

Corporate Finance

Project 1 Solution

PROJECT 1 SOLUTION

Preliminary draft report to Eleanor

Subject: Finance issues related to Bio-Fuel Generation Inc. (BFG).

This report discusses the multiple issues raised in your email.

1.

To determine the current price per share, we first need to calculate the current cost of equity.

Using the CAPM formula:

$$r_e = r_f + \beta(r_m - r_f) = 3\% + 1.9(5\%) = 12.5\%$$

To determine the price per share, the future dividends are forecast and then present valued back to today as follows:

Based on the DDM, the current price is given by the following formula:

$$P_0 = \frac{D_1}{(1+r_e)} + \frac{D_2}{(1+r_e)^2} + \frac{D_3}{(1+r_e)^3} + \frac{P_3}{(1+r_e)^3}$$

The current price is the sum of the present values of each dividend over the first three years, plus the present value of the expected price at the end of Year 3, P_3 .

The following information has been provided:

$$D_1 = \$0.75$$

$$D_2 = \$0.75 \times 1.08 = \$0.810$$

$$D_3 = \$0.81 \times 1.06 = \$0.859$$

$$g = 3\%$$

$$r_e = 12.5\%$$

Based on the constant-growth DDM, the price at the end of Year 3 can be determined as:

$$P_3 = D_4 / (r_e - g) = \$0.859 \times 1.03 / (0.125 - 0.03) = 0.885 / 0.095 = \$9.32$$

The current price of BFG's common shares is \$8.46.

$$P_0 = \$0.75/(1.125) + \$0.81/(1.125)^2 + \$0.859/(1.125)^3 + \$9.32/(1.125)^3$$

$$P_0 = \$0.667 + \$0.64 + \$0.603 + \$6.546 = \$8.46$$

Source: Topics 2.4-1 and 2.4-2

2.

Current WACC:

Determine the market value of the long-term debt as at December 31, 20X2.

$$\text{PMT} = \$1,658,560 \times 9\% = \$149,270.40$$

$$I/Y = 7.5\%$$

$$\text{FV} = \$1,658,560^*$$

$$N = 7 \text{ years (20X3 to 20X9)}$$

$$\text{CPT PV} = \$1,790,331$$

$$R_d = 7.5\%; \text{ after-tax cost of debt} = 7.5\% (1 - 0.25) = 5.625\%$$

* Note: Clearly, this is the face value of the bond because the amount did not change for 20X1 to 20X2. In addition, the amount of the payment as calculated above is equal to the amount of interest showing on the income statement for 20X2 and 20X1.

$$\text{Market value of equity} = 400,000 \text{ common shares} \times \$8.46 = \$3,384,000$$

Calculation of current WACC:

	Market value	Weighting	Cost after tax	Weighted cost
Debt	\$1,790,331	0.3460	5.625%	0.0195
Common shares	3,384,000	0.6540	12.5%	0.0818
Total	\$5,174,331	1.0000		0.1013 or 10.13%

The current WACC of BFG is 10.13%.

Source: Topics 2.2-1, 2.4, and 2.5

3.

From an investor's perspective, the cash inflows that an investor receives from owning a common share in BFG consists of dividend returns and capital gains returns, neither of which are guaranteed. The risk associated with an investment in common shares can be divided into three parts:

1. Business risk is the variability of a firm's earnings due to the nature of its industry. For example, in your industry, changes in technology, in the competitive environment, and in fuel commodity prices will impact revenues earned and costs incurred by BFG and therefore its profits and operating cash flows.
2. Operating risk is the volatility of earnings due to the cost structure of the firm. For example, if BFG has a high component of fixed costs, its operating risk will be higher than if it has a higher percentage of costs that are variable. With high fixed costs, the company's revenues must be enough to cover its variable costs and fixed costs just to break even. The higher the fixed costs, the higher the revenues

that must be earned to generate profits. And when fixed costs are high, losses will be higher if revenues are lower than for a company with low amounts of fixed costs.

3. Financial risk is the degree to which financial costs are inflexible for BFG. Inflexible financial costs are those that must be paid in any year and for BFG include the fixed interest on its long-term debt and line of credit. In addition, if the company issues the cumulative preferred shares to Trinity Venture Capitalists (Trinity), the dividends will have to be paid at some time prior to redemption or conversion. In contrast, dividends of common shares are flexible because there is no obligation to pay. In any year, the company has the flexibility to decide how much and when to pay these dividends. Therefore, the volatility of earnings and cash flows is impacted if significant payments are required.

Source: Topic 2.6-2

4.

Trinity — Cumulative preferred shares — The dividends on the preferred shares are only paid when the board declares a dividend and therefore need not be paid annually. However, as these dividends are cumulative, any dividends in arrears must be paid before dividends on common shares can be paid. The annual dividend will be \$120,000 ($\$2,000,000 \times 6\%$). Dividends are not tax deductible, so there will be no tax benefit for these payments. This amount will not show as an expense and therefore will not reduce net income. The amount of the dividend will reduce retained earnings. Therefore, in the year of payment, the cash outflow will be \$120,000.

BFG will be able to redeem these shares any time after 20X9, as long as they have not been converted to common shares. Therefore, the company will have some flexibility on redeeming these shares.

Sherry LePage — Long-term debt — The interest on the debt must be paid annually. This amount is \$140,000 ($\$2,000,000 \times 7\%$). The principal amount of \$2,000,000 must be paid in full in 20 years. All these payments are obligations, and therefore BFG must have sufficient cash on hand to make these payments as they come due.

The interest is tax deductible, and therefore the net after-tax amount will be \$105,000 [$\$140,000 \times (1 - 0.25)$]. The net amount of \$105,000 will reduce net earnings and cash flows.

Source: Topics 1.3-2 and 1.3-3

CPA Way: Assess the Situation

BFG is trying to decide on the type of financing to use to produce fuel from algae. The company is looking to raise \$2,000,000 for capital investment and has two proposals: cumulative preferred shares issued to Trinity and long-term debt issued to Sherry LePage.

CPA Way: Analyze Major Issue(s)

Below, we have analyzed qualitative factors to consider in deciding which source of financing to use.

Preferred shares

- Dividends on the preferred shares take priority over common share dividends. BFG cannot pay a dividend on its common shares unless it has fully satisfied the preferred-share dividend — both current and in arrears.
- As these preferred shares are non-voting, there is no loss of voting ownership on issuance.
- However, if these are converted, Trinity will own 200,000 common shares, giving it 33.33% ($200,000 / 600,000$) ownership of BFG on conversion. This will reduce Eleanor's and Michael's proportionate ownership to 50% ($300,000 / 600,000$) and 16.67% ($100,000 / 600,000$), respectively. Eleanor and Michael, as a block, will still have control (66.67%).
- Currently, the preferred shares have a market value of \$10, and the common shares only have a value of \$8.46, so the probability of being converted is very low. However, if over the next few years, the project is successful and the market price of common shares increases to greater than \$10 per share, Trinity would be motivated to convert.
- Trinity requires two of its members to be represented on the board of directors. Currently, there are three directors. With these two added, Trinity will have 40% ($2/5$) representation. Trinity has also stated that it wants to be involved in the day-to-day operations and in making all decisions. This may be beneficial if its representatives can provide new ideas and insights. However, this could also be problematic, if the representatives have different goals and objectives than the current three directors. Conflicts may arise, making it more difficult to make decisions.
- The preferred shares will increase equity and therefore reduce the long-term debt-to-total-assets ratio. Therefore, issuing the preferred shares will not breach the loan covenant.

Long-term loan

- The loan has a lower after-tax cost compared to the preferred shares.
- However, the interest must be paid annually, and the principal must be repaid at the end of 20 years.
- Sherry is currently a member of the board and therefore is already involved in the company. As a scientist she brings expertise to the board and is very interested and committed to this project.
- If the loan is issued, the long-term debt will increase to \$3,658,560 (\$1,658,560 + \$2,000,000). Total assets will increase to \$5,591,700 (\$3,591,700 + \$2,000,000). As a result, the total long-term debt to total asset ratio will be 0.65 ($\$3,658,560 / \$5,591,700$), which is still below the covenant of 0.70.

CPA Way: Conclude and Advise

The recommendation is to issue the long-term debt to Sherry. The loan option has the lower after-tax cost, although it is an obligation that will have to be paid annually. And although the principal is also an obligation, it is not due for 20 years, which will give the company time to save the required amount of cash.

While the dividends on the preferred shares are at the discretion of the board, they are still cumulative and will have to be paid at some time. In addition, the qualitative factors with respect to the preferred shares are disadvantageous for BFG for two primary reasons: (1) the shares are convertible into common at Trinity's option and if converted would give Trinity 33.33% ownership in the entire company, and (2) Trinity requires that two of its representatives be on the board of directors, which could result in conflicts in making decisions.

Source: Topics 1.3-2, 1.3-3, 1.3-4, and 1.3-5

6.

Sunk costs are costs that a firm incurs before the capital budgeting decision is made and that cannot be recovered if the project is not undertaken. These types of costs are not included in the capital budgeting analysis because they are not incremental to the decision. In other words, the expenditure has already been made and cannot be recovered, irrespective of whether the new project is undertaken. Only incremental future cash flows, those cash flows that change as a result of proceeding with a project, are included in the capital budgeting analysis. For BFG, the costs already incurred for the development of \$150,000 are a sunk cost and will not be included in the analysis.

Opportunity costs are incurred when a new project uses the company's existing resources if those resources have an alternative use or could be sold. For BFG, this is the vacant land. The land could be either used in the project or sold, so it has an

alternative use. Therefore, the lost opportunity cost of selling the land and receiving the net proceeds must be included in the cost of the project.

Source: Topic 3.2

7.

Similarities:

- All the methods look at the future cash flows and the initial investment required. There are assumptions required to forecast the future cash flows related to the project.
- All methods arrive at a conclusion as to whether the project should proceed, based on a standard or benchmark.

Differences:

- The PBP method does not use discounted future cash flows and therefore ignores the time value of money.
- The payback period conclusion to accept or reject a project depends on whether the future cash flows pay back the amount of initial investment within a specified (and arbitrary) period of time (for example, three years). Cash flows beyond the cutoff period (of three years, for example) are ignored.
- The NPV method uses discounted cash flows and accepts a project if the NPV of the future cash flows and the initial investment is positive. A positive result means that the project will increase firm value and shareholders' value by this amount. A negative NPV project is rejected because it will destroy value.
- For the IRR method, a project will be accepted if its percentage return is greater than the required return. Therefore, this method also incorporates the time value of money.
- One significant drawback of the IRR method is that if annual net cash flows change from positive to negative during the forecast period, the final result is not reliable because multiple IRRs can be calculated.

Recommendation

We recommend that the NPV method be used for the algae project's capital budgeting analysis. This method considers the time value of money and will also determine the impact on firm value and shareholders' value if the project is undertaken.

Source: Topic 3.7