

# Lecture II: Scarcity and Demand

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Readings

Overview of Demand

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- ▶ Becker Lectures 5
- ▶ Landsburg Chapters 6 – 7

# Overview of Demand

- The economic model of price and quantity developed in Lecture 1 is a balance act of supply and demand (Figure 1).

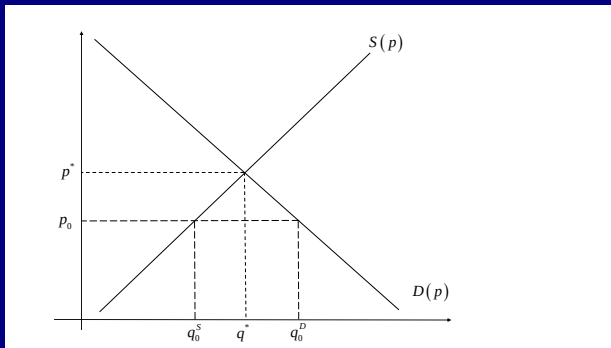


Figure : Market Equilibrium

- ▶ Basically there exists a price such that the quantity demanded equals the quantity supplied.
- ▶ From this point there is no pressure to change – there is zero excess demand.
- ▶ The goal in the first part of the course is to develop the basic concepts of supply and demand.

# Demand

- ▶ Becker – Perhaps the most fundamental finding in economics is the "law" of negatively sloped demand curves.
- ▶ Two important points:
  - ▶ All other things constant an increase in the price of any good causes the amount of that good consumed to fall.
  - ▶ There is a change in income sufficient to offset that increase in price.
- ▶ We are going to develop the concept of a market demand by developing the decision of each individual.

- ▶ We typically do not estimate the behavior of individuals.
- ▶ However, the behavior of individuals shapes the overall demand function

$$D_T(p) = \sum_{i=1}^N D_i(p) \quad (1)$$

where  $D_T(p)$  is the total demand where  $D_i(p)$  are individual demand functions.

# Elasticity of Demand

- The primary concept that we are typically interested in is the elasticity of demand

$$\epsilon = \frac{\frac{\Delta q}{q}}{\frac{\Delta p}{p}} = \frac{\Delta q}{\Delta p} \times \frac{p}{q}. \quad (2)$$

which tells us the percentage change in quantity demanded as a function of the percentage change in price.

$$\epsilon = -\frac{dq}{dp} \times \frac{p}{q} \quad (3)$$

the slope of the demand function is  $dq/dp$ .

# Marginal Revenue

- ▶ As an extension Becker discusses the concept of marginal revenue

$$pq \Rightarrow \Delta(pq) = \Delta pq + p\Delta q$$

$$\frac{\Delta(pq)}{\Delta q} = \frac{\Delta p}{\Delta q} + p$$

$$\frac{\Delta(pq)}{\Delta q} = \left[ \frac{\Delta p}{\Delta q} \frac{q}{p} + 1 \right] p$$

(4)

$$\frac{\Delta(pq)}{\Delta q} = \left[ 1 + \frac{1}{\frac{\Delta q}{\Delta p} \times \frac{p}{q}} \right] p$$

## ► Scarcity and the Law of Demand

- The basic idea is that the downward sloping nature of the demand curve is primarily an artifact of scarcity.
- Suppose that you have \$ 100 to spend this next week. Suppose that steak cost \$10 / lb and cereal costs \$ 1/carton.
- If you spend all your money on steak you could buy 10 lbs of steak. However, if you spend all your money on cereal you will be able to buy 100 cartons of cereal.
- The choice set is depicted in Figure 2.

# Budget Constraint

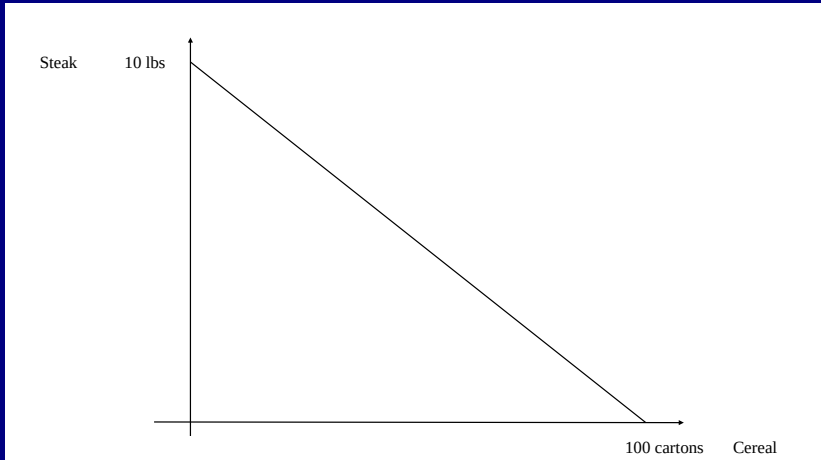


Figure : Budget Constraint

- ▶ Next, assume that the price of steak increases to \$12.50 / lb – you can buy less steak as depicted in Figure 3.

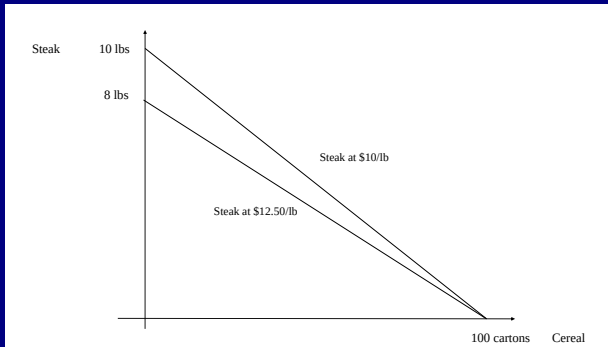


Figure : Increase in Price of Steak

- ▶ It is clear that you can no longer afford any bundle that contains a non-zero level of steak at the new price.
- ▶ Assume that you originally spent 1/2 of your income on steaks - you bought 5 lbs of steak and 50 cartons of cereal.
- ▶ In order to afford this bundle at the new price you need \$ 112.50 (as depicted in Figure 4

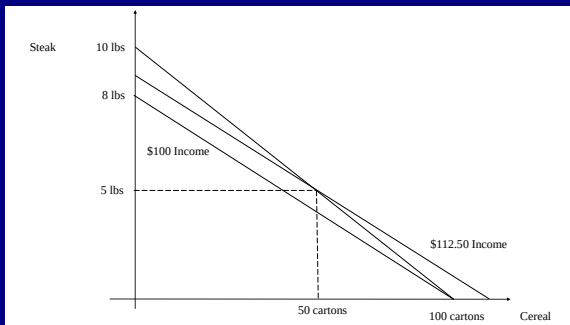


Figure : Income Shift

- ▶ The key point is that the price change has had an income effect – you have become poorer after the price change.
- ▶ As stated by Becker, the downward sloping nature of the demand curve involves scarcity.

► Back to a little math

$$p_x x + p_y y \leq I$$

$$p_x \Delta x + p_y \Delta y = \Delta I \quad (5)$$

$$p_x \frac{\Delta x}{\Delta l} + p_y \frac{\Delta y}{\Delta l} = 1$$

Note that

$$p_x \times \frac{I_x}{I} \times \frac{\Delta x}{I} \quad (6)$$

- ▶ Given that

$$\frac{p_x x}{I} = k_x \quad (7)$$

the change in income implies

$$k_x \eta_x + k_y \eta_y = 1. \quad (8)$$

- ▶ Note that I have not assumed anything about optimizing behavior.
- ▶ What we know is that a change in prices imply a change in income which implies a change in consumption.
- ▶ The relationship between income and consumption is known as the Engel curve.

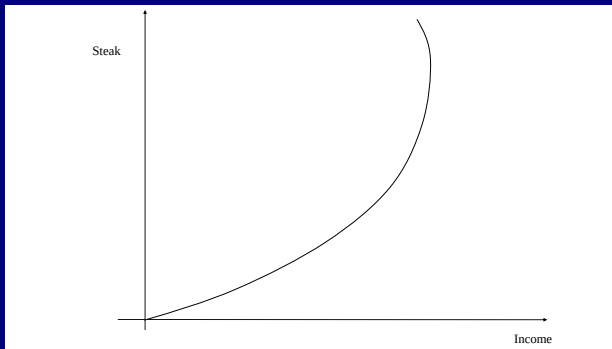


Figure : Engel Curve

- The Engel Curves for the consumer are related – not all goods can be inferior goods.