

Variety to calculate cost of equity

Countries



There are a variety of ways to calculate cost of equity, for instance using Capital Asset Pricing Model (CAPM), Dividend Discount Model, Earnings Capitalization ratio, Fama-French Model (FFM), the Pastor-Stambaugh Model (PSM), macroeconomic multifactor models and many others. In general, we do agree that Joanna's approach of using CAPM to compute the cost of equity is appropriate. However, the approach of using only method to compute cost of equity might be biased or subject to modelling risks especially if the underlying assumptions turn out to be invalid.

Accordingly, the cost of equity should be checked against other cost of equity computational methods and a simple average of the methods may be more desirable to eliminate the inherent risks and limitations (which will be discussed later) of adopting solely the CAPM model. Moreover, the accuracy of the CAPM model is highly dependent on obtaining a suitable risk-free rate, firm's beta and market risk premium. The risk-free rate is the assumed interest rate that can be attained by investing in financial instruments with no default risk.

Presently, US Treasuries are deemed as a common choice for US Dollars investments because the likelihood of the government defaulting is extremely low. Hence, we can accept Joanna's use of 20 year U. S Treasury yields as the risk-free rate as Nike is an established multi-national company which should not have any going concern issue. Beta of a stock describes the relation of the stock's return with that of the financial market as a whole. A critique on Joanna's computation obtaining the beta is the simple averaging of Nike Inc's yearly beta from 1996 to 2000.

We notice that Nike Inc's beta has been declining consistently from 0.98 in 1996 to 0.83 in 2000 (Clarence, you can decide whether to put it here or at Steven's part). In this respect, a simple average of the beta over the years is not appropriate without exact knowledge and understanding of the underlying reasons leading to the consistently-declining beta. The correct approach would be to perform a regression of Nike's returns against the benchmark (or S; P 500 returns) over the 5 year period.

In addition, the Joanna's beta computation did not include a beta drift. Studies have shown that beta has the tendency to converge to 1 over time. Equity risk premium is the excess return above the risk-free rate that investors require for holding equity securities. Joanna used the historical estimate of the risk premium for the period 1926 - 1999. The strength of using the historical estimates is its objectivity and simplicity. Furthermore, if investors are rational, then historical estimates will be unbiased.

As the market premium appears to be countercyclical, that is, it is low during good times and high during bad times, choosing the long sample period from 1926 - 1999 is appropriate so as to reduce the effects on market return from the various stages in the business cycle. Nonetheless, we do not agree that Joanna's selection of geometric mean of the equity risk premium is suitable. Using the geometric mean assumes that the equity risk premium will be the same for each and every future time period which we know is not the case.

There is considerable volatility in the year-by-year calculation of the equity risk premium and at times, the equity risk premium is even negative. The arithmetic average acknowledges the fact that the market returns vary over

time and are preferred when estimating next period returns since they reproduce the proper probabilities and means of expected returns². c. Cost of debt Joanna used cost of debt of 4.3%, which she estimated using total interest expense for the year 2001 and dividing it by the company's average debt balance between 2000 and 2001.

This approximation is inaccurate as the interest expense line may have included expenses not directly related to the company's debt. For example, it may include interest expense recognized under GAAP which may not truly reflect the interest amount to be paid if the firm were to borrow money, such as interest expense on pension fund. A more accurate indication of the Nike's cost of debt is the current market yield of Nike's publicly traded debt. This is up to date as it is based on latest trade figures and shows the current return investors ask for lending money to Nike. Exhibit 4 shows the following data on Nike's publicly traded debt:

Coupon 6.75% paid semi-annually Issued 07/15/1996 Maturity 07/15/2021 (20 years left from 2001) Current price \$95.60 Using Excel with the following inputs: $nper = 40$, $pmt = \$6.75/2$, $pv = -\$95.60$, $fv = \$100$. The annual yield of the bond, cost of debt, $kd = 3.584\% \times 2 = 7.167\%$ As such, cost of debt to be used should be 7.167% instead of 4.3%. This is higher than the 20-year Treasury yield of 5.74%, reflecting the risk premium that the market attaches to Nike's debt.

Joanna also noted that her estimated cost of debt of 4.3% is lower than the 20-year Treasury yields of 5.74% because part of Nike's funding is raised through Japanese yen notes with rates between 2.0% to 4.3%. This

justification on Nike's cost of debt is incorrect because firstly, while part of the debt is raised in a lower-yielding foreign market, the other part is raised in the US market with much higher interest rates.

As such it is prudent to be conservative and use the US debt yield. Secondly, if Joanna decides to adopt the foreign market rate, a number of adjustments should be made to the rate to take into account risk premiums for market risks, currency risks, as well as geopolitical risks.

In calculating the cost of debt Joanna has used a tax rate of 38% (35% statutory tax rate + 3% state tax). The statutory tax rate has been consistent at 35%, while the state tax ranged between 2.5% and 3.5%. In the absence of more details which can help us to determine the right marginal state tax rate to use, we agree with Joanna's approach in taking the mid-point at 3%, which results in the combined tax rate of 38%.

Relative Valuation: Relative Valuation method can be engaged in conjunct with DCF valuation to derive the intrinsic value of the company. Either a simple relative valuation using mean or median of the industry price multiples or an industry wide sectional regression analysis can be used for this method.

References

1. Brigham, Eugene F. and Joel F. Houston, Fundamentals of Financial Management, 11th Edition, Thomson, 2007. 2. Jonathan Berk and Peter DeMarzo, Corporate Finance, 1st Edition, Pearson, 2007. 3. Damodaran, Aswath, Investment Valuation: Tools and Techniques for Determining the Value of Any Asset, 2nd edition, John Wiley & Sons, 2002.

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