

Optimal Capital Structure (Is Kellogg's Still G-R-E-A-T??)

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: Kellogg (Ticker: K, <http://www.kelloggs.com/us/>) is the world's leading producer of cereal and a leading producer of convenience foods, including cookies, crackers, toaster pastries, cereal bars, frozen waffles and meat alternatives¹. Given the trend towards on-the-go consumers, Kellogg has shifted its strategy towards relying increasingly on snacks and convenience foods such as Eggo waffles, Nutri-Grain cereal bars, and Pop-Tarts. As part of this strategy, it purchased cookie and cracker giant Keebler Foods. Another part of the firm's strategy has been to progressively shift away from price discounting toward higher-margin products such as Special K cereals with fruit, and snacks such as Nutri-Grain cereal bars with a variety of fillings. The company's products are manufactured in 17 countries and distributed in 180 countries.



On February 11, 2004, Moodys affirmed Kellogg's Baa2 ratings and changed their outlook on the company from stable to positive. Kellogg's current corporate credit rating from Standard & Poor's Ratings Services is a BBB.

On April 22, 2004 (two days prior to the writing of this case), Kellogg said first-quarter earnings rose by 34 percent, lifted by robust sales and favorable foreign exchange beating Wall Street's average forecast by a penny. Kellogg also reiterated its earnings per share outlook of \$2.07 to \$2.11 for 2004 and announced that this range now includes a higher estimate for up-front costs and write-offs related to capacity rationalizations and cost-reduction initiatives².

Looking towards the future, Kellogg's operating performance will depend in part on the impact of the dynamics of consumer carb-consciousness, concern over trans-fats in cookies, increased competitive activity within biscuits, and higher commodity costs which present significant challenges to the US packaged food industry in general. Additional challenges include underwhelming volume and sales growth rates, and the continued trend toward eating away from home.

Publicly Traded Competitors: General Mills (GIS), Kraft (KFT), and RalCorp (RAH). Other competitors include Malt-O-Meal (Private).

¹ The Company's brands include Kellogg's, Keebler, Pop-Tarts, Eggo, Cheez-It, Nutri-Grain, Rice Krispies, Murray, Austin, Morningstar Farms, Famous Amos, Carr's, Plantation, Ready Crust, and Kashi.

² Whereas these costs and write-offs were previously projected to be \$0.05 per share, they are now expected to amount to \$0.10 to \$0.12 per share.

Assumptions:

Item	Assumption
Shares outstanding	See spreadsheet; use latest number given in the 10Q or 10K.
Beta	Use 5 years of monthly data (some comparables may have less than 5 years so use what data exists for these companies). Regress the return on the appropriate stock against the return on the S&P500. All returns are provided in the worksheet labeled "Returns". In re-leveraging Kellogg's beta, be sure to include the PV of Operating Leases as part of total debt.
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 CC rated bond is 200 basis points (bps) over that of a CCC rated bond, and a C rated bond is 400 bps over a CCC rated bond.
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.
PV of Operating Leases	To obtain the number of years remaining on the operating lease, divide the Thereafter number labeled "2009 and beyond" by the Operating Lease for Year 2008. Please round to the nearest whole number. For example, if $\text{Thereafter Rents}_T \div \text{Operating Lease}_{T-1} = 1.9$ then the number of year remaining is 2 years.
Marginal tax rate	Use the calculated marginal tax rate for the trailing twelve months.
NA	Set NA = 0 in the Financial Statements (Disclosure spreadsheet)

Assignment: Download the Kellogg 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 (10 points): Using Kellogg's 10Q, 10K, and information contained in the "Treasury Rates" and "Bond Spreads" worksheets, please answer the following questions. What is Kellogg's historical implied bond rating using the Altman EM score model? What is Kellogg'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 Standard and Poor's (S&P'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 S&P'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 2004 was not yet finished at the time of this case (the case was completed on April 26, 2004), you will need to discount the lease payments associated with 2004. Do not make any adjustments for the half-year; we will assume that lease payments are paid at the end of the year. 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 Kellogg 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 Kellogg's capital structure is based on the Altman model and alternately based on S&P'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 Kellogg's capital structure? Please explain.

4. Imputed Beta and Cost of Equity (20 points): Using the "4. Cost of Equity" template, together with the information contained in the worksheets labeled "Recent Stock Prices", "Returns", and the corresponding 10Qs on Kellogg's competitors, calculate the built-up beta for Kellogg. Also calculate Kellogg's historical beta using its returns for the last 60 months (5 years). Note: In calculating the debt to equity ratio for competitors, you do NOT include and are also not provided with information on operating leases for competitors. Point: We exclude the PV of Operating leases in your debt to equity ratios for the competitors since our goal is to obtain an unlevered beta (a beta that has No debt). However, Kellogg's debt to equity ratio *should* include the PV of Operating

Leases and is in terms of *market value*. After calculating Kellogg's built-up beta, calculate its LTM cost of equity using the "Treasury Rates" worksheet.

5. Weighted Average Cost of Capital (10 points): Using the "5. WACC" template in addition to your answers to the preceding questions calculate Kellogg'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 S&P.. 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?

6. Optimal Capital Structure (30 points): Using the "6. Optimal Cap Structure" template, derive what the optimal capital structure (capital structure that results in the lowest WACC) should be for Kellogg. To determine this, please proceed as follows:

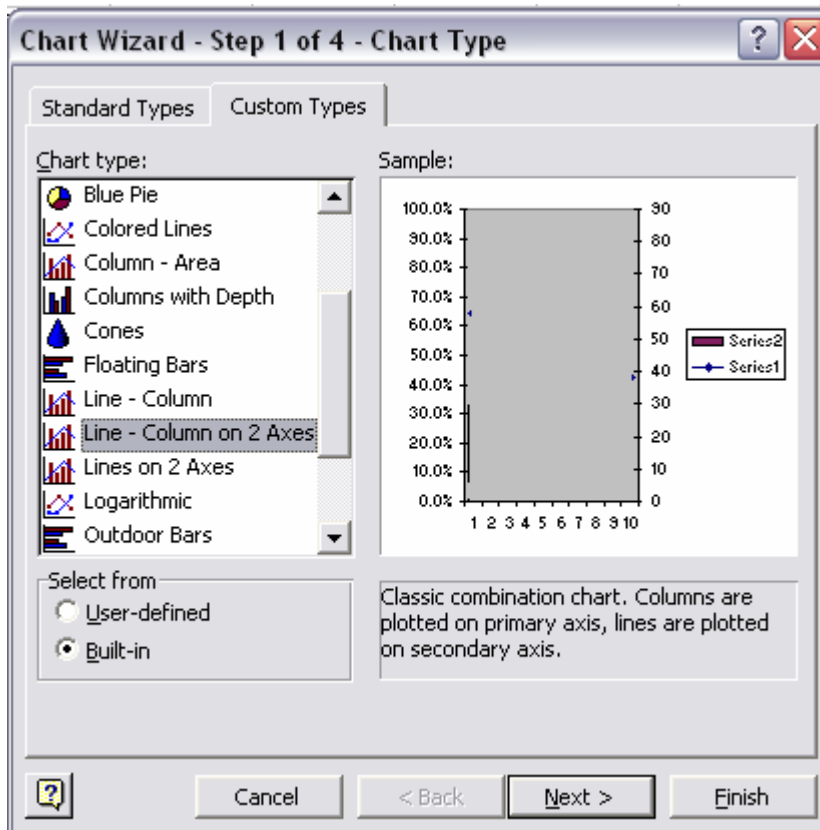
a. Step 1: Using the built-up levered beta for Kellogg that you obtained earlier, calculate the levered beta (β_L) and the corresponding cost of equity for Kellogg at the various debt to total capital ratios (debt/(debt + equity)): 0%, 10%, 20%, ..., 70%, and 80%. (*Hint: you first need to unlever the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

b. Step 2: Calculate the corresponding after-tax cost of debt for Kellogg 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 S&P. 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.³ Notice that the effective tax rate changes as more debt is used because interest is tax deductible.

c. Step 3: Calculate the after-tax weighted average cost of capital at the various debt to total capital ratios. Is Kellogg currently at or near its optimal capital structure? If it isn't at it optimum capital structure, does Kellogg need to increase or decrease its level of debt? What is the likely debt rating of Kellogg's debt (based on the interest coverage ratio imputed bond rating method) at its optimal capital structure?

³I 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.

7. Capital Structure and Price per Share (5 points): Using the “7. CapStruc vs. Price Data” template, graph the yearly relationship between Kellogg’s debt to total capital structure (book value) and the end of year (as of December of each year) stock price for Kellogg using a Line-Column on 2 Axes graph option in Excel.



Discuss how the capital structure is related to the price of Kellogg’s stock. Does the graph tend to support your results in question 6 regarding Kellogg’s optimal capital structure (if it were stated in terms of book value)?

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.