

**UNIT-II**  
**(Demand and Supply)**  
**MODULE- 8: DEMAND FORECASTING**  
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**8.0: INTRODUCTION:**

Most business decisions are made in the face of risk and uncertainty. One of the crucial aspects in which managerial economics differs from pure economic theory lies in the treatment of risk and uncertainty. Traditional economic theory assumes a risk free world of uncertainty. But the real world business is full of all sorts of risk and uncertainty. The element of risk associated with future is indefinite and uncertain. To cope with risk and uncertainty, the manager needs to fore see the the course of variables. The likely future course of variables has to be given form.i,e forecasting. The aim of economic forecasting is to reduce the risk or uncertainty that the firm faces in its short- term decision making and planning for its future growth.

**8.01: Objectives:**

The objective of this module is to explain different methods of demand forecasting. After reading this module you should be able to understand the:

- Meaning of forecasting
- Need for demand forecasting
- Types of forecasts
- Steps in demand forecasting
- Methods of forecasting

### **8.02: Meaning of demand forecasting:**

Dealing with business, a manager is concerned with problems faced in immediate present, but cannot ignore the future. The decision that a manager takes in the present implies a course of action and reaction in the future. If the manager is concerned with future event, its order, intensity, he is concerned with future prediction. If he is concerned with future course of variables, for example: demand, price, profits, he can project the future.

Projection is of two types. They are forward and backward. It is the forward projection of data variables, which is named forecasting.

### **8.03: Need for demand forecasting:**

Sales constitute the primary source of revenue for the business firm. Thus sales forecasts are needed for production planning, inventory planning, profit planning etc. Production requires support of men, material, machines, money which will have to be arranged. Thus man power planning, replacement; new investment planning, working capital management and financial planning etc depend on sales forecasts. Thus demand forecasting is crucial for corporate planning. The survival and growth of business firm has to be planned, and for this sales forecasting is the most crucial activity. The purpose of forecasting in general is not to provide an exact future data with perfect precision. The purpose is just to

bring out the range of possibilities concerning the future under a given set of assumptions.

#### **8.04: Types of forecasts:**

##### **1. Economic and non-economic:**

The future course of economic variables such as demand, prices, profits etc is called economic forecast. On the other hand crime rate forecast, population forecast, election result forecast etc are called non-economic forecasts.

##### **2. Micro and macro forecasts:**

Micro forecasts are at the level a business form i.e. future sales of a particular firm. At the economy level five year plan projections i.e agricultural production, employment etc are macro forecasts.

##### **3. Active and passive forecasts:**

If the firm extrapolates the demand of previous years to get the likely demand figures for the future, it is an example of passive forecast. If the firm is interested in conducting the demand forecasting exercise afresh in the light of changes in prices, product diversification etc, is an example of active forecast.

##### **4. Short-run and long-run forecasts:**

If the forecasts are conducted, assuming technology, tastes and preferences constant, they are called short-run forecasts. On the other hand, if the firm takes in to consideration changes in population, technology, tastes of consumers etc in projecting future sales then it is called long-run forecast.

##### **5. Conditional and non -conditional Forecasting:**

If a firm conducts forecasts assuming other things remaining constant except for example price, it is called

conditional forecast. When we relax the assumption and estimate the future course of sales in the light of changes in all the independent variables, they are called non-conditional forecasts.

### **8.05: Steps in demand forecasting:**

#### **1. Nature of forecast:**

The business firm should be clear about the use of forecast data. At the same time it has to state its objective in terms of time period i.e. short run or long run.

#### **2. Nature of product:**

Firm has to identify the nature of product for which it is attempting demand forecasting exercise. Nature of product indicates whether the firm is producing final product like food, or intermediary product like chemical which is to be used as an input in final product such as paint.

#### **3. Life cycle of the product:**

Before conducting demand forecasting study, firm should take into account the age of the product and its stage in the product life cycle. If the product is in the initial years of life cycle, forecast may show an upward trend, if it is in the last years, forecast may show downward trend etc.

#### **4. Identification of determinants:**

Business firm has to identify the determinants such as price, income, promotional expenditure, etc.

#### **5. Analysis of determinants:**

Researcher has to analyse all those determinants as whether they are cyclical, seasonal or random variables.

#### **6. Choice of technique:**

To conduct the analysis of demand forecast, researcher may use different techniques. But the choice of appropriate technique depends on the nature of the product. The accuracy and relevance of forecast data depends on the choice of technique.

**7. Testing of accuracy:**

The testing is needed to reduce the margin of error and thereby improve its validity for practical decision making purpose.

**8.06: Techniques of demand forecasting:**

Broadly speaking there are two approaches to demand forecasting. They are (1). Collect information about the likely purchase behavior of consumer through conducting opinion polls or interviews. (2). Use past experience as a guide through a set of statistical techniques. Now we shall try to understand these techniques.

**Survey method:**

Consumer survey: Under this method, business firm can collect information from census of population or from sample population. Through personal interviews it can collect consumers' preferences regarding their product. Census method, in general, yield reliable results compare to sample method. But census method needs more time and money compared to sample method. Depending up on the need and resources at the disposal of firm it has to choose between sample and census method.

**Experts' opinion method:**

It consists of an attempt to arrive at a consensus in an uncertain area by questioning a group of experts repeatedly until the response appears to converge along a single line or issues causing disagreement are clearly defined. The participants are provided

with responses to previous questions from others in the group by a coordinator. This is also known as Delphi method.

**Collective opinion method:**

This method also called sales force polling. Under this method salesmen are expected to estimate future sales in their respective areas. The rationale of this method is that, salesmen being closest to the consumer are likely to have the most intimate feel of the market i.e. customers reaction to the products of the firm and their sales trends. The estimates of individual salesmen are consolidated to find out the total future sales. Then, these estimates are reviewed to eliminate the bias of optimism on the part of some salesmen and pessimism on the part of others. These are further examined in the light of proposed changes in price, advertisement expenditures, income, etc.

**Time series and trend projection:**

A firm which has been in production process for some time generally accumulates data related to price and corresponding sales. Such data when arranged in a chronological order yields the time series. The time series relating to sales represent the past pattern of effective demand for a particular product. Such data can be presented either in tabular form or graphical for further analysis. The most popular method of analysis of time series is to **project the trend** of the time series. A trend line can be fitted through a series by means of statistical techniques such as method of least squares. The trend line then projected into the future by extrapolation.

**Example:            NOTE-1**

**Use of economic indicators (Barometric) method:**

This method is useful to forecast cyclical swings in economic activity or business cycles. Under this method we have to identify leading economic indicators. These are time series that tend to precede or lead changes in general economic activity, like changes in the mercury in a barometer precede weather conditions, hence it is called barometric method.

For the use of this method, the following steps have to be taken.

1. See whether a relationship exists between the demand for a product and certain economic indicators.
2. Establish the relationship through the method of least squares and derive the regression equation. Assuming the relationship to be linear, we can write the equation as  $Y = a + b X$
3. Once the regression equation is derived, the value of Y( dependent variable) can be estimated for any given values of X.

### **Example:- NOTE -2**

#### **Controlled Experiments:**

Under this method an effort is put to vary separately certain determinants of demand which can be manipulated for example: price, income, advertisement expenditures etc and conduct experiments assuming other factors remaining constant. Thus, the effect of demand determinants like price, advertisement etc can be asessed by either varying them over different markets or by varying them over different time periods in the same market.

#### **Judgmental Approach:**

Management may have to use its own judgment when (a) analysis of time series and trend projection is not feasible because of wide fluctuations in sales; (b) use of regression method is not possible because of lack of historical data. Further, even when statistical

methods are used, all such method cannot incorporate the potential factors affecting the demand for example a major technological break through in the product design. Statistical forecasts are more reliable for larger levels of aggregations. As a result there is need for use wisdom by the management to supplement statistical techniques.

### **Smoothing techniques:**

These predict future values of a time series on the basis of some average of its past values only. Smoothing techniques are useful when the time series exhibit little trend or seasonal variations. There are two different smoothing techniques. They are:

(a). **Moving Averages:** In this method the forecasted value of a given period is equal to the average value of ( year or quarter or month) time series in a number of previous periods.

(b). **Exponential smoothing:**

In exponential smoothing method, the forecast for period  $t+1$  is a weighted average of actual and forecasted values of the time series in period  $t$ .

### **8.07: Summary:**

In this module we discussed the meaning and importance of demand forecasting and types of forecasts and techniques of forecasts. There is no unique method demand forecasting. Business firm has to choose the right technique depending upon its objectives, nature of the product and life cycle of the product and the resources at its disposal, urgency of forecasts.

### **8.08: References:**



1. Dominick Salvatore: *Managerial Economics in a Global Economy*

2. R.L.Varshney and Maheswari: *Managerial Economics*

3. William F.Samuelson : *Managerial Economics*  
Stephen G.Marks

### **8.09:Self Assessment Test:**

1. Discuss the importance of demand forecasting.
2. Given the information related to sales with respect time find out projected sales in the year 2015.

Year	Sales (In lakh units)
2000	100
2001	125
2002	90
2003	140
2004	180
2005	120
2006	80
2007	200
2008	190
2009	220

3. Given the information related to agricultural income and demand for tractors in different years find out future demand for tractors at agricultural income Rs.200 crores.

(in thousands)	Year Sales of Tractors	Agricultural Income	
		In	Rs. Crores
	2005		50
20	2006		60
25	2007		45
15	2008		80
30	2009		100
60	2010		140
75			