Demand and Consumer Behavior

August 21, 2025

August 25, 2025

Introduction

- Decision making in everyday life
  - From a set of different consumption possibilities, we choose the one we **value** most highly
  - What is the relevance of these decisions in the context of the topics we have covered so far?
  - Our choices underlie the demand curves and elasticities
- Utility
  - A measure of **satisfaction** from consumption
  - Allows us to compare and rank different goods and services
  - We can compare apples and oranges
- When an individual chooses a bundle of consumption, in the theory of demand we say that the bundle maximizes her/ his utility

Marginal utility

- The concept of marginal utility helps us understand how utility is related to demand
- The term ‘marginal’ in economics means additional or extra
  - Thus, marginal utility denotes additional utility that we get from the consumption of an additional unit of the commodity
- *Law of diminishing marginal utility*
  - The marginal utility declines as a person consumes more of the good
  - Can marginal utility be negative?
- Total utility
  - The Total utility equals sum of all marginal utilities
  - It grows with consumption at a declining rate
  - Is maximized at a point when marginal utility is zero
- Contributions: Bernoulli, Bentham and Jevons

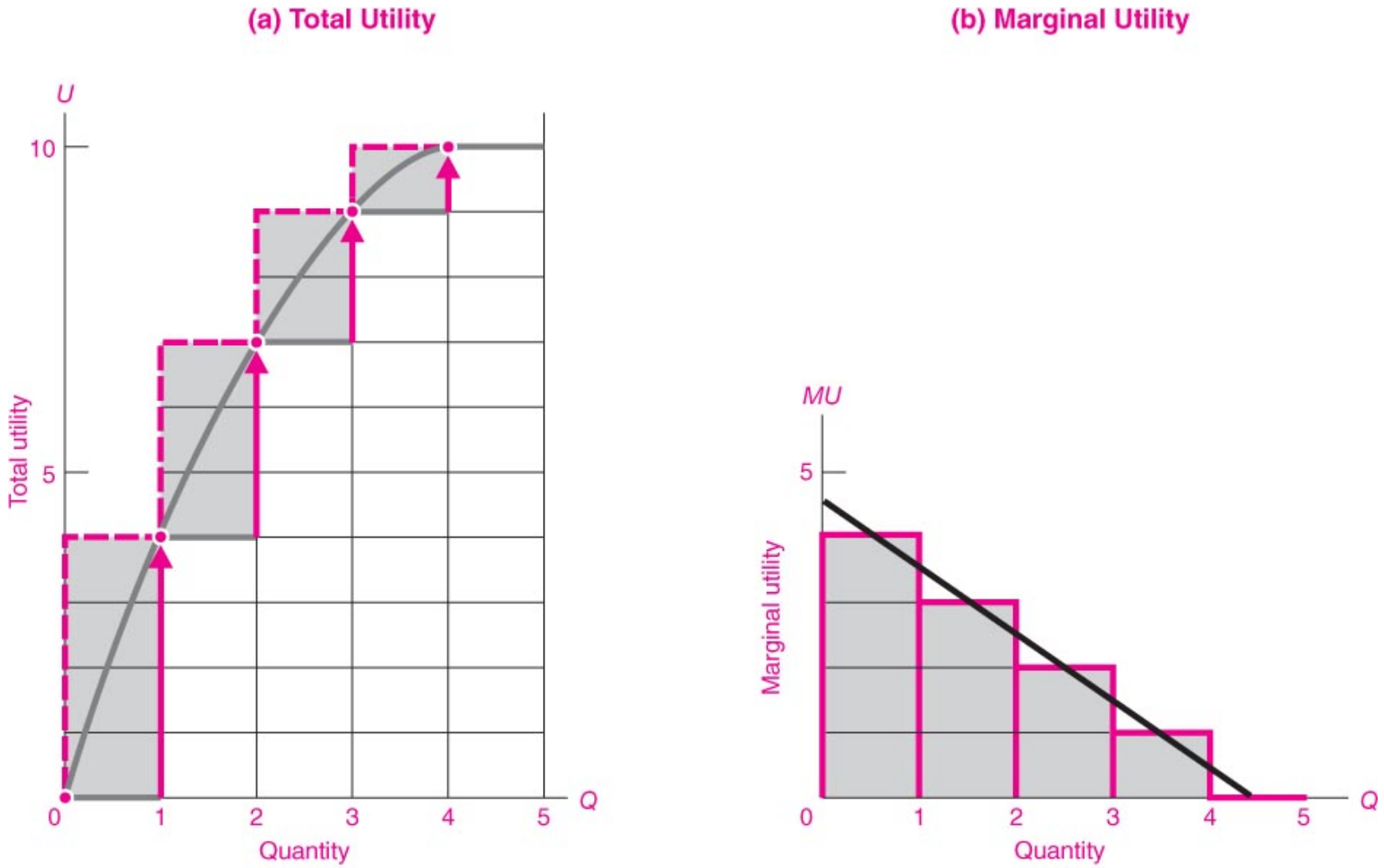


FIGURE 5-1. The Law of Diminishing Marginal Utility

The equimarginal principle (1)

- Consumers maximize their utility
  - A consumer chooses the most preferred bundle of commodities from the available options
  - In this exercise, income as well as the market process are assumed to be given/ constanr
- A consumer achieves maximum utility when the marginal utility of the last Rupee spent on that good equals the marginal utility of the last Rupee spent on any other good
- Why should this hold?
- If I get more marginal utility per Rupee from any other good, I can always increase my utility by buying more of this good until the law of diminishing marginal utility reduces its marginal utility to the extent to equalize the utility across other goods

The equimarginal principle (2)

- If I get less marginal utility per Rupee from a good, I shall buy less of this good until the marginal utility of the last Rupee spent on it rises back to the same level
- The common marginal utility per Rupee of all commodities in consumer equilibrium has been termed as the marginal utility of income
- Applicability
  - If good A costs twice as much as good B, then the consumer will buy good A only when its marginal utility is at least twice as much as that from B
  - You want to maximize your knowledge in, say, two subjects. You have limited time. Would you devote an equal amount of time studying the two subjects?

Utility and the demand curve

- Why does the demand curve slope downwards?
  - Keeping MU of income constant, suppose the price, P, increases -> MU/P decreases -> consumer will readjust consumption of the good -> need to increase MU
  - A consumer does it by reducing consumption of the good (law of diminishing marginal utility) until MU/P becomes equal to MU of income
  - Thus, the price increase has resulted in reduced consumption

Ordinal utility

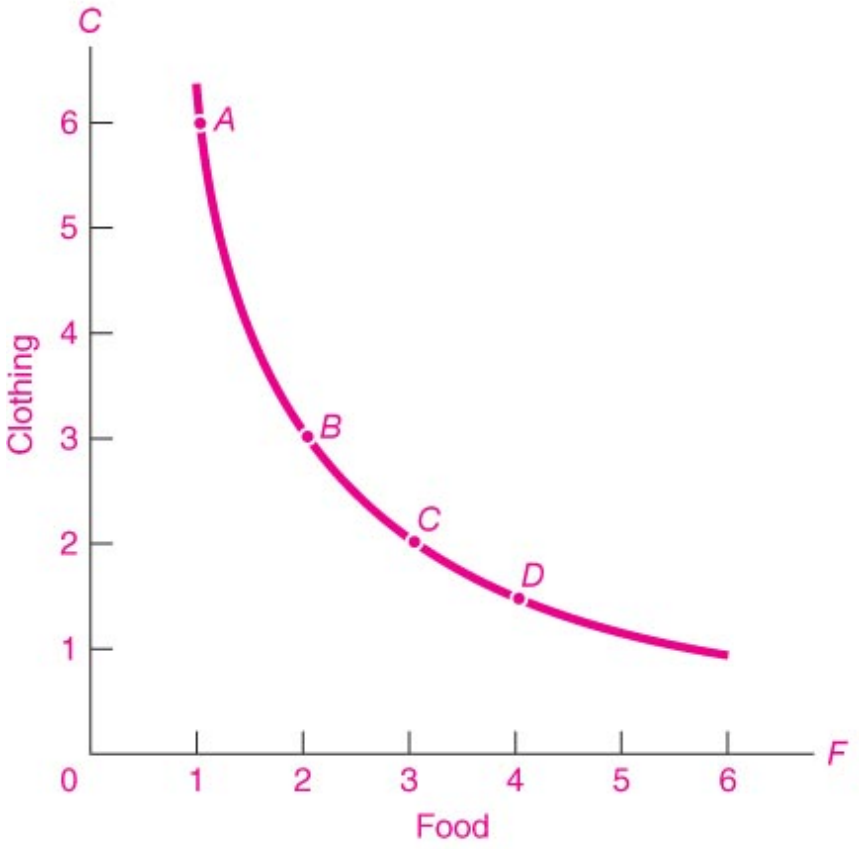
- So far, the discussion assumes that we can exactly quantify the utility from consumption
  - In other words, the function U(x) exists
  - This is the notion of *cardinal* utility
- Later developments in the utility theory have led some economists to reject the notion of cardinal utility and argue that we can only have an ordinal ranking
  - *Ordinal* utility: we are concerned with ordering/ preference ranking of bundle of commodities. For instance, is A preferred to B?
  - Size or quantum of the difference in utilities between two different consumption bundles does not matter

The indifference curve

- While the concept of marginal utility helps us explain the slope of the demand curve and determining the choice, an alternative approach to the analysis of demand is indifference curve approach
- Consider a consumer buying different combinations of two commodities, food and cloths
  - Given any two combinations A and B, u(A)>=<u(B)
  - Indifference combinations
  - Indifference curve: depicts combinations of equally desirable consumption bundles

An indifference curve

A Consumer's Indifference Curve



Indifference Combinations

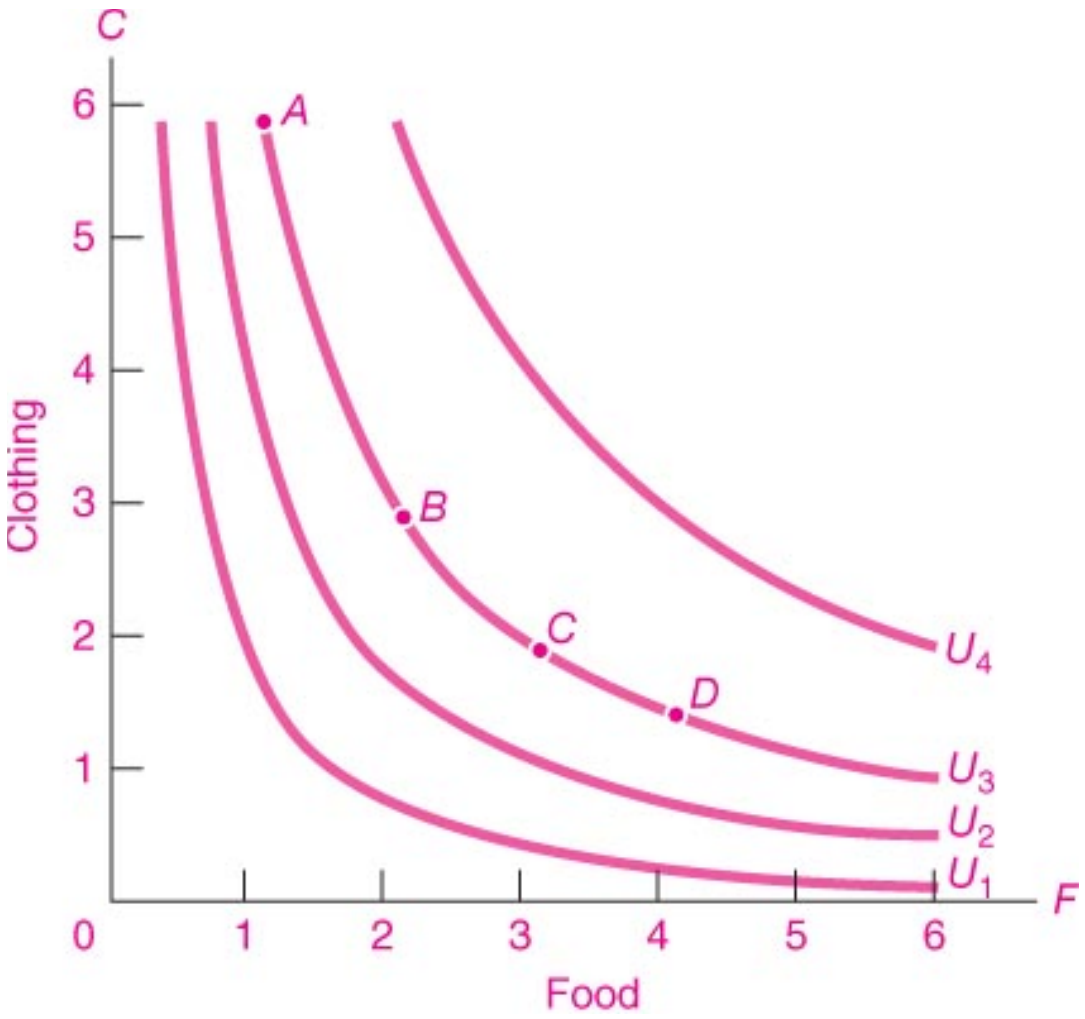
	Food	Clothing
A	1	6
B	2	3
C	3	2
D	4	$1\frac{1}{2}$

The slope of the indifference curve generally varies across the curve and is known as *marginal rate of substitution* (MRS)

Properties of indifference curves

- Higher ICs are preferred to lower ones
  - Consumption of more goods is preferred rather than less; higher ICs represent larger quantities
- ICs are downward sloping
  - Slope of an IC - the rate at which the consumer is willing to substitute one good for the other; if the quantity of one good is reduced, the quantity of the other must increase for making the consumer equally happy
- ICs do not cross
- ICs are bowed inward (convex-shaped)
  - scarcer a good the greater is higher is its relative substitution value, due to high marginal utility

The indifference map

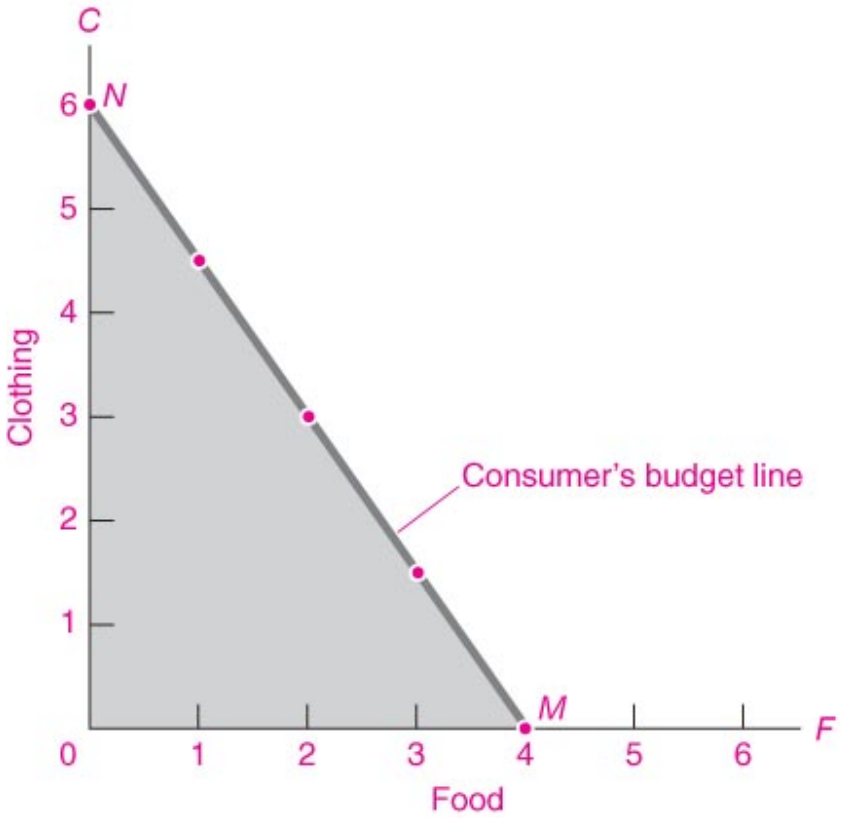


Four different utility levels, which one the consumer should prefer?
As we move outward, the total utility increases
$U_4 > U_3 > U_2 > U_1$

The budget constraint

- The need for constraint
- The income of a consumer is given
  - This constraint is captured using the budget line
- Suppose that a unit of food costs Rs 1.50 and of cloth, Rs 1
  - Mathematical expression for the budget line
  - Illustration
  - Slope of the budget line is $(-)p_x/p_y$
  - The budget line measures the opportunity cost of consuming good x

A Consumer's Budget Line



Alternative Consumption Possibilities

	Food	Clothing
M	4	0
	3	$1^1/_2$
	2	3
	1	$4^1/_2$
N	0	6

Optimal choice

- Equilibrium is attained at a point where the budget line is tangent to the highest indifference curve
  - In other words, at the equilibrium abs(MRS) equals the abs(price ratio)
  - MRS is the ratio of MUs. Thus, in the equilibrium the ratio of MUs must equal the price ratio
  - We are back to the equimarginal principle
  - Given a budget line, the optimal consumption corresponds to the highest possible indifference curve

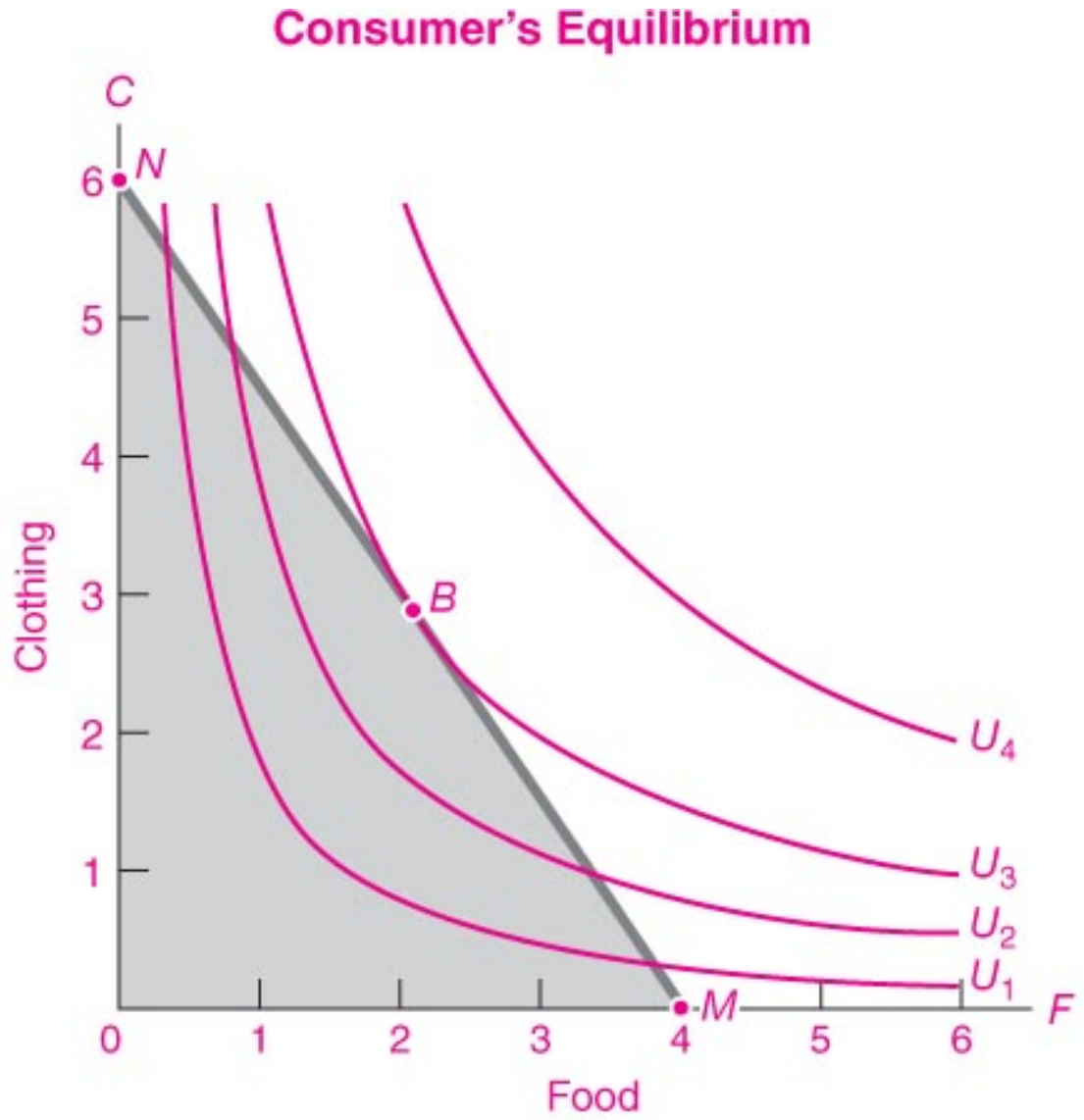


FIGURE 5A-4. Consumer's Most Preferred and Feasible Consumption Bundle Is Attained at *B*

Changes in income

- How does it affect the optimal choice?
- A change in income would result in a parallel shift in the budget line
  - What about the indifference curve?
- Consider a reduction in the income
  - In general, a reduction in income reduces the consumption of both the goods

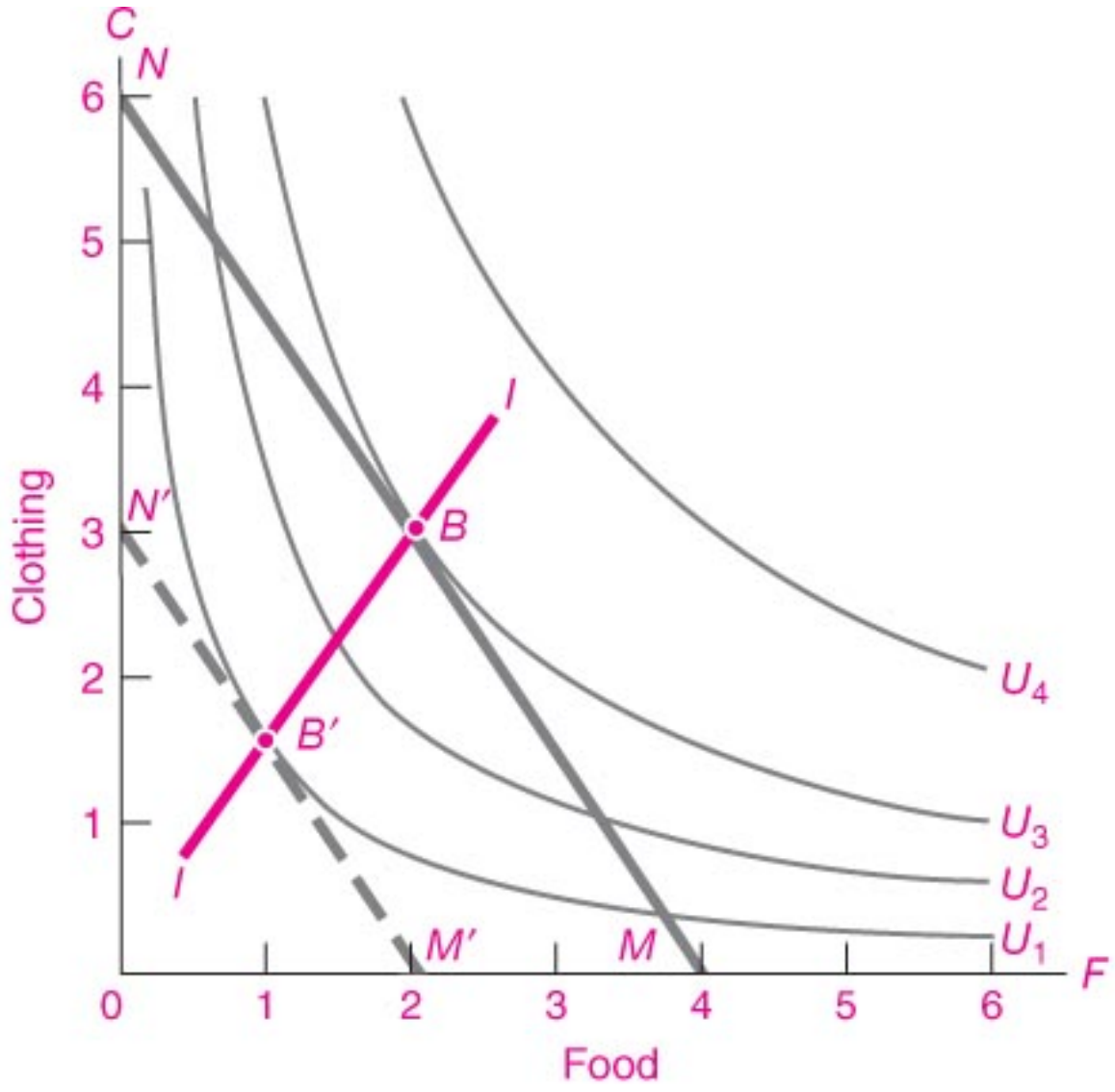


FIGURE 5A-5. Effect of Income Change on Equilibrium

Change in the price of one of the goods

- Pivoting the budget line
- Consider doubling of the food prices
- What about the optimal choice?
  - Food consumption most likely will be reduced
  - Clothing can move in either direction
- Deriving the demand curve

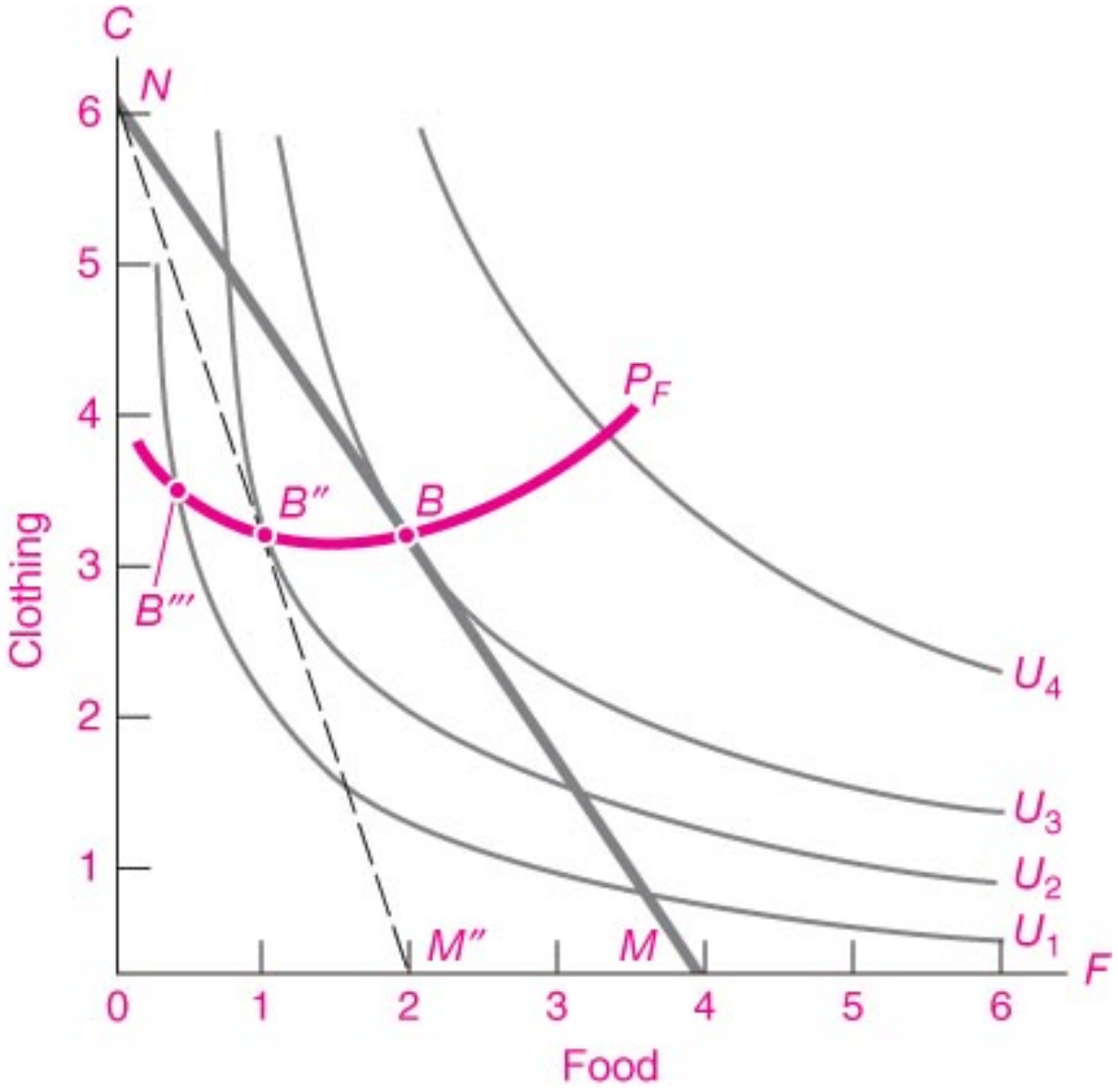


FIGURE 5A-6. Effect of Price Change on Equilibrium

Substitutes and compliments

- Substitutes: Goods A and B are substitutes if an increase in the price of good A increases the demand for good B
- Compliments: An increase in the price of good C decreases the demand for (the complementary) good D
- Draw the indifference curves for perfect substitutes and perfect compliments

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Journal of Urban Economics

Volume 108, November 2018, Pages 36-50

Is Uber a substitute or complement for public transit? ☆

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Abstract

How Uber affects public transit ridership is a relevant policy question facing cities worldwide. Theoretically, Uber's effect on transit is ambiguous: while Uber is an alternative mode of travel, it can also increase the reach and flexibility of public transit's fixed-route, fixed-schedule service. We estimate the effect of Uber on public transit ridership using a difference-in-differences design that exploits variation across U.S. metropolitan areas in both the intensity of Uber penetration and the timing of Uber entry. We find that Uber is a complement for the average transit agency, increasing ridership by five percent after two years. This average effect masks considerable heterogeneity, with Uber increasing ridership more in larger cities and for smaller transit agencies.

Normal and inferior goods

- Demand effects associated with a change in income
- Normal: the quantity demanded increases as we increase income
- Inferior: the quantity demanded decreases as we increase income
  - What do we think of bus rides or the PDS foodgrains?
- Illustration

Ordinary and Giffen goods

- Demand effects associated with the change in price
- Ordinary: price increase leads to a decrease in quantity demanded
- Giffen: price increase leads to an increase in quantity demanded
  - Unlikely to be encountered in real world behavior
  - The demand for potatoes during Irish famine (1840s) increased despite a rise in the price. The households reduced the consumption of other (relatively costly) goods and that of potatoes (much less costly) increased but its empirical validity has been questioned by Rosen*
  - A later study* provided evidence for subsidized foodgrains: a price decrease (implemented via a subsidy) was accompanied by a decrease in quantity demanded in China

- **Sources*: Rosen. 1999. Potato Paradoxes," Journal of Political Economy, 107 (6); Jensen and Miller. 2007. Giffen Behavior: Theory and Evidence. NBER WP 13243

Revisiting the price effect

- Price effect = income effect and substitution effect