

Homework Solutions - Lecture 1

1. You are analyzing a company with the expected future cash flows shown below. Based on current market prices, the market value of the firm's equity is \$1,962.9. The outstanding debt has both a market and book value of \$800. The firm's cost of equity (k_e) is 11.0%, the firm's past and future cost of debt is 10%, and the firm's tax rate is $t=50\%$. Use this information to answer the questions below.

<i>Year</i>	<i>FCF to Firm</i>	<i>Int Exp (1-t)</i>	<i>FCF to Equity</i>
1	\$ 140.0	\$ 40	\$ 100.0
2	\$ 150.0	\$ 40	\$ 110.0
3	\$ 161.0	\$ 40	\$ 121.0
4	\$ 173.1	\$ 40	\$ 133.1
5	\$ 186.4	\$ 40	\$ 146.4
Terminal Value	\$ 3339.6		\$2562.2

- a. Calculate the value of the firm's equity by discounting the listed Free Cash Flows to Equity.

$$PV_{Equity} = \frac{100}{1.11} + \frac{110}{1.11^2} + \frac{121}{1.11^3} + \frac{133.1}{1.11^4} + \frac{(146.4 + 2562.2)}{1.11^5} = \$1962.9$$

- b. Calculate the value of the overall firm by discounting the listed Free Cash Flows to the Firm. Use your solution to calculate the value of the firm's equity.

$$WACC = \left(\frac{1962.9}{2762.9} \right) 11.0\% + \left(\frac{800}{2762.9} \right) 10\% (1 - .5) = 9.26\%$$

$$PV_{Firm} = \frac{140}{1.0926^1} + \frac{150}{1.0926^2} + \frac{161}{1.0926^3} + \frac{173.1}{1.0926^4} + \frac{(186.4 + 3339.6)}{1.0926^5} = \$2762.9$$

$$PV_{Equity} = PV_{Firm} - MV \text{ of Debt} = 2762.9 - 800 = \$1962.9$$

- c. In this example, the estimated value of equity was the same using the FCFE and FCFF models. In general, this will be the case only if:
- i. The value of equity used to calculate the cost of capital is equal to the value obtained in the valuation.
 - ii. The interest expenses are equal to the pre-tax cost of debt multiplied by the market value of debt (i.e., debt is priced at face value).
 - iii. There are no extraordinary or nonoperating items that affect net income but not operating income (i.e., the only difference is interest expense).

2. I have attached Nike's financial statements from the most recent fiscal year ending May 31, 2011. The notes to the financial statements and full 10K are available on the class web site. Throughout the course, you will use this information to complete several assignments related to the valuation of Nike.
- a. Using Nike's financial statements and any additional resources required, calculate the profitability ratios we discussed in class. Compare these ratios to those we calculated for Home Depot and note any important similarities and differences between the two firms.

$$\text{Effective Tax Rate} = \frac{711}{2844} = 25.0\%$$

$$\text{Gross Profit Margin} = \frac{9508}{20862} = 45.6\%$$

$$\text{Aftertax Operating Profit Margin} = \frac{(9508 - 6693)(1 - .25)}{20862} = \frac{2111.25}{20862} = 10.1\%$$

$$\text{Net Profit Margin} = \frac{2133}{20862} = 10.2\%$$

$$\text{Return on Capital} = \frac{(9508 - 6693)(1 - .25)}{(446 + 7 + 139) + 9754} = 20.4\%$$

$$\text{Return on Equity} = \frac{2133}{9754} = 21.9\%$$

EBIT = 9508 - 6693 = 2815. The debt used for the ROC calculation includes all short-term and long-term debt, including the current portion of long-term debt and notes payable. In addition, for the ROE and ROC where we compare an income statement number to a balance sheet number, I am using the beginning of period balance sheet value. It would also be acceptable to use the average of the beginning and ending period balance sheet values.

The comparable values for Home Depot are 36.7%, 34.3%, 5.4%, 4.9%, 12.7%, and 17.2%, respectively. All of Nike's margins are significantly higher than those for Home Depot and the firm's effective tax rate is lower. In addition, both the ROC and ROE are higher for Nike than for Home Depot. By these measures, Nike is more profitable and has lower costs than Home Depot.

- b. As shown in part (a), the ROC for Nike is 20.4%, which is significantly higher than what we calculated for Home Depot (12.7%). Nike's ROC can be decomposed into an after-tax operating margin and capital turnover ratio as follows:

$$\begin{aligned} \text{Return on Capital (ROC)} &= \frac{(9508 - 6693)(1 - .25)}{(446 + 7 + 139) + 9754} = \left(\frac{2111.25}{20862} \right) \times \left(\frac{20862}{10346} \right) \\ &= 20.4\% = 10.12\% \times 2.02 \end{aligned}$$

Nike's capital turnover (2.02) is slightly lower than Home Depot's (2.34). Thus, Nike's higher ROC appears to be driven by Nike's higher operating margins (lower costs), rather than by Nike's ability to generate sales (capital turnover).

As shown in part (a), the ROE for Nike is 21.9%, which is again significantly higher than what we calculated for Home Depot (17.2%). Nike's ROE can be decomposed into net profit margin, asset turnover ratio, and financial leverage, as follows:

$$\begin{aligned} \text{Return on Equity (ROE)} &= \frac{2133}{9754} = \left(\frac{2133}{20862} \right) \times \left(\frac{20862}{14419} \right) \times \left(\frac{14419}{9754} \right) \\ &= 21.9\% = 10.22\% \times 1.45 \times 1.48 \end{aligned}$$

As with the ROC, the higher ROE for Nike appears to be driven by higher margins, while Nike's asset turnover ratio (1.45) is slightly lower than that of Home Depot (1.66). In addition, Home Depot's ROE is driven up by its use of leverage, which is much higher than that of Nike. Without this leverage, Home Depot's ROE would look even worse relative to that of Nike.

Consolidated Statements of Income

<i>(In millions, except per share data)</i>	Year Ended May 31,		
	2011	2010	2009
Revenues	\$ 20,862	\$ 19,014	\$ 19,176
Cost of sales	11,354	10,214	10,572
Gross margin	9,508	8,800	8,604
Demand creation expense	2,448	2,356	2,352
Operating overhead expense	4,245	3,970	3,798
Total selling and administrative expense	6,693	6,326	6,150
Restructuring charges (Note 16)	—	—	195
Goodwill impairment (Note 4)	—	—	199
Intangible and other asset impairment (Note 4)	—	—	202
Interest expense (income), net (Notes 6, 7 and 8)	4	6	(10)
Other (income), net (Note 17)	(33)	(49)	(89)
Income before income taxes	2,844	2,517	1,957
Income taxes (Note 9)	711	610	470
Net income	\$ 2,133	\$ 1,907	\$ 1,487
Basic earnings per common share (Notes 1 and 12)	\$ 4.48	\$ 3.93	\$ 3.07
Diluted earnings per common share (Notes 1 and 12)	\$ 4.39	\$ 3.86	\$ 3.03
Dividends declared per common share	\$ 1.20	\$ 1.06	\$ 0.98

The accompanying notes to consolidated financial statements are an integral part of this statement.

PART II

ITEM 8 Financial Statements and Supplemental Data

Consolidated Balance Sheets

(In millions)	May 31,	
	2011	2010
ASSETS		
Current assets:		
Cash and equivalents	\$ 1,955	\$ 3,079
Short-term investments (Note 6)	2,583	2,067
Accounts receivable, net (Note 1)	3,138	2,650
Inventories (Notes 1 and 2)	2,715	2,041
Deferred income taxes (Note 9)	312	249
Prepaid expenses and other current assets	594	873
Total current assets	11,297	10,959
Property, plant and equipment, net (Note 3)	2,115	1,932
Identifiable intangible assets, net (Note 4)	487	467
Goodwill (Note 4)	205	188
Deferred income taxes and other assets (Notes 9 and 17)	894	873
TOTAL ASSETS	\$ 14,998	\$ 14,419
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities:		
Current portion of long-term debt (Note 8)	\$ 200	\$ 7
Notes payable (Note 7)	187	139
Accounts payable (Note 7)	1,469	1,255
Accrued liabilities (Notes 5 and 17)	1,985	1,904
Income taxes payable (Note 9)	117	59
Total current liabilities	3,958	3,364
Long-term debt (Note 8)	276	446
Deferred income taxes and other liabilities (Notes 9 and 17)	921	855
Commitments and contingencies (Note 15)	—	—
Redeemable Preferred Stock (Note 10)	—	—
Shareholders' equity:		
Common stock at stated value (Note 11):		
Class A convertible — 90 and 90 shares outstanding	—	—
Class B — 378 and 394 shares outstanding	3	3
Capital in excess of stated value	3,944	3,441
Accumulated other comprehensive income (Note 14)	95	215
Retained earnings	5,801	6,095
Total shareholders' equity	9,843	9,754
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	\$ 14,998	\$ 14,419

The accompanying notes to consolidated financial statements are an integral part of this statement.