\frac{-800/1100}{4/10}\right| \\ &= \frac{20}{11} \\ &= 1.\overline{81}\end{aligned}$$

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- What does this say?

PED Interpretation

- Suppose $\varepsilon_D = 1.81$

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- Suppose $\varepsilon_D = 1.81$
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- Why? If[6]

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

then plugging in 1% for $\%\Delta P$ yields $\varepsilon_D\%$ for $\%\Delta Q_D$:

$$\varepsilon_D = \frac{\%\Delta Q_D}{\%\Delta P} \implies \varepsilon_D\% = \%\Delta Q_D$$

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Types of Elasticity, by Numbers

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  - Examples: goods with many substitutes, or goods which are easily accessible and/or easy to steal; e.g. phone games, souvenirs, any public goods/services with poor monitoring

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    - Other items, which are not "necessities", can be highly inelastic if they are common-place based on cultural norms, such as phones, computers, wifi, etc.

Determinants of Elasticity (cont.)

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   - Ex: You show up with an empty tank to find gas prices have shot up; you need gas right then, but you may drive less over time ($\varepsilon_D = 2.5\%$ over 1 year, $= 6\%$ over 5 years)

How PED Affects the Shape of a Demand Curve

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- In other terms, a high value for the magnitude[7] of the slope will lead to a low ε_D, all else equal
- Low $\varepsilon_D \iff$ inelastic curve, so all else equal, a steep slope means an inelastic curve

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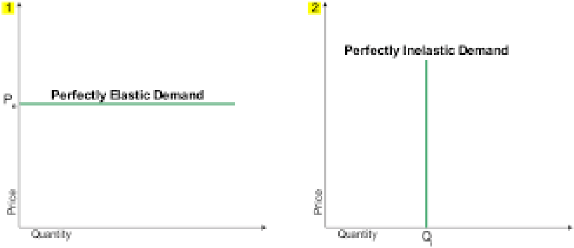
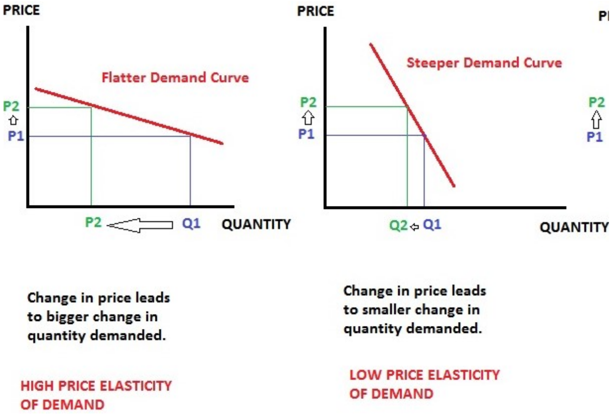
Mnemonic Device?



To remember which is which, just note that perfectly inelastic demand looks like an “I”, while perfectly elastic demand looks (kind of) like an “E”

Graphical Understanding



Note that the same(ish) level of price change leads to larger responses in flat curves than in steep curves