

What is Bond Pricing and Valuation?

Worksheet

Bond price is the present value of all future coupons and principal: $P = C/(1+y)^1 + C/(1+y)^2 + \dots + (C+FV)/(1+y)^n$, where C is coupon, y is yield, FV is face value, and n is years to maturity.

$$P = \sum_{t=1}^n C/((1+y)^t) + FV/((1+y)^n)$$

P = Bond price (present value) (\$)

C = Annual coupon payment (\$)

y = Yield to maturity (discount rate) (decimal)

FV = Face value (principal) (\$)

n = Number of periods (years) (years)

Questions

1. Higher yield to maturity means...

- A) lower bond price
- B) higher bond price
- C) no change in price
- D) zero value

2. Coupon payment is...

- A) fixed at bond issue
- B) varies daily
- C) equals yield to maturity
- D) zero at maturity

3. Bond trading at premium means...

- A) price > face value
- B) price < face value
- C) no coupon payments
- D) zero yield

4. When interest rates rise, existing bond prices...

- A) fall
- B) rise
- C) stay the same
- D) double

5. Bond: FV=1000, coupon=50/year, YTM=5%, 10 years. Price?

6. Same bond, YTM rises to 7%. New price?

7. Bond: FV=1000, coupon=60/year, YTM=4%, 10 years. Price?

8. Define: What is bond pricing?

9. Define: What is a coupon payment?

10. Define: When yield rises, bond price...

Answer Key

1. A) lower bond price — Higher discount rate reduces present value of future cash flows.
2. A) fixed at bond issue — Coupon is fixed % of face value, set when bond is issued.
3. A) price > face value — Premium bond: current price exceeds face value.
4. A) fall — Higher rates increase discount rate, lowering bond present value.
5. $P = \sum [C/(1+y)^t] + FV/(1+y)^n$ PV of coupons $\approx 50 \times [1-(1.05)^{-10}]/0.05 \approx 386$ PV of principal $= 1000/(1.05)^{10} \approx 614$ $P \approx \$1000$ (par, coupon rate = YTM)
6. PV of coupons $\approx 50 \times [1-(1.07)^{-10}]/0.07 \approx 348$ PV of principal $= 1000/(1.07)^{10} \approx 508$ $P \approx \$856$ (discount, price < FV)
7. PV of coupons $\approx 60 \times [1-(1.04)^{-10}]/0.04 \approx 541$ PV of principal $= 1000/(1.04)^{10} \approx 676$ $P \approx \$1217$ (premium, price > FV)
8. Calculating present value of all future bond cash flows (coupons + principal).
9. Regular interest payment to bondholder; fixed at bond issue.
10. Falls. Inverse relationship due to discounting future cash flows.

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