

Formulas for the calculation of the yields for Government Securities

1. Yields for Treasury Bills

Nominal yield:

$$r = \frac{N - P_c}{P_c} * \frac{365}{t} * 100$$

where:

r - nominal yield (%);

N - face value of Treasury Bill;

P_c - purchase price of Treasury Bill;

t - term of circulation (days).

Effective yield:

$$y = \left(\left(\frac{N}{P_c} \right)^{\frac{365}{t}} - 1 \right) * 100$$

where:

y - effective yield (%);

N - face value of Treasury Bill;

P_c - purchase price of Treasury Bill;

t - term of circulation (days).

2. Yield for Government Bonds (GB)

Government Bond effective yield depends on purchase price of the bond, on coupon amount and on the number of coupon payments per year and is determined by solving for i in the following formula:

$$P = \frac{C_1}{(1 + i/100)^{\frac{t_1}{365}}} + \frac{C_2}{(1 + i/100)^{\frac{t_2}{365}}} + \dots + \frac{C_n + N}{(1 + i/100)^{\frac{t_n}{365}}}$$

where:

P - purchase price of Government Bond (including accrued interest);

n - number of coupons;

C_n - amount of the coupon payment "n"; *

N - face value of Government Bond;

i - effective yield on Government Bond ;

t_n - actual number of days until coupon payment "n".

Coupon amount calculation formula:

$$C = N * \frac{r}{100} * \frac{t}{365}$$

C - coupon amount;

N - face value of Government Bond;

r - annual rate of coupon interest;

t - coupon period (days);