Twin Oaks Health Center has a bond issue outstanding with a coupon rate of 7% and four years remaining until maturity.  The par value of the bond is $1,000, and the bond pays interest annually.

a)  Determine the current value of the bond if present market conditions justify a 14% required rate of return.

The following variables are obtained from the information provided above:

Number of periods: N = 4 years

Payment (coupon amount): P = $70 (7% of $1,000)

Future value (principal): FV= $1,000

Interest rate (I) = 14%

It is noted that although market conditions increased the interest rate, it should be noted that the coupon rate amount and par value are not affected by these changes, and therefore remain fixed as per contract (Gapenski, 2008, p. 365).

**Applying the PV function using Excel spreadsheet (attached) the current value obtained is $796.04.** The following table shows the figures used in this calculation:

|  |  |
| --- | --- |
| 4 | Nper |
| 70 | Payment |
| 1000 | Future value |
| 14% | Interest rate |
| $796.04 | Current value = -PV (A5,A2,A3,A4) |

b) Supposing Twin Oaks’s four-year bond had semiannual coupon payments. What would be its current value? (Assume a 7% semiannual rate of return. However, the actual rate would be slightly less than 7% because a semiannual coupon bond is slightly less risky than an annual coupon.)

As mentioned above, the payment amount the coupon amount remains fixed as per contract and for this case would be $35 every 6 months. However, the number of periods would be doubled (8) since payments are semiannual and the interest rate applied is 7%.

**Running these figures in the spreadsheet applying the PV function with these new figures, the new par current value obtained is $791.00.** The following table includes the numbers used for this calculation:

|  |  |
| --- | --- |
| 8 | Nper |
| 35 | Payment |
| 1000 | Future value |
| 7% | Interest rate |
| $791.00 | Current value = -PV (A5,A2,A3,A4) |

c) Assuming that Twin Oak’ bond had a semiannual coupon but 20 years remaining to maturity. What is the current value under these conditions? (Assume a 7% semiannual rate of return. However, the actual rate would be slightly less than 7%, although the actual rate would probably be greater than 7% because of increased price risk.)

**Applying the same logic as in b with the new figures, the current value obtained is $533.39.** The following table includes the numbers used for this calculation:

|  |  |
| --- | --- |
| 40 | Nper |
| 35 | Payment |
| 1000 | Future value |
| 7% | Interest rate |
| $533.39 | Current value = -PV (A5,A2,A3,A4 |