

Index Number

1) Calculating Price Index number

a) simple aggregate

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

where P_0 = Base year

P_1 = Current year

b) Unweighted aggregate



Based on some year

so P_0 will be same for P_1 & P_2

2) calculate PIN based on price relative method of unweighted

Arithmetic mean

$$P_{01} = \frac{\sum P}{n}$$

Geometric mean

$$\text{Antilog} \left[\frac{\sum \log P}{n} \right]$$

where $P = \frac{P_1}{P_0} \times 100$

Weighted price index number

i) Laspeyres's price index number

$$P_{01}^L = \frac{\sum P_1 q_{10}}{\sum P_0 q_{10}} \times 100$$

ii) Pasche's price index number

$$P_{01}^P = \frac{\sum P_1 q_{11}}{\sum P_0 q_{11}} \times 100$$

iii) Marshall Edgeworth's price index

$$P_{01}^{ME} = \frac{\sum P_1 q_{10} + \sum P_1 q_{11}}{\sum P_0 q_{10} + \sum P_0 q_{11}} \times 100$$

iv) Dorbish - Bowley's Price index number.

$$P_{01}^{DB} = \frac{1}{2} [P_{01}^L + P_{01}^P]$$

$$P_{01}^{DB} = \frac{1}{2} \left[\frac{\sum P_1 q_{10}}{\sum P_0 q_{10}} + \frac{\sum P_1 q_{11}}{\sum P_0 q_{11}} \right] \times 100$$

v) Fisher's price index number

$$P_{01}^F = \sqrt{P_{01}^L \times P_{01}^P}$$

vi) Kelly's price index number.

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

Here, q_f = fixed quantity
for both P_1 & P_0

→ Weighted average of price relative

i) Arithmetic mean

$$AM = P_{01} = \frac{\sum WP}{\sum W}$$

ii) Geometric mean

$$GM = P_{01} = \text{Antilog} \left[\frac{\sum W \log P}{\sum W} \right]$$

Note :-

If expenditure is given consider it
as $P_0 q_0$ to find $q_0 = \frac{P_0 q_0}{P_0}$

In Kelly's price index number
after calculating $\frac{\sum P_1 q}{\sum P_0 q} \times 100$

you need to comment by :-

EX:- $P_{01}^K = 119.25$

then to comment $\therefore 100 - 119.25$
 $= 19.25$

19.25 percent of price is increased
in 2012 when compared to 2011.

In weighted geometric mean expenses
is considered as w

2) Calculating Quantity Price Index Number

i) Laspeyres's quantity index number

$$Q_{01}^L = \frac{\sum q_1 P_0}{\sum q_0 P_0} \times 100$$

ii) Pasche's quantity index number

$$Q_{01}^P = \frac{\sum q_1 P_1}{\sum q_0 P_1} \times 100$$

iii) Marshall's quantity index number

$$Q_{01}^{ME} = \frac{\sum q_1 P_0 + \sum q_1 P_1}{\sum q_0 P_0 + \sum q_0 P_1} \times 100$$

iv) Drobish Bowley's quantity index:

$$Q_{01}^{DB} = \frac{1}{2} [Q_{01}^L + Q_{01}^P]$$

v) Fisher's quantity index number:

$$Q_{01}^F = \sqrt{Q_{01}^L \times Q_{01}^P}$$

3) Value Index Numbers

$$V_{01} = \frac{V_1}{V_0} \times 100 \text{ where } V_1 = \sum P_1 q_1$$
$$V_0 = \sum P_0 q_0$$

a) Time Reversal Test [TRT]

$$TRT = P_{01} \times P_{10} = 1$$

TRT is not satisfied by α , P , and B .

But it satisfies ME , F and K .

b) Factor Reversal Test [FRT]

$$FRT = P_{01} \times Q_{01} = V_{01}$$

$$\text{Here, } V_{01} = \frac{\sum P_1 q_1}{\sum P_0 q_0}$$

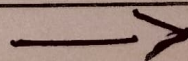
\therefore Hence _____ satisfies
FRT and TRT.

Consumer Price Index Number
[CPI]

It is also called Cost of living Index No.

$$\text{Real wage} = \frac{\text{Money wage}}{\text{Cost of living index number}} \times 100$$

These are two methods to calculate
CPI/CLI



i) Calculate CPI by

a) Aggregative method [Expenditure]

Laspeyres

$$CPI = \frac{\sum P_1 Q_0}{\sum P_0 Q_0} \times 100$$

b) Family Budget Method.

If items and weights [Expenditure] is given then its Family Budget method.

$$CPI = \frac{\sum WI}{\sum W}$$

Here $I = \text{Price}$.

→ Formula

$$IN = P_1 - P_0$$

Quantity relative = Base year [Quantity] + Current year [Quantity]

