

Question 1 :

1. Discuss the differences between net income and cash flow from operations. Which measure is more relevant to a corporate treasurer and why?
2. Briefly explain the differences between preferred and common stock. Why preferred stock is called a hybrid security.
3. Suppose you own 100 shares of IBM stock which you intend to sell today. Since you will sell it in the secondary market, IBM will receive no direct cash flows as a consequence of your sale. Why, then, should IBM's management care about the price you get for your shares?

Question 2 :

Your younger brother has come to you for advice. He is about to enter university and has two options open to him. His first option is to study engineering. If he does this, his undergraduate degree would cost him \$12,000 a year for four years. Having obtained this, he would need to gain two years of practical experience: in the first year he would earn \$20,000, in the second year he would earn \$25,000. He then would need to obtain his master's degree which will cost \$15,000 a year for two years. After that he will be fully qualified and can earn \$25,000 per year for 25 years.

His other alternative is to study accounting. If he does this, he would pay \$13,000 a year for four years, and then he would earn \$31,000 per year for 30 years.

The effort involved in the two careers is the same, so he is only interested in the earnings the jobs provide. All earnings and costs are paid at the end of the year. What advice would you give him if the applicable interest rate were 4 percent? A day later he comes back and says he took your advice, but in fact, the applicable interest rate was 7 percent. Has your brother made the right choice?

Question 3 :

You are evaluating a project for The Ultimate recreational tennis racket, guaranteed to correct that wimpy backhand. You estimate the sales price of The Ultimate to be \$400 and sales volume to be 1,000 units in year 1, 1,250 units in year 2, and 1,325 units in year 3. The project has a three year life. Variable costs amount to \$225 per unit and fixed costs are \$100,000 per year. The project requires an initial investment of \$165,000 which is depreciated straight-line to zero over the three year project life. The actual market value of the initial investment at the end of year 3 is \$35,000. Initial net working capital investment is \$75,000 and NWC will maintain a level equal to 20% of sales each year thereafter. The tax rate is 34% and the required return on the project is 10%.

1. What is EBIT for the project in the first year?
2. Given the \$75,000 initial investment in NWC, what change occurs for NWC during year 1?
3. What is the operating cash flow for the project in year 2?
4. What is the effect of the \$35,000 salvage value on year 2 cash flows?

Question 4 :

Snyder Computer Chips Inc. is experiencing a period of rapid growth. Earnings and dividends are expected to grow at a rate of 15% during the next 2 years, at 13% in the third year, and at a constant rate of 6% thereafter. Snyder's just paid (D_0) is \$1.15, and the required rate of return on the stock is 12%.

1. Calculate the value of the stock today.
2. Calculate P_1 and P_2 .
3. Calculate the dividend yield and capital gains yield for years 1, 2, and 3.

Question 5 :

A company is considering the acquisition of production equipment which will reduce labour and materials costs. The cost of the equipment is \$100,000 and it will be depreciated on a straight-line basis over a four-year period. For simplicity, we assume this asset can be depreciated straight-line for tax purposes. However, the useful life of the equipment is five years, and it will have a \$20,000 salvage value at the end of five years. Operating costs will be reduced by \$30,000 in Year 1, and the savings will increase by \$5,000 per year for years 2, 3, and 4. Due to increased maintenance costs, savings in year 5 will be \$10,000 less than the year 4 savings. The equipment will also reduce net working capital by \$5,000 throughout the life of the project. The termination of the project terminates the reduction in net working capital, so that, at the end, we return to the previous level of net working capital. The firm's tax rate is 34% and the firm requires a 16% return on capital budgeting projects.

- a. Compute operating cash flow for the project for years 1 through 5.
- b. Compute total projected cash flows for years 0 through 5 for the project.
- c. Compute the net present value for the production equipment.

Note: at the end of year 5, fixed assets have a salvage value of \$20,000 and a book value of zero, therefore, the after-tax cash inflow resulting from the sale of fixed assets is equal to:

$$(\$20,000 - \$0)(1 - 0.34) = \$13,200.$$

Solutions

Question 1:

1. Non-cash items, such as depreciation, reduce net income but do not affect cash flows. Interest expense is a cost of financing and not an operating expense; therefore it reduces net income but does not affect cash flow from operations. Cash flows are more relevant to the corporate treasurer since his/her focus is on the cash management of a firm and not the accounting management.

2. Common stockholders have the right to vote on corporate matters and have the right to receive the residual value of the firm after all liabilities and preferred stockholders are paid in a liquidation. Preferred stockholders have a promised dividend, may or may not have the right to collect dividends that have been passed, and preferred stock will typically be rated much like bonds. In a liquidation, preferred shareholders have a preference over common stockholders.

Preferred stock is referred to as a hybrid security because it has many characteristics of both common stock and bonds. It is similar to common stock because it has no fixed maturity date, the nonpayment of dividends does not bring on bankruptcy, and dividends are not deductible for tax purposes. Preferred stock is similar to bonds in that dividends are limited in amount.

3. The current market price of IBM stock reflects, among other things, market opinion about the quality of firm management. If the shareholder's sale price is low, this indirectly reflects on the reputation of the managers, as well as potentially impacting their standing in the employment market. Alternatively, if the sale price is high, this indicates that the market believes current management is increasing firm value, and therefore doing a good job.

Solution 2:

Engineer:

$$\begin{aligned}\text{NPV} &= -\$12,000 * \text{PVIFA}(0.04, 4 \text{ years}) + \$20,000 / 1.045^5 + \$25,000 / 1.046^6 - \$15,000 / 1.047^7 \\ &\quad - \$15,000 / 1.048^8 + \$40,000 * \text{PVIFA}(0.04, 25 \text{ years}) / 1.048 \\ &= \$426,874.57\end{aligned}$$

Accountant:

$$\begin{aligned}\text{NPV} &= -\$13,000 * \text{PVIFA}(0.04, 4 \text{ years}) + \$31,000 * (\text{PVIFA}(0.04, 30 \text{ years}) / 1.044^4) \\ &= \$411,031.74\end{aligned}$$

Become an engineer.

After your brother announces that the appropriate discount rate is 7%, you can recalculate the NPVs. Calculate them the same way as above except using the 7% discount rate.

Engineer NPV = \$243,500.02

Accountant NPV = \$249,436.99

Your brother made a poor decision. At a 7% rate, he should study accounting.

Solution 3:

1. To find the EBIT, simply find $\text{EBIT} = \text{Sales} - \text{costs} - \text{depreciation}$. That is for year one, $\text{EBIT} = \$400,000 - \$225,000 - \$100,000 - \$55,000 = \$20,000$.

2. Simply, find the sales for year one and then calculate the 20% of that to be the NWC. Sales for year one is \$400,000 and the 20% of that will be \$80,000. So, we had a \$5,000 increase in NWC.

3. The operating cash flows is $= \text{EBIT} + \text{Depreciation} - \text{Taxes}$. First find the EBIT for year 2, that is $\text{Sales} - \text{Costs} - \text{Depreciation} = \$500,000 - \$281,250 - \$100,000 - \$55,000 = \$63,750$ and that results in a tax bill of \$21,675. So $\text{OCF} = \text{EBIT} + \text{Depreciation} - \text{Taxes} = \$63,750 + \$55,000 - \$21,675 = \$97,075$.

4. Salvage value does not affect incremental cash flow until year 3.

Question 4:

Calculate the PV of dividend paid during the supernormal growth period

$$1) D_1 = \$1.15(1.15) = \$1.3225$$

$$D_2 = \$1.3225(1.15) = \$1.5209$$

$$D_3 = \$1.5209(1.13) = \$1.7186$$

$$\text{PV of the dividends} = \$1.3225(0.8929) + \$1.5209(0.7972) + \$1.7186(0.7972) = \$1.1809 + \$1.2125 + \$1.2233 = \$3.62$$

Find the PV of Snyder's stock price at the end of Year 3:

$$P_3 = D_4 / (r - g) = D_3(1 + g) / (r - g) = \$1.7186(1 + 0.06) / (0.12 - 0.06) = \$30.36$$

$$\text{PV of } P_3 = \$30.36(0.7118) = \$21.61$$

Now Sum the two components to find the value of the stock today

$$P_0 = \$3.62 + \$21.61 = \$25.23$$

$$2). P_1 = \$1.5209(0.8929) + \$1.7186(0.7972) + \$30.36(0.7972) = \$1.3580 + \$1.3710 + \$24.203 = \$26.93.$$

$$P_2 = \$1.7186(0.8929) + \$30.36(0.8929) = \$1.5345 + \$27.1084 = \$28.64.$$

3).

| Year | Dividend Yield | Capital gains yield | Total Return |
|------|---------------------------|------------------------------------|--------------|
| 1 | $\$1.3225/\$25.23=5.24\%$ | $(\$26.93-\$25.23)/\$25.23=6.74\%$ | 12% |
| 2 | $\$1.5209/\$26.93=5.65\%$ | $(\$28.64-\$26.93)/\$26.93=6.35\%$ | 12% |
| 3 | $\$1.7186/\$28.64=6.00\%$ | $(\$30.36-\$28.64)/\$28.64=6.00\%$ | 12% |

Question 5:

a. The pro forma income statements are presented in the following table:

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|------------------|---------|----------|----------|----------|----------|
| Sales Revenues | \$0 | \$0 | \$0 | \$0 | \$0 |
| -Operating costs | -30,000 | -35,000 | -40,000 | -45,000 | -35,000 |
| -Depreciation | 25,000 | 25,000 | 25,000 | 25,000 | 0 |
| (EBIT) | \$5,000 | \$10,000 | \$15,000 | \$20,000 | \$35,000 |
| -Tax (at 34%) | 1,700 | 3,400 | 5,100 | 6,800 | 11,900 |
| Net Income | \$3,300 | \$6,600 | \$9,900 | \$13,200 | \$23,100 |

Sales revenue does not change. Therefore, since we are concerned with incremental cash flows for the capital budgeting project, we enter zero for sales revenue. The decrease in operating costs results in an increase in EBIT and net income. Operating cash flows using data from the pro forma income statements are below:

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|----------------|----------|----------|----------|----------|----------|
| (EBIT) | \$5,000 | \$10,000 | \$15,000 | \$20,000 | \$35,000 |
| + Depreciation | 25,000 | 25,000 | 25,000 | 25,000 | |
| -Tax (at 34%) | 1,700 | 3,400 | 5,100 | 6,800 | 11,900 |
| (OCF) | \$28,300 | \$31,600 | \$34,900 | \$38,200 | \$23,100 |

b.

For years 1 through 4, total cash flow is the same as operating cash flow. For year 0, net working capital is reduced by \$5,000 and capital expenditure are \$100,000. The reduction in net working capital is a cash inflow, so that the year 0 cash outflow is $(\$100,000 - \$5,000) = \$95,000$. We assume that the termination of the project terminates the reduction in net working capital, so that, at the end, we return to the previous level of net working capital. Consequently, the resulting increase in net working capital at the end of year 5 is a cash outflow. Also at the end of year 5, fixed assets have a salvage value of \$20,000 and a book value of zero. Therefore, the after-tax cash inflow resulting from the sale of fixed assets is equal to:

$$(\$20,000 - \$0)(1 - 0.34) = \$13,200$$

$$\text{Total cash inflow for year 5 is: } \$23,100 - \$5,000 + \$13,200 = \$31,300$$

c.

The present value of the future cash flows is:

$$\$28,300/(1.16) + \$31,600/(1.16)^2 + \$34,900/(1.16)^3 + \$38,200/(1.16)^4 + \$31,300/(1.16)^5 = \$106,239.31$$

The net present value is:

$$\$106,239.31 - \$95,000 = \$11,239.31$$

Note for calculating Internal rate of return: using trial-and-error to determine the internal rate of return, we find that the present value is \$96,725.37 and the net present value is \$1,725.37 for a discount of 20%. For a discount rate of 21%, the present value and net present value are : \$94,559.88 and -\$440.12, respectively. Therefore, the internal rate of return is between 20% and 21%, indicating an acceptable investment. The precise value of the internal rate of return is 20.794%.