

Calculation - Present Value of Bond

① Coupon bond [Mention coupon rate and time.]

② Zero coupon bond [missing coupon rate]

③ Perpetual bond [time is missing]

☐ Coupon bond:

$$i) V_B = I \times \left[\frac{1 - \frac{1}{(1+kd)^n}}{kd} \right] + \frac{MV}{(1+kd)^n}$$

[annual/simple

interest]

$$ii) V_B = \frac{I}{m} \times \left[\frac{1 - \frac{1}{(1+\frac{kd}{m})^{n \times m}}}{\frac{kd}{m}} \right] + \frac{MV}{(1+\frac{kd}{m})^{n \times m}}$$

[compound
interest]

☐ Zero coupon bond:

$$iii) V_B = \frac{MV}{(1+kd)^n}$$

$$iv) V_B = \frac{I}{kd}$$

I = amount of interest

$$I = FV \times CR$$

kd = expected/required rate of return (না থাকলে always 10% ধরে নিবো।)

V_B = value of bond

n = time

m = number of compounding

MV = maturity value

MV - directly mentioned

If not mentioned, face value will be M

If premium rate given,

$$MV = FV + (FV \times PR) \quad \begin{matrix} FV = \text{Face value} \\ PR = \text{Premium Rate} \end{matrix}$$

If discount rate given

$$MV = FV - (FV \times DR) \quad \begin{matrix} FV = \text{Face value} \\ DR = \text{Discount Rate} \end{matrix}$$

to find coupon pay:

$$MV = \frac{FV}{(1+R)^n}$$

$$\frac{F}{R} = \frac{FV}{R}$$

to find interest to be paid

Yield from Bond

~~① YTM~~

① Yield to Maturity, YTM

② Yield to Call, YTC

③ Current Yield, CY

* Formula

$$\textcircled{1} \text{ YTM} = \frac{I + \frac{MV - NSV}{n}}{\frac{MV + NSV}{2}} \times 100$$

[∵ Yearly Interest]

$$\textcircled{2} \text{ YTM} = \frac{\frac{I}{m} + \frac{MV - NSV}{n \times m}}{\frac{MV + NSV}{2}} \times 100$$

[∵ Compound Interest]

$$\textcircled{3} \text{ YTC} = \frac{I + \frac{CP - NSV}{n}}{\frac{CP + NSV}{2}} \times 100$$

$$\textcircled{4} \text{CY} = \frac{I}{\text{NSV}} \times 100$$

Here,

CP = Call Price

$$\text{CP} = \text{FV} + (\text{FV} \times \text{PR}) \quad [\text{'Premium'}]$$

$$\text{CP} = \text{FV} + (\text{FV} \times \text{DR}) \quad [\text{'Discount'}]$$

NSV = Net Sales Value

$$= \text{SV} - \text{FC} \quad [\text{'FC' = Flootation Cost}]$$

SV = Sales Value

$$= \boxed{\text{SV} - (\text{SV} \times \text{FR})} \quad [\text{'FR' = Flootation Rate}]$$

→ IF flootation cost is given in %.