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Financial Management

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Optimal Capital Structure
(Turning Trash into Cash at Waste Management)

Objective: The objective of this assignment is to further apply the concepts learned regarding the cost of equity, cost of debt, and weighted average cost of capital in deriving the optimal capital structure for a firm.

Company: Waste Management (NYSE: WMI, http://www.wm.com/)

Trash piled higher and deeper is the way that Waste Management likes it. The firm is the premier waste services provider in North America, surpassing its leading rival Allied Waste. The company has approximately 27 million municipal, business, and residential customers in the US, Canada, and Mexico. It has 1,400 collection centers together with 600 landfills and transfer stations.

The company now called Waste Management Inc. was set up in 1998 when Houston-based USA Waste Services Inc. bought Illinois-based Waste Management and adopted its name. The company has recently reorganized its market areas to focus on its core North American operations. To accomplish this objective, the company has sold off its international solid- and hazardous waste management businesses. The firm has also disposed of its noncore North American assets (hazardous waste and power production operations). In addition to this, it has reduced its workforce by 2,000 employees.

A. Maurice Myers, chairman, president and chief executive officer of Waste Management stated that the company is focused on "managing costs, improving operating efficiencies, and delivering shareholder value through the best use of our substantial free cash flow."

In terms of Waste Management's financing strategy, capital needs and contractual obligations are first met from internally generated funds. Historically, they have also, when appropriate, obtained financing from issuing debt and common stock. The firm has a share buyback program which remains on target to achieve $1 billion in repurchases for the year."

On May 20, 2002, Moody's Investor Service revised its outlook for the firm, from negative to stable. It assigned a Ba1 rating (analogous to a BBB+ rating by Standard and Poor's) to Waste Management's $500 million issue of guaranteed senior unsecured notes due 2032.

Competitors: Allied Waste (AW), Casella Waste Systems (CWST), IMCO Recycling (IMR), Synagro Technologies (SYGR), Waste Connections (WCNX), Waste Industries USA (WWIN).

Assumptions:

Item	Assumption
Shares outstanding	See spreadsheet; use latest number given in the 10Q.
Beta	Use 5 years of monthly data (to the extent possible). Regress the return on the appropriate stock against the return on the S&P500. All returns are provided in the worksheet labeled "Returns".
Risk premium (R_M - r_F)	5.5%
Current r_F	Use the current yield on a 10-year Treasury Bond in "Treasury Rates" worksheet.
Bond Spread	See the "Bond Spreads" worksheet for a given rating and maturity. Assume that the bond spread for a C rated bond is 25.56%.
Imputed Bond rating using Altman model	Take the average between 2 Z-scores as the cut-off point. For example since the Z-Score for an AAA = 8.15 and the Z-Score for an AA+ = 7.6, the average is (8.15+7.6)/2 = 7.875. If the calculated Z-score is equal to or above 8.875, then set the imputed rating = AAA. If it is below 7.875 but above 7.6 then set the rating = AA+.
Debt	Assume that the book value of debt represents a good proxy for the market value of debt. For all bond-rating calculations, assume a 10-year maturity. Also assume that existing debt is refinanced at the "new rate" associated with the applicable bond rating.
Marginal tax rate	Use the calculated marginal tax rate for the trailing twelve months unless otherwise noted.
NA	Set NA = 0 in the Financial Statements (Disclosure spreadsheet)

Assignment: Download the Waste Management data from my website and use the downloaded spreadsheet to answer the following questions based on the preceding assumptions. All work should be done on this spreadsheet.

1. Cost of Debt (15 points): Using WMI's 10Q, 10K, and information contained in the "Treasury Rates" and "Bond Spreads" worksheets, please answer the following questions. What is Waste Management's historical implied bond rating using the Altman EM score model? What is WMI's current cost of debt based on the last twelve months (LTM) of available data from the 10Q based on the Altman EM score model and alternatively based on Moody's current bonding rating? Please use the worksheet template labeled "1. Cost of Debt" in answering this question and fill in the portion that is highlighted in yellow.

2. Value of Operating Leases (15 points): Using the appropriate cost of debt based on the Altman model and alternately based on Moody's current bond rating, for each set of rental/lease payments, calculate the present value of the operating leases. In doing the calculations, assume that the cost of debt for the period remains constant over time. Since the year 2002 was not yet finished at the time of this case (the case was completed on September 16, 2002), you will need to discount the lease payments associated with 2002. Do not make any adjustments for the half-year; treat 2002 as a full year for purposes of this assignment. Please use the worksheet template labeled "2. Calc PV of OpLease" in answering this question and fill in the portion that is highlighted in yellow.

3. Capital Structure (10 points): Using the "3. LTM Capital Structure" template in your workbook, calculate the current last twelve months (LTM) capital structure of Waste Management from a book value and alternatively a market value perspective by filling in the appropriate cells that are highlighted in yellow. Does it make a difference whether the WMI's capital structure is based on the Altman model and alternately based on Moody's current bond rating (do you obtain the same results using either method)? In doing your calculations, be sure to examine the role that off-balance sheet financing can have by first excluding it and then including it as part of debt. Does it make a difference whether the present value of operating leases is included in the capital structure? In other words, is off-balance sheet financing an important part of Waste Management's capital structure? Please explain.

4. Imputed Beta (15 points): Using the "4. Calc Imputed Beta" template, together with the information contained in the worksheets labeled "Recent Stock Prices", "Returns", and the corresponding 10Qs on Waste Management's competitors, calculate the built-up beta for WMI. Also calculate Waste Management's historical beta using WMI's returns for the last 60 months (5 years) e.g., from 9/97 through 8/2002. Note: In calculating the debt to equity ratio for competitors, you are not provided with information on operating leases for competitors. As such, please exclude the PV of Operating

leases in your debt to equity ratios for the competitors. However, WMI's debt to equity ratio *should* include the PV of Operating Leases and is in terms of *market value*[1].

5. Cost of Equity (10 points): Using the "5. Current Cost of Equity" template together with the "Treasury Rates" worksheet and your answers from the "4. Calc Imputed Beta" worksheet, calculate Waste Management's LTM cost of equity.

6. Weighted Average Cost of Capital (15 points): Using the "6. WMI WACC" template in addition to your answers to the preceding questions calculate Waste Management's weighted average cost of capital for the last twelve months (LTM) using the imputed bond rating from the Altman model and alternately the current bond rating from Moody's. What impact does recognizing the present value of operating leases (rental payments) as debt have on the book value and market value WACC? Does it matter whether one uses a built-up beta or the historical beta in calculating the various WACCs?

7. Optimal Capital Structure (20 points): Using the "7. Optimal Cap Structure" template, derive what the optimal capital structure (capital structure that results in the lowest WACC) should be for Waste Management. To determine this, please proceed as follows:

a. Step 1: Using the built-up levered beta for WMI that you obtained earlier, calculate the levered beta (β_L) and the corresponding cost of equity for Waste Management at the various debt to total capital ratios (debt/(debt + equity)): 0%, 10%, 20%, …., 70%, and 80%. (*Hint: you first need to unlever the beta and then relever it given the various debt to equity ratios*)

b. Step 2: Calculate the corresponding after-tax cost of debt for Waste Management at the various debt to total capital ratios. Total capital is assumed to remain constant at the LTM level and includes the present value of operating leases calculated using the current bond rating from Moody's. Only the composition of the total capital varies e.g. the portion that is equity and the portion that is debt changes for various D/(D+E) levels. I have provided to you the pre-tax interest coverage at the various Debt/(Debt+Equity) levels. Use the "Ratings (Int Coverage)" worksheet to obtain the implied bond rating corresponding to a particular interest coverage ratio. [2] Notice that the effective tax rate changes as more debt is used because interest is tax deductible.

[1] I did this to reduce the amount of time that you spend on this mini-case. In the real world, you should include the present value of operating leases in

[2] I have provided the interest coverage ratio since a circular reference exists. Essentially, the interest rate depends on the rating and the rating depends on the interest coverage ratio, which in turn depends on the interest rate. If time permits, I will show you how to model this using Excel if time permits.

c. Step 3: Calculate the after-tax weighted average cost of capital at the various debt to total capital ratios. Is Waste Management currently at or near its optimal capital structure? If it isn't at it optimum capital structure, does WMI need to increase or decrease its level of debt? What is the likely debt rating of Waste Management's debt at its optimal capital structure?

Please turn in a hard copy of your work together with your disk. This is an individual assignment. Anyone caught cheating will receive an automatic F on this assignment.