Managerial Economics

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Lecture - 23

Consumer Behavior - I

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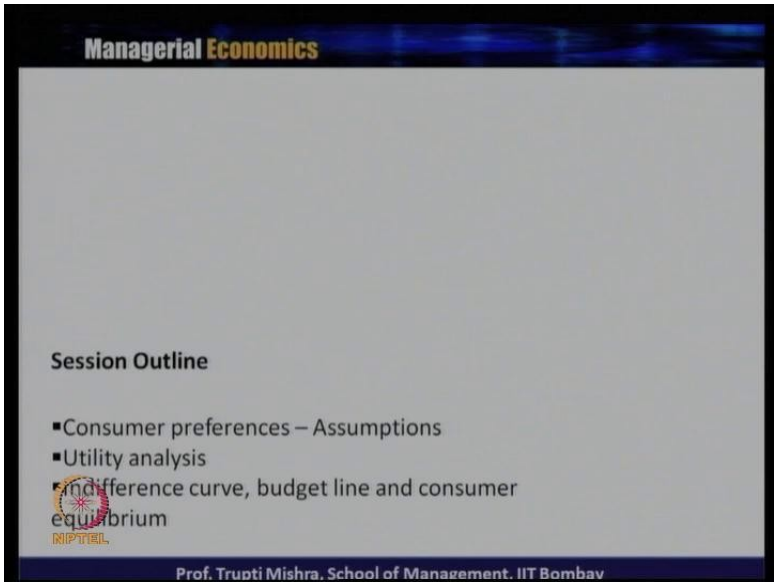

We will introduce the third topic under this module, theory of demand: that is, theory of consumer behavior today. And the session outline for this consumer behavior will be, we will first look at generally what are the pre-condition or assumptions for consumer preferences. What is utility analysis? Both cardinal and ordinal utility analysis; then we will discuss about the indifference curve, budget line and the consumer equilibrium.

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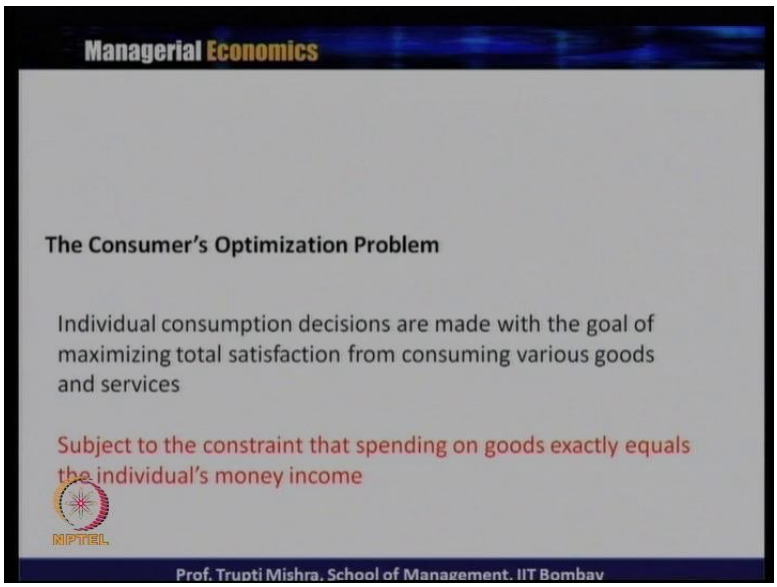

So if you remember in the very first class, we talked about the optimization problem of all the market agents or all the economic agents. So like for producer, always the optimization problem is to optimize or maximize the output. Similarly for the consumer, always his optimization problem is to maximizing the total utility or the maximizing the total satisfaction, when he or she consumes the various goods and services.

So, the today's focus is on consumer's optimization problem because we are talking about specifically the theory of consumer behaviour and what is consumer optimization problem? Consumer optimization problem is to maximize the satisfaction from which limited money income or the limited budget available to him. How he can maximize the total satisfaction from the various goods and services what he consumes.

Now what is the constraint over here? The optimization problem is to maximize the satisfaction, but the constraint over here is to the income constraint or the budget constraint. Because whatever the consumer wish to buy it is not possible always. Because there is always a value associated with each of the goods and services and there is a money income required to consume the different goods and services. So, the optimization problem is to maximize the satisfaction or the maximization of the utility by consuming various goods and services and here, the constraints is the spending on the good should be exactly equal to the consumer's money income.

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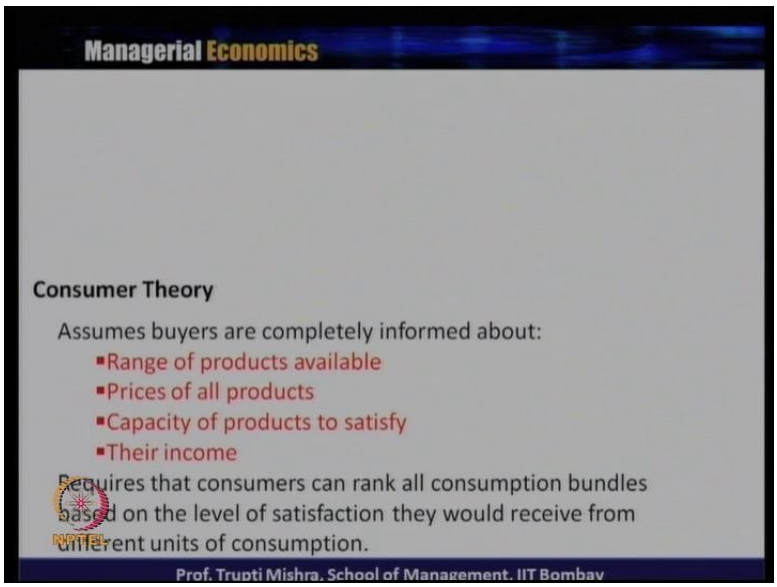

Now what are the assumptions to be practiced here? We assume that the when the consumer are making decisions regarding consumption of goods and services, we assume that the buyers are completely informed about the range of products available, what are the products available in the market, then what are the market prices of all the products; like what is the value of the products. Now what is the capacity of product to satisfy? This is a subjective term, but we can always bring it to a monetary form.

Suppose if we are minimum spending ten rupees or hundred rupees on a goods, whether the satisfaction or whether the usefulness of the product is worth of the value of the product or not; like if am spending hundred rupees on consuming a product, I always look for whether the product has the usefulness or not, is it worth to produce hundred rupees or not. So first, the consumer or the buyer has to have information about all the products available in the market, what are the market prices is available for all the products, or at what price all the products are available.

The capacity of the product should satisfy and what is the consumer's money income? This requires that all the consumers can rank all consumption bundles, based on the level of satisfaction they would receive from the different unit of consumption. Like if the products are ten or the products are twenty, the consumers can rank all the consumption bundles based

on their level of satisfaction. Suppose there are ten products available to me, and on the basis of my income I can spend only on two or three products.

Now, what is the role of rational consumer? Here the role of the rational consumer here is to first rank on the priority basis that what is the requirement, and second is that what is the usefulness I am getting from each of these products and after ranking the various products, then only I will see how much I can buy from these different kinds of products. So, that requires the consumers can rank all the consumption bundles. Based on the level of satisfaction they would receive from the different units of consumption and all this information will help them to rank all the consumption bundles; like range of products available, prices of all the products, the capacity of the product to satisfy, and what is the consumer's money income.

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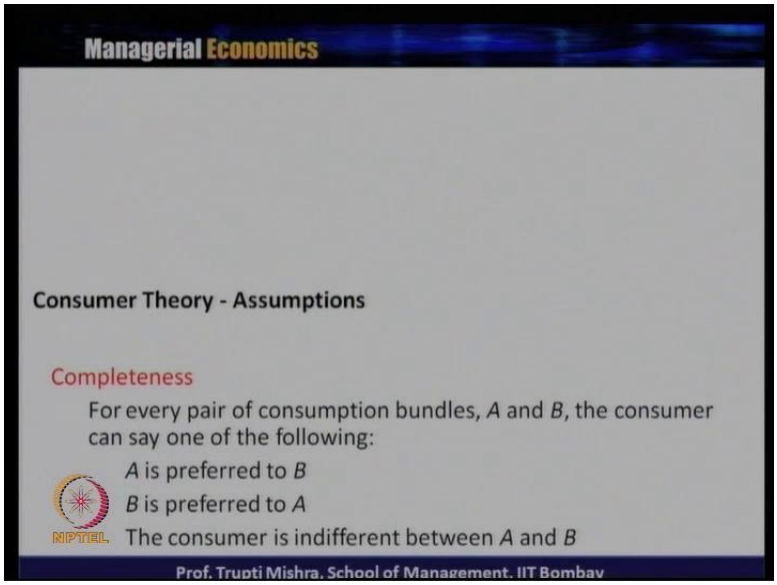

There are few assumptions when it comes to the consumer theory or the theory of consumer behavior. First one is the completeness; for every pair of consumption bundles, A and B. Suppose there are two consumption bundles A and B and may be consumption bundle A considered a different category of goods consumption, bundle B considered different bundle of goods or the different combination of goods. The consumer can say one of the following: Either A is preferred to B, B is preferred to A, and the consumer is indifferent between A and B.

What does this imply? This implies that, whether it is A, or whether it is B the consumer is getting the same level of satisfaction or the same level of usefulness after consuming the products. That is the reason. The first one is since the consumer has the information about what are the goods available under bundle A, what are the goods available under bundle B and on that basis the first assumption goes that, if A is preferred to B and B is preferred to A. The consumer is also indifferent between A and B.

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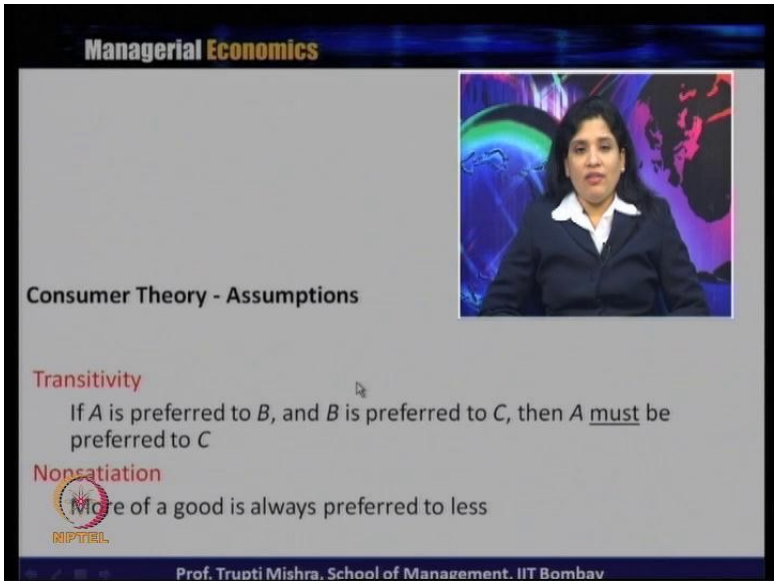

Then we have this transitivity. Under transitivity, if A is preferred to B and B is preferred to C, then A must be preferred to C. So, here A is one consumption bundle, B is another consumption bundle, and C is another consumption bundle. So, transitivity assumption says that if a consumer prefers A, consumer prefers B to A, or B to C, or C to B, then A must be preferred to C, because A is preferred to B, B is preferred to C and A must be preferred to C. The third assumption or the most important assumption in case of consumer theory if you look at, the non-satiation; it means the consumer never gets satisfied with the consumption of goods and services, and more of good is always preferred to less. The consumer never says that I have enough of this I am not going to demand for more, I am not going to consume more.

So, always they prefer a combination of more goods and services, which the consumption bundle consists of, rather than less goods and services what the consumption bundle consist

of. So more is always better, that is evident to the non-satiation assumption of the consumer theory. Then we will come to the core of this consumer theory, because all that if you look at the basis we are always using the word the consumer should get satisfaction, the consumer should get usefulness, the consumer should make a decision, on the basis of the satisfaction what they receive from the goods and services after consuming this.

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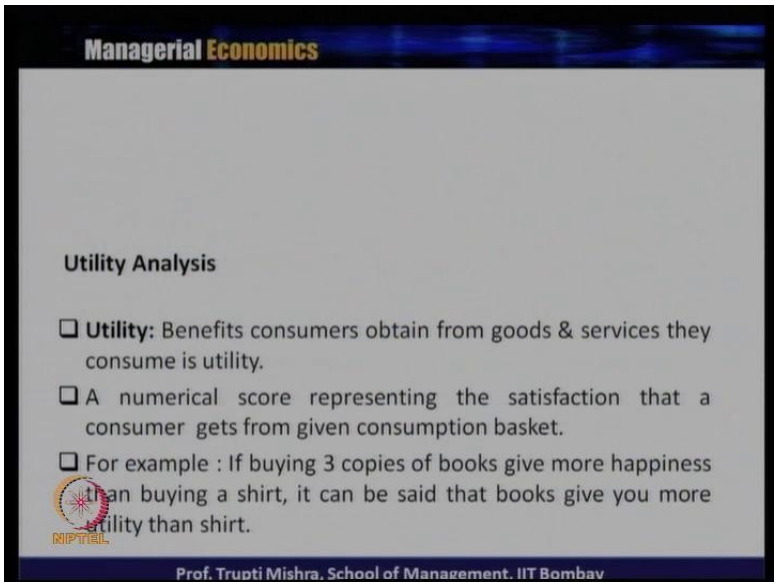

So, the core for this is that how to identify or how to measure the satisfaction, what the consumer gets from the product. The basis for this is the utility. So, we will come to the utility analysis now. We will define what is utility, we will see what is a utility function, and how this utility gets use when the consumer takes a decision regarding buying a typical product or not. So, utility is this; the benefit what the consumer gets from goods and services they consume. So, when they consume goods and services, whatever the benefit or whatever the usefulness of the product, that becomes as the utility.

So basically, it is a numerical score representing the satisfaction that a consumer gets from given consumption basket. So, it is like is I have a consumption basket which consists of ten goods; after consuming the consumption basket, if I am able to give a new numerical score or if I am able to identify what is the benefit associated with the consumption basket, then the consumption basket has the utility. So, basically, this is the benefit what the consumer gets from goods and services after consuming, and generally you can convert it to a numerical score, which represent the satisfaction that consumer gets from a given consumption basket.

So, if you can take an example: If buying 3 copies of books gives more happiness than buying a shirt, it can be said that books give you more utility than shirt, right? There are two food items A and B. If you get more satisfaction in A as compared to B, you can always say that A has more utility than in compared to B. But this utility is always a relative concept; it is not that all the consumers they are going to get the same level of utility by consuming A. May be some consumers they get more utility when they consume B, and for them B is always having a measure more utility as compared to the A. So, utility is the benefit what the consumer gets after consuming a product or consuming a consumption basket, and it can be converted in to a numerical score which represents the consumer satisfaction; and on that basis they can take a decision whether to buy this product, whether to consume this product or not.

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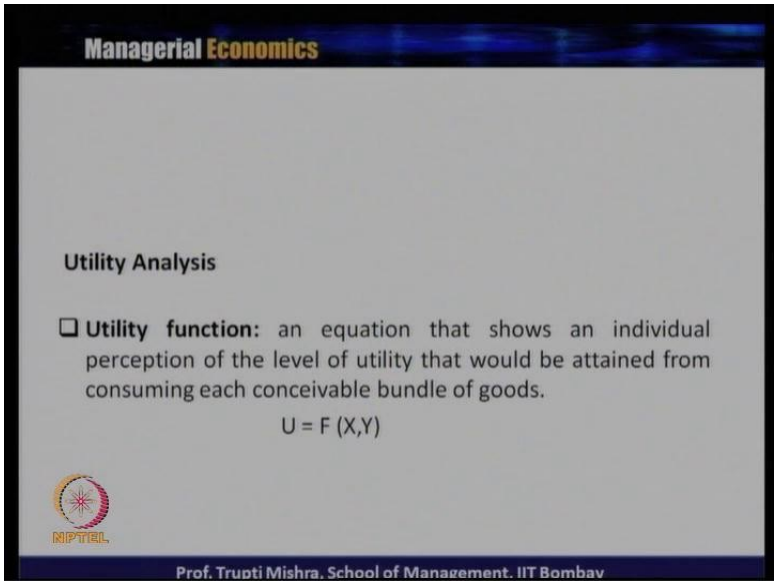

So, what is a utility function? If you are making it to a mathematical relationship, this utility and the consumption of goods and services; so utility function is an equation that shows an individual perception of the level of utility that would be attained from consuming each conceivable bundle of goods. So whatever we are explaining the numerical score of the total satisfaction, same way when you are bringing down its mathematical equations, utility is the function of the different goods or the function of the level of utility of different goods. So, U here is the utility, X and Y is the two goods what the consumer is consuming. So, the total utility what the consumer is getting is the utility of the X and utility of Y, or we can always

say this is the satisfaction what the consumer gets after consumption of both the goods, that is X and Y.

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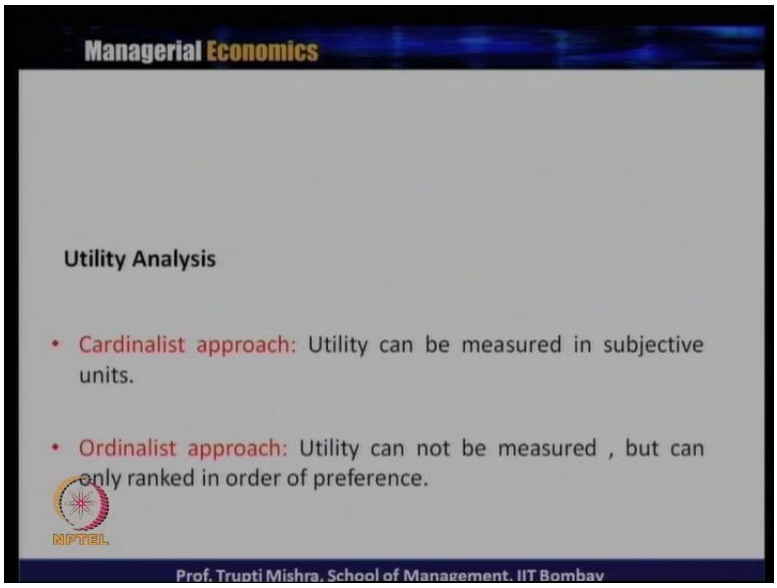

There are two ways to measure this utility; one is cardinalist approach and the second one is the ordinalist approach. So, when utility can be measured in subjective unit according to the cardinalist approach and according to ordinalist approach, utility cannot be measured but can rank only in order of preferences. So, in case of cardinalist approach, the core is again utility can be measured, utility can be quantified. Whereas in case of ordinalist approach, utility cannot be measured; rather it can be ranked in the order of the preferences.

The unit by which we can measure the utility under cardinalist approach is utils; that is called the utils. The unit of measurement under cardinalist approach is utils. Whereas in case of ordinalist approach, we cannot quantify it or we cannot measure it; rather we can rank them in the order of the preferences. Like if you are taking the example of may be having food in different restaurants. Now how it works for both the cardinalist approach and ordinalist approach? In case of cardinalist approach, I can say if I have taken food in three different restaurants, I can say after having food in restaurant one, I get 10 units of utils; after having food in restaurant two, I get 12 unit of utils and after having food in restaurant three, I get 8 units of utils; this is cardinalist approach.

But how this example can be taken in the ordinalist approach? After having food in all these three restaurants, if I am asked to give my preferences, I will give always third is the first preference, second is the second preference, and first is the first last preference, because I have got more satisfaction in having food in the third restaurant. So, one is assigning some unit in term of utils that is cardinalist approach, and second one is that on the basis of the preference, I can rank the different goods or I can rank the different products. But if you look at the basis, it is again same. In worst case, again it is a total satisfaction represented in utils term and second is again the basis is total satisfaction, which is represented on the basis of a ranking.

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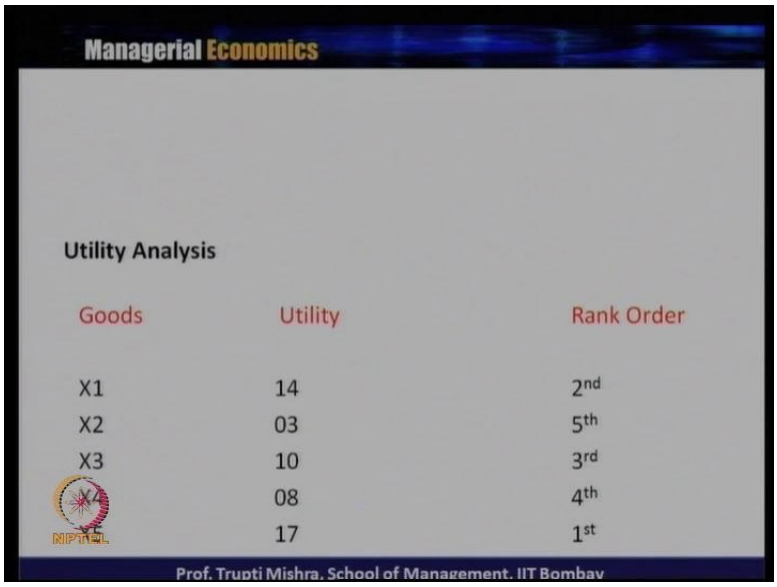

So, if you take an example; now suppose there are five goods X1, X2, X3, X4 and X5, and the second column gives us the utility what we get; that is in case of X1, we get 14 utils of utility; in case of X2, 3 utils of utility; in case of X3, 10 utils of utility; in case of X4, 8 utils of utility and in case of X5, 17 utils of utility. So if this is the utility what I am getting, the first column always gives us the cardinalist approach because it is assigning a number to the satisfaction, what the consumer is getting from the different units of goods.

But the second one, the second column that is the rank order. In this case if you look at, this is the example of the ordinalist approach, because here the number is not given for each goods; rather it is preferred according to the satisfaction or according to the preferences. So

in this case, if you look at X5 is given as the first preference, X4 is given as the fourth preference, X3 is given as the third preference, X2 is given as the fifth preference, and X1 is on the second preference. It means according to the priority, according to the preferences or may be according to the satisfaction received from each of the goods, the goods are ranked and in case of first one; in case of cardinalist approach, it is like whatever the total satisfaction the consumer is receiving after consuming each goods and services.

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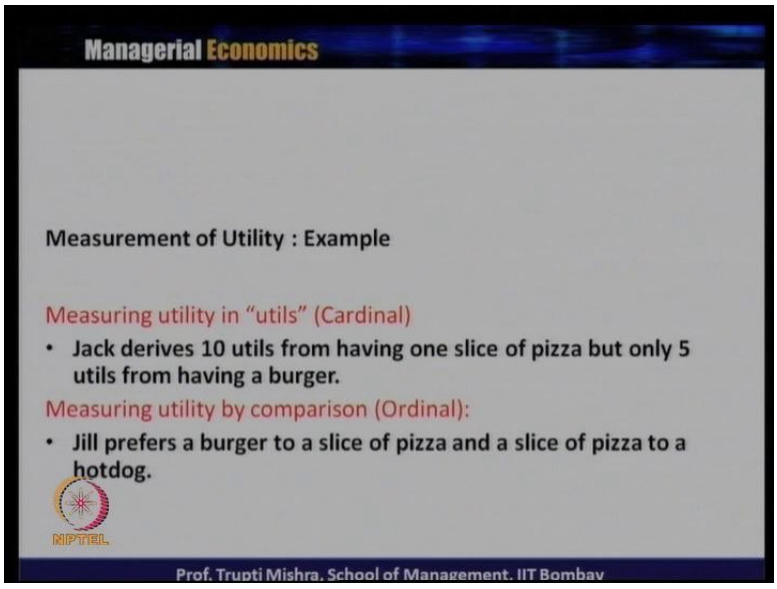

So if you take an example that measuring utility in utils, that is again example of a cardinalist approach. Like, if you are taking the example that Jack derives 10 utils from having one slice of pizza, but only 5 utils from having a burger, this is the example of a cardinalist approach. And in case of ordinalist approach, we can always take the example like Jill prefers a burger to slice of pizza to a hotdog. So, in the first case in case of cardinal, if Jack is the consumer we can always quantify in this case what is the utils he is getting when he is consuming one slice of pizza, and what is the utility when he is consuming one burger. But when it comes to ordinalist approach, we cannot quantify what is the utility; rather we can always prefer like, if you look at Jill here is a consumer.

Jill prefers a burger to a slice of pizza. It means she assigns more utility, more satisfaction after having a burger than a pizza and a slice of pizza to a hotdog. So, if it is a comparison between a hotdog and slice to slice of pizza, again she gives more importance to a slice of

pizza because she gets more satisfaction from slice of pizza than to the hotdog. So in the second case, Jill is preferring one product over another producton the basis of satisfaction he receives, or on the basis of the satisfaction, on the basis of the utility what she gets from the different quantity of or different types of goods and services.

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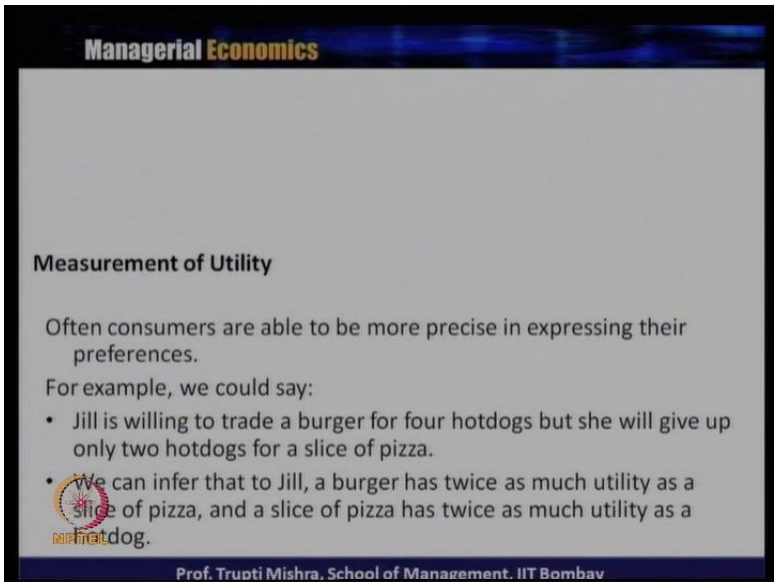

Now so when it comes again to the measurement of utility, there are two approaches: One is the cardinalist approach, the second one is the ordinalist approach. If you look at often consumers, they are able to be more precise in expressing their preferences. Like in the previous example if you look at, Jill is willing to trade a burger for four hotdogs, but she will give only two hotdogs for a slice of pizza. So, look at the trade now; all the rational consumers they are very precise in expressing their preferences, which products they want and which they can give.

So if you are taking the case of Jill, she is willing to trade a burger for four hotdogs. But she will give up only two hotdogs for a slice of pizza; she is ready to forgo four hotdogs for one burger, but two hotdogs only for the slice of pizza. It means she prefers burger more than pizza, and we can infer to that to Jill, a burger has twice as much as utility as slice of pizza and a slice of pizza has twice as much as utility of the hotdog, because she is exchanging four hotdogs for one burger and two hotdogs for one slice of pizza.

So when it comes to measurement of utility, for her the highest utility is always the burger. The second highest utility is the pizza and third utility is the hotdog because she is ready to sacrifice four hotdogs for one burger, two hotdogs for one slice of pizza. So,
burger has twice as utility as slice of pizza, and slice of pizza has twice as utility as the hotdog and when it comes to ranking the preference, then Jill can always prefer the burger, then pizza, then the hotdog.

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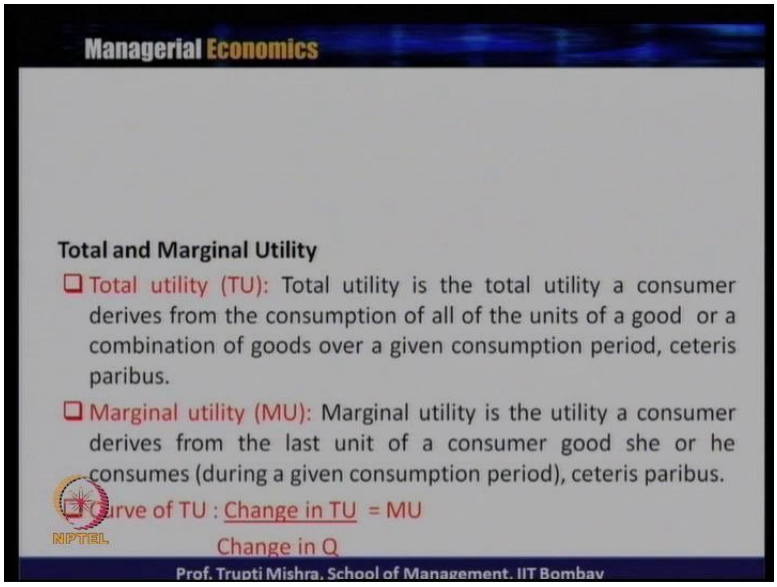

Then we will see what the total utility is; we will introduce two new concepts here; one is total utility and second one is the marginal utility. Now what is total utility? Total utility is the total utility a consumer derives from the consumption of all the units of goods and services or a combination of goods over a given consumption period, ceteris paribus. All other things constant. Total utility is nothing but the total utility of the consumer what he or she gets after consuming all the units of goods and services. And what is marginal utility? Marginal utility is the additional utility that a consumer derives from the after consuming goods and services, any additional unit of the goods and services. So, marginal utility is the utility a consumer derives from the last unit of consumer goods she or he consumes during a given consumption period, ceteris paribus, all other thing remaining constant.

So, if you plot it, the total curve; the total utility curve is or from the total utility curve we can get the marginal utility curve. And this is nothing but the change in the total utility, when there is change in the quantity of the consumption. So if there are 10 units to consume, the

marginal utility between the ninth and tenth is always what is the last additional unit of utility the consumer has added to the total utility after consuming the last unit of the product. So, total utility is the sum total of the utility what the consumer gets after consuming all units of goodsand services, and marginal utility is always the additional utility to the total utility when the consumer consuming one more additional unit of the goods.

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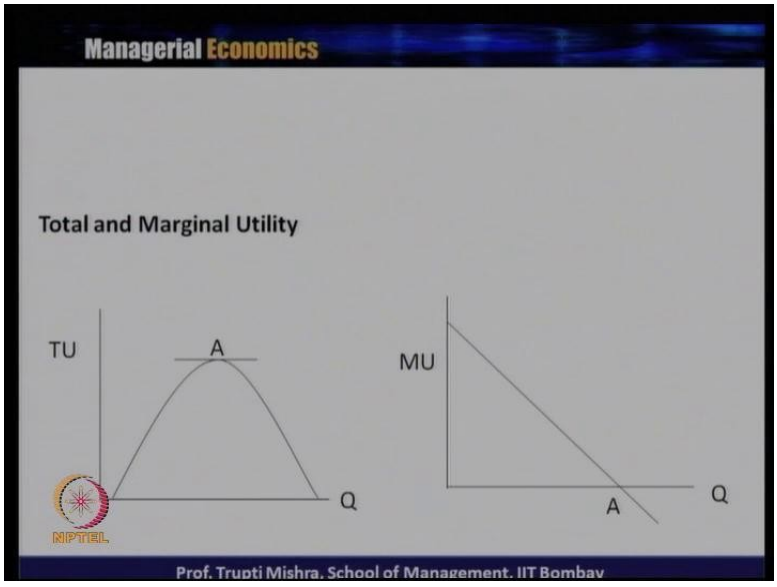

So if you graphically represent, then total utility is generally takes an inverted U-shaped. Initially it increases, reaches the maximum, then it decreases, and marginal utility is generally the slope of the total utility. So that is reason if you look at, marginal utility starts at a higher level and then slowly slowly it decreases, and then it reaches zero. We will see why the shape of the total utility is like this, why it increases at the beginning and why it decreases, may be after reaching the threshold level, and to a simply, may be a simple version of this marginal utility is just the slope of the total utility. So, initially those marginal utility if you look at, marginal utility decreases and then it reaches zero and then it goes to negative; that means there is a decreasing slope of total utility. Even if total utility is increasing, it is increasing at a decreasing rate. Then when it is decreasing, then marginal utility goes on a negative direction.

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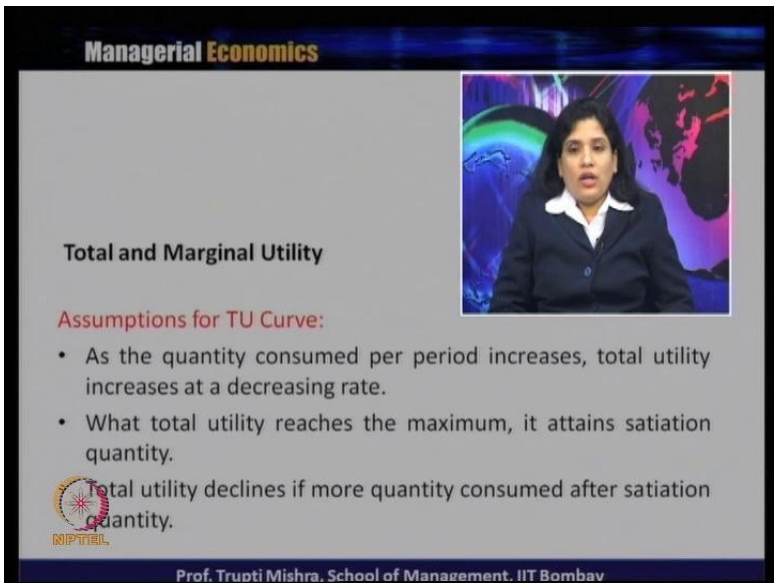

Now what are the assumptions of this total utility curve? As the quantity consumed per period increases, total utility increasing at a decreasing rate. So, when there is more and more quantity, if the consumer is consuming more and more of the goods, generally the total utility increases at a decreasing rate. So, some utility the benefit the consumer is getting, but whatever he was getting earlier that becomes less now. When total utility reaches maximum, it attains the satiation quantity. So, if you look at the top point, may be when it has stopped increasing, that point the total utility reaches maximum and that is the satiation quantity or that is the threshold level up to which the consumer gets the satisfaction. Total utility declines if more quantity is consumed after satiation quantity.

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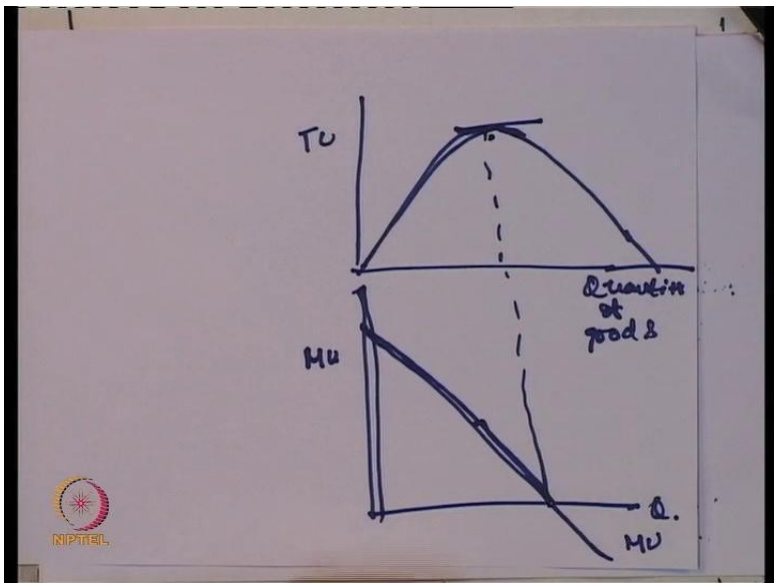

So if you look at, how this total utility and marginal utility they are related. Here suppose if you are considering total utility, this is the quantity of the goods getting produced. So, initially it increases, then it reaches the maximum, and then it decreases. So corresponding to this, our marginal utility initially decreases. So corresponding this, when this is maximum, we get a zero marginal utility, and after that this is negative. So, how these two are related? Initially total utility increases at the decreasing rate, reaches the maximum and after this total utility decreases.

Corresponding to this, the marginal utility is decreasing up to the point total utility is increasing at a decreasing rate. Marginal utility is nothing but the slope of the total utility. So if the slope is decreasing, similarly the marginal utility has to decrease and that is the reason marginal utility is reaching at this point, zero. Then when it is maximum, marginal utility is zero and when it is decreasing, marginal utility has become negative. So from there, the concept of actually the diminishing marginal utility comes, and what is diminishing marginal utility or why we get a negative slope of the total utility.

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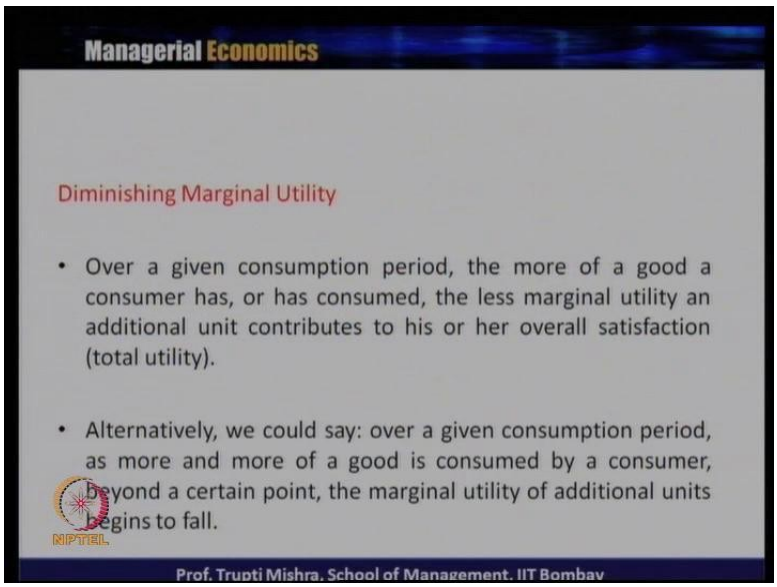

Over a given consumption period, the more of a good the consumer has or has consumed, the less marginal utility an additional unit contributes to his or her overall satisfaction. Alternatively we could say: Over a given consumption period, as more and more of good is consumed by a consumer, beyond a certain point, the marginal utility of additional unit is begins to fall. So, if you look at why the total utility is decreasing. Like take a small example of the consumption of coffee or tea. May be when you take the first cup of tea or first cup of coffee, you get the maximum usefulness or the maximum satisfaction from this product.

Then when you have the second cup of coffee, again you get some amount of the benefit or some amount of the satisfaction. But if you compare between the first cup of the tea of the day and the second cup of the tea of the day, then again there is a difference because whatever the satisfaction you have got in the first cup, you will not get in the second cup. Then may be again, it happens again you are going to have the third cup of tea or third cup of coffee within a specified time period.

So, if the time period is fixed and the same amount of product you are having, then whatever the satisfaction you are getting at the initial consumption, you are not getting that in the following consumption, where following consumption when you are having more and more of that. Similarly, if you can take an example of watching a movie or reading a book; when you first time read a book, you get the maximum utility because

this is a newer one and you get to know all the things in a new version. When you watch a movie for the first time, again you like it most. May be you have liked something, that is the reason you are watching the movie for the second time, third time or so on.

But whatever the satisfaction you have got or whatever the utility you have got in the first unit of consumption, that is always higher, and when you are going on watching the same movie, reading the same book, or may be consuming the same product, the marginal utility goes on decreases and finally it reaches a zero. So at a point of time, you can say that I am not going to have any more tea today, because I have had enough. At any point of time you can say that, I am not going to watch this movie for next three months, next one year, next two years, because I watched for ten times or twelve times or you can say that I am not going to read this book for next few weeks, because I have had enough in last few weeks. So, in the specific time, specific product, the utility decreases when we are consuming more and more of it.

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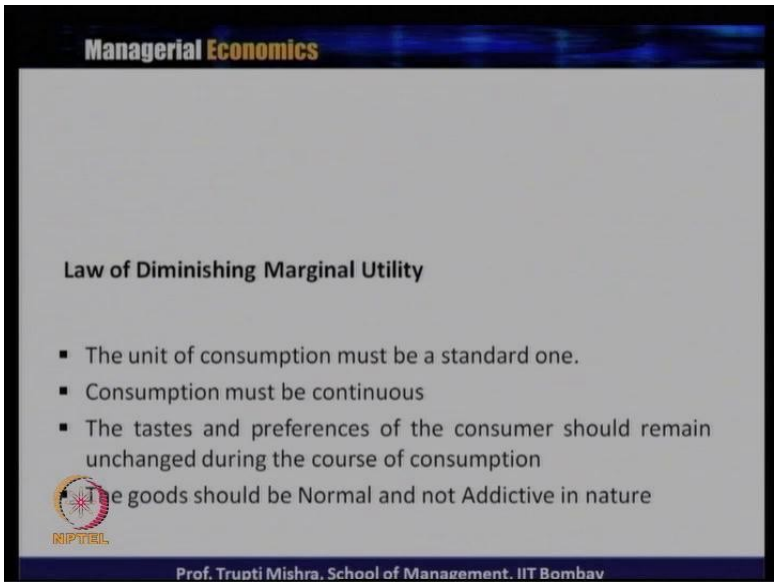

Now what are the pre-conditions in which the case the law of diminishing marginal utility is valid? The unit of consumption must be standard one; it means if you are taking the example of a book, if you are taking the example of a movie, if you are taking the example of a coffee or tea. In this case, if the first time you are having a just half cup of coffee, second time you

are having a quarter cup of coffee, third time you are having again less of it, the possibility is that you may get still the same amount of satisfaction what you would have got in the first cup of coffee.

So, the unit of consumption should be standard one, otherwise this law of diminishing marginal utility is not going to be valid, or like if you take the example of a movie, or if you are taking the example of a book, you can always say that you have to read the book full, you watch the movie full, not only part of it. If you are watching part of it, again you can get the same utility level if you are watching a different part, may be next few hours or next few days. So, unit of consumption has to be standard one then only the diminishing marginal utility has to be valid.

Consumption must be continuous; you cannot give a gap. Suppose you are having one cup of tea in the morning and one cup of tea in the afternoon, again you will get the same level of satisfaction. So in this case, law of diminishing marginal utility is not valid because the consumption is not continuous. If you are giving a gap, the possibility is that you are getting the same level of satisfaction again. The taste and preference of the consumer should remain unchanged during the course of consumption. So, if you are generally having coffee or you are generally having tea, the taste should not change during the course of consumption. If you like the products, then only you are consuming it. So, that should be there till the end of this consumption period.

The goods should be normal, not addictive in nature. Like if I am addicted to coffee, if I am addicted to tea, if I am addicted to smoking, or if I am addicted to liquor and so on, I will go on consuming, I will not get the lesser satisfaction because I am addicted to it. Someone is addicted for smoking. So, the more they consume, more satisfaction they get. Someone is addicted to tea, more they consume, more they get satisfaction. Someone is addicted to liquor, more they consume, more they get the satisfaction. In this case, the law of diminishing marginality is not going to be valid because these goods are not normal, they are addictive in nature. So, one of the pre-condition for the application of law of diminishing marginal utility is the good should be normal, not addictive in nature.

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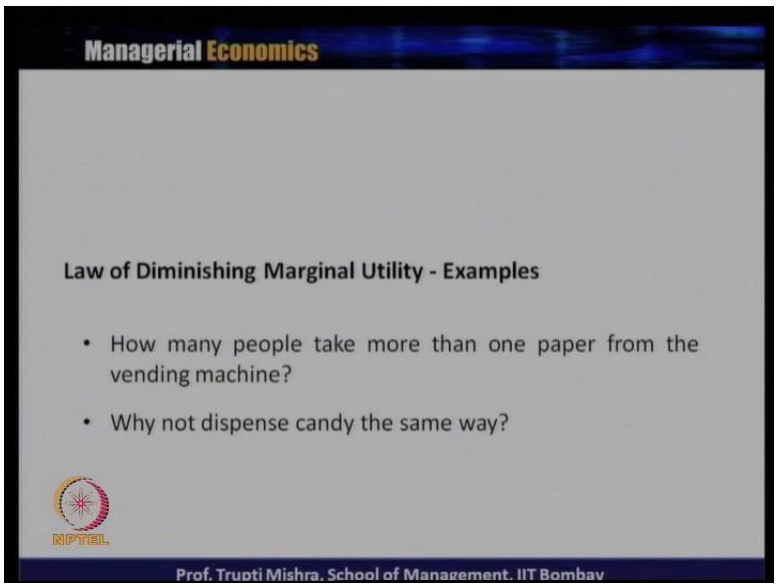

So, like if you are taking a specific example, you are taking two products: one is the may be the paper wending machine; another is the candy wending machine. So if it is a simple question, how many people take more than one paper from the wending machine? May be the answer is none of them because if you take the newspaper, it is a durable good. You go on reading for throughout the day. You do not require a second set of newspaper. But when it comes to candy, may be again, people they go on dispensing candy because may be they are having one now, may be they are having one later. So, in both these cases if you look at, there is a case of diminishing marginal utility.

But in case of diminishing marginal utility, that comes at the very first unit in case of the newspaper. But for candy, it comes at a little later because they go on consuming candy till the time the marginal utility is not reaching zero. But if you have already taken newspaper from the vending machine, the second one is again will not generate any level of utility, because you are always having the similar one for the first time. You are not going to consume again and again the same newspaper, even if you are getting a chance to get it from the vending machine. So, these are the typical examples that how the law of diminishing marginal utility is valid. As the consumer consumes more and more of a specific product, the utility generally goes on decreasing.