

Economics, Markets and Organizations (Tutorial 2)



Homework, Q1

1) Discuss the factors that can shift the demand curve for a good. How is the demand of a good affected when the price of another good that is a close substitute increases? How do your answers change if the two goods are complements?





Homework, Q2

2) Discuss the factors that can shift the supply curve. Discuss how an increase in wages affects the supply of a specific good.





Key objectives

- Understand the concept of elasticity (in general)
 - we concentrate on price elasticity (income elasticity and cross-price elasticity should be reviewed from the book)
- Understand how consumers choose which is best for them
 - Key concepts to understand: budget constraint, preference, indifference curve, constraint optimization, Slutsky decomposition (substitution effect and income effect)

Useful Youtube videos

- <https://www.youtube.com/watch?v=0KFWqw4sNIM>
- https://www.youtube.com/watch?v=w9z_I-5QZ0o
- https://www.youtube.com/watch?v=pLhh_D5bLg
- https://www.youtube.com/watch?v=68qzgnOYvNQ&list=PLVozIL0RTDnX5SDFNBov_vWcPrEqIbCXo

Price elasticity

- Define what is meant by the (own-) price elasticity of demand for a good. *Explain the formula also!* What happens to the elasticity of demand as we move along the linear demand curve? *Show it visually and also with the formula!*
- *Why do you think it is important to understand the price elasticity of a good?*



Elasticity in general

- The x elasticity of y tells how many percentage y is going to change if we increase x by 1%.
- Types of demand elasticities:
- Own price elasticity: if price increases by 1% how many percentage the quantity demanded changes?
- Cross-price elasticity: if the price of another good increases by 1%, by how many percentage the quantity demanded will change? (what if they are substitutes or complements)
- Income elasticity: if income grows by 1%, how many percentage the quantity demanded will change. (what if the good is normal or inferior?)
- Supply elasticities: the same as above, but now we are interested in the % change of the quantity supplied.

Price elasticity expressions

- Elastic demand: when the price elasticity of demand is above $|1|$ (absolute value of 1).
- Inelastic demand: when the price elasticity of demand is less than $|1|$.
- Unit elastic demand: when price elasticity is -1 .
- Perfectly inelastic: quantity does not react to changes in price at all: elasticity is zero.
- Perfectly (infinitely) elastic: at even the smallest changes of price, demand changes in an infinitely large extent.

Elasticity in general

- The x elasticity of y:

$$\varepsilon_y = \frac{\Delta y}{\Delta x} \div \frac{\Delta x}{y} = \frac{\Delta y}{\Delta x} \cdot \frac{y}{x}$$

Bases of comparison

- The x elasticity of y with midpoint formula:

$$\varepsilon_y = \frac{y_1 - y_0}{\left(\frac{y_1 + y_0}{2} \right)} \div \frac{x_1 - x_0}{\left(\frac{x_1 + x_0}{2} \right)}$$

Price elasticity of demand with midpoint method

- At $p=10$, the demand for cookies is 20.
- When $p=15$, the demand for cookies is 10.
- What is the price elasticity of demand for cookies?

$$\begin{aligned}\varepsilon_d &= \frac{Q_1 - Q_0}{\frac{Q_1 + Q_0}{2}} \div \frac{P_1 - P_0}{\frac{P_1 + P_0}{2}} = \frac{10 - 20}{\frac{(10 + 20)}{2}} \div \frac{15 - 10}{\frac{(15 + 10)}{2}} = \\ &= -\frac{10}{15} \div \frac{5}{12.5} = -\frac{10}{15} \cdot \frac{12.5}{5} = -1.67\end{aligned}$$

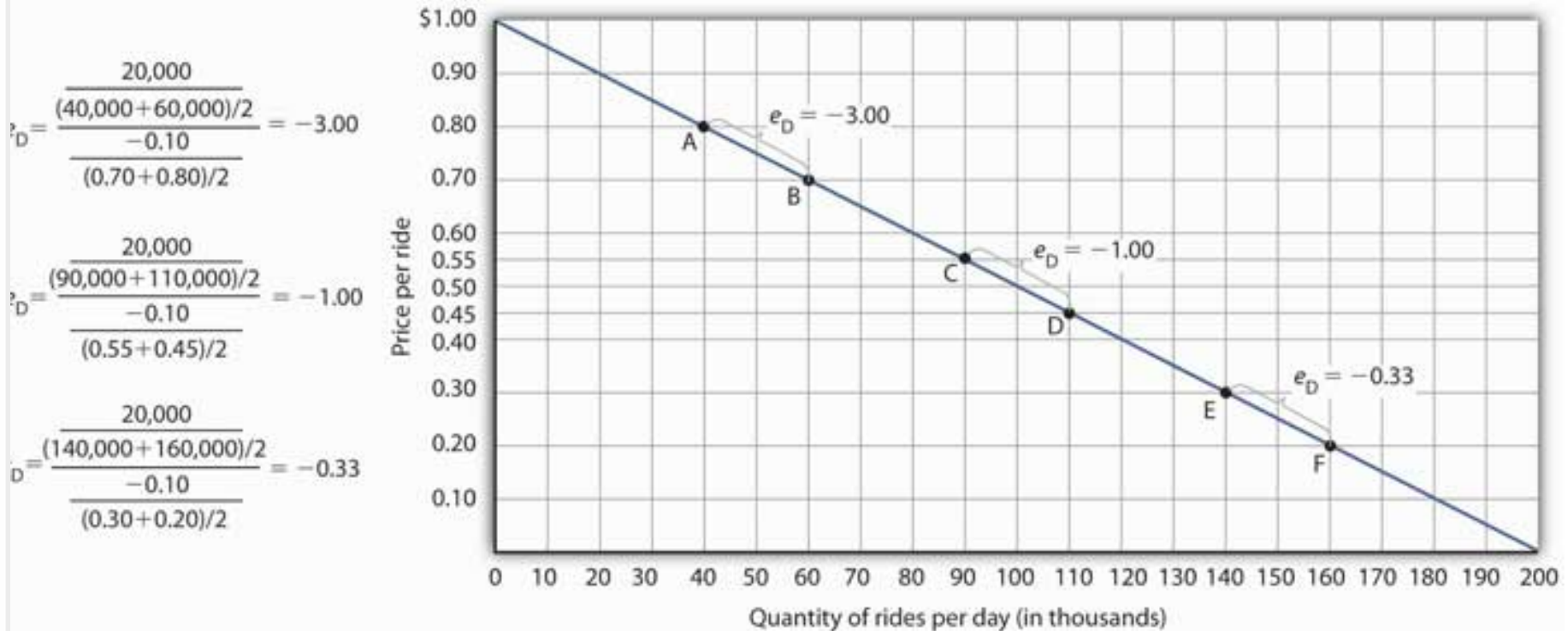
Price elasticity of demand w/o midpoint method

- What if we had not taken the average in the denominator?

$$\varepsilon_d = \frac{Q_1 - Q_0}{Q_0} \div \frac{P_1 - P_0}{P_0} = \frac{10 - 20}{20} \div \frac{15 - 10}{10} = -\frac{1}{2} \cdot 2 = -1$$

$$\varepsilon_d = \frac{Q_1 - Q_0}{Q_1} \div \frac{P_1 - P_0}{P_1} = \frac{10 - 20}{10} \div \frac{15 - 10}{15} = -1 \cdot 3 = -3$$

The elasticity changes along a line





examples

- Price elastic demand: luxury goods (car, consumer electronics, fancy clothing). Goods that you can substitute easily by other goods.
- Price inelastic demand: necessities (basic food, basic clothing, fuel) of which you have no or just a few alternatives (substitutes).



How does the consumer choose?

- He wants to achieve the highest utility given his budget constraint. That is he wishes to achieve the outermost achievable indifference curve.
- The indifference curve describes what he is willing to do (preferences), the budget line describes what he is able to do (budget constraint).
- Optimization problem: the best possible decision under given constraints.



Consumer choice theory

1. Which of the following statements is not valid? A utility maximising consumer chooses to be at a point of tangency between his budget line and an indifference curve because: (a) this is the highest indifference curve that can be obtained; (b) at any point to the left of the budget line some income would be unused; (c) all combination of goods that lie to the right of his budget line are unreachable, given money income; (d) this point represents the most favourable relative prices; (e) at any other point on the budget line he will gain less utility.





- Grace spend her entire budget and consumes 19 units of x and 18 units of y . The price of x is twice the price of y . Her income doubles and the price of y doubles, but the price of x remains the same. If she continues to buy 18 units of y , what is the highest amount of x that she can buy?



solutions

- Period 1:

$$Y = 19p_x + 18p_y$$

$$p_x = 2p_y$$

- From this:

$$Y = 38p_y + 18p_y = 56p_y$$

$$p_y = Y / 56$$

- Period 2:

$$2Y = x'p_x + 18p'_y$$

$$p_x = p'_y = 2p_y$$

$$2Y = (2x' + 36)p_y \rightarrow p_y = \frac{2Y}{2x' + 36}$$



solution

- So we have the following sys. of eq.: $p_y = Y / 56$

$$p_y = \frac{2Y}{2x' + 36}$$

- The solution is:

$$112 = 2x' + 36$$

$$x' = 38$$



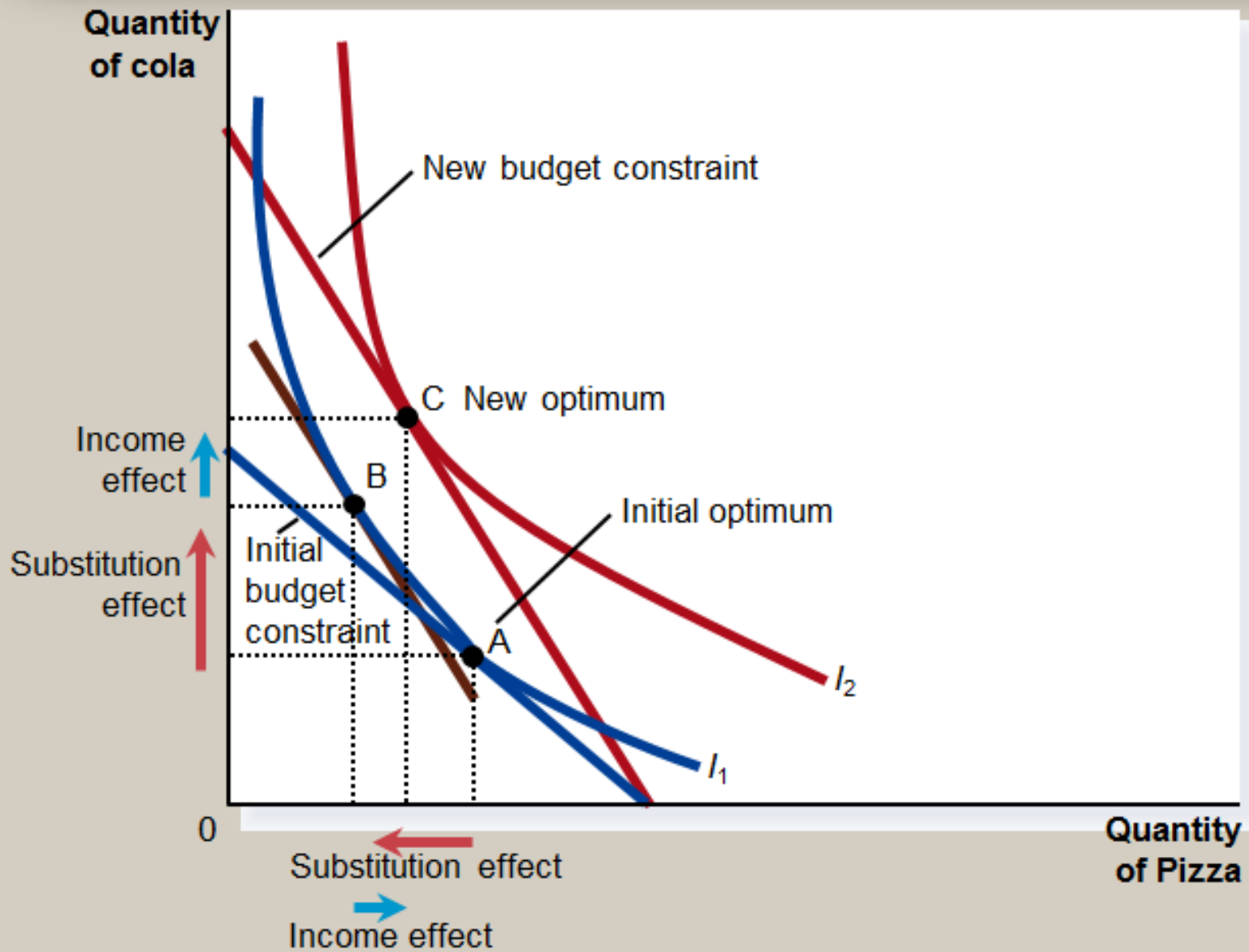
4. An individual is faced with a choice of buying housing in one of two markets; the private market where she may buy any amount of housing he pleases at the going price, and the local authority market where she will be offered, on a take it or leave it basis, a particular amount of housing. Will she necessarily choose the local authority house? If she does, may we conclude that she will consume more housing than he would have purchased had he been forced to buy on the private market? Assume that the individual is indifferent between public and private housing and prefers more housing to less. Also, she may only buy either public or private housing, and cannot mix the two.



Substitution and income effect

- When the price of a good changes, the optimal choice of the consumer changes. Changes in the optimal choice can be decomposed into a substitution and an income effect.







Consumer theory, Q2

- Is it possible that when there are two goods, x and y , that
 1. For y to be both substitute to x and a normal good
 2. For y to be complement to x and an inferior good





Y is normal and substitute of x

- If the price of x increases, then the substitution effect must be positive on y (substitution) and the income effect should be negative (normal good: when real income reduces, demand decreases).



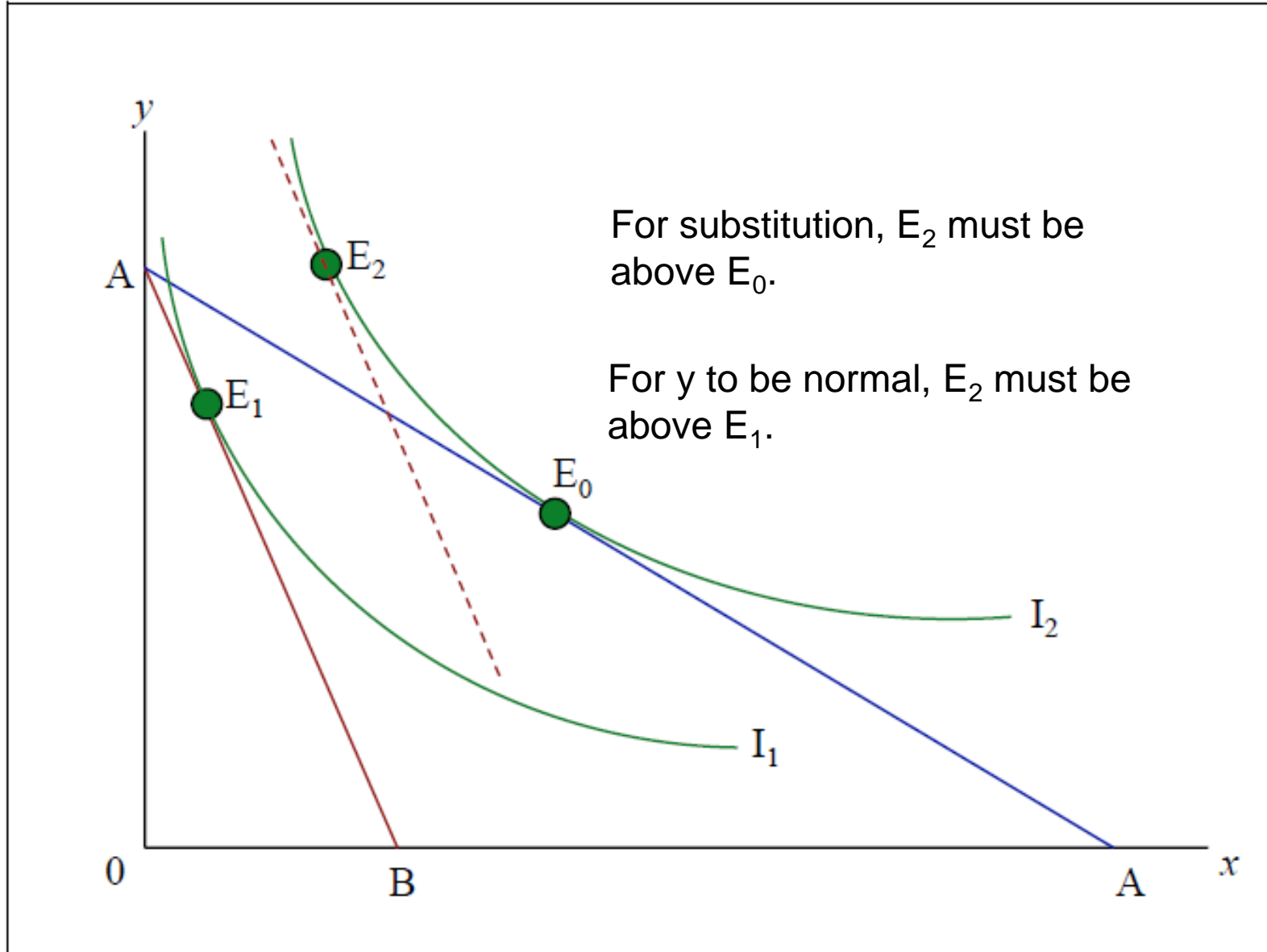


Figure 1



Y is inferior and complementary to x

- If the price of x increases, then the substitution effect must be negative on y (they are complements) and the income effect should be positive (inferior good: when real income reduces, demand increases).



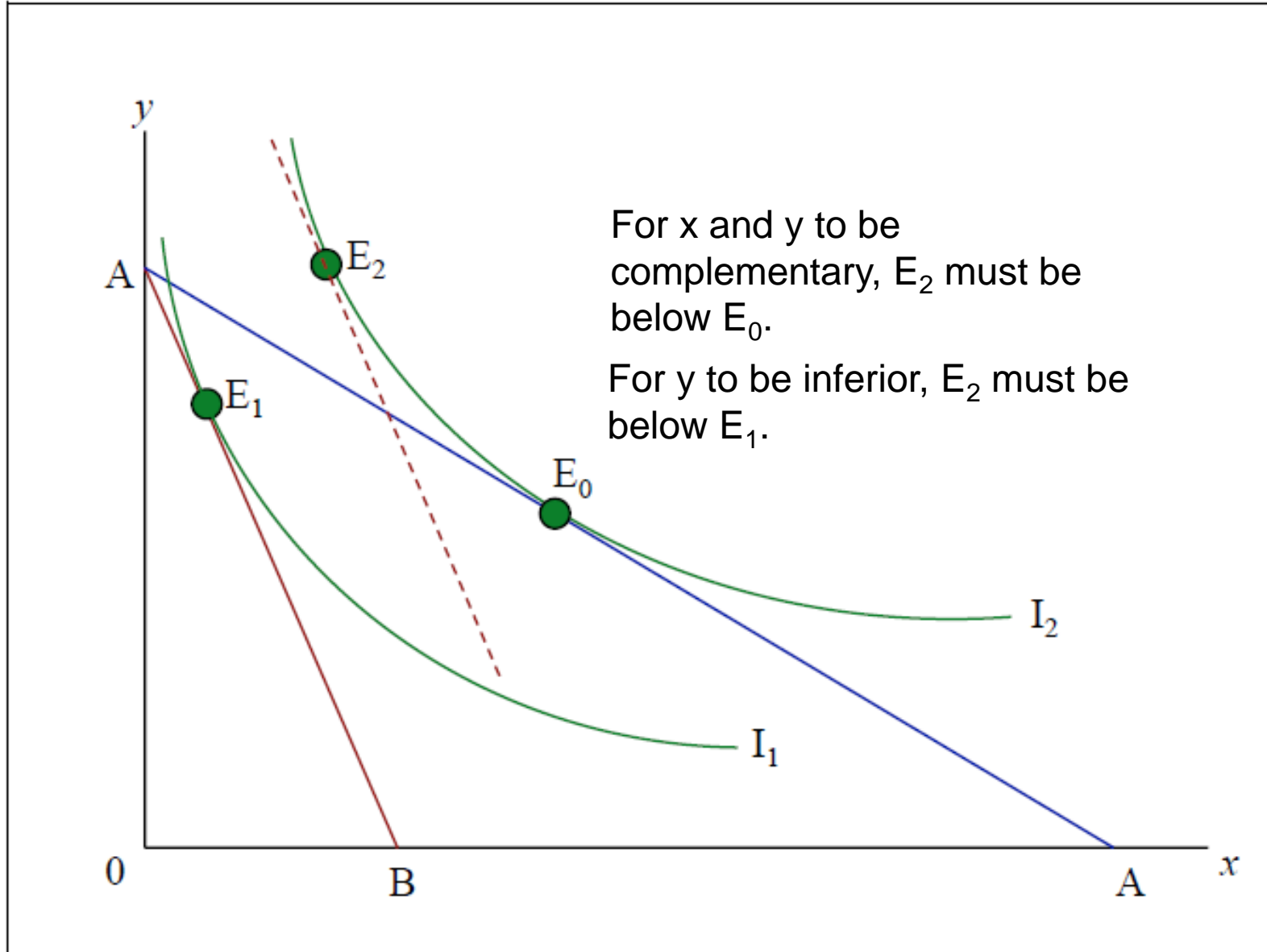


Figure 1



Y is inferior and complementary to x

- Since with increasing price of x the budget line's slope will increase in absolute terms (for example from -1 to -2)
- And since the slope of the indifference curve is decreasing as we increase x.
- The tangent point of the new budget line and the old indifference curve must be at a higher y than before. E_2 cannot be below E_0 !
- Such setting is not possible with well-behaving indifference curves.



Q5

5. Assume that an individual consumes goods X and Y. Assume that her utility function is quadratic and is described by $U(X,Y) = \log X + \log Y$. Her budget constraint is given by $P_X X + P_Y Y = M$, where P_X is the price of good X and P_Y is the price of good Y. M is her nominal income.

- Derive the marginal rate of substitution (MRS) of the individual.
- What is the MRS equal to at the point where the individual maximizes her utility subject to the budget constraint?

Solution

■ a)

$$MRS = - \frac{\frac{\partial U}{\partial x}}{\frac{\partial U}{\partial y}} = - \frac{y}{x}$$

Slope of
budget line:

■ b)

$$M = p_x X + p_y Y \rightarrow Y = \frac{M}{p_y} \left(- \frac{p_x}{p_y} \right) X$$

$$MRS = - \frac{p_x}{p_y}$$

If you were at the math refresher:

- The utility function is: $U = \ln(x) + \ln(y)$
- We take the total derivative:

$$dU = \frac{1}{x} dx + \frac{1}{y} dy$$

- Along the same indifference curve, utility cannot change, so the left side is zero. So:

$$0 = \frac{1}{x} dx + \frac{1}{y} dy \rightarrow MRS = \frac{dy}{dx} = -\frac{y}{x}$$



Does Wal-Mart Sell Inferior Goods?

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University of Missouri

April 2008

Abstract

I estimate the aggregate income elasticity of Wal-Mart's and Target's revenues using quarterly data for 1997–2006. I find that Wal-Mart's revenues increase during bad times, whereas Target's revenues decrease, consistent with Wal-Mart selling “inferior goods” in the technical sense of the term. An upper bound on the aggregate income elasticity of demand for Wal-Mart's wares is -0.5 .

JEL Codes: L81, D12

Keywords: Retail, Wal-Mart, Target, Inferior Goods



Energy Policy

Volume 39, Issue 6, June 2011, Pages 3709–3719



The price elasticity of electricity demand in South Australia

Shu Fan  , Rob J. Hyndman 

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Abstract

In this paper, the price elasticity of electricity demand, representing the sensitivity of customer demand to the price of electricity, has been estimated for South Australia. We first undertake a review of the scholarly literature regarding electricity price elasticity for different regions and systems. Then we perform an empirical evaluation of the historic South Australian price elasticity, focussing on the relationship between price and demand quantiles at each half-hour of the day.

This work attempts to determine whether there is any variation in price sensitivity with the time of day or quantile, and to estimate the form of any relationships that might exist in South Australia.





Original Article

Status Consumption and Price Sensitivity

Ronald E. Goldsmith , Leisa R. Flynn & Daekwan Kim

Pages 323-338 | Published online: 08 Dec 2014

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Abstract

This paper describes a study of status consumption and price sensitivity. The pervasive desire for social prestige motivates consumers to pay higher prices for goods that confer status. We suggest that three constructs—involvement, innovativeness, and brand loyalty—mediate this relationship. We test a model using data from 409 U.S. college students. Status consumption does influence price sensitivity; and this influence is largely, but not totally, mediated by involvement, innovativeness, and brand loyalty. The results are consistent with previous studies and theories regarding these variables and attest to the importance of status consumption in consumer behavior. Understanding how such psychological constructs interact to produce their effects improves consumer theory and marketing practice.

