

## UNIT-II

### INTRODUCTION TO DEMAND AND SUPPLY

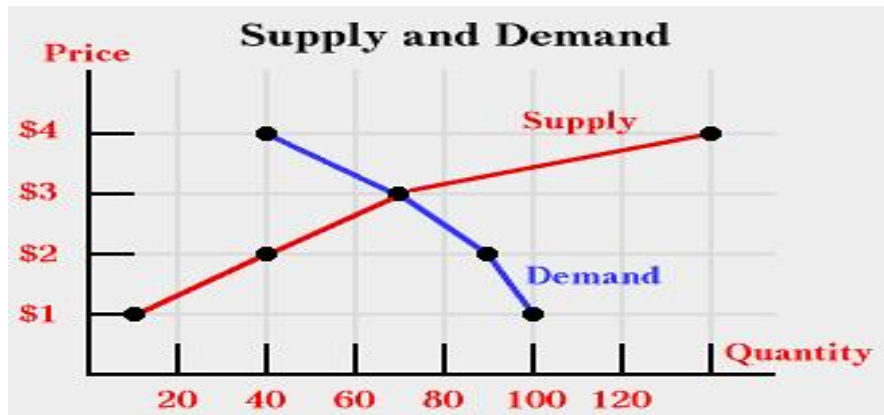
Demand is the rate at which consumers want to buy a product. Economic theory holds that demand consists of two factors: taste and ability to buy. Taste, which is the desire for a good, determines the willingness to buy the good at a specific price. Ability to buy means that to buy a good at specific price, an individual must possess sufficient wealth or income.

Demand for desire implies three things

- 1) Desire to acquire the commodity
- 2) Willingness to pay for commodity
- 3) Ability to pay for the commodity

Willingness and ability to supply goods determine the seller's actions. At higher prices, more of the commodity will be available to the buyers. This is because the suppliers will be able to maintain a profit despite the higher costs of production that may result from short-term expansion of their capability.

Demand is defined as the quantity (or amount) of a good or service people are willing and able to buy at different prices, while supply is defined as how much of a good or service is offered at each price. How do they interact to control the market? Buyers and sellers react in opposite ways to a change in price. When price increases, the willingness and ability of sellers to offer goods will increase, while the willingness and ability of buyers to purchase goods will decrease. To illustrate more clearly how the market works, we will look at the following example from the clothing industry. The same information can be shown with a graph. On the graph, the equilibrium price and quantity are indicated by the intersection of the supply and demand curves.



### What is demand and its types:

Demand in common parlance means the desire for an object. But in economics demand is something more than this.

According to Stonier and Hague, “Demand in economics means demand backed up by enough money to pay for the goods demanded”. This means that the demand becomes effective only if it is backed by the purchasing power in addition to this there must be willingness to buy a commodity. Thus demand in economics means the desire backed by the willingness to buy a commodity and the purchasing power to pay.

In the words of “Benham” “The demand for anything at a given price is the amount of it which will be bought per unit of time at that Price”. (Thus demand is always at a price for a definite quantity at a specified time.) Thus demand has three essentials – price, quantity demanded and time. Without these, demand has no significance in economics.

It deals with four aspects:

1. Consumption
2. Production
3. Exchange
4. Distribution
- 5.

### Factors Affecting Demand

There are factors on which the demand for a commodity depends. These factors are economic, social as well as political factors. The effect of all the factors on the amount demanded for the commodity is called Demand Function. These factors are as follows:

**1. Price of the Commodity:** The most important factor-affecting amount demanded is the price of the commodity. The amount of a commodity demanded at a particular price is more properly called price demand. The relation between price and demand is called the Law of Demand. It is not only the existing price but also the expected changes in price, which affect demand.

**2. Income of the Consumer:** The second most important factor influencing demand is consumer income. In fact, we can establish a relation between the consumer income and the demand at different levels of income, price and other things remaining the same. The demand for a normal

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commodity goes up when income rises and falls down when income falls. But in case of Giffen goods the relationship is the opposite.

**3. Prices of related goods:** The demand for a commodity is also affected by the changes in prices of the related goods also. Related goods can be of two types:

(i). **Substitutes** which can replace each other in use; for example, tea and coffee are substitutes. The change in price of a substitute has effect on a commodity's demand in the same direction in which price changes. The rise in price of coffee shall raise the demand for tea;

(ii). **Complementary** foods are those which are jointly demanded, such as pen and ink. In such cases complementary goods have opposite relationship between price of one commodity and the amount demanded for the other. If the price of pens goes up, their demand is less as a result of which the demand for ink is also less. The price and demand go in opposite direction. The effect of changes in price of a commodity on amounts demanded of related commodities is called Cross Demand.

**4. Tastes of the Consumers:** The amount demanded also depends on consumer's taste. Tastes include fashion, habit, customs, etc. A consumer's taste is also affected by advertisement. If the taste for a commodity goes up, its amount demanded is more even at the same price. This is called increase in demand. The opposite is called decrease in demand.

**5. Wealth:** The amount demanded of commodity is also affected by the amount of wealth as well as its distribution. The wealthier are the people; higher is the demand for normal commodities. If wealth is more equally distributed, the demand for necessities and comforts is more. On the other hand, if some people are rich, while the majorities are poor, the demand for luxuries is generally higher.

**6. Population:** Increase in population increases demand for necessities of life. The composition of population also affects demand. Composition of population means the proportion of young and old and children as well as the ratio of men to women. A change in composition of population has an effect on the nature of demand for different commodities.

**7. Government Policy:** Government policy affects the demands for commodities through taxation. Taxing a commodity increases its price and the demand goes down. Similarly, financial help from the government increases the demand for a commodity while lowering its price.

**8. Expectations regarding the future:** If consumers expect changes in price of commodity in future, they will change the demand at present even when the present price remains the same. Similarly, if consumers expect their incomes to rise in the near future they may increase the demand for a commodity just now.

**9. Climate and weather:** The climate of an area and the weather prevailing there has a decisive effect on consumer's demand. In cold areas woolen cloth is demanded. During hot Summer days, ice is very much in demand. On a rainy day, ice cream is not so much demanded.

**10. State of business:** The level of demand for different commodities also depends upon the business conditions in the country. If the country is passing through boom conditions, there will be a marked increase in demand. On the other hand, the level of demand goes down during depression

### **DETERMINANTS OF DEMAND:**

Determinants of demand are as follows

1. No. of buyers
2. Income
3. Normal Good

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#### 4. Inferior good

Among the many causal factors affecting demand, price is the most significant and the price-quantity relationship called as the Law of Demand is stated as follows: "The greater the amount to be sold, the smaller must be the price at which it is offered in order that it may find purchasers, or in other words, the amount demanded increases with a fall in price and diminishes with a rise in price" (Alfred Marshall). In simple words other things being equal, quantity demanded will be more at a lower price than at higher price. The law assumes that income, taste, fashion, prices of related goods, etc. remain the same in a given period. The law indicates the inverse relation between the price of a commodity and its quantity demanded in the market. However, it should be remembered that the law is only an indicative and not a quantitative statement. This means that it is not necessary that such variation in demand be proportionate to the change in price.

#### **Definitions**

1	<i>"Law of Demand states that people will buy more at lower prices and buy less at higher prices, if other things remaining the same." - Prof. Samuelson.</i>
2	<i>The Law of Demand states that amount demanded increases with a fall in price and diminishes when price increases." - Prof. Marshall</i>
3	<i>"According to the law of demand, the quantity demanded varies inversely with price." – Ferguson</i>
4	<i><b>Benham:-</b> "Usually a larger quantity of commodity will demanded at lower price than a higher price"</i>

#### **Characteristics of law of demand**

- Inverse relationship between price and demand.
- Price is independent variable
- Demand is dependent variable on price of goods.

#### **Assumptions**

Every law will have limitation or exceptions. This law operates when the commodity's price changes and all other prices and conditions do not change. The main assumptions are

- Habits, tastes and fashions remain constant
- Money, income of the consumer does not change.
- Prices of other goods remain constant

- The commodity in question has no substitute
- The commodity is a normal good and has no prestige or status value.
- People do not expect changes in the prices.

## **DEMAND FUNCTION**

The term „micro“ means small. The study of an individual consumer or a firm is called microeconomics (also called the *Theory of Firm*). Micro means „one millionth“. Microeconomics deals with behavior and problems of single individual and of micro organization. Managerial economics has its roots in microeconomics and it deals with the micro or individual enterprises. It is concerned with the application of the concepts such as price theory, Law of Demand and theories of market structure and so on.

Micro-economic theory takes the total quantity of resources as given and seeks to explain how they are assigned to the production of different goods. Allocation of resources determines what goods shall be produced and how they shall be produced. In a free market economy, the allocation of resources to the production of various goods depends upon the prices of the various goods and prices of the various resources or factors of production. Hence, micro-economics proceeds to analyses how the relative prices of goods and factors are determined in order to explain how the allocation of resources is determined. Therefore, the theory of product pricing and theory of factor pricing or the theory of distribution fall within the domain of micro-economics.

### **Classification of Demand**

#### **1. Individual demand:-**

A commodity or good demanded by a single person is called individual demand.

<b>Individual Demand Schedule</b>	
<b>Price</b>	<b>Individual Quantity Demanded</b>
1	4
2	3
3	2
4	1

**Application:** when the price is very high, a low-income buyer may not buy anything, though a high-income buyer may buy something. In such a case, we may distinguish between the demand of an individual buyer and that of the market which is the aggregate of individuals.

#### **2. Market Demand**

A demand for a particular product by all customers and added, is called market demand. (Total all individual demand is called as the market demand)

Table is the market demand schedule. This schedule, from the angle of simplification, is based

on the assumption that there are two buyers, A and B for X commodity. By adding up their individual demand, the market demand schedule has been estimated:

<b>Market demand Schedule</b>				
<b>Price of Commodity X (Rs.)</b>	<b>Demand of person A</b>	<b>Demand of person B</b>	<b>Market Demand Person (A+B+.....= market demand)</b>	
<b>1</b>	4	5	4 + 5 =	9
<b>2</b>	3	4	3 + 4 =	7
<b>3</b>	2	3	2 + 3 =	5
<b>4</b>	1	2	1 + 2 =	3

### **Factors affecting market demand**

Market or aggregate demand is the summation of individual demand curves. In addition to the factors which can affect individual demand there are three factors that can affect market demand (cause the market demand curve to shift):

a change in the number of consumers,

a change in the distribution of tastes among consumers,

a change in the distribution of income among consumers with different tastes

### **3 Derive Demand**

The increase in demand for one particular good causes increase in the demand for other good is called derived demand. Complementary goods are those goods which are jointly used to satisfy a want. In other words, complementary goods are those which are incomplete without each other. These are things that go together, often used simultaneously. For example, pen and ink, Tennis rackets and tennis balls, cameras and film, etc.

For example, demand for coal leads to derived demand for mining, as coal must be mined for coal to be consumed.

#### **Examples:**

- Increasing demand for use computers in various fields will cause increase in demand for the operating systems like Microsoft windows products.
- Increase in the demand for automobiles like bikes, cars and large & heavy vehicle will cause increase in the demand for the fuel like petrol and diesel.
- Increase in the demand for the cellular phone will cause increase in the demand for the memory cards for the multimedia purpose.
- Increase in the demand for the education will cause increase in the demand for the text books for the various subjects.

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- 5. Cross Demand:** When the demand of one commodity is related with the price of other commodity is called cross demand. The commodity may be substitute or complementary. Substitute goods are those goods which can be used in case of each other. For example, tea and coffee, Coca-cola and Pepsi. In such case demand and price are positively related. This means if the price of one increased then the demand for other also increases and vice versa.

**Cross elasticity demand:**

There is a mutual relationship between change in price and quantity demanded of two related goods. Change in the price of one goods can cause change in the demand for the related good. For example, change in the price of tea ordinarily causes change in demand for coffee. Likewise, change in the price of cars causes change in demand for petrol. Mutual relationship between quantity demanded of a good due to change in the price of another goods can be measured by cross elasticity of demand.

**ELASTICITY OF DEMAND:**

**Elasticity of Demand** Elasticity of demand explains the relationship between a change in price and consequent change in amount demanded. “Marshall” introduced the concept of elasticity of demand. Elasticity of demand shows the extent of change in quantity demanded to a change in price. In the words of “Marshall”, “The elasticity of demand in a market is great or small according as the amount demanded increases much or little for a given fall in the price and diminishes much or little for a given rise in Price” Elastic demand: A small change in price may lead to a great change in quantity demanded. In this case, demand is elastic. In-elastic demand: If a big change in price is followed by a small change in demanded then the demand in “inelastic”.

**Measurement of Elasticity of Demand**

- A. Perfectly elastic demand:**
- B. Perfectly Inelastic Demand**
- C. Relatively elastic demand:**
- D. Relatively in-elastic demand.**
- E. Unit elasticity of demand:**

**Types of Elasticity of Demand**

- 1. Price Elasticity of Demand:**
- 2. Income Elasticity of Demand:**

**DEGREES OF PRICE ELASTICITY**

Different commodities have different price elasticities. Some commodities have more elastic demand while others have relative elastic demand. Basically, the price elasticity of demand ranges from zero to infinity. It can be equal to zero, less than one, greater than one and equal to unity.

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According to **Dr. Marshall** : "The elasticity or responsiveness of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price and diminishes much or little for a given rise in price."

However, some particular values of elasticity of demand have been explained as under ;

### **Types of Price Elasticity of Demand:-**

1. Perfectly elastic demand.
2. Perfectly inelastic demand.
3. Relatively elastic demand.
4. Relatively inelastic demand.
5. Unitary inelastic demand.

### **MEASUREMENT OF PRICE ELASTICITY OF DEMAND**

There are five methods to measure the price elasticity of demand.

1. Total Expenditure Method.
2. Proportionate Method.
3. Point Elasticity of Demand.
4. Arc Elasticity of Demand.
5. Revenue Method.

#### **Total Expenditure Method**

Dr. Marshall has evolved the total expenditure method to measure the price elasticity of demand. According to this method, elasticity of demand can be measured by considering the change in price and the subsequent change in the total quantity of goods purchased and the total amount of money spend on it.

#### **Proportionate Method**

This method is also associated with the name of Dr. Marshall. According to this method, "price elasticity of demand is the ratio of percentage change in the amount demanded to the percentage change in price of the commodity." It is also known as the Percentage Method, Flux Method, Ratio Method, and Arithmetic Method.

$$E_d = \frac{\text{Proportionate change in Quantity Demanded}}{\text{proportionate change in price}}$$

#### **Arc Elasticity of Demand**



- According to Prof. Baumol: "Arc elasticity is a measure of the average responsiveness to price change exhibited by a demand curve over some finite stretch of the curve".
- According to Leftwich : "When elasticity is computed between two separate points on a demand curve, the concept is called Arc elasticity."

### **DEMAND FORECASTING–PURPOSE/ DETERMINANTS:**

The information about the future is essential for both new firms and those planning to expand the scale of their production. Demand forecasting refers to an estimate of future demand for the product. It is an „objective assessment of the future course of demand”. In recent times, forecasting plays an important role in business decision-making. Demand forecasting has an important influence on production planning. It is essential for a firm to produce the required quantities at the right time. It is essential to distinguish between forecasts of demand and forecasts of sales. Sales forecast is important for estimating revenue cash requirements and expenses. Demand forecasts relate to production, inventory control, timing, reliability of forecast etc. However, there is not much difference between these two terms.

**Types of demand Forecasting:** Based on the time span and planning requirements of business firms, demand forecasting can be classified in to

1. Short-term demand forecasting and
2. Long – term demand forecasting.

1. **Short-term demand forecasting:** Short-term demand forecasting is limited to short periods, usually for one year. It relates to policies regarding sales, purchase, price and finances. It refers to existing production capacity of the firm. Short-term forecasting is essential for formulating a suitable price policy. If the business people expect of rise in the prices of raw materials of shortages, they may buy early. This price forecasting helps in sale policy formulation. Production may be undertaken based on expected sales and not on actual sales. Further, demand forecasting assists in financial forecasting also. Prior information about production and sales is essential to provide additional funds on reasonable terms.
2. **Long – term forecasting:** In long-term forecasting, the businessmen should now about the long-term demand for the product. Planning of a new plant or expansion of an existing unit depends on long-term demand.

**The various factors that influence demand forecasting are explained as follows:**

#### **i. Types of Goods:**

Affect the demand forecasting process to a larger extent. Goods can be producer’s goods, consumer goods, or services. Apart from this, goods can be established and new goods.

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Established goods are those goods which already exist in the market, whereas new goods are those which are yet to be introduced in the market.

Information regarding the demand, substitutes and level of competition of goods is known only in case of established goods. On the other hand, it is difficult to forecast demand for the new goods. Therefore, forecasting is different for different types of goods.

**ii. Competition Level:**

Influence the process of demand forecasting. In a highly competitive market, demand for products also depends on the number of competitors existing in the market. Moreover, in a highly competitive market, there is always a risk of new entrants. In such a case, demand forecasting becomes difficult and challenging.

**iii. Price of Goods:**

Acts as a major factor that influences the demand forecasting process. The demand forecasts of organizations are highly affected by change in their pricing policies. In such a scenario, it is difficult to estimate the exact demand of products.

**iv. Level of Technology:**

Constitutes an important factor in obtaining reliable demand forecasts. If there is a rapid change in technology, the existing technology or products may become obsolete. For example, there is a high decline in the demand of floppy disks with the introduction of compact disks (CDs) and pen drives for saving data in computer. In such a case, it is difficult to forecast demand for existing products in future.

**v. Economic Viewpoint:**

Play a crucial role in obtaining demand forecasts. For example, if there is a positive development in an economy, such as globalization and high level of investment, the demand forecasts of organizations would also be positive.

**DEMAND FORECASTING–METHODS**

**Methods of Forecasting**

Several methods are employed for forecasting demand. All these methods can be grouped under survey method and statistical method. Survey methods and statistical methods are further subdivided in to different categories.

***1. Survey Method:***

Under this method, information about the desires of the consumer and opinion of experts are collected by interviewing them. Survey method can be divided into four types viz., Option survey method; expert opinion; Delphi method and consumers interview methods.

***a. Opinion survey method:***

This method is also known as sales-force composite method (or) collective opinion method. Under this method, the company asks its salesman to submit estimate of future sales in their respective territories. Since the forecasts of the salesmen are biased due to their optimistic or pessimistic attitude ignorance about economic developments etc. these estimates are

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consolidated, reviewed and adjusted by the top executives. In case of wide differences, an average is struck to make the forecasts realistic.

This method is more useful and appropriate because the salesmen are more knowledgeable. They can be an important source of information. They are cooperative. The implementation within unbiased or their bias can be corrected.

**B. Expert opinion method:** Apart from salesmen and consumers, distributors or outside experts may also be used for forecasting. In the United States of America, the automobile companies get sales estimates directly from their dealers. Firms in advanced countries make use of outside experts for estimating future demand. Various public and private agencies all periodic forecasts of short or long term business conditions. Apart from salesmen and consumers, distributors or outside experts may also be used for forecasting. In the United States of America, the automobile companies get sales estimates directly from their dealers. Firms in advanced countries make use of outside experts for estimating future demand. Various public and private agencies all periodic forecasts of short or long term business conditions.

**C. Delphi Method:**

A variant of the survey method is Delphi method. It is a sophisticated method to arrive at a consensus. Under this method, a panel is selected to give suggestions to solve the problems in hand. Both internal and external experts can be the members of the panel. Panel members are kept apart from each other and express their views in an anonymous manner. There is also a coordinator who acts as an intermediary among the panelists. He prepares the questionnaire and sends it to the panelist. At the end of each round, he prepares a summary report. On the basis of the summary report the panel members have to give suggestions. This method has been used in the area of technological forecasting. It has proved more popular in forecasting. It has proved more popular in forecasting non-economic rather than economic variables.

**D. Consumers interview method:**

In this method the consumers are contacted personally to know about their plans and preference regarding the consumption of the product. A list of all potential buyers would be drawn and each buyer will be approached and asked how much he plans to buy the listed product in future. He would be asked the proportion in which he intends to buy. This method seems to be the most ideal method for forecasting demand.

**2. Statistical Methods:**

Statistical method is used for long run forecasting. In this method, statistical and mathematical techniques are used to forecast demand. This method relies on past data.

**a. Time series analysis or trend projection methods:**

A well-established firm would have accumulated data. These data are analyzed to determine the nature of existing trend. Then, this trend is projected into the future and the results are used as the basis for forecast. This is called as time series analysis. This data can be presented either in a tabular form or a graph. In the time series past data of sales are used to forecast future.

**b. Barometric Technique:**

Simple trend projections are not capable of forecasting turning points. Under Barometric method, present events are used to predict the directions of change in future. This is done with the help of

economics and statistical indicators. Those are (1) Construction Contracts awarded for building materials (2) Personal income (3) Agricultural Income. (4) Employment (5) Gross national income (6) Industrial Production (7) Bank Deposits etc.

**c. Regression and correlation method:**

Regression and correlation are used for forecasting demand. Based on past data the future data trend is forecasted. If the functional relationship is analyzed with the independent variable it is simple correlation. When there are several independent variables it is multiple correlation. In correlation we analyze the nature of relation between the variables while in regression; the extent of relation between the variables is analyzed. The results are expressed in mathematical form. Therefore, it is called as econometric model building. The main advantage of this method is that it provides the values of the independent variables from within the model itself..

**DEMAND FORECASTING**

The activity of estimating the quantity of a product or service that consumers will purchase. Demand forecasting involves techniques including both informal methods, such as educated guesses, and quantitative methods, such as the use of historical sales data or current data from test markets. Demand forecasting may be used in making pricing decisions, in assessing future capacity requirements, or in making decisions on whether to enter a new market. According

1	<b>Cundiff and Still</b> , <i>"Demand Forecasting is an estimate of Demand during a specified period. Which estimate is tied to a proposed marketing plan and which assumes a particular set of uncontrollable and competitive forces."</i>
2	<b>Prof. Philip Kotler</b> . <i>The company (sales) forecast is the expected level of company sales based on a chosen marketing plan and assumed marketing environment"</i>
3	<b>Evan J. Douglas</b> , <i>"Demand forecasting may be defined as the process of finding values for demand in future time periods."</i>

The cost should be controlled by producing correct level of goods in the firm and also according to the demand for those goods in the market. For the estimation of demand, demand forecasting is to be done by the firm.

- Forecasting = estimation of future situations.
- Forecasting reduces or minimizes the uncertainty.
- By forecasting effective decisions can be taken for tomorrow.
- Demand forecasting is based on the determinants of the demand.
- Demand for goods increases and gives sales.
- Sales are the primary source of the income for a firm.

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## **STEPS INVOLVED IN DEMAND FORECASTING**

### **1. Identification of business objectives:**

In the first stage we should know what is the aim of forecasting? What we get or know from the forecasting? Estimation of factors like quantity and composition of demand for goods, price to be quoted, sales planning and inventory control etc., are done in the first stage.

### **2. Determining the nature of goods under consideration:**

Different category of goods has their own distinctive demand. Example capital goods, consumer durables and non-durables goods in which category our goods fall we should estimate.

### **3. Selecting a proper method of forecasting:**

There are different methods for demand forecasting. Which is best suited method that we should select for doing demand forecasting?

### **4. Interpretation of results:**

The forecasting which is done by the managerial economist should be interpreted in detailed manner. That means it should be easy to understand by the top management.

## **Demand Forecasting Techniques**

To invest money and others factors in business; we require a reasonable accurate forecast of demand. Starting with qualitative methods like survey of collective opinions, buyers' intention, Delphi approach and its variant, a number of quantitative methods are used for computing demand forecasts as detailed below:

### **Opinion polling method**

#### **a) Collective opinion Survey:**

Sales personnel are closest to the customers and have an intimate feel of the market. Thus they are most suited to assess consumer's reaction to company's products. Here each salesperson makes an estimate of the expected sales in their area, territory, state and/or region, These estimates are collated, reviewed and revised. Taking in to account product design, features and price is decided and made. Thus, "collective opinion survey forms the basis of market Analysis and demand forecasting.

Although this method is simple, direct, first hand and most acceptable, it suffers from following weaknesses

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1. demand estimates by individual salespersons to obtain total demand of the country may be risky as each person has knowledge about a small portion of market only
  2. Salesperson may not prepare the demand estimation with the seriousness and care
  3. limited experience in their employment, salesperson may not have the required knowledge and experience

**b) Survey of Customers Intention**

Another method of demand forecasting is to carry out a survey of what consumers prefer and intend to buy. If the product is sold to a few large industrial buyers, survey would involve interviewing them. If it is a consumer durable product, a sample survey is carried out about what they are planning or intending to buy. It is not easy to query all consumers through direct contact or through printed questionnaire by mail. These surveys serve useful purpose in establishing relationships between

- a) Demand and price
- b) Demand and income of consumers
- c) Demand and expenditure on advertisement etc.

This method is preferred when bulk of the sales made to institutions and industrial buyers and only a few of them have to be contacted. Disadvantages are. Survey method is not useful for households - interviewing them is not only difficult but also expensive. They are not able to give precise idea about their intentions particularly when alternative products are available in the market.

**c) Delphi Method**

The Delphi technique was developed at RAND Corporation in the 1950s. Delphi method is a group (members) process and aims at achieving a `single opinion of the members on the subject. Herein experts in the field of marketing research and **demand forecasting** are engaged in

- analyzing economic conditions
- carrying out sample surveys of market
- conducting opinion polls

Based on the above, demand forecast is worked out in following steps:

1. Administrator sends out a set of questions in writing to all the experts on the panel, who are requested to write back a brief predication.
2. Written predictions of experts are collected and combined, edited and summarized together by the administrator.
3. Based on the summary, administrator designs a new set of questions and gives them to the same experts who answer back again in writing.
4. Administrator repeats the process of collecting, combining, editing and summarizing the responses.

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5. Steps 3 and 4 are repeated by the administrator to experts with diverse backgrounds until they come to one single opinion.

If there is divergence of opinions and hence conclusions, administrator has to sort it out through mutual discussions. Administrator has to have the necessary experience and background as he plays a key role in designing structured 'questionnaires and synthesizing the data.

## **Statistical methods**

- **Trend projection method**

This technique assumes that whatever past years demand pattern will be continued in the future also. Basing on the historical data that means previous year's data is used to predict the demand for the future. In this trend projection method, previous year's data is presented on the graph and future demand is estimated.

- **Regression Analysis**

Past data is used to establish a functional relationship between two variables. For Example, demand for consumer goods has a relationship with income of Individuals and family; demand for tractors is linked to the agriculture income and demand for cement, bricks etc. are dependent upon value of construction contracts at any time. Forecasters collect data and build relationship through co-relation and regression analysis of variables.

- **Econometric Models**

Econometric models are more complex and comprehensive as this model uses mathematical and statistical tools to forecast demand. This model takes various factors which affect the demand. For example, demand for passenger transport is not only dependent upon the population of the city, geographical area, industrial units, their location etc. It is not easy to locate one single economic indicator for determining the demand forecast of a product. Invariably, a multi-factor situation applies Econometric Models, although complex, are being increasingly used for market analysis and demand forecasts.

- **Simple Average Method**

Among the quantitative techniques for demand analysis, simple Average Method is the first one that comes to one's mind. Herein, we take simple average of all past periods - simple monthly average of all consumption figures collected every month for the last

twelve months or simple quarterly average of consumption figures collected for several quarters in the immediate past. Thus,

Sum of Demands of all periods =

$$= \frac{\text{Simple Average}}{\text{Number of periods}}$$

Year	Sales in lakhs
2005	2
2006	2.2
2007	2.3
2008	2.2
2009	2.3
2010	?

$$\frac{2 + 2.2 + 2.3 + 2.2 + 2.3}{5} = 2.2 \text{ average sales expected in 2010}$$

### **DETERMINANTS OF SUPPLY**

When price changes, quantity supplied will change. That is a movement along the same supply curve. When factors other than price changes, supply curve will shift. Here are some determinants of the supply curve.

#### **1. Production cost:**

Since most private companies' goal is profit maximization. Higher production cost will lower profit, thus hinder supply. Factors affecting production cost are: input prices, wage rate, government regulation and taxes, etc.

	Cost of production depends on the factors like
1	Price of raw materials
2	Rents and interest on capital
3	Cost of machinery
4	Payments to human resources (wages and salaries)
5	Transportation charges

If cost of production is high normally supply will be low



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## 2. Technology:

Technological improvements help reduce production cost and increase profit, thus stimulate higher supply. Use of latest technology decreases the cost of production and increases the production capacity which increases supply of goods.

## 3. Number of sellers:

More sellers in the market increase the market supply. Supply depends upon the below said factors. These factors should not arise if they arise; they affect the supply directly or indirectly.

1	whether conditions
2	Floods
3	Wars
4	Epidemics (unexpected situations)

## 4. Expectation for future prices:

If producers expect future price to be higher, they will try to hold on to their inventories and offer the products to the buyers in the future, thus they can capture the higher price.

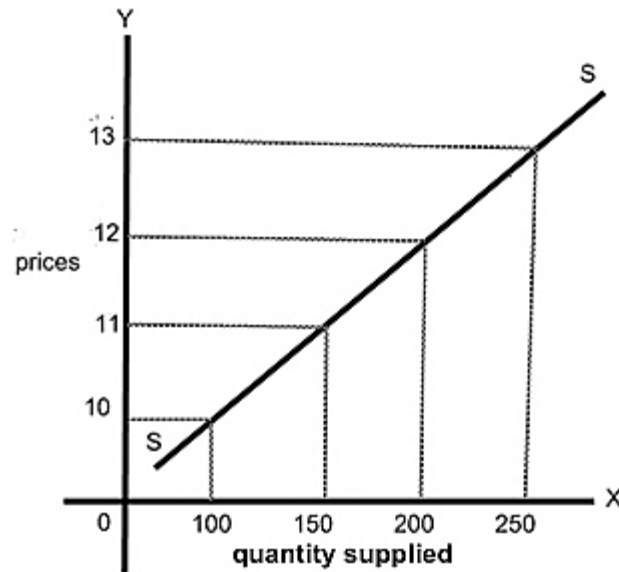
The relationship between price and quantity supplied is usually a positive relationship. A rise in price is associated with a rise in quantity supplied.

## LAW OF SUPPLY FUNCTION

<b>1</b>	<b>Dooley.</b> "The law of supply states that other things being equal the higher the price, the greater the quantity supplied or the lower the price, the smaller the quantity supplied."
<b>2</b>	to <b>Lipsey,</b> "The law of supply states that other things being equal, the quantity of any commodity that firms will produce and offer for sale is positively related to the commodity's own price, rising when price rises and falling when price

As the price of good increases, suppliers will attempt to maximize profits by increasing the quantity of the product sold.

Prices of pens	Quantity supplied
10	100
11	150
12	200
13	250



## SUPPLY FUNCTION

The supply function is the mathematical expression of the relationship between supply and those factors that affect the willingness and ability of a supplier to offer goods for sale

$$SX = f( PX ,PF ,O,.....T , t, s)$$

$SX$  = Supply of goods

$PX$  = Price

$PF$  = Factor input employed (used) for production.

- Raw material
- Human resources
- Machinery

$O$  = Factors outside economic sphere.

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T = Technology.

t = Taxes.

S = Subsidies

There is a functional (direct) relationship between price and supply.

### **ELASTICITY OF SUPPLY**

The Price Elasticity of Supply measures the rate of response of quantity demanded due to a price change. If you've already read Elasticity of Demand and understand it, you may want to just skim this section, as the calculations are similar.

#### **Definitions**

1	to <b>Lipsey</b> , " <i>Elasticity of supply is the ratio of percentage change in quantity supplied over the percentage change in price.</i> "
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**Price elasticity of supply** measures the relationship between change in quantity supplied and a change in price. The formula for price elasticity of supply is:

$$\text{PES} = \frac{\text{Percentage change in quantity supplied}}{\text{Percentage change in price}} \text{ or } \frac{\Delta Q}{\Delta P} \times \frac{P1}{Q1}$$

- $\Delta Q$  = change in the demand. (difference in demand)
- $\Delta P$  = change in the price. (difference in the price)
- P1 = initial price. (first price/ old price)
- Q1 = initial demand. (first demand/ old demand)

The value of elasticity of supply is **positive**, because an increase in price is likely to increase the quantity supplied to the market and vice versa.

#### **Five Types of Elasticities of Supply:**

1. **Unit Elastic Supply:** When change in price of X brings about exactly proportionate change in its quantity supplied then supply is unit elastic i.e. elasticity of supply is equal to one, e.g. if price rises by 10% and supply expands by 10% then, change in the quantity supplied the supply is relatively inelastic or elasticity of supply is less than one.

$$E_s = \frac{\% \text{ change in Quantity Supplied of X}}{\% \text{ change in price of X}}$$

2. **Relatively Elastic Supply:** When change in price brings about more than proportionate change in the quantity supplied, then supply is relatively elastic or elasticity of supply is greater than one.
3. **Perfectly Inelastic Supply:** When a change in price has no effect on the quantity supplied then supply is perfectly inelastic or the elasticity of supply is zero.
4. **Perfectly Elastic Supply:** When a negligible change in price brings about an infinite change in the quantity supplied, then supply is said to be perfectly elastic or elasticity of supply is infinity.

All the five types of Elasticities of supply can be shown by different slopes of the supply curve. Fig. (1) Shows the supply is unit elastic because change in price from OP to OP1 brings about exactly proportionate change in the quantity supplied of commodity X viz., from OM to OM1. In this case  $E_s = 1$ .

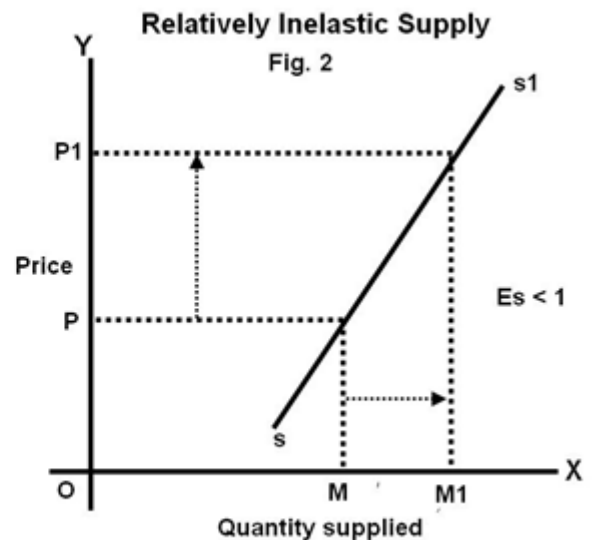
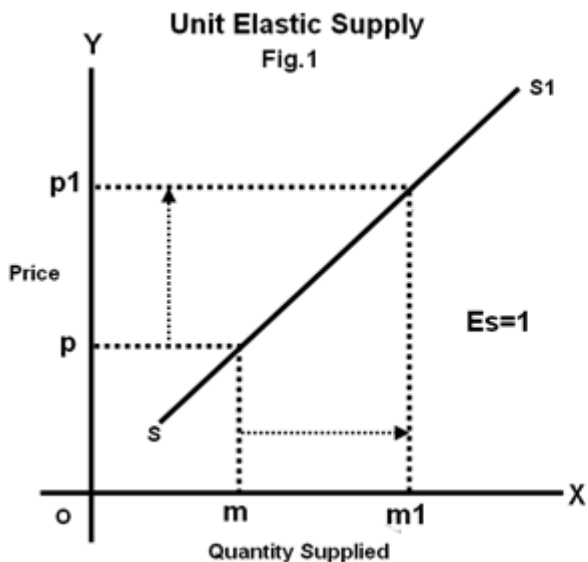


Fig (2) shows that supply is relatively inelastic because change in price of from OP to OP1 brings about less than proportionate change in quantity supplied of X. in this case  $E_s < 1$ .

Fig (3) shows that supply is relatively elastic because change in price of X from OP to OP1 brings about more than proportionate change in quantity supplied of X. in this case  $E_s > 1$ .

Fig (4) shows that supply is perfectly inelastic because change in price of X from OP to OP1 has absolutely no effect on quantity supplied of X. in this case  $E_s = 0$ . Thus, if the supply curve is vertical, i.e. parallel to Y-axis it represents perfectly inelastic supply.

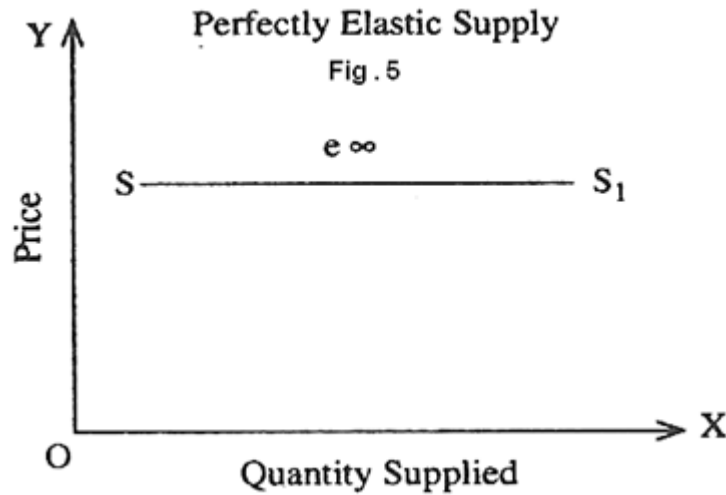
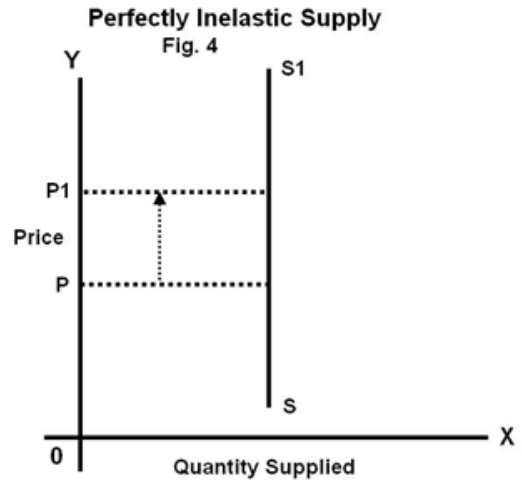
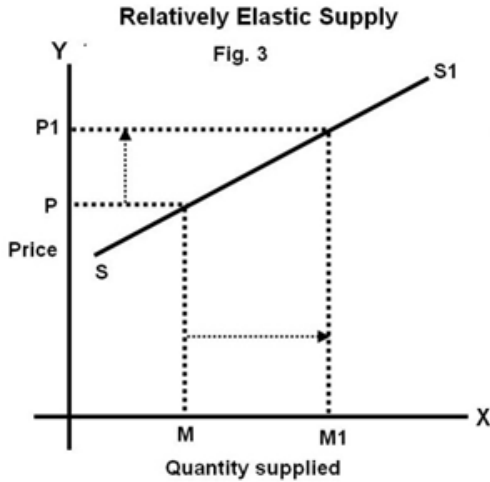


Fig shows that supply is perfectly elastic because a small change in price of X brings about infinite change in supply. Thus, if the supply curve is horizontal or parallel to X- axis it represents perfectly elastic supply.

Hence, the five different types of elasticity's of supply can be shown by five different slopes of supply curve.