

FORMULAE on BOND VALUATION

1. Yield To Maturity

Method 1:

YTM = IRR of Cash Flows of Bond.

Method 2: Short-Cut Method

$$YTM = \frac{\text{Interest (after tax) + Amortization}}{(0.6 \times \text{spot price}) + (0.4 \times \text{Maturity Price})}$$

Method 3: Institute Method

$$YTM = \frac{\text{Interest (after tax) + Amortization}}{(\text{spot price} + \text{Maturity Price})/2}$$

2. Duration of the Bond (Macaulay's Duration)

Method 1:

Duration = The weighted average maturity of its cash flows stream, where weights are proportional to the PV of cash flows.

Method 2:

$$\text{Duration} = \frac{1 + Y}{Y} - \frac{(1 + Y) + T(C - Y)}{C[(1 + Y)^T - 1] + Y}$$

Y = Yield to Maturity

C = Coupon Rate

T = Term

Note: Use this formula when the term is long with intra period coupon.

3. Volatility / Modified Duration

$$\text{Volatility} = \frac{D}{1 + YTM}$$

Volatility measures the change in bond price in relation to change in YTM.