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 tradeoff 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 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.

Solutions to Questions and Problems

Basic

1.

Balance Sheet					
CA	$3,000	CL	$900	OE = $9,000 – 5,900	= $3,100
NFA	6,000	LTD	5,000	NWC = $3,000 – 900	= $2,100
TA	$9,000	OE	3,100		
		TL + OE	$9,000		

2.

Income Statement	
Sales	$432,000
Costs	210,000
Depreciation	25,000
EBIT	$197,000
Interest	8,000
EBT	$189,000
Taxes	66,150
Net income	$122,850

3. Net income = divs + add. to ret. earnings; add. to ret. earnings = $122,850 – 65,000 = $57,850

4. EPS = NI / shares = $122,850 / 30,000 = $4.10 per share
DPS = divs / shares = $65,000 / 30,000 = $2.17 per share

5. NWC = CA – CL; CA = $900K + 1.8M = $2.7M

Book value CA	= $2.7M	Market value CA	= $2.9M
Book value NFA	= $1.6M	Market value NFA	= $1.5M
Book value assets	= $2.7M + 1.6M = $4.3M	Market value assets	= $2.9M + 1.5M = $4.4M

6. Taxes = 0.15($50K) + 0.25($25K) + 0.34($25K) + 0.39($185K – 100K) = $55,400

7. Average tax rate = $55,400 / $185,000 = 29.95%; marginal tax rate = 39%

8.

Income Statement	
Sales	$9,750
Costs	5,740
Depreciation	1,000
EBIT	$3,010
Interest	240
Taxable income	$2,770
Taxes (35%)	969.50
Net income	$1,800.50

OCF = EBIT + D – T
= $3,010 + 1,000 – 969.50 = $3,040.50

9. Net capital spending = $NFA_{end} – NFA_{beg}$ + depreciation = $3.5M – 3.1M + 850K = $1.25M

10. Change in NWC = $NWC_{end} – NWC_{beg} = (CA_{end} – CL_{end}) – (CA_{beg} – CL_{beg})$
= ($1,440 – 525) – ($1,200 – 720) = $915 – 480 = $435

11. Cash flow to creditors = interest paid – net new borrowing = $400K – $(LTD_{end} – LTD_{beg})$
= $400K – ($3.6M – 3.1M) = $400K – 500K = – $100K

12. Cash flow to stockholders = dividends paid – net new equity = $500K – [($common_{end}$ + $APIS_{end}$) – ($common_{beg}$ + $APIS_{beg}$)]
= $500K – [($825K + 7.8M) – ($750K + 7.2M)]
= $500K – [$8.625M – 7.95M] = –$175K

13. Cash flow from assets = cash flow to creditors + cash flow to stockholders
= –$100K – 175K = –$275K
Cash flow from assets = –$275K = OCF – change in NWC – net capital spending
= OCF – (–$195K) – 600K = –$275K
Operating cash flow = –$275K – 195K + 600K = $130K

Intermediate

14.

Income Statement	
Sales	$130,000
Costs	82,000
Other expenses	3,500
Depreciation	6,000
EBIT	$38,500
Interest	14,000
Taxable income	$24,500
Taxes (34%)	8,330
Net income	$16,170
Dividends	$6,400
Add. to ret. earnings	$9,770

a. OCF = EBIT + Depreciation – Taxes
= $38,500 + 6,000 – 8,330 = $36,170
b. CFC = interest – net new LTD
= $14,000 – (–6,000) = $20,000
c. CFS = dividends – net new equity
= $6,400 – 2,830 = $3,570
d. CFA = CFC + CFS = $20,000 + 3,570
= $23,570
$23,570 = OCF – net cap. sp. – change in NWC;
Net cap. sp. = inc. in NFA + depreciation
= $5,000 + 6,000 = $11,000
Change in NWC = OCF – net cap. sp. – CFA
= $36,170 – 11,000 – 23,570
= $1,600

15. Net income = dividends + addition to ret. earnings = $800 + 4,000 = $4,800
EBT = NI / (1– tax rate) = $4,800 / 0.65 = $7,385
EBIT = EBT + interest = $7,385 + 1,200 = $8,585
Sales – costs = EBDIT = $21,000 – 10,000 = $11,000
Depreciation = EBDIT – EBIT = 11,000 – 8,585 = $2,415

16.

Balance Sheet

Cash	$300,000	Accounts payable	$700,000
Accounts receivable	150,000	Notes payable	145,000
Inventory	425,000	Current liabilities	$845,000
Current assets	$875,000	Long-term debt	1,300,000
		Total liabilities	$2,145,000
Tangible net fixed assets	3,500,000		
Intangible net fixed assets	775,000	Common stock	??
Total assets	$5,150,000	Accumulated ret. earnings	2,150,000
		Total liab. & owners' equity	$5,150,000

?? = $5,150,000 – 2,150,000 – 2,145,000 = $855,000

17. Owners' equity = Max [(TA – TL), 0]; if TA = $3,600, OE = $700; if TA = $2,300, OE = $0

18. *a.* Taxes Growth = 0.15($50K) + 0.25($25K) + 0.34($5K) = $15,450
Taxes Income = 0.15($50K) + 0.25($25K) + 0.34($25K) + 0.39($235K) + 0.34($8.665M)
= $3,060,000

b. Each firm has a marginal tax rate of 34% 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.

19.

Income Statement

	Sales	$900,000
	COGS	600,000
	A&S expenses	170,000
	Depreciation	105,000
	EBIT	$25,000
	Interest	85,000
	Taxable income	($60,000)
	Taxes (35%)	0
a.	Net income	($60,000)

b. OCF = EBIT + D – T
= $25,000 + 105,000 – 0 = $130,000

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, not an operating, expense.

20. 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 cap. sp. = net new equity = 0. (Assumed)
Cash flow from assets = OCF – change in NWC – net cap. sp. = $130K – 0 – 0 = $130K
Cash flow to stockholders = dividends – net new equity = $25K – 0 = $25K
Cash flow to creditors = cash flow from assets – cash flow to stockholders = $130K – 25K = $105K
Cash flow to creditors = interest – net new LTD;
Net new LTD = interest – cash flow to creditors = $85K – 105K = –$20K

21.

Income Statement	
Sales	$12,200
Cost of good sold	9,000
Depreciation	1,600
EBIT	$1,600
Interest	200
Taxable income	$1,400
Taxes (34%)	476
a. Net income	$924

b. OCF = EBIT + D – T
= $1,600 + 1,600 – 476 = $2,724

c. Change in NWC = $NWC_{end} - NWC_{beg}$
= $(CA_{end} - CL_{end}) - (CA_{beg} - CL_{beg})$
= ($3,100 – 1,800) – ($2,000 – 1,500)
= $1,300 – 500 = $800
Net cap. sp. = $NFA_{end} - NFA_{beg} + D$
= $8,400 – 8,000 + 1,600 = $2,000
CFA = OCF – change in NWC – net cap.sp
= $2,724 – 800 – 2,000 = –$76

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 $76 in funds from its stockholders and creditors to make these investments.

d. Cash flow to creditors = interest – net new LTD = $200 – 0 = $200
Cash flow to stockholders = cash flow from assets – cash flow to creditors
= –$76 – 200 = –$276 = dividends – net new equity;
Net new equity = $300 + 276 = $576
The firm had positive earnings in an accounting sense (NI > 0) and had positive cash flow from operations. The firm invested $800 in new net working capital and $2,000 in new fixed assets. The firm had to raise $76 from its stakeholders to support this new investment. It accomplished this by raising $576 in the form of new equity. After paying out $300 of this in the form of dividends to shareholders and $200 in the form of interest to creditors, $76 was left to just meet the firm's cash flow needs for investment.

22. *a.* Total assets 2001 = $625 + $2,800 = $3,425; total liabilities 2001 = $245 + 1,400 = $1,645
Owners' equity 2001 = $3,425 – 1,645 = $1,780
Total assets 2002 = $684 + 3,100 = $3,784; total liabilities 2002 = $332 + 1,600 = $1,932
Owners' equity 2002 = $3,784 – 1,932 = $1,852

b. NWC 2001 = CA01 – CL01 = $625 – 245 = $380
NWC 2002 = CA02 – CL02 = $684 – 332 = $352
Change in NWC 2002 = NWC02 – NWC01 = $352 – 380 = –$28

c. Net cap. sp. = NFA02 – NFA01 + D02 = $3,100 – 2,800 + 700 = $1,000
Net cap. sp. = fixed assets bought – fixed assets sold
$1,000 = $1,500 – fixed assets sold; fixed assets sold = $1,500 – 1,000 = $500
EBIT = Sales – costs – depreciation = $8,100 – 3,920 – 700 = $3,480
EBT = EBIT – interest = $3,480 – 212 = $3,268;
Tax = EBIT × .35 = $3,268 × .35 = $1,143.80
OCF02 = EBIT + Dep – Taxes = $3,480 + 700 – 1,143.80 = $3,036.20
Cash flow from assets = OCF – inc. in NWC – net cap. sp.
= $3,036.20 – (–28) – 1,000 = $2,064.20

d. Net new borrowing = LTD02 – LTD01 = $1,600 – 1,400 = $200
Cash flow to creditors = interest – net new LTD = $212 – 200 = $12
Net new borrowing = $200 = debt issued – debt retired; debt retired = $300 – 200 = $100

Challenge

23. Net cap. sp. $= NFA_{end} - NFA_{beg} + D$
$= (NFA_{end} - NFA_{beg}) + (D + AD_{beg}) - AD_{beg}$
$= (NFA_{end} - NFA_{beg}) + AD_{end} - AD_{beg}$
$= (NFA_{end} + AD_{end}) - (NFA_{beg} + AD_{beg}) = FA_{end} - FA_{beg}$

24. *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. Taxes = 0.15($50K) + 0.25($25K) + 0.34($25K) + 0.39($235K) = $113.9K
Average tax rate = 113.9K / 335K = 34%; Marginal tax rate on next dollar of income = 34%
For corporate taxable income levels of $335K to $10M, average tax rates are equal to marginal tax rates.
Taxes = 0.34($10M) + 0.35($5M) + 0.38($3.333M) = $6,416,667
Average tax rate = 6,416,667 / 18,333,334 = 35%; Marginal tax rate on next dollar of income = 35%. For corporate taxable income levels over $18,333,334, average tax rates are again equal to marginal tax rates.

c. Taxes = 0.34($200K) = $68K = 0.15($50K) + 0.25($25K) + 0.34($25K) + X($100K);
X(100K) = 68K – 22.25K = 45.75K; X = 45.75K / 100K = 45.75%

25.

12/31/01 Balance Sheet

Cash	$1,505	A/P	$1,581
A/R	1,992	N/P	291
Inventory	3,542	CL	$1,872
CA	$7,039	LTD	5,040
NFA	12,621	OE	12,748
TA	$19,660	TL&E	$19,660

12/31/02 Balance Sheet

Cash	$1,539	A/P	$1,533
A/R	2,244	N/P	273
Inventory	3,640	CL	$1,806
CA	$7,423	LTD	5,880
NFA	12,922	OE	12,659
TA	$20,345	TL&E	$20,345

2001 Income Statement

Sales	$2,870.00
COGS	987.00
Other expenses	238.00
Dep	413.00
EBIT	$1,232.00
Interest	192.00
EBT	$1,040.00
Tax (34%)	353.60
NI	$686.40
Dividends	$350.00
Add. to RE	$336.40

2002 Income Statement

Sales	$3,080.00
COGS	1,121.00
Other expenses	196.00
Dep	413.00
EBIT	$1,350.00
Interest	221.00
EBT	$1,129.00
Tax (34%)	383.86
NI	$745.14
Dividends	$385.00
Add. to RE	$360.14

26. 2002: OCF = EBIT + Dep – T = \$1,350 + 413 – 383.86 = \$1,379.14

Change in NWC = $NWC_{end} - NWC_{beg} = (CA - CL)_{end} - (CA - CL)_{beg}$
= (\$7,423 – 1,806) – (\$7,039 – 1,872)
= \$5,617 – 5,167 = \$450

Net cap. sp. = $NFA_{end} - NFA_{beg}$ + dep = \$12,922 – 12,621 + 413 = \$714

∴ Cash flow from assets = OCF – change in NWC – net cap. sp.
= \$1,379.14 – 450 – 714 = \$215.14

Cash flow to creditors = interest – net new LTD;
net new LTD = $LTD_{end} - LTD_{beg}$
Cash flow to creditors = \$221 – (\$5,880 – 5,040) = –\$619

Net new equity = common $stock_{end}$ – common $stock_{beg}$
Common stock + retained earnings = total owners' equity
Net new equity = $(OE - RE)_{end} - (OE - RE)_{beg}$
= $OE_{end} - OE_{beg} + RE_{beg} - RE_{end}$
$RE_{end} = RE_{beg}$ + add. to RE02
∴ Net new equity = $OE_{end} - OE_{beg} + RE_{beg} - (RE_{beg}$+ add. to RE02)
= $OE_{end} - OE_{beg}$ – ARE02
Net new equity = \$12,659 – 12,748 – 360.14 = –\$449.14

CF to stockholders = div – net new equity = \$385 – (–449.14) = \$834.14

As a check, cash flow from assets = \$215.14
= cash flow from creditors + cash flow to stockholders
= –\$619 + \$834.14 = \$215.14