List of formulae

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1 Future Value

$$FV_n = principal \times (1 + i)^n$$

2 **Present value**

$$PV = \frac{FV_n}{(1+i)^n}$$

3 Interest

$$I = P \times \frac{nr}{100}$$

4 Amount

$$A = P + \frac{Pnr}{100}$$

5 Compounding for periods not annually.

$$A = P(1 + \frac{R}{m})^{nm}$$

6 Discounting a series

$$P = \sum_{i=1}^{i=n} \frac{A_i}{(1+r)^i}$$

7 Annuities

$$P = \frac{A[1-(1+r)^{-n}]}{r}$$

8 Perpetuities

$$P = \frac{A}{r}$$

9 **Simple aggregate price index**

$$I_{1,0} = \frac{\sum_{i=1}^{n} pi,1}{\sum_{1=1}^{n} p_{i,0}} \times 100$$

where
$I_{1,0}$= index in the current period 1 with base period 0 $p_{i,1}$ price of commodity *i* in the current period 1 (*i* = 1,2...*n*) $p_{i,0}$ price of commodity *i* in the base period 0 (*i* = 1,2...*n*)

10 Average of relative price index
$\frac{p_{i1}}{p_{i0}}$ (i=1,2...n).

$$I_{10} = \frac{1}{n}\left[\sum_{i=1}^{n}\left(\frac{p_{i1}}{p_{i0}}\right)\right] \times 100$$

11 **Weighted aggregate price index**

$$I_{1,0} = \left[\sum_{i=1}^{n} w_i \frac{p_{i,1}}{p_{i,0}}\right] \times 100$$

where the weights $w_i{}^0s$ are non negative and sum to 1.That is $0 \leq w_i \leq 1$ and $\sum_{i=1}^{n} w_i = 1$

12 **Laspeyres price index**

$$I_{1,0}^{LP} = \left[\frac{\sum_{i=1}^{n} pi, 1q_{i,0}}{\sum_{i=1}^{n} p_{i0}q_{i0}}\right] \times 100$$

13 Paasche Price index

$$I_{1,0}^{PP} = \left[\frac{\sum_{1=1}^{n} p_{i,1}q_{i,1}}{\sum_{i=1}^{n} p_{i,0}q_{i,1}}\right] \times 100$$

14 **Fisher price index**

$$F_{1,0} = \sqrt{Paasche \times Lasperyers} = \sqrt{I_{1,0}^{LP} \times I_{1,0}^{PP}}$$

The simple aggregate quantity index is given by

$$I_Q = \frac{\sum q_{i,1}}{\sum q_{i,0}}$$

. **Laspeyre quantity index**

$$I_q^L = \frac{\sum p_{i,0}q_{i,1}}{\sum p_{i,0}q_{i,0}} \times 100$$

15 **Paasche quantity index**

$$I_q^P = \frac{\sum p_{i,0}q_{i,1}}{\sum p_{i,0}q_{i,0}} \times 100$$

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$$Real\ income = \frac{Nominal\ income}{CPI} \times\ base\ yr\ index.$$

$$Real\ GDP = \frac{Nominal\ GDP}{CPI} \times\ base\ yr\ index$$

or

$$GDP(inconstant\$) = \frac{GDP(current\$}{\times\ baseyearindex\ CPI}$$

Least squares estimators

$$b_1 = \frac{\sum xy - \frac{\sum x \sum y}{n}}{\sum x^2 - \frac{(\sum x)^2}{n}}$$

$$\hat{\beta}_0 = \bar{y} - \hat{\beta}_1 \bar{x}$$

The coefficient of determination;

$$r^2 = \frac{[\sum x_i y_i - n\bar{x}\bar{y}]^2}{(\sum x_i^2 - n\bar{x}^2)(\sum y_i^2 - n\bar{y}^2)}$$

Coefficient of Correlation

$$r = \frac{\sum xy - \frac{\sum x \sum y}{n}}{\sqrt{\left(\sum x^2 - \frac{(\sum x)^2}{n}\right)\left(\sum y^2 - \frac{(\sum y)^2}{n}\right)}}$$

Sum of a Arithmetic progression (AP)

$$S_n = \frac{n}{2}[2a + (n-1)d]$$

The n^{th} term of a AP

$$A_n = a + (n-1)d$$

Sum of a geometric progression, GP

$$S_n = a(\frac{r^n - 1}{r - 1})$$

The n^{th} term of a GP $A_n = ar_{n-1}$