# Valuation: Measuring and Managing the Value of Companies

Frameworks for Valuation

Chapter 6 Problems

1. Exhibit 6.18 presents the income statement and reorganized balance sheet for BrandCo, an $800 million consumer products company. Using the methodology outlined in Exhibit 6.5, determine NOPLAT for Year 1. Assume an operating tax rate of 25 percent. Using the methodology outlined in Exhibit 6.6, determine free cash flow for Year 1.
2. BrandCo currently has 50 million shares outstanding. If the BrandCo’s shares are trading at $17.88 per share, what is the company’s market capitalization (value of equity)? Assuming the market value of debt equals today’s book value of debt, what percentage of the company’s value is attributable to debt, what percentage is attributable to equity? When is the market value of debt not equal to the book value? Using these weights, compute the weighted average cost of capital. Assume the pre-tax cost of debt is 8 percent, the cost of equity is 12 percent, and the marginal tax rate is 30 percent.
3. Using free cash flow computed in Question 1 and the weighted average cost of capital computed in Question 2, estimate BrandCo’s enterprise value using the growing-perpetuity formula.
4. Assuming the market value of debt equals today’s book value of debt, what is the intrinsic equity value for BrandCo? What is the value per share? Does it differ from the share price used to determine the cost of capital weightings?
5. What are the three components required to calculate economic profit? Determine BrandCo‘s economic profit in Year 1?
6. Using economic profit calculated in Question 5 and the weighted average cost of capital computed in Question 2, value BrandCo using the economic-profit-based key value driver model. Does the calculation generate enterprise value or equity value? Should discounted economic profit be greater than, equal to, or less than discounted free cash flow. Hint: remember, prior year invested capital must be used to determine ROIC and capital charge.
7. Using the methodology outlined in Exhibit 6.16, determine equity cash flow for Year 1. Use the growing-perpetuity formula (based on equity cash flow) to compute BrandCo’s equity value. Assume the cost of equity is 12 percent and cash flows are growing at 5 percent.



# Valuation: Measuring and Managing the Value of Companies

Reorganizing the Financial Statements

Chapter 7 Problems

1. Exhibit 7.15 presents the income statement and balance sheet for Companies A, B, and C. Compute each company’s return on assets, return on equity, and return on invested capital. Based on the three ratios, which company has the best operating performance?
2. Why does the return on assets differ between Company A and Company B? Why do companies with equity investments tend to have lower return on assets than companies with only core operations?
3. Why does the return on equity differ between Company A and Company C? Is this difference attributable to operating performance? Does return on assets better reflect operating performance than return on equity? If not, which ratio does and why?
4. Exhibit 7.16 presents the income statement and balance sheet for HealthCo, a $600 million healthcare company. Compute NOPLAT, average invested capital, and ROIC. Assume an operating tax rate of 25 percent and a marginal tax rate of 35 percent. If the weighted average cost of capital is 9 percent, is the company creating value?
5. Using the reorganized financial statements created in Question 4, what is the free cash flow for HealthCo in the current year?
6. You decide to look closer at HealthCo’s tax reconciliation footnote. The table reports $35 million in statutory taxes, a $10 million credit for manufacturing investments, and a onetime tax expense of $5 million related to a past year audit. Reported taxes are therefore $30 million. What is HealthCo’s statutory tax rate, operating tax rate, and effective rate? Why does computing the operating tax rate require judgment?
7. Many companies hold significant amounts of excess cash, cash above the amount required for day-to-day operations. Does including excess cash as part of invested capital distort the ROIC upwards or downwards? Why?



# Valuation: Measuring and Managing the Value of Companies

Analyzing Performance and Competitive Position

Chapter 8 Problems

1. JetCo is a manufacturer of high speed aircraft. The company generates $100 million in operating profit on $600 million of revenue and $800 million of invested capital. JetCo’s primary competitor Gulf Aviation also generates $100 million in NOPLAT. Gulf Aviation is slightly larger; the company recorded $800 million in revenue. Gulf Aviation has $600 million in invested capital. Based on the preceding data, which company is creating more value? Assume an operating tax rate of 25 percent and cost of capital of 8 percent.
2. Using the industry data presented in Question 1, decompose ROIC into operating margin and capital turnover for each company. Which ratio is more important in determining ROIC, operating margin or capital turnover?
3. DefenseCo announces a purchase of Gulf Aviation for $1.1 billion in cash. Consequently, Gulf Aviation’s invested capital with goodwill and acquired intangibles rises from $600 to $1.1 billion. Next year, while conducting its annual review of Gulf Aviation, senior management at DefenseCo asks you the following questions: Based on the profitability figures presented in Question 1, is Gulf Aviation creating value for DefenseCo? Which company, JetCo or Gulf Aviation, has the best financial performance in the industry?
4. Gulf Aviation generates $800 million per year, with no material growth. The consolidated revenues for DefenseCo are $1.5 billion in Year 1, $1.8 billion in Year 2 (the year of the acquisition), and $2.5 billion in Year 3. If DefenseCo closed the acquisition of Gulf Aviation on October 1 of Year 2, what is the “apples-to-apples” organic growth for Defense Co in Year 2 and Year 3? How does this differ from reported revenues? Assume Gulf Aviation revenues are consolidated into DefenseCo only after the acquisition close and that the fiscal year closes for both companies on December 31 of each year.
5. Using an Internet search tool, find Procter & Gamble’s investor relations website. Under “Financial Reporting,” you will find the company’s 2009 annual report. In the annual report’s section titled “Management’s Discussion and Analysis,” you will find a discussion on revenue growth. How fast did the company grow (or shrink) revenues in 2009? How much is attributable to price, number of units sold, foreign currencies, and shift in the mix of products sold? How does this compare to 2008 (which can also be found in the 2009 annual report)? What would the growth have been on a “constant currency basis?” Is the difference with and without currency meaningful?
6. Which interest coverage ratio, EBITDA to interest or EBITA to interest, will lead to a higher number? When is the EBITDA interest ratio more appropriate than EBITA ratio? When is the EBITA interest coverage ratio more appropriate than the EBITDA ratio?

# Valuation: Measuring and Managing the Value of Companies

Forecasting Performance

Chapter 9 Problems

1. Using an Internet search tool, find Procter & Gamble’s investor relations website. Under “Financial Reporting,” you will find the company’s 2009 annual report. In 2009, the company reported $8.6 billion in “ACCRUED AND OTHER LIABILITIES” and $79.0 billion in revenue, such that accrued and other liabilities equaled 10.9 percent of revenue. Using data provided in Note 3 of the annual report, discuss why a forecast ratio of 10.9 percent going forward would distort your forecast of free cash flow. How should the balance sheet be reorganized to prevent this?
2. Exhibit 9.14 presents the income statement and balance sheet for PartsCo, a $900 million supplier of machinery parts. Next year, the company is expected to grow revenues by 15 percent to $945 million. Using the methodology outlined in Exhibit 9.3, forecast next year’s income statement for PartsCo. Assume next year’s forecast ratios are identical to this year’s forecast ratios. Forecast depreciation as a percentage of last year’s property and equipment. Forecast interest as a percentage of last year’s total debt.
3. Using the methodology outlined in Exhibit 9.10, forecast the operating items on next year’s balance sheet for PartsCo. Forecast each balance sheet item as a function of revenue, except inventory and accounts payable, which should be forecast as a function of cost of sales. Your forecast should be consistent with the revenue and cost of sales forecast in Question 2.
4. Using the methodology outlined in Exhibit 9.12, forecast the financing items on next year’s balance sheet for PartsCo. Assume long-term debt remains at $260 million, no equity is raised, and no dividends are paid. Use short-term debt as the funding plug to balance the balance sheet. Your forecast should be consistent with forecasts in Questions 2 and 3.
5. The chief financial officer of PartsCo has asked you to rerun the forecast of the company’s income statement and balance sheet at a growth rate of 5 percent. If the company generates more cash than it needs, how can the balance sheet be adjusted to handle this? What alternatives exist to handle new cash?
6. The Federal Reserve Bank of St. Louis provides extensive interest rate and economic data. Using an Internet search tool, find the website: “St. Louis Fed: Economic Data – FRED.” In the FRED database’s search box, type “FII10.” This number is the Series ID for the 10-Year Treasury Inflation-Indexed Security. Using FRED data, determine the yield-to-maturity as of January 1, 2010. Next, type “GS10” in the database search box, which is the Series ID for a comparable 10-Year Treasury. What is the yield-to-maturity for the 10-year Treasury bond as of January 1, 2010? What is the inflation rate implied by the two bonds?



# Valuation: Measuring and Managing the Value of Companies

Estimating Continuing Value

Chapter 10 Problems

1. Exhibit 10.13 presents free cash flow and economic profit forecasts for ApparelCo, a $250 million company that produces men’s clothing. ApparelCo is expected to grow revenues, operating profits, and free cash flow at 6 percent per year indefinitely. The company earns a return on new capital of 15 percent. The company’s cost of capital is 10 percent. Using the key value driver formula, what is the continuing value as of Year 5? Using discounted cash flow, what is the value of operations for ApparelCo? What percentage of ApparelCo’s total value is attributable to the continuing value?
2. Since growth is stable for ApparelCo, you decide to start the continuing value with Year 3 cash flows (i.e. cash flows in Year 3 and beyond are part of the continuing value). Using the key value driver formula (and data provided in Question 1), what is the continuing value as of Year 2? Using discounted cash flow, what is the value of operations for ApparelCo? What percentage of ApparelCo’s total value is attributable to the continuing value? How does this compare to Question 1?
3. Using the economic profit formula, what is the continuing value for ApparelCo as of Year 5? Using discounted economic profit, what is the value of operations for ApparelCo? What percentage of ApparelCo’s total value is attributable to current invested capital, to interim economic profits, and to economic profits in the continuing value period?
4. Since growth is stable for ApparelCo, you decide to start the continuing value with Year 3 economic profits (i.e. economic profits in Year 3 and beyond are part of the continuing value). Using the economic profit formula (and data provided in Question 1), what is the continuing value as of Year 2? Using discounted economic profit, what is the value of operations for ApparelCo? What percentage of ApparelCo’s total value is attributable to the continuing value? How does this compare to Question 2?
5. A colleague suggests that a 6 percent growth rate is too low for revenue, profit, and cash flow growth beyond Year 5. He suggests raising growth to 12 percent in the continuing value. If NOPLAT equals $26.6 million, return on new capital equals 15 percent, and the cost of capital equals 10 percent, what is the continuing value as of Year 5? Is there an alternative model that would perform better?
6. SuperiorCo earns a return on invested capital of 20 percent on its existing stores. Given intense competition for new stores sites, you believe new stores will only earn their cost of capital. Consequently, you set return on new capital (8 percent) equal to the cost of capital (8 percent) in the continuing value formula. A colleague argues this is too conservative, as SuperiorCo will create value well beyond the forecast period. What is the flaw in your colleague’s argument?



# Valuation: Measuring and Managing the Value of Companies

Estimating the Cost of Capital

Chapter 11 Problems

1. Sao Paolo Foods is a Brazilian producer of breads and other baked goods. Over the last year, profitability has been strong and the share price has risen from R$15 per share to R$25 per share. Financial analysts (who generate projections in Brazilian Real) expect the profit growth to continue. The company has 20 million shares outstanding. The company’s borrowing is conservative; the company has only R$100 million in debt. The debt trades at a yield-to-maturity 50 basis points above Brazilian risk free bonds. Sao Paolo Foods has a market beta of 0.7. If the Brazilian risk free rate is 7 percent, the market risk premium is 5 percent, and the marginal tax rate is 30 percent, what is Sao Paolo’s cost of capital?
2. Sao Paolo Foods (introduced in Question 1) is considering a leveraged recapitalization of the company. Upon announcement, management expects the share price to rise by 10 percent. If the company raises R$200 million in new debt to repurchase shares, how many shares can the company repurchase? Assuming management will actively manage to the new capital structure; estimate its new market beta. If the company’s interest rate rises to 100 basis points above the Brazilian risk free rate, what will its new cost of capital equal?
3. Your company, EuropeCo (a conglomerate of food, beverages, and consumer products) has announced its intention to purchase Sao Paolo Foods (introduced in Question 1). If the German risk free rate is 5 percent and the beta of EuropeCo is 0.9, what is the cost of capital for Sao Paolo Foods once under EuropeCo control?
4. In 2009, the median price-to-earnings ratio for the S&P 500 was 11.1. If the long-run return on equity is 13.5 percent and the long-run growth in GDP is expected to be 6.7 percent (3.5 percent real growth and 3.2 percent inflation), what is real cost of equity implied by the equity-denominated key value driver formula?
5. Market betas are typically computed with five years of monthly data or two weeks of yearly data. For computational simplicity, we present only 12 data points. Using a spreadsheet regression package or other software tool, compute a regression beta for the following data:



1. You are analyzing a distressed bond with one year to maturity. The bond has a face value of $100 and pays a coupon rate of 5 percent per year. The bond is currently trading at $80. What is the yield to maturity on the bond? If the probability of default is 35 percent, what is the cost of debt? Assume that upon default only 50 percent of face will be recovered and that remaining coupons will not be paid.

# Valuation: Measuring and Managing the Value of Companies

Moving from Enterprise Value to Value per Share

Chapter 12 Problems

1. MarineCo manufactures, markets, and distributes recreational motor boats. Using discounted free cash flow, you value the company’s operations at $2,500 million. The company has a 20% stake in a nonconsolidated subsidiary valued at $500 million. The investment is recorded on MarineCo’s balance sheet as an equity investment of $50 million. MarineCo is looking to increase its ownership. The company’s marginal tax rate is 30 percent. Based on this information, what is MarineCo’s enterprise value? If new management announced its plan to sell the subsidiary at its current value, how would that change your valuation?
2. MarineCo has unfunded pension liabilities valued at $200 million, recorded as a long-term other liability. MarineCo has detailed a potential legal judgment of $100 million for defective engines in its annual report. Since management estimates a 90% likelihood the judgment will be enforced against the engine maker and not MarineCo, they have not reported a liability on the balance sheet. The company’s marginal tax rate is 30 percent. Based on this information and information provided in Question 1 (assuming no sale of the subsidiary), what is MarineCo’s equity value?
3. To finance customer purchases, MarineCo recently started a customer financing unit. MarineCo’s income statement and balance sheet is provided in Exhibit 12.8. Separate MarineCo’s income statement and balance sheet into the two segments: manufacturing and the customer subsidiary. Assume equity in financing subsidiary is the difference between finance receivables and debt related those receivables. What is the return on invested capital for the manufacturing segment? What is the return on equity for the customer financing subsidiary?
4. In Question 4, we computed ROE based on an equity calculation equal to the difference between finance receivables and debt related those receivables. Why might this ROE measurement lead to a result that is too high?
5. You are valuing a company using probability-weighted scenario analysis. You carefully model three scenarios, such that the resulting enterprise value equals $300 million in Scenario 1, $200 million in Scenario 1, and $100 million in Scenario 1. The probability of each scenario is 25 percent, 50 percent, and 25 percent respectively. What is the expected enterprise value? What is the expected equity value? Management announces a new plan that eliminates the downside scenario, making Scenario 2 that much more likely. What happens to enterprise value and equity value? Why does enterprise value rise more than equity value?
6. You are valuing a technology company whose enterprise value is $800 million. The company has no debt, but considerable employee options, 10 million in total. Based on option pricing models, you value each option at $6.67 per option. If the company has 40 million shares outstanding, what is the company’s equity value and value per share? What is the value per share using the exercise value approach? Assume the average strike price equals $15.



# Valuation: Measuring and Managing the Value of Companies

Calculating and Interpreting Results

Chapter 13 Problems

1. You are valuing a DistressCo, a company struggling to hold share. The company currently generates $120 million in revenue, but is expected to shrink to $100 million next year. Cost of sales currently equals $90 million and depreciation equals $18 million. Working capital equals $36 million and equipment equals $120 million. Using this data, construct operating profit and invested capital for the current year. You decide to build an “as-is” valuation of DistressCo. To do this, you forecast each ratio (such as cost of sales to revenues) at its current level. Based on this forecast method, what are operating profits and invested capital expected to be next year? What are two critical operating assumptions (identify one for profits, and one for capital) embedded in this forecast method?
2. You decide to value a steady-state company using probability-weighted scenario analysis. In Scenario 1, NOPLAT is expected to grow at 6 percent and ROIC equals 16 percent. In Scenario 2, NOPLAT is expected to grow at 2 percent and ROIC equals 8 percent. Next year’s NOPLAT is expected to equal $100 million and the weighted average cost of capital is 10 percent. Using the key value driver formula introduced in Chapter 2, what is the enterprise value in each scenario? If each scenario is equally likely, what is the enterprise value for the company?
3. A colleague recommends a short cut to value the company in Question 2. Rather than compute each scenario separately, he recommends averaging each input, such that growth equals 4 percent and ROIC equals 12 percent. Will this lead to the same enterprise value found in Question 2? Which method is correct? Why?
4. Using an Internet search tool, find Procter & Gamble’s investor relations website. Under “Financial Reporting,” you will find the company’s 2009 annual report. In the annual report’s section titled “Management’s Discussion and Analysis,” you will find growth by segment. How many segments does Procter & Gamble report? Using 2009 as a proxy, does each segment have the same organic growth characteristics? Set organic growth equal to sum of volume excluding acquisitions, price, mix and other. Based on growth by segment, can P&G be valued as a whole, or should individual segments be valued separately?
5. Using an Internet search tool, find Procter & Gamble’s investor relations website. Under “Financial Reporting,” you will find the company’s 2009 annual report. In Note 11 of the 2009 annual report, you will find financials by segment. What are the operating margins by segment? Based on operating margin by segment, can P&G be valued as a whole, or should individual segments be valued separately?

# Valuation: Measuring and Managing the Value of Companies

Using Multiples to Triangulate Results

Chapter 14 Problems

1. Exhibit 14.12 presents market and profit data for three companies. Using this data, compute enterprise value to EBITDA and enterprise value to EBITA for Companies 1 and 2. Is the net difference between Company 1 and Company 2 the same for both ratios? If not, why might this be?
2. Exhibit 14.12 presents market and profit data for three companies. If Company 3 has nonopearting assets valued at $50 million, what is the company’s enterprise-value-to-EBITDA and enterprise-value-to-EBITA multiples?
3. You are valuing multiple steady-state companies in the same industry. Company A is projected to earn $160 in EBITA, grow at 2 percent per year, and generate ROICs equal to 15 percent. Company Bis projected to earn $100 in EBITA, grow at 6 percent per year, and generate ROICs equal to 10 percent. Both companies have an operating tax rate of 25 percent and a cost of capital of 10 percent. What are the enterprise-value-EBITA multiples for both companies? Does higher growth lead to a higher multiple in this case?
4. You are valuing multiple steady-state companies in the same industry. Company A is projected to earn $160 in EBITA, grow at 2 percent per year, and generate ROICs equal to 15 percent. Company C is projected to earn $120 in EBITA, grow at 5 percent per year, and generate ROICs equal to 12 percent. Both companies have an operating tax rate of 25 percent and a cost of capital of 10 percent. What are the enterprise-value-EBITA multiples for both companies? Does higher growth lead to a higher multiple in this case? Why do the results differ between Questions 4 and 5?
5. Two companies have the same long-term prospects concerning growth and ROIC. One of the companies temporarily stumbles during a new product launch, and profits drop considerably as the company scrambles to fix the error. Which company is likely to have the higher multiple and why?
6. LeverCo is financed entirely by equity. The company generates operating profit equal to $80 million. LeverCo currently trades at an equity value of $900 million. At a tax rate of 25 percent, what is the price-to-earnings multiple for LeverCo? New management decides to increase leverage through a share repurchase. The company issues a $400 million bond to retire $400 million in equity. If the bond pays interest at 5 percent, what is the company’s new price-to-earnings ratio? How can you predict the direction the P/E ratio will move without performing the calculation?

