

End of Chapter Solutions
Corporate Finance: Principles and Applications
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CHAPTER 1

INTRODUCTION TO CORPORATE FINANCE

Answers to Concept Questions

1. The three basic forms are sole proprietorships, partnerships, and corporations. Some disadvantages of sole proprietorships and partnerships are: unlimited liability, limited life, difficulty in transferring ownership, and hard to raise capital funds. Some advantages are: simpler, less regulation, the owners are also the managers, and sometimes personal tax rates are better than corporate tax rates. The primary disadvantage of the corporate form is the double taxation to shareholders on distributed earnings and dividends. Some advantages include: limited liability, ease of transferability, ability to raise capital, and unlimited life. When a business is started, most take the form of a sole proprietorship or partnership because of the relative simplicity of starting these forms of businesses.
2. To maximize the current market value (share price) of the equity of the firm (whether it's publicly traded or not).
3. 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.
4. 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.
5. 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.
6. 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, unethical 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?"
7. 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.

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8. 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.
9. 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. 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.
10. 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 that 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. When stock prices soar, management cleans 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.

CHAPTER 2

FINANCIAL STATEMENTS AND CASH FLOW

Answers to Concept Questions

1. Liquidity measures how quickly and easily an asset can be converted to cash without significant loss in value. It's desirable for firms to have high liquidity so that they have a large factor of safety in meeting short-term creditor demands. However, since liquidity also has an opportunity cost associated with it - namely that higher returns can generally be found by investing the cash into productive assets - low liquidity levels are also desirable to the firm. It's up to the firm's financial management staff to find a reasonable compromise between these opposing needs
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 statement of cash flows treats 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/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 operating 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 productively, not whether cash flow from assets is positive or negative.
7. It's probably not a good sign for an established company, but it would be fairly ordinary for a start-up, so it depends.

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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 it 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.

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	\$6,800	CL	\$5,400
NFA	<u>29,400</u>	LTD	13,100
		OE	<u>??</u>
TA	<u>\$36,200</u>	TL & OE	<u>\$36,200</u>

We know that total liabilities and owners' equity (TL & OE) must equal total assets of \$36,200. We also know that TL & OE is equal to current liabilities plus long-term debt plus owners' equity, so owners' equity is:

$$\text{Owners' equity} = \$36,200 - 13,100 - 5,400 = \$17,700$$

$$\text{NWC} = \text{CA} - \text{CL} = \$6,800 - 5,400 = \$1,400$$

2. The income statement for the company is:

<u>Income Statement</u>	
Sales	\$528,600
Costs	264,400
Depreciation	<u>41,700</u>
EBIT	\$222,500
Interest	<u>20,700</u>
EBT	\$201,800
Taxes (35%)	<u>70,630</u>
Net income	<u>\$131,170</u>

One equation for net income is:

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

Rearranging, we get:

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

$$\text{Addition to retained earnings} = \$131,170 - 27,000$$

$$\text{Addition to retained earnings} = \$104,170$$

3. To find the book value of current assets, we use the NWC equation, that is:

$$\text{NWC} = \text{CA} - \text{CL}$$

Rearranging to solve for current assets, we get:

$$\text{CA} = \text{NWC} + \text{CL}$$

$$\text{CA} = \$320,000 + 1,075,000$$

$$\text{CA} = \$1,395,000$$

So, the book value balance sheet will be:

<u>Book Value Balance Sheet</u>	
Current assets	\$1,395,000
Fixed assets	<u>3,900,000</u>
Total assets	<u>\$5,295,000</u>

The market value of current assets is given, so the market value balance sheet is:

<u>Market Value Balance Sheet</u>	
NWC	\$ 410,000
Fixed assets	<u>5,300,000</u>
Total assets	<u>\$5,710,000</u>

4. Taxes = .15(\$50,000) + .25(\$25,000) + .34(\$25,000) + .39(\$328,500 - 100,000)
 Taxes = \$111,365

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

$$\text{Average tax rate} = \$111,365 / \$328,500$$

$$\text{Average tax rate} = .3390, \text{ or } 33.90\%$$

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

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

Income Statement	
Sales	\$30,700
Costs	11,100
Depreciation expense	<u>2,100</u>
EBIT	\$17,500
Interest expense	<u>1,140</u>
EBT	\$16,360
Taxes (40%)	<u>6,544</u>
Net income	<u>\$ 9,816</u>

Using the equation for OCF, we get:

$$\begin{aligned} \text{OCF} &= \text{EBIT} + \text{Depreciation} - \text{Taxes} \\ \text{OCF} &= \$17,500 + 2,100 - 6,544 \\ \text{OCF} &= \$13,056 \end{aligned}$$

6. The net capital spending is the increase in fixed assets, plus depreciation, so:

$$\begin{aligned} \text{Net capital spending} &= \text{NFA}_{\text{end}} - \text{NFA}_{\text{beg}} + \text{Depreciation} \\ \text{Net capital spending} &= \$4,450,000 - 3,750,000 + 395,000 \\ \text{Net capital spending} &= \$1,095,000 \end{aligned}$$

7. The long-term debt account will increase by \$9.5 million, the amount of the new long-term debt issue. Since the company sold 4 million new shares of stock with a \$1 par value, the common stock account will increase by \$4 million. The capital surplus account will increase by \$22 million, the value of the new stock sold above its par value. Since the company had a net income of \$15.3 million, and paid \$3.1 million in dividends, the addition to retained earnings was \$12.2 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>\$ 46,500,000</u>
Total long-term debt	\$ 46,500,000

Shareholders' equity	
Preferred stock	\$ 2,100,000
Common stock (\$1 par value)	12,900,000
Capital surplus	63,000,000
Accumulated retained earnings	<u>87,500,000</u>
Total equity	\$ 165,500,000

8. The cash flow to creditors is the interest paid minus the change in long-term debt, so:

$$\begin{aligned} \text{Cash flow to creditors} &= \text{Interest paid} - \text{Net new borrowing} \\ \text{Cash flow to creditors} &= \$187,000 - (\text{LTD}_{\text{end}} - \text{LTD}_{\text{beg}}) \\ \text{Cash flow to creditors} &= \$187,000 - (\$2,530,000 - 2,400,000) \\ \text{Cash flow to creditors} &= \$57,000 \end{aligned}$$

9. The cash flow to stockholders is the dividends paid minus any new equity purchased by shareholders, so:

$$\begin{aligned} \text{Cash flow to stockholders} &= \text{Dividends paid} - \text{Net new equity} \\ \text{Cash flow to stockholders} &= \$270,000 - [(\text{Common}_{\text{end}} + \text{APIS}_{\text{end}}) - (\text{Common}_{\text{beg}} + \text{APIS}_{\text{beg}})] \\ \text{Cash flow to stockholders} &= \$270,000 - [(\$595,000 + 6,180,000) - (\$540,000 + 5,600,000)] \\ \text{Cash flow to stockholders} &= -\$365,000 \end{aligned}$$

Note: APIS is the additional paid-in surplus.

10. We know that the cash flow from assets must be equal to the cash flow to creditors plus the cash flow to stockholders, so:

$$\begin{aligned} \text{Cash flow from assets} &= \text{Cash flow to creditors} + \text{Cash flow to stockholders} \\ \text{Cash flow from assets} &= \$57,000 - 365,000 \\ \text{Cash flow from assets} &= -\$308,000 \end{aligned}$$

Now, we can use the relationship between the cash flow from assets and the operating cash flow, change in net working capital, and capital spending to find the operating cash flow. Doing so, we find:

$$\begin{aligned} \text{Cash flow from assets} &= -\$308,000 = \text{OCF} - \text{Change in NWC} - \text{Net capital spending} \\ -\$308,000 &= \text{OCF} - (-\$65,000) - 640,000 \\ \text{Operating cash flow} &= \$267,000 \end{aligned}$$

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:

<u>Statement of cash flows</u>	
<i>Operations</i>	
Net income	\$148
Depreciation	77
Changes in other current assets	-12
Change in accounts payable	<u>6</u>
Total cash flow from operations	<u>\$219</u>
 <i>Investing activities</i>	
Acquisition of fixed assets	<u>-\$211</u>
Total cash flow from investing activities	<u>-\$211</u>
 <i>Financing activities</i>	
Proceeds of long-term debt	\$44
Dividends	<u>-40</u>
Total cash flow from financing activities	<u>\$4</u>
 Change in cash (on balance sheet)	 <u>\$ 12</u>

- b. The change in net working capital is the ending net working capital minus the beginning net working capital, so:

$$\begin{aligned}
 \text{Change in NWC} &= \text{NWC}_{\text{end}} - \text{NWC}_{\text{beg}} \\
 &= (\text{CA}_{\text{end}} - \text{CL}_{\text{end}}) - (\text{CA}_{\text{beg}} - \text{CL}_{\text{beg}}) \\
 &= [(\$93 + 265) - 301] - [(\$81 + 253) - 295] \\
 &= \$57 - 39 \\
 &= \$18
 \end{aligned}$$

- c. To find the cash flow generated by the firm's assets, we need the operating cash flow, and the capital spending. Since there are no interest payments, EBIT is the same as EBT. Calculating each of these, we find:

<i>Operating cash flow</i>	
EBT	\$246
Depreciation	77
-Taxes	<u>98</u>
Operating cash flow	\$225

Next, we will calculate the capital spending, which is:

<i>Capital spending</i>	
Ending fixed assets	\$824
–Beginning fixed assets	690
Depreciation	<u>77</u>
Capital spending	\$211

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

<i>Cash flow from assets</i>	
Operating cash flow	\$225
–Capital spending	211
–Change in NWC	<u>18</u>
Cash flow from assets	–\$4

Notice that the accounting statement of cash flows shows a positive cash flow, but the financial cash flows show a negative cash flow. The financial cash flow is a better number for analyzing the firm's performance.

12. To construct the cash flow identity, we will begin cash flow from assets. Cash flow from assets is:

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

So, the operating cash flow is:

$$\begin{aligned} \text{OCF} &= \text{EBIT} + \text{Depreciation} - \text{Taxes} \\ \text{OCF} &= \$153,769 + 66,513 - 45,671 \\ \text{OCF} &= \$174,611 \end{aligned}$$

Next, we will calculate the change in net working capital which is:

$$\begin{aligned} \text{Change in NWC} &= \text{NWC}_{\text{end}} - \text{NWC}_{\text{beg}} \\ \text{Change in NWC} &= (\text{CA}_{\text{end}} - \text{CL}_{\text{end}}) - (\text{CA}_{\text{beg}} - \text{CL}_{\text{beg}}) \\ \text{Change in NWC} &= (\$66,284 - 32,978) - (\$57,026 - 29,342) \\ \text{Change in NWC} &= \$5,622 \end{aligned}$$

Now, we can calculate the capital spending. The capital spending is:

$$\begin{aligned} \text{Net capital spending} &= \text{NFA}_{\text{end}} - \text{NFA}_{\text{beg}} + \text{Depreciation} \\ \text{Net capital spending} &= \$498,312 - 415,289 + 66,513 \\ \text{Net capital spending} &= \$149,536 \end{aligned}$$

Now, we have the cash flow from assets, which is:

$$\begin{aligned} \text{Cash flow from assets} &= \text{OCF} - \text{Change in NWC} - \text{Net capital spending} \\ \text{Cash flow from assets} &= \$174,611 - 5,622 - 149,536 \\ \text{Cash flow from assets} &= \$19,453 \end{aligned}$$

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The company generated \$19,453 from its assets. The cash flow from operations was \$174,611, and the company spent \$5,622 on net working capital and \$149,536 in fixed assets.

The cash flow to creditors is:

$$\begin{aligned} \text{Cash flow to creditors} &= \text{Interest paid} - \text{New long-term debt} \\ \text{Cash flow to creditors} &= \text{Interest paid} - (\text{Long-term debt}_{\text{end}} - \text{Long-term debt}_{\text{beg}}) \\ \text{Cash flow to creditors} &= \$23,280 - (\$179,400 - 165,300) \\ \text{Cash flow to creditors} &= \$9,180 \end{aligned}$$

The cash flow to stockholders is a little trickier in this problem. First, we need to calculate the new equity sold. The equity balance increased during the year. The only way to increase the equity balance is to add addition to retained earnings or sell equity. To calculate the new equity sold, we can use the following equation:

$$\begin{aligned} \text{New equity} &= \text{Ending equity} - \text{Beginning equity} - \text{Addition to retained earnings} \\ \text{New equity} &= \$352,218 - 277,673 - 69,618 \\ \text{New equity} &= \$4,927 \end{aligned}$$

What happened was the equity account increased by \$74,545. Of this increase, \$69,618 came from addition to retained earnings, so the remainder must have been the sale of new equity. Now we can calculate the cash flow to stockholders as:

$$\begin{aligned} \text{Cash flow to stockholders} &= \text{Dividends paid} - \text{Net new equity} \\ \text{Cash flow to stockholders} &= \$15,200 - 4,927 \\ \text{Cash flow to stockholders} &= \$10,273 \end{aligned}$$

The company paid \$9,180 to creditors and \$10,273 to its stockholders.

Finally, the cash flow identity is:

$$\begin{array}{rcl} \text{Cash flow from assets} & = & \text{Cash flow to creditors} \quad + \quad \text{Cash flow to stockholders} \\ \$19,453 & = & \$4,927 \quad + \quad \$10,273 \end{array}$$

The cash flow identity balances, which is what we expect.

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

<i>Cash flows from the firm</i>	
Capital spending	-\$19,200
Additions to NWC	<u>-2,700</u>
Cash flows from the firm	-\$21,900

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

<i>Cash flows to investors of the firm</i>	
Sale of long-term debt	-\$16,500
Sale of common stock	-2,700
Dividends paid	<u>7,100</u>
Cash flows to investors of the firm	-\$12,100

14. 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	\$757,000
Cost of goods sold	249,800
Selling expenses	146,000
Depreciation expense	<u>87,000</u>
EBIT	\$274,200
Interest expense	<u>40,500</u>
EBT	\$233,700
Taxes	<u>81,795</u>
Net income	<u><u>\$151,905</u></u>

- b. And the operating cash flow is:

$$\begin{aligned} \text{OCF} &= \text{EBIT} + \text{Depreciation} - \text{Taxes} \\ \text{OCF} &= \$274,200 + 87,000 - 81,795 \\ \text{OCF} &= \$279,405 \end{aligned}$$

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

<u>Income Statement</u>	
Sales	\$225,000
Costs	103,200
Other expenses	6,100
Depreciation expense	<u>15,300</u>
EBIT	\$100,400
Interest expense	<u>11,200</u>
EBT	\$89,200
Taxes	<u>31,227</u>
Net income	<u><u>\$57,973</u></u>
Dividends	\$18,100
Addition to retained earnings	\$39,873

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- a. The operating cash flow was:

$$\begin{aligned}\text{OCF} &= \text{EBIT} + \text{Depreciation} - \text{Taxes} \\ \text{OCF} &= \$100,400 + 15,300 - 31,227 \\ \text{OCF} &= \$84,473\end{aligned}$$

- b. The cash flow to creditors is the interest paid minus any net new long-term debt, so:

$$\begin{aligned}\text{CFC} &= \text{Interest} - \text{Net new LTD} \\ \text{CFC} &= \$11,200 - (-\$8,500) \\ \text{CFC} &= \$19,700\end{aligned}$$

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

- c. The cash flow to stockholders is the dividends paid minus any net new equity, or:

$$\begin{aligned}\text{CFS} &= \text{Dividends} - \text{Net new equity} \\ \text{CFS} &= \$18,100 - 6,000 \\ \text{CFS} &= \$12,100\end{aligned}$$

- d. We know that $\text{CFA} = \text{CFC} + \text{CFS}$, so:

$$\begin{aligned}\text{CFA} &= \$19,700 + 12,100 \\ \text{CFA} &= \$31,800\end{aligned}$$

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

$$\begin{aligned}\text{Net capital spending} &= \text{Increase in NFA} + \text{Depreciation} \\ \text{Net capital spending} &= \$33,000 + 15,300 \\ \text{Net capital spending} &= \$48,300\end{aligned}$$

Now we can use:

$$\begin{aligned}\text{CFA} &= \text{OCF} - \text{Net capital spending} - \text{Change in NWC} \\ \$31,800 &= \$84,473 - 48,300 - \text{Change in NWC}\end{aligned}$$

Solving for the change in NWC yields \$4,373, meaning the company increased its NWC by \$4,373.

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

$$\begin{aligned}\text{Net income} &= \text{Dividends} + \text{Addition to retained earnings} \\ \text{Net income} &= \$5,200 + 8,100 \\ \text{Net income} &= \$13,300\end{aligned}$$

Now, looking at the income statement:

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

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

$$\begin{aligned} EBT &= NI / (1 - \text{Tax rate}) \\ EBT &= \$13,300 / (1 - .35) \\ EBT &= \$20,462 \end{aligned}$$

Now we can calculate:

$$\begin{aligned} EBIT &= EBT + \text{Interest} \\ EBIT &= \$20,462 + 2,050 \\ EBIT &= \$22,512 \end{aligned}$$

The last step is to use:

$$\begin{aligned} EBIT &= \text{Sales} - \text{Costs} - \text{Depreciation} \\ \$22,512 &= \$57,900 - 28,600 - \text{Depreciation} \\ \text{Depreciation} &= \$6,788 \end{aligned}$$

17. The balance sheet for the company looks like this:

<u>Balance Sheet</u>			
Cash	\$168,000	Accounts payable	\$429,000
Accounts receivable	237,000	Notes payable	<u>171,000</u>
Inventory	<u>385,000</u>	Current liabilities	\$600,000
Current assets	\$790,000	Long-term debt	<u>1,985,000</u>
		Total liabilities	\$2,585,000
Tangible net fixed assets	3,410,000	Common stock	??
Intangible net fixed assets	<u>827,000</u>	Accumulated ret. earnings	<u>2,084,000</u>
Total assets	<u>\$5,027,000</u>	Total liab. & owners' equity	<u>\$5,027,000</u>

Total liabilities and owners' equity is:

$$TL \ \& \ OE = CL + LTD + \text{Common stock}$$

Solving this equation for equity gives us:

$$\begin{aligned} \text{Common stock} &= \$5,027,000 - 2,084,000 - 2,585,000 \\ \text{Common stock} &= \$358,000 \end{aligned}$$

18. 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: $\text{Shareholders' equity} = \text{Max} [(TA - TL), 0]$. So, if TA is \$15,100, equity is equal to \$3,500, and if TA is \$9,900, equity is equal to \$0. We should note here that the book value of shareholders' equity can be negative.
19. a. $\begin{aligned} \text{Taxes Growth} &= .15(\$50,000) + .25(\$25,000) + .34(\$4,500) = \$15,280 \\ \text{Taxes Income} &= .15(\$50,000) + .25(\$25,000) + .34(\$25,000) + .39(\$235,000) \\ &\quad + .34(\$7,950,000 - 335,000) \\ &= \$2,703,000 \end{aligned}$

- 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.

20. a. The income statement for the company is:

Income Statement	
Sales	\$809,000
Costs	549,000
Administrative and selling expenses	136,000
Depreciation expense	85,000
EBIT	\$ 39,000
Interest expense	67,000
EBT	-\$28,000
Taxes	0
Net income	-\$28,000

- b. $OCF = EBIT + Depreciation - Taxes$
 $OCF = \$39,000 + 85,000 - 0$
 $OCF = \$124,000$

- 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.

21. 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 = $OCF - \text{Change in NWC} - \text{Net capital spending}$
 Cash flow from assets = $\$124,000 - 0 - 0 = \$124,000$

Cash flow to stockholders = $\text{Dividends} - \text{Net new equity}$
 Cash flow to stockholders = $\$75,000 - 0 = \$75,000$

Cash flow to creditors = $\text{Cash flow from assets} - \text{Cash flow to stockholders}$
 Cash flow to creditors = $\$124,000 - 75,000$
 Cash flow to creditors = $\$49,000$

Cash flow to creditors is also:

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

So:

Net new LTD = $\text{Interest} - \text{Cash flow to creditors}$
 Net new LTD = $\$67,000 - 49,000$
 Net new LTD = $\$18,000$

22. a. The income statement is:

<u>Income Statement</u>	
Sales	\$44,600
Cost of goods sold	27,500
Depreciation	<u>4,630</u>
EBIT	\$12,470
Interest	<u>1,050</u>
Taxable income	\$11,420
Taxes (40%)	<u>4,568</u>
Net income	<u><u>\$ 6,852</u></u>

b. $OCF = EBIT + Depreciation - Taxes$
 $OCF = \$12,470 + 4,630 - 4,568$
 $OCF = \$12,532$

c. $Change\ in\ NWC = NWC_{end} - NWC_{beg}$
 $= (CA_{end} - CL_{end}) - (CA_{beg} - CL_{beg})$
 $= (\$7,720 - 4,830) - (\$6,840 - 4,580)$
 $= \$630$

$Net\ capital\ spending = NFA_{end} - NFA_{beg} + Depreciation$
 $= \$35,610 - 27,510 + 4,630$
 $= \$12,730$

$CFA = OCF - Change\ in\ NWC - Net\ capital\ spending$
 $= \$12,532 - 630 - 12,730$
 $= -\$828$

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 \$828 in funds from its stockholders and creditors to make these investments.

d. $Cash\ flow\ to\ creditors = Interest - Net\ new\ LTD$
 $= \$1,050 - 0$
 $= \$1,050$

$Cash\ flow\ to\ stockholders = Cash\ flow\ from\ assets - Cash\ flow\ to\ creditors$
 $= -\$828 - 1,050$
 $= -\$1,878$

We can also calculate the cash flow to stockholders as:

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

Solving for net new equity, we get:

$Net\ new\ equity = \$2,275 - (-1,878)$
 $= \$4,153$

The firm had positive earnings in an accounting sense ($NI > 0$) and had positive cash flow from operations. The firm invested \$630 in new net working capital and \$12,730 in new fixed assets. The firm had to raise \$828 from its stakeholders to support this new investment. It accomplished this by raising \$4,153 in the form of new equity. After paying out \$2,275 of this in the form of dividends to shareholders and \$1,050 in the form of interest to creditors, \$828 was left to meet the firm's cash flow needs for investment.

$$\begin{aligned} 23. \quad a. \quad \text{Total assets 2016} &= \$1,066 + 5,184 = \$6,250 \\ \text{Total liabilities 2016} &= \$475 + 2,880 = \$3,355 \\ \text{Owners' equity 2016} &= \$6,250 - 3,355 = \$2,895 \end{aligned}$$

$$\begin{aligned} \text{Total assets 2017} &= \$1,145 + 5,472 = \$6,617 \\ \text{Total liabilities 2017} &= \$518 + 3,090 = \$3,608 \\ \text{Owners' equity 2017} &= \$6,617 - 3,608 = \$3,009 \end{aligned}$$

$$\begin{aligned} b. \quad \text{NWC 2016} &= CA_{2016} - CL_{2016} = \$1,066 - 475 = \$591 \\ \text{NWC 2017} &= CA_{2017} - CL_{2017} = \$1,145 - 518 = \$627 \\ \text{Change in NWC} &= \text{NWC}_{2017} - \text{NWC}_{2016} = \$627 - 591 = \$36 \end{aligned}$$

c. We can calculate net capital spending as:

$$\begin{aligned} \text{Net capital spending} &= \text{Net fixed assets 2017} - \text{Net fixed assets 2016} + \text{Depreciation} \\ \text{Net capital spending} &= \$5,472 - 5,184 + 1,339 \\ \text{Net capital spending} &= \$1,627 \end{aligned}$$

So, the company had a net capital spending cash flow of \$1,627. We also know that net capital spending is:

$$\begin{aligned} \text{Net capital spending} &= \text{Fixed assets bought} - \text{Fixed assets sold} \\ \$1,627 &= \$2,740 - \text{Fixed assets sold} \\ \text{Fixed assets sold} &= \$2,740 - 1,627 \\ \text{Fixed assets sold} &= \$1,113 \end{aligned}$$

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):

$$\begin{aligned} \text{EBIT} &= \text{Sales} - \text{Costs} - \text{Depreciation} \\ \text{EBIT} &= \$15,690 - 3,739 - 1,339 \\ \text{EBIT} &= \$10,612 \end{aligned}$$

$$\begin{aligned} \text{EBT} &= \text{EBIT} - \text{Interest} \\ \text{EBT} &= \$10,612 - 562 \\ \text{EBT} &= \$10,050 \end{aligned}$$

$$\begin{aligned} \text{Taxes} &= \text{EBT} \times .35 \\ \text{Taxes} &= \$10,050 \times .35 \\ \text{Taxes} &= \$3,518 \end{aligned}$$

$$\begin{aligned} \text{OCF} &= \text{EBIT} + \text{Depreciation} - \text{Taxes} \\ \text{OCF} &= \$10,612 + 1,339 - 3,518 \\ \text{OCF} &= \$8,434 \end{aligned}$$

$$\begin{aligned} \text{Cash flow from assets} &= \text{OCF} - \text{Change in NWC} - \text{Net capital spending} \\ \text{Cash flow from assets} &= \$8,434 - 36 - 1,627 \\ \text{Cash flow from assets} &= \$6,771 \end{aligned}$$

d. $\text{Net new borrowing} = \text{LTD}_{2017} - \text{LTD}_{2016}$
 $\text{Net new borrowing} = \$3,090 - 2,880$
 $\text{Net new borrowing} = \210

$$\begin{aligned} \text{Net new borrowing} &= \$210 = \text{Debt issued} - \text{Debt retired} \\ \text{Debt retired} &= \$634 - 210 \\ \text{Debt retired} &= \$424 \end{aligned}$$

$$\begin{aligned} \text{Cash flow to creditors} &= \text{Interest} - \text{Net new LTD} \\ \text{Cash flow to creditors} &= \$562 - 210 \\ \text{Cash flow to creditors} &= \$352 \end{aligned}$$

24.

<u>Balance sheet as of Dec. 31, 2016</u>			
Cash	\$21,364	Accounts payable	\$27,349
Accounts receivable	28,283		
Inventory	<u>50,287</u>	Long-term debt	71,550
Current assets	\$99,934		
Net fixed assets	<u>\$179,166</u>	Owners' equity	<u>180,201</u>
Total assets	<u>\$279,100</u>	Total liab. & equity	<u>\$279,100</u>
 <u>Balance sheet as of Dec. 31, 2017</u>			
Cash	\$21,856	Accounts payable	\$25,639
Accounts receivable	31,864		
Inventory	<u>51,675</u>	Long-term debt	83,476
Current assets	\$105,395		
Net fixed assets	<u>\$183,440</u>	Owners' equity	<u>179,720</u>
Total assets	<u>\$288,835</u>	Total liab. & equity	<u>\$288,835</u>

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<u>2016 Income Statement</u>		<u>2017 Income Statement</u>	
Sales	\$40,743.00	Sales	\$43,277.00
COGS	14,020.00	COGS	15,912.00
Other expenses	3,322.00	Other expenses	2,776.00
Depreciation	<u>5,853.00</u>	Depreciation	<u>5,858.00</u>
EBIT	\$17,548.00	EBIT	\$18,731.00
Interest	<u>2,098.00</u>	Interest	<u>3,142.00</u>
EBT	\$15,450.00	EBT	\$15,589.00
Taxes (35%)	<u>5,407.50</u>	Taxes (35%)	<u>5,456.15</u>
Net income	\$10,042.50	Net income	\$10,132.85
Dividends	\$4,966.00	Dividends	\$5,468.00
Additions to RE	\$5,076.50	Additions to RE	4,664.85

25. $OCF = EBIT + Depreciation - Taxes$

$$OCF = \$18,731 + 5,858 - 5,456.15$$

$$OCF = \$19,132.85$$

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

$$\text{Change in NWC} = (\$105,395 - 25,639) - (\$99,934 - 27,349)$$

$$\text{Change in NWC} = \$7,171$$

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

$$\text{Net capital spending} = \$183,440 - 179,166 + 5,858$$

$$\text{Net capital spending} = \$10,132$$

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

$$\text{Cash flow from assets} = \$19,132.85 - 7,171 - 10,132$$

$$\text{Cash flow from assets} = \$1,829.85$$

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

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

$$\text{Cash flow to creditors} = \$3,142 - (\$83,476 - 71,550)$$

$$\text{Cash flow to creditors} = -\$8,784$$

$$\text{Net new equity} = \text{Common stock}_{\text{end}} - \text{Common stock}_{\text{beg}}$$

$$\text{Common stock} + \text{Retained earnings} = \text{Total owners' equity}$$

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

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

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

$$\text{Net new equity} = OE_{\text{end}} - OE_{\text{beg}} + RE_{\text{beg}} - (RE_{\text{beg}} + \text{Additions to RE}_{2014})$$

$$\text{Net new equity} = OE_{\text{end}} - OE_{\text{beg}} - \text{Additions to RE}_{2014}$$

$$\text{Net new equity} = \$179,720 - 180,201 - 4,664.85$$

$$\text{Net new equity} = -\$5,145.85$$

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

$$\text{Cash flow to stockholders} = \$5,468 - (-\$5,145.85)$$

$$\text{Cash flow to stockholders} = \$10,613.85$$

As a check, cash flow from assets is \$1,829.85.

Cash flow from assets = Cash flow to creditors + Cash flow to stockholders
 Cash flow from assets = $-\$8,784 + 10,613.85$
 Cash flow from assets = \$1,829.85

Challenge

26. 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 = $\$321 + 185 + 34 + 96$
 EBIT = \$636

Now we can calculate the operating cash flow as:

Operating cash flow

Earnings before interest and taxes	\$636
Depreciation	177
– Current taxes	<u>185</u>
Operating cash flow	\$628

The net capital spending is found in the investing activities portion of the accounting statement of cash flows, so:

Net capital spending

Acquisition of fixed assets	\$332
– Sale of fixed assets	<u>42</u>
Capital spending	\$290

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	\$27
Accounts receivable	52
Inventories	–41
Accounts payable	–33
Accrued expenses	17
Other	<u>–4</u>
NWC cash flow	\$18

CHAPTER 2 B-18

Except for the interest expense and notes payable, 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	\$96
Retirement of debt	<u>195</u>
Debt service	\$291
– Proceeds from sale of long-term debt	<u>–105</u>
Total	\$186

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	\$158
Repurchase of stock	<u>26</u>
Cash to stockholders	\$184
– Proceeds from new stock issue	<u>–50</u>
Total	\$134

27. Net capital spending = $NFA_{end} - NFA_{beg} + \text{Depreciation}$
 = $(NFA_{end} - NFA_{beg}) + (\text{Depreciation} + AD_{beg}) - AD_{beg}$
 = $(NFA_{end} - NFA_{beg}) + AD_{end} - AD_{beg}$
 = $(NFA_{end} + AD_{end}) - (NFA_{beg} + AD_{beg}) = FA_{end} - FA_{beg}$

28. 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 \$335,001, the taxes will be:

$$\text{Taxes} = .15(\$50,000) + .25(\$25,000) + .34(\$25,000) + .39(\$235,000)$$

$$\text{Taxes} = \$113,900$$

$$\text{Average tax rate} = \$113,900 / \$335,000$$

$$\text{Average tax rate} = .34, \text{ or } 34\%$$

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

For corporate taxable income levels greater than \$18,333,334, average tax rates are equal to marginal tax rates.

$$\text{Taxes} = .34(\$10,000,000) + .35(\$5,000,000) + .38(\$3,333,334)$$

$$\text{Taxes} = \$6,416,667$$

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

$$\text{Average tax rate} = .35, \text{ or } 35\%$$

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.

$$\begin{aligned} \text{c. Taxes} &= .34(\$200,000) = \$68,000 \\ \$68,000 &= .15(\$50,000) + .25(\$25,000) + .34(\$25,000) + X(\$100,000) \\ X(\$100,000) &= \$68,000 - 22,250 = \$45,750 \\ X &= \$45,750 / \$100,000 \\ X &= .4575, \text{ or } 45.75\% \end{aligned}$$

sample

Case Solutions
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CHAPTER 1

EAST COAST YACHTS

1. An LLC (limited liability company) is essentially a hybrid form of a partnership (or sole proprietorship) and a corporation. The goal is to operate like a partnership or sole proprietorship, but have limited liability for the owner(s). The advantages to an LLC are: 1) Reduction of personal liability. A sole proprietor has unlimited liability, which can include the potential loss of all personal assets. 2) Taxes. Forming an LLC may mean that more expenses can be considered business expenses and be deducted from the company's income. 3) Improved credibility. The business may have increased credibility in the business world compared to a sole proprietorship 4) Ability to attract investment. Corporations, even LLCs, can raise capital through the sale of equity. 5) Continuous life. Sole proprietorships have a limited life, while corporations have a potentially perpetual life. 6) Transfer of ownership. It is easier to transfer ownership in a corporation through the sale of stock. 7) Potential for reduced agency problems compared to a corporation.

The biggest disadvantage is the potential cost, although the cost of forming an LLC can be relatively small. Another potential disadvantage is double taxation, which applies to corporations and LLCs, but can be avoided for the LLC if certain specific criteria are met. There are also other potential costs, including more expansive record-keeping.

2. Forming a corporation has the same advantages as forming an LLC, but the costs are likely to be higher.
3. As a small company, changing to an LLC is probably the most advantageous decision at the current time. If the company grows, and Larissa is willing to sell equity ownership, the company can reorganize as a corporation at a later date. Additionally, forming an LLC is likely to be less expensive than forming a corporation.

CHAPTER 2

CASH FLOWS AT EAST COAST YACHTS

The operating cash flow for the company is:

$$\begin{aligned}\text{OCF} &= \text{EBIT} + \text{Depreciation} - \text{Current taxes} \\ \text{OCF} &= \$87,531,900 + 19,958,400 - 30,512,400 \\ \text{OCF} &= \$76,877,900\end{aligned}$$

To calculate the cash flow from assets, we need to find the capital spending and change in net working capital. The capital spending for the year was:

Capital spending

Ending net fixed assets	\$350,435,700
– Beginning net fixed assets	317,612,300
+ Depreciation	<u>19,958,400</u>
Net capital spending	\$52,781,800

Alternatively, the company purchased \$59.5 million in fixed assets and sold \$6,718,200, for a total capital spending of \$52,781,800.

And the change in net working capital was:

Change in net working capital

Ending NWC	\$538,300
– Beginning NWC	<u>–1,142,400</u>
Change in NWC	\$1,680,700

So, the cash flow from assets was:

Cash flow from assets

Operating cash flow	\$76,877,900
– Net capital spending	52,781,800
– Change in NWC	<u>1,680,700</u>
Cash flow from assets	\$22,415,400

The cash flow to creditors was:

Cash flow to creditors

Interest	\$11,000,900
Retirement of debt	<u>22,600,000</u>
Debt service	\$33,600,900
– Proceeds from sale of long-term debt	<u>–40,000,000</u>
Total	–\$6,399,100

Alternatively

Beginning long-term debt	\$151,860,000
Ending long-term debt	169,260,000
Interest	<u>11,000,900</u>
Total	–\$6,399,100

The cash flow to stockholders was:

Cash flow to stockholders

Dividends	\$17,374,500
Repurchase of stock	<u>35,640,000</u>
Cash to stockholders	\$53,014,500
– Proceeds from new stock issue	<u>24,200,000</u>
Total	\$28,814,500

Alternatively

Beginning total equity	\$164,609,900
– Ending total equity	181,714,000
Dividends	17,374,500
Retained earnings	<u>28,544,100</u>
Total	\$28,814,500

And the cash flow identity was:

$$\begin{array}{rcl}
 \text{Cash flow from assets} & = & \text{Cash flow to creditors} + \text{Cash flow to stockholders} \\
 \$22,415,400 & = & -\$6,399,100 \quad + \quad 28,814,500
 \end{array}$$

C - 4 CASE SOLUTIONS

The accounting statement of cash flows for the year was:

Accounting Statement of Cash Flows	
Operations	
Net income	\$45,918,600
Depreciation	19,958,400
Changes in assets and liabilities	
Accounts receivable	243,300
Inventories	-3,059,550
Accounts payable	979,350
Accrued expenses	705,900
Other	-74,500
Total cash flow from operations	<u>\$64,671,500</u>
Investing activities	
Acquisition of fixed assets	-\$59,500,000
Sale of fixed assets	6,718,200
Total cash flow from investing activities	<u>-\$52,781,800</u>
Financing activities	
Retirement of debt	-\$22,600,000
Proceeds of long-term debt	40,000,000
Dividends	-17,374,500
Repurchase of stock	-35,640,000
Proceeds from new stock issues	24,200,000
Total cash flow from financing activities	<u>-\$11,414,500</u>
Change in cash (on balance sheet)	<u>\$475,200</u>

Answers to questions

1. The firm had positive earnings in an accounting sense ($NI > 0$) and had positive cash flow from operations. The firm invested \$1,680,700 in new net working capital and \$52,781,800 in new fixed assets. The firm received \$6,399,100 from its creditors, and paid \$28,814,500 to its stockholders.
2. The financial cash flows statement presents a more accurate picture of the company since it accurately reflects interest cash flows as a financing decision rather than an operating decision.
3. The expansion plans look like they are probably a good idea since the company appears to have fairly strong operating cash flow, although the company already invested a significant amount in fixed assets during the past year. This decision will be discussed in more detail later in the book.

CHAPTER 3

RATIOS AND FINANCIAL PLANNING AT EAST COAST YACHTS

1. Preferred stock has features of both debt and equity. Preferred shareholders receive a stated dividend, and, if the corporation is liquidated, preferred shareholders get a stated value. Often, preferred stocks carry credit ratings much like those of bonds. Furthermore, preferred stock is sometimes convertible into common stock, and preferred stocks are often callable.

In addition, many issues of preferred stock have obligatory sinking funds. The existence of such a sinking fund effectively creates a final maturity because it means that the entire issue will ultimately be retired. For these reasons, preferred stock seems to be a lot like debt. However, for tax purposes, preferred dividends are treated like common stock dividends.

Whether preferred stock is equity or debt is debatable. Never the less, we will include preferred stock in the company's total equity. As a practical matter, since preferred stock makes up about one percent of the total equity, it will make little difference in this case.

2. The calculations for the ratios listed are:

Current ratio = Current assets/Current liabilities

Current ratio = $\$51,123,050/\$50,584,750$

Current ratio = 1.01 times

Quick ratio = (Current assets – Inventory)/Current liabilities

Quick ratio = $(\$51,123,050 - 20,149,650)/\$50,584,750$

Quick ratio = .61 times

Total asset turnover = Sales/Total assets

Total asset turnover = $\$611,582,000/\$401,558,750$

Total asset turnover = 1.52 times

Inventory turnover = COGS/Inventory

Inventory turnover = $\$431,006,000/\$20,149,650$

Inventory turnover = 21.39 times

Receivables turnover = Sales/Accounts receivable

Receivables turnover = $\$611,582,000/\$18,681,500$

Receivables turnover = 32.74 times

Total debt ratio = (Total assets – Total equity)/Total assets

Total debt ratio = $(\$401,558,750 - 181,714,000)/\$401,558,750$

Total debt ratio = .55 times

Debt-equity ratio = (Current liabilities + Long-term debt)/Total equity
 Debt-equity ratio = $(\$50,584,750 + 169,260,000)/\$181,714,000$
 Debt-equity ratio = 1.21 times

Equity multiplier = Total assets/Total equity
 Equity multiplier = $\$401,558,750/\$181,714,000$
 Equity multiplier = 2.21 times

Interest coverage = EBIT/Interest
 Interest coverage = $\$87,531,900/\$11,000,900$
 Interest coverage = 7.96 times

Profit margin = Net income/Sales
 Profit margin = $\$45,918,600/\$611,582,000$
 Profit margin = .0751, or 7.51%

Return on assets = Net income/Total assets
 Return on assets = $\$45,918,600/\$401,558,750$
 Return on assets = .1144, or 11.44%

Return on equity = Net income/Total equity
 Return on equity = $\$45,918,600/\$181,714,000$
 Return on equity = .2527, or 25.27%

3. Regarding the liquidity ratios, East Coast Yachts' current ratio is below the median industry ratio. This implies the company has less liquidity than the industry in general. However, the current ratio is above the lower quartile, so there are companies in the industry with lower liquidity than East Coast Yachts. The company may have more predictable cash flows, or more access to short-term borrowing.

The turnover ratios are all higher than the industry median; in fact, all three turnover ratios are above the upper quartile. This may mean that East Coast Yachts is more efficient than the industry in using its assets to generate sales.

The financial leverage ratios are all at or above the industry median, but below the upper quartile. East Coast Yachts generally has more debt than comparable companies, but is still within the normal range. The exceptions are the interest coverage ratio, which is only slightly below the industry median, and the debt ratio, which is essentially equal to the industry median.

The profit margin for the company is about the same as the industry median, the ROA is slightly higher than the industry median, and the ROE is well above the industry median. East Coast Yachts seems to be performing well in the profitability area.

Overall, East Coast Yachts' performance seems good, although the liquidity ratios indicate that a closer look may be needed in this area.

Below is a list of possible reasons why it may be good or bad that each ratio is higher or lower than the industry. Note that the list is not exhaustive, but merely one possible explanation for each ratio.

C-8 CASE SOLUTIONS

Ratio	Good	Bad
Current ratio	Better at managing current accounts.	May be having liquidity problems.
Quick ratio	Better at managing current accounts.	May be having liquidity problems.
Total asset turnover	Better at utilizing assets.	Assets may be older and depreciated, requiring extensive investment soon.
Inventory turnover	Better at inventory management, possibly due to better procedures.	Could be experiencing inventory shortages.
Receivables turnover	Better at collecting receivables.	May have credit terms that are too strict. Decreasing receivables turnover may increase sales.
Total debt ratio	Less debt than industry median means the company is less likely to experience credit problems.	Increasing the amount of debt can increase shareholder returns. Especially notice that it will increase ROE.
Debt-equity ratio	Less debt than industry median means the company is less likely to experience credit problems.	Increasing the amount of debt can increase shareholder returns. Especially notice that it will increase ROE.
Equity multiplier	Less debt than industry median means the company is less likely to experience credit problems.	Increasing the amount of debt can increase shareholder returns. Especially notice that it will increase ROE.
Interest coverage	Less debt than industry median means the company is less likely to experience credit problems.	Increasing the amount of debt can increase shareholder returns. Especially notice that it will increase ROE.
Profit margin	The PM is slightly above the industry median, so it is performing better than many peers.	May be able to better control costs.
ROA	Company is performing above many of its peers.	Assets may be old and depreciated relative to industry.
ROE	Company is performing above many of its peers.	Profit margin and EM could still be increased, which would further increase ROE.

If you created an Inventory to Current liabilities ratio, East Coast Yachts would have a ratio that is lower than the industry median. The current ratio and quick ratio are both below the industry median. This implies that East Coast Yachts also has less inventory to current liabilities than the industry median.

4. To calculate the sustainable growth rate, we first need to find the ROE and the retention ratio, so:

$$\text{ROE} = \text{NI/TE}$$

$$\text{ROE} = \$45,918,600/\$181,714,000$$

$$\text{ROE} = .2527, \text{ or } 25.27\%$$

C-10 CASE SOLUTIONS

$b = \text{Addition to RE/NI}$

$b = \$28,544,100/\$45,918,600$

$b = .62$, or 62%

So, the sustainable growth rate is:

Sustainable growth rate = $(\text{ROE} \times b)/[1 - (\text{ROE} \times b)]$

Sustainable growth rate = $[\.2527(.62)]/[1 - .2527(.62)]$

Sustainable growth rate = .1864, or 18.64%

The sustainable growth rate is the growth rate the company can achieve with no external financing while maintaining a constant debt-equity ratio.

At the sustainable growth rate, the pro forma statements next year will be:

<i>Income statement</i>	
Sales	\$725,553,856
COGS	511,326,470
Other expenses	86,705,644
Depreciation	19,958,400
EBIT	\$107,563,341
Interest	11,000,900
Taxable income	\$96,562,441
Taxes (40%)	38,624,977
Net income	\$57,937,465
Dividends	\$21,922,151
Add to RE	\$36,015,314

Balance Sheet

Assets		Liabilities & Equity	
Current assets		Current liabilities	
Cash and equivalents	\$13,191,921	Accounts payable	\$52,747,218
Accounts receivable	22,162,906	Accrued expenses	<u>6,123,200</u>
Inventory	23,904,654	Total current liabilities	\$58,870,418
Other	<u>1,390,646</u>		
Total current assets	\$60,650,127		
		Long-term debt	\$169,260,000
Fixed assets	<u>\$415,741,427</u>	Stockholders' equity	
		Preferred stock	\$1,970,000
		Common stock	37,583,700
		Capital surplus	28,116,300
		Accumulated RE	197,579,314
		Less treasury stock	<u>(47,520,000)</u>
		Total equity	<u>\$217,729,314</u>
Total assets	<u><u>\$476,391,554</u></u>	Total liabilities and shareholders' equity	<u><u>\$445,859,732</u></u>

So, the EFN is:

EFN = Total assets – Total liabilities and equity

EFN = \$476,391,554 – 445,859,732

EFN = \$30,531,822

The ratios with these pro forma statements are:

Current ratio = Current assets/Current liabilities

Current ratio = \$60,650,127/\$58,870,418

Current ratio = 1.03 times

Quick ratio = (Current assets – Inventory)/Current liabilities

Quick ratio = (\$60,650,127 – 23,904,654)/\$58,870,418

Quick ratio = .62 times

Total asset turnover = Sales/Total assets

Total asset turnover = \$725,553,856/\$476,391,554

Total asset turnover = 1.52 times

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Inventory turnover = $\text{COGS}/\text{Inventory}$

Inventory turnover = $\$511,326,470/\$23,904,654$

Inventory turnover = 21.39 times

Receivables turnover = $\text{Sales}/\text{Accounts receivable}$

Receivables turnover = $\$725,553,856/\$22,162,906$

Receivables turnover = 32.74 times

Total debt ratio = $(\text{Total assets} - \text{Total equity})/\text{Total assets}$

Total debt ratio = $(\$476,391,554 - 217,729,314)/\$476,391,554$

Total debt ratio = .54 times

Debt-equity ratio = $(\text{Current liabilities} + \text{Long-term debt})/\text{Total equity}$

Debt-equity ratio = $(\$58,870,418 + 169,260,000)/\$217,729,314$

Debt-equity ratio = 1.05 times

Equity multiplier = $\text{Total assets}/\text{Total equity}$

Equity multiplier = $\$476,391,554/\$217,729,314$

Equity multiplier = 2.19 times

Interest coverage = $\text{EBIT}/\text{Interest}$

Interest coverage = $\$107,563,341/\$11,000,900$

Interest coverage = 9.78 times

Profit margin = $\text{Net income}/\text{Sales}$

Profit margin = $\$57,937,465/\$725,553,856$

Profit margin = .0799, or 7.99%

Return on assets = $\text{Net income}/\text{Total assets}$

Return on assets = $\$57,937,465/\$476,391,554$

Return on assets = .1216, or 12.16%

Return on equity = $\text{Net income}/\text{Total equity}$

Return on equity = $\$57,937,465/\$217,729,314$

Return on equity = .2661, or 26.61%

The current and quick ratios increase slightly since we are assuming accrued expenses remain constant, while all current assets increase spontaneously with sales. The asset utilization ratios remain constant since all inputs vary directly with sales, and the leverage ratios all change since we are assuming debt and equity do not vary directly with sales. The profitability ratios increase since we are assuming depreciation and interest expense do not increase spontaneously with sales.

It should be noted that the calculation of the ratios in this case is somewhat problematic since the balance sheet does not balance. For example, the equity multiplier is no longer one plus the debt-equity ratio. However, the company can increase both the debt and equity in such a way as to maintain the ratios at the current levels.

5. Pro forma financial statements for next year at a 20 percent growth rate are:

<i>Income statement</i>	
Sales	\$733,898,400
COGS	517,207,200
Other expenses	87,702,840
Depreciation	<u>19,958,400</u>
EBIT	\$109,029,960
Interest	<u>11,000,900</u>
Taxable income	\$98,029,060
Taxes (40%)	<u>39,211,624</u>
Net income	<u>\$58,817,436</u>
Dividends	\$22,255,111
Add to RE	\$36,562,325

<i>Balance Sheet</i>			
Assets		Liabilities & Equity	
Current assets		Current liabilities	
Cash and equivalents	\$13,343,640	Accounts payable	\$53,353,860
Accounts receivable	22,417,800	Accrued expenses	<u>6,123,200</u>
Inventory	24,179,580	Total current liabilities	\$59,477,060
Other	<u>1,406,640</u>		
Total current assets	\$61,347,660	Long-term debt	\$169,260,000
		Stockholders' equity	
Fixed assets	<u>\$420,522,840</u>	Preferred stock	\$1,970,000
		Common stock	37,583,700
		Capital surplus	28,116,300
		Accumulated RE	198,126,325
		Less treasury stock	<u>(47,520,000)</u>
		Total equity	<u>\$218,276,325</u>
		Total liabilities and	
Total assets	<u><u>\$481,870,500</u></u>	shareholders' equity	<u><u>\$447,013,385</u></u>

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So, the EFN is:

$$\begin{aligned} \text{EFN} &= \text{Total assets} - \text{Total liabilities and equity} \\ \text{EFN} &= \$481,870,500 - 447,013,385 \\ \text{EFN} &= \$34,857,115 \end{aligned}$$

To achieve the 20 percent growth rate without new external equity, the company will need to change its payout ratio or change its capital structure by increasing its long-term debt.

6. Now we are assuming the company can only build in amounts of \$95 million. We will assume that the company will go ahead with the fixed asset acquisition. In this case, the pro forma financial statement calculation will change slightly. Before, we made the assumption that depreciation increased proportionally with sales, which makes sense if fixed assets increase proportionally with sales. This is not the case now. To estimate the new depreciation charge, we will find the current depreciation as a percentage of fixed assets, then apply this percentage to the new fixed assets. The depreciation as a percentage of assets this year was:

$$\begin{aligned} \text{Depreciation percentage} &= \$19,958,400 / \$350,435,700 \\ \text{Depreciation percentage} &= .0570, \text{ or } 5.70\% \end{aligned}$$

The new level of fixed assets with the \$95 million purchase will be:

$$\begin{aligned} \text{New fixed assets} &= \$350,435,700 + 95,000,000 \\ \text{New fixed assets} &= \$445,435,700 \end{aligned}$$

So, the pro forma depreciation as a percentage of sales will be:

$$\begin{aligned} \text{Pro forma depreciation} &= .0570(\$445,435,700) \\ \text{Pro forma depreciation} &= \$25,368,945 \end{aligned}$$

We will use this amount in the pro forma income statement. So, the pro forma income statement will be:

<i>Income statement</i>	
Sales	\$733,898,400
COGS	517,207,200
Other expenses	87,702,840
Depreciation	<u>25,368,945</u>
EBIT	\$103,619,415
Interest	<u>11,000,900</u>
Taxable income	\$92,618,515
Taxes (40%)	<u>37,047,406</u>
Net income	<u><u>\$55,571,109</u></u>
Dividends	\$21,026,779
Add to RE	\$34,544,331

The pro forma balance sheet will remain the same except for the fixed asset and equity accounts. The fixed asset account will increase by \$95 million, rather than the growth rate of sales.

Balance Sheet

Assets	Liabilities & Equity
Current assets	Current liabilities
Cash and equivalents	Accounts payable
\$13,343,640	\$53,353,860
Accounts receivable	Accrued expenses
22,417,800	<u>6,123,200</u>
Inventory	Total current liabilities
24,179,580	\$59,477,060
Other	
1,406,640	
<u>Total current assets</u>	
\$61,347,660	
	Long-term debt
	\$169,260,000
	Stockholders' equity
Fixed assets	Preferred stock
<u>\$445,435,700</u>	\$1,970,000
	Common stock
	37,583,700
	Capital surplus
	28,116,300
	Accumulated RE
	196,108,331
	Less treasury stock
	<u>(47,520,000)</u>
	Total equity
	<u>\$216,258,331</u>
	Total liabilities and
Total assets	shareholders' equity
<u><u>\$506,783,360</u></u>	<u><u>\$444,995,391</u></u>

So, the EFN is:

$$\text{EFN} = \text{Total assets} - \text{Total liabilities and equity}$$

$$\text{EFN} = \$506,783,360 - 444,995,391$$

$$\text{EFN} = \$61,787,969$$

Since the fixed assets have increased at a faster percentage than sales, the capacity utilization for next year will decrease.

CHAPTER 4

THE MBA DECISION

1. Age is obviously an important factor. The younger an individual is, the more time there is for the (hopefully) increased salary to offset the cost of the decision to return to school for an MBA. The cost includes both the explicit costs such as tuition, as well as the opportunity cost of the lost salary.
2. Perhaps the most important nonquantifiable factors would be whether or not he is married and if he has any children. With a spouse and/or children, he may be less inclined to return for an MBA (especially full-time) since his family may be less amenable to the time and money constraints imposed by classes. Other factors would include his willingness and desire to pursue an MBA, job satisfaction, and how important the prestige of a job is to him, regardless of the salary.
3. He has three choices: remain at his current job, pursue a Wilton MBA, or pursue a Mt. Perry MBA. We need to find the aftertax value of each, so:

Remain at current job:

$$\text{Aftertax salary} = \$57,000(1 - .26) = \$42,180$$

His salary will grow at 3 percent per year, so the present value of his aftertax salary is:

$$\text{PV} = C \left[\frac{1 - \left(\frac{1+g}{1+r} \right)^t}{r-g} \right]$$
$$\text{PV} = \$42,180 \left[\frac{1 - \left(\frac{1+.03}{1+.061} \right)^{40}}{.061 - .03} \right]$$
$$\text{PV} = \$945,099.73$$

Wilton MBA:

The direct costs of attending Wilton are the costs of tuition, books and other supplies, health insurance costs, and the increased room and board expenses. The present value of the direct costs are:

$$\text{PV of direct expenses} = (\$63,000 + 2,500 + 3,000 + 2,000) \\ + (\$63,000 + 2,500 + 3,000 + 2,000)/1.061$$

$$\text{PV of direct costs} = \$136,946.75$$

We also need to account for the gain, that is the present value of his future salary, plus bonus, so:

$$\text{PV of aftertax bonus paid in two years} = \$18,000(1 - .31)/1.061^2 = \$11,032.93$$

His aftertax salary will be:

$$\text{Aftertax salary} = \$105,000(1 - .31) = \$72,450$$

His salary will grow at 4 percent per year. We must also remember that he will now only work for 38 years, so the present value of his aftertax salary is:

$$PV = C \left[\frac{1 - \left(\frac{1+g}{1+r} \right)^t}{r-g} \right]$$

$$PV = \$72,450 \left[\frac{1 - \left(\frac{1 + .04}{1 + .061} \right)^{38}}{.061 - .04} \right]$$

$$PV = \$1,836,007.92$$

Since the first salary payment will be received three years from today, we need to discount this for two years to find the value today, which will be:

$$PV = \$1,836,007.92/1.061^2$$

$$PV = \$1,630,961.77$$

So, the total value of a Wilton MBA is:

$$\text{Value} = -\$136,946.75 + 11,032.93 + 1,630,961.77 = \$1,505,047.95$$

Mount Perry MBA:

Costs:

$$\text{Total direct costs} = \$75,000 + 3,500 + 3,000 + 2,000 = \$83,500$$

Note, this is also the PV of the direct costs since they are all paid today.

Salary:

$$\text{PV of aftertax bonus paid in 1 year} = \$15,000(1 - .29)/1.061 = \$10,037.70$$

$$\text{Aftertax salary} = \$88,000(1 - .29) = \$62,480$$

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His salary will grow at 3.5 percent per year. We must also remember that he will now only work for 39 years, so the present value of his aftertax salary is:

$$PV = C \left[\frac{1 - \left(\frac{1+g}{1+r}\right)^t}{r-g} \right]$$

$$PV = \$62,480 \left[\frac{1 - \left(\frac{1 + .035}{1 + .061}\right)^{39}}{.061 - .035} \right]$$

$$PV = \$1,489,928.56$$

This is the value of his salary in one year since the first salary payment will be received two years from today. We need to discount this for one year to find the value today, which will be:

$$PV = \$1,489,928.56/1.061$$

$$PV = \$1,404,268.20$$

So, the total value of a Mount Perry MBA is:

$$\text{Value} = -\$83,500 + 10,037.70 + 1,404,268.20 = \$1,330,805.90$$

4. He is somewhat correct. Calculating the future value of each decision will result in the option with the highest present value having the highest future value. Thus, a future value analysis will result in the same decision. However, his statement that a future value analysis is the appropriate method is wrong since a present value analysis will give the same correct answer as well.
5. To find the salary offer he would need to make the Wilton MBA as financially attractive as the current job, we need to take the PV of his current job, add the costs of attending Wilton, and the PV of the bonus on an aftertax basis. So, the necessary PV to make the Wilton MBA the same as his current job will be:

$$PV = \$945,099.73 = -\$136,946.75 + 11,032.93 + \text{PV of salary}$$

$$\text{PV of salary} = \$1,071,013.55$$

This PV will make his current job exactly equal to the Wilton MBA on a financial basis. So, the present value of the salary in two years when he graduates must be:

$$\text{Value in 2 years} = \text{Value today}(1 + r)^2$$

$$\text{Value in 2 years} = \$1,071,013.55(1 + .061)^2$$

$$\text{Value in 2 years} = \$1,205,662.44$$

Now, we solve for the first salary payment using the growing annuity equation. Doing so, we find:

$$PV = C \left[\frac{1 - \left(\frac{1+g}{1+r}\right)^t}{r-g} \right]$$

$$\$1,205,662.44 = C \left[\frac{1 - \left(\frac{1 + .04}{1 + .061}\right)^{38}}{.061 - .04} \right]$$

$$C = \$47,576.18$$

This is the aftertax salary. So, the pretax salary must be:

$$\text{Pretax salary} = \$47,576.18 / (1 - .31)$$

$$\text{Pretax salary} = \$68,950.99$$

6. The cost (interest rate) of the decision depends on the riskiness of the use of funds, not the source of the funds. Therefore, whether he can pay cash or must borrow is irrelevant. This is an important concept which will be discussed further in capital budgeting and the cost of capital in later chapters.

SAMPLE