Hw 1.2

Friday, September 13, 2024 10:59 AM

Task 2

6 month : 5 %.
12 month : 6 %.
18 month : 6,5 %.
24 month : 7 %.

zero rate with semi annual compounding

The present value of future cash flow is

$$PV = \frac{CF}{(1+r)^t}$$

To price a bond I need the future cash flow and the par value at maturity

$$\text{Bond price} = \sum_{i=1}^{n} \frac{C}{(1+r)^i} + \frac{F}{(1+r)^n}$$

I want the coupon rate equal to its value

$$F = \frac{C}{2}\sum_{i=1}^{n} \frac{1}{(1+r)^2} + \frac{F}{(1+r)^n}$$

$$1 = \frac{C}{2}\left(\frac{1}{(1+\frac{0,05}{2})^1} + \frac{1}{(1+\frac{0,06}{2})^2} + \frac{1}{(1+\frac{0,065}{2})^3} + \frac{1}{(1+\frac{0,07}{2})^4} \right) + \frac{1}{(1+\frac{0,07}{2})^4}$$

$$C = 2\left(\frac{1 - \frac{1}{(1+\frac{0,07}{2})^4}}{\left(\frac{1}{(1+\frac{0,05}{2})^1} + \frac{1}{(1+\frac{0,06}{2})^2} + \frac{1}{(1+\frac{0,065}{2})^3} + \frac{1}{(1+\frac{0,07}{2})^4} \right)}\right) \approx 0,0695$$