

#### [Frequently Asked Questions]

Index Numbers (Part – 2)

Subject:

**Business Economics** 

**Course:** 

Paper No. & Title:

B. A. (Hons.), 1st Semester, Undergraduate

Paper - 102 Statistics for Business Economics

Unit No. & Title:

Index Numbers

Unit – 4

Lecture – 2 Index Numbers (Part – 2)

Lecture No. & Title:

#### **Frequently Asked Questions**

## Q1. How the different formulae of index number can be compared?

**A1.** As none of the index number formulae measures the price or quantity changes with perfection and have some bias, statisticians have devised a number of tests to choose the most appropriate formula in a given situation. These tests are termed as Tests of Adequacy.

Unit Test Time Reversal Test Factor Reversal Test Circular Test

#### Q2. What is unit test?

**A2.** Unit test requires that the index number formula should be independent of the units in which the prices or quantities of various commodities are quoted.

### Q3. What is time reversal test?

**A3.** Time reversal test requires the index number formula to possess time consistency by working both forward and backward with respect to time. It means if we reverse the time subscripts of a price or quantity index the result should be the reciprocal of the original index.

i.e.  $P_{01} \times P_{10} = 1$ 

#### Q4. What is factor reversal test?

**A4.** Factor reversal test requires that if the price and quantity indices are obtained for the same data, same base and current periods and

using the same formula, then their product, without the factor 100, should give the true value ratio.

i.e.

$$P_{01} \times Q_{01} = \frac{\sum p_1 q_1}{\sum p_0 q_0} = V_{01}$$

where  $\sum p_1 q_1$  and  $\sum p_0 q_0$  denote the total value in the current and base year respectively.

#### Q5. What is circular test?

**A5.** Circular Test is an extension of the time reversal test over several years. It requires the index to work in circular manner which enables to find the index numbers from period to period without referring back to the original base each time. The test requires

 $P_{01} \times P_{12} \times P_{23} \times \dots \dots \dots \dots \times P_{n-1,n} \times P_{no} = 1$ By time reversal test  $P_{0n} \times P_{no} = 1$ 

$$\begin{split} &=> P_{no} = \frac{1}{P_{0n}} \\ &=> P_{0n} = P_{01} \times P_{12} \times P_{23} \times \dots \times P_{n-1,n} \end{split}$$

# Q6. Which formulae satisfy the different tests of adequacy?

**A6.** All the formulae discussed satisfy unit test. The index number which is based on simple aggregate of prices or quantities without attaching any weights to them,

i.e.

$$P_{01} = \frac{\sum p_1}{\sum p_0} \times 100$$

$$Q_{01} = \frac{\sum q_1}{\sum q_0} \times 100$$

does not satisfy the unit test. This is because all the commodities do not have the same unit of measurement. Moreover some commodities are costly and others are cheap. Some are essential goods while others are luxury items. All this should be reflected in the weights attached to them. But in simple aggregate of prices and quantities index numbers weights are not considered, so they do not satisfy the unit test. Time reversal test is satisfied by simple aggregate index, Marshall-Edgeworth index and Fisher index. Laspeyres and Paasche indices do not satisfy this test, except when both are equal. Fisher index is the only index satisfying factor reversal test, so it is also known as Fisher Ideal Index. If Laspeyres index is equal to Paasche index, then both these index numbers satisfy the factor reversal test. Circular test is satisfied by the aggregate index with fixed weights which is also called Kelly fixed base method.

$$P_{01}^{K} = \frac{\sum w p_1}{\sum w p_0}$$

where instead of using base period or current period quantities as weights, w is the weight from any representative period.

## Q7. What is the difference between base shifting and splicing of index numbers?

**A7.** If we want to compare series of index numbers with different base periods, both the series must be expressed with a common base period. Here base shifting is required, which means the changing of the given base period of a series of index numbers and recasting them into a new series based on some new base period. Splicing is an application of the principle of base shifting,

by which two or more overlapping series of index numbers are combined to obtain a single continuous series.

# Q8. What deflating of index number means and how it is useful?

**A8.** Deflating is the process of eliminating the price effect from a given set of monetary values. Deflating of index numbers is desirable to determine real income and purchasing power of money in an economy which has inflationary trends.

 $\begin{aligned} \textit{Real Income} &= \frac{\textit{Nominal Income}}{\textit{Price Index}} \times 100 \\ \textit{Purchasing Power} &= \frac{1}{\textit{Price Index}} \times 100 \end{aligned}$ 

#### **Q9. What is Consumer Price Index?**

**A9.** Consumer price index number is a measure of change in the price level of a basket of goods and services purchased by households during any given period with respect to some fixed base period. It is based on retail prices and thus is also termed as Retail Price Index Number or Cost of Living Index Number.

The consumption patterns of various commodities differ widely from class to class, like poor, lower income group, high income group, labour class, industrial workers, agricultural workers and within same group from region to region, like town, city, rural area, urban area, planes and hills. To study the effect of rise or fall in the prices of various commodities on the purchasing power, the consumer price index numbers are constructed for different classes of people of the society and also for different geographical areas. The final overall index is calculated using the various indices and sub-indices.

#### Q10. What is BSE index?

**A10.** Bombay Stock Exchange Index is the weighted stock market index computed on the basis of free float capitalization method. Free float means the proportion of total issued shares of the company that are traded in the stock market. It is different from market capitalization of a company which is determined by multiplying the price of one share by the number of outstanding shares of the company. The BSE index shows the free float market value of 30 stocks in the current period relative to a base period. It considers 30 well established and financially sound companies representative of the various industrial sectors of the Indian economy that are listed on Bombay Stock Exchange. The base year of the BSE index is 1978-79 and the base value is taken as 100 on 1<sup>st</sup> April 1979.