

Absolute Valuation: Economic Profit/EVA

Objective: The objective of this assignment is to help reinforce the concept of Economic Profit otherwise known as Economic Value Added (EVA). More specifically, this exercise is designed to have you learn how to:

- Calculate NOPAT, Operating Capital, EVA, and MVA (Market Value Added)
- Partition the EVA and use this partition in analyzing the firm
- Perform discounted cash flow analysis using EVA
- Use EVA in conjunction with Tobin's Q to make investment decisions (buy/sell)

Prior to doing this assignment, please read Chapters 8 - 12 in Copeland, Kotler, and Murrin, *Valuation: Measuring and Managing The Value of Companies*.

Company: Procter and Gamble (Ticker: PG, <http://www.pg.com/>) 

is the number one U.S. maker of household products, with 300 brands in five main categories: laundry and cleaning (detergents), paper goods (toilet paper), beauty care (cosmetics, shampoos), food and beverages (coffee, snacks), and health care (toothpaste, medicine). P&G's top ten brands account for about fifty percent (50%) of its sales. Currently, it is shedding weaker brands that don't have long-term growth potential and simultaneously acquiring product lines such as buying hair products giant Clairol from Bristol-Myers Squibb that is in line with their 4%-6% growth target. It is also reportedly in negotiations to sell its studios, which produce the soap operas *Guiding Light* and *As the World Turns* to Viacom.



This restructuring is tied to P&G's declining economic performance. For example, [Stern Stewart](#) ranked Procter and Gamble 11th in terms of their 1994 MVA. By 1998, Procter and Gamble's MVA had declined to 15th. A year later, it's MVA declined again to 17th (\$127,222 million). In terms of its 1999 performance, the latest year for which Stern Stewart reports EVA statistics, P&G had a return on capital (ROC) of 15.52% versus a weighted average cost of capital (WACC) of 9.72%. Thus, the firm is still generating a return that is higher than it's borrowing cost. In dollar terms, this translates to a 1999 EVA on average capital of 1,782 (mil\$). At 1999 year-end, it had operating capital of 31,587 (mil\$).

Competitors: Colgate-Palmolive (CL), Gillette (G), and Kimberly-Clark (KMB)

Assignment: Download the spreadsheet labeled PG2001.xls from my website and do all your work on this spreadsheet. This is an *individual* assignment. Although you can discuss this case with your classmates, you are responsible for doing the case yourself. Students caught cheating will be given an F on this assignment. In doing this

assignment, please use the assumptions given on the next page. The assignment/questions can be found after the assumptions.

Assumptions to Use in Calculations:

Item	Assumption
Growth rate in sales	P&G's recently announced a growth target of 4%-6% in sales. As such, assume a 5% growth rate in sales.
Sales/Beginning Capital via Operating Approach	Based on historical performance, assume that P&G continues to have a sales-to-beginning capital ratio of 1.4
Cost of Goods Sold (COGS)	Cost of Goods Sold <i>includes</i> Depreciation and Amortization IF there is an "NA" for Depreciation and Amortization in the income statement. If this is the case, subtract out Depreciation and Amortization from COGS.
COGS (exclu. Depreciation & Amortization)/ Sales	Based on historical performance, assume that P&G continues to have a COGS/Sales ratio of .435
(SGA + R&D Expenses)/ Sales	Based on historical performance, assume that P&G continues to have a (Selling, General, and Administrative expense + R&D Expense)-to-Sales ratio of .33.
Depreciation & Amortization	Use the Depreciation & Amortization number given in the income statement. If there is a NA, use the Depreciation and Amortization number given in the Statement of Cash Flows.
Depreciation & Amortization /Sales	Assume that this ratio is .055 based on historical performance. Technically, we should use the ratio of depreciation to Capital Expenditures (CapEx) and the ratio of CapEx to Sales in calculating Depreciation.
Tax Rate	Tax Rate = Provision for Income Taxes/Income Before Tax
Accounting Adjustments/ Sales	Based on historical performance, assume that (Goodwill Amortization + Implied Interest on Operating Leases + Change in LIFO Reserves)/ Sales = .008
Cash Operating Taxes/ Adjusted Operating Profit	Based on historical performance, assume that this cash tax rate is 35%
Beta	Assume that the beta in year 2000 is .53 and that the beta in 2010 is 1 (mean reversion to beta of the market). The beta is assumed to increase each year from 2000 to 2010 in a linear fashion using the formula $\beta_T = \beta_{T-1} + (\beta_{2010} - \beta_{2000})/10$

Item	Assumption
Risk free Rate	Assume that the rate on a 10-year Treasury bond remains constant at 6%
Risk Premium	Assume that it is .055. As an aside, Bennet Stewart in his book "Quest for Value" uses 6%.
After-tax Cost of Debt	For the valuation based on EVA, assume that the after-tax cost of debt remains constant at 5%.
Weights for Debt and Equity	For the valuation based on EVA, assume that the weight for debt and equity are 17% and 83% respectively.
Terminal Value	For the valuation based on EVA, assume that the terminal value is calculated using the constant growth model: $\text{Terminal Value} = \text{EVA}_{2011} / (\text{WACC}_{2010} - \text{Sales Growth})$ <p>Note: Sales Growth = Growth in EVA in stable growth period due to our percentage of sales assumptions.</p>
NA	Assume that NA is equal to zero. See the preceding comment for the case of Depreciation and Amortization.
Absolute Value	Use the =abs() function in Excel in calculating the absolute value
Present Value of Operating Leases	Use the before-tax cost of debt associated with the firm's bond rating for a particular year as the discount rate. Several examples are given in the worksheet labeled Operating Leases.
Intangibles	The line item labeled INTANGIBLES in the balance sheet includes Goodwill and is on a NET basis.

Assignment:

1. Using the financial statements, operating leases, and risk factors as well as bond yields provided, calculate the

- a. Net Operating Profit (NOPAT)
- b. Cash Operating Taxes
- c. Present Value of the Operating Lease (also fill in the highlighted section in the worksheet labeled Operating Leases)
- d. Capital via the Financing Approach
- e. Capital via the Operating Approach
- f. Market Value of Capital
- g. After-tax WACC based on market value weights

- h. Return on Capital
- i. Economic Profit (Economic Value Added (EVA))
- j. Market Value Added (MVA)

using the EVA Template for each firm. The area to be completed is highlighted in yellow. Note: There is a line item in each firm's income statement called Income Before Depreciation and Amortization (INC BEF DEP & AMORT). This may or may not be equivalent to EBITDA. The reason is that the Depreciation and Amortization is sometimes included in the Cost of Goods Sold. Please see the assumptions above.

2. To make sure that you understand where the LIFO Reserves, Accumulated Goodwill Amortization, Deferred Income Taxes, and Implied Interest on Operating Leases are found in the 10K, print out the appropriate pages from Procter and Gamble's 10K for the year ended June 30, 2000 and highlight the relevant numbers in yellow. One source of 10K reports is <http://www.wsrn.com>. Type in Procter and Gamble's ticker (PG). Click either on SEC Filings (SEC) or SEC Filings (Edgar-Online). If you use SEC Filings (SEC) be sure that the search string is PROCTER and GAMBLE and not PROCTER and GAMBLE0000080424.

3. Complete the highlighted sections of the worksheet labeled "Pct of Sales Template" using the various EVA Templates that you finished in part 1 above. Next, using your completed percent of sales worksheet, complete the highlighted sections of the next worksheet labeled "Partitioning the EVA". Discuss how effective Procter and Gamble's management is at controlling their operating expenses relative to their Peers (management of income statement). Is P&G's management doing a better or worse job over time? Besides this, discuss how well P&G manages their assets (balance sheet) relative to their Peers e.g. \$1 of assets (various asset components) generates how many dollars in sales? To what extent does differences in accounting affect profit at the firm level (EBIT) for P&G relative to their Peer group?

4. Using your results in the worksheet labeled EVA Template (PG), calculate the justified value of the firm and the justified value of the equity for Procter and Gamble by completing the highlighted sections of the worksheet labeled "Valuation (%PG Sales)". Your cash flows should be in millions of dollars (Note: the financial statements are in thousands of dollars). The necessary assumptions regarding growth, risk, etc., are given above.

a. Based on year-end 2000 as your date of valuation (12/31/2000) and the price on that date, should you buy, sell, or hold P&G?

b. What proportion of the justified value of the firm is based on future growth potential (and understated book value)? What portion of P&G's value is due to its existing asset base inclusive of excess cash and the value of non-operating assets? (Hint: the sum of the present value of the EVAs is equal to MVA. Think of how MVA is related to the value of the firm).

c. Using the Data Table command in Excel, complete the sensitivity table of prices at various levels of expected growth in sales and for various levels of beta in the year 2010.

d. Several analyst reports for P&G assume that the WACC remains constant over time ($WACC_{2000} = WACC_{2001} = \dots = WACC_{2010}$) for purposes of discounted cash flow valuation. Using the results in your completed sensitivity table, what is the justified price of P&G assuming a constant WACC (no mean reversion exists over the 10 year forecasting horizon)? Given this assumption, is P&G's stock a buy, a sell, or is it fairly priced (a hold)?

5. The MVA, EVA, Operating Capital, ROIC, and WACC for the top 150 and bottom 150 firms for 1999 are located in the worksheet labeled "SternStewart 1999 EVA".¹ Complete this worksheet by calculating Tobin's Q, the ROIC-WACC spread, and finally the Investment Decision for each firm. In calculating Tobin's Q, assume that the Market Value of the Firm is approximately equal to MVA + Operating Capital and that Operating Capital is a proxy for the Replacement Cost of the Firm's Assets. Use the following decision rule in your investment decision-making:

<u>IF</u>	<u>THEN DECISION IS</u>
Tobin's Q > 1 and ROIC – WACC > 0	Value Creating
Tobin's Q > 1 and ROIC – WACC < 0	Firm is Overvalued
Tobin's Q < 1 and ROIC – WACC < 0	Value Destroying
Tobin's Q < 1 and ROIC – WACC > 0	Firm is Undervalued

To reduce the time spent on this exercise, use a series of IF Statements e.g., for the first company, Microsoft, a portion of the IF statement in cell J4 is given below:

=IF(AND(H4>1,I4>0),"Value Creating",IF(AND(H4<1,I4<0),"Value Destroying")

If you are not familiar with the IF command, click on Help in Excel and then select Contents and Index. As an example of what I want to see, Tobin's Q, ROIC-WACC, and the Investment Decision is already given for Procter and Gamble in row 20.

The last 2 columns of this worksheet contain the returns calculated over the period from June 15, 2000 to June 15, 2001 which we will use to see whether we can use EVA analysis as a predictor of investment performance. The question that we want to answer is whether economic performance ($EVA/MVA ><$) is related to *future* investment performance.

6. Complete the worksheet labeled "Quadrant Investing" based on your results for the worksheet labeled "SternStewart 1999 EVA". The best way to complete this worksheet is to first make a copy of the "SternStewart 1999 EVA" worksheet using Edit → Move or Copy Sheet ... → Select SternStewart 1999 EVA → Create a copy → OK. Next,

¹ The actual number of firms in the spreadsheet is less than 300 due to mergers, de-listings, etc.

highlight the area that you wish to sort using the cursor and go to Data → Sort ...wherein you sort by the investment decision. Be sure in sorting the data that all of the columns are highlighted otherwise Excel will only sort one column while all other columns remain unsorted. In calculating the Probability of Positive Returns and the Probability of Negative Returns, use relative frequencies that you learned in statistics. For example, suppose that there are 54 “Overvalued firms”. Of these 54 overvalued firms, 38 firms have positive 52 week returns relative to the S&P500 (returns are not only positive but also exceed the S&P500 ... $R_{i,t}/R_{SP500,t} > 0$). The probability of a positive return is thus $38/54 = 30\%$ and the probability of a negative return is $1 - .3 = 16/54 = 70\%$.

- a. In which quadrants is investment performance related to economic performance?
- b. In which quadrants does investment performance differ from economic performance? Based on what you have learned from this class and your other finance classes, what is the probable reason for this difference, if any?
- c. Comment on whether you would use EVA as an aid in investment decision-making? Why or why not?

Please turn in a hard copy of the spreadsheet together with your disk containing the spreadsheet with all the appropriate calculations.