NPTEL

Course Name: Security Analysis and Portfolio Management

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Session 32: Bond Pricing and Yield

1. What do you understand by bond pricing?
Ans.

Bond Pricing:

- The value of the bond is equal to the present value of the cash flows expected from it.
- For determining the bond price: It requires an estimate of expected cash flow, an estimate of required rate of return

Bond values with Annual Interest

$$P_m = \sum_{t=1}^{n} \frac{Ct}{(1+i)^t} + \frac{P_p}{(1+i)^n}$$

Where:
Pm=the current market price of the bond
n = the number of years to maturity
C*i* = the annual coupon payment for bond *i*
i = the prevailing yield to maturity for this bond issue
Pp=the par value of the bond
P= Ct*PVIFA r, n + Pp *PVIFr,n

Bond values with Semi Annual Interest
The present-value model

$$P_m = \sum_{t=1}^{2n} \frac{C_t/2}{(1+i/2)^t} + \frac{P_p}{(1+i/2)^{2n}}$$

Where:
P_m=the current market price of the bond
n = the number of years to maturity
C_i = the annual coupon payment for bond *i*
i = the prevailing yield to maturity for this bond issue
P_p=the par value of the bond
P= Ct/2*PVIFA r/2, 2n + Pp *PVIFr/2,2n

2. Expalin Price –Yield Relationship.
Ans.

- If yield < coupon rate, bond will be priced at a premium to its par value
- If yield > coupon rate, bond will be priced at a discount to its par value

- Price-yield relationship is convex (not a straight line)

The Yield Model: The expected yield on the bond may be computed from the market price

$$P_m = \sum_{t=1}^{2n} \frac{C_i/2}{(1+i/2)^t} + \frac{P_p}{(1+i/2)^{2n}}$$

Where,

Where:
i = the discount rate that will discount the cash flows to equal the current market price of the bond

3.What are the various measures available for computing bond yield?
Ans.

Yield Measure	Purpose
Nominal Yield	**Measures the coupon rate**
Current yield	**Measures current income rate**
Yield to maturity	**Measures expected rate of return for bond held to maturity**
Yield to call	**Measures expected rate of return for bond held to first call date**
Realized (horizon) yield	**Measures expected rate of return for a bond likely to be sold prior to maturity. It considers specified reinvestment assumptions and an estimated sales price. It can also measure the actual rate of return on a bond during some past period of time.**

4. Explain the meaning of Promised Yield to Maturity.
Ans.

- Promised Yield to Maturity : Widely used bond yield figure
- Assumes: Investor holds bond to maturity, all the bond's cash flow is reinvested at the computed yield to maturity

$$P_m = \sum_{t=1}^{2n} \frac{C_i/2}{(1+i/2)^t} + \frac{P_p}{(1+i/2)^{2n}}$$

Solve for *i* that will equate the current price to all cash flows from the bond to maturity, similar to IRR

Computing the Promised Yield to Maturity:

- Approximate promised yield

$$\text{APY} = \frac{C_i + \dfrac{P_p - P_m}{n}}{\dfrac{P_p + P_m}{2}}$$

= Coupon + Annual Straight-Line Amortization of Capital Gain or Loss
Average Investment

- Present-value model:

$$P_m = \sum_{t=1}^{2n} \frac{C_i/2}{(1+i/2)^t} + \frac{P_p}{(1+i/2)^{2n}}$$

5. Write short note on current yield.
Ans.
Current Yield

Similar to dividend yield for stocks it is important for income oriented investors

$$CY = C_i/P_m$$

where:
CY = the current yield on a bond
C_i = the annual coupon payment of bond *i*
P_m = the current market price of the bond