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BEHAVIOURAL ECONOMICS

Spl FC
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Principles of Microeconomic Behaviour

- Microeconomics seeks to understand the behaviour of individual economic agents such as individuals and firms.
- Microeconomics bases its theory of consumer behaviour on the three following premises:
 1. Individual tastes or preferences determine the amount of pleasure people derive from the goods and services they consume.
 2. Consumers face constraints, or limits, on their choices.
 3. Consumers maximize their well-being or pleasure from consumption subject to the budget and other constraints they face.

- Lazy poor
- Tax avoidance

Principles of Microeconomic Behaviour

- The theory of consumer behaviour then, is built on 4 main parts:
 1. Preferences.
 2. Utility.
 3. Budget Constraint
 4. Constrained Consumer Choice.

1. Preferences

- Economists assume that consumers have a set of tastes or preferences that they use to guide them in choosing between goods. These tastes can differ substantially among individuals. However, all consumers must allocate their money to buy a bundle of goods (or combination of goods).
- A consumer's ranking of preferences is denoted by the following relation symbols: weakly prefers, \succeq , strictly prefers, \succ , and indifferent between, \sim . If the consumer likes Bundle a at least as much as Bundle b, we say that the consumer weakly prefers a to b, which we write as $a \succeq b$.
- If an agent weakly prefers bundle a to bundle b, and weakly prefers bundle b to bundle a, then the agent is **indifferent** between the two bundles.
- Mathematically: If $a \succeq b$ and $b \succeq a$, then $a \sim b$

Properties of Consumer Preferences

- **Completeness:** Given bundles a and b , a consumer can rank them so that one and only one of the following relationships is true: $a \succeq b$, $b \succeq a$, or both giving $a \sim b$. The completeness property rejects the possibility that the consumer cannot rank the bundles.
- **Transitivity:** Given three bundles a , b and c . If $a \succeq b$, and $b \succeq c$, then $a \succeq c$. The transitivity property holds that behaviour is logically consistent. Illogical behaviour is automatically ruled out.
- **Convexity:** Given three bundles a , b and c , such that $a \succeq c$, and $b \succeq c$, and θ such that $0 < \theta < 1$. Then, $(\theta)a + (1 - \theta)b \succeq c$. This is required for Monotonicity to hold.
- **Monotonicity:** Given two bundles a and b such that $a \gg b$, it follows that $a \succeq b$.

The Indifference Curve

- Mapping the properties of the Preferences we get a **Preference Map** or an **Indifference Curve**.
- Given the properties of preferences, the Indifference Curve has the following properties:
 1. Bundles on indifference curves farther from the origin are preferred to those on indifference curves closer to the origin. (Monotonicity)
 2. Every bundle lies on an indifference curve.
 3. Indifference curves cannot cross. (Transitivity)
 4. Indifference curves cannot slope upward. (Monotonicity)

Indifference Curve Graph



2. Utility

- Economists use Utility to generally mean the satisfaction/happiness which we get after we use a good or service.
- A Utility function $U(x)$ represents a preference relation in a functional form. $U(x)$ models the relationship between utility measures and every possible bundle of goods a consumer can select. Utility functions can be integrated to Indifference Curves.
- Mathematically, $a \succeq b = U(a) \geq U(b)$.
- An indifference curve consists of all those bundles that correspond to a particular utility measure. If a consumer's utility function is $U(a, b)$, then the expression for one of the corresponding indifference curves is $\bar{U} = U(a, b)$.
- This expression determines all those bundles of a and b that give the consumer \bar{U} utils of pleasure.

The Marginal Rate of Substitution (MRS)

- The derivative of a point e on the indifference curve ($db/da [e]$) is called the marginal rate of substitution (MRS) at that point e . It is the maximum amount of one good that a consumer will sacrifice (trade) to obtain one more unit of another good.
- The MRS depends on how much extra utility a consumer gets from a little more of each good. We call the extra utility that a consumer gets from consuming the last unit of a good the **Marginal Utility**.
- Given that a consumer's Utility function is $U(a,b)$, the marginal utility the consumer gets from consuming a little more of bundle a , holding bundle b constant is given by $\partial U/\partial a = U_a$. Similarly Marginal Utility of b is $\partial U/\partial b = U_b$.
- We can determine the MRS along an indifference curve by ascertaining the changes in a and b that leave a consumer's utility unchanged, keeping the consumer on the original indifference curve, $U = U(a,b)$.

The MRS along an Indifference Curve

- We can determine the MRS along an indifference curve by ascertaining the changes in a and b that leave \bar{U} unchanged. Let $b = b(a)$ be the implicit function that determines how much b it takes, given that the consumer takes a , to keep \bar{U} unchanged. Since now $\bar{U} = U(a, b(a))$. Since \bar{U} is constant, $d\bar{U}/da = 0$.
- Which is the same as $\partial U(a, b(a))/\partial a + \partial U(a, b(a))/\partial b * db/da = 0$ [Chain Rule]
- Which is the same as $U_a + U_b * db/da = 0$ [$\partial U(a, b(a))/\partial a = U_a$]
- The MRS is given by db/da . Hence by rearranging the previous equation, we get
- $MRS = db/da = -U_a/U_b$.
- Thus, the slope of the indifference curve is the negative of the ratio of the marginal utilities

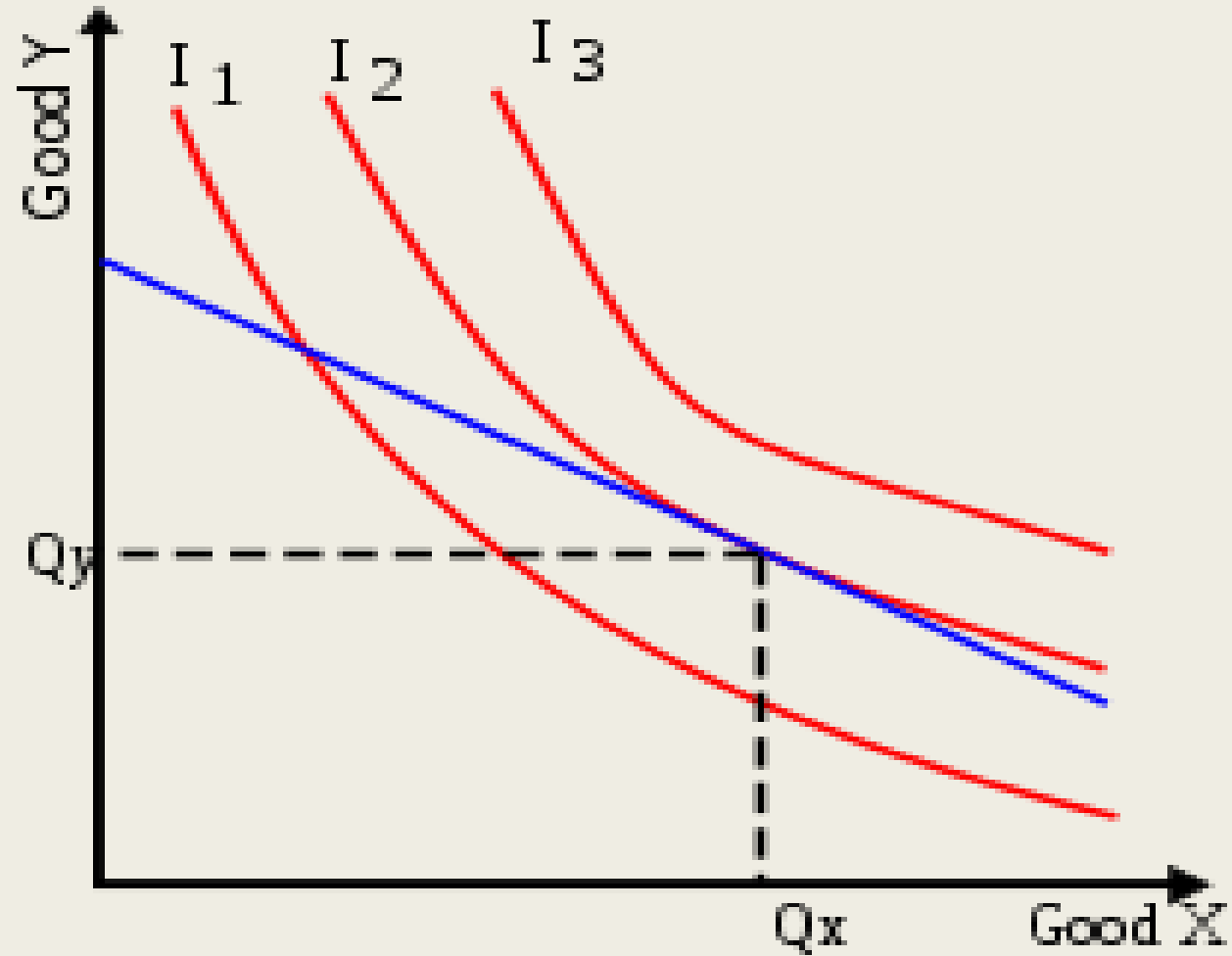
3. Budget Constraint

- As previously said, consumers maximize their well-being subject to constraints. A budget constraint of two goods a and b is given by the function $p_1a + p_2b = Y$, where p_1 and p_2 are the prices of goods a and b respectively and Y is the income.
- If a consumer were to spend all their income on a single good a, their total consumption will be given by the function Y/p_1 . Similarly, if they were to spend it completely on b, their consumption will be given by Y/p_2 .
- The slope of the budget line is called the **Marginal Rate of Transformation (MRT)**. In our case, where income is held constant, it is given by $d/da [p_1a + p_2b = Y] = p_1 + p_2^*$
 $db/da = 0$.
- Rearranging, we get $MRT = db/da = -p_2/p_1$

4. Constrained Consumer Choice

- This connects all the important parts discussed previously and shows how a consumer makes an optimal choice of consumption, having indifference curves and subject to a budget constraint.
- The optimal consumption bundle is on the highest indifference curve that touches the budget line, so it is the bundle that gives the highest utility subject to the budget constraint.
- Mathematically, this occurs when $MRS = MRT$ and so by rearranging, when $U_a/p_1 = U_b/p_2$.

Graphical Representation



Nudge Theory

- https://www.youtube.com/watch?v=QzGk_1Zjr14

Game Theory

- A **game** is an interaction between players (such as individuals or firms) in which players use strategies to get payoffs.
- A **strategy** is a battle plan that specifies the actions or moves that a player will make conditional on the information available at each move and for any possible contingency.
- **Payoffs** are the benefits received by players from a game's outcome, such as profits for firms or incomes or utilities for individuals. A **payoff function** specifies each player's payoff as a function of the strategies chosen by all players. We normally assume that players seek to maximize their payoffs.
- There are two types of games, Static and Dynamic games: Static games in which both the players act simultaneously and Dynamic games in which players act repeatedly or sequentially.
- It is assumed that all the relevant knowledge required for the players is common knowledge and information is perfect.

Static Game Strategies

- We can precisely predict the outcome of any game in which every player has a **dominant strategy**: a strategy that produces a higher payoff than any other strategy the player can use for every possible combination of its rivals' strategies.
- Many games do not have a dominant strategy solution. For these games, we use a more general approach. For any given set of strategies chosen by rivals, a player wants to use its **best response**: the strategy that maximizes a player's payoff given its beliefs about its rivals' strategies.
- Given a dominant strategy is a strategy that is a best response to all possible strategies that a rival might use. Thus, a dominant strategy is a best response. However, even if a dominant strategy does not exist, each firm can determine its best response to any possible strategies chosen by its rivals.
- A set of strategies is a Nash equilibrium if, when all other players use these strategies, no player can obtain a higher payoff by choosing a different strategy.

Prisoner's Dilemma

- <https://www.youtube.com/watch?v=NdITTDI5coE>

Example Game 1: Free Money Game

Strategy	Player 1 votes 'Yes'	Player 1 votes 'No'
Player 2 votes 'Yes'	10,10	0, 0
Player 2 votes 'No'	0, 0	0, 0

Example Game 2: Prisoner's Dilemma

Strategy	Player 1 betrays	Player 1 remains silent
Player 2 betrays	-3,-3	-3,0
Player 2 remains silent	0,-3	0,0

Suggested Readings

- Randal C. Picker, "An Introduction to Game Theory and the Law" (Coase-Sandor Institute for Law & Economics Working Paper No. 22, 1994).
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