Chapter 5

5-1

The rate of return is $(1000/300)^{1/10}$ or 12.79%

5-2

Value of 15-year corporate bond; 9% coupon rate; 8 % market interest rate
Assuming coupons are paid semi-annually,
Value of Bond $= 45*(1-1.04^{-30})/.04+1,000/1.04^{30} = \$1,086.46$
If market interest rates increase to 10%,
Value of Bond $= 45*(1-1.05^{-30})/.05+1,000/1.05^{30} = \$923.14$
The bonds will trade at par only if the market interest rate = coupon rate.

Alternatively, you could consider the compounding effect in the market interest rate – the six-month interest rate will be less than 4%. In that case, the value of the bonds would be as follows:
Six-month rate $= (1.08)^{1/2} - = .0392$
Value of Bond $= 45*(1-1.0392^{-30})/.0392+1,000/1.08^{15} = \$1,101$

5-3

If the NV Technologies bond is trading at par, its yield is equal to its coupon rate of 8%.
If GEV Technologies has the same rating, it should have a similar yield. Hence, we can
write: $95 = \dfrac{3.75}{.04}(1 - \dfrac{1}{1.04^n}) + \dfrac{100}{1.04^n}$, where $n/2$ is the maturity in years of the GEV bond.
Solving, we find n = 41; hence the maturity is 20.5 years.

5-4

The yield on the bond is $6.5 + 0.5 = 7\%$.
The present value of the payments equals
$\dfrac{30}{.035}(1 - \dfrac{1}{1.035^{40}}) + \dfrac{35}{.035(1.035)^{40}}(1 - \dfrac{1}{1.035^{40}}) + \dfrac{1000}{1.035^{80}} = 640.65 + 188.79 + 63.79 =$
$\$893.23$

5-5

The coupon solves $1000c/.03 = 636$, where c is the semi-annual coupon rate; hence the annual coupon rate equals 3.82%.

5-6

   a. The price is obtained by using the formula $\dfrac{1.5(1.05)}{.13 - 0.05} = \$19.6875$

   b. If the stock is trading, instead at \$15, then the growth rate, g, can be solved as the solution to $15 = \dfrac{1.5(1 + g)}{.13 - g}$; i.e. 1.95 - 15g = 1.5 + 1.5g, or g = 2.7272%

5-7

We solve $51.25 = \dfrac{2.5(1.05)}{r - 0.05}$, where r is the expected rate of return. Solving, we get $r = 10.122\%$

5-8
Value of Dividends during high growth period = $ 1.00 (1.15)(1-1.15^5/1.125^5)/(.125-.15)
= $5.34
Expected Dividends in year 6 = $1.00 (1.15)^5*1.06***2** = $4.26 (Payout doubles in year 6)
Expected Terminal Price = $4.26/(.125-.06) = $65.54
Value of Stock = $5.34 + $65.54/1.125^5 = $41.70

5-9
a. According to the Dividend Discount Model, the share price is 1.88(1.05)/(.1-.05) = $39.48.
b. According to the FCFE model, the price of the share is 2.4(1.05)/(.1-0.05) = $50.40.
c. The difference in price could be due to the fact that the company is not following the optimal dividend policy. The FCFE value is probably more accurate, since it assumes that the firm will follow an optimal dividend policy. However, if there is no market mechanism available to force the company's management to change its dividend policy, the market price will probably reflect the $37.6 valuation rather than the truer underlying value of $48.

5-10
   a. The total value of the equity in CVS Corporation equals

   $$\frac{300(1.15)}{(0.11 - 0.15)}\left[1 - \frac{1.15^5}{1.11^5}\right] + \frac{300(1.15)^5(1.05)}{(.11 - .05)(1.11)^5} = 1670.17 + 6266.62 = \$7936.79m.$$

   b. The value of equity per share equals $7936.79m./392m. = $20.25

   c. We solve the equation $36 = \dfrac{300(1.15)}{(0.11 - 0.15)}\left[1 - \dfrac{1.15^n}{1.11^n}\right] + \dfrac{300(1.15)^n(1.05)}{(.11 - .05)(1.11)^n}$ and find

       that n = 14 years. (Trial and error is probably the best way to get to this solution)

5-11
   a. The value of the entire firm is 650(1.045)/(.085-.045) = 16,981.25m.
   b. The value of the equity can be estimated as 16.98125b. – 3.88b. = 13.10125b.
   c. This implies that the price per share should be 13101.25/66.3 = $197.01; hence at a market price of $32, the stock is undervalued by $165.01

5-12
The value of the entire firm is $\dfrac{3(1.15)}{(0.09 - 0.15)}\left[1 - \dfrac{1.15^{10}}{1.09^{10}}\right] + \dfrac{3(1.15)^{10}(1.05)}{(.09 - .05)(1.09)^{10}} =$
175.3359b. Hence the estimated value of the equity is 175.3359 – 1.2 = 174.1359b. The value per share is 174.1359/1.15 = $151.42.

5-13

The stock price would rise if the market's expected rate of increase was below the announced 50%; else it would decrease if the actual increase was less than expected.

5-14
This is not sufficient. There will always be some investors who will beat the market by chance. Hence, it is necessary to show that these investors beat the market consistently or beyond what would be expected by chance. Another reason why these investors might have beaten the market is because they might have taken above average risks. Hence, investor returns have to be corrected for risks as well.

5-15
If investors receive the same information about assets, they can still disagree if their personal characteristics, such as degree of risk aversion and marginal tax rates differ. They may also disagree on the implications of the information for value.