

Numerical Examples of Coupon Rate and Yield to Maturity

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1. Formula for solving for yield to maturity in an annual pay bond:

$$P = \frac{C}{1+r} + \frac{C}{(1+r)^2} + \dots + \frac{C+F}{(1+r)^t}$$

2. For $C = \$80$, $t = 4$, and $F = \$1000$, we have

$$P = \frac{80}{1+r} + \frac{80}{(1+r)^2} + \frac{80}{(1+r)^3} + \frac{1080}{(1+r)^4}$$

3. Suppose the bond sells at par. That means $P = \$100$ per \$100 face value. Substituting in $P = \$100$ produces

$$(1) C/F = .08 \quad (2) \text{ YTM} = \text{IRR} = .08$$

or $C/F = \text{YTM}$.

Lesson: When the bond sells at par, the coupon rate equals the yield to maturity.

4. Suppose the bond sells at a discount. For example, $P = \$90$ per \$100 face value. Substituting in $P = \$90$ produces

$$(1) C/F = .08 \quad (2) \text{ YTM} = \text{IRR} = .1123$$

or $C/F < \text{YTM}$.

Lesson: When the bond sells at a discount, the coupon rate is less than yield to maturity.

5. Suppose the bond sells at a premium. For example, $P = \$110$ per \$100 face value. Substituting in $P = \$110$ produces

$$(1) C/F = .08 \quad (2) \text{ YTM} = \text{IRR} = .0516$$

or $C/F > \text{YTM}$.

Lesson: When the bond sells at a premium, the coupon rate is greater than yield to maturity.