MANAGERIAL ECONOMICS

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Lecture No - 12 : Consumer Behaviour

Session Outline

- Consumer preferences – Assumptions
- Utility analysis
- Indifference curve, budget line and consumer equilibrium

The Consumer's Optimization Problem

Individual consumption decisions are made with the goal of maximizing total satisfaction from consuming various goods and services

Subject to the constraint that spending on goods exactly equals the individual's money income

Consumer Theory

Assumes buyers are completely informed about:
- Range of products available
- Prices of all products
- Capacity of products to satisfy
- Their income

Requires that consumers can rank all consumption bundles based on the level of satisfaction they would receive from different units of consumption.

Consumer Theory - Assumptions

Completeness

    For every pair of consumption bundles, *A* and *B*, the consumer can say one of the following:

        A is preferred to *B*

        B is preferred to *A*

        The consumer is indifferent between *A* and *B*

Consumer Theory - Assumptions

Transitivity

    If *A* is preferred to *B*, and *B* is preferred to *C*, then *A* <u>must</u> be preferred to *C*

Nonsatiation

    More of a good is always preferred to less

Utility Analysis

❑ **Utility:** Benefits consumers obtain from goods & services they consume is utility.

❑ A numerical score representing the satisfaction that a consumer gets from given consumption basket.

❑ For example : If buying 3 copies of books give more happiness than buying a shirt, it can be said that books give you more utility than shirt.

Utility Analysis

❑ **Utility function:** an equation that shows an individual perception of the level of utility that would be attained from consuming each conceivable bundle of goods.

$$U = F(X,Y)$$

Utility Analysis

- Cardinalist approach: Utility can be measured in subjective units.

- Ordinalist approach: Utility can not be measured , but can only ranked in order of preference.

Utility Analysis

Goods	Utility	Rank Order
X1	14	2nd
X2	03	5th
X3	10	3rd
X4	08	4th
X5	17	1st

Measurement of Utility : Example

Measuring utility in "utils" (Cardinal)

- **Jack derives 10 utils from having one slice of pizza but only 5 utils from having a burger.**

Measuring utility by comparison (Ordinal):

- **Jill prefers a burger to a slice of pizza and a slice of pizza to a hotdog.**

Measurement of Utility

Often consumers are able to be more precise in expressing their preferences.

For example, we could say:

- Jill is willing to trade a burger for four hotdogs but she will give up only two hotdogs for a slice of pizza.

- We can infer that to Jill, a burger has twice as much utility as a slice of pizza, and a slice of pizza has twice as much utility as a hotdog.

Total and Marginal Utility

❑ Total utility (TU): Total utility is the total utility a consumer derives from the consumption of all of the units of a good or a combination of goods over a given consumption period, ceteris paribus.

❑ Marginal utility (MU): Marginal utility is the utility a consumer derives from the last unit of a consumer good she or he consumes (during a given consumption period), ceteris paribus.

❑ Curve of TU : <u>Change in TU</u> = MU

                            Change in Q

Total and Marginal Utility
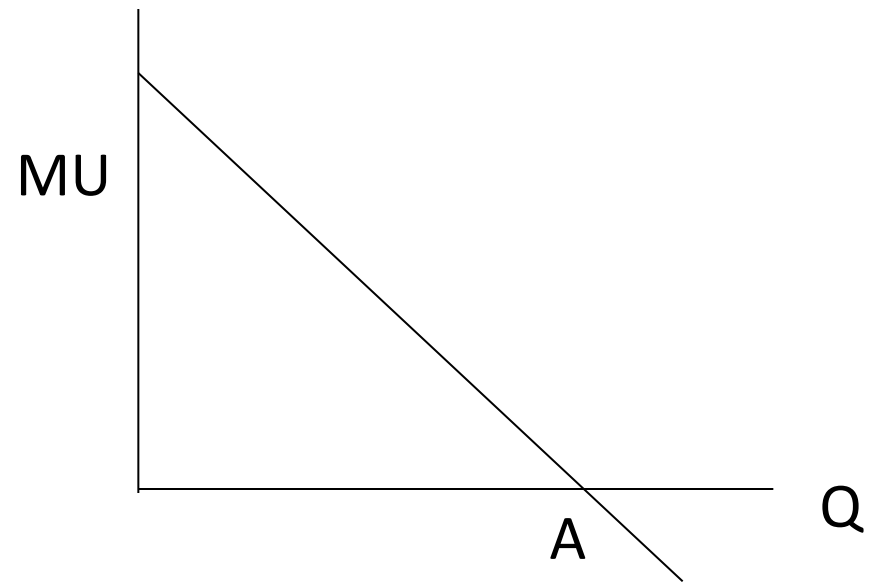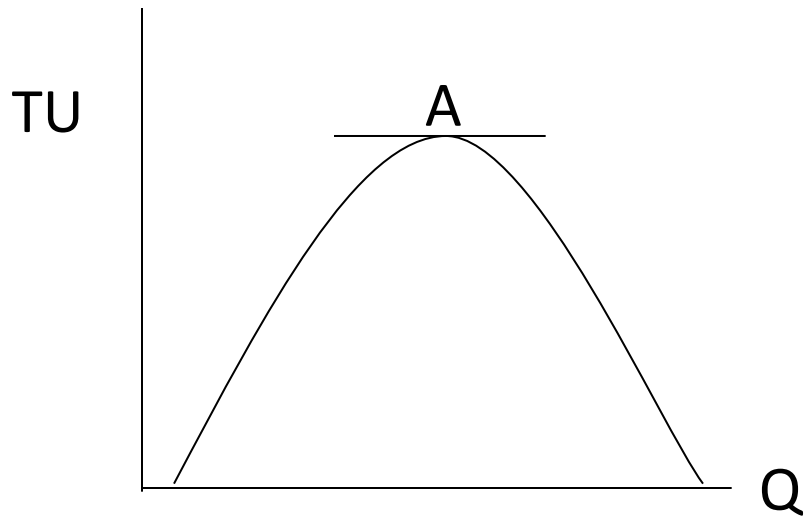
Total and Marginal Utility

Assumptions for TU Curve:

- As the quantity consumed per period increases, total utility increases at a decreasing rate.

- What total utility reaches the maximum, it attains satiation quantity.

- Total utility declines if more quantity consumed after satiation quantity.

Diminishing Marginal Utility

- Over a given consumption period, the more of a good a consumer has, or has consumed, the less marginal utility an additional unit contributes to his or her overall satisfaction (total utility).

- Alternatively, we could say: over a given consumption period, as more and more of a good is consumed by a consumer, beyond a certain point, the marginal utility of additional units begins to fall.

Law of Diminishing Marginal Utility

- The unit of consumption must be a standard one.

- Consumption must be continuous

- The tastes and preferences of the consumer should remain unchanged during the course of consumption

- The goods should be Normal and not Addictive in nature

Law of Diminishing Marginal Utility - Examples

- How many people take more than one paper from the vending machine?

- Why not dispense candy the same way?

Total and Marginal Utility

Q	TU	MU
0	0	---
1	20	20
2	27	7
3	32	5
4	35	3
5	35	0
6	34	-1
7	36	-2

- TU, in general, increases with Q

- At some point, TU can start falling with Q (see Q = 6)

- If TU is increasing, MU > 0

- From Q = 1 onwards, MU is declining $\Rightarrow$ principle of diminishing marginal utility $\Rightarrow$ As more and more of a good are consumed, the process of consumption will (at some point) yield smaller and smaller additions to utility

Indifference Curve Analysis

- The Indifference curve analysis is a technique for explaining how choices between two alternatives are made.

- Locus of points representing different bundles of goods, each of which yields the same level of total utility

Indifference Curve Analysis

- A curve that defines the combinations of 2 or more goods that give a consumer the same level of satisfaction.

- Negatively sloped & convex

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Indifference Curve properties

❑ IC will be downward sloping : If they sloped upward, they would violate the assumption that more is preferred to less

❑ An IC must be convex to the origin :As more of one good is consumed, a consumer would prefer to give up fewer units of a second good to get additional units of the first one. As food becomes less scarce, he/she would give up less of clothing for an additional food.

Indifference Curve properties

❑ Two ICs can not intersect each other.

❑ Higher Indifference curve gives higher level of satisfaction

Typical Indifference Map
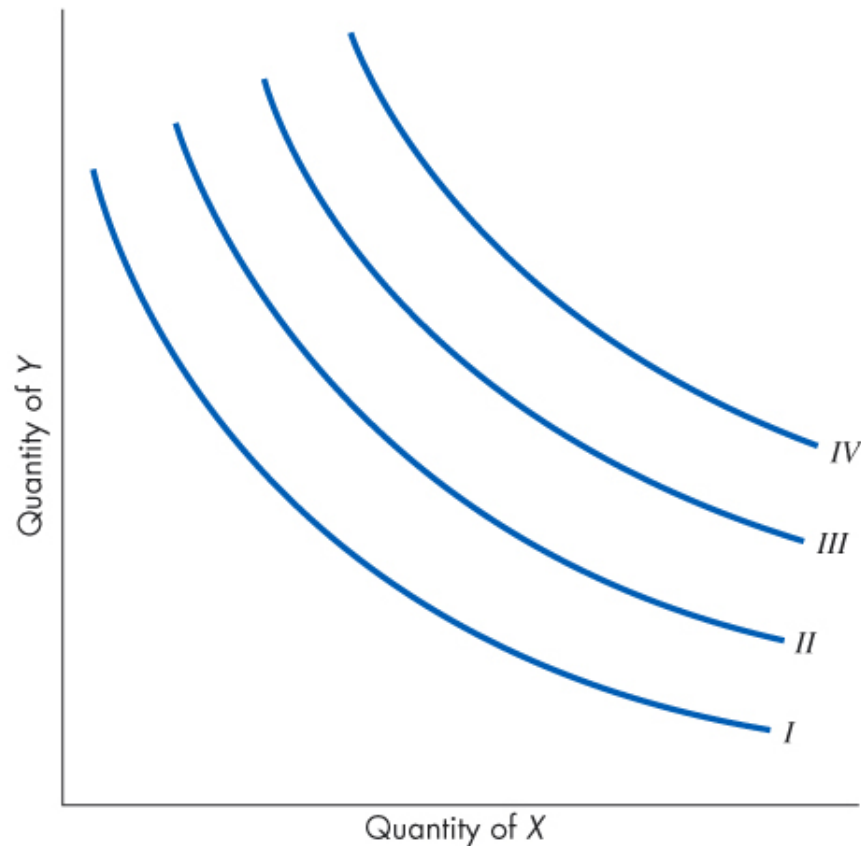
To describe preferences for all combinations of goods/services, we have a set of indifference curves – an *indifference map* e indifference curves shift to the right.

Marginal Rate of Substitution

- *MRS* shows the rate at which one good can be substituted for another while keeping utility constant
    - Negative of the slope of the indifference curve
    - Diminishes along the indifference curve as *X* increases & *Y* decreases
    - Ratio of the marginal utilities of the goods

$$MRS \equiv -\frac{\Delta Y}{\Delta X} = \frac{MU_X}{MU_Y}$$

Marginal Rate of Substitution

- The MRS diminishes along the indifference curve
    - As one consumes more of good X they will be less willing to give up move of good Y.
    - The relative price of good Y increases.

Marginal Rate of Substitution

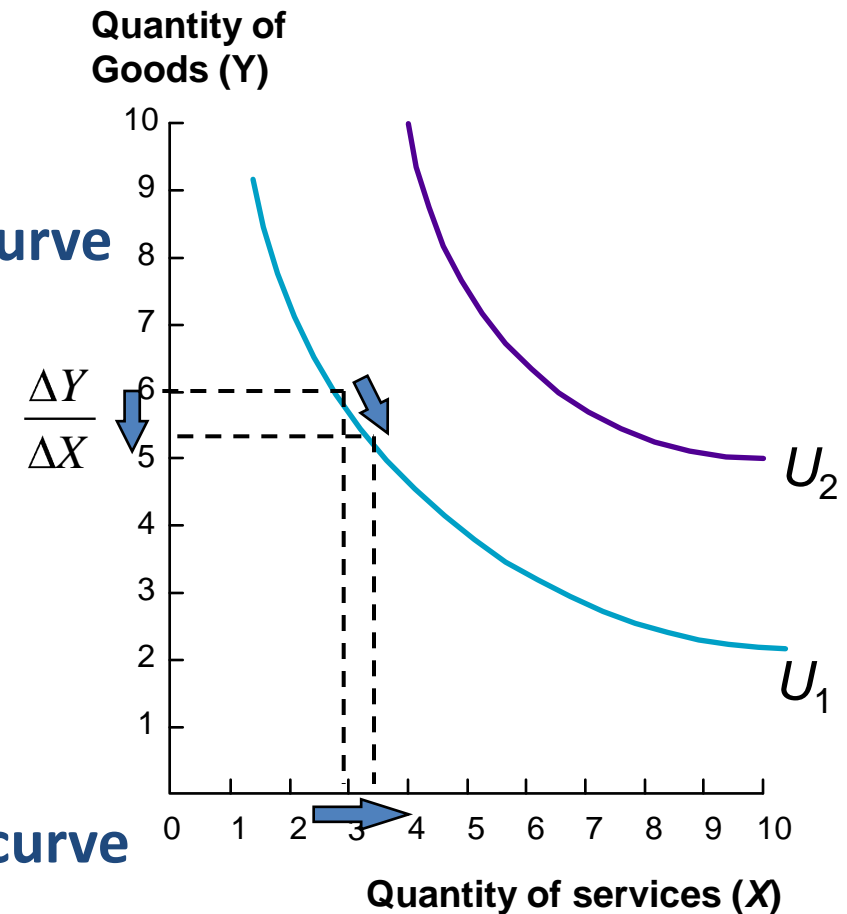| Combination	X	Y	MRS
A	1	6	-
B	3	3	1.5
C	4	2	1.0
D	7	1	0.3

Marginal Rate of Substitution

$$-MRS = -\frac{\Delta Y}{\Delta X} =$$ **slope of indifference curve**

$$\Delta U = MU_Y \times \Delta Y$$

$$\Delta U = -MU_X \times \Delta X$$

$$MU_X \times \Delta X = -MU_Y \times \Delta Y$$

$$\frac{\Delta Y}{\Delta X} = -\frac{MU_X}{MU_Y} =$$ **slope of indifference curve**

Quantity of Goods (Y)

$\dfrac{\Delta Y}{\Delta X}$

U_2

U_1

Quantity of services (X)

Types of Indifference Curve

- Indifference curves with different shapes imply a different willingness to substitute

Perfect Substitute

- Two goods are perfect substitutes when the marginal rate of substitution of one good for the other is constant

- Example: a person might consider apple juice and orange juice perfect substitutes. They would always trade 1 glass of OJ for 1 glass of Apple Juice

Types of Indifference Curve

Perfect Complements: Two goods are perfect complements
when the indifference curves for the goods are shaped as
right angles

Example: If you have 1 left shoe and 1 right shoe, you are
indifferent between having more left shoes only. Must have
one right for one left. That's why we always get a *pair of
shoes, not one by one.*
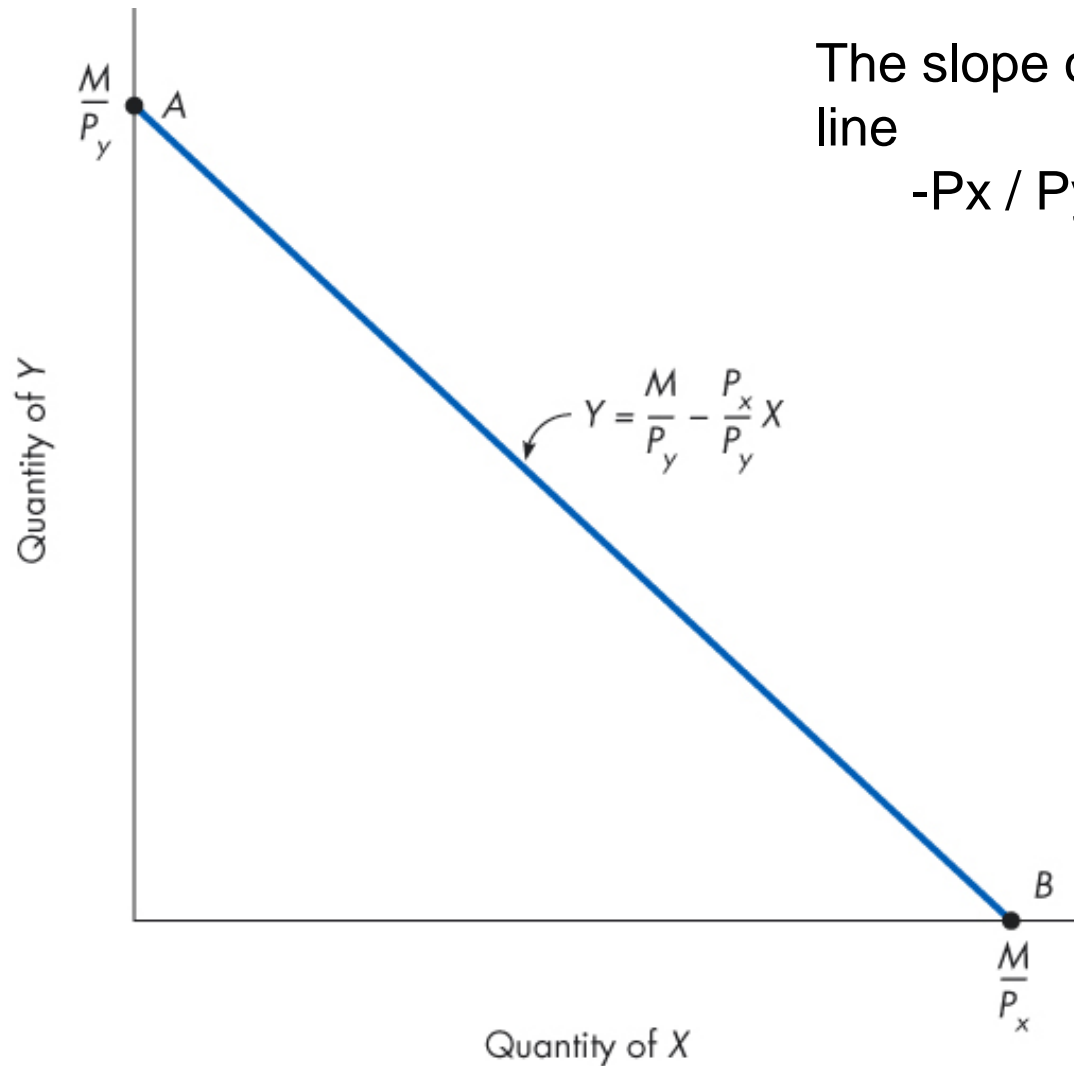
Consumer's Budget Line

- A **budget line** describes the limits to consumption choices and depends on a consumer's budget and the prices of goods and services.

- Shows all possible commodity bundles that can be purchased at given prices with a fixed money income

$$M = P_X X + P_Y Y$$
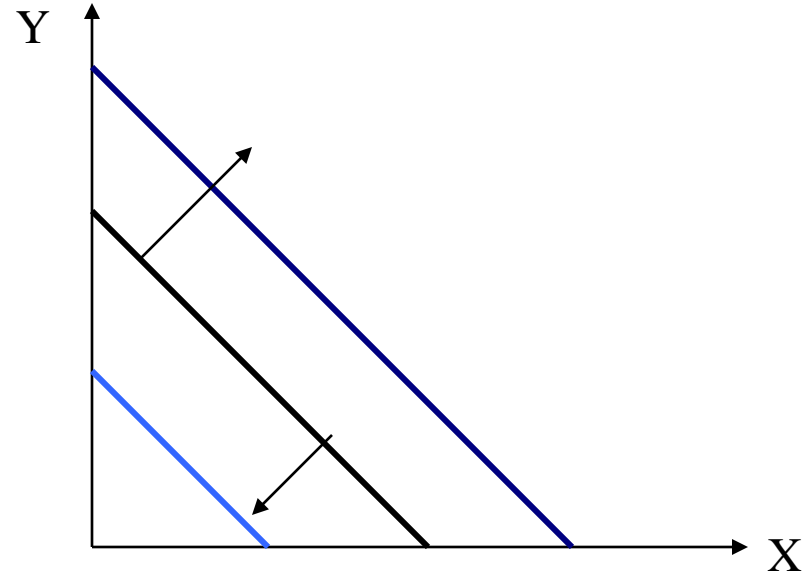
or

$$Y = \frac{M}{P_Y} - \frac{P_X}{P_Y} X$$

Consumer's Budget Constraint

The slope of the budget line

-Px / Py

$$Y = \frac{M}{P_y} - \frac{P_x}{P_y} X$$

Quantity of Y

Quantity of X

Changes in the Budget Line

❑ Changes in Income

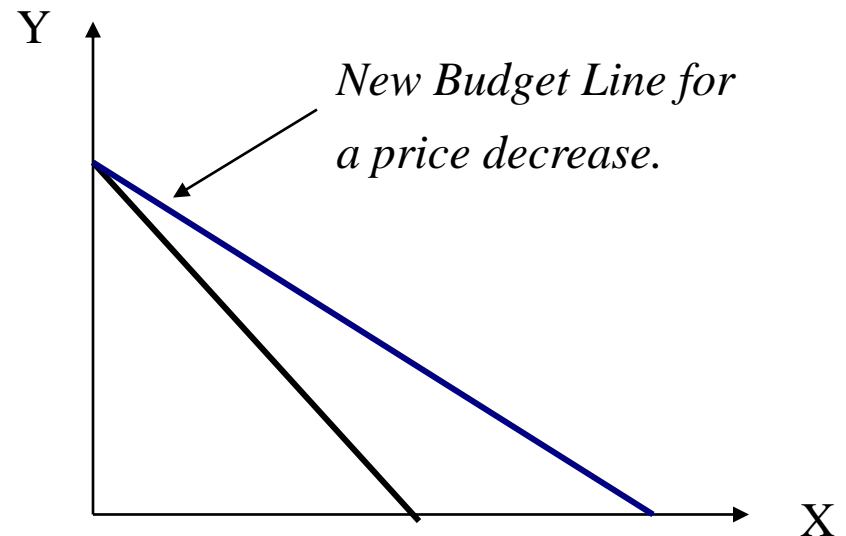 ▪ Increases lead to a parallel, outward shift in the budget line.

  ▪ Decreases lead to a parallel, downward shift.

Changes in the Budget Line

❑ Changes in Price

- A decreases in the price of good X rotates the budget line counter-clockwise.

- An increases rotates the budget line clockwise.

New Budget Line for a price decrease.

Y

X

Consumer Equilibrium

❑ A consumer behaves rationally and would always aim to maximize utility , given income and prices of goods in the consumption basket.

❑ Is at a point where the budget line is tangent to the highest attainable indifference curve by the consumer subject to budget constraint.

Consumer Equilibrium

- Consumer's objective: to maximize his/her utility subject to income constraint
- 2 goods (X, Y)
- Prices Px, Py are fixed
- Consumer's income (I) is given

Optimal Consumption
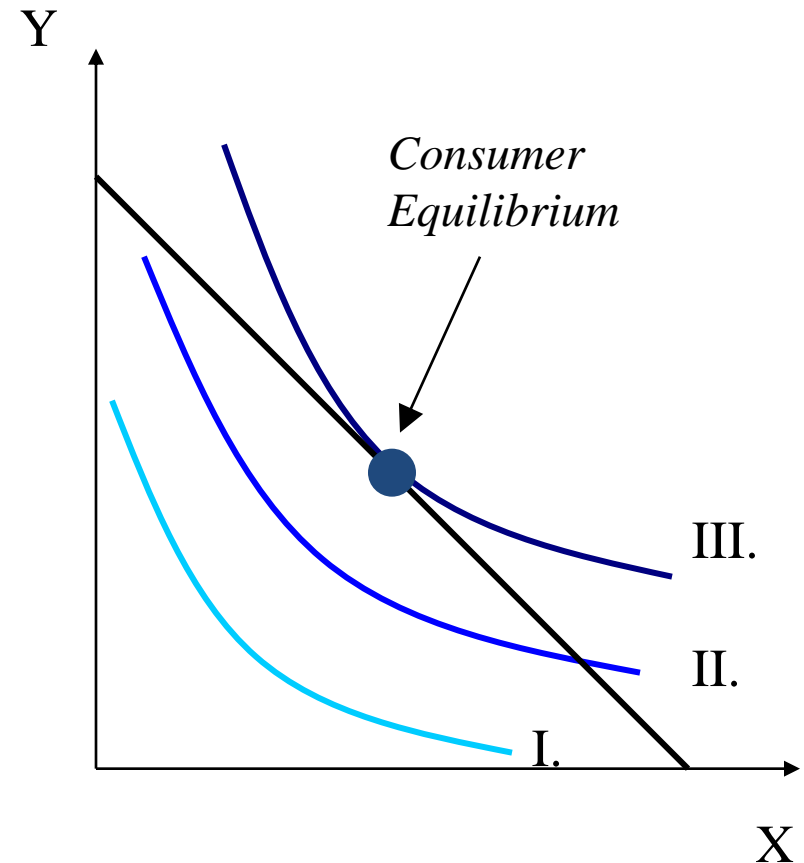
- ❑ Utility Maximization
    - ▪ Optimality requires $P_X/P_Y = MRS_{XY}$ $(MU_X/MU_Y.)$
    - ▪ Optimality requires $MU_X/P_X = MU_Y/P_Y.$

Consumer Equilibrium

❑ The equilibrium consumption bundle is the affordable bundle that yields the highest level of satisfaction.
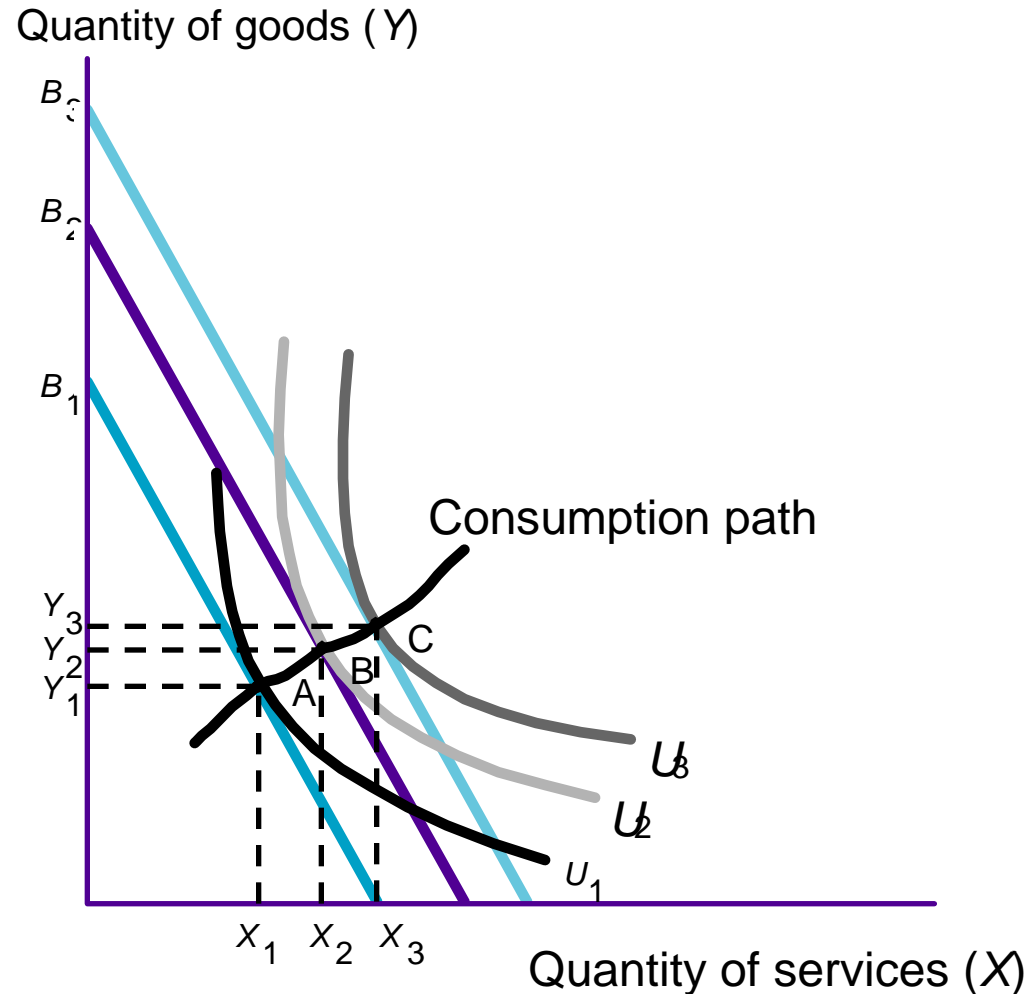
Y

Consumer Equilibrium

III.

II.

I.

X

Consumer Equilibrium

$$\frac{\Delta Y}{\Delta X} = -\frac{MU_X}{MU_Y}$$ **= slope of indifference curve**

$$-\frac{P_X}{P_Y}$$ **= slope of the budget line**

Optimal consumer's basket

$$\frac{MU_X}{MU_Y} = -\frac{P_X}{P_Y}$$

Quantity of goods (Y)

Consumption path

U_3

U_2

U_1

Quantity of services (X)

Consumer Equilibrium

Consumer allocates income so that the marginal utility per rupee spent on each good is the same for all commodities purchased

$$\frac{MU_X}{P_X} = \frac{MU_Y}{P_Y}$$

$$\frac{MU_X}{P_X} > \frac{MU_Y}{P_Y}$$

- $\Rightarrow$ spend more on good X and less on Y

Session References

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