

***Corporate Finance 11th edition Ross Solutions  
Manual***

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# **Solutions Manual**

## ***Corporate Finance***

**Ross, Westerfield, Jaffe, and Jordan**  
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# **CHAPTER 1**

## **INTRODUCTION TO CORPORATE FINANCE**

### **Answers to Concept Questions**

1. In the corporate form of ownership, the shareholders are the owners of the firm. The shareholders elect the directors of the corporation, who in turn appoint the firm's management. This separation of ownership from control in the corporate form of organization is what causes agency problems to exist. Management may act in its own or someone else's best interests, rather than those of the shareholders. If such events occur, they may contradict the goal of maximizing the share price of the equity of the firm.
2. Such organizations frequently pursue social or political missions, so many different goals are conceivable. One goal that is often cited is revenue minimization; i.e., provide whatever goods and services are offered at the lowest possible cost to society. A better approach might be to observe that even a not-for-profit business has equity. Thus, one answer is that the appropriate goal is to maximize the value of the equity.
3. Presumably, the current stock value reflects the risk, timing, and magnitude of all future cash flows, both short-term *and* long-term. If this is correct, then the statement is false.
4. An argument can be made either way. At the one extreme, we could argue that in a market economy, all of these things are priced. There is thus an optimal level of, for example, ethical and/or illegal behavior, and the framework of stock valuation explicitly includes these. At the other extreme, we could argue that these are non-economic phenomena and are best handled through the political process. A classic (and highly relevant) thought question that illustrates this debate goes something like this: "A firm has estimated that the cost of improving the safety of one of its products is \$30 million. However, the firm believes that improving the safety of the product will only save \$20 million in product liability claims. What should the firm do?"
5. The goal will be the same, but the best course of action toward that goal may be different because of differing social, political, and economic institutions.
6. The goal of management should be to maximize the share price for the current shareholders. If management believes that it can improve the profitability of the firm so that the share price will exceed \$35, then they should fight the offer from the outside company. If management believes that this bidder or other unidentified bidders will actually pay more than \$35 per share to acquire the company, then they should still fight the offer. However, if the current management cannot increase the value of the firm beyond the bid price, and no other higher bids come in, then management is not acting in the interests of the shareholders by fighting the offer. Since current managers often lose their jobs when the corporation is acquired, poorly monitored managers have an incentive to fight corporate takeovers in situations such as this.

7. We would expect agency problems to be less severe in other countries, primarily due to the relatively small percentage of individual ownership. Fewer individual owners should reduce the number of diverse opinions concerning corporate goals. The high percentage of institutional ownership might lead to a higher degree of agreement between owners and managers on decisions concerning risky projects. In addition, institutions may be better able to implement effective monitoring mechanisms on managers than can individual owners, based on the institutions' deeper resources and experiences with their own management.
8. The increase in institutional ownership of stock in the United States and the growing activism of these large shareholder groups may lead to a reduction in agency problems for U.S. corporations and a more efficient market for corporate control. However, this may not always be the case. If the managers of the mutual fund or pension plan are not concerned with the interests of the investors, the agency problem could potentially remain the same, or even increase since there is the possibility of agency problems between the fund and its investors.
9. How much is too much? Who is worth more, Larry Ellison or Tiger Woods? The simplest answer is that there is a market for executives just as there is for all types of labor. Executive compensation is the price that clears the market. The same is true for athletes and performers. Having said that, one aspect of executive compensation deserves comment. A primary reason executive compensation has grown so dramatically is that companies have increasingly moved to stock-based compensation. Such movement is obviously consistent with the attempt to better align stockholder and management interests. In recent years, stock prices have soared, so management has cleaned up. It is sometimes argued that much of this reward is due to rising stock prices in general, not managerial performance. Perhaps in the future, executive compensation will be designed to reward only differential performance, i.e., stock price increases in excess of general market increases.
10. Maximizing the current share price is the same as maximizing the future share price at any future period. The value of a share of stock depends on all of the future cash flows of company. Another way to look at this is that, barring large cash payments to shareholders, the expected price of the stock must be higher in the future than it is today. Who would buy a stock for \$100 today when the share price in one year is expected to be \$80?

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# **CHAPTER 2**

## **ACCOUNTING STATEMENTS, TAXES, AND CASH FLOW**

### **Answers to Concepts Review and Critical Thinking Questions**

1. True. Every asset can be converted to cash at some price. However, when we are referring to a liquid asset, the added assumption that the asset can be quickly converted to cash at or near market value is important.
2. The recognition and matching principles in financial accounting call for revenues, and the costs associated with producing those revenues, to be “booked” when the revenue process is essentially complete, not necessarily when the cash is collected or bills are paid. Note that this way is not necessarily correct; it’s the way accountants have chosen to do it.
3. The bottom line number shows the change in the cash balance on the balance sheet. As such, it is not a useful number for analyzing a company.
4. The major difference is the treatment of interest expense. The accounting statement of cash flows treats interest as an operating cash flow, while the financial cash flows treat interest as a financing cash flow. The logic of the accounting statement of cash flows is that since interest appears on the income statement, which shows the operations for the period, it is an operating cash flow. In reality, interest is a financing expense, which results from the company’s choice of debt and equity. We will have more to say about this in a later chapter. When comparing the two cash flow statements, the financial statement of cash flows is a more appropriate measure of the company’s performance because of its treatment of interest.
5. Market values can never be negative. Imagine a share of stock selling for –\$20. This would mean that if you placed an order for 100 shares, you would get the stock along with a check for \$2,000. How many shares do you want to buy? More generally, because of corporate and individual bankruptcy laws, net worth for a person or a corporation cannot be negative, implying that liabilities cannot exceed assets in market value.
6. For a successful company that is rapidly expanding, for example, capital outlays will be large, possibly leading to negative cash flow from assets. In general, what matters is whether the money is spent wisely, not whether cash flow from assets is positive or negative.
7. It’s probably not a good sign for an established company to have negative cash flow from operations, but it would be fairly ordinary for a start-up, so it depends.

8. For example, if a company were to become more efficient in inventory management, the amount of inventory needed would decline. The same might be true if the company becomes better at collecting its receivables. In general, anything that leads to a decline in ending NWC relative to beginning would have this effect. Negative net capital spending would mean more long-lived assets were liquidated than purchased.
9. If a company raises more money from selling stock than it pays in dividends in a particular period, its cash flow to stockholders will be negative. If a company borrows more than it pays in interest and principal, its cash flow to creditors will be negative.
10. The adjustments discussed were purely accounting changes; they had no cash flow or market value consequences unless the new accounting information caused stockholders to revalue the assets.

### Solutions to Questions and Problems

*NOTE: All end-of-chapter problems were solved using a spreadsheet. Many problems require multiple steps. Due to space and readability constraints, when these intermediate steps are included in this solutions manual, rounding may appear to have occurred. However, the final answer for each problem is found without rounding during any step in the problem.*

#### Basic

1. To find owners' equity, we must construct a balance sheet as follows:

| <u>Balance Sheet</u> |                 |         |                 |
|----------------------|-----------------|---------|-----------------|
| CA                   | \$ 4,900        | CL      | \$ 4,100        |
| NFA                  | <u>25,000</u>   | LTD     | 10,300          |
|                      |                 | OE      | <u>??</u>       |
| TA                   | <u>\$29,900</u> | TL & OE | <u>\$29,900</u> |

We know that total liabilities and owners' equity (TL & OE) must equal total assets of \$29,900. We also know that TL & OE is equal to current liabilities plus long-term debt plus owners' equity, so owners' equity is:

$$\begin{aligned}\text{Owners' equity} &= \$29,900 - 10,300 - 4,100 \\ \text{Owners' equity} &= \$15,500\end{aligned}$$

And net working capital is current assets minus current liabilities, so:

$$\begin{aligned}\text{NWC} &= \text{Current assets} - \text{Current liabilities} \\ \text{NWC} &= \$4,900 - 4,100 \\ \text{NWC} &= \$800\end{aligned}$$

2. The income statement for the company is:

| <u>Income Statement</u> |                  |
|-------------------------|------------------|
| Sales                   | \$435,000        |
| Costs                   | 216,000          |
| Depreciation            | <u>40,000</u>    |
| EBIT                    | \$179,000        |
| Interest                | <u>21,000</u>    |
| EBT                     | \$158,000        |
| Taxes                   | <u>55,300</u>    |
| Net income              | <u>\$102,700</u> |

One equation for net income is:

$$\text{Net income} = \text{Dividends} + \text{Addition to retained earnings}$$

Rearranging, we get:

$$\text{Addition to retained earnings} = \text{Net income} - \text{Dividends}$$

$$\text{Addition to retained earnings} = \$102,700 - 30,000$$

$$\text{Addition to retained earnings} = \$72,700$$

3. To find the book value of current assets, we use:  $\text{NWC} = \text{CA} - \text{CL}$ . Rearranging to solve for current assets, we get:

$$\text{Current assets} = \text{Net working capital} + \text{Current liabilities}$$

$$\text{Current assets} = \$800,000 + 2,400,000 = \$3,200,000$$

The market value of current assets and net fixed assets is given, so:

$$\text{Book value CA} = \$3,200,000$$

$$\text{Market value CA} = \$2,600,000$$

$$\text{Book value NFA} = \underline{\$5,200,000}$$

$$\text{Market value NFA} = \underline{\$6,500,000}$$

$$\text{Book value assets} = \$8,400,000$$

$$\text{Market value assets} = \$9,100,000$$

4.  $\text{Taxes} = .15(\$50,000) + .25(\$25,000) + .34(\$25,000) + .39(\$198,000 - 100,000)$   
 $\text{Taxes} = \$60,470$

The average tax rate is the total tax paid divided by taxable income, so:

$$\text{Average tax rate} = \$60,470 / \$198,000$$

$$\text{Average tax rate} = .3054, \text{ or } 30.54\%$$

The marginal tax rate is the tax rate on the next \$1 of earnings, so the marginal tax rate = 39%.

5. To calculate OCF, we first need the income statement:

| <u>Income Statement</u> |                |
|-------------------------|----------------|
| Sales                   | \$19,800       |
| Costs                   | 10,900         |
| Depreciation            | <u>2,100</u>   |
| EBIT                    | \$6,800        |
| Interest                | <u>1,250</u>   |
| Taxable income          | \$5,550        |
| Taxes                   | <u>2,220</u>   |
| Net income              | <u>\$3,330</u> |

$$\text{OCF} = \text{EBIT} + \text{Depreciation} - \text{Taxes}$$

$$\text{OCF} = \$6,800 + 2,100 - 2,220$$

$$\text{OCF} = \$6,680$$

6. Net capital spending =  $\text{NFA}_{\text{end}} - \text{NFA}_{\text{beg}} + \text{Depreciation}$   
 Net capital spending =  $\$1,510,000 - 1,320,000 + 137,000$   
 Net capital spending =  $\$327,000$
7. The long-term debt account will increase by \$30 million, the amount of the new long-term debt issue. Since the company sold 5 million new shares of stock with a \$1 par value, the common stock account will increase by \$5 million. The capital surplus account will increase by \$58 million, the value of the new stock sold above its par value. Since the company had a net income of \$8 million, and paid \$1.8 million in dividends, the addition to retained earnings was \$6.2 million, which will increase the accumulated retained earnings account. So, the new long-term debt and stockholders' equity portion of the balance sheet will be:

|                      |                      |
|----------------------|----------------------|
| Long-term debt       | <u>\$ 85,000,000</u> |
| Total long-term debt | \$ 85,000,000        |

|                               |                    |
|-------------------------------|--------------------|
| Shareholders' equity          |                    |
| Preferred stock               | \$ 3,100,000       |
| Common stock (\$1 par value)  | 17,000,000         |
| Accumulated retained earnings | 125,200,000        |
| Capital surplus               | <u>114,000,000</u> |
| Total equity                  | \$ 259,300,000     |

|                            |                |
|----------------------------|----------------|
| Total Liabilities & Equity | \$ 344,300,000 |
|----------------------------|----------------|

8. Cash flow to creditors = Interest paid – Net new borrowing  
 Cash flow to creditors =  $\$185,000 - (\text{LTD}_{\text{end}} - \text{LTD}_{\text{beg}})$   
 Cash flow to creditors =  $\$185,000 - (\$1,730,000 - 1,625,000)$   
 Cash flow to creditors =  $\$185,000 - 105,000$   
 Cash flow to creditors =  $\$80,000$

9. Cash flow to stockholders = Dividends paid – Net new equity  
 Cash flow to stockholders =  $\$275,000 - [(\text{Common}_{\text{end}} + \text{APIS}_{\text{end}}) - (\text{Common}_{\text{beg}} + \text{APIS}_{\text{beg}})]$   
 Cash flow to stockholders =  $\$275,000 - [(\$545,000 + 3,850,000) - (\$510,000 + 3,600,000)]$   
 Cash flow to stockholders =  $\$275,000 - (\$4,395,000 - 4,100,000)$   
 Cash flow to stockholders =  $-\$10,000$

Note, APIS is the additional paid-in surplus.

10. Cash flow from assets = Cash flow to creditors + Cash flow to stockholders  
 =  $\$80,000 - 10,000$   
 =  $\$70,000$

Cash flow from assets = OCF – Change in NWC – Net capital spending  
 $\$70,000 = \text{OCF} - (-\$132,000) - 975,000$   
 Operating cash flow =  $\$70,000 - 132,000 + 975,000$   
 Operating cash flow =  $\$913,000$

### Intermediate

11. a. The accounting statement of cash flows explains the change in cash during the year. The accounting statement of cash flows will be:

#### Statement of cash flows

##### *Operations*

|                                 |              |
|---------------------------------|--------------|
| Net income                      | \$120        |
| Depreciation                    | 90           |
| Changes in other current assets | (15)         |
| Change in accounts payable      | <u>15</u>    |
| Total cash flow from operations | <u>\$210</u> |

##### *Investing activities*

|                                           |                |
|-------------------------------------------|----------------|
| Acquisition of fixed assets               | <u>\$(110)</u> |
| Total cash flow from investing activities | <u>\$(110)</u> |

##### *Financing activities*

|                                           |               |
|-------------------------------------------|---------------|
| Proceeds of long-term debt                | \$10          |
| Dividends                                 | <u>(95)</u>   |
| Total cash flow from financing activities | <u>\$(85)</u> |

|                                   |             |
|-----------------------------------|-------------|
| Change in cash (on balance sheet) | <u>\$15</u> |
|-----------------------------------|-------------|

- b.  $\text{Change in NWC} = \text{NWC}_{\text{end}} - \text{NWC}_{\text{beg}}$   
 $= (\text{CA}_{\text{end}} - \text{CL}_{\text{end}}) - (\text{CA}_{\text{beg}} - \text{CL}_{\text{beg}})$   
 $= [(\$80 + 185) - 140] - [(\$60 + 170) - 125]$   
 $= \$125 - 105$   
 $= \$20$
- c. To find the cash flow generated by the firm's assets, we need the operating cash flow, and the capital spending. So, calculating each of these, we find:

*Operating cash flow*

|                     |           |
|---------------------|-----------|
| Net income          | \$120     |
| Depreciation        | <u>90</u> |
| Operating cash flow | \$210     |

Note that we can calculate OCF in this manner since there are no taxes.

*Capital spending*

|                        |           |
|------------------------|-----------|
| Ending fixed assets    | \$405     |
| Beginning fixed assets | -385      |
| Depreciation           | <u>90</u> |
| Capital spending       | \$110     |

Now we can calculate the cash flow generated by the firm's assets, which is:

*Cash flow from assets*

|                       |            |
|-----------------------|------------|
| Operating cash flow   | \$210      |
| Capital spending      | -110       |
| Change in NWC         | <u>-20</u> |
| Cash flow from assets | \$ 80      |

12. With the information provided, the cash flows from the firm are the capital spending and the change in net working capital, so:

*Cash flows from the firm*

|                          |                |
|--------------------------|----------------|
| Capital spending         | \$(27,000)     |
| Additions to NWC         | <u>(2,300)</u> |
| Cash flows from the firm | \$(29,300)     |

And the cash flows to the investors of the firm are:

*Cash flows to investors of the firm*

|                                     |               |
|-------------------------------------|---------------|
| Sale of long-term debt              | \$(17,800)    |
| Sale of common stock                | (5,000)       |
| Dividends paid                      | <u>15,200</u> |
| Cash flows to investors of the firm | \$(7,600)     |

13. a. The interest expense for the company is the amount of debt times the interest rate on the debt. So, the income statement for the company is:

| <u>Income Statement</u> |                  |
|-------------------------|------------------|
| Sales                   | \$925,000        |
| Cost of goods sold      | 490,000          |
| Selling costs           | 220,000          |
| Depreciation            | <u>120,000</u>   |
| EBIT                    | \$ 95,000        |
| Interest                | <u>29,600</u>    |
| Taxable income          | \$ 65,400        |
| Taxes                   | <u>22,890</u>    |
| Net income              | <u>\$ 42,510</u> |

- b. And the operating cash flow is:

$$\begin{aligned}\text{OCF} &= \text{EBIT} + \text{Depreciation} - \text{Taxes} \\ \text{OCF} &= \$95,000 + 120,000 - 22,890 \\ \text{OCF} &= \$192,110\end{aligned}$$

14. To find the OCF, we first calculate net income.

| <u>Income Statement</u> |                 |
|-------------------------|-----------------|
| Sales                   | \$215,000       |
| Costs                   | 117,000         |
| Other expenses          | 6,700           |
| Depreciation            | <u>18,400</u>   |
| EBIT                    | \$72,900        |
| Interest                | <u>10,000</u>   |
| Taxable income          | \$62,900        |
| Taxes                   | <u>25,370</u>   |
| Net income              | <u>\$37,530</u> |
|                         |                 |
| Dividends               | \$9,500         |
| Additions to RE         | \$28,030        |

- a.  $\text{OCF} = \text{EBIT} + \text{Depreciation} - \text{Taxes}$   
 $\text{OCF} = \$72,900 + 18,400 - 25,370$   
 $\text{OCF} = \$65,930$
- b.  $\text{CFC} = \text{Interest} - \text{Net new LTD}$   
 $\text{CFC} = \$10,000 - (-\$7,200)$   
 $\text{CFC} = \$17,200$

Note that the net new long-term debt is negative because the company repaid part of its long-term debt.

- c.  $\text{CFS} = \text{Dividends} - \text{Net new equity}$   
 $\text{CFS} = \$9,500 - 8,100$   
 $\text{CFS} = \$1,400$

d. We know that  $CFA = CFC + CFS$ , so:

$$CFA = \$17,200 + 1,400 = \$18,600$$

CFA is also equal to  $OCF - \text{Net capital spending} - \text{Change in NWC}$ . We already know OCF. Net capital spending is equal to:

$$\text{Net capital spending} = \text{Increase in NFA} + \text{Depreciation}$$

$$\text{Net capital spending} = \$28,400 + 18,400$$

$$\text{Net capital spending} = \$46,800$$

Now we can use:

$$CFA = OCF - \text{Net capital spending} - \text{Change in NWC}$$

$$\$18,600 = \$65,930 - 46,800 - \text{Change in NWC}$$

Solving for the change in NWC gives \$530, meaning the company increased its NWC by \$530.

**15.** The solution to this question works the income statement backwards. Starting at the bottom:

$$\text{Net income} = \text{Dividends} + \text{Addition to retained earnings}$$

$$\text{Net income} = \$1,670 + 5,200$$

$$\text{Net income} = \$6,870$$

Now, looking at the income statement:

$$EBT - (EBT \times \text{Tax rate}) = \text{Net income}$$

Recognize that  $EBT \times \text{tax rate}$  is the calculation for taxes. Solving this for EBT yields:

$$EBT = NI / (1 - \text{Tax rate})$$

$$EBT = \$6,870 / (1 - .40)$$

$$EBT = \$11,450$$

Now we can calculate:

$$EBIT = EBT + \text{Interest}$$

$$EBIT = \$11,450 + 1,850$$

$$EBIT = \$13,300$$

The last step is to use:

$$EBIT = \text{Sales} - \text{Costs} - \text{Depreciation}$$

$$\$13,300 = \$44,000 - 27,500 - \text{Depreciation}$$

$$\text{Depreciation} = \$3,200$$

16. The market value of shareholders' equity cannot be negative. A negative market value in this case would imply that the company would pay you to own the stock. The market value of shareholders' equity can be stated as: Shareholders' equity =  $\text{Max}[(TA - TL), 0]$ . So, if TA is \$12,400, equity is equal to \$1,100, and if TA is \$9,600, equity is equal to \$0. We should note here that while the market value of equity cannot be negative, the book value of shareholders' equity can be negative.

17. a.  $\begin{aligned} \text{Taxes Growth} &= .15(\$50,000) + .25(\$25,000) + .34(\$82,500 - 75,000) = \$16,300 \\ \text{Taxes Income} &= .15(\$50,000) + .25(\$25,000) + .34(\$25,000) + .39(\$235,000) \\ &\quad + .34(\$8,250,000 - 335,000) \\ &= \$2,805,000 \end{aligned}$
- b. Each firm has a marginal tax rate of 34 percent on the next \$10,000 of taxable income, despite their different average tax rates, so both firms will pay an additional \$3,400 in taxes.

18.

|                | <u>Income Statement</u> |
|----------------|-------------------------|
| Sales          | \$590,000               |
| COGS           | 455,000                 |
| A&S expenses   | 85,000                  |
| Depreciation   | <u>125,000</u>          |
| EBIT           | -\$75,000               |
| Interest       | <u>65,000</u>           |
| Taxable income | -\$140,000              |
| Taxes (35%)    | <u>0</u>                |
| a. Net income  | <u>-\$140,000</u>       |

- b.  $\begin{aligned} \text{OCF} &= \text{EBIT} + \text{Depreciation} - \text{Taxes} \\ \text{OCF} &= -\$75,000 + 125,000 - 0 \\ \text{OCF} &= \$50,000 \end{aligned}$
- c. Net income was negative because of the tax deductibility of depreciation and interest expense. However, the actual cash flow from operations was positive because depreciation is a non-cash expense and interest is a financing expense, not an operating expense.
19. A firm can still pay out dividends if net income is negative; it just has to be sure there is sufficient cash flow to make the dividend payments.

Change in NWC = Net capital spending = Net new equity = 0. (Given)

Cash flow from assets = OCF – Change in NWC – Net capital spending

Cash flow from assets =  $\$50,000 - 0 - 0 = \$50,000$

Cash flow to stockholders = Dividends – Net new equity

Cash flow to stockholders =  $\$34,000 - 0 = \$34,000$

Cash flow to creditors = Cash flow from assets – Cash flow to stockholders

Cash flow to creditors =  $\$50,000 - 34,000$

Cash flow to creditors = \$16,000

Cash flow to creditors is also:

$$\text{Cash flow to creditors} = \text{Interest} - \text{Net new LTD}$$

So:

$$\text{Net new LTD} = \text{Interest} - \text{Cash flow to creditors}$$

$$\text{Net new LTD} = \$65,000 - 16,000$$

$$\text{Net new LTD} = \$49,000$$

20. a. The income statement is:

| <u>Income Statement</u> |                |
|-------------------------|----------------|
| Sales                   | \$20,300       |
| Cost of goods sold      | 14,500         |
| Depreciation            | <u>2,900</u>   |
| EBIT                    | \$ 2,900       |
| Interest                | <u>690</u>     |
| Taxable income          | \$ 2,210       |
| Taxes                   | <u>884</u>     |
| Net income              | <u>\$1,326</u> |

b.  $\text{OCF} = \text{EBIT} + \text{Depreciation} - \text{Taxes}$

$$\text{OCF} = \$2,900 + 2,900 - 884$$

$$\text{OCF} = \$4,916$$

c.  $\text{Change in NWC} = \text{NWC}_{\text{end}} - \text{NWC}_{\text{beg}}$   
 $= (\text{CA}_{\text{end}} - \text{CL}_{\text{end}}) - (\text{CA}_{\text{beg}} - \text{CL}_{\text{beg}})$   
 $= (\$5,345 - 2,785) - (\$4,630 - 2,520)$   
 $= \$2,560 - 2,110$   
 $= \$450$

$$\begin{aligned} \text{Net capital spending} &= \text{NFA}_{\text{end}} - \text{NFA}_{\text{beg}} + \text{Depreciation} \\ &= \$17,120 - 15,470 + 2,900 \\ &= \$4,550 \end{aligned}$$

$$\begin{aligned} \text{CFA} &= \text{OCF} - \text{Change in NWC} - \text{Net capital spending} \\ &= \$4,916 - 450 - 4,550 \\ &= -\$84 \end{aligned}$$

The cash flow from assets can be positive or negative, since it represents whether the firm raised funds or distributed funds on a net basis. In this problem, even though net income and OCF are positive, the firm invested heavily in both fixed assets and net working capital; it had to raise a net \$84 in funds from its stockholders and creditors to make these investments.

d.  $\text{Cash flow to creditors} = \text{Interest} - \text{Net new LTD}$   
 $= \$690 - 0$   
 $= \$690$

$$\begin{aligned}
 \text{Cash flow to stockholders} &= \text{Cash flow from assets} - \text{Cash flow to creditors} \\
 &= -\$84 - 690 \\
 &= -\$774
 \end{aligned}$$

We can also calculate the cash flow to stockholders as:

$$\text{Cash flow to stockholders} = \text{Dividends} - \text{Net new equity}$$

Solving for net new equity, we get:

$$\begin{aligned}
 \text{Net new equity} &= \$774 - (-\$660) \\
 &= \$1,434
 \end{aligned}$$

The firm had positive earnings in an accounting sense ( $NI > 0$ ) and had positive cash flow from operations. The firm invested \$450 in new net working capital and \$4,550 in new fixed assets. The firm had to raise \$84 from its stakeholders to support this new investment. It accomplished this by raising \$1,434 in the form of new equity. After paying out \$660 of this in the form of dividends to shareholders and \$690 in the form of interest to creditors, \$84 was left to meet the firm's cash flow needs for investment.

21. a.  $\begin{aligned} \text{Total assets 2014} &= \$964 + 4,384 = \$5,348 \\ \text{Total liabilities 2014} &= \$401 + 2,380 = \$2,781 \\ \text{Owners' equity 2014} &= \$5,348 - 2,781 = \$2,567 \end{aligned}$
- $\begin{aligned} \text{Total assets 2015} &= \$1,176 + 5,104 = \$6,280 \\ \text{Total liabilities 2015} &= \$445 + 2,713 = \$3,158 \\ \text{Owners' equity 2015} &= \$6,280 - 3,158 = \$3,122 \end{aligned}$
- b.  $\begin{aligned} \text{NWC 2014} &= \text{CA14} - \text{CL14} = \$964 - 401 = \$563 \\ \text{NWC 2015} &= \text{CA15} - \text{CL15} = \$1,176 - 445 = \$731 \\ \text{Change in NWC} &= \text{NWC15} - \text{NWC14} = \$731 - 563 = \$168 \end{aligned}$
- c. We can calculate net capital spending as:

$$\begin{aligned}
 \text{Net capital spending} &= \text{Net fixed assets 2015} - \text{Net fixed assets 2014} + \text{Depreciation} \\
 \text{Net capital spending} &= \$5,104 - 4,384 + 1,190 \\
 \text{Net capital spending} &= \$1,910
 \end{aligned}$$

So, the company had a net capital spending cash flow of \$1,910. We also know that net capital spending is:

$$\begin{aligned}
 \text{Net capital spending} &= \text{Fixed assets bought} - \text{Fixed assets sold} \\
 \$1,910 &= \$2,350 - \text{Fixed assets sold} \\
 \text{Fixed assets sold} &= \$2,350 - 1,910 \\
 \text{Fixed assets sold} &= \$440
 \end{aligned}$$

To calculate the cash flow from assets, we must first calculate the operating cash flow. The operating cash flow is calculated as follows (you can also prepare a traditional income statement):

$$\text{EBIT} = \text{Sales} - \text{Costs} - \text{Depreciation}$$

$$\text{EBIT} = \$14,740 - 5,932 - 1,190$$

$$\text{EBIT} = \$7,618$$

$$\text{EBT} = \text{EBIT} - \text{Interest}$$

$$\text{EBT} = \$7,618 - 328$$

$$\text{EBT} = \$7,290$$

$$\text{Taxes} = \text{EBT} \times .40$$

$$\text{Taxes} = \$7,290 \times .40$$

$$\text{Taxes} = \$2,916$$

$$\text{OCF} = \text{EBIT} + \text{Depreciation} - \text{Taxes}$$

$$\text{OCF} = \$7,618 + 1,190 - 2,916$$

$$\text{OCF} = \$5,892$$

$$\text{Cash flow from assets} = \text{OCF} - \text{Change in NWC} - \text{Net capital spending}$$

$$\text{Cash flow from assets} = \$5,892 - 168 - 1,910$$

$$\text{Cash flow from assets} = \$3,814$$

d.  $\text{Net new borrowing} = \text{LTD}_{15} - \text{LTD}_{14}$

$$\text{Net new borrowing} = \$2,713 - 2,380$$

$$\text{Net new borrowing} = \$333$$

$$\text{Net new borrowing} = \$333 = \text{Debt issued} - \text{Debt retired}$$

$$\text{Debt retired} = \$455 - 333$$

$$\text{Debt retired} = \$122$$

$$\text{Cash flow to creditors} = \text{Interest} - \text{Net new LTD}$$

$$\text{Cash flow to creditors} = \$328 - 333$$

$$\text{Cash flow to creditors} = -\$5$$

22.

Balance sheet as of Dec. 31, 2014

|                     |                 |                      |                 |
|---------------------|-----------------|----------------------|-----------------|
| Cash                | \$4,931         | Accounts payable     | \$5,179         |
| Accounts receivable | 6,527           | Notes payable        | <u>953</u>      |
| Inventory           | <u>11,604</u>   | Current liabilities  | \$6,132         |
| Current assets      | \$23,062        |                      |                 |
|                     |                 | Long-term debt       | \$16,152        |
| Net fixed assets    | <u>\$41,346</u> | Owners' equity       | <u>42,124</u>   |
| Total assets        | <u>\$64,408</u> | Total liab. & equity | <u>\$64,408</u> |

Balance sheet as of Dec. 31, 2015

|                     |                 |                      |                 |
|---------------------|-----------------|----------------------|-----------------|
| Cash                | \$6,244         | Accounts payable     | \$5,022         |
| Accounts receivable | 7,352           | Notes payable        | <u>895</u>      |
| Inventory           | <u>11,926</u>   | Current liabilities  | \$5,917         |
| Current assets      | \$25,522        |                      |                 |
|                     |                 | Long-term debt       | \$19,260        |
| Net fixed assets    | <u>\$42,332</u> | Owners' equity       | <u>42,677</u>   |
| Total assets        | <u>\$67,854</u> | Total liab. & equity | <u>\$67,854</u> |

2014 Income Statement

|                |                   |
|----------------|-------------------|
| Sales          | \$9,402.00        |
| COGS           | 3,235.00          |
| Other expenses | 767.00            |
| Depreciation   | <u>1,350.00</u>   |
| EBIT           | \$4,050.00        |
| Interest       | <u>630.00</u>     |
| EBT            | \$3,420.00        |
| Taxes          | <u>1,162.80</u>   |
| Net income     | <u>\$2,257.20</u> |

|                 |            |
|-----------------|------------|
| Dividends       | \$1,147.00 |
| Additions to RE | 1,110.20   |

2015 Income Statement

|                |                   |
|----------------|-------------------|
| Sales          | \$10,091.00       |
| COGS           | 3,672.00          |
| Other expenses | 641.00            |
| Depreciation   | <u>1,351.00</u>   |
| EBIT           | \$4,427.00        |
| Interest       | <u>724.00</u>     |
| EBT            | \$3,703.00        |
| Taxes          | <u>1,259.02</u>   |
| Net income     | <u>\$2,443.98</u> |

|                 |            |
|-----------------|------------|
| Dividends       | \$1,261.00 |
| Additions to RE | 1,182.98   |

23.  $OCF = EBIT + Depreciation - Taxes$ 

$$OCF = \$4,427 + 1,351 - 1,259.02$$

$$OCF = \$4,518.98$$

$$\text{Change in NWC} = NWC_{\text{end}} - NWC_{\text{beg}} = (CA - CL)_{\text{end}} - (CA - CL)_{\text{beg}}$$

$$\text{Change in NWC} = (\$25,522 - 5,917) - (\$23,062 - 6,132)$$

$$\text{Change in NWC} = \$2,675$$

$$\text{Net capital spending} = NFA_{\text{end}} - NFA_{\text{beg}} + \text{Depreciation}$$

$$\text{Net capital spending} = \$42,332 - 41,346 + 1,351$$

$$\text{Net capital spending} = \$2,337$$

Cash flow from assets = OCF – Change in NWC – Net capital spending

Cash flow from assets = \$4,518.98 – 2,675 – 2,337

Cash flow from assets = –\$493.02

Cash flow to creditors = Interest – Net new LTD

Net new LTD =  $LTD_{end} - LTD_{beg}$

Cash flow to creditors = \$724 – (\$19,260 – 16,152)

Cash flow to creditors = –\$2,384

Net new equity =  $Common\ stock_{end} - Common\ stock_{beg}$

Common stock + Retained earnings = Total owners' equity

Net new equity =  $(OE - RE)_{end} - (OE - RE)_{beg}$

Net new equity =  $OE_{end} - OE_{beg} + RE_{beg} - RE_{end}$

$RE_{end} = RE_{beg} + \text{Additions to RE}$

$$\begin{aligned}\therefore \text{Net new equity} &= OE_{end} - OE_{beg} + RE_{beg} - (RE_{beg} + \text{Additions to RE}) \\ &= OE_{end} - OE_{beg} - \text{Additions to RE}\end{aligned}$$

$$\text{Net new equity} = \$42,677 - 42,124 - 1,182.98 = -\$629.98$$

Cash flow to stockholders = Dividends – Net new equity

Cash flow to stockholders = \$1,261 – (–\$629.98)

Cash flow to stockholders = \$1,890.98

As a check, cash flow from assets is –\$493.02

Cash flow from assets = Cash flow from creditors + Cash flow to stockholders

Cash flow from assets = –\$2,384 + 1,890.98

Cash flow from assets = –\$493.02

### Challenge

24. We will begin by calculating the operating cash flow. First, we need the EBIT, which can be calculated as:

EBIT = Net income + Current taxes + Deferred taxes + Interest

EBIT = \$192 + 84 + 13 + 41

EBIT = \$330

Now we can calculate the operating cash flow as:

#### *Operating cash flow*

|                                    |            |
|------------------------------------|------------|
| Earnings before interest and taxes | \$330      |
| Depreciation                       | 76         |
| Current taxes                      | <u>–84</u> |
| Operating cash flow                | \$322      |

The cash flow from assets is found in the investing activities portion of the accounting statement of cash flows, so:

*Cash flow from assets*

|                             |            |
|-----------------------------|------------|
| Acquisition of fixed assets | \$198      |
| Sale of fixed assets        | <u>-21</u> |
| Capital spending            | \$177      |

The net working capital cash flows are all found in the operations cash flow section of the accounting statement of cash flows. However, instead of calculating the net working capital cash flows as the change in net working capital, we must calculate each item individually. Doing so, we find:

*Net working capital cash flow*

|                     |           |
|---------------------|-----------|
| Cash                | \$29      |
| Accounts receivable | 16        |
| Inventories         | -17       |
| Accounts payable    | -13       |
| Accrued expenses    | 7         |
| Other               | <u>-2</u> |
| NWC cash flow       | \$20      |

Except for the interest expense, the cash flow to creditors is found in the financing activities of the accounting statement of cash flows. The interest expense from the income statement is given, so:

*Cash flow to creditors*

|                                      |             |
|--------------------------------------|-------------|
| Interest                             | \$41        |
| Retirement of debt                   | <u>150</u>  |
| Debt service                         | \$191       |
| Proceeds from sale of long-term debt | <u>-115</u> |
| Total                                | \$76        |

And we can find the cash flow to stockholders in the financing section of the accounting statement of cash flows. The cash flow to stockholders was:

*Cash flow to stockholders*

|                               |            |
|-------------------------------|------------|
| Dividends                     | \$ 81      |
| Repurchase of stock           | <u>11</u>  |
| Cash to stockholders          | \$ 92      |
| Proceeds from new stock issue | <u>-43</u> |
| Total                         | \$ 49      |

$$\begin{aligned}
 25. \text{ Net capital spending} &= \text{NFA}_{\text{end}} - \text{NFA}_{\text{beg}} + \text{Depreciation} \\
 &= (\text{NFA}_{\text{end}} - \text{NFA}_{\text{beg}}) + (\text{Depreciation} + \text{AD}_{\text{beg}}) - \text{AD}_{\text{beg}} \\
 &= (\text{NFA}_{\text{end}} - \text{NFA}_{\text{beg}}) + \text{AD}_{\text{end}} - \text{AD}_{\text{beg}} \\
 &= (\text{NFA}_{\text{end}} + \text{AD}_{\text{end}}) - (\text{NFA}_{\text{beg}} + \text{AD}_{\text{beg}}) = \text{FA}_{\text{end}} - \text{FA}_{\text{beg}}
 \end{aligned}$$

26. a. The tax bubble causes average tax rates to catch up to marginal tax rates, thus eliminating the tax advantage of low marginal rates for high income corporations.

- b. Assuming a taxable income of \$335,000, the taxes will be:

$$\text{Taxes} = .15(\$50\text{K}) + .25(\$25\text{K}) + .34(\$25\text{K}) + .39(\$235\text{K}) = \$113.9\text{K}$$

$$\text{Average tax rate} = \$113.9\text{K} / \$335\text{K} = 34\%$$

The marginal tax rate on the next dollar of income is 34 percent.

For corporate taxable income levels of \$335K to \$10M, average tax rates are equal to marginal tax rates.

$$\text{Taxes} = .34(\$10\text{M}) + .35(\$5\text{M}) + .38(\$3.333\text{M}) = \$6,416,667$$

$$\text{Average tax rate} = \$6,416,667 / \$18,333,334 = 35\%$$

The marginal tax rate on the next dollar of income is 35 percent. For corporate taxable income levels over \$18,333,334, average tax rates are again equal to marginal tax rates.

- c. Taxes = .34(\$200K) = \$68K = .15(\$50K) + .25(\$25K) + .34(\$25K) + X(\$100K);  
 X(\$100K) = \$68K – 22.25K = \$45.75K  
 X = \$45.75K / \$100K  
 X = .4575, or 45.75%

