BITS Pilani K.K. Birla Goa Campus

Lecture Notes: Principles of Economics (ECON F211)

Index Number

Simple Aggregative Method

In Simple Aggregative Method, the total price of commodities in a given (current) year is divided by the total price of commodities in a base year and expressed as a percentage.

Steps involved in Simple Aggregative Method:

- Add the prices of all the commodities in the current year. Denote the sum as $\sum P_1$
- Add the prices of all the commodities in the base year. Denote the sum as $\sum P_0$
- Use the following formula to find the simple price index number of the current year based on the base year.

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

Example

Prices of commodities for the years 2019 and 2020 are as given in the table. Find the simple aggregative price index from the data displayed in the table.

Commodity	Unit	Price in Rs. Per unit	
		2019	2020
Wheat	1 kg	10	15
Rice	1 kg	40	30
Pulses	1 kg	10	12
Onions	1 kg	5	13
Oil	1 litre	40	50

Solution:

Commodity	Unit	Price in Rs. Per unit	
		2019	2020
Wheat	1 kg	10	15
Rice	1 kg	40	30
Pulses	1 kg	10	12
Onions	1 kg	5	13
Oil	1 litre	40	50
Total		$\sum P_1 = 105$	$\sum P_0 = 120$

The price index number for 2020 taking 2019 as base year is given by

$$P_{01} = (\Sigma P_1 / \Sigma P_0) \times 100$$
$$P_{01} = (120 / 105) \times 100$$
$$P_{01} = 114.3$$

It indicates that the prices in 2020 had increased by 14.3 % compared to 2019.

Merits of Simple Aggregative Method:

- This is the simplest method of constructing an index number.
- It is very easy to understand.
- It is very simple to calculate.

Demerits of Simple Aggregative Method:

- It is affected by the magnitude of the prices of the different commodities.
- It is influenced by the units of the articles through which the prices are quoted.
- It is based on the assumption that the various items and their prices are expressed in the same unit.
- It ignores the relative importance of the different commodities included in the index number, as no consideration is given to the relative importance of the commodities.
- It is unduly affected by high and low values of the commodities selected.
- It is not capable of being calculated through other averages viz. geometric mean, median, etc.

Simple Average of Relative Method

In this method, average of price relative of commodity is calculated.

Steps involved in Simple Average of Relative Method

- Find price relative for each commodity for the current year using the formula R = (P1 / P0) × 100.
- Add all price relatives of all the commodities.
- Divide sum obtained in step 2 by the number of commodities (N).
- Overall formula for the method is.

$$P_{01} = \frac{\Sigma\left(\frac{P_1}{P_0} \times 100\right)}{N}$$

Example

Prices of commodities for the year 2019 and 2020 are as given in the table. Find the price index by a simple average of relative method and using the arithmetic mean from the data given in the table.

Commodity	Unit	Price in Rs. Per unit	
		2019	2020
Wheat	1 kg	10	15
Rice	1 kg	40	30
Pulses	1 kg	10	12
Onions	1 kg	5	13
Oil	1 litre	40	50

Solution:

Commodity	Unit	Price in Rs. Per unit		R = (P1 / P0) × 100
		2019	2020	
Wheat	1 kg	10	15	(15/10) x 100 = 150.0
Rice	1 kg	40	30	(30/40) x 100 = 75.0
Pulses	1 kg	10	12	(12/10) x 100 = 120.0
Onions	1 kg	5	13	(13/5) x 100 = 260.0
Oil	1 litre	40	50	(50/40) x 100 = 125.0
Total				Σ R = 730

The price index number by simple average of relative method using arithmetic mean for 2020 taking 2019 as base year is given by

$$P_{01} = (1/N)(\Sigma R)$$
$$P_{01} = (1/5)(730)$$
$$P_{01} = 146.0$$

Merits of Simple Average of Relative Method:

- It is not affected by units in which prices are quoted.
- As prices are converted into price relatives, it is not affected by absolute values of prices.
- It gives equal importance to all items, and hence extreme values of certain items do not unduly affect the index number.
- The index number calculated by this method satisfies the unit test.

Demerits of Simple Average of Relative Method:

- As it is an unweighted average, the importance of all the items is assumed to be the same.
- The index number constructed by this method does not satisfy the criteria laid down for index number.
- The index number is unduly influenced by high or low prices when the arithmetic mean is used.
- The index number constructed using geometric mean is tedious and time-consuming.