VIVEKANANDA COLLEGE
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NAAC ACCREDITED 'A' GRADE

Topic: Demand Forecasting
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Demand for Durable and Non-Durable goods

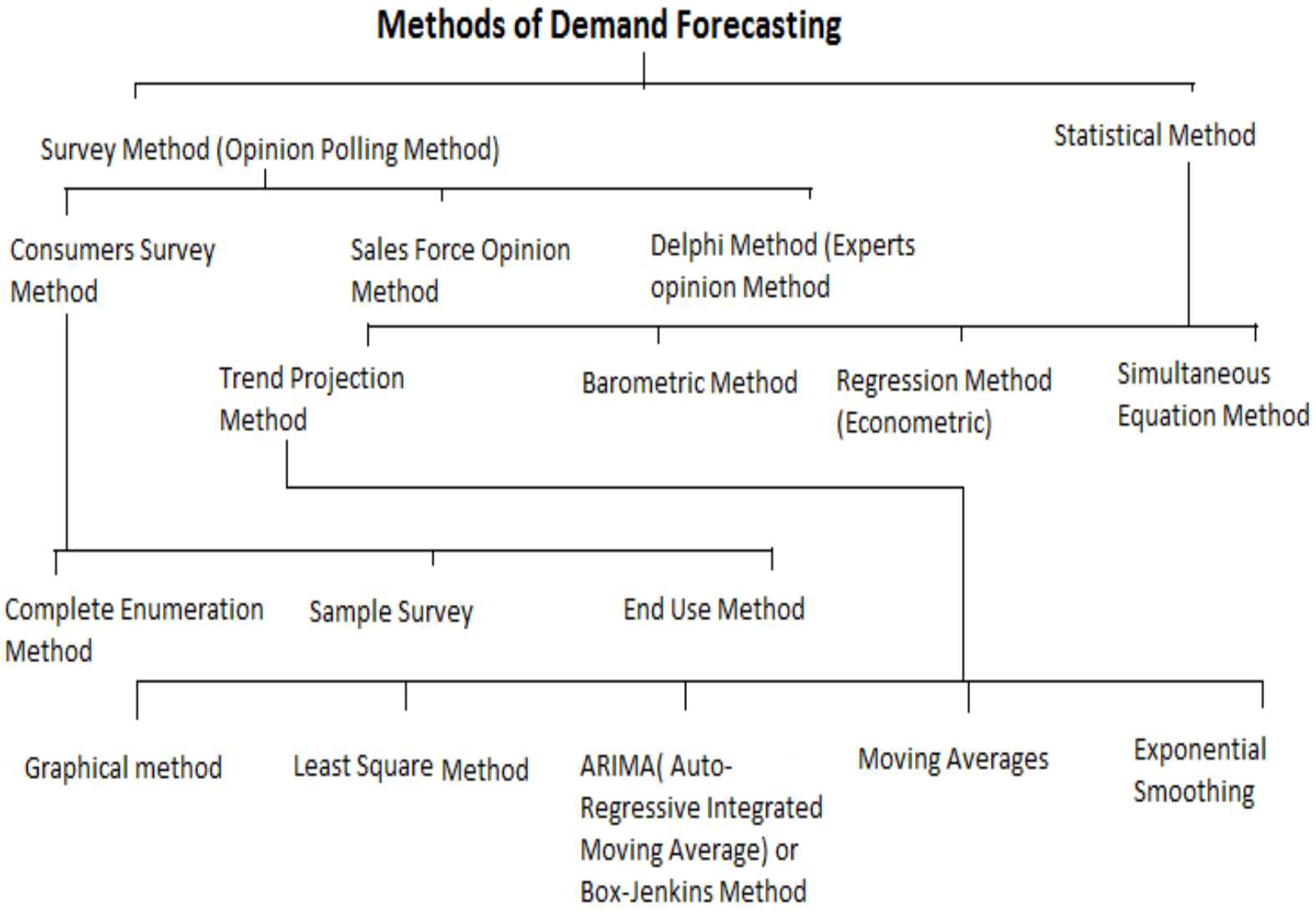
- Durable goods are those goods that go on yielding services to the consumers over a long period of time. It is because of their durability that they can be stored for longer periods of time.
- The use of services for a relatively long term makes the demand for durable goods more volatile than the demand for non-durable goods.
- Another reason for the volatility is that the demand for durable goods can be deferred by undertaking additional maintenance expenditure on existing durable goods possessed by them.

- An important difference between durable and non-durable goods is that non-durable goods are purchased for current consumption only, whereas durables are demanded for getting their services in future periods. Consequently, the demand for them crucially depends on consumer's expectations regarding their future incomes, especially when they buy them on credit; on their availability in future; expectations regarding future prices; rate of change in technology that makes them obsolete.

- Thus, fluctuations in demand for durables is relatively greater as it depends on expectations of consumers about future developments. If the expectations of consumers are such that price of durable goods will rise in future due to their short supply, their demand will increase to meet their current and future consumption. Similarly, if the consumers expect the price of durable goods to fall in future, the consumers will postpone their purchases resulting in a huge decline in their demand.

Demand Forecasting Techniques

- Demand forecasting is done to predict the likely demand for a product or service in the future. This prediction is based on past behaviour patterns and the continuing trends in the present.


Methods of Demand Forecasting
Survey Method (Opinion Polling Method)
Statistical Method
Consumers Survey Method
Sales Force Opinion Method
Delphi Method (Experts opinion Method
Trend Projection Method
Barometric Method
Regression Method (Econometric)
Simultaneous Equation Method
Complete Enumeration Method
Sample Survey
End Use Method
Graphical method
Least Square Method
ARIMA(Auto-Regressive Integrated Moving Average) or Box-Jenkins Method
Moving Averages
Exponential Smoothing

(I) Survey Method (Opinion Polling Method)

- It is one of the most common and direct methods of forecasting demand in the short term.

(1) Consumers Survey Method:-

When the demand needs to be forecasted in the short-run, say a year, then the most feasible method is to ask the consumers directly what they intend to buy. Thus, under this method, potential consumers are directly interviewed. This survey can be done in the following ways:

(a) Complete Enumeration Method:- In this method, nearly all the potential buyers are asked about their future purchase plans.

DF = ID_1+ID_2+ .....+IDn ;DF= Demand forecast, IDn= nth individual demand.

Note:- It is expensive and time consuming.

(b)Sample Survey Method:-

In this method, a sample of potential buyers are chosen scientifically and only those chosen are asked about their future purchase plans.

Note:- It is simple, economical and time saving.

(c) End- Use Method:-

It is especially used for forecasting the demand of the inputs. In this method the final users, i.e. The industries using the intermediate product are identified. Once the demand for the final consumption goods are known, the demand for the product used as intermediate goods can be estimated using some norms.

(2) Sales Force Opinion Method:-

- In this method, the views of the sales force (Salesman & Sales Management Personnel) regarding the demand for the product are obtained to prepare the sales forecast.

(3)Delphi Method (Experts Opinion Method):-

This method is used for new products or for very long-range forecasts. In this method, questions are individually asked from a group of experts to obtain their opinions on demand for products in future. These questions are repeatedly asked until a consensus is obtained. In addition, each expert is provided information regarding the estimates made by other experts in the group so that he can revise his estimate with respect to other's estimates. In this way, the forecasts are cross-checked among experts to reach more accurate decision making.

(II) Statistical Methods:-

- These methods are complex methods of demand forecasting. These methods are used to forecast demand in the long-term. In this method, demand is forecasted on the basis of historical data and cross-sectional data.
- Historical data refers to the past data obtained from various sources, such as previous year's balance sheets and market survey reports. Whereas, cross-sectional data is collected by conducting interviews with individuals and performing market surveys.
- Statistical methods are cost effective and reliable.

(1) Trend Projection Method:-

- This method uses time-series data on sales for forecasting the demand of a product.
- (a) Graphical Method:- In this method, the forecasting of the future sales of a product is done with the help of a graph. A curve is drawn using the sales data and a line is drawn in such a way that the distance between the points and the line is minimum. It is assumed that the future sales will follow the same trend of the past in the direction of the line.

(b) Fitting Trend Method (Least Square):-

- It is a least square method in which a trend line(curve) is fitted to the time-series data of sales.
- In this method, there are two types of trends taken into account:-
- (i) Linear Trend:- When the time-series data reveals a rising or a linear trend in sales, the following straight line equation is fitted.

  S=a+bT; where S= Annual Sales;T= time(years);a,b are constants.
- (ii) Exponential Trend:- The Exponential trend is used when the data reveal that the totals ales have increased over the past years, either at an increasing rate or at a constant rate per unit time.

Y=aT^b ; where Y= Annual Sales; T=time(years); a,b are constants.

Taking Log on both sides we get;

Log Y= Log a+ bLog T

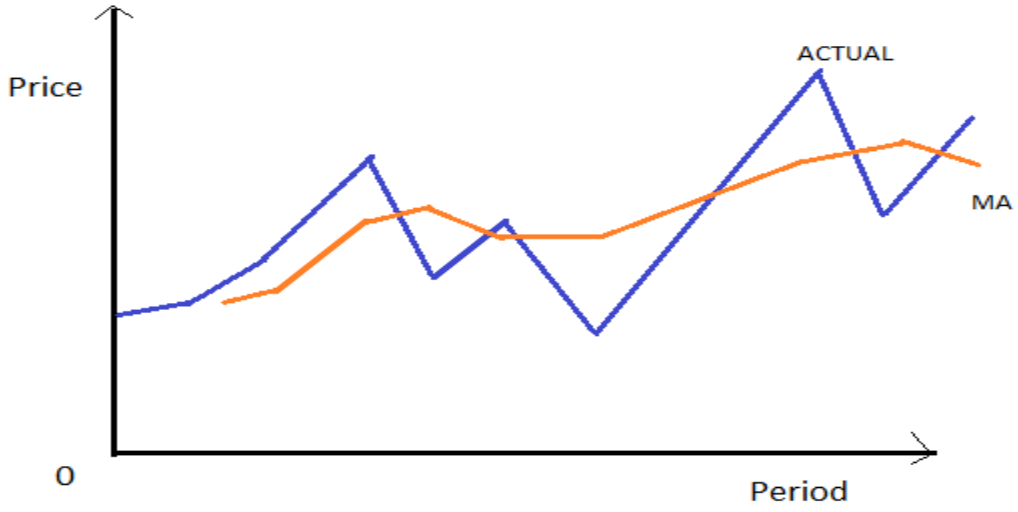
The main advantage of this method is that, it is simple to use. The data requirement of this method is very limited(only sales data is required), thus making it inexpensive.

(c) Box-Jenkins Method:-

- It is only used for short-term forecasting. This method forecasts demand only with stationary time-series data that does not reveal the long-term trend. It is used in those situations where time-series data depicts monthly or seasonal variations with some degree of regularity. For e.g., this method can be used for estimating the sales forecast of umbrellas during rainy season.

(d) Moving Averages:-

- In this method, the sales pattern is smoothened by taking the average from consecutive periods. The averages are continually recalculated as more data becomes available. Rapid changes as a result of seasonal fluctuations are smoothed to analyse the bigger picture more accurately.



(e) Exponential Smoothing:-

- Recent observations provide more relevant information than the past observations. Hence, unlike Moving Averages which gives equal weights to all data points, Exponential Smoothing gives larger weights to more recent observations and the weights decrease exponentially as the observations becomes more distant.
- This method is used for forecasting a time series when there is no trend or seasonal pattern, but the mean of the time series is slowly changing over time.

(2) Barometric Method:-

- In this method, the forecast on a certain time series is done through observation (indicators) on another time series.
- These indicators can be grouped into three types on the basis of their timings with respect to the occurrence of the events.
- (i) Leading indicators:- These indicators move ahead of the occurrence.
- (ii) Coincident indicators:- These indicators take place simultaneously to the occurrence.
- (iii) Lagging indicators:- These indicators move after the occurrence.
- The main advantage of barometric method is that it is applicable even in the absence of past data. However it is not applicable in case of new products.

(3) Econometric Methods:-

- Econometric methods combine statistical tools with economic theories for forecasting.
- The forecasts made by these methods are very reliable than any other method.
- An econometric model consists of two types:-
- (a) Regression Method:- In regression method, the demand function for a product is estimated where demand is the dependent variable and variables that determine the demand are independent variables.
- If only one variable affects the demand, then it is called single variable demand function, where simple regression technique is used. If demand is affected by many variables, then it is called multi-variable demand function, where multiple regression technique is applied.

(b) Simultaneous Equation Method:-

- In this method, demand forecasting involves the estimation of several simultaneous equations. It enables the forecaster to study the simultaneous interaction between the dependent and independent variables. These equations are often the behavioural equations, market- clearing equations and mathematical identities.
- This method is very complicated. This method employs several mathematical and statistical tools of estimation. However, with the help of computers this method can be used to get meaningful forecasts.