Advanced Economics Notes - Grade 10

December, 2017 E.C

Contents

Unit 1: Theory of Consumer Behavior

1.1 The Concept of Utility

- **Utility:** The satisfaction or pleasure a consumer derives from consuming a good or service.
- **Relativity of Utility:** Utility is subjective and varies based on individual needs, preferences, and circumstances. The same good can provide different levels of satisfaction to different people.

1.2 The Cardinal Utility Theory

1.2.1 Assumptions

- **Rational Consumer:** Consumers make choices to maximize their satisfaction.
- **Cardinal Utility:** Utility is measurable and quantifiable. Economists use a unit called" **utils**" to represent satisfaction.
- **Diminishing Marginal Utility (DMU):** As a consumer consumes more of a good, the additional utility gained from each additional unit decreases. For example, the first slice of pizza might be very satisfying, but the fifth slice might be less so.
- **Constant Marginal Utility of Money:** The utility derived from each additional unit of money remains constant. This means that the satisfaction a consumer gets from an extra birr is the same regardless of how much money they already have.

1.2.2 Total Utility (TU)

- **Definition:** The total satisfaction a consumer derives from consuming a given quantity of a good.

1.2.3 Marginal Utility (MU)

- **Definition:** The additional utility gained from consuming one more unit of a good.
- **Equation:** MU = Change in TU / Change in Quantity

1.2.4 The Law of Diminishing Marginal Utility (DMU)

- **Definition:** As consumption of a good increases, the marginal utility derived from each additional unit tends to decrease.

1.3 The Consumer Maximization Problem

1.3.1 Consumer Budget (Income)

- **Definition:** The total amount of money a consumer has available to spend on goods and services.

1.3.2 Consumer Equilibrium (One Commodity)

- **Condition:** The consumer maximizes utility when the marginal utility of the good equals its price (MU = P). This means the consumer is getting as much satisfaction as possible from each birr spent.

1.3.3 Consumer Equilibrium (Multiple Commodities)

- **Condition:** The consumer maximizes utility when the ratio of the marginal utility of each good to its price is equal for all goods. This means that the consumer is getting the same level of satisfaction from the last birr spent on each good.
- **Equation:** MUx / Px = MUy / Py = MUz / Pz ... (for goods x, y, z, etc.)
- **Budget Equation:** Total Income = Px * Qx + Py * Qy + Pz * Qz ... (for goods x, y, z, etc.)

1.4 Introduction to the Ordinal Utility Theory

- **Ordinal Utility:** Utility is not measurable in absolute terms, but consumers can rank different consumption bundles based on their preferences. Instead of assigning specific numbers, consumers can simply say they prefer one bundle to another.

1.4.1 Assumptions

- **Rationality:** Consumers make choices to maximize their satisfaction.
- **Ordinal Utility:** Utility is not cardinally measurable, but consumers can rank preferences.

- **Diminishing Marginal Rate of Substitution (DMRS):** As a consumer consumes more of one good, they are willing to give up less of another good to maintain the same level of satisfaction. For example, if you have a lot of apples, you might be willing to trade only one apple for two oranges, but if you have few apples, you might demand three oranges for one apple.
- **Consistency and Transitivity of Choices:** Consumers make consistent and logical choices. If a consumer prefers apples to oranges and oranges to bananas, then they will also prefer apples to bananas

Unit 2: Theories of Demand and Supply

2.1 Theory of Demand

- **Demand:** The quantity of a good that consumers are willing and able to buy at various prices, during a specific time period.
- Demand= willingness + able to pay + availability of the commodity itself
- Expressed by time, period, willingness, ability to pay and availability of the commodity
- A demand for a product is the result of decisions made by consumers about which needs and wants to satisfy.

THE DETERMINANTS OF DEMAND

⇨ **The following factors will influence the demand for a product:**

- the price of the product
- the consumers' tastes and buying behavior
- the consumers' income
- the availability and prices of substitute products, and
- the availability and prices of complementary products.

- **Substitute products:** are those products that can be used in the place of one another if the original product is not available or too expensive, such as butter and margarine, coffee and Tea…

➢ here when price of coffee increase, the demand of tea also increases.

➢ Therefore, there is a direct r/ship between price and demand

- **Complementary products:**
  - ➢ are those products that are used together, such as petrol and a motor vehicle.
  - ➢ Inverse relationship between price and demand

2.1.1 Law of Demand

⇨ **The law of demand states that:**

- as the price of the product increases, the quantity demanded of the product decreases, and
- as the price of the product decreases, the quantity demanded of the product increases assuming other factors remain constant (ceteris paribus)

➢ **Substitution Effect:** Consumers switch to cheaper alternatives.

➢ **Income Effect:** As the price rises, consumers have less purchasing power

Demand Schedule and Curve

- **Demand Schedule:** A table showing the quantity demanded at different prices.
- **Demand Curve:** A graph showing the relationship between price and quantity demanded, typically downward sloping.

2.1.2 Demand Function

- **Definition:** A mathematical equation representing the relationship between price and quantity demanded.

2.1.3 Market Demand

- **Definition:** The total quantity demanded of a good by all consumers in a market at various prices.

Movement along a Demand Curve

- ✓ Known as change in quantity demanded:
- ✓ Occurred when the quantity demanded increases or decreases due to fall or rise in the price of a commodity alone,
- ✓ Here the movement is – either **upward** or **downward** – along the same demand curve.
- ✓ **ΔQd** occurs due to change only in the price of the commodity itself.
- ✓ Downward movement along the demand curve is called ***extension*** of demand,
- ✓ the **upward** movement as ***contraction*** of demand.

Shift in the demand curve

- ✓ Known as change in demand
- ✓ In this situation, there is an either ***rightward shift*** or *leftward shift* in the demand curve itself.
- ✓ Here the **rightward shift** in the demand curve indicates *increase in demand*
- ✓ while the leftward shift indicates ***decrease in demand.***
- ✓ In other words, while an increase in demand is explained by an ***outward shift*** of the demand curve,
- ✓ a decrease in demand is explained by an ***inward shift*** of the demand curve.

2.2 Theory of Supply

- **Supply:** The quantity of a good that producers are willing and able to sell at various prices, during a specific time period.

2.2.1 Law of Supply

- **Definition:** As the price of a good increases, the quantity supplied increases, assuming other factors remain constant (ceteris paribus).

Explanation:

- **Profit Incentive:** Higher prices mean higher profits, encouraging producers to produce more.

2.2.2 Supply Schedule and Curve

- **Supply Schedule:** A table showing the quantity supplied at different prices.
- **Supply schedules are of two types:**

I. **Individual supply schedule.**

II. **Market supply schedule.**

I. **Individual supply schedule** is a tabular statement which shows the different quantities of a commodity offered for sale by an individual firm at different prices per time period.

II. **Market supply** schedule is a tabular statement which shows the sum of the quantities supplied by all the sellers.

Supply Curve: A graph showing the relationship between price and quantity supplied, typically upward sloping.

- conveys the same information as a supply schedule.
- But it shows the information graphically rather than in a tabular form.

Supply curves also are of two types:

1. **Individual supply curve**.
2. **Market supply curve.**

Individual supply curve *refers to the curve which expresses graphically the relationship between different quantities of a commodity supplied by an individual firm at different prices per time period*

Market supply curve *is found by adding horizontally the individual supply curves.*

Supply Function

- **Definition:** A mathematical equation representing the relationship between price and quantity supplied. **QX =F(PX), ceteris paribus**. OR **SX= f(Determinants)**

Market Supply

- **Definition:** The total quantity supplied of a good by all producers in a market at various prices.

Example: Suppose there are 120 sellers of potatoes (in tons) in a market and the sellers have a more or less similar supply curve of the form (supply equation) Qs = 20p - 5. Driven by the market supply equation. What is the quantity supplied in the market when the price is Birr 4? 28

Solution:

I. **Market supply is** Qm = Qs x 120 = 120 (20p - 5) Qm = **1440p – 600** (market supply equation).

II. **Total quantity** (market) supplied at price Birr 4 is; Qm (p=4) = 1440 (4) – 600 =5760 - 600 = **5160 tons.**

The law of supply states that there is a direct relationship between the price of a commodity and its supply. Or

- Other things being equal, the supply of a commodity increases with an increase in its price and decreases with the fall in price
- the slope of the supply curve is **positive**

Determinants of Supply

- Price of the Commodity:
- Changes in Factor Prices:
- Price of Related Goods:
- State of Technology:
- Other Factors: *fiscal policy of the government, Tax and subsidies: Transport:*

Movement along a supply curve (or change in quantity supplied):

- Other things being equal, if the quantity supplied increases or decreases due to rise or fall in the prices of the commodity alone, it is known as movement **along a supply curve** or change in quantity supplied.
- In this, we move along the same supply curve either **upwards** or downwards.
- Upward movement along the supply curve is **extension of supply** (that is, more quantity supplied at a higher prices)
- while the downward movement is **contraction of supply** (that is, less quantity supplied at a lower prices).

2.3 Market Equilibrium

- **Equilibrium:** A state of balance where opposing forces are equal.

2.3.1 Market Equilibrium

Definition: The point where the quantity demanded equals the quantity supplied ⇨**(Qd =Qs)**

2.3.2 Equilibrium Price and Quantity

1. **Equilibrium Price:** The price at which quantity demanded equals quantity supplied.
2. **Equilibrium Quantity:** The quantity bought and sold at the equilibrium price.

⇨ The price of commodity in a market is determined by its demand and supply.

⇨ At equilibrium price, demand and supply are in equilibrium.

Example 1: Assume in a market individual supply function of a commodity A is given by SA = 2PA – 3 and individual demand function is DA = 12 – 4PA. There are 200 suppliers of commodity A with identical supply function and there are 8,000 buyers of the commodity A with identical demand function. Where; S_A is quantity supplied, DA is quantity demanded and P_A is price of commodity A. Find market equilibrium price and quantity demanded.

Solution:

Market demand function = Number of buyers × Individual demand function

=8,000× (12 – 4PA) = 96,000 – 32,000PA

Market supply function = Number of sellers × Individual supply function

= 200 × (2PA – 3) = 400PA – 600

at equilibrium: market demand = market supply

$96,000 – 32,000P_A = 400P_A – 600$

$96,000 + 600 = 400P_A + 32,000P_A$

$96,600 = 32,400P_A$

P_A = 2.98 (approximately)

Equilibrium quantity = 400 × 2.98 – 600 = 1192 – 600 = **592**

2.3.3 Excess Demand and Excess Supply

1. **Excess Demand:** When the quantity demanded is greater than the quantity supplied, leading to a shortage.
   - ❖ Below the equilibrium price: Qd > Qs ⇨ A shortage(negative)
   - ❖ A shortage forces the price up
   - ❖ When there is a shortage, producers raise the price
   - ❖ When price rises, Qd decreases and Qs increases until we reach equilibrium.
2. **Excess Supply:** When the quantity supplied is greater than the quantity demanded, leading to a **surplus**- forces the price down
   - ❖ Above the equilibrium price: Qs > Qd ⇨ a surplus(positive)
   - ❖ When there is surplus, producer cut the price
   - ❖ When price falls, Qs decreases and Qd increases until we reach equilibrium

2.3.4 Changes in Equilibrium

The point where supply and demand meet can change for 3 reasons

1. **Shifts(changes) in Demand:** Changes in factors other than price (like income, tastes, or the price of related goods) can shift the demand curve, leading to new equilibrium price and quantity.
   - ❖ If there is shortage, price rises, which increases supply and decreases demand
   - ❖ When demand falls, suppliers cut prices and find a new equilibrium
2. **Shifts(changes) in Supply:** Changes in factors other than price (like input costs or technology) can shift the supply curve, leading to new equilibrium price and quantity.
   - ❖ **Excess supply leads to a surplus**- Qs>Qd⇨leads to a decrease in price and an increase in demand.
   - ❖ A decrease in supply leads to an increase in price and this leads to a decrease in demand.
3. **Shift (Change) in price**
   - ❖ As prices change, supply and demand will both change.
   - ❖ If price is too low, the Qd > Qs, and we have a shortage and the shortage bids up price till we reach equilibrium.
   - ❖ If price is too high, the Qs > Qd, and we have a surplus and the surplus bids down the price till we reach equilibrium

Elasticities of Demand and Supply

- **Elasticity:** A measure of the sensitivity of one variable to another.

❖ A measure of responsiveness of a dependent variable to changes in an independent variable.

- **Elasticity of demand:** refers to the degree of responsiveness of Qd of a good a change in its price or change in income or change in prices of related goods.

❖ Commonly there are 3 kinds of demand elasticity

1. **Price elasticity of demand**
2. **Income elasticity**
3. **Cross elasticity**

2.1.1 Price Elasticity of Demand

- **Definition:** Measures the responsiveness of quantity demanded to changes in price.
  - ⇨ It can be measured in two ways.

A. Point price elasticity of demand: calculated to find elasticity at a given point.

- **Equation:** $Ed = \frac{\%Qd}{\%P}$

➢ **Where %ΔQd=** $\frac{Q2-Q1}{P1}X100$ AND **%ΔP=** $\frac{P2-P1}{P1}X100$

Thus, **Ep** = $\frac{\Delta Q}{\Delta P}X\frac{P1}{Q1}$

B. Arc elasticity of demand: measures a portion or a segment of the demand curve between the two points.

- the midpoints of the old and the new values of both price and Qd are used.

Formula: $\mathbf{Ed} = \frac{Q2-Q1}{Q1+Q2} \div \frac{P2-P1}{P1+P2}$ or $\frac{\Delta Q}{\Delta P} \times \frac{P1+P2}{Q1+Q2}$

Example: Consider the demand for pop (Dpop) when Price falls from Br.1.50 to Br. 1.00 and the Qd increases from 5 to 10, the what is the price elasticity of demand?

solution

ε = |(ΔQd/ Q average)/(ΔP / P average)|

ε =| 5 / 7.5 | /-0.5/1.25| = | +66.6% |/-40%| = |1.67 |= **1.67**

➢ **Types if elasticity**

a. Elastic Demand (Ed > 1):

- Quantity demanded is very sensitive to price changes.
- **Consumer's price sensitivity:** relatively high

b. Inelastic Demand (Ed < 1):

- Quantity demanded is not very sensitive to price changes
- **(% ΔQdx < % ΔPx)**
- Demand curve relatively steep
- Consumer's price sensitivity: relatively low

c. **Unitary Elasticity (Ed = 1):**
   - Quantity demanded changes proportionally to price changes.
   - **(% ΔQdx = % ΔPx)**

d. **Perfectly inelastic (Ed = 0):**
   - Demand curve is vertical and %ΔQ=0
   - Consumers' price sensitivity: None

e. **Perfectly elastic (Ed = ∞):** Demand curve is **horizontal**

2.1.2 Cross-Price Elasticity of Demand

Definition: Measures the responsiveness of the quantity demanded of one good to changes in the price of another good.

- **Equation:** Exy = %ΔQdx/ %ΔPy = $\frac{\frac{\Delta Qx}{Qx}}{\frac{\Delta Py}{Py}}$ = **ΔQ/ΔP x P_1/Q_1**
- **Interpretation:**

a. **Substitute Goods:** Exy is **positive**. An increase in the price of one good leads to an increase in demand for the other good.

b. **Complementary Goods:** Exy is **negative**. An increase in the price of one good leads to a decrease in demand for the other good.

c. **Unrelated Goods:** Exy is **zero**. Changes in the price of one good have no impact on **The elasticity of demand depends on the following factors:**

Nature of the commodity: The demand for necessities is inelastic because the demand does not change much with a change in price. But the demand for luxuries is elastic in nature.

- **Availability of close substitutes:** The commodity that has the greatest number of substitutes has relatively elastic demand. A commodity with fewer substitutes has relatively inelastic demand. People with high incomes are less affected by price changes than people with low incomes.
- **Proportion of income spent on the commodity**: When a small part of income is spent on the commodity, the price change does not affect the demand. Therefore, the demand is inelastic in nature.
- **Urgency of demand / postponement of purchase:** The demand for certain commodities is highly inelastic because you cannot postpone their purchase.

- **Durability of a commodity:** If the commodity is durable, then it will be used for a long period of time. Therefore, the elasticity of demand is high. Price changes highly influence the demand for durables in the market.
- **Product purchase frequency or recurrence of demand:** Demand for frequently purchased goods is more elastic than demand for rarely purchased goods.
- **Time:** In the short run, demand will be less elastic, but in the long run, demand for commodities will be more elastic.

example

____ 1. The price elasticity of demand measures how much

A. quantity demanded responds to a change in price.
B. quantity demanded responds to a change in income.
C. price responds to a change in demand.
D. demand responds to a change in supply.

____ 2. A good will have a more inelastic demand,

A. the greater the availability of close substitutes.
B. the broader the definition of the market.
C. the longer the period of time.
D. the more it is regarded as a luxury.

____ 3. Suppose there is a 6 percent increase in the price of good X and a resulting 6 percent decrease in the quantity of X demanded. Price elasticity of demand for X is

A. 0. B. 1. C. 6. D. 36.

……4. Consider the market for bicycles. The demand is given by P= -1.5Qd+ 60. Suppose that the price changes from $15 to $30. Using the standard percentage change formula (Point method), what is the price elasticity of demand?

A. 1/3 B. 1/6 C. 3 D. ½

5. Based on question number 4 what is the price elasticity of demand using the midpoint method?

A. 3/5 B. 3/2 C. 5/3 D. 4

2.3.4 Income Elasticity of Demand

Definition: Measures the responsiveness of the quantity demanded to changes in consumer income.

Equation: Ey $= \frac{\%\Delta Qd}{\%\,\Delta I} = \frac{\frac{\Delta Q}{Q}}{\frac{\Delta I}{I}}$ **= ΔQ/ΔP X I/Q**

Interpretation:

- **Normal Goods (Ie > 1) ,** Ey is **positive**. An increase in income leads to an increase in demand.
- **Inferior Goods:** Ey is **negative** (Ey<0) An increase in income leads to a decrease in demand.
- **Luxury Goods:** Ey > 1- ***demand is very sensitive to income changes*.**
- **Necessity Goods:** Ey<1 -***demand is less sensitive to income changes.***
- **Substitutes (Ce > 0**)
- **Complements (Ce < 0)**

- **Zero Income Elasticity:** The increase in income of the individual does not make any difference in the demand for that commodity **(E^d_I= 0).**
- **Negative Income Elasticity:** The increase in the income of consumers leads to less purchase of those goods (E^D_I< 0).
- **Unitary Income Elasticity:** The change in income leads to the same percentage of change in the demand for goods **(E^DI= 1).**
- **Income Elasticity is Greater than one:** The change in income increases the demand for that commodity more than the change in income **(E^DI> 1).**
- **Income Elasticity is Less than one**: The change in income increases the demand for the commodity, but at a lesser percentage than the change in income **(E^DI< 1).**

Price Elasticity of Supply

Definition: Measures the responsiveness of quantity supplied to changes in price.

- indicates how sellers react to change in price.

Equation: Es $= \frac{\%\Delta Q}{\%\Delta P} = E_P^S = \frac{\Delta Q_s}{\Delta P_x} \cdot \frac{P_x}{Q_s}$ **----------Point elasticity**

$$E_P^S = \frac{\Delta Q_s}{\Delta P_x} \cdot \left(\frac{P_1 + p_2}{Q_1 + Q_2}\right)$$ ..... **Arc elasticity**

Example 1: Suppose an increase in price of a ball pen from Birr 4 to Birr 5 results in increase in quantity supplied of pens from 1,000 to 1,500 units. Then find price elasticity of supply using the point method.

Solution: *Given:* Q1 = 1000, Q2 = 1500, P 1= 4, P2 = 5

ΔQ = 1, 500 – 1,000 = 500, ΔP = 5 – 4 = 1,

$\therefore$ es= $\frac{\Delta O}{\Delta P} \times \frac{P}{Q} = \frac{500}{1} X \frac{4}{1000} = \frac{2000}{1000} = \mathbf{2}$

If price increases by 1%, quantity supplied increases by 2%

Example 2: A local producer of edible oil reduced its quantity supplied from 10,000 liters to 8,000 liters per month in response to price fall of oil from Birr 25 to Birr 20. Then find price elasticity of supply using the Arc method.

Solution: Price elasticity of supply using arc method can be found as follows.

Given: P_1 = 25, Q_1 = 10,000, P_2 = 20, Q_2 = 8,000

ΔQ=8000-10000= -**2000**, ΔP= 20 – 25 = -**5**

$$\frac{\Delta Q}{\Delta P} \times \frac{P1 + P2}{Q1 + Q2} = \frac{-2000}{-5} X \frac{45}{18000} = \frac{90000}{90000} = 1$$

Interpretation:

Elastic Supply (Es > 1): Quantity supplied is very sensitive to price changes.

Inelastic Supply (Es < 1): Quantity supplied is not very sensitive to price changes.

Unitary Elasticity (Es = 1): Quantity supplied changes proportion- ally to price changes.

Determinants of the price elasticity of supply:

Expectation of future prices:

Production period:

- supply is relatively elastic to price changes in the long-run and
- relatively inelastic in the short-run.

Factor substitution:

- If there are greater substitutes for factors of production, supply is more **elastic.**
- Whenever there is a slight change in the price of a factor input, it can be substituted for others, making supply quite elastic.
- With no substitutes, supply becomes **inelastic.**

Number of sellers:

- *The market's supply will be more **elastic** when there are large numbers of firms serving the market.*
- *With a smaller number of firms/ sellers, supply becomes inelastic.*

EXAMPLES

1. The consumer surplus in a market is equal to:

A. The total revenue earned by all consumers in the market
B. The difference between the price at which a consumer buys a product and the cost of producing that product
C. The difference between the price at which a consumer buys a product and the price at which producers are willing to sell that product
D. The total profit earned by all consumers in the market

2. If the elasticity of supply is greater than one, the supply curve would be _____.
   A. **Touching y-axis** C. Passing through the origin
   B. Vertical D. Horizontal
3. In May 2019, a firm was providing 5000 kg of sugar at a market price of Rs. 30 per kg. But in June 2019, the supply of sugar decreased to 4500 kg at a market price of Rs. 20 per kg. This change shows that the supply of sugar is _____.
   A. More elastic **B. Less elastic** C. Perfectly inelastic D. Perfectly elastic

4. If price changes by 1% and supply changes by 2%, then the supply is _____.
a. Static b. Indeterminate c. Inelastic d. Elastic

5. The supply curve will be_____ when the supply elasticity is greater than one.
   A. Horizontal B. vertical C. touching y-axis D. passing through the origin

6. In July 2012, a company was giving 6000kgs of flour at the market value of rupee 40 per kg. But in august 2012, the flour supply was reduced to 5500 kg at the market value of rupee 30kg. This change in flour supply is_____.
   A. less elastic B. more elastic C. perfectly elastic. D. perfectly inelastic

7. Suppose you are told that the own-price elasticity of supply equal 0.5. Which of the following is the correct interpretation of this number?
a) A 1% increase in price will result in a 50% increase in quantity supplied.
b) A 1% increase in price will result in a 5% increase in quantity supplied.
c) A 1% increase in price will result in a 2% increase in quantity supplied.
d) A 1% increase in price will result in a 0.5% increase in quantity supplied.