Answer on Question #51497, Economics, Finance

Power of Tower Inc. has bonds that mature in 6½ years with a par value of RM1,000. They pay a coupon rate of 9% with semiannual payments. If the required rate of return on these bonds is 11% what is the bond's current value?

Solution:

In given task we have the following data. Future value = 1,000, Total number of coupon payments = (6.5*2=13), Coupon rate = 4.5% (0.045 semi-annually), Required rate of return = 5.5% (0.055 semi-annually). Firstly we can determine the future value Payment (PMT). We apply the following formula.

$$\text{PMT} = \text{Coupon Rate} \times \text{Future value}$$

We substitute the given values into the noted above formula.

$$\text{PMT} = 0.045 \times 1{,}000 = 45$$

Now our challenge is to define the bond's current value. We apply the following formula for calculation.

$$\text{Present Value} = \left(\frac{\text{PMT} \cdot \text{k}}{\text{ip}} - \text{Future value}\right) \cdot \frac{1}{(1+\text{ip})^{\text{N}}} - \frac{\text{PMT} \cdot \text{k}}{\text{ip}}$$

Where:

PV = Present Value

PMT = 45 (Payment)

k = 1 if payment is made at the end of the period; 1 + ip if made at the beginning of the period

FV = 1,000 (Future Value);

ip = 5.5% (Interest Rate per period);

N = 13 (Number of periods).

Now we can substitute the given values into the formula in order to find the Present value.

$$\text{Present Value} = \left(\frac{45 \cdot 1}{0.055} - 1{,}000\right) \cdot \frac{1}{(1+0.055)^{13}} - \frac{45 \cdot 1}{0.055}$$

Simplify the obtained equation.

$$\begin{aligned}\text{Present Value} &= (818.181 - 1{,}000) \cdot (0.498561) - 818.181 \\ &= (-181.818 \cdot 0.499) - 818.181 = -90.647 - 818.181 = -908.829\end{aligned}$$

Thus, the Present value is equal to $\text{RM}908.829$.