

### Chapter 8: Index numbers

1. **Meaning:** Index numbers is a statistical tool for measuring relative change in a group of related variables over two or more different times.

#### 2. Features of an Index Number

- They are expressed in percentages.
- They are special types of averages.
- They measure the effect of change over a period of time.

#### 3. Problems in construction of Index Numbers

- Defining the purpose of index numbers
- Selection of items
- Selection of base period
- Selection of prices
- Selection of weights
- Choice of an average
- Choice of the formulae

#### 4. Price index are of two types

- Simple Index Number
- Weighted price Index numbers

#### 5. Construction of simple Index Numbers:-

There are two methods

- Simple aggregate Method

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

- Simple Average of price relative method

$$P_{01} = \frac{\sum (P_1 / P_0 \times 100)}{N}$$

#### 6. Weighted Index Numbers

There are two methods:-

- Weighted Aggregate method:- In this method commodities are assigned weights on the basis of quantities purchased.

$$P_{01} = \frac{\sum P_1 Q_0}{\sum P_0 Q_0} \quad (\text{Base year quantities as weight})$$

- Weighted Average of Price Relative Method:-

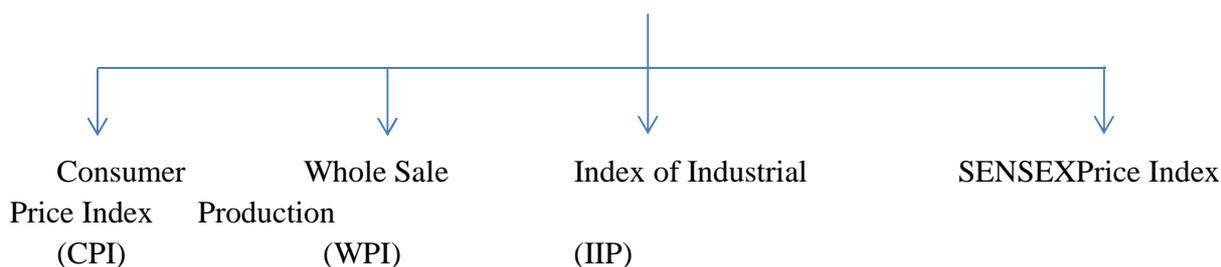
Under this method commodities are assigned weight or the basis of base's year value ( $W = P_0 Q_0$ ) or fixed weights ( $W$ ) are used.

$$P_{01} = \frac{\sum RW}{\sum W}$$

$$\text{Where } R = \frac{P_1}{P_0} \times 100$$

$$W = \text{value in the base year } (P_0 Q_0) \text{ or fixed weights}$$

7. **Types of Index Numbers**



a. **Consumer Price Index:- (CPI)** The methods of constructing CPI are

- **Aggregate Expenditure Method** 
$$P_{01} = \frac{\sum P_1 Q_0}{\sum P_0 Q_0} \times 100$$

- **Family Budget Method** 
$$P_{01} = \frac{\sum RW}{\sum W} \times 100$$
  
Where  $R = \frac{P_1}{P_0}$

$$W = P_0 Q_0 \text{ or fixed weights}$$

8. **Uses of Consumer Price Index:- (CPI)**

- It is used in calculating purchasing power of money
- It is used for grant of Dearness Allowance.
- It is used by government for framing wage policy, price policy etc.
- CPI is used as price deflator of income
- CPI is used as indicator of price movements in retail market.

9. **Wholesale Price Index (WPI):-**

- It measures the relative change in the price of commodities traded in wholesale market.
- It indicates the change in the general price level.
- It does not include services

Uses of WPI

- Basis of Dearness Allowance
- Indicator of changes in economy
- Measures the rate of inflation

10. **Index Number of Industrial Production (IIP)**

It indicates the changes in level of Industrial production or a percentage change in physical volume of output of commodities in following industries

- Mining
- Quarrying
- Manufacturing
- Electricity etc.,

$$\text{Formula IIP} = \sum (q_1/q_0) \cdot W$$

$$\frac{\sum W}{\dots}$$

W = relative importance of different output.

q<sub>0</sub> = Base year quantity.

q<sub>1</sub> = Current Year Quantity.

### 11. Uses of Index Numbers.

- Helps us to measure changes in price level
- Help us to know changes in cost of living
- Help government in adjustment of salaries and allowances
- Useful to Business Community
- Information to Politicians
- Information regarding foreign trade

### 12. SENSEX

SENSEX is the short form of Stock Exchange Sensitive Index with 1978-79 as base. It is a useful guide for the investors in the stock market. It deals with 30 stocks represented by 13 sectors of the economy.

#### Questions:-

- What is an Index Number?
- What is a Base Year?
- What is SENSEX?
- Mention any three problems in the construction of Index Numbers
- Calculate weighted average of price relative index from the following data

Items	Weight in % (Rs.)	Base year price (Rs.)	Current year Price (Rs.)
A	40	2	4
B	30	5	6
C	20	4	5
D	10	2	3