ECO5002 Introduction to Economics

Lecture 4: Consumer Theory (Addendum)

Long Ma

School of Management and Economics
Chinese University of Hong Kong, Shenzhen

July-August, 2024

IV. The Effect of Price Change

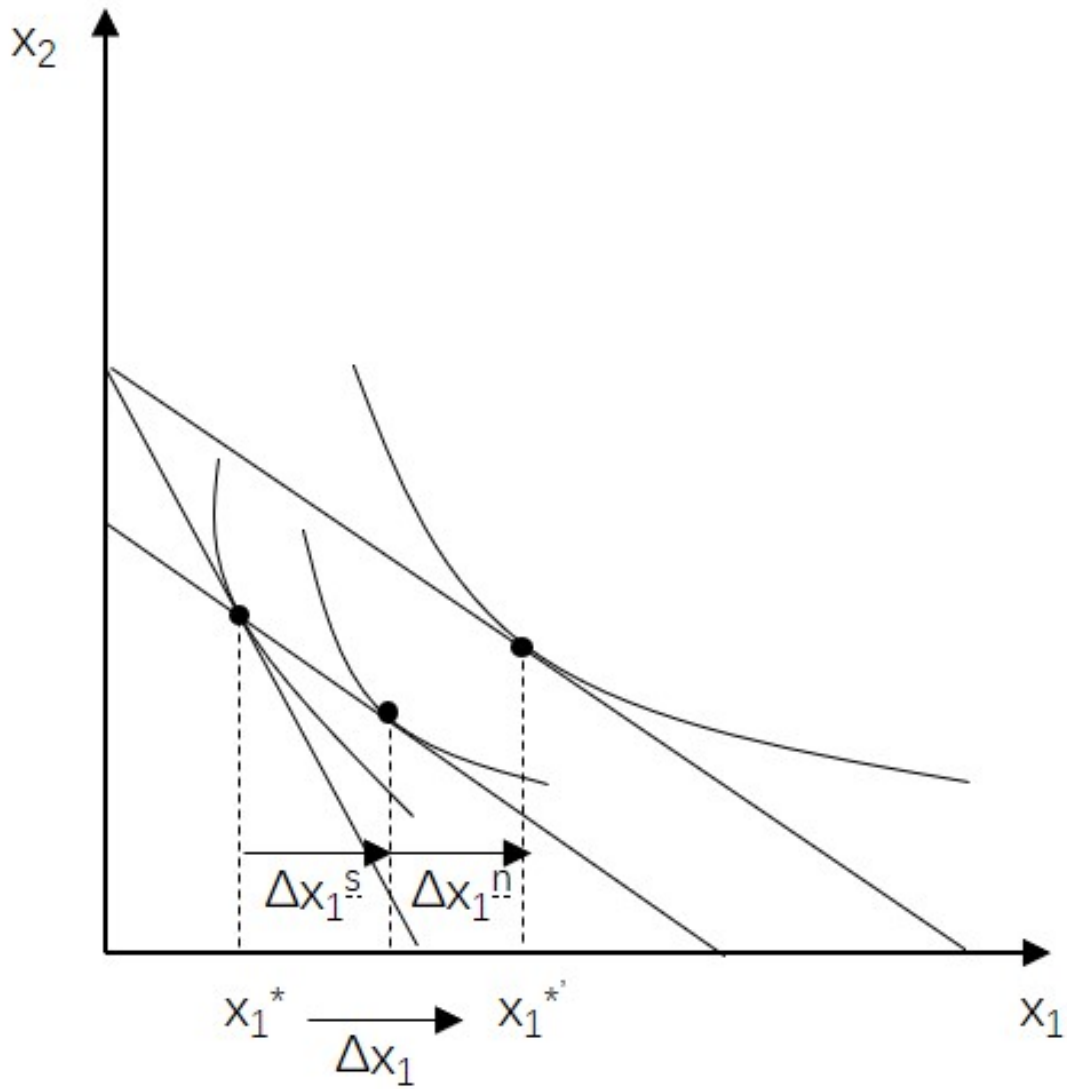
- We can use the trick of price change to draw the Marshallian demand curve: normally, price $\downarrow \Rightarrow$ quantity demanded $\uparrow$.
- Then, let us decompose this price effect into two parts.
- **Substitution effect**
  - if the price of good 1 decreases, $p_1 \downarrow$, but p_2 doesn't change.
  - good 1 becomes relatively cheaper than good 2.
  - a consumer would like to buy more good 1.
- **Income effect**
  - if the price of good 1 decreases, $p_1 \downarrow$, but p_2 doesn't change.
  - it seems that the consumer's income increases
  - a consumer may like to buy more good 1 and good 2.

IV. The Effect of Price Change

Slutsky Decomposition:

- **Total effect**: if the price of good 1 decreases, the quantity demanded for good 1 moves (increases) from x_1^* to $x_1^{*\prime}$.
- Step 1: rotate the original budget constraint parallel to the new one and let it still cross the old consumption bundle. The old bundle is still feasible. This intermediate budget line will be tangent to another indifference curve and the quantity increment is called **substitution effect**, i.e., Δx_1^s.
- Step 2: shift the intermediate budget constraint towards the new position, and the quantity increment is called **income effect**, i.e., Δx_1^n.

IV. The Effect of Price Change

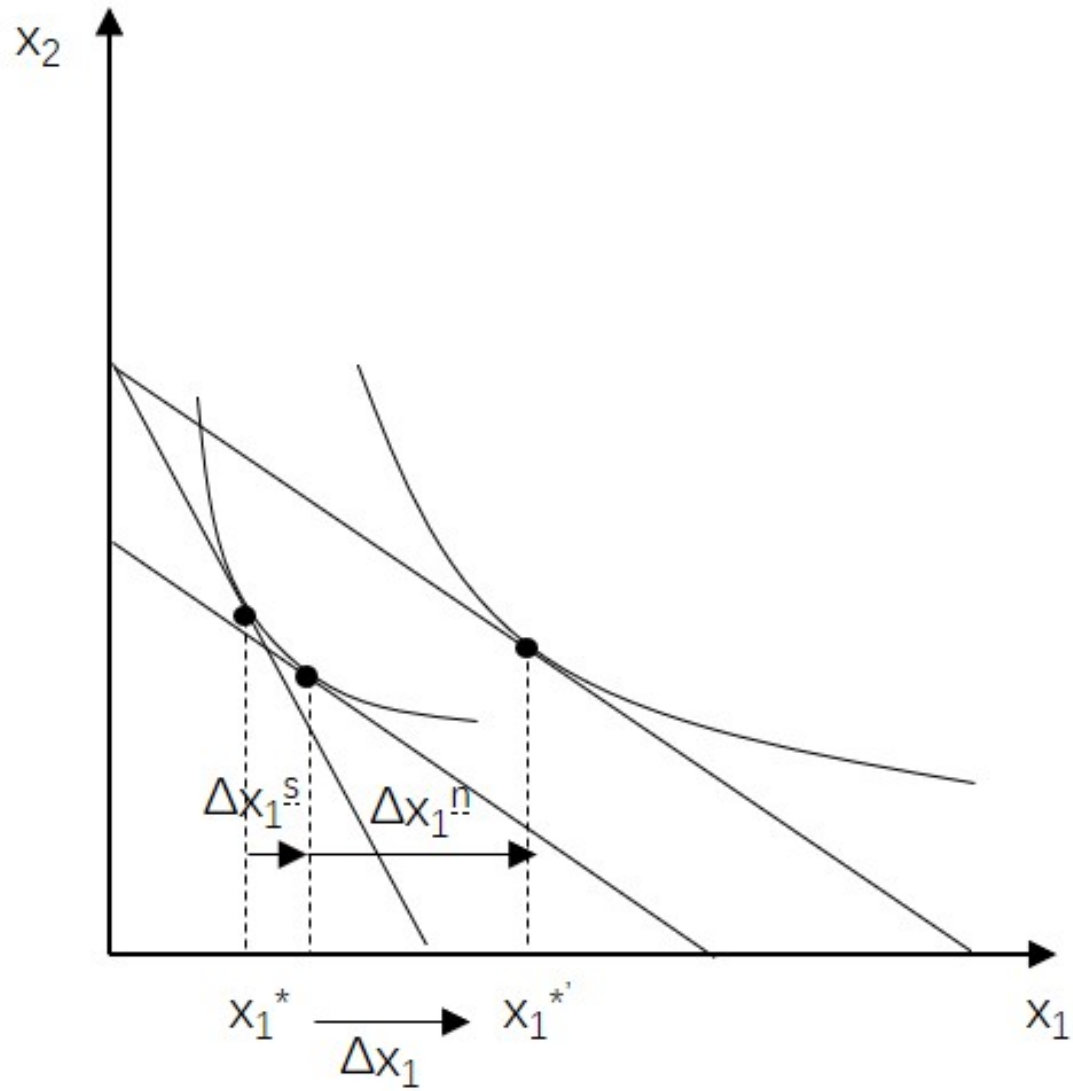


IV. The Effect of Price Change

Hicksian Decomposition:

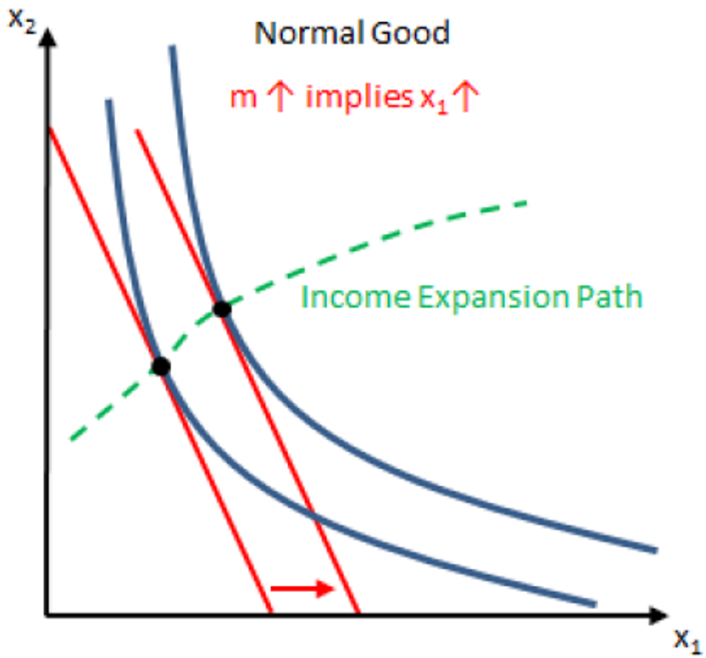
- **Total effect**: if the price of good 1 decreases, the quantity demanded for good 1 moves (increases) from x_1^* to $x_1^{*\prime}$.
- Step 1: rotate the original budget constraint parallel to the new one and let it still be tangent to the old curve. The old bundle is infeasible. The quantity increment is called **substitution effect**, i.e., Δx_1^s.
- Step 2: shift the intermediate budget constraint towards the new position, and the quantity increment is called **income effect**, i.e., Δx_1^n.

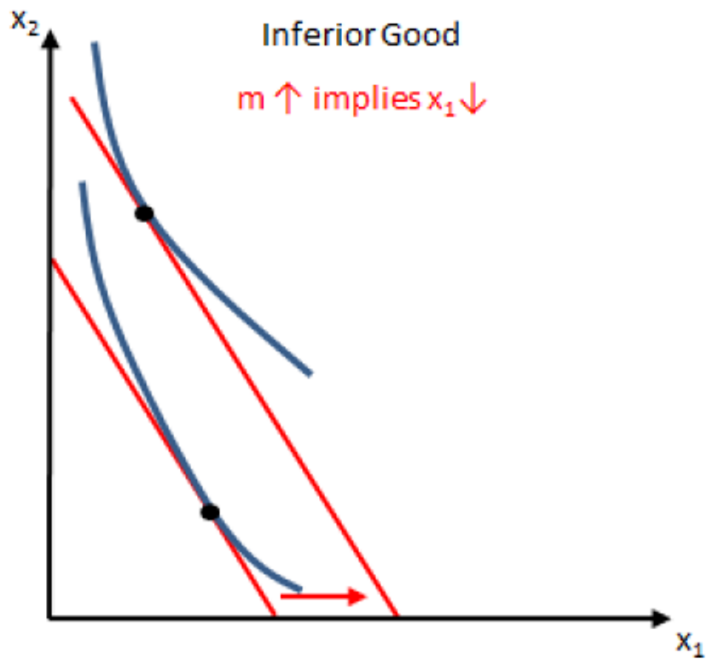
IV. The Effect of Price Change



IV. The Effect of Price Change

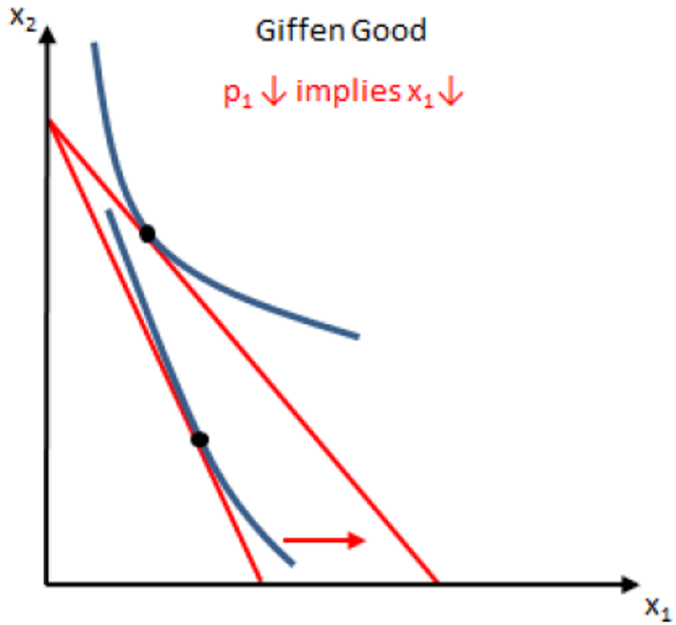
Normal goods v.s. Inferior goods





IV. The Effect of Price Change

Ordinary goods v.s. Giffen goods



- $\Delta x_1 = \Delta x_1^s + \Delta x_1^n$.
- The substitution effect is always negative: $p_1 \downarrow$, $\Delta x_1^s > 0$.
- The income effect could be positive or negative.
- A Giffen good must be an inferior good. But an inferior good may not be a Giffen good.

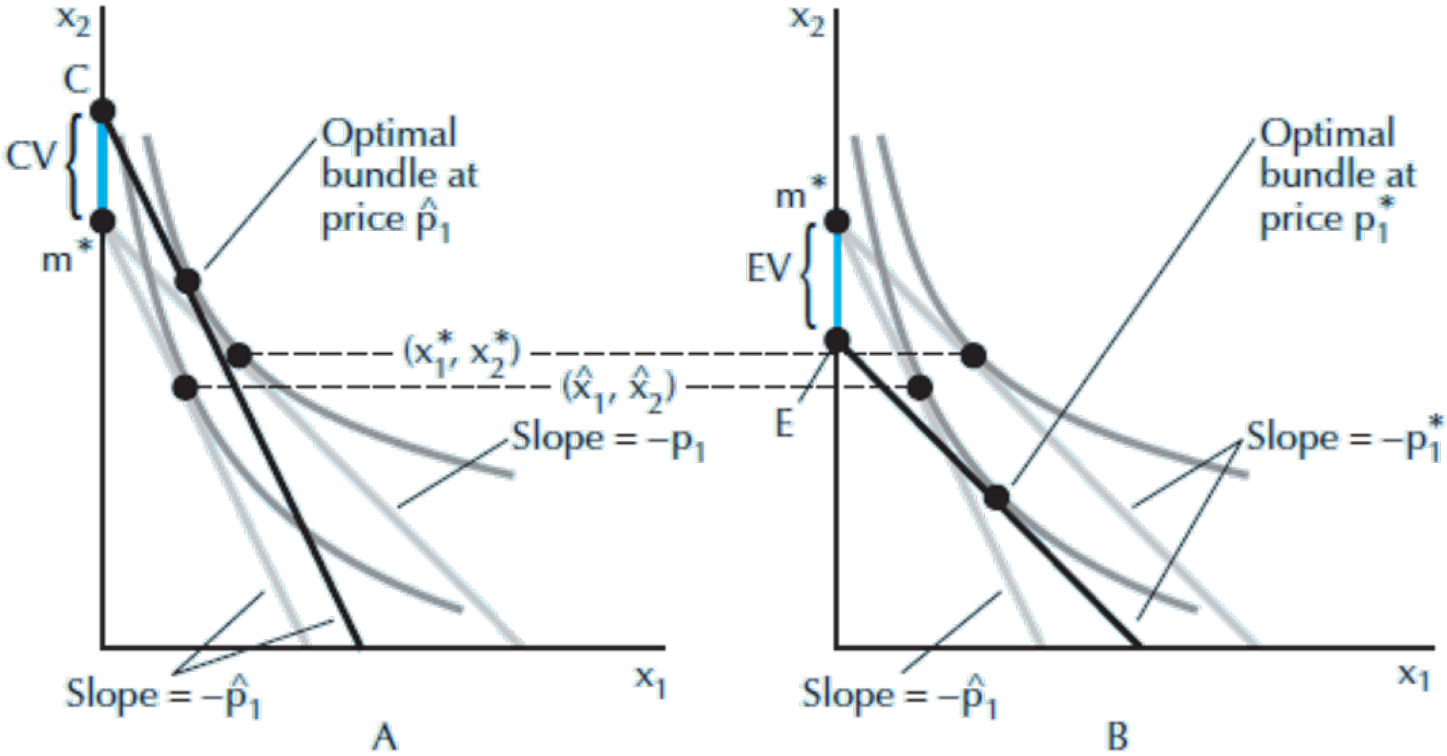
V. Compensating and Equivalent Variation

- Consumer surplus is a way to measure the welfare change when the price changes.

$$CS = \int_{p_1^1}^{p_1^2} x_1(p_1, p_2, m)\mathrm{d}p_1$$

- There are two alternative criteria:
  - **Equivalent Variations**: it is the change in income that the consumer needs at the old prices p_1^1 to be as well off as at the new price p_1^2.
  - **Compensating Variations**: it is the change in income that the consumer needs at the new prices p_1^2 to be as well off as at the old prices p_1^1.

V. Compensating and Equivalent Variation



- Old price: p_1, new price: $\hat{p}_1 > p_1$. Normalize $p_2 = 1$.
- Old optimal bundle: (x_1^*, x_2^*), new optimal bundle: $(\hat{x}_1, \hat{x}_2)$.

Reading

- Chapter 8 and 14, Intermediate Microeconomics by Varian.