CONSUMER BEHAVIOR

**Introduction**

The central figure in microeconomic theory is the consumer, and the first step is always to provide a model of the consumer’s behavior. We usually think of a consumer as an entity that chooses from some given set of ***feasible options***, and so the major aim of this section is to provide models of consumer choice given that resources are scarce. The theory of consumer behavior attempts to explain how the consumer behaves in as far as making optimal choices is concerned.

### There are 2 basic approaches to measuring utility i.e.

### *The Cardinal Utility approaches*

### *The Ordinal Utility/ Indifference Curve approach*

### THE CONCEPT OF UTILITY

### Utility is the basis of consumer demand; they demand a commodity because they derive utility/ satisfaction from it. It can be defined as the psychological feeling of satisfaction, pleasure, happiness or wellbeing which, a consumer derives from the consumption, possession or the use of a commodity. Generally speaking, [utility](https://www.investopedia.com/terms/u/utility.asp) refers to the degree of pleasure or satisfaction (or removed discomfort) that an individual receives from an economic act. An example would be a consumer purchasing a hamburger to alleviate hunger pangs and to enjoy a tasty meal, providing her with some utility. All [economists](https://www.investopedia.com/terms/e/economist.asp) would agree that the consumer has gained utility by eating the hamburger. Most economists would agree that human beings are, by nature, utility-maximizing agents; human beings choose between one act or another based on each act's expected utility. The controversial part comes in the application and measurement of utility. The economic utility of a good or service is important to understand, because it directly influences the demand, and therefore price, of that good or service. The utility definition in economics is derived from the concept of usefulness. An economic good yields utility to the extent to which it's useful for satisfying a consumer’s want or need.

## Important points to note under utility

* A commodity need not be useful for all in order to have utility e.g., alcohol, cigarettes
* Utility of a commodity varies from person to person
* Utility varies from time to time. A commodity need not have the same utility for the same consumer at different points of time and place, at different levels of consumption and at different moods of a consumer.
* A commodity which satisfies any type of want, whether moral or immoral, socially desirable or undesirable, has utility, i.e., a knife has utility as a household appliance to a housewife, but it has also a utility to a killer for stabbing some body.
* Utility is subjective i.e.; it depends on the consumers own judgement.

### THE CARDINAL UTILITY APPROACH

### This approach that was put forth by neo- classical economists like Alfred Marshall is based on the belief that utility is measurable and quantifiable in units called “utils”.

It was assumed that one util equals one unit of money and also that utility of money remains constant.

**Assumptions of the Cardinal Utility Approach**

* **Rationality**; it is assumed that a consumer is a rational being in the sense that he satisfies his wants in order of their preference subject to his budget constraint.
* **Utility is measurable**; that the utility/ level of satisfaction derived from a commodity, is measurable, the most convenient measure being money. The cardinalists assumed that one util=1 unit of money. Utility therefore is denoted by the monetary units that the consumer is willing to pay for another unit of the commodity.
* **Constant Marginal Utility of money**; this approach assumes that the MU of money remains constant whatever the level of a consumer’s income. This is important because if money is to be used as a measure of utility, it should be a standard value in order to yield meaningful results. The essential feature of a standard measure is that is should be constant e.g., a meter, mile etc
* **Diminishing MU**; utility gained from successive units of a commodity diminishes i.e., the MU diminishes as the consumer acquires larger and larger quantities of it
* **Utility is additive;** cardinalists believe that utility derived from various goods and services consumed by a consumer can be added together to get the total utility. TU= f (X1, X2, X3…Xn)
* The consumer’s decision to consume is not influenced by other consumers i.e., the consumers utility function is independent of other consumers’ utility functions
* Assumes consumption of only one commodity.

**Total Utility**

This is the total satisfaction that a consumer gets from consuming a commodity i.e., the total of all “utilities” derived from the consumption of different units of a commodity.

If we could measure utility, total utility would be the number of units of utility that a consumer gains from consuming a given quantity of a good, service, or activity during a particular time period. The higher a consumer’s total utility, the greater that consumer’s level of satisfaction.

Units of Cdty

U

Point of satiety

TU

# Marginal Utility

This refers to the additional utility derived from an extra unit of the given commodity purchased, acquired or consumed by the consumer. The amount by which total utility rises with consumption of an additional unit of a good, service, or activity, all other things unchanged. The marginal utility of any quantity of a commodity is the increase in total utility which results from a unit increase in its consumption.

MU= δTU/ δQx i.e., change in total utility/ change in qty of X

The MU is also the slope of the TU curve

The marginal utility curve is downward sloping; it shows that marginal utility for a good or service declines as he consumes more of them.

**Relationship between total utility and marginal utility**

Marginal utility is the change in total utility due to consumption of one extra unit of a commodity. It therefore refers to the extra satisfaction derived from the consumption of an additional unit of a commodity. Marginal utility is equal to the slope of the total utility function. The marginal utility is positive up to the point when total utility is at maximum. Marginal utility is zero at this point. Beyond this, marginal utility becomes negative and total utility falls.

# Calculation of TU and MU

Consider the table below

|  |  |  |
| --- | --- | --- |
| **No of units** **Consumed** | **Total Utility** | **Marginal Utility** |
| 1 | 30 | - |
| 2 | 50 | 20 |
| 3 | 60 | 10 |
| 4 | 65 | 5 |
| 5 | 60 | -5 |
| 6 | 45 | -15 |

It can be concluded from the table that with the increase in the number of units consumed, Total Utility increases but at a diminishing rate. The diminishing MU is shown in the 3rd column

Units of X

MU

TU

Units of X

MU

U

From the diagram above we can note that

* When TU is rising, MU is positive
* When TU reaches maximum, MU reaches zero. When the consumption of a unit of a commodity makes no addition to the total utility, then it is the point of Zero Utility.
* When TU is diminishing, MU is negative. Negative Utility is that utility where if the consumption of a commodity is carried to excess, then instead of giving any satisfaction, it may cause dis-satisfaction.
* The highest point of the TU curve is known as the point of satiety.

The slope of the TU and MU curves is due to ***the law of diminishing MU***, which states that as the quantity consumed of a commodity increase, the utility derived from each successive/ additional unit decreases and eventually becomes negative. **(E.g., using bottles beer)**

## Why does MU decline as more units are consumed?

The utility gained form a unit of a commodity depends on intensity of the desire for it. When a person consumes successive units of a commodity, his need is satisfied by the degrees in the process of consumption and the intensity of his need goes on decreasing. Therefore, the utility obtained from each successive unit goes on decreasing. Suppose that you are thirsty and you decide to consume a soft drink. Consuming the drink increases your utility, probably by a lot. Suppose now you have another. That second drink probably increases your utility by less than the first. A third would increase your utility by still less. This tendency of marginal utility to decline beyond some level of consumption during a period. This law implies that all goods and services eventually will have downward-sloping marginal utility curves.

**Exemptions of the Law of Diminishing Marginal Utility**

The law of diminishing marginal utility holds only under certain given conditions, which include;

First, the unit of the consumer goods must be standard, e.g., a cup of tea, a bottle of cold drink, a pair of shoes or trousers etc. if the units are excessively small or large, and the law may not apply.

Second, consumer’s taste and preference remain unchanged during the period of consumption.

Third, there must be continuity in consumption and where there is a break, it must be appropriately short.

Fourth, the mental condition of the consumer remains normal during the period of consumption. For, it a person eating and drinking (alcohol) the utility pattern will not be certain.

Fifth, the price of the commodity remains constant over the period of consumption.

Sixth, Quality of the commodity should not undergo any change. Take the example of glass of water. From the quality point of view, a consumer who drinks a glass of cold water must continue with the same. He or she cannot change its quality from cold to normal as normal water give different satisfaction.

# EQUILIBRIUM OF THE CONSUMER

When a consumer buys any good or service, his/her main objective is to get maximum satisfaction from the quantity of the commodities purchased by spending his/her income at the given market price. A consumer is said to be in equilibrium when s/he equates the MU to price paid for an extra unit of the commodity. I.e., MUx = Px

If there are many commodities, the consumer is in equilibrium when s/he equates the ration of MU to price for the individual commodities, i. e.

MUx/ Px = MUy/Py = … = MUn/ Pn

The utility derived from spending an additional unit of money must be the same for all the commodities. If the consumer derives greater utility from any one commodity, he can increase his welfare by spending more on that commodity and less on others, until the above equilibrium condition is fulfilled. If MUX > Px, the consumer goes on buying the commodity because she is paying less for each additional amount of satisfaction. As she buys more, MU falls due to operation of law of diminishing marginal utility. When MU becomes equal to price, consumer gets maximum satisfaction and now she is at equilibrium. When MUX< Px, the consumer will have to reduce consumption of the commodity to raise his total satisfaction till MU becomes equal to price. This is because she is paying more than the additional amount of satisfaction that she is getting.

**Derivation of the demand curve under the CUA**

It is based on the following assumptions

* Utility measured in monetary terms i. e. MUx = Px at the point of equilibrium
* Diminishing MU implying that since, MUx = Px, lower levels of Utility correspond to lower prices paid for the commodity and vice versa.
* The consumer is rational- he aims at maximization of utility given his income and the prevailing prices
* Only one commodity is consumed
* The commodity is a normal good
* The consumer’s income is fixed

TU

Units of Cdty X

X

 P

U

U

TU

 X

From the diagram when more units of the commodity are consumed, TU increases from TU1, TU2, TU3 up to the maximum point D. (Graph 1). Also, marginal utilities keep on diminishing from MU1 MU2 and MU3­ at points A1, B1 and C1 respectively. Since the consumer pays the price equal to the marginal utility derived from the extra unit consumed, points A1, B1 and C1 correspond to their respective prices P1 P2 and P3­ respectively in graph III. Joining points a, b and c give rise to the demand curve. It can be seen that a consumer is always willing to pay less as marginal utility from the consumption of an extra unit declines. At point D on graph 1, TU reaches maximum, MU is zero and the consumer is only willing to pay zero price for the 4th unit of the commodity consumed.

## LIMITATION OF CARDINAL UTILITY APPROACH

* The basic limitation of the approach is that utility can be measured numerically. Satisfaction is psychological in nature, which makes it impossible to measure.
* The consumer’s utility function is not independent of the utility functions of other consumers. A consumer may consume under the influence of other consumers.
* The assumption of diminishing marginal utility is also not a must for all commodities. For some commodities, the consumer may derive more satisfaction as he consumes more and therefore, he may be willing to pay more.
* Commodities are not perfectly divisible as the theory assumes.
* The theory assumes consumption of one commodity, which is not always the case.
* Money is also not a good measure of utility because it changes value over time. Marginal utility of money is also not constant. Poor people get more utility from a unit of shilling compared to rich people.
* Rationality – which a consumer satisfies his wants in order of preference i.e., begins with a commodity with the highest utility.

THE ORDINAL UTILITY THEORY/ INDIFFERENCE CURVE APPROACH

Modern economists e.g., Hicks have used this approach to analyze consumer behavior.

 This approach abandons the assumption that utility is measurable in numerical terms. Instead, the consumer is faced with a number of baskets (goods) from which he/ she can express preference by way of ranking. The consumer is expected to rank his / her scale of preference from the most to the least satisfying.

## The basic tool of analysis is an “indifference curve”. An indifference curve refers to a locus of points showing different combinations of two commodities that yield the same level of satisfaction to a consumer. The consumer is expected to be indifferent among the different combinations that lie on the same indifference curve.

# ASSUMPTIONS OF THE ORDINAL UTILITY APPROACH

* **Rationality**; the consumer is assumed to be rational- he aims ay maximization of his utility, given his income and market prices. It is assumed that he has full knowledge (certainty) of all relevant information
* **Utility is ordinal**; it is taken that the consumer can rank his preferences according to the level of satisfaction of each basket of goods.
* **Diminishing marginal rate of substitution**; this is the slope of an indifference curve. It’s the rate at which one commodity is substituted for another and it diminishes as more of one good and less of the other are consumed
* **Transitivity and consistency**; the consumer’s choices are assumed to be transitive. Transitivity means that if a consumer prefers A to B and B to C, he must prefer A to C, or, if he treats A=B and B=C, he must treat A=C. consistency on the other hand means that if he prefers A to B in one period, he will not prefer B to A in another period or even treat them as equal.
* **Non-satiety**; a consumer is never satisfied, always prefers more to less.
* **Two commodities**- the theory assumes consumption of two commodities

# INDIFFERENCE CURVES

An indifference curve is a locus of two commodity combinations that a consumer consumes that yield him the same level/ amount of satisfaction.

**Table-3 shows the indifference schedule for goods X and Y:**

Table-3 depicts that a consumer starts with one unit of good X and 12 units of good Y. For gaining an additional unit of X, he/she sacrifices 4 units of good Y, so that the level of satisfaction remains the same. Similarly, we get the combinations of 3X+ 5Y, 4X+ 3Y, 5X+2Y. The consumer’s satisfaction remains same whichever the combination of goods. This schedule of combinations can be shown graphically on indifference curve. The quantity of good X is measured on X-axis and quantity of good Y is shown on Y- axis.

 Cdty

Y

 Commodity X

#### PROPERTIES OF INDIFFERENCE CURVES

* An Indifference curve has a negative slope. This implies that the two commodities can be substituted for each other and that if the quantity of one commodity increases, the quantity of another must reduce.
* Between two ICs, it is possible to have several other combinations from which the consumer obtains the same level of satisfaction.
* An Indifference curve does not touch either axis. If it touches X-axis, the consumer would be consuming one commodity X and zero of Y yet the consumer derives utility from a combination of two commodities according to the ordinal utility theory.
* They are convex to the origin. The slope of the curve reduces as one move from left to right. This is because of the diminishing marginal rate of substitution.
* An Indifference curve that lies to the right of another show higher levels of satisfaction while the one to the left show’s lower levels of satisfaction.
* Indifference curves do not intersect. If they do intersect, they would contradict the assumption of consistency and transitivity.
* Indifference curves are not necessarily parallel to each other. This is because the MRS of two commodities may not necessarily be the same for different curves.

##### THE BUDGET LINE

This is a line, which shows attainable combinations of two commodities X and Y that exhaust the consumer’s income. A rational consumer would like to reach the highest possible indifference curve on his indifference map but she/he is limited by income, which acts as a constraint to maximizing utility. The income constraint/budget line for two commodities x and y can be written as

 B= Px \* Qx + Py \* Qy

Where Px and Py are the prices of X and Y respectively, and Qx and Qy are their respective quantities; M is the consumer’s income.

 Assume that the consumer’s income is given as

 B = 1000

 Px = 200

 Py = 100

A budget schedule may be derived as below

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| X | 0 | 1 | 2 | 3 | 4 | 5 |
| Y | 10 | 8 | 6 | 4 | 2 | 0 |

If he spends all his income on Y, he buys zero of X and if he spends all his income on X, he buys zero of Y. Joining the above points; we obtain the consumers budget line.

 Y

B/Py =Y=10

###

###  X B/Px =X=5

### Between A and B, the consumer can get many combinations of X and Y by reducing his budget on one and increasing it on the other. Below the budget line the consumer’s income is not exhausted while above, the combinations are desirable but not attainable due to the budget constraint.

#### THE BUDGET CONSTRAINT OF A CONSUMER

The consumer is assumed to have a fixed amount of income. This acts as a constraint to the consumer’s utility maximization. In a situation where the consumer consumes two commodities, X and Y, the income constraint is given by

 B = Px.X + PyY

Show the slope of the budget line

**SHIFTS IN THE BUDGET LINE**

Changes in the level of income and prices of goods and services will shift the budget line e.g., if the price of X and Y all increase the Budget line B-L will shift towards the origin. This is because the consumer will now be able to buy less with the given income. If they reduce, it will shift outwards because he can buy more of the two goods.

 Px = 400 Py = 200 B = 1000

 10

 5

 2.5 10

If the consumer’s income increases the budget line will shift to the right and will shift to the left when his income reduces.

 20

 Px = 200 B = 2000

 10

 Py = 100 B = 500

 5 10

#### Rotations in the Budget line

##### Assumptions

* The consumers income remains constant
* The price of one commodity changes
* The price of the other commodity remains constant
* The law of demand is assumed

When the price of commodity X reduces leaving that of Y constant and consumers income unchanged, the budget line will rotate outwards.

 10

 B = 1000 Px = 100 Py = 100

 5 10

This means that disposable income available for commodity X has increased giving the consumer an opportunity to buy more X. when the price increases, the line rotates inwards

#### Equilibrium of the consumer

A consumer is in equilibrium when he maximizes his total utility given his income and market prices for goods and services he purchases. Under ordinal utility approach, the consumer is in equilibrium when his highest possible indifference curve is tangent to his budget line

Points A, B and C are affordable by the consumer given his or her income. However, combination D lies below the budget and does not exhaust the consumer’s income. Combination A and C lie along a lower IC and therefore the consumer obtains less satisfaction compared to B. Combination E is the most desirable but not affordable given the income constraint. The only point therefore that is attainable while exhausting his income is B hence the consumer’s equilibrium.

The necessary condition for consumer equilibrium is that indifference curve must be tangent to the origin. The sufficient condition is that at equilibrium, the slope of the B-L and that of the indifference curve are equal.

# THE INCOME CONSUMPTION CURVE

An Income Consumption Curve (YCC) is a locus of equilibrium points showing combinations of two commodities X & Y a consumer may purchase when his or her income changes while the commodity prices remain constant.

***Diagram and explanation***

The slope of the income consumption curve depends upon the nature of the commodities X & Y. i.e., Inferior, Normal or Necessity.

##### YCC when Y is inferior while X is a normal good *Diagram and explanation*

 ***Diagram and explanation***

YCC when Y is normal good while X is a necessity

***Diagram and explanation***

**The price consumption curve**

The Price Consumption Curve (PCC) is a locus of points showing different equilibrium positions of the consumer when the price of one commodity (Y) remains constant while that of the other (X) changes.

**Assumptions**

* The price of one commodity (Y) remains constant
* The price of the other commodity (X) changes or falls
* The consumer’s equilibrium is assumed

***Diagram and explanation***

The slope of the P.C.C determines the relationship between the two commodities. I.e., substitutes or complements. Derive the P.C.C when the two commodities in question are complements.

***Diagram and explanation***

**DERIVING AN INDIVIDUAL DEMAND CURVE UNDER THE ORDINAL UTILITY APPORACH**

**Assumptions**

* The law of demand is assumed
* The price of commodity X falls
* The price of commodity Y remains constant
* The consumer’s income remains constant.

##### THE ENGEL CURVE

The Engel curve shows the relationship between change in the income of the consumer and resultant change in quantity demanded of a given commodity. It is constructed for the income consumption curve.

###### The Engel Curve of an Inferior Good

# INCOME AND SUBSTITUTION EFFECTS OF PRICE CHANGE

**Assumptions**;

* Price of Y remains constant.
* 2 commodities X and Y are consumed
* Consumer’s income, tastes and preferences remain constant.
* Price of X reduces.

The income and substitution effect of price change occurs whenever there is fall in the price of a given commodity while the price of the other remains constant. A fall in the price of a commodity gives rise to the ***total price effect***. This effect can be broken down into two components and these include.

* The substitution effects
* The income effect.

The substitution effect arises when the consumer buys more units of a commodity whose price has reduced and less quantities of the other commodity whose price has remained constant. i.e., The consumer substitutes the expensive commodity (Y) with the less expensive one (X)

Also, a fall in the price of a given commodity implies that the consumer’s real income increases (***purchasing power***). If the commodity is a normal good, there will be increase in its quantity demanded. This may be illustrated as below

Initially the consumer is in equilibrium at point e1 where the budget line is tangent to the indifference curve one (IC.1). A fall in the price of the commodity will lead a rotation in the budget line from BL to BL1. The consumer will move to a higher indifference curve in respect of the new equilibrium position e2. This is referred to the total price effect and can be broken down into its components using ***a hypothetical /assumed*** budget line (HB). The hypothetical budget line prevents the consumer from moving to a higher IC indicating that it is only the consumer’s purchasing power that increased as a result of a price fall but not his /her income in absolute terms. The hypothetical BL must form a tangency with the original IC1 and must be parallel to budget line B-L1. A movement form e1 toe3 along the same IC1 is referred to as the substitution effect of price change. i.e. along the curve, the consumer substitutes one commodity for another while maintaining the same level of satisfaction. A movement from e3 toe2 is referred to as the income effect of price change i

**NB.**

* For normal goods, increase in income leads to increase in quantity demanded
* For necessities, increase in income does not affect the quantity demanded at all
* For giffen goods, increase in income leads a greater fall in quantity demanded
* For luxuries, increase in income leads to a greater increase in quantity demanded