6)  
\[ S_{10\%}^{2\text{nd}} \]

\[ 70 \quad 70 \quad 70 \quad \uparrow \quad 70 \quad 70 \quad 70 \quad \text{FV} 1000 \]

\[ \text{i} = 16\% \]

\[ \dot{C} = \frac{16\%}{2} = 8\% \]

\[ \text{PMT} = 70 \]

\[ \dot{C} = \frac{16\%}{2} = 8\% \]

\[ \text{FV} = 1000 \quad 1073.60 \]

\[ N = 10 \]

\[ \text{PV} = ? \]

**Today** = $966.99

\[ \text{PV} = ? = 1073.60 \]
7) CH 5 Bond P.587

Time Scale: 0 5 10

CPN Rate = 102, compounded

FV = \$1000,

\[ \text{FV} = \frac{1}{(1 + r)^n} \]

\[ \text{PMT} = \frac{\text{FV}}{r} \]

\[ \text{YTM} = 8\% \]

\[ \text{YTC} = 7.5\% \]

\[ \text{FV} = \$1000 \]

\[ \text{PMT} = 25 \]

\[ \text{N} = 10 \times 4 = 40 \]

\[ \text{C} = 8\% / 4 = 2 \]

\[ \text{PV} = 91136.78 \]

\[ \text{PMT} = 25 \]

\[ \text{PV} = 1136.78 \]

\[ \text{N} = 5 \times 4 = 20 \]

\[ \text{PMT} = (25) \]

\[ \text{I} = \frac{7.5}{4} = 1.875\% \]

\[ \text{Call Price} \quad \text{FV} = 91048.34 \]
Recently, Ohio Hospitals Inc. filed for bankruptcy. The firm was reorganized as American Hospitals Inc., and the court permitted a new indenture on an outstanding bond issue to be put into effect. The issue has 10 years to maturity and a coupon rate of 10 percent, paid annually. The new agreement allows the firm to pay no interest for 5 years. Then, interest payments will be resumed for the next 5 years. Finally, at maturity (Year 10), the principal plus the interest that was not paid during the first 5 years will be paid. However, no interest will be paid on the deferred interest. If the required annual return is 20 percent, what should the bonds sell for in the market today?
Q1. Zero Coupon Bonds

Suppose your company needs to raise $10 million and you want to issue 20-year bonds for this purpose. Assume the required return on your bond issue will be 9 percent, and you’re evaluating two issue alternatives: a 9 percent annual coupon bond, and a zero coupon bond. Your company’s tax rate is 35 percent.

a. How many of the coupon bonds would you need to issue to raise the $10 million? How many of the zeroes would you need to issue?
b. In 20 years, what will your company’s repayment be if you issue the coupon bonds? What if you issue the zeroes?
c. Consider the firm’s after tax cash flow for the first year under the two scenarios. Why would you want to ever issue zero coupon bonds?
a) 9.2% Reg'd. Return = 9% YTM \(= 9\% \text{ mkt. int. rate} \downarrow = \)
9.8 coupon rate so trades at Par $1,000

Need \(\frac{\$10,000,000}{\$1,000} = 10,000 \text{ bonds} \)

Zeros

\[
\begin{align*}
\text{FV} &= 1,000 \\
N &= 20 \\
\delta &= 9 \\
PMT &= 0 \\
PV &= ? = \$178.43
\end{align*}
\]

\[
\frac{\$19,000,000}{\$178.43} = 56,044 \text{ bonds}
\]

b) coupon repayment # am't @ maturity in 20 yrs

\[
\begin{align*}
\text{FV} &= 10,000,000 \\
PMT &= \frac{900,000}{1 + \delta} \\
\text{PV} &= \frac{10,000,000}{(1.09)^{20}} \\
\text{PMT} &= \frac{1}{10,900,000} \text{ Repaid}
\end{align*}
\]

56,044 bonds
\[
\times \$1,000
\]
\[
\$56,044,000 \text{ Repaid}
\]
10,000 bonds

$900,000 \times 90 = 90,000 \text{ per year interest ex}

\left( 1 - .35 \right) \text{ After-tax effect}

<585,000 \text{ All cash outflow}

\begin{align*}
FV &= 1000 \\
N &= 19 \\
\hat{C} &= 9 \\
PV &= 178.43 \\
PV &= ? \approx 194.49
\end{align*}

$16,06 \text{ interest} \times (56,044 \times .35) = 315,023 \text{ cash inflow}
**Bonds**

12. **Burger King**

- **Par**: $1000
- **FV**: $1000
- **Coupon**: $8\% \times \$1000 = $80
- **PMT**
- **N**: 30
- **i**: ?

Use **Equiv. Annual Rate** based on Mickey D's 12% **nominal**-**reqd** return on its semiannual basis bonds.

\[
30 \times \text{PV} = \$1000
\]

\[
\text{PMT} = \frac{?}{2} = 80
\]

\[
N = 30
\]

\[
i = 12\% / 2 = 6\%
\]

**PV** = ? = $699.07

**McDonalds**

- **Par**: $1000
- **FV**: $1000
- **Coupon**: $8\% / 2 = 4\% \times \$1000 = 40
- **N**: 20 \times 2 = 40
- **i**: 12\% / 2 = 6\%
- **PV** = ? = $699.07

**B. k** - $681.54

\[
\text{B. k} = \frac{681.54}{17.53}
\]