Quick View

Introduction

A **consumer** is one who buys goods and services for satisfaction of wants. The objective of a consumer is to get maximum satisfaction from spending his income on various goods and services, given prices.
In economics, a **rational consumer** is defined as the people who act in a rational way and make rational choices, namely spending their money wisely.
We start with a simple example. Suppose a consumer wants to buy a commodity. How much of it should he buy? One of the approaches used for getting an answer to this question is 'utility' analysis.
Before using this approach, we would like to familiarize ourselves with some basic concepts used in this approach,

Concepts

The term **utility** refers to the want satisfying power of a commodity. Commodity will possess utility only if it satisfies a want. Utility differs from person to person, place to place, and time to time.

Marginal Utility is the utility derived from the last unit of a commodity purchased. It can also be defined as the addition to the total utility when one more unit of the commodity is consumed.

Total Utility is the sum of the utilities of all the units consumed.

As we consume more units of a commodity, each successive unit consumed gives lesser and lesser satisfaction that is marginal utility diminishes. It is termed as the **Law of Diminishing Marginal Utility.**
The following utility schedule will make the Law clear.

Units of a commodity	Total Utility (Utils)	Marginal Utility(Utils)
1	4	4
2	7	3
3	9	2
4	10	1
5	10	0
6	9	-1

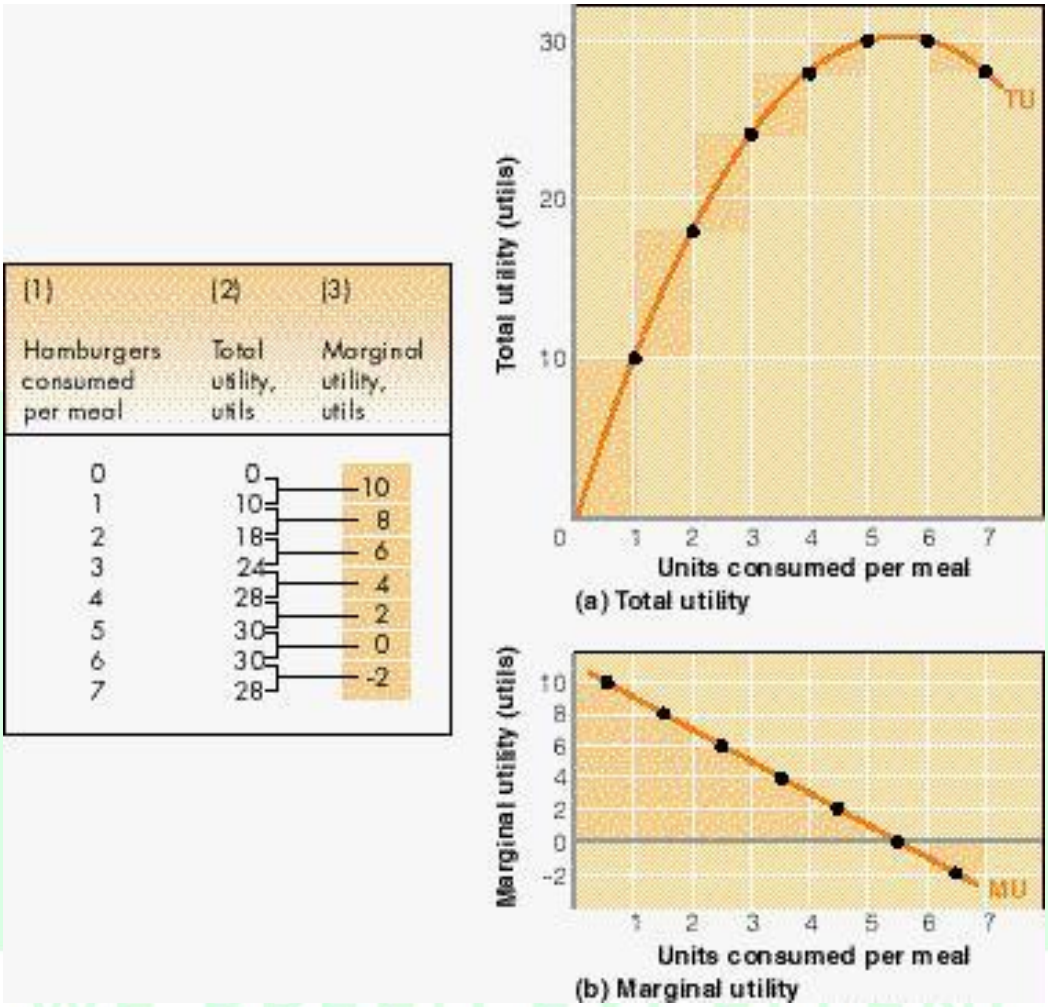
Here we observe that as more units are consumed marginal utility declines. This is termed as the **law of diminishing marginal utility.** The law states that with each successive unit consumed the utility from it diminishes.

Assumptions

The utility approach to consumer's equilibrium is based on certain assumptions.

1. Utility can be cardinally measurable, i.e. can be expressed in exact units.
2. Utility is measurable in monetary terms
3. Consumer’s income is given
4. Prices of commodities are given and remain constant.

Study the relationship between TU and MU graphical analyses. They suggest that when:



(1) Hamburgers consumed per meal	(2) Total utility, utils	(3) Marginal utility, utils
0	0	
1	10	10
2	18	8
3	24	6
4	28	4
5	30	2
6	30	0
7	28	-2

1) TU curve slopes upwards and is concave – MU is positive
2) TU is at its maximum - MU is at zero. This means that more is better up to the saturation point. Beyond this point, more becomes worse.
3) TU slopes downwards – MU is negative

Equilibrium

(a) One commodity case

Suppose the consumer wants to buy a good. Further suppose that price of goods is Rs. 3 per unit. Let the utility be expressed in utils which are measured in rupees. We are given the marginal utility schedule of the consumer.

Quantity	Price (Rs.)	Marginal Utility
1	3	8
2	3	7
3	3	5
4	3	3
5	3	2

When he purchases the first unit, the utility that he gets is 8 utils. He has to pay only Rs. 3/- for it. Will he buy the 1st unit? Obviously, yes, because he gets more than what he gives. Similarly, we compare the utility received from other units with the price paid. We find that he will buy 4 units. At the 4th unit, MU equals price. If he buys the 5th unit, he is a looser because the utility that he gets is 2 utils and what he has to pay is Rs. 3. Therefore, the consumer will maximize his satisfaction by buying 4 units of this commodity. The condition for maximization of satisfaction if only one commodity is purchased then is:

MU = Price.

(b) Two commodities case

Suppose a consumer consumes only two goods. Let these goods be X and Y. Given income and prices (Px and Py), the consumer will get maximum satisfaction by spending his income in such a way that he gets the same utility from the last rupee spent on each good. This is satisfied when

$$\frac{MUx}{Px} = \frac{MUy}{Py} = M.U. of\ a\ rupee\ spent\ on\ a\ good$$

We can show that in order to maximise satisfaction this condition must be satisfied. If it is not satisfied what difference will it make. Suppose the two ratios are:

$$\frac{MUx}{Px} > \frac{MUy}{Py}$$

It means that per rupee MUx is higher than per rupee MUy. It further means that by transferring one rupee from Y to X, the consumer gains more utility than he loses. This prompts the consumer to transfer some expenditure from Y to X. Buying more of X reduces MUx, Px remaining unchanged, MUx/Px, i.e. per rupee MUx, is also reduced. Buying less of Y raises MUy. Py remaining unchanged it raises, per rupee MUy. The change continues till per rupee MUx becomes equal to per rupee MUy. In other words:

$$\frac{MUx}{Px} = \frac{MUy}{Py} = M.U. of\ a\ rupee\ spent\ on\ a\ good$$

Limitation of utility analysis

One major limitation of the Utility Analysis is that utility is cardinally measurable, i.e., it can be expressed in exact unit. The limitation is that utility is a feeling of mind and there cannot be a standard measure of what a person feels. Therefore, it cannot be expressed in figures. There are other limitations too. Their discussion is beyond the scope.

Indifference Curve Analysis

The aim of indifference curve analysis is to analyze how a rational consumer chooses between two goods. An indifference curve is a graph showing different bundles of goods, each measured as to quantity, between which a consumer is indifferent. That is, at each point on the curve, the consumer has no preference for one bundle over another. In other words, they are all equally preferred. One can equivalently refer to each point on the indifference curve as giving the same level of satisfaction for the consumer.

For instance, in Figure 1 the indifference curve is I1. A person would receive the same utility (satisfaction) from consuming 4 hours of work and 6 hours of leisure, as they would if they consumed 7 hours of work and 3 hours of leisure.

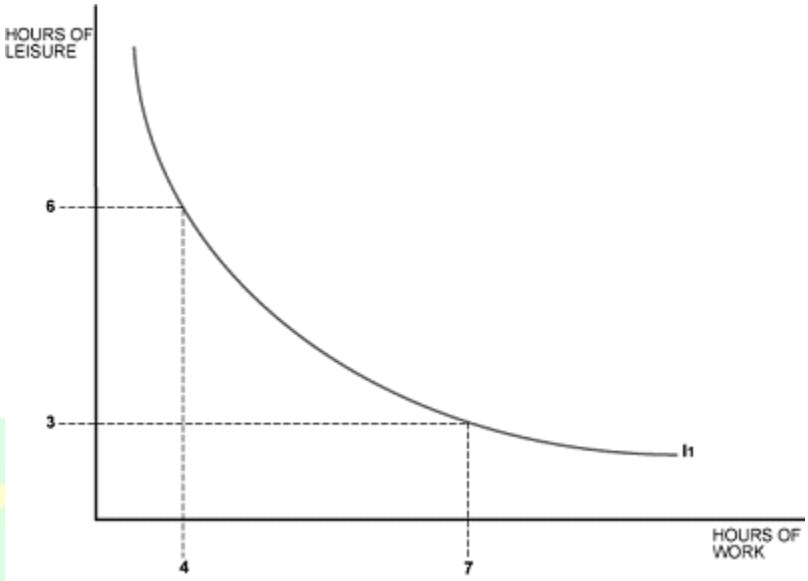


Figure 1: An indifference curve for work and leisure

Marginal Rate of Substitution

The rate at which an individual must give up "good A" in order to obtain one more unit of "good B", while keeping their overall utility (satisfaction) constant. The marginal rate of substitution is calculated between two goods placed on an indifference curve, which displays a frontier of equal utility for each combination of "good A" and "good B".

The equation is below

The marginal rate of substitution (MRS) = change in good X / change in good Y

Using Figure 1, the marginal rate of substitution between point A and Point B is;

MRS = -3 / 3 = -1 = 1

Note, the convention is to ignore the sign. That means absolute value is considered.

The reason why the marginal rate of substitution diminishes is due to the principle of diminishing marginal utility. Where this principle states that the more units of a good are consumed, then additional units will provide less additional satisfaction than the previous units. Therefore, as a person consumes more of one good (i.e. work) then they will receive diminishing utility for that extra unit (satisfaction), hence, they will be willing to give up less of their leisure to obtain one more unit of work.

The relationship between marginal utility and the marginal rate of substitution is often summarised with the following equation;

MRS = MUx / MUy

It is possible to draw more than one indifference curve on the same diagram. If this occurs then it is termed an indifference curve map (Figure 2).

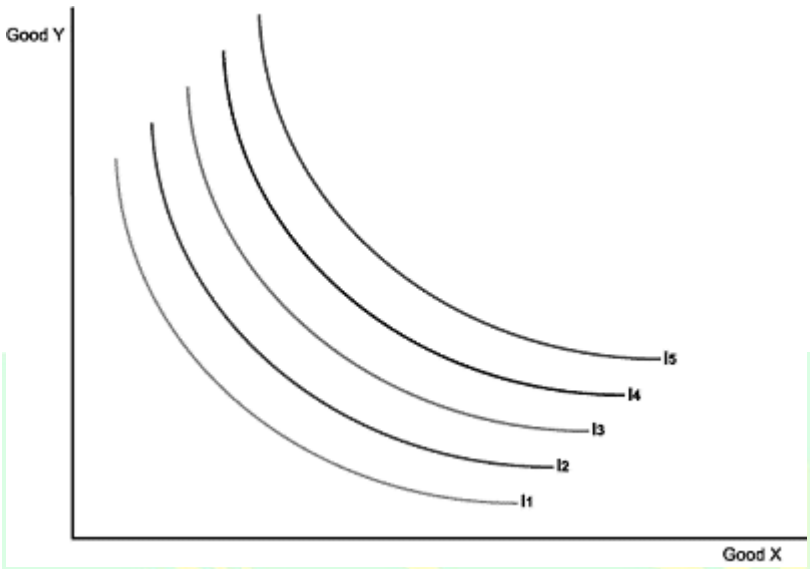


Figure 2: An indifference map

The general rule is that indifference curves further too the right (I4 and I5) show combinations of the two goods that yield a higher utility, while curves to the left (I2 and I1) show combinations that yield lower levels of utility.

Assumptions of Indifference Curve

1. **Rationality:** A consumer is assumed to be rational in his behavior. It means that he aims to maximize his satisfaction from consumption of goods with his limited income and prevailing prices.
2. **Ordinality:** Utility is ordinal. Utility cannot be measured cardinally. In other words, the consumer can rank his various combinations of goods according to the satisfaction or utility of each basket.
3. **Diminishing marginal rate of substitution:** In the indifference curve analysis, the principle of diminishing marginal rate of substitution is assumed.
4. **Consistency in choice:** The consumer, it is assumed, is consistent in his behavior during a period of time. For instance, if the consumer prefers combination of A of goods to combination B of goods, he then remains consistent in his choice. His preference, during another period of time does not change.
5. **Transitivity:** The consumer's preferences are not self contradictory. means that if combination A is preferred over combination B and combination B is preferred over C, then combination A is preferred over C. Symbolically it can be expressed, If A> B and B > C, then A> C.

6. **Monotonic Preference:** A consumer's preferences are monotonic if and only if between any two bundles, the consumer prefers the bundle which has more of at least one of the goods and no less of the other good as compared with the other bundle

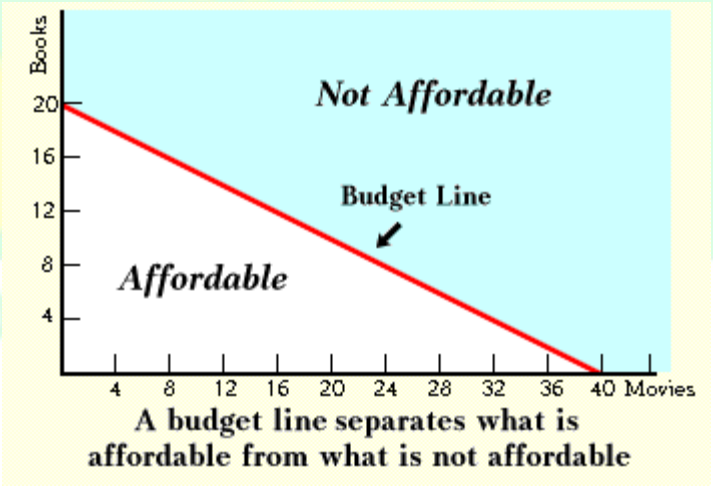
Properties of Indifference Curve

1. Higher indifference curves are preferred to lower ones. Consumers usually prefer more of something to less of it. This preference for more quantities is reflected in indifference curves. Higher indifference curves represent larger quantities of goods than lower indifference curves.
2. Indifference curves are downward sloping. The slope of an indifference curve reflects the rate at which the consumer is willing to substitute one good for the other. In most cases, the consumer likes both goods. Therefore, if the quantity of one good is reduced, the quantity of other good must increase in order for the consumer to be equally happy.
3. Indifference curves do not intersect.
4. Indifference curves are convex to the origin. The slope of an indifference curve is the marginal rate of substitution-the rate at which the consumer is willing to trade off one good for the other. The convexity of the indifference curve reflects the consumer's greater willingness to give up a good that he already has in large quantity.

Budget Line

A consumer's budget line characterizes on a graph the maximum amounts of goods that the consumer can afford.

Anita has only Rs. 100 to spend on her two passions in life: buying books and attending movies. If all books cost Rs. 5.00 and all movies cost Rs. 2.50 (these are simply assumptions to make the problem easier--as is the assumption that only two items are involved in the problem), the graph below shows the options open to Anita. The budget line is a frontier showing what Anita can attain. The budget line limits choices; it is due to scarcity. The cost of a book is Rs. 5.00 or two movies. Spending money on a product means that money cannot be used to purchase another product. In the case of books versus movies, the tradeoff is a straight line because one more book always costs two movies, regardless of how many books Anita has already.



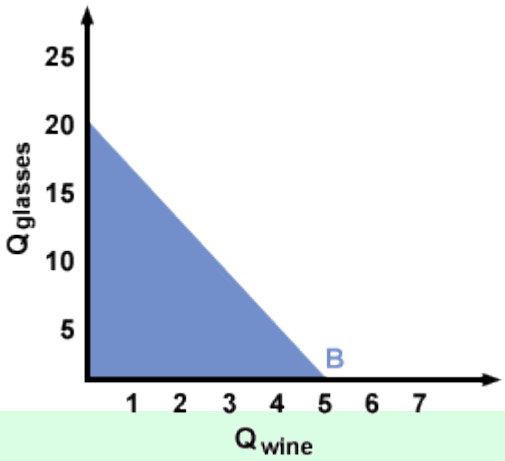
A budget line separates what is affordable from what is not affordable

Budget Constraint

To draw a budget constraint, a line that shows the maximum amount of goods a buyer can purchase with their available funds, you need to know two things:
1) How much money they have?
2) The prices of the two goods being considered.

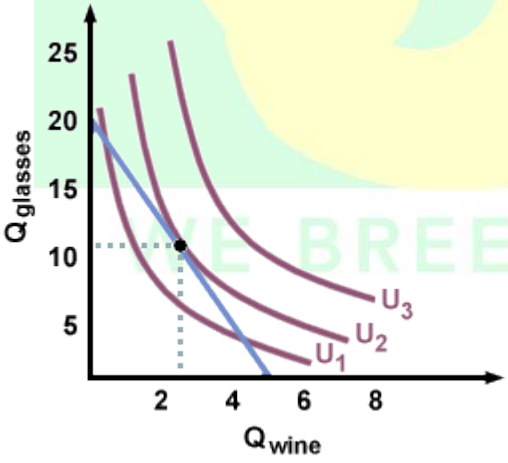
Once you have both pieces of information, it is simply a matter of finding out the maximum amount of the first good you can buy, without buying any of the second, then finding the maximum amount of the second good you can buy, without buying any of the first. Mark these points on the graph and connect them.

To illustrate, suppose Tina has $100. She is deciding how many bottles of wine and how many wine glasses she wants to buy. If wine costs $20 a bottle and glasses cost $5 each, then the most wine she can buy is ($100/$20)=5 bottles. Likewise, she can buy at most ($100/$5)=20 wine glasses. Her budget constraint would look like the darker line, while the filled area includes all of her possible buying decisions, given the amount of money she has. Anything not included in the colored area is out of her budget:



Tina's Budget Constraint

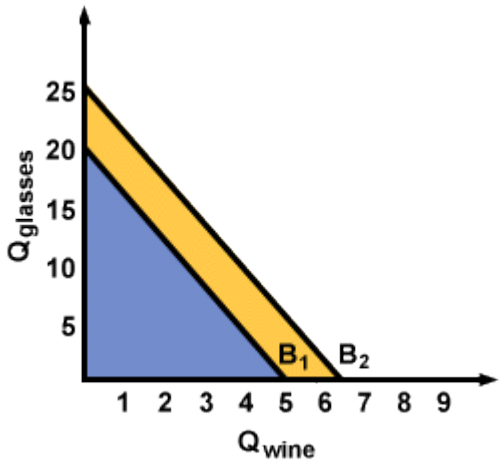
If we know her indifference curves, we can draw her budget constraint in with them on the same graph. After that, it is simply a matter of finding the outermost indifference curve that is tangent to (just barely touches) her budget constraint, and use this tangent point as her optimal combination of wine and glasses. In this case, it is the second indifference curve that optimizes her utility given her budget.



Optimizing Tina's Purchasing Decision

It looks like Tina will buy about 12 wine glasses and 2 bottles of wine. Even though the optimal amount is a little more than 2 bottles, she has to buy either 2 bottles or 3 bottles, and 2 are all she can afford. (When doing such problems, never round up, since that will land you outside of the budget constraints).

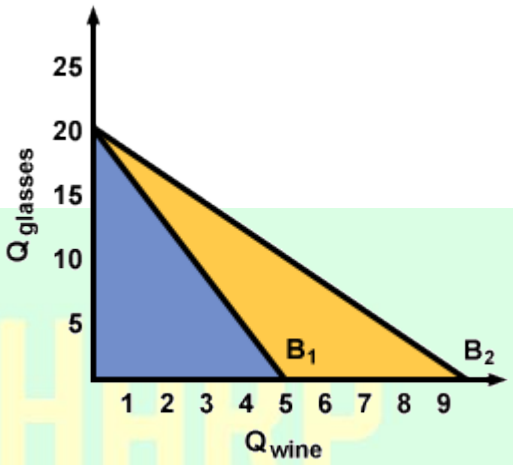
Why does it have to be the indifference curve that is tangent to her budget constraint? If it were an indifference curve that crosses her budget constraint, such as the first indifference curve, then we can see that the two points of intersection don't make her as happy as the single tangent point in the previous graph. By picking the outermost curve that still touches her budget constraint, we have maximized her utility. We can't pick a curve any further out, such as the third indifference curve, since she can't afford to buy more than $100 worth of wine and glasses.



A Shift in Tina's Budget Constraint

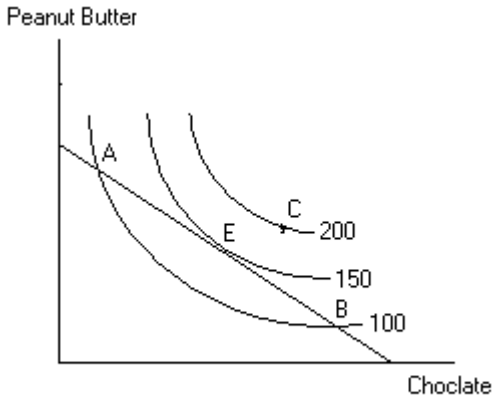
Obviously, budget constraints change with changes in income or price. For instance, if Tina now has $125 instead of $100, her new budget constraint will be a parallel shift out from her original budget constraint. The yellow shaded region represents the increase in possible purchases she can make:

On the other hand, if Tina still has only $100, but the price of wine changes from $20 a bottle to $10 a bottle, her budget constraint will pivot to reflect this change:



Maximization-Consumers' Equilibrium

We can find the point of maximum utility by putting the indifference curves (consumer's preferences) and budget line (her ability) together. For example, consider the following diagram



The consumer can afford bundles A and B but these are not the point of maximum utility (equilibrium) since there are points such as E that are on a higher indifference curve and can be afforded by the consumer. Bundles such as C are, of course, preferred but the consumer cannot afford them. The point on the highest possible indifference curve that is still in touch with the budget line is, therefore, the point of equilibrium. Quite clearly, as long as an indifference curve intersects the budget line at two points it cannot represent the maximum utility. Maximum utility occurs where indifference curve is tangent to the budget line. In this case, a higher indifference curve will not touch the budget line and therefore is not affordable.

We know from geometry that when two curves are tangents their slopes are equal. This means that at the point of maximum slope of budget line must be equal to the slope of the indifference curve. We found earlier that slope of indifference curve is MRS and slope of the budget line is P_X/P_Y. Therefore at the equilibrium we must have MRS = P_X/P_Y