13-1  a. Assets-in-place, also known as operating assets, include the land, buildings, machines, and inventory that the firm uses in its operations to produce its products and services. Growth options are not tangible. They include items such as R&D and customer relationships. Financial, or nonoperating, assets include investments in marketable securities and non-controlling interests in the stock of other companies.

b. Operating current assets are the current assets used to support operations, such as cash, accounts receivable, and inventory. It does not include short-term investments. Operating current liabilities are the current liabilities that are a natural consequence of the firm’s operations, such as accounts payable and accruals. It does not include notes payable or any other short-term debt that charges interest. Net operating working capital is operating current assets minus operating current liabilities. Operating capital is the sum of net operating working capital and operating long-term assets, such as net plant and equipment. Operating capital also is equal to the net amount of capital raised from investors. This is the amount of interest-bearing debt plus preferred stock plus common equity minus short-term investments. NOPAT is the amount of net income a company would generate if it had no debt and held no financial assets. NOPAT is a better measure of the performance of a company’s operations because debt lowers income. In order to get a true reflection of a company’s operating performance, one would want to take out debt to get a clearer picture of the situation. Free cash flow is the cash flow actually available for distribution to investors after the company has made all the investments in fixed assets and working capital necessary to sustain ongoing operations. It is the most important measure of cash flows because it shows the exact amount available to all investors.

c. The value of operations is the present value of all the future free cash flows that are expected from current assets-in-place and the expected growth of assets-in-place when discounted at the weighted average cost of capital:

\[
V_{\text{op (at time 0)}} = \sum_{t=1}^{\infty} \frac{FCF_t}{(1 + WACC)^t}.
\]

The terminal, or horizon value, is the value of operations at the end of the explicit forecast period. It is equal to the present value of all free cash flows beyond the forecast period, discounted back to the end of the forecast period at the weighted average cost of capital:

\[
V_{\text{op (at time N)}} = \frac{FCF_{N+1}}{WACC - g} = \frac{FCF_N (1 + g)}{WACC - g}.
\]

The corporate valuation model defines the total value of a company as the value of operations plus the value of nonoperating assets plus the value of growth options.
d. Value-based management is the systematic application of the corporate value model to a company’s decisions. The four value drivers are the growth rate in sales (g), operating profitability (OP=NOPAT/Sales), capital requirements (CR=Capital/Sales), and the weighted average cost of capital (WACC). Return on Invested Capital (ROIC) is NOPAT divided by the amount of capital that is available at the beginning of the year.

e. Managerial entrenchment occurs when a company has such a weak board of directors and has such strong anti-takeover provisions in its corporate charter that senior managers feel there is very little chance that they will be removed. Non-pecuniary benefits are perks that are not actual cash payments, such as lavish offices, memberships at country clubs, corporate jets, and excessively large staffs.

f. Targeted share repurchases, also known as greenmail, occur when a company buys back stock from a potential acquiror at a higher than fair-market price. In return, the potential acquiror agrees not to attempt to take over the company. Shareholder rights provisions, also known as poison pills, allow existing shareholders in a company to purchase additional shares of stock at a lower than market value if a potential acquiror purchases a controlling stake in the company. A restricted voting rights provision automatically deprives a shareholder of voting rights if the shareholder owns more than a specified amount of stock.

g. A stock option allows its owner to purchase a share of stock at a fixed price, called the exercise price, no matter what the actual price of the stock is. Stock options always have an expiration date, after which they cannot be exercised. A restricted stock grant allows an employee to buy shares of stock at a large discount from the current stock price, but the employee is restricted from selling the stock for a specified number of years. An Employee Stock Ownership Plan, often called an ESOP, is a type of retirement plan in which employees own stock in the company.

13-2 The first step is to find the value of operations by discounting all expected future free cash flows at the weighted average cost of capital. The second step is to find the total corporate value by summing the value of operations, the value of nonoperating assets, and the value of growth options. The third step is to find the value of equity by subtracting the value of debt and preferred stock from the total value of the corporation. The last step is to divide the value of equity by the number of shares of common stock.

13-3 A company can be profitable and yet have an ROIC that is less than the WACC if the company has large capital requirements. If ROIC is less than the WACC, then the company is not earning enough on its capital to satisfy its investors. Growth adds even more capital that is not satisfying investors, hence, growth decreases value.

13-4 Entrenched managers consume to many perquisites, such as lavish offices, excessive staffs, country club memberships, and corporate jets. They also invest in projects or acquisitions that make the firm larger, even if they don’t make the firm more valuable.

13-5 Stock options in compensation plans usually are issued with an exercise price equal to the current stock price. As long as the stock price increases, the option will become valuable, even if the stock price doesn’t increase as much as investors expect.
13-1 \[ \text{NOPAT} = \text{EBIT}(1 - T) \]
\[ = 100(1 - 0.4) = \$60. \]

Net operating WC\(_{05}\) = \((\$27 + \$80 + \$106) - (\$52 + \$28)\)
\[ = \$213 - \$80 = \$133. \]

Operating capital\(_{05}\) = \$133 + \$265 = \$398.

Net operating WC\(_{06}\) = \((\$28 + \$84 + \$112) - (\$56 + \$28)\)
\[ = \$224 - \$84 = \$140. \]

Operating capital\(_{06}\) = \$140 + \$281 = \$421.

FCF = NOPAT - Net investment in operating capital
\[ = \$100(0.6) - (\$421 - \$398) \]
\[ = \$37.0. \]

13-2 Value of operations = \(V_{op} = \text{PV of expected future free cash flow}\)
\[ V_{op} = \frac{\text{FCF}(1 + g)}{WACC - g} = \frac{\$400,000(1.05)}{0.12 - 0.05} = \$6,000,000. \]

13-3 a. \[ V_{op_2} = \frac{\$108,000}{0.12 - 0.08} = \$2,700,000. \]

b. 
\[
\begin{array}{ccc}
0 & 1 & 2 \\
\text{WACC} = 12\% & 8\% & \text{N} \\
\$80,000 & \$100,000 & \$108,000 \\
\hline
$71,428.57 \\
79,719.39 \\
2,152,423.47 \\
$2,303,571.43 \\
\end{array}
\]

Mini Case: 13 - 3
13-4  a.  \[ V_{op_3} = \frac{\$40 \times (1.07)}{0.13 - 0.07} = \$713.33. \]

b.  

\[
\begin{array}{cccccc}
& 0 & 1 & 2 & 3 & 4 & N \\
WACC & 13\% & & & & & \\
V_{op} & 713.33 & \text{g = 7\%} & & & & \\
\end{array}
\]

\[
\begin{array}{ccc}
-20 & 30 & 40 \\
($ 17.70) & 23.49 & \text{V}_{op_3} = 713.33 \\
\$522.10 & \text{753.33} \\
\$527.89 & \\
\end{array}
\]

c.  Total value \( t=0 \) = \$527.89 + \$10.0 = \$537.89.

Value of common equity = \$537.89 - \$100 = \$437.89.

Price per share = \( \frac{\$437.89}{10.0} \) = \$43.79.

13-5  The growth rate in FCF from 2007 to 2008 is \( g = \frac{($750.00 - $707.55)}{$707.50} = 0.06. \)

\[ V_{Op at 2007} = \frac{$707.55 \times (1.06)}{0.11 - 0.06} = \$15,000. \]

13-6  \[ V_{op} =$200,000,000 + \left[ \frac{$200,000,000}{0.098 - 0.05} \right] [0.09 - 0.10] \]

\[ =\$200,000,000 + (-$40,000,000) = \$160,000,000. \]

MVA = \$160,000,000 - \$200,000,000 = -\$40,000,000.

13-7  Capital\(_{2009}\) = Sales\(_{2009}\) \(\times 0.43\) = \$129,000,000.

\[ V_{Op at 2009} =$129,000,000 + \left[ \frac{\$300,000,000 \times (1 + 0.05)}{0.098 - 0.05} \right] [0.06 - (0.098 \left( \frac{0.43}{1 + 0.05} \right))] \]

\[ =\$129,000,000 + [\$6,562,500,000 \times 0.020] \]

\[ =\$129,000,000 + \$130,375,000 = \$259,375,000. \]

13-8  Total corporate value = Value of operations + marketable securities = \$756 + \$77 = \$833 million.

Value of equity = Total corporate value – debt – Preferred stock

\[ = \$833 - (\$151 + \$190) - \$76 = \$416 million. \]

13-9  Total corporate value = Value of operations + marketable securities = \$651 + \$47 = \$698 million.

Value of equity = Total corporate value – debt – Preferred stock

\[ = \$698 - (\$65 + \$131) - \$33 = \$469 million. \]

Price per share = \( \frac{\$469}{10} \) = \$46.90.
13-10  

**a.** \( \text{NOPAT}_{2006} = 108.6(1-0.4) = 65.16 \) million.

\( \text{NOWC}_{2006} = (5.6 + 56.2 + 112.4) - (11.2 + 28.1) = 134.9 \) million.

\( \text{Capital}_{2006} = 134.9 + 397.5 = 532.4 \) million.

\( \text{FCF}_{2006} = \text{NOPAT} - \text{Investment in Capital} = 65.16 - (532.4 - 502.2) = 65.16 - 30.2 = 34.96 \) million.

**b.** \( \text{HV}_{2006} = \frac{[34.96(1.06)]}{(0.11-0.06)} = 741.152 \) million.

**c.** \( \text{V}_{\text{Op at 12/31/2005}} = \frac{[34.96 + 741.152]}{(1+0.11)} = 699.20 \) million.

**d.** Total corporate value = $699.20 + $49.9 = $749.10 million.

**e.** Value of equity = $749.10 – ($69.9 + $140.8) - $35.0 = $503.4 million. 
Price per share = $503.4 / 10 = $50.34.