

Problem 1

Answer: 4.5

This value is given in the background text: “Sunrise currently pays about 4.5% on their debt, and that rate is not expected to change with the additional purchase of the oven.”

Problem 2

Answer: 7.4

To determine the cost of equity, we need a few values given in the background text. The relevant part is the following:

In researching similar large public bakery and other food manufacturers, she found that firms in her industry with about the same level of risk mostly had stock market betas around 0.80 on average. She also noted that many analysts used a ballpark equity risk premium of 5.5% and a current yield on U.S. treasury bonds (risk-free rate) of about 3%.

Summarizing:

- ▷ the risk-free rate is $r_{RF} = 0.03$;
- ▷ the company's beta is $\beta = 0.8$;
- ▷ the equity premium is $EP = 0.055$.

Recall that the cost of equity R_e can be computed as follows:

$$R_e = r_{RF} + \beta \cdot EP. \quad (1)$$

By substituting the known values into the RHS of the above equation, we get

$$\begin{aligned} R_e &= r_{RF} + \beta \cdot EP \\ &= 0.03 + 0.8 \cdot 0.055 \\ &= 0.074. \end{aligned} \quad (2)$$

Therefore, the cost of equity is 7.4%.

Problem 3

Answer: 6.3375

To answer this question, we need more data found in the background text. Specifically, we need the tax rate. This value is given in the following sentence: “Sunrise has a corporate tax rate of 30%.” Another relevant part of the background text is

Currently, Sunrise maintains a rough capital structure of about 25% debt and 75% equity. (...) Overall, the cash purchase of the oven is not expected to change the capital structure of the Sunrise Corporation.

Next, we summarize the data we'll use to solve this problem. If we denote the value of the assets by A , then we have the following:

- ▷ equity is $E = 0.75A$;
- ▷ debt is $D = 0.25A$;
- ▷ cost of equity is $R_e = 0.074$;
- ▷ cost of debt is $R_d = 0.045$;
- ▷ tax rate is $t = 0.3$.

To continue, recall that the WACC is given by

$$\text{WACC} = \frac{E}{E+D}R_e + \frac{D}{E+D}(1-t)R_d. \quad (3)$$

By substituting the known values into the RHS of this equation, we get

$$\begin{aligned} \text{WACC} &= \frac{E}{E+D}R_e + \frac{D}{E+D}(1-t)R_d \\ &= \frac{0.75A}{0.75A+0.25A}R_e + \frac{0.25A}{0.75A+0.25A}(1-t)R_d \\ &= 0.75R_e + 0.25(1-t)R_d \\ &= 0.75 \cdot 0.074 + 0.25 \cdot (1-0.3) \cdot 0.045 \\ &= 0.75 \cdot 0.074 + 0.25 \cdot 0.7 \cdot 0.045 \\ &= 0.063375. \end{aligned} \quad (4)$$

Therefore, as a percentage, the WACC is 6.3375%.

Problem 4

Answer: 6.3375

To evaluate the feasibility of the oven purchase, we should use the WACC. Then the answer to this question is the same as the previous one.

Problem 5

Answer: 35000

There's nothing to compute. The annual depreciation expense can be found in the income statement we were given. The corresponding value is \$35,000.

Problem 6

Answer: Row A

Once again, there's nothing to compute. The answer corresponds to the last line of the income statement.

Problem 7

Answer: Row B

In this case, the working capital is computed as the difference between the non-cash current assets [Other Current Assets (Inventory/Receivables)] and the current liabilities [Current Liabilities (Payables)]. After calculating the working capital, we can determine its changes by subtracting consecutive values. However, we need to pay special attention to the first and last changes. The background text explains what the first change should be:

Operation of the oven also requires a small initial investment in an inventory of spare parts of \$15,000. (...) The investment in inventory represents an increase in other current assets (inventory) that should be included as a change in working capital requirements for Sunrise Bakery.

In the same paragraph, the value for the last change is also explained:

At the end of the project, Erica expects to recover all of the working capital invested in the project. In other words, she expects a cash flow equal to the amount of Non-Cash Current Assets less Current Liabilities in the last year of the project.

By using the above information, we can construct the following table:

	0	1	2	3	4	5	6
Other Current Assets (Inventory/Receivables)	\$15,000	\$17,025	\$17,175	\$17,325	\$17,475	\$17,475	\$17,475
Current Liabilities (Payables)	\$0	\$2,700	\$2,900	\$3,100	\$3,300	\$3,300	\$3,300
Working Capital	\$15,000	\$14,325	\$14,275	\$14,225	\$14,175	\$14,175	\$14,175
Change in Working Capital	\$15,000	-\$675	-\$50	-\$50	-\$50	\$0	-\$14,175

Notice that the last row is identical to Row B. This is the correct answer.

Problem 8

Answer: 140000

Once again, there's nothing that we need to compute. In this case, the terminal value corresponds to the value of the oven after six years. This amount is given to us in the background text. The relevant part is

After six years, Erica's sales representative expects the oven to be worth about \$140,000, which is just equal to the accounting book value of the oven after six years of accumulated depreciation (...).

Then the answer is clearly \$140,000.

Problem 9

Answer: Row D

First, recall how to calculate the free cash flow. We start from the net income, which is given in the income statement [Profit after tax (Net Income)]. Then we do the following:

- ▷ subtract the increase in working capital;
- ▷ add the depreciation back;
- ▷ subtract the capital expenditure; and
- ▷ add the salvage value.

We already know the changes in working capital. These amounts were computed when we solved Problem 7. We also know the depreciation values. They can be found in the income statement. Moreover, we know that the capital expenditure is non-zero only for period 0. This amount corresponds to the price of the oven, \$350,000. Finally, as discussed in the solution to the previous problem, we have the salvage value: \$140,000. This amount contributes to the free cash flow only in the last period. Therefore, we already have all the data we need to determine the free cash flows. By performing the calculations described above, we get the following result:

0	1	2	3	4	5	6
-\$365,000	\$91,675	\$96,650	\$102,250	\$107,850	\$107,800	\$261,975

Notice that the last row is identical to Row D. This is the correct answer.

Problem 10

Answer: 21.942182380796513

I wrote a Python function to help me compute the IRR. So I'm not going to explain the solution to this problem in a detailed manner. It's possible to show that the IRR is the only positive number x that satisfies the equation

$$14600x^6 + 83933x^5 + 196799x^4 + 235776x^3 + 142550x^2 + 28591x - 16128 = 0. \quad (5)$$

A very close approximation for this root is $x \approx 0.21942182380796513$. As a percentage, this value can be written as 21.942182380796513%. Probably, this level of precision isn't required. However, I'm not sure about the number of decimal places I should include. Then I decided to include as many as I can.

Problem 11

Answer: 236546

Once again, I implemented a Python function to solve the problem. All this function does is to apply the definition of NPV. We know the value of the initial investment, and we've computed the cash flow for each of the six years. We've also determined the discount rate to be used, which is equal to the WACC. So it's really just a matter of substituting values into a formula. By doing so, we obtain a net present value of \$236,546.

Problem 12

Answer: 4

To answer this question, all we need to do is to accumulate the free cash flows until the result becomes greater than or equal to the initial investment. To do so, I wrote a simple Python loop. The value I got is 4. Therefore, it takes 4 years to pay off the investment.

Problem 13

Answer: 27.42857142857143

To determine the return on invested capital, we need two averages. Specifically, we have to know

- ▷ the mean net income, and
- ▷ the mean value of net fixed assets.

In this case, the ROIC corresponds to the ratio of these two averages. Fortunately, they're simple to calculate. It's easy to check that the mean net income is \$67,200. Moreover, it's straightforward to show that the mean value of net fixed assets is \$245,000. By dividing the first average by the second one, we get the following result for the ROIC: 27.42857142857143%. As in Problem 10, since the number of decimal places to keep isn't clear, we answer this question with as much precision as we can get.

Problem 14

Answer: Yes

In Problem 11, we've computed the NPV. As we've seen, this value is positive. This suggests it's a good idea to purchase the oven.