Managerial Economics

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Lecture - 25

Consumer Behaviour (Contd…) - I

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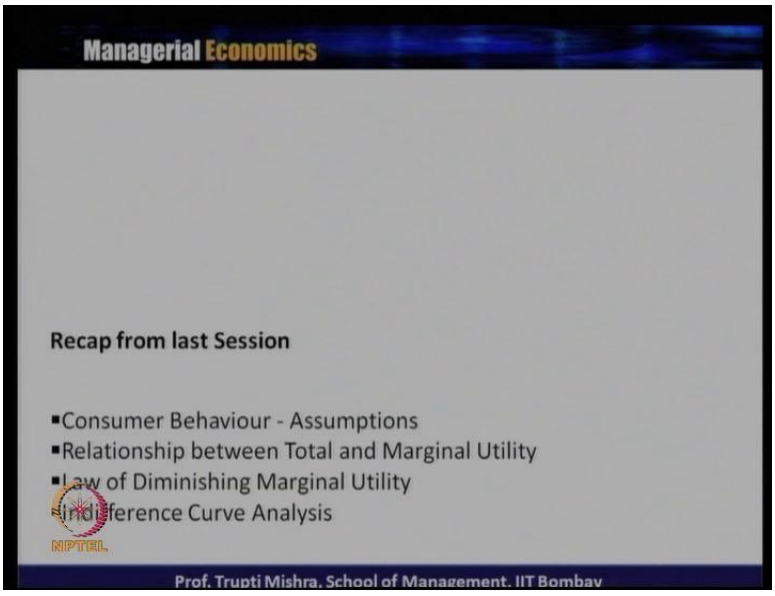

We will continue our discussion on Consumer Theory or Theory of Consumer Behaviour in this session also. So, if you remember in the previous session, we talked about the assumption what is generally taken in the theory of consumer behaviour or when we do the consumer behaviour analysis. Then when introduce the concept of total utility, marginal utility. How both of them they are related to each other? And this is the total utility and marginal utility is generally based on the perception of the consumer on the satisfaction, what they get after consuming the product.

Then, we introduce the concept of law of diminishing marginal utility, which tells us that; when a consumer go on consuming product after a certain point of time generally the marginal utility diminishes, and sometimes it even reaches to 0, and sometimes you get it the negative marginal utility. Then we introduce the concept of indifference curve analysis, which is a part of ordinal utility analysis. And here we discuss about the different properties of indifference curve. Then what is the rate at which the goods get substituted with each other

like the marginal substitution. And also, we discussed about the different kind of indifference curve like, when the nature of goods are different like complimentary goods are maybe the substitute goods.

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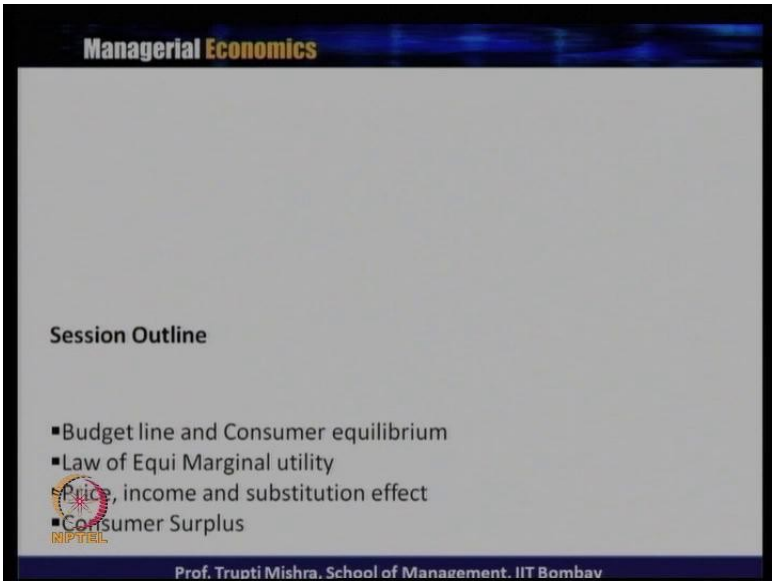

So, in today's class, we will carry our discussion on the budget line. How the consumer incomes get limited by the consumer preferences. Then we talk about the consumer equilibrium keeping budget line the constraint is the budget line or the budget constraint. Then we will introduce the concept of law of equi marginal utility.

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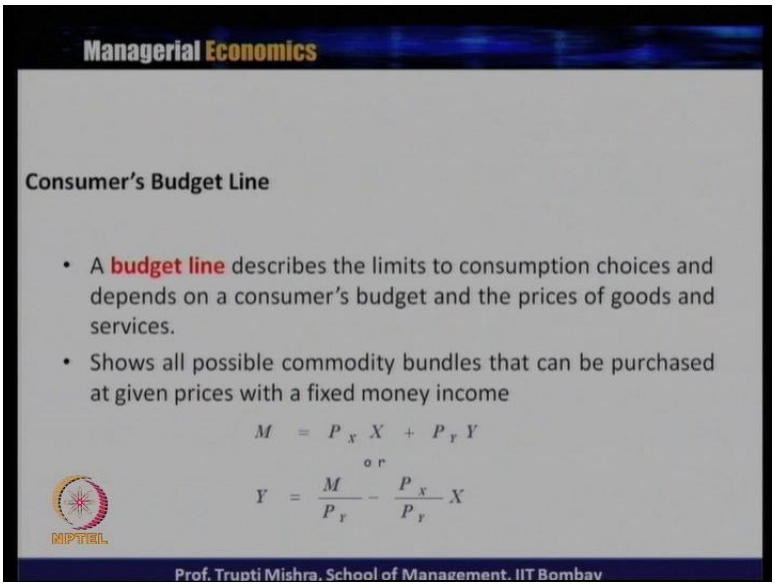

Then, we will discuss about the price income substitution effect. And finally, our discussion point will be on consumer surplus. So, what is a budget line? So, till the time we know that indifference curve gives us the consumer preferences. And at the same point, it also gives us the different combination of goods and services, which get the same level of satisfaction.

Now, more is always better for the consumer, but when it comes to affordability of the consumer always the income pose as a constraint. So, the consumer income is here, we consumer income, we represent in term of the consumer budget line. And budget line describes the limits to consumption choice, and depends on the consumer budgets or the prices of the goods and services.

So, it shows all possible commodity bundles that can be purchase at a given price with fixed money income. So, income is fixed, budget line shows us the different kind of goods, and services what the consumer can consume with this typical fixed income.

So, in this case, if you consider M is the money income. And if the total consumption basket of the consumer is just consist of just 2 goods X and Y. Then the total budget line will be represented in term of M, which is equal to P x X plus P y Y.

Now, why this is only P x X and P x Y? We are assuming that the entire money income of the consumer is getting spent only on the consumption of goods X and Y. So, P x is the price of X, P y is the price of Y. So, the x is the quantity of X, and y is the quantity of Y. So, entire money income is getting spent on the X and Y, and since it is equal to income the price of X. And price of Y is also multiplied along with the quantity of x and y.

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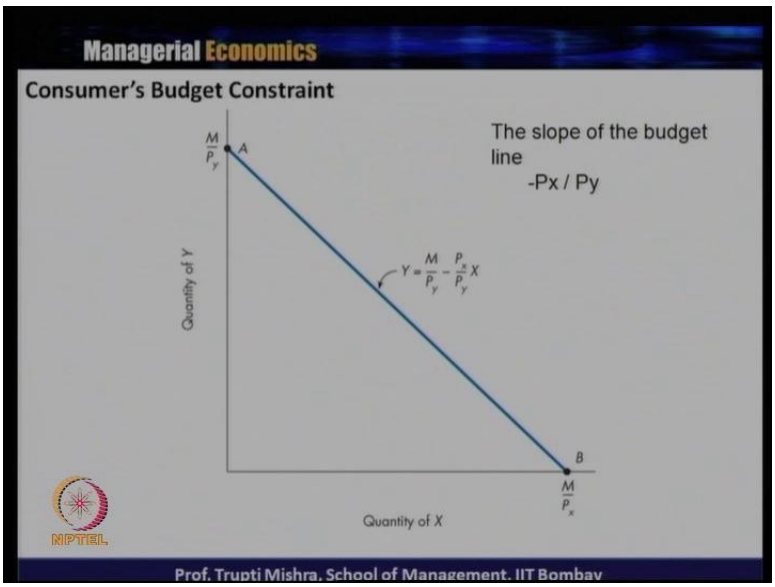

So, this is the graphical representation of the budget line. And if you look at here, we represent in the graph A and B as the budget line. Then, at the point A, if you will get the value is equal to M is equal to P y. And how you get the value of A at the point Y axis is equal to M by P y, because the entire money income is getting spent on only in the consumption of good one of the goods.

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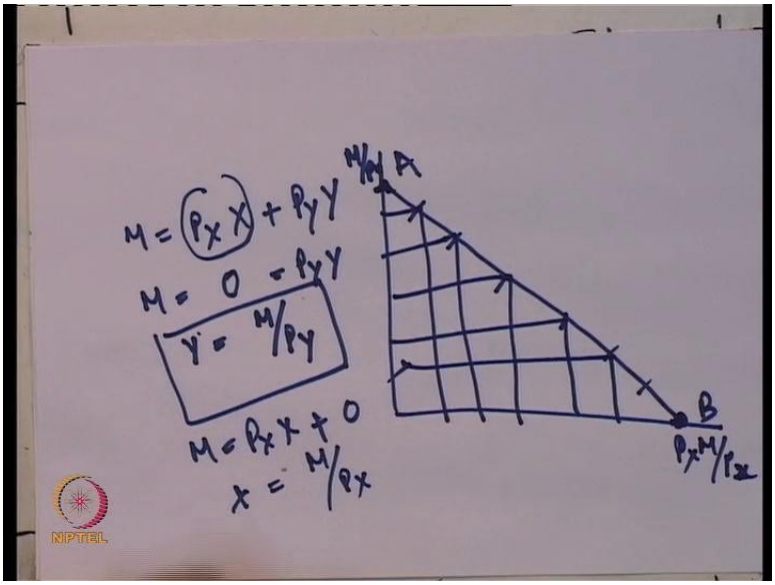

Similarly, M by P x, if you look at the other extreme here also the entire consumption is getting spent only the consumption of the goods and services. Let us see, how we can draw this budget line. So, if you remember this the budget line equation is P x X and P y Y. So, if we assume that the entire money income is getting spent only on consuming Y. Then this term becomes 0, and if you solve for Y. Then you get the value which is M is equal to P y, which we get here that is M is equal to P y.

Then similarly, if you spent the entire money income or if the consumer is spending entire money income only on consumption of X. Then the second item becomes 0. So, this M is equal to P x by X and the value of X is M/P x. So, here we get the value which is equal to M/ P x. So, if you join this 2 point, what is the significance of these 2 points? Suppose this is a; suppose this is B at this point A. The entire consumption is this entire money income is getting spent only on consumption of y.

And at this point the entire money income of the consumer is getting spent on the consumption of x. And in between all this point, it gives us the different quantity of x and y. So, any point in this range will give a mix of combination of goods x and y whereas, this 2 extreme point gives us that, when the entire money income is getting spent only on the consumption of the specific good.

In case of horizontal axis, this is on the consumption of good x. And in case of vertical x is in the consumption of good y. So in difference curve gives us the consumer preferences on goods and services. And whatever the satisfaction they get out of it. And budget line gives us, what is the possible combination of x and y can be consumed with a fixed money income of the consumer. We have simplified this analysis of indifference curve, and the budget line to 2 goods just for the simplicity of it. When you just take 2 goods otherwise also, there is an option when you have more goods and services. You can cluster them into specific groups, and you can represent them in the indifference curve.

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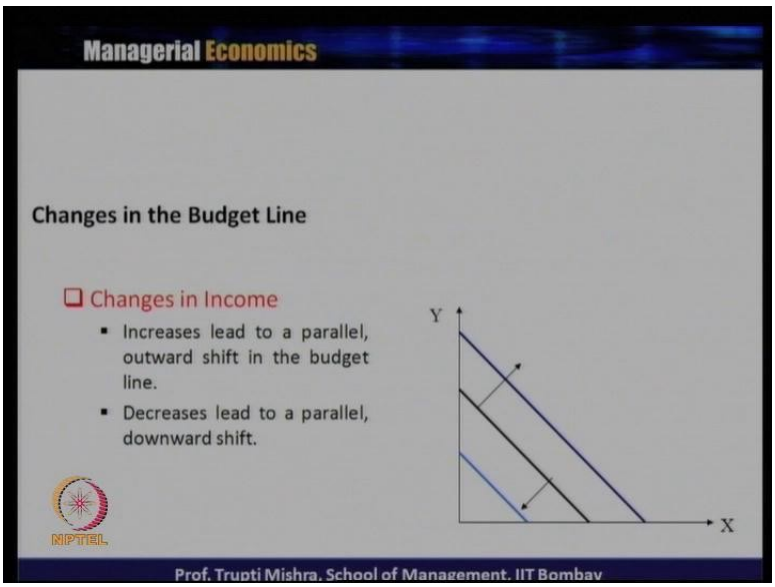

So, we have introduced the concept of the indifference curve in the previous session. And this session, we have introduced the case of the budget line. With the help of this, we will see how the consumer is reaching the equilibrium, but before analyzing the condition of consumer equilibrium. We will see that in which case, the budget line gets changes. First, when there is a change in the income. So, whenever there is a change in the income, it increases in the income leads to a parallel outward shift in the budget line.

Like, if you look at the third line that is the increase in the income from the original budget line. And decrease always in the downward direction. So, increase in the income lead to a right shift in the budget line. And decrease in the income leads to a left shift in the budget line.

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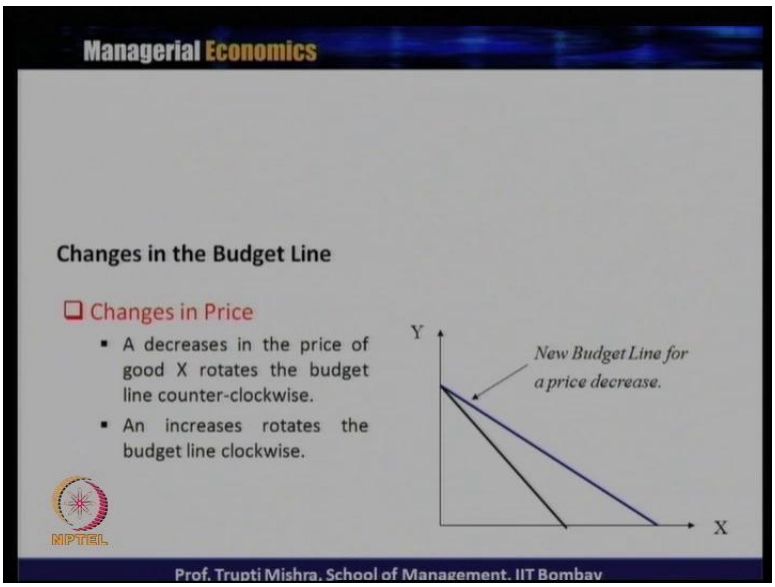

So, 1 is upward in case of increase and downward in case of decrease. Now, what is the change in the budget line, when there is a change in the price? A decrease in the price of good X rotates the budget line counter clockwise? If you, when you can see in the graph. So, the initial budget line is the black line.

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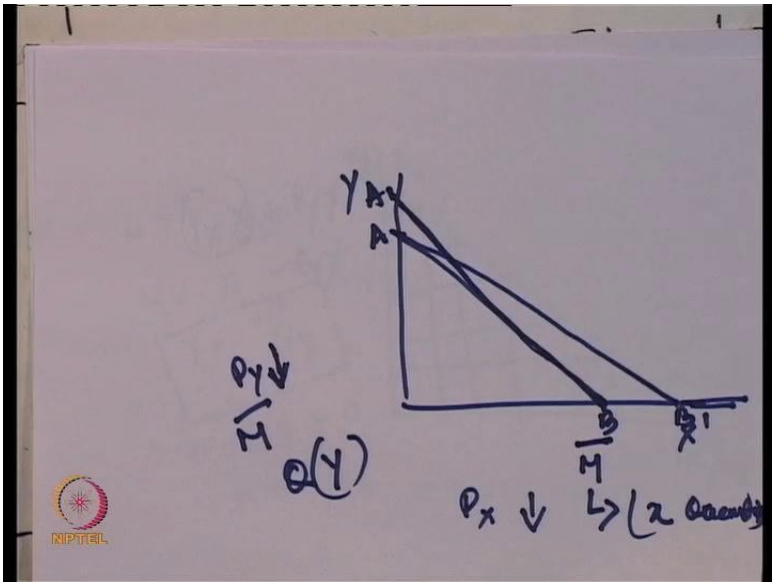

And when there is a change in the price of the goods. Now, with the same amount of money income; the consumer can consume more of good x, and because of this the budget line shift to the right. So, if you look at this case, if you are considering here as the X, here you are considering as the Y.

This is the original budget line. Now, price of X decreases, so with the same money income. Now the consumer can still have more quantity of x, as the price of price of x has decrease. So, in this case the budget line will shift to the right, this is the new budget line. So, this is A B; this is A B 1. Now, suppose the price of y decreases. Now, the same money income now, the consumer can have more quantity of Y. So, at this point B remain constraint.

Now, the curvature will change in case of Y, and suppose this is A 1 B. So, the new budget line is A 1 B, if the price of y is decreasing. Now, it will move in the opposite direction. If the price of x is increasing or price of x is, price of y is increasing. This is the case in the previous case; we analyse the decrease in the case decrease in the price of X and price of Y. And the scenario will change, when the price of X will increase or price of y will increase.

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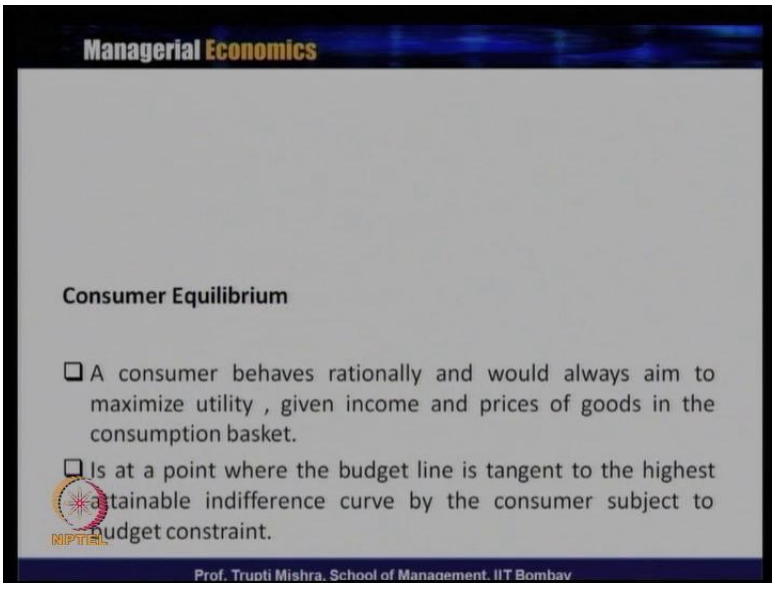

Now, we will see how to reach the consumer equilibrium? Consumer equilibrium is the point. This is the optimal consumption for the consumer. And what is the optimization problem for the consumer? The optimization problem for the consumer is to maximize the satisfaction.

So, consumer behaves rationally, and would always aim to maximize the utility given the money income prices of the goods in the consumption basket. So, irrespective of the price of the goods, and services the income keeping this as a constraint. The consumer always behave rationally, and always see that how they can maximize the utility.

It is at a point, where the budget line is tangent to the highest at a level of indifference curve by the consumer subject to the budget constraint. So, graphically how you get the point of consumer equilibrium? It is at a point where the budget line is tangent to the highest attainable indifference curve by the consumer subject to the budget constraint.

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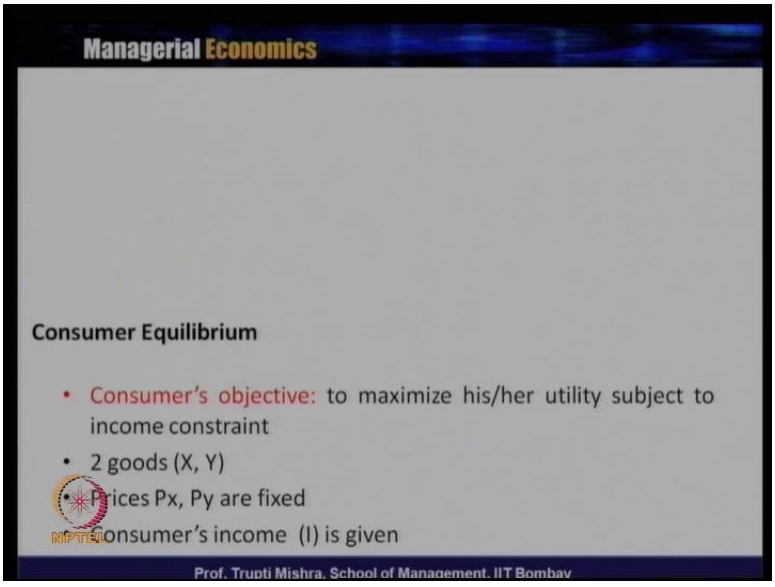

So, what is the consumer objective or what is the consumer optimization problem; to maximize his or her utility to the income constraint? We have kept 2 goods in this case; 1 is X and other is Y. So, the consumer consumption basket is consists of 2 goods X and Y. Price of both the x and y are fixed like P x and P y are fixed. Consumer income is given. So, price X and Y is fixed, income is fixed, 2 goods are there x and y. And the consumer objective is to maximize his or her utility subject to the income constraint.

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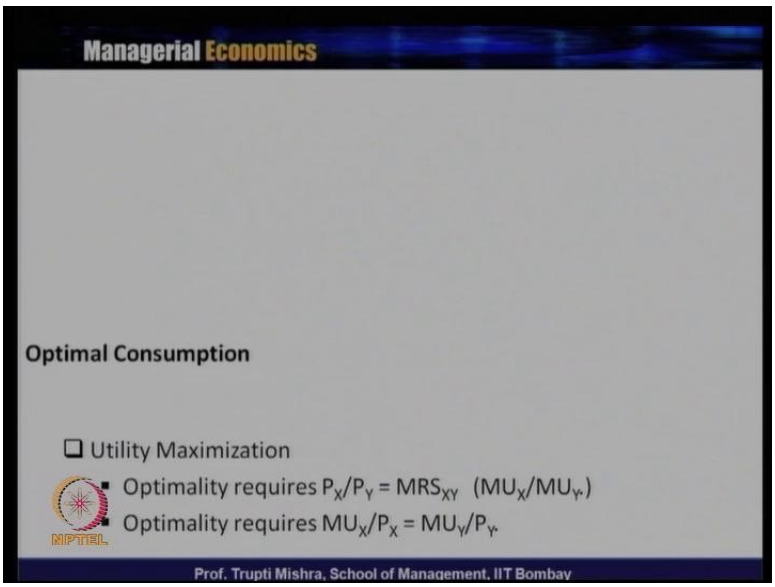

Now, what is optimal consumption? Optimal consumption is the point at which the consumer maximizes the utility or where the utility maximizing take place or that is point where the consumer equilibrium. Now, what is the precondition for this optimality or what is the precondition for this utility maximization? It requires the slope of the budget line is equal to the slope of the indifference curve. So, in the previous case, if you remember the budget line is A B right.

So, at the point A; this is we get a value that is M is equal to P y. And at the point B we get a value equal to M by P x. So, corresponding to this, what will be the slope of the budget line? The slope of the budget line will be P x by P y. And, as we know previously that the slope of the indifference curve is marginal rate of technical substitution is that is sorry marginal rate of substitution that is M R S x y, which is also equal to the ratio of marginal utility of x and marginal utility of y?

So, optimality requires the equality between the ratios of marginal utility and price of x, which is equal to the marginal utility and price of y. So, we have 2 goods in this case, price of x and price of y is fixed, income is fixed.

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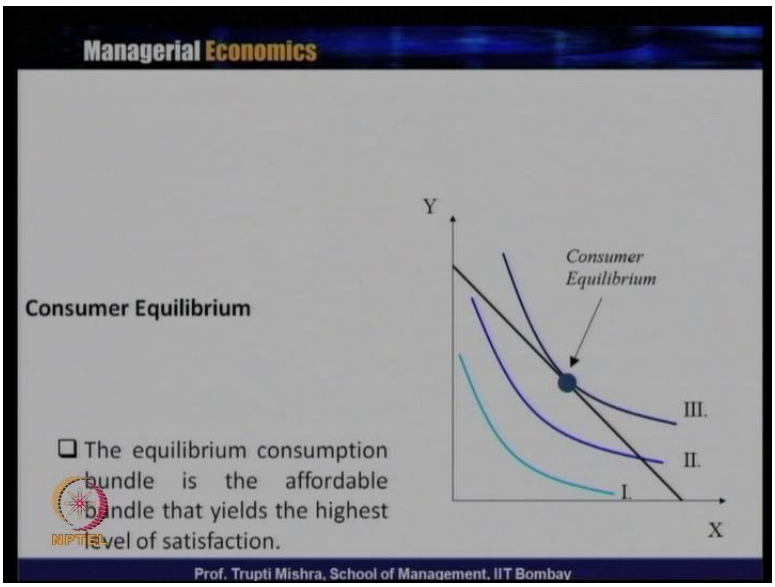

The optimal consumption or the want at which the consumer will reaches the equilibrium. At this point the ratio of marginal utility and price of x should be equal to the ratio of marginal utility and price of y. So, now if you look at in the graph, at this point you look at the arrow mark; this is the point of consumer equilibrium

Why this is the point of the consumer equilibrium? Because this is the equilibrium consumption bundle is the affordable bundle that in the highest level of satisfaction. The consumer can pick up the combination in the indifference curve 1. The consumer can pick up a combination in indifference curve 2.

The consumer can also pick up a combination good X and Y in the indifference curve 3. But the consumers since the optimality or since the optimization problem for the consumer is to maximize the satisfaction, maximize the utility. That is the reason the consumer will reach the equilibrium.

At this at the point in the indifference curve 3, because that gives a highest level of satisfaction and also the combination in indifference curve 3 can be achieved with the constraint in the form of the budget line or constraint in the form of the income. So, the straight line is the budget line, there are 3 indifference curves.

And the consumer will always pick up a point in the highest indifference curve, because that will give a higher level of satisfaction or the higher level of utility. And that goes the basic optimization problem with the consumer.

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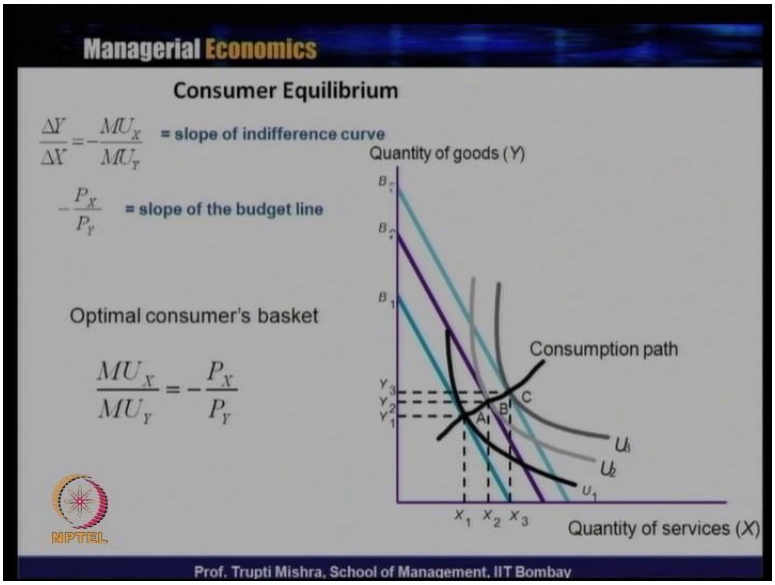

Now, we will check what is the condition for this consumer equilibrium in detail? So, del y by del x or ratio of marginal utility of x or y is the slope of the indifference curve. P x by P y is the slope of the budget line. And what is the ? What is the precondition? What are the conditions for the optimal consumption? That is ratio of marginal utility of x and y marginal is equal to the ratio of price of x and y. So, if you look at there are 3 points A point B and point C.

All these 3 points, the consumer is reaching the equilibrium. Because U 1 is one indifference curve, U 2 is the second indifference curve, and U 3 is the third indifference curve. Similarly, we have 3 budget lines B 1 B 2 and B 3. Now, suppose consumer has the income, which is equal to B 1. Now, having the equilibrium B 1, the consumer can only pick a point in case of combination in the case of indifference curve 1 that is U 1.

Suppose the income increases for the consumer from B 1 to B 2. Now the consumer can prefer a quantity or prefer a combination of x and y in the higher indifference curve that is U 2. So, that is another consumer equilibrium point at the point B.

Similarly, when the price of B 3 increases or the income of the consumer increases from B 2 to B 3? The consumer can again achieve a higher level of satisfaction by choosing a combination as the indifference curve 3 that is U 3. So, if you join these 3 points A B and c. We reach to a path which is consumption path. And why this is known as the consumption path, because when the income increases the consumption pattern of the consumer. And if you look at each equilibrium point the consumer maximize the satisfaction.

So, after joining point A B and C, all these are consumer equilibrium point, we get as the consumption path. So, consumer equilibrium is the point, this is also known as the optimal consumption or this is also known as the, may be the best consumption for the consumer, because they get a higher level of satisfaction or the highest level of satisfaction with a limited income with a fixed income.

And when the prices are also fixed and how this can be achieved? There are 2 points to achieve this; 1 at this point, where the ratio of the marginal utility. And price of x is equal to the ratio of marginal utility and price of y.

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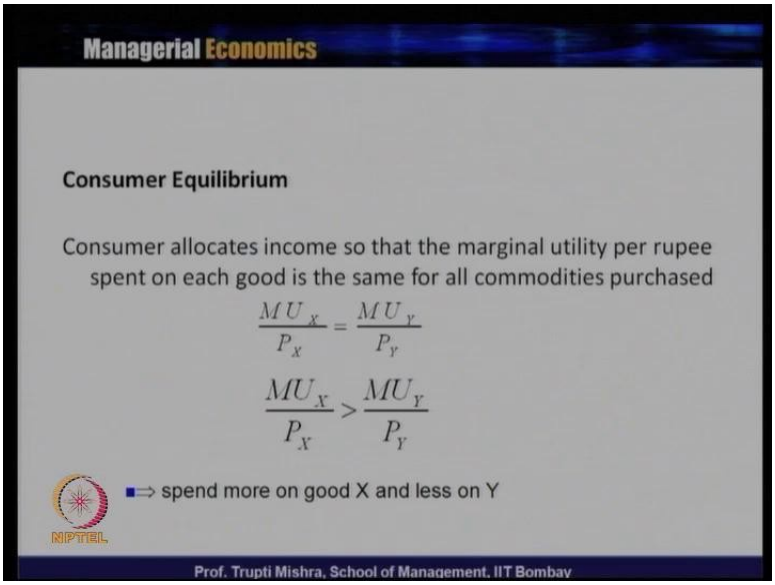

And geometrically, this is at the point where the budget line is tangent to the indifference curve. So, consumer there is an equality ratio between the marginal utility, and price of x and marginal utility and price of y.

So, consumer allocates income. So, that the marginal utility per rupees spend on each good is same for all commodity purchase. So, like since there is a ratio is equal to ratio of one good is equal to another good. It can be said that the marginal utility per rupee spent on per rupees for each good is same for all the commodities purchase.

Till the time the equality is maintained, then this is fine. But when there is a disturbance in the equality or at any point of time. The ratio of marginal utility price of ONE good is greater than or smaller than the ratio marginal utility and the price of the other goods.

In this case, we can say that like in this case the ratio of marginal utility of x is greater than price of x is greater than the marginal utility of y than price of y the consumer will spend more on good x. And less on y, because he is getting more marginal utility by spending on x as compared to y.

The situation will again change, if the marginal utility and price of y is greater than the ratio of marginal utility and price of x. In this case the consumer will prefer to spend more on good y as compared to x, because the consumer is getting a higher level of satisfaction or higher level of utility by spending on good y.

Because the marginal utility, what he is getting by spending one additional rupee on it is giving a higher utility as compared to additional utility that he is getting from good x. So, if it equality, then the consumer is spending money in such a way because the marginal utility is getting that is equal.

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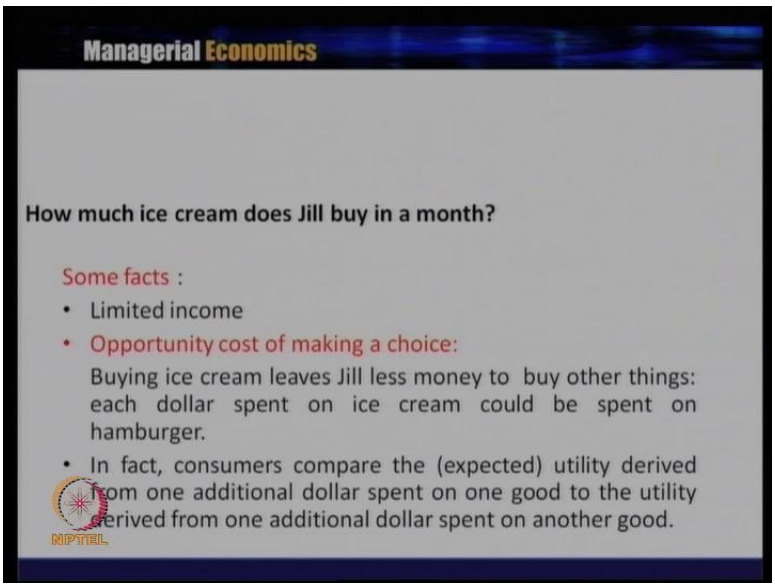

But, sometime there is a mismatch; the consumer always spends more money income, where they get a higher level of marginal utility. Now, we will take an example that how generally these choices are made, when it comes to the decision making in term of the marginal utility.

We will take a case of Jill that how much of ice cream does Jill by in a month. There are some facts, this is limited income. And there is also an opportunity cost involved of making a choice. Buying ice cream leaves Jill less money to buy other thing each dollar spent on ice cream could be spent on the hamburger.

So, how much ice cream Jill should buy it. There are few facts on this. He cannot buy unlimited, because there is limited income. And also, there is opportunity cost associated with it, whenever he is buying the ice cream, because the same dollar or the same money income spent on buying other goods like the case of the hamburger.

So, whether it is Jill or any other consumer, they always make a comparison before deciding on where they have to spend the money income. So, in this case, if it ice cream or it is the case of ham burger, Jill has to decide on the basis of the marginal utility. How much marginal utility he is generating? When he is spending money on the ice cream? Or spending money on the ham burger for example?

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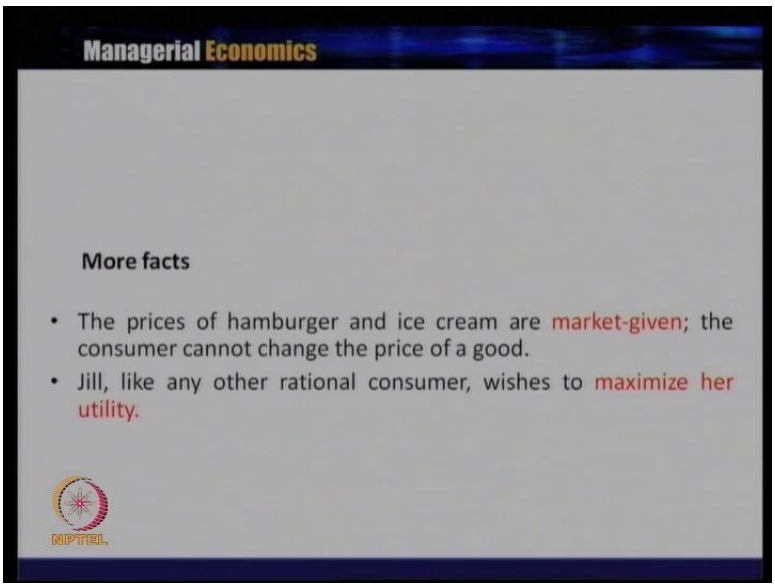

So, some more facts the price of hamburger, and ice creams are market given. The consumer cannot change the price of the goods. Jill, like any other rational consumer wishes to maximize her utility. So, prices are given, marketing are given consumer cannot change it. And Jill maximize her utility, because this is the general optimization problem for any rational consumer.

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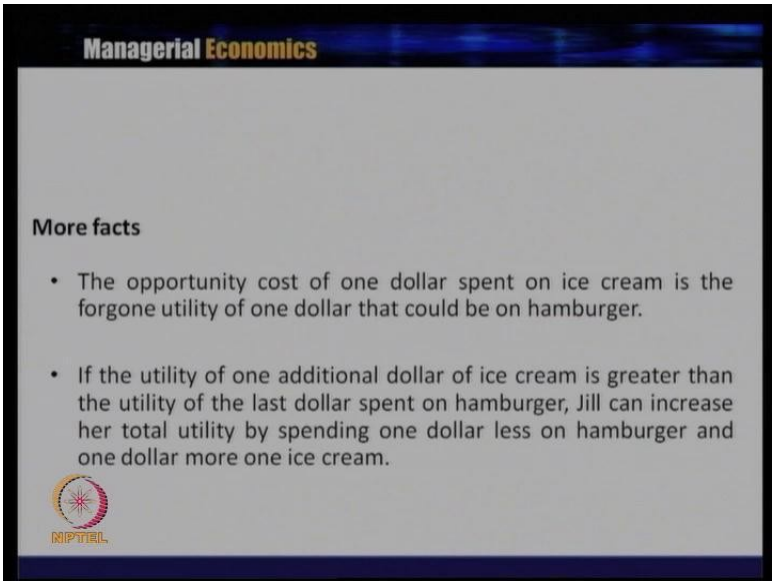

The opportunity cost of 1 dollar spent on ice cream is the forgone utility for 1 dollar that could be spent on the hamburger. Because what is the opportunity cost here, if he is spending one dollar on ice cream. Then the opportunity cost of this dollar is to forgone the utility of 1 dollar that could be on hamburger.

So, if he is not spending on the ice cream. He could have got it on the, he could have bought a hamburger, if the utility of 1 additional dollar of ice cream is greater than the utility of the last dollar spent on hamburger. Jill can increase her total utility by spending 1 dollar less on ham burger and on dollar more on ice cream.

So, it is like, when he is getting more utility by spending additional dollar on ice cream rather than on ham burger. In his next consumption, what he will do is, he will reduce his consumption from ham burger. And he will spend more on ice cream, because he is getting a higher level of utility, if he is spending on ice cream.

So, here the decision rule is, when he is spending or when any consumer is spending on more unit of money. Whether it is in the form of dollar; in the form of the rupees; whatever the additional utility they are getting. And their decision always goes for the product, where they are getting a higher level of utility. And the same is happening in the case of Jill. Even if she is spending both on ice cream and hamburger, but if she is getting more utility on ice cream she will prefer to spend more on ice cream rather than the hamburger.

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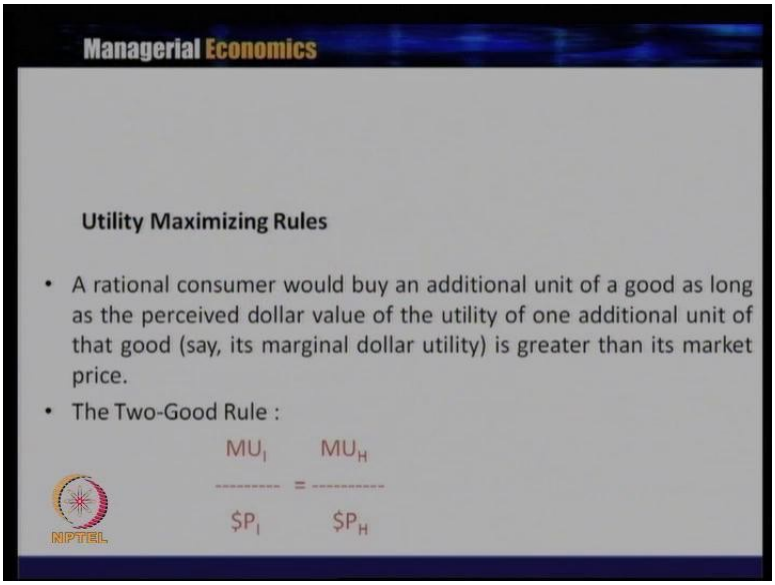

So, utility maximizing rule has to say, that there is a ratio of marginal utility of x and y. Similarly, if you take two-good here I and H; the two-good rule is the ratio of marginal utility and price of I. It should be equal to the ratio of marginal utility and price of H.

The rational consumer would buy an additional unit of good H. The perceive dollar value of utility of 1 additional unit of that good say, marginal utility is greater than its market price. Like till the time, the ratio is equal, the consumer is spending on both the goods, but when it comes to inequality as we discussed in before few minutes.

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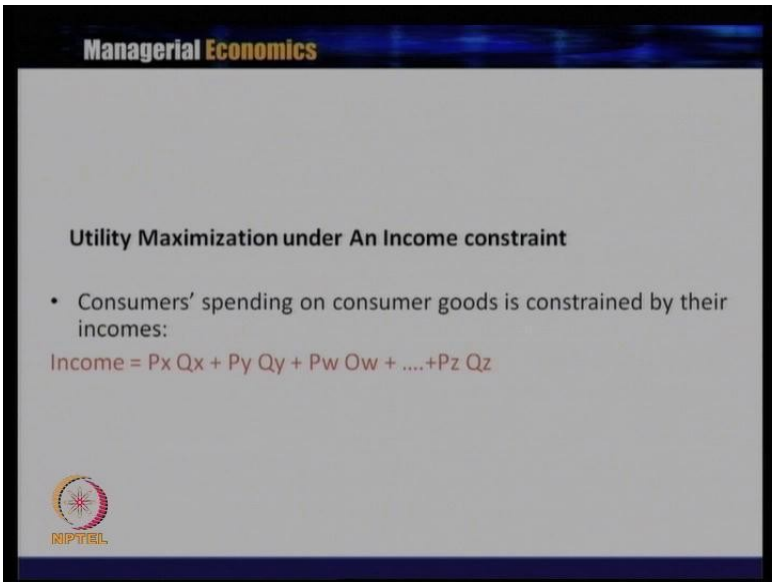

If there is an inequality, the consumer always spends more on the goods where they are getting higher level of utility. Now, we will see how the utility maximizes takes place under an income constraint. Consumer spending on consumer goods is constraint by their income like here.

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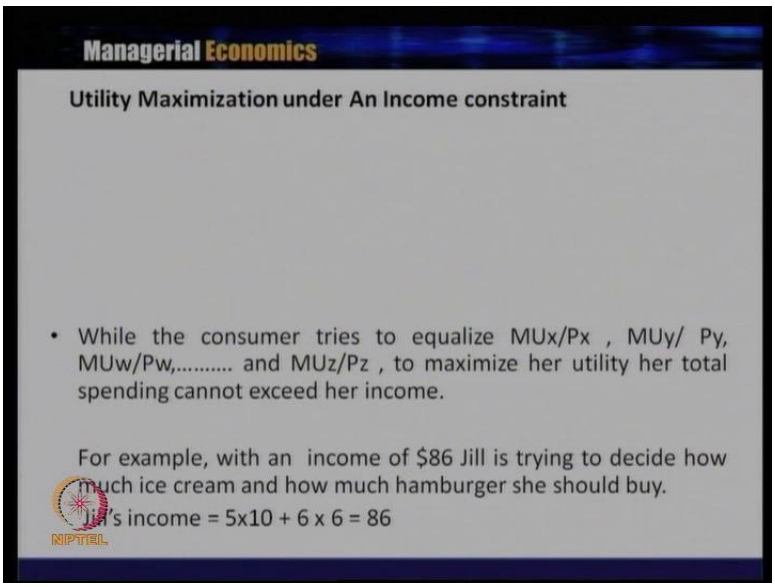

You can look at the budget line equation is, P x Q x plus P y Q y or P w or Q w or P z Q z and the income constraint or the budget constraint consist the price of the goods and the quantity of the goods. So, that what can be purchased with a fixed money income? So, in this case, even if the consumer tries to always equal the ratio of the marginal utility and the price of all the goods, they can spend equal amount of money on all the goods. But to maximize our total utility if it is a case of Jill, her total spending cannot exceed her income.

For example, with an income of 86 dollars, Jill is trying to decide how much hamburger she should buy. So, if Jill income is 86, then she can consume both the goods, may be ice cream and the hamburger. So, if it is 5 multiplied by 10, plus 6 multiplied by 6.Then it comes to 86 rupees. Now, we will see how we get this number 5 10 6 and 6, which one is the unit and which one is the price, and what is the requirement for here? We should know what the price of ice cream we should know what is the price of hamburger. We should know what the money income that Jill is having.

So, we know that the Jill is having the income equal to 86 dollar. Now we will see with a help of 86 dollars, how much unit of ice cream or how much unit of hamburger Jill can buy. With this income, we see whether she is reaching the optimization or optimal consumption or not.

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So, this is the example of the quantity price of both the ice cream and hamburger. So, the first column gives us the quantity. The second column gives us the marginal utility of ice cream. The third column gives us the price of ice cream. The fourth column gives us the ratio of marginal utility and price of ice cream. The fifth column gives us the marginal utility of hamburger. The sixth column gives us the price of hamburger. And the last column gives us the ratio of the marginal utility of hamburger and price of hamburger.

Now if the price is 10 for ice cream and 6 for hamburger, then how many units of ice cream Jill should buy and how much unit of hamburger she should buy? What is the ratio? If you remember the equality condition, optimal consumption is one where the marginal utility and price of both the goods has to be equal. So, in this case we are getting the marginal utility and price of good is equal, either at the unit 5, where the price is 10 rupees, may be the price of ice cream is 10 dollars and price of hamburger is 6 dollars.

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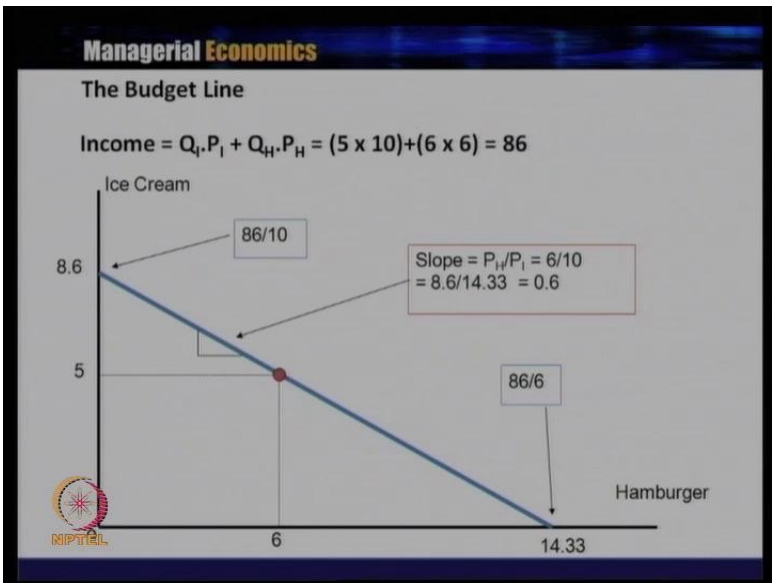

Now looking at this, if you plot it in a budget line, when the entire 86 rupees is getting spent on ice cream, then the value of y is 8.6 because price of ice cream is 10 dollar. And with the help of 86 dollar, the consumer can only buy 8.6 units of ice cream. And if the consumer is buying hamburger only, then in this case, the consumer can buy 14.33 units of hamburger. because, the price of the hamburger is fixed at 6 rupees. So, there are 2 extremes; one extreme 8.6, the other extreme 14.33.

And, what is the optimal consumption? The optimal consumption is when the consumer is buying 5 unit of ice cream and 6 unit of hamburger. So, price of ice cream is 10 dollars, it comes to 5 units, it comes to 50 dollars and price of hamburger is 6 dollars, when the consumer is spending 6 units on hamburger that gives us the 36 dollars. So, 50 plus 36, that gives us the 86 dollar. And what is slope here? The slope here is 6 by 10. Because 6 is the price of the hamburger and 10 is the price of the ice cream, and that comes to 0.6 as the slope.

So, if you look at now, what is the optimal consumption? The optimal consumption is 5 unit of ice cream and 6 unit of hamburger, which gives the level of satisfaction to Jill, and also this fits within the income that is 86 dollar.

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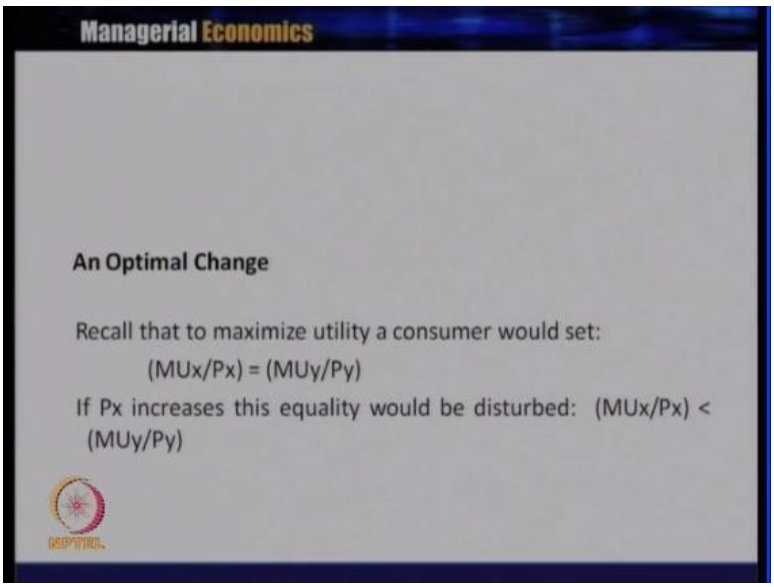

So, if you recall the utility maximize rule. This is also the ratio of the one goods as compare to the ratio of the other goods. And the price of x increases, this equality would be disturbed. It is not only the utility will disturb this equality. Also when there is a change in the price that will also disturb the equality. So, M U x P x will be less than M U y P U y, if there is a increase in the price of x. And similar thing also happen, if there is a change in the price of y.

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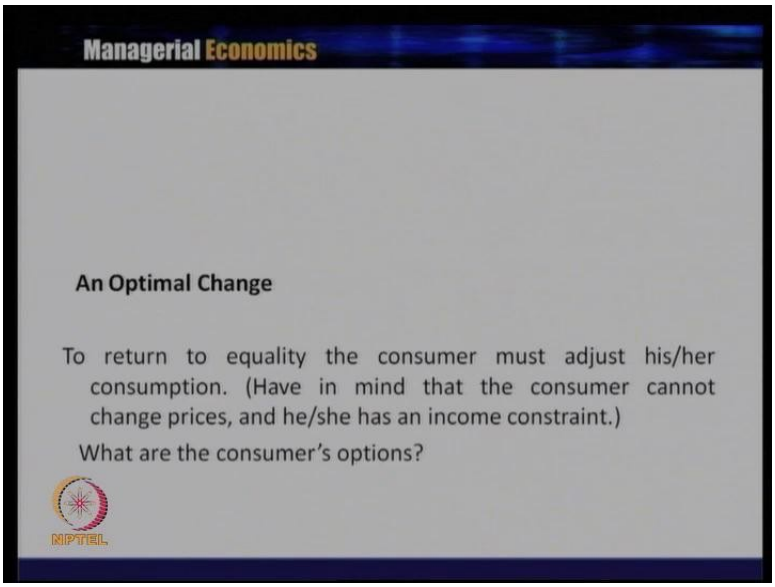

So, to return to equality the consumer must adjust his or her consumption, having in mind that the consumer cannot change the price, if he or she has an income constraint. Then what are the consumer options? If there is a mismatch to reach to the optimal consumption, the consumer must adjust to his or her consumption. Here we need to remember here that, the consumer cannot change the price, the consumer cannot change the income available to him.

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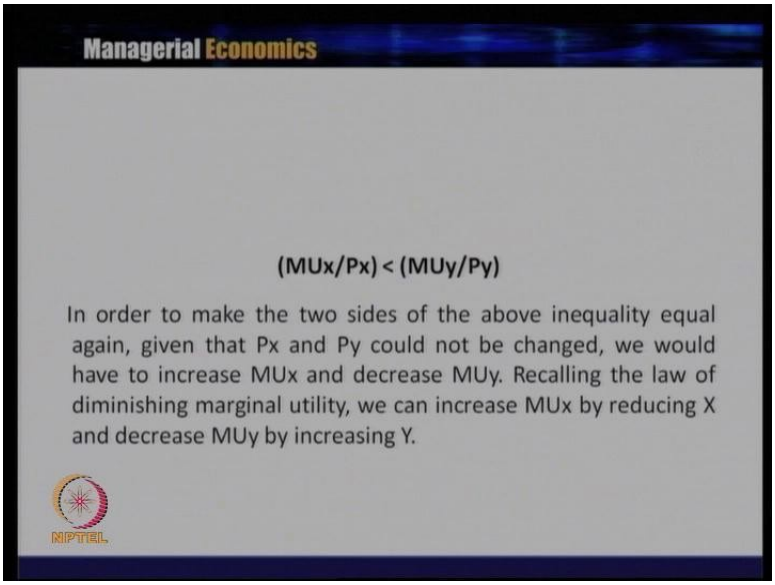

Now, what are the consumer options? In order to make the two sides of the above inequality equal again, given that P x P y could not be changed, we could have to increase M U x and decrease M U y. Recalling the law of diminishing marginal utility, we can increase M U x by reducing X and we can decrease M U y by increasing Y.