

MAFA : CA FINAL

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CA Final (2nd Group Pending)

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Disclaimer

Every effort is taken to avoid errors and omissions.

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Valuation of Bonds

Meaning of bond

Definition Debt instrument
Investor is entitled to receive a series of periodic interest

Types of Bond

Based on Maturity of Bond

classified into Perpetual Bond
Redeemable bond

Perpetual Bond Doesn't have any maturity period

Redeemable Bond Bond would mature after a specific period of time

Valuation of Perpetual Bond

Tax Rate not given

Value of Perpetual bond = $\frac{I}{K}$

Tax Rate given

Value of Perpetual bond = $\frac{I (1 - t)}{K}$

Where, I = Annual Interest
 K = Discounting Rate

Valuation of Redeemable Bond

Value of Redeemable bond =	PV of Future CFAT
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Where, Future CFAT= Receipt of Interest
 Repayment of Principal
 (@ par / Premium / Discount)

Semi - Annual Interest & Quaterly Interest

step 1 Find the Interest for the prescribed period, by
 applying the Per annum interest rate

Step 2 Discounting rate = K to be divided by

2 times For semi annual interest
4 times For quaterly interest

Valuation of Bonds

Example

Face value Rs. 1,000
Interest rate / coupon Rate = 12%
Interest payable semiannually
K = 14%
Life of bond 8 years

Interest for 6 months Rs. 60
Discounting rate = 14/2 7%

Value of bond =	$\frac{60}{1.07}$	+	$\frac{60}{(1.07)^2}$	+	$\frac{60}{(1.07)^3}$	+	$\frac{60}{(1.07)^{16}}$
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YTM

Yield to Maturity (discounting Rate)

Similarity Similar to the concept of IRR

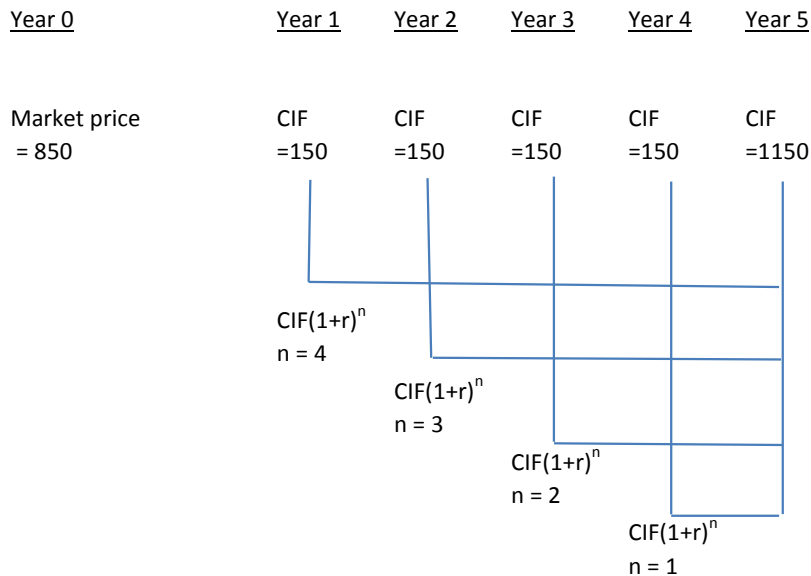
Meaning It is a Discounting Rate, @ which

Present value of Future CFAT in relation to bond	= Value of bond / Market price of bond
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RYTM

Realised Yield to Maturity

Main Theme The cash Inflow, within the period of maturity is invested
And realised at once, in the year of maturity



Cash inflow for year 5

1150
(+) CIF(1+r)ⁿ
 n = 4

Valuation of Bonds

$$\begin{aligned}
 (+) \quad & \text{CIF}(1+r)^n \\
 & n = 3 \\
 (+) \quad & \text{CIF}(1+r)^n \\
 & n = 2 \\
 (+) \quad & \text{CIF}(1+r)^n \\
 & n = 1
 \end{aligned}$$

Where, r = RE-investment interest rate

RYTM

$$850 = \frac{\text{Cash inflow for the year 5}}{(1+x)^5}$$

or

$$850 = \text{PV of Cash inflow for the year 5}$$

Holding period Return

Formulae

$$\frac{(\text{Sale price} - \text{Purchase Price}) + \text{Interest}}{\text{Purchase Price}}$$

Important problem

13.14 & 13.15, to be worked out, again

Duration of Bond

Meaning

It is a Technique
To measure the Risk of Bond
(time required to get back the money invested)

Types of Duration

Macaulay Duration
Modified duration

Macaulay's Duration

Meaning

Measures the average time taken by a Security
On a Discounted basis
to pay back the Original investment

Decision

Longer the Duration, Higher the Risk
Shorter the Duration, Lower the Risk

formulae

$$\frac{(\text{PV of CF of Year 1} * 1) + (\text{PV of CF of Year 2} * 2) + (\text{PV of CF of Year n} * n)}{\text{Sum of PV of Future CFAT}}$$

Modified Duration

Based on	Duration of Bond
Meaning	It is the price Elasticity (i.e., sensitivity) It indicates Percentage change in price for a Percentage change in Yield

How to find the %age change in Price

By computing Volatility of bond
(by computing price elasticity of a bond)

Volatility = $\frac{\text{Duration}}{(1 + \text{YTM})}$	Ans = %age
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Interpretation

For 1% Increase / Decrease in the required yield, will result in Volatility %age, fall / rise respectively in the price of the Bond

Interpretation : Inverse relationship b/w Price & Interest/yield

If interest rate increases : Price Decreases
If interest rate decreases : Price Increases

Duration for Bond Portfolio

computation	weighted average duration of the bonds within Portfolio
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Important point

Discounting rate	For this the information may be given as, Yield / Current yield
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Basis Points : Meaning

75 basis points	Means 0.75
50 basis points	Means 0.50

Immunization

Interest rate goes up : Consequences to the holder of Bond

Disadvantage :	Value of bond Would fall
Advantage :	Return on reinvestment of Interest income would increase

Valuation of Bonds

Interest rate goes down : Consequences to the holder of Bond

Advantage :	Value of bond would increase
Disadvantage :	Reinvestment return of the interest Income Would decrease

Question ?

Whether, we can make

Advantage = Disadvantage

Reason : The holder of Bond is immunized against the
Interest Fluctuation risk

Answer

Affirmative

Mechanism

Investor has to choose a Bond,

Duration of Bond = Investment Horizon



KEEP SMILING