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Financial Management

Free Cash Flow to the Firm (FCFF) 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_val_fall2004.xls. The data is current as of April 16, 2004.

The Company: RadioShack (Ticker: RSH), formerly known as Tandy, is one of the leading US retailers of consumer electronic goods and services through its RadioShack store chain. The Company operates 5,161 stores located throughout the United States, as well as Puerto Rico and the United States Virgin Islands. The Company has 8 manufacturing facilities, 7 of which are in the United States and one in the Asia Pacific region. The firm manufactures a variety of products, primarily sold through its retail outlets, including telephony, antennas, wire and cable products, and a wide variety of "hard to find" parts and accessories for consumer electronics products. The Company competes with consumer electronics retailers such as Circuit City and Best Buy/MusicLand; department and specialty stores such as Sears and The Home Depot; wireless companies such as Sprint and Verizon, and mass merchants such as Wal-Mart and Target.

RadioShack leases rather than owns most of their facilities. Their retail stores comprise the largest portion of their leased facilities. These stores are located primarily in major shopping malls and shopping centers owned by other companies. Some leases are based on a minimum rental plus a percentage of the store's sales in excess of a stipulated base figure. They also lease distribution centers and office space.

In 2001, the firm initiated a restructuring program related primarily to a general reduction of their corporate management and administrative labor force, mainly for early retirement and involuntary and voluntary employee severance, closure of their national commercial installation business, and closure of 35 underperforming RadioShack stores. During the first quarter of 2002, they completed a significant portion of the remaining restructuring program, utilizing the reserves established in 2001.

Goals for year 2004:

In a Conference Call on February 19, 2004, Mr. Len Roberts, RadioShack Chairman and CEO stated that "We anticipate 13 to 15 percent earnings per share growth over 2003, which applies at least $1.99 earnings per share for 2004. This is primarily predicated upon 3 to 4 percent sales growth, 50 to 70 basis points of gross margin improvement, 1.5 to 2.5 percent growth in SG&A, and the stock buyback program (approximately 200 to $250 million worth of our stock in 2004.)

Primary Publicly Traded Competitors: BestBuy (BBY), Circuit City Stores (CC), and Tweeter Home Entertainment Group (TWTR).

Assignment/Tasks: Download the file fm_val_fall2004.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 alternatively using S&P/Fitch's bond rating and Moody's bond rating for RadioShack. Assume that RSH'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 all 3 models? Please explain.

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 2004 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, S&P/Fitch's 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 2004 and onwards (years after 2004). Assume that all operating lease payments are due at the *end* of the year (you are doing the valuation as of April 2004). Note: Do not adjust pro-rata for the 3 months that have already passed.

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 2004) as debt[1]. Next, calculate the total market value of equity. Finally,

[1]At the time that this case was prepared, 4 quarters remained in Year 2004. As such, we use the PV of Operating Leases associated with the Year 2004 as our PV of Operating Leases (LTM) since we assume in this case that operating lease payments are due at the *end* of each year.

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, S&P/Fitch bond rating and also the Moody's bond rating. Are the weights for debt and equity similar under all three approaches?

4. <u>Built-up Beta and Cost of Equity</u> (10 points):

a. Compute the built-up beta as well as the historical beta for RadioShack. To calculate the beta, you can use the SLOPE function in excel. Use the book value of debt (only debt as it appears on the balance sheet) and the market value of equity in calculating the debt-to-equity ratio for the comparable firms. For the ***comparable*** firms, we will **not** 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 RadioShack). Please round your answer to two decimal places. Next, calculate the cost of equity using the built-up beta for RadioShack. Also calculate RadioShack's beta based on its historical returns in relation to the returns on the S&P500. Does using RadioShack's historical beta make sense? Why or why not?

b. Compute the built-up beta for RadioShack using only its nearest competitor, BestBuy. As in part a above, use the book value of debt (only debt as it appears on the balance sheet) and the market value of equity in calculating the debt-to-equity ratio for for BestBuy. For BestBuy, we will **not** include the PV of Operating leases in the total value of their debt. (However, we will include the PV of Operating leases with respect to RadioShack). Please round your answer to two decimal places. Next, calculate the cost of equity using the built-up beta for RadioShack.

5. <u>Cost of equity and weighted average cost of capital</u> (10 points): Calculate the five after-tax weighted average cost of capital using

- Altman EM Z-score model for Cost of Debt and Built-up Beta based on 3 comparables for Cost of Equity
- S&P/Fitch's bond rating for Cost of Debt and Built-up Beta based on 3 comparables for Cost of Equity
- Moody's bond rating for Cost of Debt and Built-up Beta based on 3 comparables for Cost of Equity
- S&P/Fitch's bond rating for Cost of Debt and Built-up Beta based only on BestBuy for Cost of Equity
- Moody's bond rating for Cost of Debt and RSH's Historical Beta for Cost of Equity

[2]Intuition: We are trying to find the unlevered beta. After the unlevered beta or beta with no debt is found, we will then include as debt the On Balance Sheet Debt as well as the PV of Operating Leases in calculating your debt to equity ratio for our subject firm,RadioShack.

6. Margin analysis (10 points): Do a margin analysis for RadioShack using the Margin Analysis worksheet in your fm_val_fall2004.xls workbook. This analysis is a prelude to forecasting the cash flows. For the Peer Group (BBY, CC, TWTR), use the information contained in the respective 10K's for these firms. For the S&P Specialty Retail, use the workbook SP Specialty Retail 10K which I downloaded from Compustat.

7. Free cash flow to the firm, target stock price and sensitivity analysis (40 points):

a. **Value Based on Analyst Expectations**: Use the worksheet labeled "7a. Target Price-Builtup1 (RSH)" to calculate the FCFF, the value of the firm, and the target stock price for RadioShack. The worksheet assumes that stable/normal growth occurs in year 6. In calculating the terminal value (enterprise value) at the beginning of year 6, use the TEV/EBITDA multiple applied to EBITDA (The EBITDA that you use is NOT adjusted for imputed interest from Operating Leases) in year 6. How does your target stock price compare to that of Deutsche Bank's target price of $28 that they issued as of February 20, 2004 (after the conference call with RadioShack)? 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 RSH changes with a change in the assumption regarding the growth rate for revenues, the WACC, and the COGS/Sales multiple. For valuation purposes, the WACC in this scenario should be based on S&P/Fitch's bond rating for the cost of debt and the built-up beta using all 3 comparables for the cost of equity. In the valuation scenario, assume that the firm does NOT repurchase any shares and therefore the number of shares outstanding remains at 162,552 shares (stated in 000s) over the valuation period.

b. **Value Based on Management Expectations**: Use the worksheet labeled "7b. Target Price-BBY(RSH)" to calculate the FCFF, the value of the firm, and the target stock price for RadioShack based on management expectations. In this scenario, assume that management views BestBuy as its closest competitor and therefore in calculating their cost of equity, uses BestBuy (BBY) as the only comparable for the built-up beta. For the cost of debt calculation, management is assumed to use the S&P/Fitch bond rating. In the valuation scenario, assume that the firm does repurchase $250 million worth of shares and therefore the number of shares outstanding is 154,840 shares (stated in 000s) over the valuation period. Please see the last 2 pages of this handout for other assumptions regarding management expectations (these are indicated in parenthesis as management expectations. Note that in some case, management expectations are similar to analysts expectations) How does your target stock price compare to that of Deutsche Bank's target price of $28? Next, do a sensitivity analysis using the data table command in Excel by completing the 2 two-way tables in the worksheet. How does your target stock price compare to the actual price of RSH? Is RSH overvalued, undervalued or correctly priced if BBY is used as the only comparable?

8. Economic Value Added (EVA) (5 points): Calculate the economic profit using the book value of equity and the book value of debt and assuming

a. After-tax WACC is computed using S&P/Fitch's bond rating for cost of debt calculations and using built-up beta (all 3 comparable firms) for cost of equity calculations.

b. Marginal tax rate for last twelve months or trailing twelve months

c. NOPAT = EBIT(1-t) for the last twelve months or trailing twelve months

Is RadioShack'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.

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	Forecast period[3]: 2.5% (Analysts expectations) 4.0% (Management expectations) Stable growth period: 8% (Specialty retail)
Margin analysis or Percentage of Sales	
Cost of goods sold (COGS)/Net sales	Forecast period: 49.5%[4]; Stable growth period: 67.5% This ratio is based on COGs which *excludes* depreciation and amortization.
Selling, gen. & admin. expense(SGA)/ Net sales	Forecast period: 1) We assume that analysts would expect SGA/Sales of 37% based on past margins. 2) Management expects SGA to grow at 1.5% per year[5] over the forecast period. Stable growth pd: 22.5% (Specialty retail)
Depreciation and Amortization/Net sales	Forecast period: 2%; Stable growth period: 2.2% (Specialty retail)
Marginal tax rate (τ)	Forecast period: 37%; Stable growth period: 30%
Capital Expenditures[6]	CapEx Lagged One Year/Revenues = $CapEx_{T-1}/Sales_T$ remains constant at 2.5% over the forecast period and becomes 5% in the stable growth period.
Non-cash Working capital (NWC)	NWC is defined as Accounts Receivables + Inventory – Accounts Payable. NWC/Net Sales remains constant at 14% over the forecast period and declines to 8.3% in the stable growth period.

[3]The forecast period is the period prior to normal or stable growth; stable growth is defined as the period in which the firm reverts to the mean of the industry (in this case specialty retail).
[4]This is based on CEO Roberts statement that he expects a 50 to 70 basis points of gross margin improvement in 2004 over the prior year.
[5]This is based on CEO Roberts statement that he expects a 1.5 to 2.5 percent growth in SG&A in 2004. We use 1.5% assuming that this is the best scenario (optimistic estimate).
[6]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.

Valuation Assumptions: (continued)

Item	Assumption
Total Enterprise Value(TEV)/EBITDA	11.7x (remains constant)[7]; EBITDA is not adjusted for Operating Leases (interest on OpLease isn't added back). This is the multiple of RSH's closest competitor, Best Buy (BBY) obtained from yahoo.finance.com on 4/12/2004 This multiple is applied to EBITDA in year 6, stable growth period, to obtain the terminal value of the firm in year 5.
Free Cash Flow to the Firm	FCFF = EBIT(1-τ) + Imputed Interest on Operating Leases + Depreciation – CapEx – Change in Non-cash Working Capital
PV of Operating Lease	In calculating the number of years in the annuity as part of your PV of Operating lease calculations, please round to the nearest whole number. For example, if the number of years is 5.7 then the number of years remaining on the operating lease is 6 years.
Market risk premium (R_M-r_F)	5.5%
Forecast period	5 years; Year 2003 is time 0 (current period). Stable growth (when growth reverts to the mean of the specialty retail industry) begins in year 2009.
Firm's Bond Rating	S&P/Fitch: A3/A- Moody's: Baa1 (equivalent to BBB+)
Maturity of Long Term Debt	10 years
Market Value of Debt	Assume that the Market Value of Debt = Book Value of Debt[8]; Total debt includes the PV of Operating Leases.
Value of Equity Options (in 000s)	15,540; This is based on information contained in RSH's 2004 Proxy Statement.
Shares Outstanding (stated in 000s)	162,552 shares if firm does NOT repurchase any shares; if the firm DOES repurchase $250 million worth of stock then the number of shares outstanding is 154,840 shares[9].

[7]This is based on a relative valuation analysis of comparable firms.
[8]This isn't the case from a theoretical perspective although many analysts make this assumption.
[9]This is based on CEO Roberts statement that he expects to continue the firm's stock buyback program of approximately 200 to $250 million worth of RSH stock in 2004. Based on RSH's stock price of $32.42 on 3/26/2004, this translates into 154,840 ($250 million/32.42) shares (stated in 000s).