What is Bond Valuation?

Worksheet

Bond valuation calculates the present value of all future coupon payments and principal repayment, discounted at the market interest rate. Higher market rates lower bond prices; lower rates raise them.

$$BV = \Sigma_{(t=1)}^{n} C/((1+r)^t) + F/((1+r)^n)$$

BV = Bond Value (present value) ($)
C = Annual coupon payment ($)
F = Face value (principal) ($)
r = Market yield (discount rate) (% per year)
n = Years to maturity (years)

Questions

1. What is the main factor that changes a bond's value?

A) Inflation
B) Market interest rates (yield)
C) Company color
D) Stock price

2. If market yield = coupon rate, bond price = ?

A) Zero
B) Par value (face value)
C) Above par
D) Below par

3. What is the coupon payment on a $1000 bond with 6% coupon?

A) $60/month
B) $60/year
C) $6/year
D) $600/year

4. A 1000 bond trades at950. This is...

A) At par
B) At a discount
C) At a premium
D) Matured

5. Bond: 1000 face, 5% coupon (50/year), 5-year maturity, market yield 5%. What is its value?

6. Same bond, but market yield is now 7%. New value?

7. Same bond, market yield 3%. New value?

8. Define: What is bond valuation?

9. Define: What happens when market yield rises?

10. Define: What happens when market yield falls?

Answer Key

1. B) Market interest rates (yield) — Bond prices move inversely with market yields. Higher yields = lower prices; lower yields = higher prices.

2. B) Par value (face value) — When discount rate = coupon rate, the bond trades at par value.

3. B) $60/year — 1000 × 6% =60/year (paid semi-annually or annually depending on terms).

4. B) At a discount — Below par value = discount. Usually because market yield exceeds the coupon rate.

5. PV of coupons: $50/(1.05)^1$ +50/(1.05)^2 + $50/(1.05)^3$ +50/(1.05)^4 + $50/(1.05)^5$ =216.48 PV of principal: $1000/(1.05)^5$ =783.53 Bond value = 216.48 +783.53 = $1000 (par value)

6. PV of coupons: $50/(1.07)^1$ + ... +50/(1.07)^5 = 205.08 PV of principal:1000/(1.07)^5 = 712.99 Bond value =205.08 + 712.99 =918.07 (discount)

7. PV of coupons: $50/(1.03)^1$ + ... +50/(1.03)^5 = 229.23 PV of principal:1000/(1.03)^5 = 863.84 Bond value =229.23 + 863.84 =1093.07 (premium)

8. Calculating the present value of all future coupons and principal repayment using market yield.

9. Bond prices fall — future cash flows are discounted at a higher rate, reducing present value.

10. Bond prices rise — future cash flows are discounted at a lower rate, increasing present value.