

## Optimal Capital Structure (What Type of Bucks in Starbucks?)

**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:** Starbucks (Nasdaq: SBUX, <http://www.starbucks.com/>)

Starbucks Coffee opened for business in the Pike Place Market in April of 1971 to provide high-quality coffee, dark-roasted in small batches, the European way. The Seattle based company was formed by three coffee lovers - Writer Jerry Baldwin, English teacher Gordon Bowker, and history teacher Zev Siegl, each of whom contributed \$1,350 and borrowed another \$5,000 to open a store that sold coffee beans which they ordered from Peet's Coffee and Tea in Berkeley. Since they wanted to use a nautical theme, they named their coffee bar after the first mate in *Moby Dick*<sup>1</sup>. Howard Schultz, Starbucks current CEO, joined the company in 1982 and then purchased the company in 1987 for \$4 million.



Starbucks is the US's #1 gourmet coffee purveyor with nearly 4,600 locations in the US and about 20 other countries. Starbucks' strategy is to establish its name everywhere. Near term, the company is focusing on Europe, where it plans to enter at least six new countries and open an additional 650 stores by 2004. In addition, it is planning to take its Japan unit public in that country.

For the fiscal year ended October 1, 2000, company-operated retail stores accounted for approximately 84% of net revenues with specialty revenues (which include royalties and fees from licensees as well as product sales) accounting for the remainder of company revenues. In terms of its retail sales mix by product type, approximately 73% is due to handcrafted beverages, 14% to food items, 8% to whole bean coffees, and 5% to coffee-making equipment and accessories.

The Company has two 50-50 joint ventures that generate specialty revenues. The North American Coffee Partnership, is a joint venture with Pepsi, to develop and distribute ready-to-drink coffee-based products such as its Frappuccino coffee drink. The Company also has a joint venture with Dreyer's Grand Ice Cream to develop and distribute Starbucks premium coffee ice creams.

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<sup>1</sup>Howard Shultz, *Pour Your Heart Into It: How Starbucks Built a Company One Cup at a Time*, (New York: Hyperion, 1997), 28-35.

**Competitors:** AFC Enterprises (AFCE), Diedrich Coffee (DDRX), Farmer Brothers (FARM), Green Mountain Coffee (GMCI), New World Coffee (NWC), Panera Bread (PNRA), Peet's Coffee (PEET), Tully's Coffee Corporation (Private).

**Assumptions:**

Item	Assumption
Shares outstanding	See spreadsheet; use latest number given. Shares outstanding should be adjusted for splits since the stock price is adjusted for splits.
Beta	Use 5 years of monthly data. Regress the return on the appropriate stock against the return on the S&P500. All returns are provided in the worksheet labeled "Returns" and "Historical SBUX returns."
Risk premium ( $R_M - r_F$ )	5.5%
Current $r_F$	Use the current yield on a 10-year Treasury Bond in spreadsheet
Bond Spread	See spreadsheet under Bond Spreads for given rating and maturity. Assume that the bond spread for a C rated bond is 14%.
Bond rating	If the bond rating is between two ratings e.g., AAA and AA, use the average of the two spreads.
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.
NA	Set $NA = 0$ in the Financial Statements (Disclosure spreadsheet)

**Assignment:** Download the Starbucks 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. Historical Cost of Debt ( points): What is Starbucks historical pre-tax and after-tax cost of debt using the Altman EM score model in each period from 1995 through 2000? What is Starbucks current cost of debt based on the last twelve months (LTM) of available data from the 10Q? Information on historical bond yields, current bond spreads, and treasury rates are in various worksheets in your workbook.

2. Historical Value of Operating Leases ( points): Using the appropriate cost of debt for each set of rental/lease payments, calculate the present value of the operating leases for the period from 1995 through 2001. In doing the calculations, assume that the cost of debt for the period remains constant over time. For example, in calculating the present value of operating leases for 1995 (T), assume that

- whatever your cost of debt is remains stationary over time
- the operating lease in the current period (T=1995) is already paid at the beginning of the period. As such, cash outflows begin in year T+1 (1996)

Example: Suppose that you have the following operating lease

Year	0	1	2	3	4
Rent	350	325	300	275	250

If the pre-tax cost of debt is 6% at time 0 and 7% at time 1, then the present value of the operating lease at year 0 is \$1002.52 ( $325 \cdot 1.06^{-1} + 300 \cdot 1.06^{-2} + 275 \cdot 1.06^{-3} + 250 \cdot 1.06^{-4}$ ). The PV of the operating lease in year 1 is 724.64 ( $300 \cdot 1.07^{-1} + 275 \cdot 1.07^{-2} + 250 \cdot 1.07^{-3}$ ).

3. Historical Capital Structure ( points): Using the Historical Capital Structure template in your workbook, calculate the capital structure of Starbucks from 1995 to the present from a book value and alternatively a market value perspective. 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. What common theme exists with respect to SBUX's capital structure over time regardless of whether it is measured from a book or market value perspective and whether it includes or excludes operating leases? 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 Starbucks capital structure? Please explain.

4. Imputed Beta ( points): Using the Imputed Beta template, the corresponding 10Qs, monthly returns, and current stock prices on Starbucks competitors in your workbook, calculate the built-up beta for Starbucks. Also calculate Starbucks current beta using SBUX's returns for the last 60 months (5 years) e.g., from 9/96 through 8/2001. 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, SBUX's debt to equity ratio *does* include the PV of Operating Leases and is in terms of *market value*<sup>2</sup>.

5. Historical Cost of Equity ( points): Using the Historical Cost of Equity template in your workbook together with the worksheets labeled "Historical Bond Yields" and "Historical SBUX Returns", calculate the cost of equity each year for Starbucks from 1997 until the present. Use the appropriate 60 months of return data in calculating the beta for Starbucks. For example, to obtain the SBUX beta as of 9/28/97, regress the return on Starbucks from 10/92 until 9/97 against returns on the S&P500 over the same time period.

6. Historical Weighted Average Cost of Capital ( points): Using the Historical SBUX WACC template in addition to your results from the Historical Capital Structure, Historical Cost of Equity, Historical Cost of Debt templates, calculate the weighted average cost of capital from a book value and market value perspective for each year, from 1997 until the present. 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?

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

a. Step 1: Calculate the levered beta ( $\beta_L$ ) based on SBUX's historical beta for the last 60 months and the corresponding cost of equity for Starbucks 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 Starbucks at the same debt to total capital ratios.<sup>3</sup> Total capital is assumed to remain constant at the LTM levels. 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.

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

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<sup>2</sup>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

<sup>3</sup>I have given you the synthetic bond rating 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.