
Question 2: Corporate Finance**(40 points)**

a)

Accounts payable:

The implicit financing cost involved in settling the purchasing price for raw materials, etc. after a certain period of time has elapsed is presumably already included in the cost of sales since it is added to the purchasing price. Conceptually, therefore, it would be possible to include accounts payable in invested capital and at the same time estimate the implicit financing cost included in the purchasing price. However, little would be gained by doing this in comparison to the complexity of the calculations involved. It is therefore more practical not to include accounts payable in invested capital when estimating WACC.

Deferred tax:

Deferred tax represents the discrepancy in the timing of "corporate income taxes" in financial accounting with "payment of tax liabilities" in tax accounting. Until taxes are actually paid to the central or local government, the funds still belong to the shareholders and can earn money for them. In that sense, deferred taxes are "quasi-equity" in economic terms. However, this value should already be reflected as a component of the share price, so there is no need to consider deferred tax as a separate item from invested capital when estimating WACC, which is concerned with the prevailing market value of shareholders' equity.

b)

ABC's market-value capital structure is:

| | Amount (\$1 million) | Percentage |
|---------------------------------|-------------------------|------------|
| Short-term debt (@ 6.00%) | 250 | 8.24% |
| Long-term debt (@ 8.10%) | $800 \times 0.98 = 784$ | 25.84% |
| Shareholders' equity (@ 12.20%) | $50 \times 40 = 2'000$ | 65.92% |
| Total | 3'034 | 100.00% |

The cost of ABC's shareholders' equity is estimated from CAPM as:

$$E(R_{ABC}) = R_F + \beta_{ABC} \cdot [E(R_M) - R_F] = 5\% + 1.20 \cdot 6\% = 12.20\%$$

Therefore:

$$WACC = 6\% \cdot (1 - 0.4) \cdot \frac{250}{3,034} + 8.1\% \cdot (1 - 0.4) \cdot \frac{784}{3,034} + 12.2\% \cdot \frac{2,000}{3,034} = 9.59\%$$

c)

Calculations of the after-tax WACC already take account of the corporate tax shield benefits from deductions of interest expense. If the benefits from interest deductions were included in cash flow calculations too, they would be counted twice. ABC avoids this.

d)

Conclusion: do not agree.

Reasons:

- 1) Generally for an investment project to be adopted it must generate greater returns than the rate of return (cost of capital) demanded by the providers of funds (shareholders and creditors) from investment opportunities with equivalent risk. This project would increase capacity in mainline businesses, so its risk profile should be similar to the average risk profile of ABC as a whole. It is therefore more reasonable to apply the company-wide WACC as the discount rate because it reflects the capital structure for ABC as a whole.
- 2) The method by which investment funds are raised for a project has no direct bearing on the project's discount rate. The project itself does not bring ABC any increase in debt capacity. In addition, it does not have any impact on the target debt ratio.

e)

e1)

$$\text{Asset beta} = \frac{\text{Equity beta}}{\left[1 + (1 - \text{Corporate tax}) \cdot \frac{\text{debt}}{\text{Shareholders' equity}} \right]} = \frac{1.2}{\left[1 + (1 - 0.4) \cdot \frac{(250 + 784)}{2,000} \right]} = 0.92$$

e2)

$$(\Delta \text{ corporate value}) = (\text{Corporate tax rate}) \cdot (\Delta \text{ in debt}) = 0.4 \cdot 300 = 120 \text{ million}$$

e3)

If there is no signaling effect, share purchases do not by themselves impact the share price. All that needs be considered is the tax shelter effect from the increase in debt. Assuming that the interest rate on debt does not change, the 120 million euro increase in firm value from the tax benefits of debt will translate directly and fully into an increase in the market value of shareholders' equity. Therefore, the equity beta will be after change in capital structure:

$$\begin{aligned} &= \text{Asset beta} \cdot \left[1 + (1 - \text{Corporate tax rate}) \cdot \frac{\text{Debt}}{\text{Shareholders' equity}} \right] \\ &= 0.92 \cdot \left[1 + (1 - 0.4) \cdot \frac{250 + (784 + 300)}{(2,000 - 300 + 120)} \right] = 1.32 \end{aligned}$$

This results in the following estimation for cost of shareholders' equity:

$$\text{Cost of shareholders' equity after change in capital structure} = 5\% + 1.32 \cdot 6\% = 12.92\%$$

One can compute the reduction of the WACC by first computing the WACC after the change in capital structure as follows:

$$6\% \cdot 0.6 \cdot \frac{250}{3,034 + 120} + 8.1\% \cdot 0.6 \cdot \frac{784 + 300}{3,034 + 120} + 12.92\% \cdot \frac{2,000 - 300 + 120}{3,034 + 120} = 9.41\%$$

The difference in the WACC before and after the change in capital structure is therefore:
 $9.59\% - 9.41 = 0.18\%$. The WACC will decline by an estimated 0.18 percentage point.