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Free Cash Flow to the Firm Valuation

Objective: The purpose of this project is to reinforce the concepts that you have been exposed to through readings, lectures, and mini-cases. In essence, you will learn how the following concepts are used in the context of valuing the equity of an actual firm:

- cost of debt
- present value of operating leases and imputed interest on this "debt"
- built-up beta and cost of equity (discount rate for cash flows to stockholders)
- weighted average cost of capital (discount rate to firm's cash flows)
- margin analysis
- free cash flow to the firm (FCFF) and the terminal value of the firm
- economic profit (EVA)

The data for this project can be downloaded from my website. The file is called fm_val2003.xls. The data is current as of August 8, 2002.

The Company: Hershey (http://www.hersheys.com) is the market leader in the U.S. candy business with such well known brands as Hershey's Kisses, Reese's peanut butter cups, Twizzlers licorice, Jolly Rancher, Mounds and Almond Joy among others. Hershey announced on July 25, 2002 that it is exploring the possibility of a sale following a decision by the Milton Hershey School Trust to diversify its assets. The trust owns over 30% of Hershey's shares and roughly 76% of the voting stock. The Wall Street Journal reported that an auction could fetch more than $10 billion. The trust and other charitable foundations are under intense pressure to diversify their holdings amid the stock market downturn and the spate of corporate scandals such as Enron and WorldCom. The decision also comes amid a big wave of consolidation in the food industry, which has seen the sale of such companies as Nabisco, Ralston Purina and Best Foods to multinational food conglomerates.

On the same day that Hershey's announced that it is exploring the possible sale of the company, Moody's Investors Service placed the firm's A1 long term rating under review (direction uncertain) and its prime short term rating under review for possible downgrade.

According to it's 10K, "Going forward, the Company has set balanced and sustainable goals including 3%-4% sales growth, gross margin expansion, 9%-11% growth in earnings per share, and continued market share gains. The Corporation anticipates that the total U.S. confectionary market will grow at a rate of 2%-3% in 2002."

Competitors: Archibald Candy (private firm), Cadbury Schweppes(CSG), Campbell Soup (CPB; owns Godiva), Kraft Foods (KFT), Mars (private firm), Nestle S.A. (NSRGF), PepsiCo. (PEP), Rocky Mountain Chocolate Factory (RMCF), Russell Stover (private firm), See's Candies (a subsidiary of Berkshire Hathaway), Tootsie Roll (TR), Topps (TOPP), World's Finest Chocolate (private firm), and Wrigley (WWY).

For purposes of this analysis, we will use Cadbury Schweppes(CSG), Campbell Soup (CPB; owns Godiva)), PepsiCo. (PEP), Rocky Mountain Chocolate Factory (RMCF), Tootsie Roll (TR), Topps (TOPP), and Wrigley (WWY) as our comparable firms. We exclude Kraft Foods given its short operating history. We also exclude Nestle S.A. given its lack of recent financial information.

Assignment/Tasks: Download the file fm_val2003.xls and then given the assumptions on the last page of this mini-case, perform the following tasks using this spreadsheet

1. Cost of debt (10 points): Calculate the pre-tax cost of debt and the after-tax cost of debt using the Altman EM Z-Score model. In addition to this, calculate the pre-tax cost of debt and the after-tax cost of debt using Moody's bond rating for Hersheys. Assume that HSY's debt has a 10-year maturity. As such, you should use the 10-year Treasury bond for the risk free rate in your calculations. Is the cost of debt the same under both models? Is the Moody's downgrade justified based on Altman's EM Z-Score model? Please explain. Does the Altman model include all sources of debt?

2. PV of Operating Leases and Imputed Interest (10 points): Calculate the present value of the operating leases using the pre-tax cost of debt that you calculated in question #1 above as the discount rate. Assume that the year 2002 is the current period (time 0). Calculate the PV of operating leases using pre-tax cost of debt from the Altman EM Z-Score model and also Moody's bond rating. You are using the ***pre-tax*** cost of debt since operating leases are a form of financing and as such represent ***before-tax*** cash flow to debtholders. In addition to this, calculate the imputed interest on these operating leases for Year 2002 and onwards (years after 2002).

3. Total value of debt and total value of equity (5 points): Calculate the total value of debt for the last twelve months (LTM) assuming that the book value of debt is equal to the market value of debt. Be sure to include the present value of operating leases (at the year 2002) as debt[1]. Next, calculate the total market value of equity. Finally, compute the market value of total capital as well as the weights for debt and equity. Perform the calculations using the rating based on the Altman EM Z-score and also the Moody's rating. Are the weights for debt and equity similar under both approaches?

4. Built-up Beta (10 points): Compute the built-up beta as well as the historical beta for Hershey. Use the book value of debt and the market value of equity in calculating the debt-to-equity ratio for the comparable firms. For the comparable firms, we will not

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[1] At the time that this case was prepared, 2 quarters remained in Year 2002. As such, we use the PV of Operating Leases associated with the Year 2002 as our PV of Operating Leases (LTM).

include the PV of Operating leases in the total value of their debt[2]. (However, we will include the PV of Operating leases with respect to Hershey). Round your answer to two decimal places.

5. Cost of equity and weighted average cost of capital (10 points): Calculate the cost of equity using the built-up beta for Hershey's. Also calculate Hershey's beta based on its historical returns in relation to the returns on the S&P500. What problems exist in using Hershey's historical beta? Does using Hershey's historical beta make sense? Why or why not? Next, calculate the two after-tax weighted average cost of capital using the alternative costs of debt (Altman EM Z-score model and Moody's rating).

6. Margin analysis (10 points): Do a margin analysis for Hersheys using the Margin Analysis worksheet in your fm_val2003.xls workbook. This analysis is a prelude to forecasting the cash flows.

7. Free cash flow to the firm, target stock price and sensitivity analysis (40 points): Use the worksheet labeled "7. Justified Price & Sensitivity" to calculate the FCFF, the value of the firm, and the target stock price for Hershey. The worksheet assumes that stable/normal growth occurs in year 5.[3] In calculating the terminal value (enterprise value) at the beginning of year 5, use the TEV/EBIT multiple applied to EBIT(The EBIT that you use is NOT adjusted for imputed interest from Operating Leases) in year 5. How does your target stock price compare to that of Salomon Smith Barney's target price (as of August 6, 2002) of $80 for HSY? Next, do a sensitivity analysis using the data table command in Excel by completing the 2 two-way tables in the worksheet. These sensitivity tables show how the target (justified) price per share for HSY changes with a change in the assumption regarding the growth rate for revenues, the WACC, and the TEV/EBIT multiple. For valuation purposes, we will use the bond rating from Moody's.

8. Economic Value Added (EVA) (5 points): Calculate the economic profit using the book value of equity and the book value of debt. Is Hershey's management adding value to the firm?

Please turn in a hard copy of your solutions together with your disk showing all your spreadsheet calculations. This is an individual project. As such, anyone caught cheating will be given an F on this assignment.

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[2]We should include the PV of Operating Leases. However, this would add to the time required to complete this assignment. If you were doing this in practice, please remember to take the PV of Operating leases into account in calculating your debt to equity ratio.

[3]For Hersheys, they are already in a stable growth phase. As such, years 1 through 4 don't represent a

Valuation Assumptions:

Item	Assumption
TTM or LTM (Trailing twelve months)	Use the last twelve months of data (LTM)/last 4 quarters of data in the 10Q. Remember that only "flow" items are added for the last 4 quarters while only the most current quarter is used for "stock" items.
Expected growth rate in sales per year[4]	2%
Expected growth rate in depreciation and amortization	2%; Use LTM for Depreciation and amortization in year 0
Margin analysis a.k.a. Percentage of Sales	
Cost of goods sold (COGS)/Net sales	55% (per year); This ratio is based on COGs which excludes depreciation and amortization.
Selling, gen. & admin. expense(SGA)/ Net sales	26% (per year)
Marginal tax rate (τ)	39.1%
Capital Expenditures[5]	CapEx/Revenues remains constant at 3.5% over the forecast period. Capital expenditures in year 5 is assumed to be equal to whatever depreciation and amortization is in year 5.
Non-cash Working capital (NWC)	NWC is defined as Non-cash current assets minus non-debt current liabilities. NWC/Net Sales remains constant at 13.5% over the forecast period.
Total Enterprise Value(TEV)/EBIT	17.5x (remains constant)[6]; EBIT is *not* adjusted for imputed interest from PV of Operating Leases
Free Cash Flow to the Firm	FCFF = EBIT(1-τ) + Imputed Interest on Operating Leases + Depreciation – CapEx – Change in Non-cash Working Capital
Market risk premium (R_M-r_F)	5.5%

[4]Analysts at several Wall Street firms expect sales growth to be around 2% (Banc of America 1.81%, Morgan Stanley 1.7%, CFSB 2.75%, and Merrill Lynch 3%). Hershey anticipates that the total U.S. confectionary market will grow at a rate of 2%-3%.

[5]Capital Expenditures are increases (decreases) in property, plant, and equipment. It is found in the statement of cash flows under Cash Flow Provided by Investing Activity.

[6]This is based on a relative valuation analysis of comparable firms.

Valuation Assumptions: (continued)

Item	Assumption
Forecast period	5 years with stable growth starting in Year 5; Actually, for Hershey's, it is already in its stable growth period.
Firm's Bond Rating	Use Moody's bond rating for valuation
Maturity of Long Term Debt	10 years
Market Value of Debt	Assume that the Market Value of Debt = Book Value of Debt[7]; Total debt includes the PV of Operating Leases.
Value of Equity Options (in 000s)	13,989

[7]This isn't the case from an theoretical perspective although many analysts make this assumption.