


INDEX NUMBER

- **According to Spiegel**, an index number is a statistical measure designed to show changes in a variable or a group of related variables with respect to time, geographical locations, or other characteristics.
- **Some important characteristics of index numbers.**
- A change in terms of the absolute values may not be comparable.
- Index numbers are expressed in percentage, so they remove this barrier. Although, we do not use the percentage sign.
- Index numbers measure a net or relative change in a variable or a group of variables.

- 
- Index numbers measure the net change among the related variables over a period of time or at two or more places.
 - Index numbers are specialised average, expressed in percentage, and help in measuring and comparing the change in those variables that are expressed in different units.

- **Types of Index Numbers**
- **Price Index Numbers**
- The price index is considered a particular sort of average of homogenous units. It represents the net relative changes in commodities **prices** and can be expressed in different units
- $Poi = \text{Price relative} = \frac{pi}{po} \times 100$



- **Quantity Index Numbers**

- This type of index number is concerned with measuring changes in the number of commodities, as the number of commodities purchased, consumed, and produced. Thus, this type of index number helps make comparisons of quantity or volume.
- Quantity or volume relative = $q_i/q_o \times 100$

- **Value index:** Value index numbers are concerned with evaluating the changes incurred in the total value of products over a certain period by considering the total value of the base period.

$$(p_i/p_o) \cdot (q_i/q_o) \times 100$$

price relative x quantity relative

Important Formulae

- **Laspeyre's Price Index:** Laspeyre's Price Index or Base Year Method French economist Laspeyere in 1871, suggested that quantities of commodities consumed in base year can be taken as weights for the purpose of calculating index numbers. That is

$$P_{01} = \frac{\sum P_1 q_0}{\sum P_0 q_0} \times 100$$

- **Paasche's Price Index** : Paasche's Price Index or Given Year Method By taking year quantities as weights. This formula is suggested by German statistician Paasche in 1874 and so it is named after him . Thus

Paasche's Index :

$$P_{01} = \frac{\sum P_1 q_1}{\sum P_0 q_1} \times 100 =$$

- **Irving Fisher's Index Number:** Irving Fisher's Index Number Fisher's index number is the geometric mean of the Laaspeyere's and Paasche's formula. Mathematically –

Fisher Ideal Index

$$P_{01} = \sqrt{\frac{\sum p_1 q_0}{\sum p_0 q_0} \times \frac{\sum p_1 q_1}{\sum p_0 q_1}} \times 100$$

- This formula satisfies several tests and so it is taken as the best of all formulae that is why it is known as “Fisher's Ideal Index Number”.

Use of Index Numbers

- An index number is a device for measuring changes in a variable or a group of related variables.
- The index number of Industry enables us to study the progress of industrialization in the country.
- These cost of living index numbers show changes in the prices of goods consumed by people.
- Index number helps the Government to formulate its policies.
- They are also used to evaluate the purchasing power of money.
- Index numbers are also being used for business forecasting and business cycles etc.