UNIT 1

THEORY OF CONSUMER BEHAVIOR AND DEMAND

Introduction to Consumer Behavior and Utility Theories

Economic Agents

Consumers are one of the four key economic agents, alongside business firms, government, and entrepreneurs. Each of these agents seeks to achieve their own goals. Consumers aim to maximize their satisfaction from consumption, given their limited resources.

Cardinal Utility Theory

Utility

Utility is the satisfaction or happiness derived from consuming goods and services. Cardinal utility theory measures this satisfaction in absolute terms, using units called "utils."

Marginal Utility (MU)

Marginal Utility is the additional satisfaction gained from consuming one more unit of a good. According to the **law of diminishing marginal utility**, as more of a good is consumed, the additional satisfaction from each new unit decreases.

Consumer Optimum

Consumers maximize their satisfaction by equating the ratio of marginal utility to price for all goods they purchase. Mathematically, this is where:

$$MU_X/P_X = MU_Y/P_Y$$

Derivation of Demand Curve

The demand curve shows the relationship between the price of a good and the quantity demanded. It is derived from the concept of diminishing marginal utility.

Example Activity

If Fenet increases her tea consumption from 4 to 5 cups and her total utility rises from 40 to 50 utils, her marginal utility for the 5th cup is:

$$MU = 50 - 40 = 10 \text{ utils}$$

Ordinal Utility Theory

Preferences and Ranking
Ordinal utility theory does not measure satisfaction in absolute terms but rather in relative terms. Consumers rank different combinations of goods based on their preferences.

Indifference Curves
An indifference curve (IC) shows all combinations of two goods that provide the same level of satisfaction. The consumer is indifferent between these combinations.

Indifference Set and Map

- **Indifference Set**: A table of combinations providing the same utility.
- **Indifference Map**: A collection of indifference curves representing different satisfaction levels.

Properties of Indifference Curves

1. **Negative Slope**: To maintain the same level of satisfaction, as the quantity of one good increases, the quantity of the other must decrease.
2. **Non-intersection**: Indifference curves cannot intersect, as this would imply inconsistent satisfaction levels.
3. **Higher Curves are Preferred**: Curves further from the origin represent higher satisfaction levels.
4. **Convex to the Origin**: The curve is bowed inward, reflecting the diminishing marginal rate of substitution.

Marginal Rate of Substitution (MRS)
MRS is the rate at which a consumer is willing to give up one good to obtain an additional unit of another good while maintaining the same level of satisfaction. It is given by:

$$MRS_{X,Y} = \Delta Y / \Delta X$$

In general, MRS decreases as more of one good is consumed in place of another, reflecting a diminishing willingness to substitute.

Example Activity
Calculate the MRS between two points on an indifference curve to understand

how much of one good a consumer is willing to give up for an additional unit of another good.

1.2.4 Marginal Utility and MRS

Marginal Utility (MU): The additional satisfaction a consumer gains from consuming one more unit of a good.

Marginal Rate of Substitution (MRS): Measures the rate at which a consumer is willing to give up good Y to obtain an additional unit of good X, while maintaining the same level of satisfaction. It is derived from the concept of Marginal Utility.

Derivation of MRS:

1. **Utility Function:** U(X, Y) represents the total utility a consumer derives from consuming quantities X and Y of two goods.
2. **Indifference Curve:** Shows combinations of X and Y that give the same level of satisfaction. The slope of this curve at any point is the MRS.
3. **Calculation of MRS:** When moving along the same indifference curve, the total utility remains constant. Thus, the change in utility is zero:

   $MU_x \cdot \Delta X + MU_y \cdot \Delta Y = \Delta U = 0M$

   This implies that:

   $MU_x \cdot \Delta X = -MU_y \cdot \Delta Y$

   Rearranging gives us:

   $MRS_{x,y} = -(MU_x/MU_y)$

   This negative sign indicates that to gain more of good X, you must give up some of good Y. Economists often refer to MRS as its absolute value (positive number).

1.2.5 Special Types of Indifference Curves

1. Standard Indifference Curves:

- **Shape:** Downward sloping and convex to the origin, indicating that goods are imperfect substitutes.
- **Meaning:** Goods can replace each other, but not perfectly.

2. Perfect Substitutes:

- **Shape:** Straight line with a constant negative slope.
- **Example:** Blue pen vs. black pen. Consumers are willing to trade one for another at a constant rate
- **Utility Function:** $U(X,Y)=aX+bY$

3. Perfect Complements:

- **Shape:** Right angle (L-shaped curve).
- **Example:** Left shoe and right shoe. You need one of each to gain satisfaction.
- **Utility Function:** $U(X,Y)=Min(aX,bY)$
- **MRS:** Zero (no substitution between the goods).

1.3 The Budget Line or the Price Line

Budget Line: Represents the combinations of two goods that a consumer can purchase given their income and the prices of the goods.

Budget Equation:

$M=PX \cdot X+PY \cdot YM$

Where:

- M = consumer's income
- PX = price of good X
- PY = price of good Y
- X and Y = quantities of goods X and Y

1. Drawing the Budget Line:

- **Intercepts:**
    - **X-intercept:** M/PX
    - **Y-intercept:** M/PY
- **Slope:** $-PX/PY-$

2. Factors Affecting the Budget Line:

- **Change in Income:**
    - **Increase:** Shifts the budget line outward (more purchasing power).
    - **Decrease:** Shifts the budget line inward (less purchasing power).
- **Change in Prices:**

- o **Price of X rises:** Budget line rotates inward.
- o **Price of X falls:** Budget line rotates outward.
- o **Price of Y rises:** Budget line rotates inward.
- o **Price of Y falls:** Budget line rotates outward.

Activities:

1. **Effect of Price Changes:** Analyze how a change in the price of one good while holding the price of the other good and income constant affects the budget line.
2. **Effects of Income Changes:** Illustrate how an increase or decrease in income shifts the budget line.

Example Problem:

- **Initial Situation:**
  - o Income (M) = 60 Birr
  - o Price of Tea (P_X) = 3 Birr
  - o Price of Coffee (P_Y) = 6 Birr
  - o **Budget Line Equation:** 60=3X+6Y
- **With 50% Increase in Income:**
  - o New Income = 90 Birr
  - o New Budget Line: 90=3X+6Y
- **If Price of Tea Doubles:**
  - o New Price of Tea = 6 Birr
  - o New Budget Line: 60=6X+6Y
- **If Price of Coffee Falls to 3 Birr:**
  - o New Price of Coffee = 3 Birr
  - o New Budget Line: 60=3X+3Y

These changes illustrate how variations in income and prices can shift or rotate the budget line, affecting the consumer's choice.

Optimum of the Consumer

Key Concepts

1. **Consumer Optimum:**
   - o Consumers aim to maximize their satisfaction or utility given their budget constraints.
   - o The optimum or equilibrium position is achieved when the consumer is on the highest possible indifference curve that is tangent to the budget line.
   - o At this point, the Marginal Rate of Substitution (MRS) between two goods equals the price ratio of those goods.

2. **Graphical Representation**:
    - The optimum position is where an indifference curve is tangent to the budget line, ensuring that the slope of the indifference curve (MRS) equals the slope of the budget line (PX/PY).
3. **Effect of Income Changes**:
    - **Increase in Income**: Shifts the budget line outward, allowing the consumer to reach higher indifference curves and achieve a new optimum position.
    - **Decrease in Income**: Shifts the budget line inward, leading to a new, lower level of satisfaction and a new equilibrium point.
    - The Income Consumption Curve (ICC) shows how the optimal combination of goods changes as income varies.
4. **Effect of Price Changes**:
    - **Price Increase**: Decreases the quantity of the more expensive good the consumer can buy, rotating the budget line inward.
    - **Price Decrease**: Increases the quantity of the good the consumer can buy, rotating the budget line outward.
    - The Price Consumption Curve (PCC) represents the combinations of goods purchased at different prices, and the demand curve is derived from it.

Summary

- **Indifference Curve**: Represents combinations of two goods providing equal satisfaction.
- **Budget Line**: Represents all combinations of goods the consumer can afford given their income and prices.
- **Consumer Optimum**: Occurs where the budget line is tangent to the highest attainable indifference curve.
- **Income Changes**: Shift the budget line and ICC, altering the consumer's equilibrium.
- **Price Changes**: Rotate the budget line, affecting the PCC and leading to a new demand curve.

1. **What is consumer optimum?**
    - It is the point where the consumer achieves the highest possible satisfaction, given their budget constraint, with the indifference curve tangent to the budget line.
2. **What factors affect consumer optimum?**
    - Changes in income and changes in the prices of goods.