Business 3019

Assignment 1

Suggested Answers

(a) Why is it important to estimate a firm's cost of capital? Is the Weighted Average Cost of Capital (WACC) set by investors or managers?

Answer: A firm's cost of capital determines the rate of return it must achieve on its investments in order to justify its earnings retention. The WACC is set by investors since the weights and returns used in its calculation are determined by the market.

(b) Do you agree with Diana Springer's WACC calculation? Why or why not?

Answer: There are some mistakes in Diana's calculations:

- She uses book values to determine the equity and debt weights.
- To calculate the cost of debt, she does not use the yield to maturity of ABC's bonds, which is the actual return set by the market.
- One could argue that her choice of the average Beta is also inappropriate since this average is not necessarily forward looking.
- One could also argue that a risk premium of 5.9% is not forward looking.

(c) Calculate ABC's *cost of equity capital* using (i) the CAPM and (ii) the dividend growth model (try different growth rates: self calculated, published source, sustainable growth rate, etc.). Do you know any other method that can be used to calculate the cost of equity capital? What are the advantages and disavantages of each method?

Answer: When using the CAPM, we have to justify the values that are used for the risk-free rate (r_f), the equity risk premium ($r_m - r_f$) and the stock's risk factor (β). For example, one could have chosen

- $r_f = 5.39\%$, the current yield on the U.S. 10-year bonds, since 10 years is the investment horizon being considered. The survey shows that long-term bonds are often used as the risk-free rate in the CAPM. Note that $r_f = 5.74\%$ could also be used, here. The difference between the 10-year yield and the 20-year yield won't affect significantly affect the WACC calculation.
- $r_m - r_f = 5.9\%$, where the geometric average is preferred over the arithmetic average as it takes compounding into account. Note that a lower risk premium could be used since historical values is not necessarily what investors have in mind when buying stocks.
- $\beta = 0.69$, the latest value of ABC's Beta. One could argue that this Beta is a better estimate of the forward-looking Beta, being the most recent one. Note that the average Beta excluding the "outliers" 0.98 and 0.63 could also be used.

This gives us

$$k_e^{\text{CAPM}} \;=\; r_f \;+\; \beta(r_m - r_f) \;=\; 5.39 \;+\; .69 \times 5.9 \;=\; 9.46\% \;.$$

On the other hand, the dividend growth model (DDM) gives us

$$k_e^{\text{DDM}} \;=\; \frac{(1+g)D_0}{P_0} \;+\; g,$$

where P_0 is the current stock price, D_0 is the last dividend paid, and g is the growth rate in dividends. Using $D_0 = \$0.48$, $P_0 = \$42.09$ and $g = 5.5\%$, we find

$$k_e^{\text{DDM}} \;=\; \frac{1.055 \times 0.48}{42.09} \;+\; 0.055 \;=\; 6.7\%.$$

Note that there is a significant difference between the CAPM estimate and and the DDM estimate. Moreover, the DDM yields a cost of capital that is lower than ABC's bond yield (7.17%), which is not realistic. The DDM could be dropped for that reason.

Also, is \$0.48 growing at the rate of 5.5% a reasonable estimate of the stream of future dividends? looking at Exhibit 1, one could argue that ABC's future growth rate may be hard to assess given the volatility in its revenue and earnings growth. Nevertheless, one may take an average of the CAPM and DDM estimates but then what is the weight on each estimate? Why 50-50? In the present example, I'll be using the CAPM estimate only.

(d) Calculate your own WACC for ABC and be ready to justify your assumptions.

Answer: The WACC is calculated as

$$\text{WACC} \;=\; (1-t)W_d k_d \;+\; W_e k_e,$$

where t is ABC's marginal tax rate, W_d is the weight of debt in the firm's market value, k_d is the cost of issuing debt, W_e is the weight of equity in the firm's market value and k_e is ABC's cost of capital. Using \$1,296.6 for the market value of debt and \$42.09 $\times$ 271.5 for the market value of equity, we find $W_d = 10.2\%$ and $W_e = 89.9\%$. The tax rate 38/and the yield that I have calculated on ABC's bonds is 7.17%. ABC's WACC is therefore

$$\text{WACC} \;=\; 7.17\% \times (1-.38) \times 10.2\% \;+\; 9.46\% \times 89.8 \;=\; 8.95\%.$$

(e) Using your WACC and ABC's forecasted cash flows, what is your recommendation regarding an investment in ABC?

Answer: Discounting the cash flows in Exhibit 2 at the rate 8.95% gives us a value of \$39.21 per share, which is below ABC's actual stock price.

(f) Using the cost of equity capital that you obtained with the CAPM, calculate the value of ABC's stock using the dividend growth model. What is then your recommendation regarding an investment in ABC?