

The Theory Of Consumer Choice

Paper : Introductory Microeconomics

Unit III - The Households

Lesson: The Theory Of Consumer Choice

Lesson Developer: Jasmin

Jawaharlal Nehru University

Table of Contents

The Theory of Consumer Choice

Learning Outcomes

Introduction

The Budget Constraint

- **Slope of the budget constraint**

Consumer Preferences and Indifference Curves

- **Indifference Curves: Properties**
- **Types of Indifference Curves and their shapes**

Optimization

- **Changes in Income and Consumer's Choices**
- **Changes in Prices and Consumer Choice**
- **Income and Substitution effects**
- **Equivalent and Compensating Variation**

Demand Curve: Derivation

Application of The Theory of Consumer Choice

- **Slope of the demand curve: case of a giffen good**
- **Wages and Labor Supply**
- **Interest Rates and Household Savings**

Conclusion

Summary

Exercises

Glossary

References

Web-links

The Theory Of Consumer Choice

Learning Outcomes

This chapter aims to give the reader, a deep insight into the Theory of Consumer Choice. The lesson deals with questions like “How does a consumer decide what to buy?”, “What are the trade-offs faced by him while making such decisions?”, “How do the decisions change with change in factors like price, incomes, interest rates etc.?”. After reading the chapter, the reader should be able to understand the concepts of affordability and budget constraint, Indifference curves and how do they depict consumer preferences, the impact of changes in income and price on the consumer’s choice, Income and Substitution Effects. The chapter ends with derivation of demand curve and a few applications of the Theory of Consumer Choice. The practice questions at the end of the lesson will help in developing a better understanding of the concepts discussed in the lesson.

Introduction

The theory of demand has its foundations in the theory of consumer choice. Analysis of consumer behavior is a prerequisite to deal with the theory of demand. The Theory of Consumer Choice relies on the assumption that the consumer is rational, he is equipped with the knowledge regarding his income, commodities available and their prices, to make a decision as to what to buy. Trade-offs faced by the consumers while making a choice, assume an important role in the theory of consumer choice. Amount to be spent on different commodities, given the income and the price, amount of time to be devoted to leisure and work, whether to consume more in the present or to save more for the future are a few important questions that a consumer encounters in his day to day life. In the due course, we will see how the theory of consumer choice caters to these questions.

The Budget Constraint

A consumer would prefer having greater quantity or better quality of the goods he consumes, however, his income acts as a limit on the amount of money he can spend on consumption of those goods. It is important to understand this constraint. To take a simple example, let’s study the case of a consumer who consumes only two commodities: Burger and Milkshake. Suppose that the consumer earns a monthly income of Rs.1000, the price of a burger is Rs.20 and that of a glass of milkshake is Rs.10. Table No. 1 lists several

The Theory Of Consumer Choice

combinations of milkshake and burger that the consumer can choose from given his income and prices of the two goods.

Glasses of Milkshake	Number of Burgers	Spending on Milkshake	Spending on Burger	Total Spending
0	50	0	1000	1000
10	45	100	900	1000
20	40	200	800	1000
30	35	300	700	1000
40	30	400	600	1000
50	25	500	500	1000
60	20	600	400	1000
70	15	700	300	1000
80	10	800	200	1000
90	5	900	100	1000
100	0	1000	0	1000

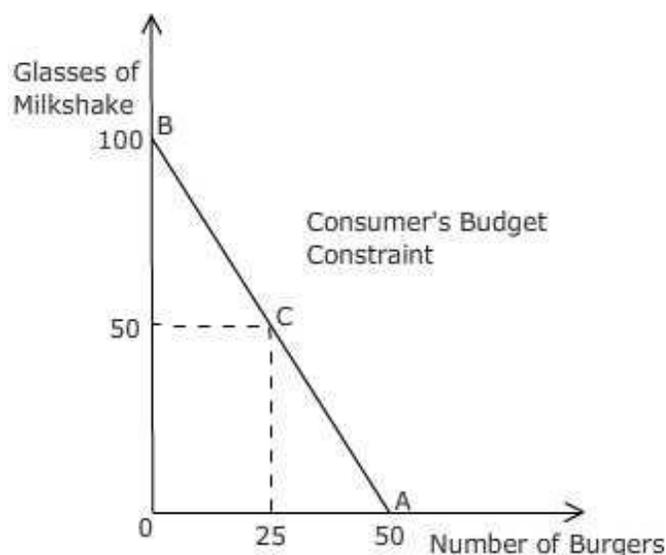


Figure 1: Consumer's Budget Constraint

The first row in table 1 shows that if all the income is spent on burgers, the consumer will be able to consume 50 burgers but no milkshake, however if he spends the entire income on milkshakes, he will be able to consume 100 glasses of milkshake but no burgers. Figure 1 depicts consumer's budget constraint. The vertical axis plots glasses of milkshake while

The Theory Of Consumer Choice

the horizontal axis plots number of burgers. Point A corresponds to the case where the consumer spends all his income on burgers while at point B he consumes 100 glasses of milkshake but no burgers. At point C consumer spends equal amount of income on burger and milkshake. The downward sloping curve BCA shows the trade-off, the consumer faces in consuming burger and milkshake, given income and prices. Consuming more of burgers leaves less money with the consumer to buy milkshakes. Hence, as the consumption of one commodity rises, the consumption of the other commodity has to fall, if the income and prices of the commodities are kept fixed.

Slope of the Budget Constraint

Budget constraint's slope measures the rate at which the consumer can trade one good for the other. Slope between any two points is calculated as the ratio of change in the vertical distance to the change in the horizontal distance. For instance if the points C and A in figure 1 are considered, the vertical distance is 50 glasses of milkshake and the horizontal distance is 25 burgers, so the slope is 2 glasses of milkshake per burger. The slope of the budget constraint is the same as the ratio of the prices of the two commodities. Since the price of a burger is Rs.20 and the price of a glass of milkshake is Rs.10, the opportunity cost of a burger is 2 glasses of milkshake. The budget constraint's slope of 2 is the trade-off that market offers the consumers. The consumer can trade 2 glasses of milkshake for a burger in the market. Since the budget constraint is downward sloping, the slope is a negative number.

Consumer Preferences and Indifference Curves

Just like the budget constraint, consumer preferences are also an important part of the theory of consumer choice. To continue with the example of burgers and milkshake, it is the consumer preferences that help the consumer to choose from different combinations of these two goods. To show the consumer preferences graphically, we often use indifference curves. An indifference curve is the locus of several bundles of consumption that give the consumer an equal level of satisfaction. Figure 2 shows indifference curves for the consumer who consumes burgers and milkshake. Points A, B and C on the indifference curve I_1 show various combinations of burgers and milkshake that make the consumer equally happy. Moving from point A to B, the consumption of milkshake increases while that of burger, falls. Same is the case when the consumer moves from B to C. The slope of the indifference curve is termed as the marginal rate of substitution which equals the rate at which the consumer is ready to substitute one good for the other. In this case the marginal rate of substitution is the measure of the number of glasses of milkshake that need to be given to the consumer for a unit reduction in consumption of burger. Indifference curve I_2 , shows greater level of satisfaction relative to the indifference curve I_1 .

An indifference map gives a complete ranking of the consumer preferences, a consumption bundle on a higher indifference curve will give a greater level of satisfaction to the consumer relative to the consumption bundle on the lower indifference curves. If the points A and B lie on the same indifference curve, the consumer is indifferent between the combinations A and B and if A lies on an indifference curve higher than the indifference curve on which B lies, the consumer prefers consumption bundle A to B.

The Theory Of Consumer Choice

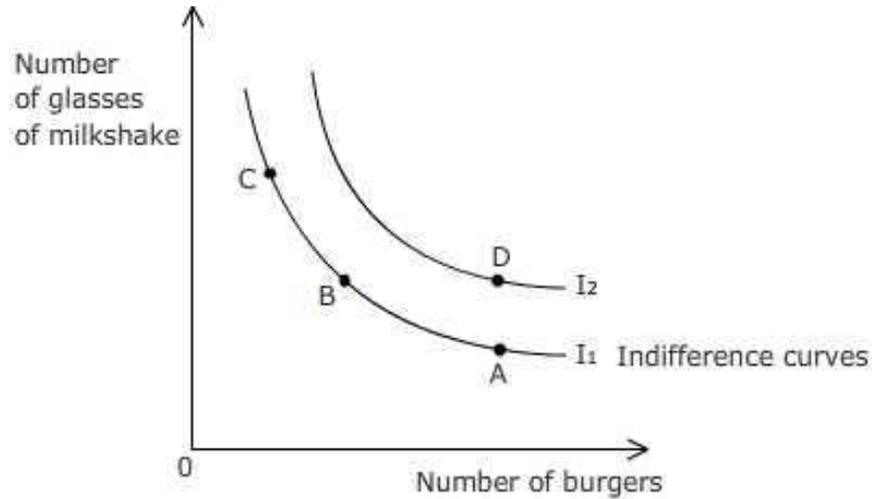


Figure 2: Consumer's Preferences Represented by Indifference Curves

Indifference Curves: Properties

Discussed below are a few important properties of Indifference curves:

- 1.) Higher indifference curves carry a greater level of satisfaction compared to the lower ones: The preference of the consumers for greater quantities gets exhibited in the indifference curve approach also. Higher indifference curves depict bundles with larger quantities of goods relative to the lower ones and the consumer prefers higher indifference curves to the lower ones.
- 2.) Indifference curves slope downwards: In the case where a consumer likes both the goods, when the quantity of one good is raised, the quantity of the other good has to fall for the consumer to stay at the same level of satisfaction. This is what makes the indifference curves slope downwards.
- 3.) Indifference curves do not intersect: This property can be best illustrated through a graph. Look at figure 3, suppose points A and B lie on the same indifference curve, also point B and C lie on the same indifference curve. This implies that the consumer is equally satisfied at points A and B and the same applies to points B and C as well. This would imply that the consumer is indifferent between points A and C, which is not possible because point C has greater amount of both the goods. We reach a contradiction, indifference curves cannot cross.

The Theory Of Consumer Choice

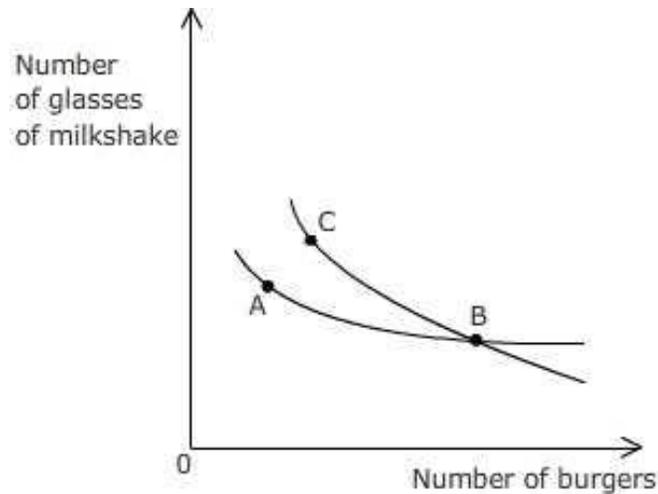


Figure 3: Indifference Curves Cannot Intersect

- 4.) Indifference curves are bowed inwards: As we know the slope of an indifference curve is equal to the marginal rate of substitution which depends on the amount of the two goods that the consumer is consuming presently. People are willing to give more of that commodity which they possess in greater quantity and are less willing to give up on the one which is held in meagre amounts. If the consumer has a lot of glasses of milkshake and small number of burgers, he will be willing to give up more number of glasses of milkshakes for every single unit of increase in the number of burgers. However as he continues to have more and more burgers, the number of glasses of milkshakes that he gives up for every burger will reduce. This explains why indifference curves are bowed inwards. As illustrated by figure 4, at point A, the consumer has a lot of milkshake but less number of burgers, at this point it would be required to give a lot of glasses of milkshake to the consumer to make him give up one burger. At point B on the other hand, the consumer has a lot of burgers but less milkshake, so the consumer will be willing to give up a burger for a few glasses of milkshake. The marginal rate of substitution at point A is 5 glasses of milkshake for a burger while the marginal rate of substitution at point B is 1 glass of milkshake for a burger.

The Theory Of Consumer Choice

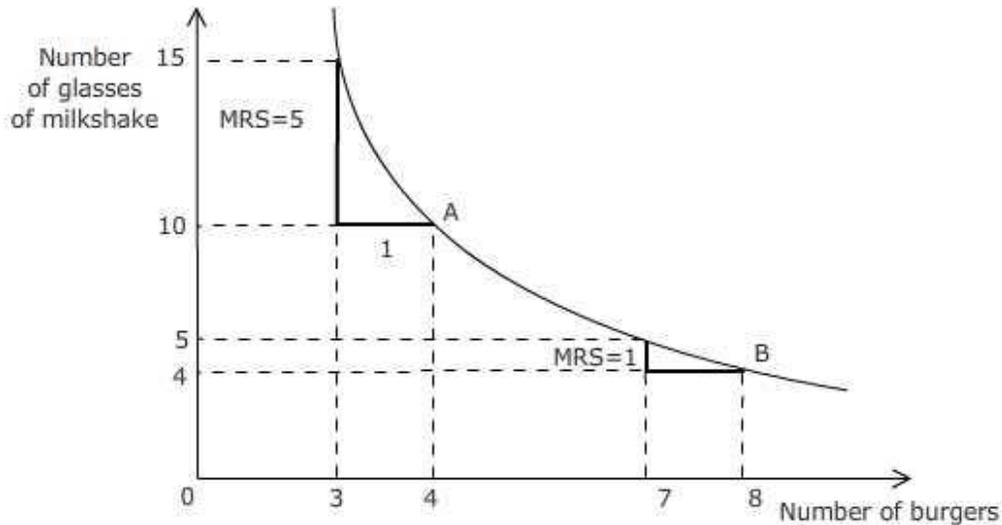


Figure 4: Indifference Curves are Bowed Inwards

Types of Indifference Curves and their shapes

Different kind of preferences can be shown by different types of indifference curves:

- 1.) Perfect Substitutes: perfect substitutes are shown by straight line indifference curves, the slope along these straight lines stays constant which means that the rate at which one good can be exchanged for the other is constant. For instance a pack of 20 black paperclips can be perfectly substituted for a pack of 20 green paper clips for a person who does not have any color preference.

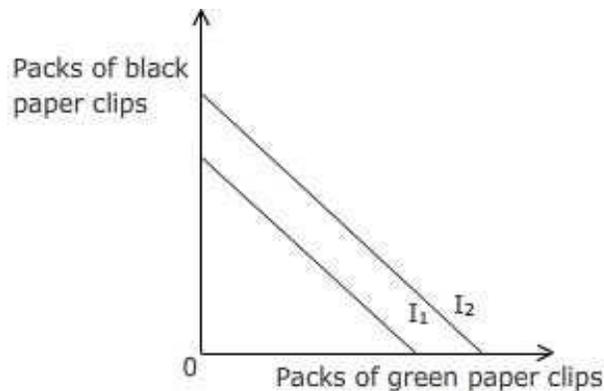


Figure 5: Perfect Substitutes

- 2.) Perfect Complements: When the two goods are perfect complements, the indifference curves to represent such preferences are L-shaped or right angled. A good example of perfect complements is pair of shoes. A bundle of 5 left shoes and 7 right shoes yields 5 pair of shoes.

The Theory Of Consumer Choice

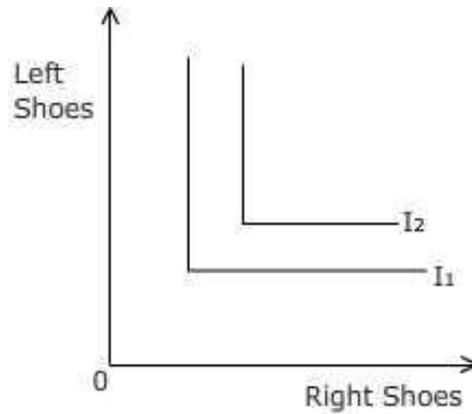


Figure 6: Perfect Complements

- 3.) Good with zero utility: In case the consumer gets 0 satisfaction out of one good, he will consume the other good which gives him positive utility and would not be willing to sacrifice any amount of the other good for the one that offers no satisfaction. For example egg cannot offer any satisfaction to a vegetarian.

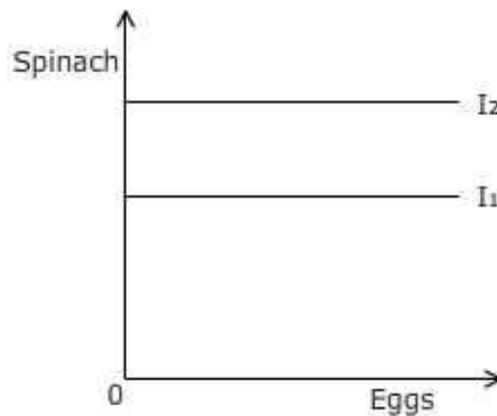


Figure 7: Good with Zero Utility

- 4.) A Necessity: There are certain commodities that are absolute necessity, there might be a minimum quantity of such goods which is necessary for living. The indifference curve in such a case becomes steeper as the consumption of the absolute necessity falls towards the minimum quantity for sustenance.

The Theory Of Consumer Choice

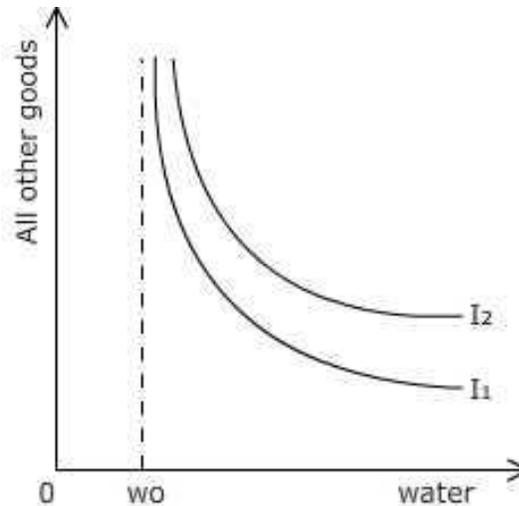


Figure 8: A Necessity

- 5.) Good that offers negative utility beyond a particular level of consumption: Beyond a particular point of consumption, if a consumer consumes or is forced to consume more of a particular good, he would start getting negative utilities out of further consumption. In such a case the indifference curve becomes positively sloped beyond that point of consumption. If the extra units can be disposed off without incurring any costs the indifference curves will become horizontal.

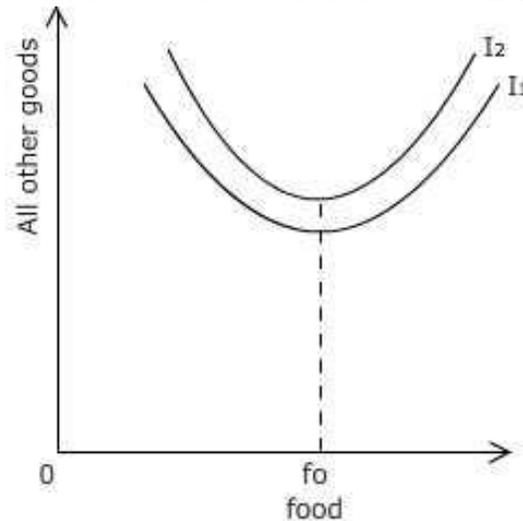


Figure 9: Good that Offers Negative Utility Beyond a Particular Level of Consumption

- 6.) A good that is not consumed: When a consumer in an equilibrium condition does not consume any amount of one good, it is called a corner solution. In this case the indifference curve cuts the axis of the good which is not consumed. The slope of the indifference curve is flatter than the budget line.

The Theory Of Consumer Choice

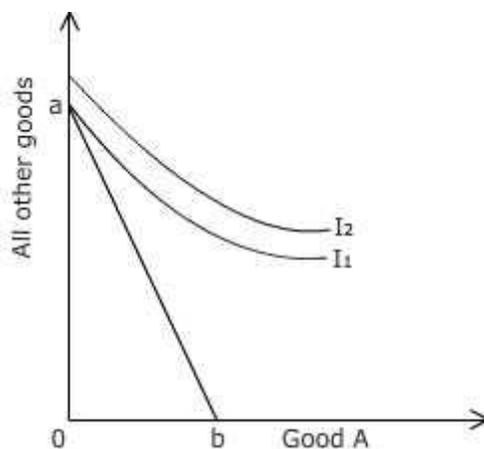


Figure 10: A Good that is not Consumed

Optimization

Optimization involves two important components: first being the consumer's budget constraint and the second, consumer's preferences. The consumer's optimum can be explained graphically. As shown in figure 11, the optimum is reached when the budget constraint is tangential to the indifference curve i.e. point C. At point B, the consumer is at a lower indifference curve, however given the budget constraint the consumer can afford to move to a higher level of satisfaction. Point A is not affordable for the consumer. At the optimum, the slope of the indifference curve is equal to the slope of the budget constraint i.e. the marginal rate of substitution is the same as the relative prices. At this point the market valuation of the goods is equal to the value that consumers place on two goods.

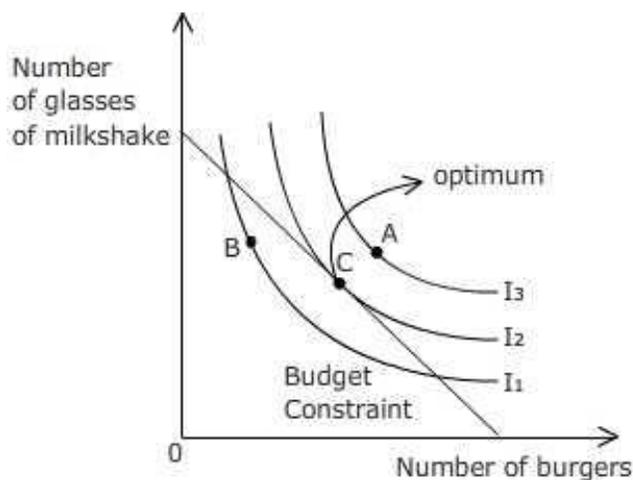


Figure 11: Consumer's Optimum

Changes in income and consumer's choices

A change in income has important effects on the consumer's choice. In case, the income of the consumer changes, since there is no effect on the price of the two goods, the slope of the budget constraint doesn't change. However, due to a change in the income, the budget constraint will shift outward or inward parallelly, depending on whether there is a rise or a

The Theory Of Consumer Choice

fall in the income. On the new budget constraint, the consumer can afford to reach a higher indifference curve with a better consumption bundle. Depending on the consumer preferences, the consumer can consume at any point on the new budget constraint where the indifference curve is tangential to it. If the consumption of a good rises with a rise in the income, it is called a normal good. However, if the consumer decreases his consumption of a good as the income rises, the good is said to be an inferior good. We can illustrate this graphically. Graph A in figure 12 shows that as the income rises the consumer raises his consumption of both milkshakes and burgers, so both these goods are normal. However in graph B, the consumption of burgers rises while that of milkshakes falls, depicting that milkshake is an inferior good.

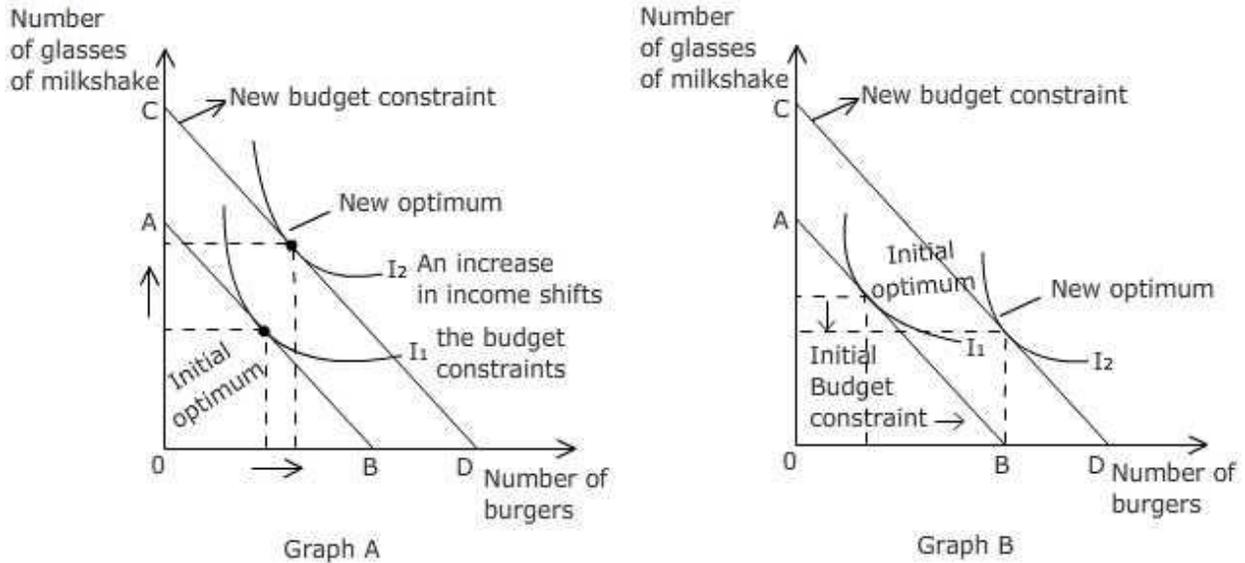


Figure 12: Changes in Income and Consumer's Choices

Changes in price and consumer choices

Now we consider the impact of a change in price. Suppose the price of a burger falls from Rs.20 to Rs.10. The price of a glass of milkshake and income of the consumer stays the same. So the slope of the budget constraint goes down from 2 milkshake for a burger to 1 milkshake for a burger, suggesting that the budget constraint pivots and becomes relatively flatter. If the consumer spends all his money on burgers he will be able to consume 100 burgers. The new budget constraint is AD now. The new point of consumption again depends on the consumer preferences. As the figure 13 shows, at the new optimum, the consumer is having more of burgers and less of milkshake.

The Theory Of Consumer Choice

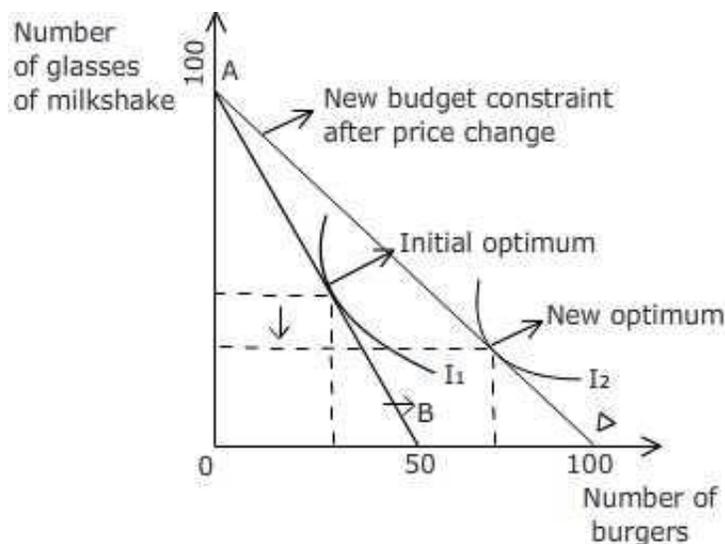


Figure 13: Changes in Price and Consumer Choices

Income and Substitution effects

The price effect can be segregated into income and substitution effect. If after the price change an adjustment is made, such that the consumer is left with the level of income that leaves him with the same level of satisfaction (original indifference curve) as before the price change but the consumer faces new relative prices, then the consumer's response in terms of quantity demanded is termed as substitution effect. However, if the money income is restored and the consumer moves on to a higher or a lower indifference curve, the response of the consumer is then called income effect. In the figure 14, graph A we can see that as the price of burger falls the consumer moves from point A to point C. This change can be broken down to two important steps. In the graph that illustrates the case of a fall in the price of a burger, when the consumer moves from point A to point B which is on the same indifference curve as point A, he faces new set of relative prices, this bit is termed as substitution effect. Once the consumer shifts to the new indifference curve at point C, he still faces the new set of relative prices (as at point B), this bit is called the income effect. The substitution effect therefore is shown by rotating the budget constraint around the original fixed indifference curve while the income effect is shown by a parallel shift in the budget constraint. Movement from point A to point B is only about a change in the relative prices, there is no change in the level of satisfaction. On the other hand, the movement from point B to point C involves a change in the level of satisfaction and no change in the relative prices. The substitution effect always works in the same direction, which means that if the relative price of a commodity falls more of that commodity is consumed. However, income effect can work in any direction: more or less of a good can be consumed when it's relative price falls depending on whether the good is normal or inferior. In case the good is normal, any increase in the real income due to a fall in price will lead to an increase in the consumption of that good. The income effect and substitution effect both work in the same direction. In such a case the demand curve is negatively sloping. If on the other hand the good is of inferior nature: less of a good is consumed when the real income rises due to the price rise. The substitution effect works in the same direction suggesting that the quantity consumed of the commodity should rise when its relative price falls. However, the end result completely depends on the intensity of these two effects. If the substitution effect outweighs the negative income effect such that the quantity demanded increases when the

The Theory Of Consumer Choice

relative price of the good falls, it can be defined as a case of inferior good even though the demand curve has a negative slope. However if the negative income effect outweighs the substitution effect, one reaches a positively sloped demand curve. This is the case of a giffen good. The giffen goods are inferior goods and the negative income effect in their case is strong enough to out power the substitution effect.

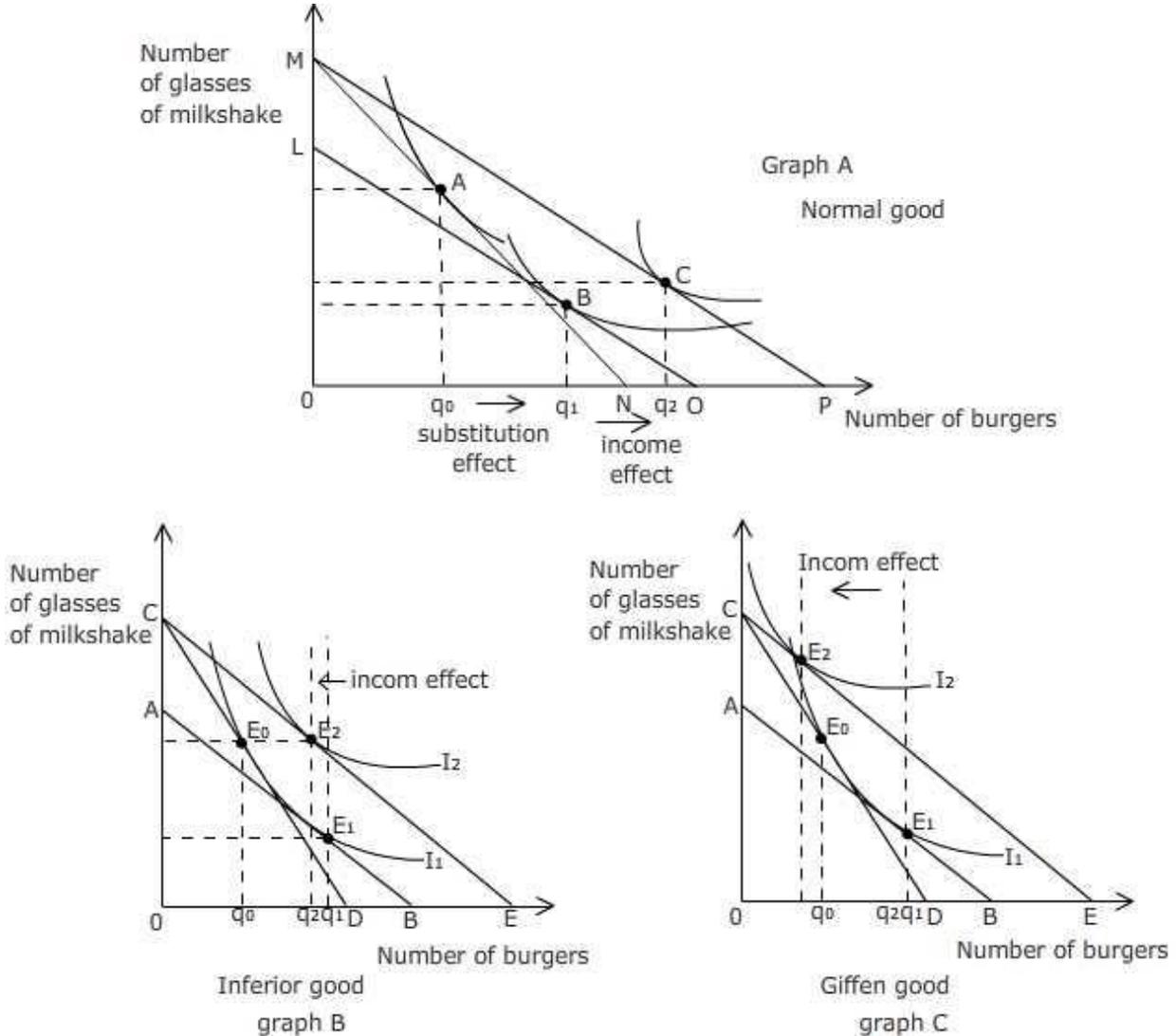


Figure 14: Income and Substitution Effects

Equivalent and Compensating Variation

Two very important concepts attached with the income effect of a price change are equivalent variation and compensating variation.

Equivalent Variation: it is equivalent to giving some money income to the consumer instead of a price change, such that he becomes as satisfied as he is after the price change. This can be shown graphically by shifting the original budget constraint in a parallel manner such that it touches the new indifference curve after the price change.

The Theory Of Consumer Choice

Compensating Variation: it is the amount of income that needs to be taken away from a consumer when the price of a good falls to make him return to a level of satisfaction at which he was before the price change i.e. the original indifference curve. In the graph this magnitude can be shown by the vertical distance OL.

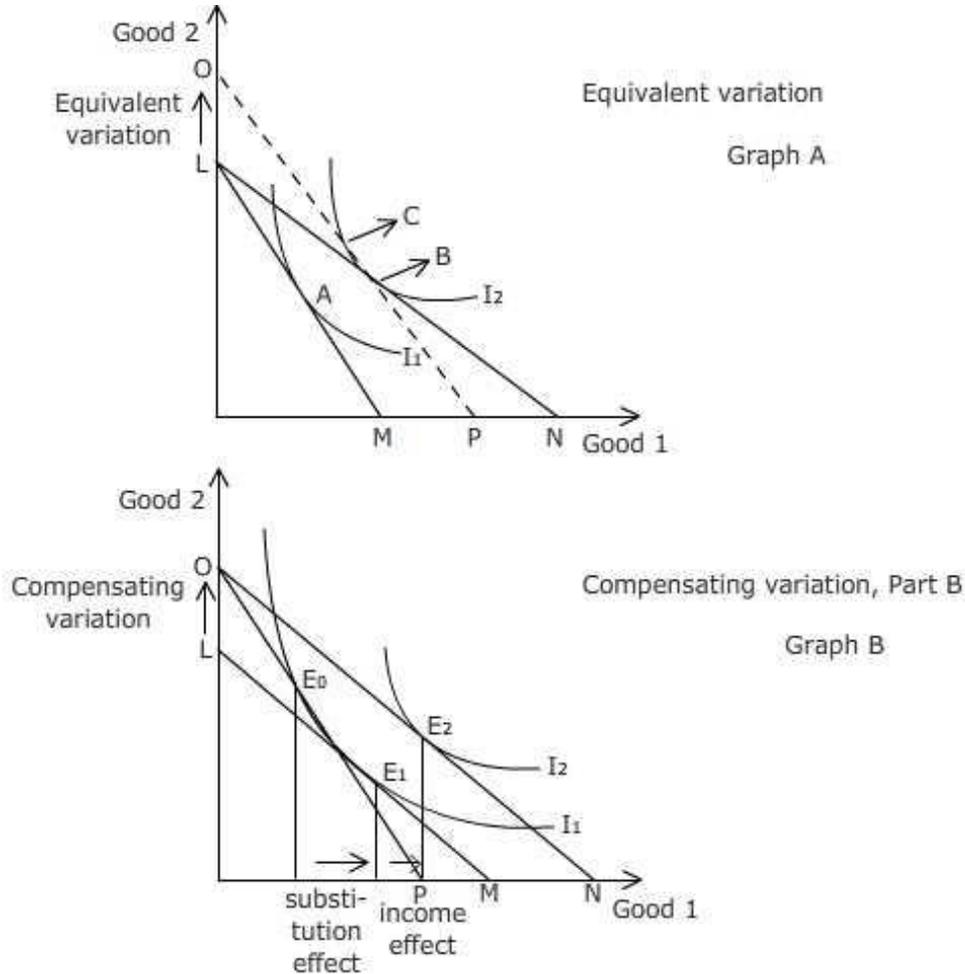


Figure 15: Equivalent and Compensating Variation

Demand Curve: Derivation

A demand curve can be seen as a locus of various optimum consumption points that a consumer chooses. Suppose when the price of burger falls from Rs.20 to Rs10 the consumer shifts from point A where he is consuming 10 burgers and 80 glasses of milkshake to point B where he consumer 50 burgers and 50 glasses of milkshakes. Now, we get two points on the demand curve for burger. Figure 16 shows the consumer's optimum and the demand curve for burger.

The Theory Of Consumer Choice

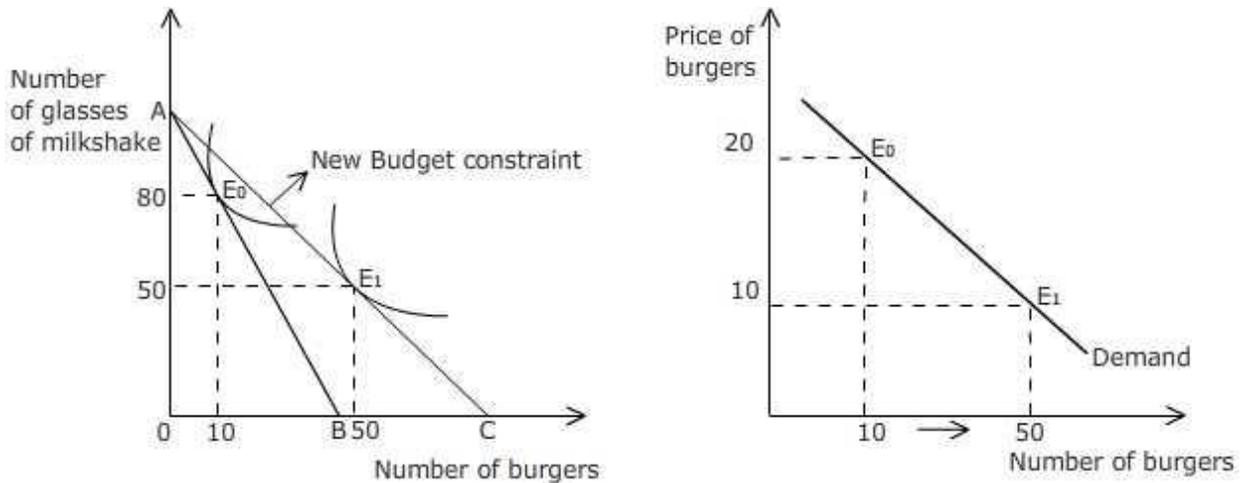


Figure 16: Derivation of Demand Curve

Applications of the theory of consumer choice

The theory of consumer choice has many important applications and we will discuss a few in this section of the lesson.

Slope of the demand curve: Case of Giffen Goods

The law of demand says that as the price of the good rises the quantity demanded of it falls, this is shown by a regular downward sloping demand curve. However, there are cases where the law of demand gets violated. In the case of giffen goods, the demand curve is an upward sloping one. Let's take the example of a consumer in china who consumes rice and chicken. As the graph shows the consumer was consuming at point C initially. Now, there is a rise in the price of rice, the relevant budget constraint is DA. The consumer consumes at the new point E, where he has more of rice and less of chicken. This happens because rice is a giffen good for a consumer in china. As the price of rice rises, the consumer gets poor in a relative sense. The income effect says that the consumer should buy more of rice and less of chicken, on the other hand the substitution effect would direct him to buy less of rice and more of chicken. Since, the income effect outweighs the substitution effect the, consumer ends up buying more of rice and less of chicken.

The Theory Of Consumer Choice

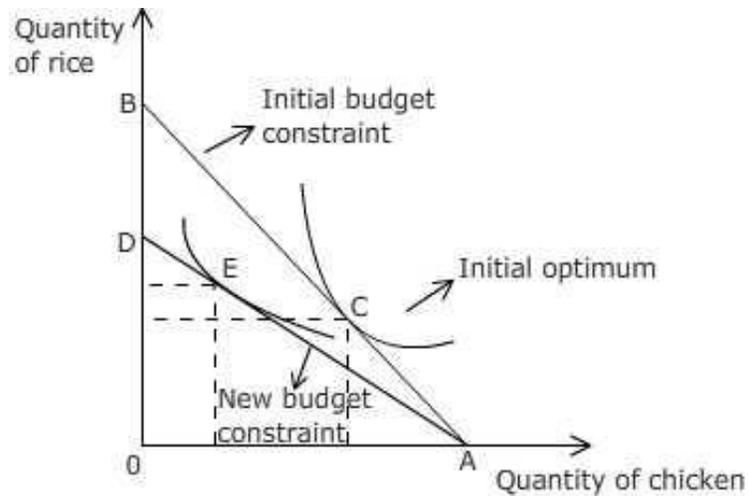


Figure 17: Case of a Giffen Good

Giffen Goods: Rice and Wheat in China

The notion of giffen goods was first introduced by Alfred Marshall in his book *Principles of Economics* in the year 1895. The idea of giffen goods can be attributed to Robert Giffen, who pointed out how a rise in the price of bread draws down the income of poor families. The marginal utility of money rises for these families in such a manner that rather than buying more of other foods they end up consuming more of bread, which is still relatively the cheapest compared to the other foods.



Though in reality, giffen goods are rare to find, Jensen and Miller found evidence of giffen behavior. In their study, they present data from field experiment, wherein they have tried to gauge the response of the poor households in China to changes in the prices of staple food items. Evidence has been found for giffen behavior in the case of rice and wheat when their prices were subsidized.

Source: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2964162/>

The Theory Of Consumer Choice

Wages and Labor Supply

The theory of consumer choice can also be used to determine the labor supply decisions i.e. how to decide how much time should be allocated to work and leisure. Let's take the example of Subhash who works at the ice cream parlor. Subhash is awake for 120 hours in a week. He can spend this time in leisure or he can work and earn a salary of Rs.100 per hour of work. For every hour of work Subhash can have get consumption worth Rs.100. One hour of leisure means Subhash loses out on this consumption. The opportunity cost of one hour of leisure is Rs.100 worth of consumption. If he works for 120 hours in a week, he earns Rs.12000 but enjoys no leisure and if he doesn't work at all, he earns nothing and doesn't consume anything but gets 120 hours of leisure. As shown in the graph the consumer can make an optimal choice consisting of work and leisure hours.

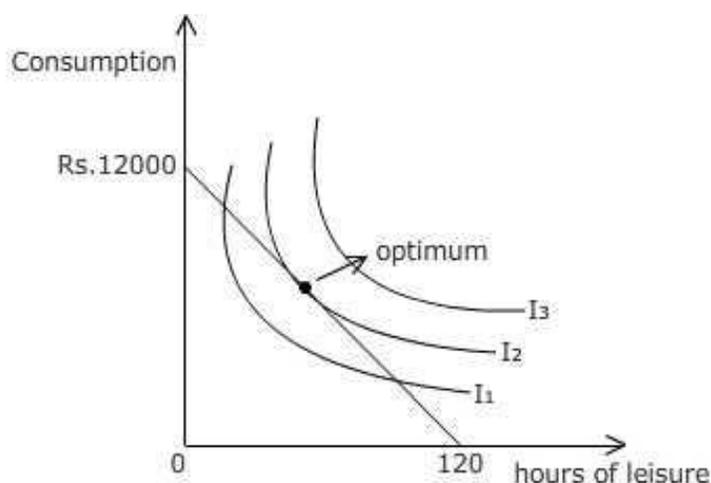


Figure 18: Subhash's Work-Leisure Decision

Now, suppose Subhash's salary rises from Rs.100 per hour to Rs.150 per hour, there can be two possible outcomes. With the rise in the wage rate the budget constraint rotates from BA to BC and becomes relatively steeper. With a higher wage rate, for every hour of leisure foregone, the consumer enjoys higher consumption. The optimal choice depends a lot on Subhash's preferences. With a rise in wage rate the consumption will rise definitely but what happens to leisure, depends on Subhash's response. Subhash can respond to the rise in the wage rate by enjoying either more leisure or less of it.

When the wage rate rises, the substitution effect says that since leisure is relatively expensive now compared to consumption, Subhash should work more and hence consume more. Income effect on the other hand says as the wage rate rises the consumer becomes better off. The consumer gets a higher wage for all the hours that he works. Assuming that the both leisure and consumption are normal goods, the income effect encourages Subhash to work less and enjoy more of leisure. If the substitution effect is stronger than the income effect, labor supply curve will be upward sloping as shown in part a of figure 19 and if the income effect is stronger than the substitution effect the labor supply slopes backward, as depicted in part b of the figure. In both the cases, consumption rises. Hence the labor supply curve can slope upward or downward.

The Theory Of Consumer Choice

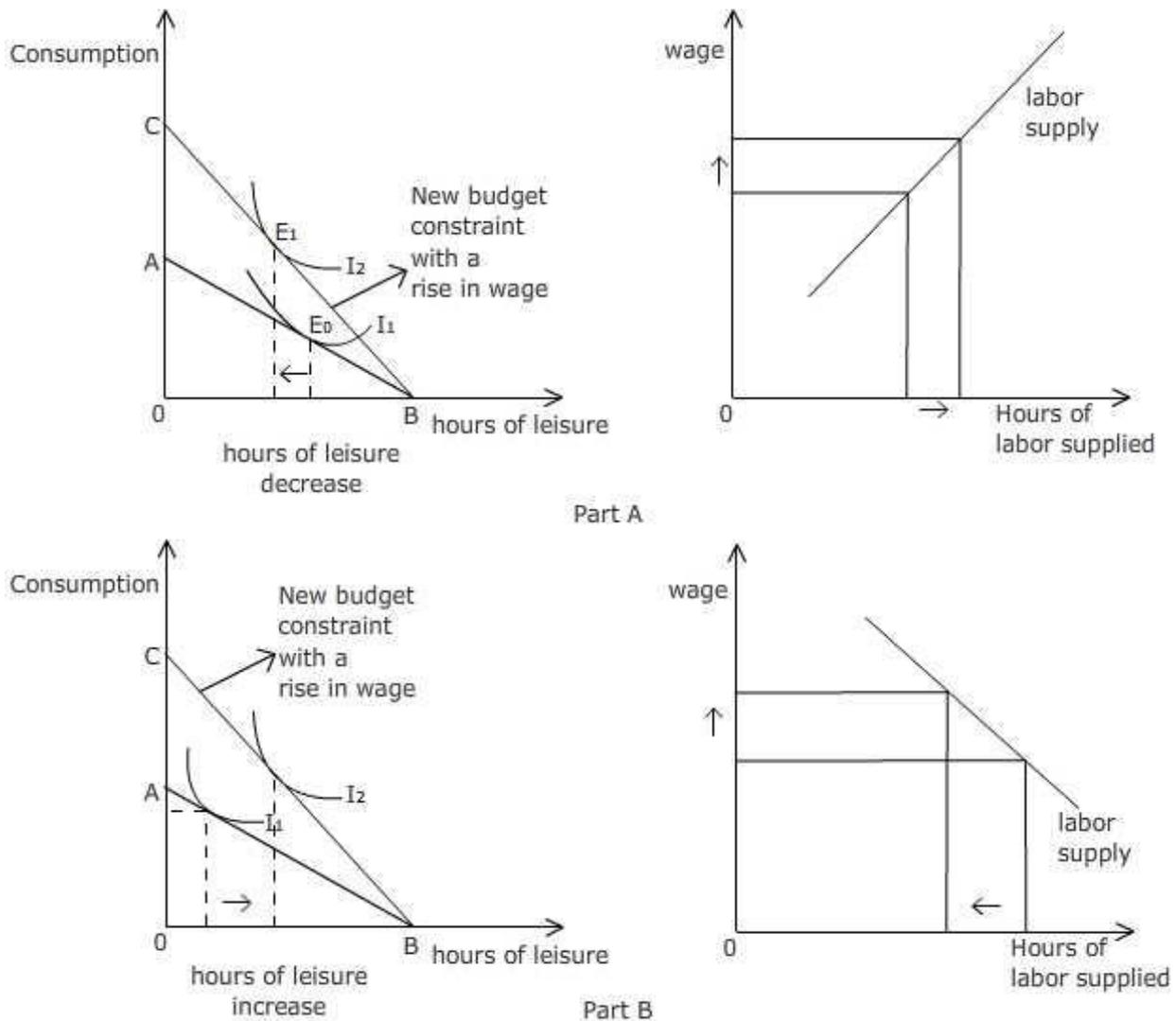


Figure 19: Income and Substitution Effects : Labor Supply Curve

Interest rates and household savings

Savings of a household depend on the interest rate. A consumer's lifetime can be divided into two periods, the first is the young age where he works and earns and the second is the old age when he retires. Suppose Samir, the consumer, earns Rs.100000 in his young age which he can use for present consumption and saving. In the old age Samir will live on the savings that he makes in the young age. If the interest rate is 10 percent, for every rupee saved in the young age, Samir gets to enjoy consumption worth Rs.1.10 in old age. Samir has to find an optimal combination of consumption in the young age and consumption in the old age, which has been shown in the figure. If he consumes all of his income today, he will be able to enjoy Rs.100000 worth of consumption but he will starve in his old age. On the other hand, if he consumes nothing in the present he will be able to enjoy consumption worth Rs.110000 in his old age.

The Theory Of Consumer Choice

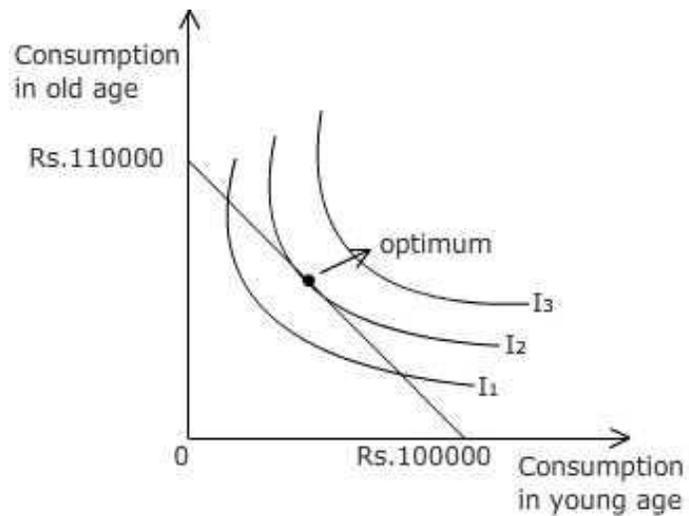


Figure 20: Interest Rates and Household Saving

Now let's see what happens when the interest rate rises to 30 percent. Again the substitution effect and income effect come into the picture. The consumption in the old age will certainly rise, however the consumption in the young age will depend on income and substitution effects. When the interest rises to 30 percent, the budget constraint rotates outwards to become BC from BA, it becomes steeper. For every rupee saved in the young age, Samir gets Rs.1.3 worth of consumption in his old age. The substitution effect says that as the interest rate rises consumption in the young age becomes costly relative to consumption in the old age. So, it would make Samir save more in the young age. The income effect says that the rise in the interest rate makes Samir better off compared to his original position and if consumption in both the periods is seen as normal goods, Samir would want to consume more in both the periods thereby saving less in the young age. Figure 21 shows both the cases, part a where consumption in the young age falls as substitution effect overpowers the income effect and part b where the consumption in the young age rises because the income effect is stronger than the substitution effect. Hence the effect of changes in interest rate on the savings is ambiguous which has implications for the tax policy.

The Theory Of Consumer Choice

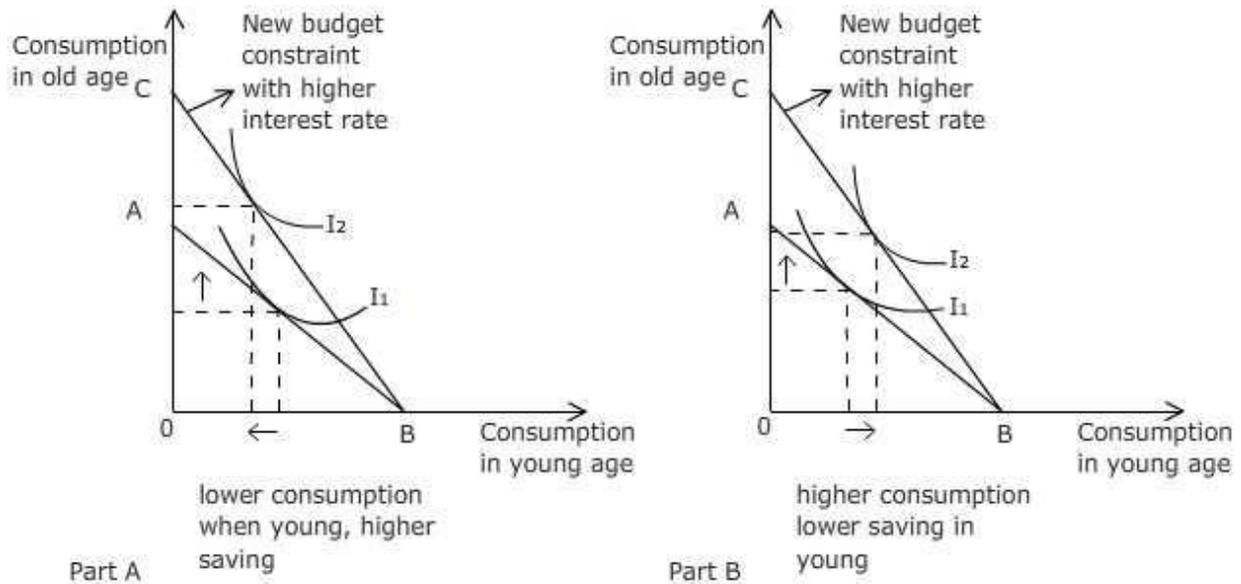


Figure 21: Effect of Increase in the Interest Rate

Conclusion

The Theory of Consumer Choice helps us understand the important factors that contribute to decision making at the level of a consumer. Decision to consume different quantities of different goods, allocation of time to work and leisure, inter-temporal choices, types of preferences are explained with the help of consumer choice theory. Indifference curves, budget constraint and tools of optimization together form the core of consumer theory. Not that in reality every consumer goes about carrying out these optimization exercises, but every consumer knows that his choice is limited by his budget. Given the constraint of income the consumer has to reach the best possible combination of goods for which he has a preference.

The Theory of Consumer Choice provides a brilliant framework for analyzing the real world choices and it has several application, few of which we have already gone through.

The Theory Of Consumer Choice

Summary

In this lesson we have learnt that:

- The concept of budget constraint is very important when it comes to understanding, how the consumer makes optimal decisions.
- The budget constraint acts as a limit to the amount the consumer can spend on consumption of goods.
- The second important aspect of the consumer choice theory is the consumer preference which can be graphically depicted by indifference curves.
- There are certain important properties of the indifference curves.
- Different preference patterns can be represented by indifference curves of different shapes, for instance perfect substitutes and perfect complements.
- The budget constraint and the indifference curves together help in finding the optimal choice.
- Changes in income and price effect the consumer choice.
- Income and Substitution Effect determine what the final optimal choice will be.
- While substitution effect always acts in one direction, the direction of income effect depends on whether the good is normal or inferior.
- The optimal choices obtained through the optimization exercise can help derive the demand curve.
- There are certain important applications of the theory of consumer choice, for instance the case of giffen goods, work-leisure decisions and inter-temporal consumption and saving decisions.
- The theory of consumer choice is a vital concept and can be applied to understand a few real life problems.

The Theory Of Consumer Choice

Exercise

Review Questions

Q.1 Draw the budget constraint for Ravi, who has a weekly income of Rs.2000. He consumes only two goods: Sandwiches and Pepsi. The price of a sandwich is Rs.20 and that of a glass of Pepsi is Rs.10. Determine the slope of the budget line.

Q.2 Can indifference curves intersect?

Q.3 How are the concepts of equivalent and compensating variation different?

Q.4 Draw the demand curve for a Giffen good, taking hypothetical values.

Q.5 Explain the case of a backward bending labor supply curve.

Q.6 Draw the set of indifference curves for left-hand and right-hand gloves.

Q.7 Can an indifference curve be upward sloping? What are the cases when it can slope upwards?

[Hint: Think of a good (bad) that gives negative utility like pollution or a good that starts giving out negative utility beyond a point of consumption]

Q.8 A consumer consuming apples and oranges gets a salary raise. Illustrate, how the consumption choice changes on the rise in income when both apple and oranges are normal goods.

Q.9 In extension to question number 8, what would happen if apple is an inferior good?

Q.10 Explain Income and Substitution effects.

Multiple Choice Questions

Q.1 Points lying on or below the budget line:

- Are affordable, given the income and the prices of the goods.
- Are unaffordable, given the income and the prices of the goods.
- Give equal level of satisfaction.
- Indicate the bundles of goods that exhaust the total given income.

Q.2 An Indifference curve shows:

- Several combinations of goods that give the consumer an equal level of satisfaction
- Various combinations of goods that the consumer can afford.
- The level of income that the consumer can use to buy goods.
- All of the above.

The Theory Of Consumer Choice

Q.3 If the prices of the two goods stay constant and the income increases:

- a. The budget constraint become flatter.
- b. The budget constraint becomes steeper.
- c. The budget constraint shifts outward, in a parallel manner.
- d. The budget constraint shifts inward, in a parallel manner.

Q.4 If the prices of goods X and Y rise by the same percentage:

- a. The budget constraint become flatter.
- b. The budget constraint becomes steeper.
- c. The budget constraint shifts outward, in a parallel manner.
- d. The budget constraint shifts inward, in a parallel manner.

Q.5 A normal good is the one, the demand for which rises:

- a. When the income falls.
- b. When the income rises.
- c. They are not related to income.
- d. None of the above.

Q.6 Perfect substitutes are:

- a. The goods that can perfectly replace each other or can be used perfectly in place of each other.
- b. The goods that are used in conjunction with each other.
- c. Both a. and b.
- d. None of the above.

Q.7 At the point of optimum:

- a. The slope of the budget constraint is equal to the slope of the indifference curve.
- b. The slope of the budget constraint is greater than the slope of the indifference curve.
- c. The slope of the budget constraint is less than the slope of the indifference curve.
- d. None of the above.

Q.8 Suppose the price of burgers falls (Burger is a normal good). Resultantly, Sam's real income rises, which he uses to buy greater number of burgers each week. This effect is called:

- a. Substitution effect.
- b. Income effect.
- c. Price effect.
- d. None of the above.

Q.9 Samir consumes pizza and peps (both the goods are assumed to be normal), the income and the price of peps stay the same, while the price of pizza rises. The example of substitution effect in this case will be:

- a. Samir buys more of peps and less of pizza as the price of pizza rises.
- b. Samir buys more of pizza when his income rises.
- c. Samir buys more of pizza as its price has risen.
- d. None of the above.

The Theory Of Consumer Choice

Q.10 Which one of these is not the property of indifference curves:

- a. Indifference curves slope downwards.
- b. Indifference curves intersect each other.
- c. Indifference curves are bowed inwards.
- d. Higher indifference curves carry a greater level of satisfaction compared to the lower ones

Correct Answers/Options for the Multiple Choice Questions	
Question Number	Option
Q.1	a
Q.2	a
Q.3	c
Q.4	d
Q.5	b
Q.6	a
Q.7	a
Q.8	b
Q.9	a
Q.10	b

Justification for the Correct Answers for Multiple Choice Questions

Answer 1. All the points lying below or on the budget line represent the combinations of goods that the consumer can afford to consume given the income and prices of the goods.

Answer 2. An indifference curve is the locus of the bundle of goods that give the same level of satisfaction to the consumer.

Answer 3. A rise in income does not impact the slope of the budget constraint. A rise in income, with the prices fixed can help the consumer, consume more of both the goods, so there is a parallel shift outwards in the budget constraint.

Answer 4. When the prices of both the goods rise by the same percentage, the relative prices of the two goods stay constant. With the rise in prices, less of both the goods can be afforded given the same level of income, hence the budget constraint shows a parallel shift inwards.

Answer 5. Normal goods are the goods, the demand for which rises as the income rises.

Answer 6. Perfect substitutes are the goods that can replace each other perfectly to satisfy the needs of the consumer.

The Theory Of Consumer Choice

Answer 7. The point of optimum occurs where the indifference curve is tangential to the budget constraint. This is the point where the marginal rate of substitution is equal to the relative prices.

Answer 8. The fall in price of burgers, other things constant, raise the real income of the consumer. There is a rise in the purchasing power of the consumer which he can use to buy more of burgers (burgers being normal goods).

Answer 9. When the price of pizza rises relative to that of pepsi, it becomes more expensive to consume pizza relative to the consumption of pepsi, so the substitution effect will induce the consumer to consume more of pepsi and less of pizza.

Answer 10. Indifference curves cannot intersect each other as it violates the principle of transitivity.

Feedback for the Wrong Answers for Multiple Choice Questions

Answer 1. Option b is incorrect because the points lying on the budget line or below it can be consumed given the income and the prices. It is the points above the budget line that are unaffordable. Option c is incorrect since it is the points on the indifference curve that show equal levels of satisfaction. Budget constraint simply shows whether a bundle is affordable or not at the given income and prices. Option d is also incorrect since, only the bundles lying on the budget line exhaust the total given income of the consumer, but the points or bundles lying below the budget line require a fraction of the total income, not the whole of it.

Answer 2. Option b is incorrect, it is the budget line that shows which all bundles of consumption are affordable. Option c is wrong because the indifference curve shows the preference of the consumers, the budget constraint depicts the income of the consumer. Hence option d (All of the above) is also incorrect.

Answer 3. Options a and b are incorrect because there is no change in the prices of the goods, since the relative price of the two goods is the same, the slope will not change. Hence the budget constraint cannot become flatter or steeper. Option d is also incorrect since a rise in income expands the consumption possibilities for both the goods, the budget constraint will shift inwards in a parallel manner when the income decreases.

Answer 4. When the price of both the goods rise by the same percentage, there will be no change in the slope of the budget constraint. The budget constraint cannot get flatter or steeper so the options a and b are not possible. Rise in prices of both the goods means that given the income the consumer will be able to consume less of both the commodities, hence the budget cannot shift outwards in a parallel manner. So option c is also wrong.

Answer 5. A normal good is usually defined with respect to income. It is the good, the demand for which rises when a consumer's income rises. So option a is incorrect, since the demand for the normal good will fall as the income falls. Option c is wrong, the demand for normal goods is related to income. Option d is ruled out since answer is option b.

The Theory Of Consumer Choice

Answer 6. Option b is incorrect, perfect complements are the goods that are used in conjunction with each other. Options c and d are also incorrect.

Answer 7. At the optimum level the slope of the indifference curve and the budget constraint is equal. If these slopes are not equal there is a scope that the consumer can still do better and reach the position of optimum. At the optimum, consumer is highly satisfied given his income, since the rate at which he is willing to trade one good for the other is equal to the trade-off for the two goods set by the market i.e. the ratio of prices of the two goods. So, the options b, c and d are incorrect.

Answer 8. Option a is incorrect since the substitution effect will make him consume more of burgers since after a fall in price, the burgers become relatively cheap, not because his purchasing power has risen. Option c is incorrect since the price effect is the overall effect of the price change which includes income and substitution effect, the result of the price effect will depend on the substitution and income effects. Option d is also ruled out. The correct answer is income effect.

Answer 9. Option b is incorrect since the rise in income does not involve any substitution effect. Option c is incorrect pizza is a normal good, when the price of pizza rises both the substitution and income effects will make the consumer consume less of it and not more of it. Option d is ruled out since option a is correct.

Answer 10. The options a, c and d are incorrect because they are the properties of indifference curves. Option b is correct because indifference curves do not intersect.

The Theory Of Consumer Choice

Glossary

Trade-off: To give up one thing for another, which might be of more or less equal value to the decision maker.

Rational: A behavior based on logical reasoning, taking into account all the information available, without any inconsistencies.

Constraint: A factor that serves as a limit or a restriction, thereby impacting economic behavior.

Slope: It is a measure that gives out the rate at which one variable changes for a unit change in the other.

Relative: When something is measure in comparison to something else.

Utility: Utility is the satisfaction one gets out of consuming a good or service.

Substitutes: Goods that can replace each other to satisfy the needs of the consumer.

Complements: Goods which are usually used in conjunction with each other to satisfy various uses.

Necessity: A good, the consumption of which is necessary for survival. The proportion of expenditure on such goods falls with a rise in income.

Optimization: Making a choice which is cost effective or which delivers the best result, given the constraints.

Inter-temporal: This term refers to the decisions made in the present and the future. Decisions regarding consumption and savings made in the present have an impact on the alternatives available in the future.

Normal good: These are the goods, the demand for which rises as the income rises.

Inferior good: The goods for which the demand falls as the income rises.

Giffen good: These are rare type of goods, for which the demand rises as the price rises. They violate the law of demand.

The Theory Of Consumer Choice

References

Mankiw, N.G. (2007), "Principles of Microeconomics", Ch.21, Cengage Learning

Lipsey, Richard & Chrystal, Alec (2011), "Economics", Ch.5, (PP.91, 97-99), Oxford University Press

Web Link

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2964162/>