Summary

- Seasonal variations can be attributed to periodic movements in business activity. Such activities can be predicted accurately. However any business is impacted by seasonal changes but the degree of impact varies. Seasonal does not necessarily align to the different seasons in a year but to certain kind of variations that are periodic in nature and where the cycles repeat.

- Most of the phenomena in economic and business show seasonal patterns. When data are expressed annually there is no seasonal variation. However monthly or quarterly data frequently exhibit strong seasonal movements and considerable interest attaches to devising a pattern of average seasonal variation.

- For example, if we observe the sales of a book-seller we find that for the quarter July-September (when most of the students purchase book), sales are maximum. If we know by how much the sales of this quarter are usually above or below the previous quarter for seasonal reasons, we shall be able to answer a very basic question, namely, was this due an underlying upward tendency or simply because this quarter is usually seasonally higher than the previous quarter.

- In order to analyze the seasonal variation it is necessary to assume that the seasonal pattern is super imposed on a series of values and is independent of these in the sense that the same pattern is super imposed on a series irrespective of the level of the series.

- Before attempting to measure seasonal variations, certain preliminary decisions must be made. For ex it is necessary to decide whether weekly quarterly or monthly indexes are required. This will be decided in the light of the nature of problem and the type of data available.

- To obtain the statistical description of a pattern of seasonal variation it will be desirable to first free the data from the effects of the trend cycles and irregular variations. Once these components have been eliminated we can calculate in index form the measure of seasonal variations which is usually referred to as a seasonal index. Thus the measures of seasonal variations are called Seasonal Indexes.

- There are several methods of measuring seasonal variations; however the most popular amongst them used in practice are Method of Simple Average, Ratio to Trend method, Ration to Moving Average method and Link Relative method.

- Simplest of all the methods is the Method of Monthly Averages; however this assumes that there is no trend component in time series. Hence it can be used only if seasonal rhythm dominates the data and trend and cycles are negligible.

- Method of Link Relatives, though popular earlier, is not a popular choice now due to the limitations and disadvantages outlined earlier.

- Ratio-to-Moving Average outweighs Ratio-to-Trend method due to the various advantages, flexibility and coverage of all aspects of the data and variations that makes it the popular choice amongst the statisticians to adopt this method.

- It is important to take into consideration the number of years that are used for arriving at seasonal index since using a short period is affected by conditions prevailing during one phase of the business cycle or random influences.

- The period should encompass at least one or more business cycles. However it advisable to have several business cycles for us to arrive at a more accurate seasonal index.

- In all the 4 methods the individual monthly averages were averaged in order to eliminate random influences. If you noticed we used a combination of arithmetic mean and the median in our descriptions. Since arithmetic mean is affected by every item in the series, it is used only when the number of years is large.

- When the period is shorter, it is better to use the media instead of arithmetic mean since usage of mean would imply that the cyclical factors or the random factors would distort the value. Median is a positional average and is not influenced by the inclusion / exclusion of a year or two.

Uses of Seasonal Index

i. Seasonal index (SI) can be used either analytically or synthetically.

ii. Analytically a SI is used to adjust original data in order to yield de-seasonalized data that permits study of short run fluctuations of a series not associated with seasonal variations. Divide each of the original observations by appropriate seasonal index for that month which is – $T \times C \times I = T \times S \times C \times I / S$

iii. Synthetically SI is useful in planning sales of production for specific periods. For e.g. If a firm expects to sell Rs. 36 Lakhs worth of goods during the coming year, average monthly sales of Rs. 3 Lakhs is expected. If the volume of sales is subjected to seasonal variations, the actual monthly values will deviate from the average.

iv. Forecast for future periods are made by combining the known entity of Trend and seasonal elements. First compute the Trend ordinate for a month. Multiply this ordinate by the seasonal index for that month. This helps in eliminating cyclical and random influences.

v. Diversification is a viable solution for avoiding seasonal influences there by helping in reducing the cost and impacts of seasonal variations.

Limitations:

i. No technique can precisely measure seasonal variations since all techniques are based on unrealistic assumptions and expectations that the seasons are changing in a regular and systematic pattern, which in reality is not true.

ii. The measures obtained for each month are only rough estimates only.

iii. Though the computed index of seasonal variations indicates a pattern, it may have no significance for a particular year as the seasonal index represents an average pattern of many years. If the patterns of seasonal variations in a series are not stable, any average pattern may be a bad representation of the actual seasonal variations in the given years.