Effective and Nominal Interest Rates

Relationship between effective and nominal interest rates

Interest rate is only meaningful in the context of time - in general is understood as - *per year* - which may be called

- *the nominal interest rate*

With other periods of time than year - like *month*, *week*, or *day* - the interest rate may be called

- *the effective interest rate*

Calculating Nominal Interest Rate

Nominal interest rate for a period with effective interest rates for it's sub-periods can be calculated as

$$i = (1 + i_e)^n - 1 \qquad (1)$$

where

i = nominal interest rate for the period

i_e = effective interest rate for the sub-period

n = number of sub-periods

Example - Nominal interest rate with Effective monthly interest rates

Nominal interest rate (per year) with monthly effective rates of *1%* can be calculated as

$$i_n = (1 + 0.010)^{12} - 1$$

$$= 0.127$$

$$= \underline{12.7}\%$$

Calculating Effective Interest Rate

Effective interest rate for the sub-periods of a period can be calculated as

$$i_e = (i_n + 1)^{1/n} - 1 \qquad (2)$$

Example - Nominal interest rate with Effective monthly interest rates

Effective interest rate per month with a nominal rate of *10%* can be calculated as

$i_e = (0.1 + 1)^{1/12} - 1$

$= 0.00797$

$= \underline{0.797}\%$

Source:

http://www.engineeringtoolbox.com/effective-nominal-interest-rates-d_1468.html

$i_e = (0.1 + 1)^{1/12} - 1$