
CHAPTER 2

FINANCIAL STATEMENTS, TAXES, AND CASH FLOW

Answers to Concepts Review and Critical Thinking 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. Historical costs can be objectively and precisely measured whereas market values can be difficult to estimate, and different analysts would come up with different numbers. Thus, there is a trade-off between relevance (market values) and objectivity (book values).
4. Depreciation is a noncash deduction that reflects adjustments made in asset book values in accordance with the matching principle in financial accounting. Interest expense is a cash outlay, but it's a financing cost, not an operating cost.
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, 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 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 that 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, 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 derivatives.
11. Enterprise value is the theoretical takeover price. In the event of a takeover, an acquirer would have to take on the company's debt but would pocket its cash. Enterprise value differs significantly from simple market capitalization in several ways, and it may be a more accurate representation of a firm's value. In a takeover, the value of a firm's debt would need to be paid by the buyer. Thus, enterprise value provides a much more accurate takeover valuation because it includes debt in its value calculation.
12. In general, it appears that investors prefer companies that have a steady earnings stream. If true, this encourages companies to manage earnings. Under GAAP, there are numerous choices for the way a company reports its financial statements. Although not the reason for the choices under GAAP, one outcome is the ability of a company to manage earnings, which is not an ethical decision. Even though earnings and cash flow are often related, earnings management should have little effect on cash flow (except for tax implications). If the market is "fooled" and prefers steady earnings, shareholder wealth can be increased, at least temporarily. However, given the questionable ethics of this practice, the company (and shareholders) will lose value if the practice is discovered.

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>27,300</u>		LTD	10,200
			OE	<u>??</u>
TA	<u>\$32,200</u>		TL & OE	<u>\$32,200</u>

We know that total liabilities and owners' equity (TL & OE) must equal total assets of \$32,200. We also know that TL & OE is equal to current liabilities plus long-term debt plus owners' equity, so owners' equity is:

$$\text{Owners' equity} = \$32,200 - 10,200 - 4,100 = \$17,900$$

$$\text{NWC} = \text{CA} - \text{CL} = \$4,900 - 4,100 = \$800$$

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2. The income statement for the company is:

<u>Income Statement</u>	
Sales	\$796,000
Costs	327,000
Depreciation	42,000
EBIT	\$427,000
Interest	34,000
EBT	\$393,000
Taxes (21%)	82,530
Net income	<u>\$310,470</u>

3. One equation for net income is:

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

Rearranging, we get:

$$\text{Addition to retained earnings} = \text{Net income} - \text{Dividends} = \$310,470 - 95,000 = \$215,470$$

4. $\text{EPS} = \text{Net income}/\text{Shares} = \$310,470/80,000 = \$3.88$ per share

$$\text{DPS} = \text{Dividends}/\text{Shares} = \$95,000/80,000 = \$1.19$$
 per share

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

<u>Income Statement</u>	
Sales	\$46,200
Costs	23,100
Depreciation	2,200
EBIT	\$20,900
Interest	1,700
Taxable income	\$19,200
Taxes (22%)	4,224
Net income	<u>\$14,976</u>

$$\text{OCF} = \text{EBIT} + \text{Depreciation} - \text{Taxes} = \$20,900 + 2,200 - 4,224 = \$18,876$$

6. $\text{Net capital spending} = \text{NFA}_{\text{end}} - \text{NFA}_{\text{beg}} + \text{Depreciation}$
Net capital spending = \$3,300,000 - 2,400,000 + 319,000
Net capital spending = \$1,219,000

7. $\text{Change in NWC} = \text{NWC}_{\text{end}} - \text{NWC}_{\text{beg}}$
 $\text{Change in NWC} = (\text{CA}_{\text{end}} - \text{CL}_{\text{end}}) - (\text{CA}_{\text{beg}} - \text{CL}_{\text{beg}})$
Change in NWC = (\$5,360 - 2,970) - (\$4,810 - 2,230)
Change in NWC = \$2,390 - 2,580 = -\$190

8. $\text{Cash flow to creditors} = \text{Interest paid} - \text{Net new borrowing}$
Cash flow to creditors = Interest paid - (LTD_{end} - LTD_{beg})
Cash flow to creditors = \$255,000 - (\$2,210,000 - 1,870,000)
Cash flow to creditors = -\$85,000

9. Cash flow to stockholders = Dividends paid – Net new equity
 Cash flow to stockholders = Dividends paid – [(Common_{end} + APIS_{end}) – (Common_{beg} + APIS_{beg})]
 Cash flow to stockholders = \$545,000 – [(\$805,000 + 4,200,000) – (\$650,000 + 3,980,000)]
 Cash flow to stockholders = \$170,000

Note, APIS is the additional paid-in surplus.

10. Cash flow from assets = Cash flow to creditors + Cash flow to stockholders
 = –\$85,000 + 170,000 = \$85,000

$$\begin{aligned} \text{Cash flow from assets} &= \$85,000 = \text{OCF} - \text{Change in NWC} - \text{Net capital spending} \\ &= \$85,000 = \text{OCF} - (-\$45,000) - 1,250,000 \end{aligned}$$

$$\text{Operating cash flow} = \$85,000 - 45,000 + 1,250,000$$

$$\text{Operating cash flow} = \$1,290,000$$

Intermediate

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

$$\text{CA} = \text{NWC} + \text{CL} = \$235,000 + 895,000 = \$1,130,000$$

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

Book value CA	= \$1,130,000	Market value CA	= \$1,150,000
Book value NFA	= <u>3,400,000</u>	Market value NFA	= <u>5,100,000</u>
Book value assets	= <u>\$4,530,000</u>	Total	= <u>\$6,250,000</u>

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

<u>Income Statement</u>	
Sales	\$305,000
Costs	176,000
Other expenses	8,900
Depreciation	<u>18,700</u>
EBIT	\$101,400
Interest	<u>12,900</u>
Taxable income	\$88,500
Taxes	<u>23,345</u>
Net income	<u>\$ 65,155</u>
Dividends	\$19,500
Additions to RE	\$45,655

a. $\text{OCF} = \text{EBIT} + \text{Depreciation} - \text{Taxes} = \$101,400 + 18,700 - 23,345 = \$96,755$

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b. $CFC = \text{Interest} - \text{Net new LTD} = \$12,900 - (-4,900) = \$17,800$

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

c. $CFS = \text{Dividends} - \text{Net new equity} = \$19,500 - 6,400 = \$13,100$

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

$$CFA = \$17,800 + 13,100 = \$30,900$$

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

$$\text{Net capital spending} = \text{Increase in NFA} + \text{Depreciation} = \$46,000 + 18,700 = \$64,700$$

Now we can use:

$$\begin{aligned} CFA &= OCF - \text{Net capital spending} - \text{Change in NWC} \\ \$30,900 &= \$96,755 - 64,700 - \text{Change in NWC} \\ \text{Change in NWC} &= \$1,155 \end{aligned}$$

This means that the company increased its NWC by \$1,155.

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

$$\text{Net income} = \text{Dividends} + \text{Addition to retained earnings} = \$1,980 + 5,700 = \$7,680$$

Now, looking at the income statement:

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

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

$$\text{EBT} = \text{NI}/(1 - \text{Tax rate}) = \$7,680/(1 - .22) = \$9,846$$

Now you can calculate:

$$\text{EBIT} = \text{EBT} + \text{Interest} = \$9,846 + 4,400 = \$14,246$$

The last step is to use:

$$\begin{aligned} \text{EBIT} &= \text{Sales} - \text{Costs} - \text{Depreciation} \\ \$14,246 &= \$64,000 - 30,700 - \text{Depreciation} \\ \text{Depreciation} &= \$19,054 \end{aligned}$$

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

<u>Balance Sheet</u>			
Cash	\$ 127,000	Accounts payable	\$ 210,000
Accounts receivable	115,000	Notes payable	<u>155,000</u>
Inventory	<u>286,000</u>	Current liabilities	\$ 365,000
Current assets	\$ 528,000	Long-term debt	<u>830,000</u>
		Total liabilities	\$1,195,000
Tangible net fixed assets	\$1,610,000	Common stock	??
Intangible net fixed assets	<u>660,000</u>	Accumulated ret. earnings	<u>1,368,000</u>
Total assets	<u>\$2,798,000</u>	Total liab. & owners' equity	<u>\$2,798,000</u>

Total liabilities and owners' equity is:

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

Solving this equation for common stock gives us:

$$\text{Common stock} = \$2,798,000 - 1,195,000 - 1,368,000 = \$235,000$$

15. 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 are \$9,400, equity is equal to \$1,600, and if TA are \$6,700, equity is equal to \$0. We should note here that the book value of shareholders' equity can be negative.

16. Income Statement

Sales	\$705,000
COGS	445,000
A&S expenses	95,000
Depreciation	<u>140,000</u>
EBIT	\$25,000
Interest	<u>70,000</u>
Taxable income	-\$45,000
Taxes (25%)	<u>0</u>
a. Net income	<u>-\$45,000</u>

b. $OCF = EBIT + \text{Depreciation} - \text{Taxes} = \$25,000 + 140,000 - 0 = \$165,000$

- 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.

17. 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.

$$\text{Change in NWC} = \text{Net capital spending} = \text{Net new equity} = 0. \text{ (Given)}$$

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

$$\text{Cash flow from assets} = \$165,000 - 0 - 0 = \$165,000$$

$$\text{Cash flow to stockholders} = \text{Dividends} - \text{Net new equity} = \$102,000 - 0 = \$102,000$$

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

Cash flow to creditors = \$165,000 – 102,000 = \$63,000

Cash flow to creditors = Interest – Net new LTD

Net new LTD = Interest – Cash flow to creditors = \$70,000 – 63,000 = \$7,000

18. a.

<u>Income Statement</u>	
Sales	\$33,106
Cost of goods sold	23,624
Depreciation	<u>5,877</u>
EBIT	\$ 3,605
Interest	<u>2,650</u>
Taxable income	\$ 955
Taxes (22%)	<u>210</u>
Net income	<u>\$ 745</u>

b. $OCF = EBIT + Depreciation - Taxes$
 $= \$3,605 + 5,877 - 210 = \$9,272$

c. $Change\ in\ NWC = NWC_{end} - NWC_{beg}$
 $= (CA_{end} - CL_{end}) - (CA_{beg} - CL_{beg})$
 $= (\$8,612 - 4,575) - (\$6,970 - 3,920)$
 $= \$4,037 - 3,050 = \987

Net capital spending = $NFA_{end} - NFA_{beg} + Depreciation$
 $= \$24,394 - 19,820 + 5,877 = \$10,451$

CFA = $OCF - Change\ in\ NWC - Net\ capital\ spending$
 $= \$9,272 - 987 - 10,451 = -\$2,166$

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 \$2,166 in funds from its stockholders and creditors to make these investments.

d. Cash flow to creditors = Interest – Net new LTD = \$2,650 – 0 = \$2,650

Cash flow to stockholders = Cash flow from assets – Cash flow to creditors
 $= -\$2,166 - 2,650 = -\$4,816$

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 = \$1,888 – (–4,816) = \$6,704

The firm had positive earnings in an accounting sense ($NI > 0$) and had positive cash flow from operations. The firm invested \$987 in new net working capital and \$10,451 in new fixed assets. The firm had to raise \$2,166 from its stakeholders to support this new investment. It accomplished this by raising \$6,704 in the form of new equity. After paying out \$1,888 of this in the form of dividends to shareholders and \$2,650 in the form of interest to creditors, \$2,166 was left to meet the firm's cash flow needs for investment.

19. a. $\text{Total assets}_{2017} = \$1,206 + 4,973 = \$6,179$
 $\text{Total liabilities}_{2017} = \$482 + 2,628 = \$3,110$
 $\text{Owners' equity}_{2017} = \$6,179 - 3,110 = \$3,069$
- $\text{Total assets}_{2018} = \$1,307 + 5,988 = \$7,295$
 $\text{Total liabilities}_{2018} = \$541 + 2,795 = \$3,336$
 $\text{Owners' equity}_{2018} = \$7,295 - 3,336 = \$3,959$
- b. $\text{NWC}_{2017} = \text{CA}_{2017} - \text{CL}_{2017} = \$1,206 - 482 = \$724$
 $\text{NWC}_{2018} = \text{CA}_{2018} - \text{CL}_{2018} = \$1,307 - 541 = \$766$
 $\text{Change in NWC} = \text{NWC}_{2018} - \text{NWC}_{2017} = \$766 - 724 = \$42$

- c. We can calculate net capital spending as:

$$\begin{aligned} \text{Net capital spending} &= \text{Net fixed assets}_{2018} - \text{Net fixed assets}_{2017} + \text{Depreciation} \\ \text{Net capital spending} &= \$5,988 - 4,973 + 1,363 = \$2,378 \end{aligned}$$

So, the company had a net capital spending cash flow of \$2,378. We also know that net capital spending is:

$$\begin{aligned} \text{Net capital spending} &= \text{Fixed assets bought} - \text{Fixed assets sold} \\ \$2,378 &= \$2,496 - \text{Fixed assets sold} \\ \text{Fixed assets sold} &= \$2,496 - 2,378 = \$118 \end{aligned}$$

To calculate the cash flow from assets, we must first calculate the operating cash flow. The income statement is:

<i>Income Statement</i>	
Sales	\$15,301
Costs	7,135
Depreciation expense	<u>1,363</u>
EBIT	\$ 6,803
Interest expense	<u>388</u>
EBT	\$ 6,415
Taxes (21%)	<u>1,347</u>
Net income	<u><u>\$ 5,068</u></u>

So, the operating cash flow is:

$$\text{OCF} = \text{EBIT} + \text{Depreciation} - \text{Taxes} = \$6,803 + 1,363 - 1,347 = \$6,819$$

And the cash flow from assets is:

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$$\begin{aligned}\text{Cash flow from assets} &= \text{OCF} - \text{Change in NWC} - \text{Net capital spending.} \\ &= \$6,819 - 42 - 2,378 = \$4,399\end{aligned}$$

$$\begin{aligned}d. \text{ Net new borrowing} &= \text{LTD}_{18} - \text{LTD}_{17} = \$2,795 - 2,628 = \$167 \\ \text{Cash flow to creditors} &= \text{Interest} - \text{Net new LTD} = \$388 - 167 = \$221 \\ \text{Net new borrowing} &= \$167 = \text{Debt issued} - \text{Debt retired} \\ \text{Debt retired} &= \$504 - 167 = \$337\end{aligned}$$

Challenge

$$\begin{aligned}20. \text{ Net capital spending} &= \text{NFA}_{\text{end}} - \text{NFA}_{\text{beg}} + \text{Depreciation} \\ &= (\text{NFA}_{\text{end}} - \text{NFA}_{\text{beg}}) + (\text{Depreciation} + \text{AD}_{\text{beg}}) - \text{AD}_{\text{beg}} \\ &= (\text{NFA}_{\text{end}} - \text{NFA}_{\text{beg}}) + \text{AD}_{\text{end}} - \text{AD}_{\text{beg}} \\ &= (\text{NFA}_{\text{end}} + \text{AD}_{\text{end}}) - (\text{NFA}_{\text{beg}} + \text{AD}_{\text{beg}}) \\ &= \text{FA}_{\text{end}} - \text{FA}_{\text{beg}}\end{aligned}$$

21.

Balance sheet as of Dec. 31, 2017

Cash	\$8,676	Accounts payable	\$6,269
Accounts receivable	11,488	Notes payable	<u>1,674</u>
Inventory	<u>20,424</u>	Current liabilities	\$7,943
Current assets	\$40,588		
		Long-term debt	\$29,060
Net fixed assets	<u>\$72,770</u>	Owners' equity	<u>\$76,355</u>
Total assets	<u>\$113,358</u>	Total liab. & equity	<u>\$113,358</u>

Balance sheet as of Dec. 31, 2018

Cash	\$9,247	Accounts payable	\$6,640
Accounts receivable	13,482	Notes payable	<u>1,641</u>
Inventory	<u>21,862</u>	Current liabilities	\$8,281
Current assets	\$44,591		
		Long-term debt	\$35,229
Net fixed assets	<u>\$77,610</u>	Owners' equity	<u>\$78,691</u>
Total assets	<u>\$122,201</u>	Total liab. & equity	<u>\$122,201</u>

<u>2017 Income Statement</u>		<u>2018 Income Statement</u>	
Sales	\$16,549.00	Sales	\$18,498.00
COGS	5,690.00	COGS	6,731.00
Other expenses	1,353.00	Other expenses	1,178.00
Depreciation	<u>2,376.00</u>	Depreciation	<u>2,484.00</u>
EBIT	\$7,130.00	EBIT	\$8,105.00
Interest	<u>1,110.00</u>	Interest	<u>1,325.00</u>
EBT	\$6,020.00	EBT	\$6,780.00
Taxes (21%)	<u>1,264.20</u>	Taxes (21%)	<u>1,423.80</u>
Net income	<u>\$4,755.80</u>	Net income	<u>\$5,356.20</u>
Dividends	\$1,979.00	Dividends	\$2,314.00
Additions to RE	2,776.80	Additions to RE	3,042.20

22. $OCF = EBIT + Depreciation - Taxes = \$8,105 + 2,484 - 1,424 = \$9,165$

$$\begin{aligned} \text{Change in NWC} &= NWC_{\text{end}} - NWC_{\text{beg}} = (CA - CL)_{\text{end}} - (CA - CL)_{\text{beg}} \\ &= (\$44,591 - 8,281) - (\$40,588 - 7,943) \\ &= \$3,665 \end{aligned}$$

$$\begin{aligned} \text{Net capital spending} &= NFA_{\text{end}} - NFA_{\text{beg}} + \text{Depreciation} \\ &= \$77,610 - 72,770 + 2,484 = \$7,324 \end{aligned}$$

$$\begin{aligned} \text{Cash flow from assets} &= OCF - \text{Change in NWC} - \text{Net capital spending} \\ &= \$9,165 - 3,665 - 7,324 = -\$1,824 \end{aligned}$$

$$\begin{aligned} \text{Cash flow to creditors} &= \text{Interest} - \text{Net new LTD} \\ \text{Net new LTD} &= LTD_{\text{end}} - LTD_{\text{beg}} \\ \text{Cash flow to creditors} &= \$1,325 - (\$35,229 - 29,060) = -\$4,844 \end{aligned}$$

$$\begin{aligned} \text{Net new equity} &= \text{Common stock}_{\text{end}} - \text{Common stock}_{\text{beg}} \\ \text{Common stock} + \text{Retained earnings} &= \text{Total owners' equity} \\ \text{Net new equity} &= (OE - RE)_{\text{end}} - (OE - RE)_{\text{beg}} \end{aligned}$$

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

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

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

$$\begin{aligned} \text{Net new equity} &= OE_{\text{end}} - OE_{\text{beg}} - \text{Additions to RE} \\ &= \$78,691 - 76,355 - 3,042 = -\$706 \end{aligned}$$

$$\begin{aligned} \text{CFS} &= \text{Dividends} - \text{Net new equity} \\ \text{CFS} &= \$2,314 - (-706) = \$3,020 \end{aligned}$$

As a check, cash flow from assets is $-\$1,824$.

$$\begin{aligned} \text{CFA} &= \text{Cash to/from creditors} + \text{Cash flow to stockholders} \\ \text{CFA} &= -\$4,844 + 3,020 = -\$1,824 \end{aligned}$$