Chapter 2
Financial Statements, Cash Flow, and Taxes

ANSWERS TO END-OF-CHAPTER QUESTIONS

2-1 a. The annual report is a report issued annually by a corporation to its shareholders. It contains basic financial statements, as well as management's opinion of the past year's operations and the firm's future prospects. A firm's balance sheet is a statement of the firm's financial position at a specific point in time. It specifically lists the firm's assets on the left-hand side of the balance sheet, while the right-hand side shows its liabilities and equity, or the claims against these assets. An income statement is a statement summarizing the firm's revenues and expenses over an accounting period. Net sales are shown at the top of each statement, after which various costs, including income taxes, are subtracted to obtain the net income available to common shareholders. The bottom of the statement reports earnings and dividends per share.

b. Common shareholders' equity (Net worth) is the capital supplied by common shareholders—capital stock, paid-in capital, retained earnings, and, occasionally, certain reserves. Paid-in capital is the difference between the stock's par value and what shareholders paid when they bought newly issued shares. Retained earnings is the portion of the firm's earnings that have been saved rather than paid out as dividends.

c. The statement of retained earnings shows how much of the firm's earnings were retained in the business rather than paid out in dividends. Note that retained earnings represents a claim against assets, not assets per se. Firms retain earnings primarily to expand the business, not to accumulate cash in a bank account. The statement of cash flows reports the impact of a firm's operating, investing, and financing activities on cash flows over an accounting period.

d. Depreciation is a non-cash charge against tangible assets, such as buildings or machines. It is taken for the purpose of showing an asset's estimated dollar cost of the capital equipment used up in the production process. Amortization is a non-cash charge against intangible assets, such as copyrights. EBITDA is earnings before interest, taxes, depreciation, and amortization.

e. Operating current assets are the current assets used to support operations, such as cash, accounts receivable, and inventory. It does not include short-term investments. Operating current liabilities are the current liabilities that are a natural consequence of the firm's operations, such as accounts payable and accruals. It does not include notes payable or any other short-term debt that incurs interest charges. Net operating working capital is operating current assets minus operating current liabilities. Total net operating capital is sum of net operating working capital and operating long-term assets, such as net plant and equipment. Operating capital also is equal to the net amount of capital raised from investors. This is the amount of interest-bearing debt plus preferred stock plus common equity minus short-term investments.

f. Accounting profit is a firm's net income as reported on its income statement. Net cash flow, as opposed to accounting net income, is the sum of net income plus non-cash adjustments. NOPAT, net operating profit after taxes, is the amount of profit a company would generate if it had no debt and no financial assets. Free cash flow is the cash flow actually available for distribution to investors after the company has made all investments in fixed assets and working capital necessary to sustain ongoing operations.

g. Market value added is the difference between the market value of the firm (i.e., the sum of the market value of common equity, the market value of debt, and the market value of preferred shares) and the book value of the firm's common equity, debt, and preferred shares. If the book values of debt and preferred shares are equal to their market values, then MVA is also equal to the difference between the market value of equity and the amount of equity capital that investors supplied. Economic value added represents the residual income that remains after the cost of all capital, including equity capital, has been deducted.

h. A progressive tax means the higher one's income, the larger the percentage paid in taxes. Taxable income is defined as gross income less a set of exemptions and deductions that are spelled out in the instructions to the tax forms individuals must file. Marginal tax rate is defined as the tax rate on the last unit of income. Average tax rate is calculated by taking the total amount of tax paid divided by taxable income.

i. Capital gain (loss) is the profit (loss) from the sale of a capital asset for more (less) than its purchase price. Ordinary corporate operating losses can be carried back for 3 years or forward for 20 years to offset taxable income in a given year.

2-2 The four financial statements contained in most annual reports are the balance sheet, income statement, statement of retained earnings, and statement of cash flows.

2-3 No because the $20 million of retained earnings would probably not be held as cash. The retained earnings figure represents the reinvestment of earnings by the firm. Consequently, the $20 million would be an investment in all of the firm's assets.

2-4 Operating capital is the amount of interest-bearing debt, preferred stock, and common equity used to acquire the company's net operating assets. Without this capital a firm cannot exist, as there is no source of funds with which to finance operations.

2-5 NOPAT is the amount of net income a company would generate if it had no debt and held no financial assets. NOPAT is a better measure of the performance of a company's operations because debt lowers income. In order to get a true reflection of a company's operating performance, one would want to take out debt to get a clearer picture of the situation.

2-6 Free cash flow is the cash flow actually available for distribution to investors after the company has made all the investments in fixed assets and working capital necessary to sustain ongoing operations. It is the most important measure of cash flows because it shows the exact amount available to all investors.

2-7 If the business were organized as a partnership or a proprietorship, its income could be taken out by the owners without being subject to double taxation. Also, if you expected to have losses for a few years while the company was getting started, if you were *not* incorporated, and if you had outside income, the business losses could be used to offset your other income and reduce your total tax bill. These factors would lead you to *not* incorporate the business.

SOLUTIONS TO END-OF-CHAPTER PROBLEMS

2-1 Corporate yield = 6%; T = 35%
AT yield = 6%(1 - T)
= 6%(0.65) = 3.9%.

2-2 NI = $3,000,000; EBIT = $6,000,000; T = 40%; Interest = ?
Need to set up an income statement and work from the bottom up.

EBIT	$6,000,000
Interest	1,000,000
EBT	$5,000,000
Taxes (40%)	2,000,000
NI	$3,000,000

$$EBT = \frac{\$3,000,000}{(1-T)} = \frac{\$3,000,000}{0.6}$$

Interest = EBIT – EBT = $6,000,000 – $5,000,000 = $1,000,000.

2-3 EBITDA = $7,500,000; NI = $1,600,000; Int = $2,000,000; T = 30%; DA = ?

EBITDA	$7,500,000	
DA	3,214,286	EBITDA – DA = EBIT; DA = EBITDA – EBIT
EBIT	$4,285,714	EBIT = EBT + Int = $3,000,000 + $2,000,000
Int	2,000,000	(Given)
EBT	$2,285,714	$\frac{\$1,600,000}{(1-T)} = \frac{\$1,600,000}{0.7}$
Taxes (30%)	685,714	
NI	$1,600,000	(Given)

2-4 NI = $3,100,000; DEP = $500,000; AMORT = 0; NCF = ?
NCF = NI + DEP + AMORT = $3,100,000 + $500,000 = $3,600,000.

2-5 NI = $50,000,000; $R/E_{Y/E}$ = $810,000,000; $R/E_{B/Y}$ = $780,000,000; Dividends = ?

$R/E_{B/Y}$ + NI – Div = $R/E_{Y/E}$
$780,000,000 + $50,000,000 – Div = $810,000,000
$830,000,000 – Div = $810,000,000
Div = $20,000,000.

2-6

	Cash Provided (Used)
Operating Activities	
Net Income	$18,000
Adjustments:	
Noncash adjustments:	
Amortization	4,000
Due to changes in working capital	
Increase in accounts receivable	(4,000)
Decrease in inventories	8,000
Increase in accounts payable	4,000
Net cash provided by operating activities	$30,000

2-7 Interest Income = $500

Capital Gain = $10,000/$50 = 200 shares × $2.50/share = $500

Interest Income		Capital Gain	
$500 × 16.67% =	$83.35	$500 × 16.67% × 0.5 =	$41.68
$500 × 22% =	$110.00	$500 × 22% × 0.5 =	$55.00
Total tax =	$193.35	Total tax =	$96.68
$500 - $193.35 =	$306.65	$500 - $96.68 =	$403.32

2-8

	Alpha	Beta
Sales	$2,000,000	$2,000,000
COGS (65%)	1,300,000	1,300,000
Gross Profit	$700,000	$700,000
Operating Expense	300,000	300,000
Depreciation	30,000	60,000
EBT	370,000	340,000
Taxes (32%)	118,400	108,800
Earnings After Tax	$251,600	$231,200
+ Depreciation	30,000	60,000
Cash Flow	$281,600	$291,200

The difference between the cash flows is $9,600 ($291,200 - $281,600). Beta has larger cash flows because it claimed higher depreciation expense. Since depreciation is a tax deductible item, it creates a tax shield. The depreciation tax shield for Beta is $19,200 ($60,000 × 0.32), while the depreciation tax shield for Alpha is $9,600 ($30,000 × 0.32). The difference in tax shields of $9,600 accounts for the difference in cash flows.

2-9 EBIT = $750,000; DEP = $200,000; 100% Equity; T = 40%
NI = ?; NCF = ?

First, determine net income by setting up an income statement:

EBIT	$750,000
Interest	0
EBT	$750,000
Taxes (40%)	300,000
NI	$450,000

NCF = NI + DEP = $450,000 + $200,000 = $650,000.

2-10 a.

	Income Statement
Sales revenues	$12,000,000
Costs except depreciation	9,000,000
Depreciation	1,500,000
EBT	$ 1,500,000
Taxes (40%)	600,000
Net income	$ 900,000
Add back depreciation	1,500,000
Net cash flow	$ 2,400,000

b. If depreciation doubled, taxable income would fall to zero and taxes would be zero. Thus, net income would decrease to zero, but net cash flow would rise to $3,000,000. Berndt would save $600,000 in taxes, thus increasing its cash flow:

$$\Delta CF = T(\Delta Depreciation) = 0.4(\$1{,}500{,}000) = \$600{,}000.$$

c. If depreciation were halved, taxable income would rise to $2,250,000 and taxes to $900,000. Therefore, net income would rise to $1,350,000, but net cash flow would fall to $2,100,000.

d. You should prefer to have higher depreciation charges and higher cash flows. Net cash flows are the funds that are available to the owners to withdraw from the firm and, therefore, cash flows should be more important to them than net income.

2-11 NOPAT = EBIT(1 – Tax rate)

= $80 million(1 – 0.30) = $56 million

FCF = NOPAT - Net investment in operating capital

FCF = $56 million - $30 million

FCF = $26 million

Market Value of 10% of shares = 0.10($22 × 10 million) = $22 million

$26 million is the free cash flow available to investors. After $10 million is paid to creditors in interest, $16 million is available to repurchase shares. Since $22 million is needed to repurchase 10% of its shares, Marine Tech will be able to fully carry out its repurchase plan.

2-12 a. NOPAT = EBIT(1 - Tax rate)
= $150,000,000(0.7)
= $105,000,000.

b. $NOWC_{11}$ = Operating CA – operating CL
= $360,000,000 - ($90,000,000 + $60,000,000)
= $210,000,000.

$NOWC_{12}$ = $372,000,000 - $180,000,000 = $192,000,000.

c. Operating $capital_{11}$ = Net plant and equipment + Net operating working capital
= $250,000,000 + $210,000,000
= $460,000,000.

Operating $capital_{12}$ = $300,000,000 + $192,000,000
= $492,000,000.

d. FCF = NOPAT - Net investment in operating capital
= $105,000,000 - ($492,000,000 - $460,000,000)
= $73,000,000.

e. The large increase in dividends for 2012 can most likely be attributed to a large increase in free cash flow from 2011 to 2012, since FCF represents the amount of cash available to be paid out to shareholders after the company has made all investments in fixed assets and working capital necessary to sustain the business.

2-13

a. MVA = Market Value of Stock – Equity Capital supplied by shareholders
= ($15/share) × (50,000,000 shares) - $275,000,000 = $475,000,000.

b. ROIC = NOPAT/Operating Capital. NOPAT was previously calculated as $105,000,000.
Operating capital was previously calculated to = $492,000,000.
ROIC = $105,000,000/$492,000,000 = 0.183 = 21.3%

c. EVA = (Operating capital)(ROIC – WACC) = ($492,000,000)(0.213 – 0.14) = $35,916,000.

2-14 Standard Industrial Corporation: Statement of Cash Flows for 2012 (Millions of Dollars)

	Cash Provided or (Used)
Operating Activities	
Net income	$89.8
Adjustments:	
Noncash adjustments:	
Depreciation	30.0
Due to changes in working capital	
Increase in accounts receivable	(30.0)
Decrease in inventories	20.0
Increase in accounts payable	18.0
Increase in accruals	12.0
Net cash provided by operating activities	139.8
Investing Activities	
Cash used to acquire fixed assets	(80.0)
Change in short-term investments	(12.8)
Net cash used by investing activities	(92.8)
Financing Activities	
Increase in notes payable	15.5
Increase in bonds outstanding	0.0
Payment of dividends	(60.5)
Net cash used by financing activities	(45.0)
Summary	
Increase in cash	$2.0
Cash at beginning of year	$10.0
Cash at end of year	$12.0

2-15

Prior Years	**2009**	**2010**	**2011**
Profit earned	$150,000	$150,000	$150,000
Carry-back credit	150,000	150,000	150,000
Adjusted profit	$ 0	$ 0	$ 0
Tax previously paid (40%)	60,000	60,000	60,000
Tax refund: Taxes previously paid	$ 60,000	$ 60,000	$ 60,000

Total check from Canada Revenue Agency = $60,000 + $60,000 + $60,000 = $180,000.

Future Years	**2012**	**2013**	**2014**	**2015**	**2016**
Estimated profit	$(650,000)	$150,000	$150,000	$150,000	$150,000
Carry-forward credit	0	150,000	50,000	0	0
Adjusted profit	$ 0	$ 0	$100,000	$150,000	$150,000
Tax (at 40%)	$ 0	$ 0	$ 40,000	$ 60,000	$ 60,000

2-16 a. NOPAT = EBIT(1-T)
= $1,750,000(0.75)
= $1,312,500.

$NOWC_{12}$ = Operating CA – Operating CL
= ($4,830,000 - $380,000) – ($3,700,000 - $1,050,000)
= $1,800,000.

$NOWC_{13}$ = $4,980,000 – ($3,878,000 - $903,000)
= $2,005,000.

Operating $Capital_{12}$ = Net plant & equipment + NOWC
= $3,670,000 + $1,800,000
= $5,470,000.

Operating $Capital_{13}$ = Net plant & equipment + NOWC
= $4,320,000 + $2,005,000
= $6,325,000.

FCF = NOPAT – Net investment in operating capital
= $1,312,500 – ($6,325,000 - $5,470,000)
= $457,500.

b. $$\text{ROIC} = \frac{\text{NOPAT}}{\text{Operating Capital}} = \frac{\$1{,}312{,}500}{\$6{,}325{,}000} = 0.2075 = 20.75\%$$

c. EVA = (Operating capital)(ROIC – WACC) = ($6,325,000)(0.2075 – 0.13)= $490,188.

MVA = Market Value of Stock – Equity Capital supplied by shareholders
= $20 x 400,000 – $4,922,000 = $3,078,000.

2-17 Bristle Brush-Off Corporation: Statement of Cash Flows, Year Ended December 31 2013 ($000s)

	Cash Provided or (Used)
Operating Activities	
Net income	$822
Adjustments:	
Noncash adjustments:	
Depreciation	750
Due to changes in working capital	
Increase in accounts receivable	(190)
Increase in inventory	(360)
Increase in accounts payable	310
Increase in accruals	15
Net cash provided by operating activities	1,347
Investing Activities	
Cash used to acquire fixed assets	(1,400)
Proceed from sale of short-term investments	380
Net cash used by investing activities	(1,020)
Financing Activities	
Repayment of notes payable	(147)
Change in long-term debt	0
Payment of cash dividends	(200)
Net cash used by financing activities	(347)
Summary	
Decrease in cash	(20)
Cash at beginning of year	$60
Cash at end of year	$40

SOLUTION TO SPREADSHEET PROBLEM

2-16 The detailed solution for the spreadsheet problem is in the file ***Ch 02 Build a Model Solution.xlsx*** and is available on the textbook's website.

MINI CASE

Donna Jamison, a recent graduate of the University of Western Ontario with four years of banking experience, was recently brought in as assistant to the chairman of the board of Computron Industries, a manufacturer of electronic calculators.

The company doubled its plant capacity, opened new sales offices outside its home territory, and launched an expensive advertising campaign. Computron's results were not satisfactory, to put it mildly. Its board of directors, which consisted of its president and vice-president plus its major shareholders (who were all local businesspeople), was most upset when directors learned how the expansion was going. Suppliers were being paid late and were unhappy, and the bank was complaining about the deteriorating situation and threatening to cut off credit. As a result, Al Watkins, Computron's president, was informed that changes would have to be made, and quickly, or he would be fired. Also, at the board's insistence, Donna Jamison was brought in and given the job of assistant to Fred Campo, a retired banker who was Computron's chairman and largest shareholder. Campo agreed to give up a few of his golfing days and to help nurse the company back to health, with Jamison's help.

Jamison began by gathering financial statements and other data.

Balance Sheets

Assets	**2012**	**2011**
Cash	$ 7,282	$ 9,000
Short-term investments	20,000	48,600
Accounts receivable	632,160	351,200
Inventories	1,287,360	715,200
Total current assets	1,946,802	1,124,000
Gross fixed assets	1,202,950	491,000
Less: accumulated depreciation	263,160	146,200
Net fixed assets	939,790	344,800
Total assets	$ 2,886,592	$ 1,468,800

Liabilities and Equity	**2012**	**2011**
Accounts payable	$ 324,000	$ 145,600
Notes payable	720,000	200,000
Accruals	284,960	136,000
Total current liabilities	1,328,960	481,600
Long-term debt	1,000,000	323,432
Common stock (100,000 shares)	460,000	460,000
Retained earnings	97,632	203,768
Total equity	557,632	663,768
Total liabilities and equity	$ 2,886,592	$ 1,468,800

Income Statements

	2012	2011
Sales	$ 5,834,400	$ 3,432,000
Cost of goods sold	4,980,000	2,864,000
Other expenses	720,000	340,000
Depreciation	116,960	18,900
Total operating costs	5,816,960	3,222,900
EBIT	17,440	209,100
Interest expense	176,000	62,500
EBT	(158,560)	146,600
Taxes (40%)	(63,424)	58,640
Net income	$ (95,136)	$ 87,960

Other Data	2012	2011
Stock price	$ 6.00	$ 8.50
Shares outstanding	100,000	100,000
EPS	$ (0.95)	$ 0.88
DPS	$ 0.110	$ 0.220

Statement of Cash Flows, 2012

Operating activities	
Net income	$ (95,136)
Adjustments:	
Noncash adjustments:	
depreciation	116,960
Changes in working capital:	
Increase in accounts receivable	(280,960)
Increase in inventories	(572,160)
Increase in accounts payable	178,400
change in accruals	148,960
Net cash used by operating activities	(503,936)
Investing activities	
Cash used to acquire fixed assets	(711,950)
Proceed from sale of short-term investments	28,600
Net cash used by operating activities	(683,350)
Financing activities	
Issue of notes payable	520,000
Issue of long-term debt	676,568
Change in common stock	-
Payment of cash dividends	(11,000)
Net cash provided by financing activities	1,185,568
Summary	
Decrease in cash	(1,718)
Cash at beginning of year	9,000
Cash at end of year	$ 7,282

a. **What effect did the expansion have on sales and net income? What effect did the expansion have on the asset side of the balance sheet? What effect did it have on liabilities and equity?**

Answer: Sales increased by over by over $2.4 million, but net income fell by over $180,000. Assets almost doubled. Debt and funds provided by suppliers increased, but retained earnings fell due to the year's loss and dividend payments.

b. **What do you conclude from the statement of cash flows?**

Answer: Net CF from operations = -$503,936, because of the loss and increases in net working capital. The firm spent $711,950 on fixed assets. The firm borrowed heavily and sold some short-term investments to meet its cash requirements. Even after borrowing, cash fell by $1,718.

c. **What is free cash flow? Why is it important? What are the five uses of FCF?**

Answer: FCF is the amount of cash available from operations for distribution to all investors (including shareholders and debtholders) after making the necessary investments to support operations. A company's value depends upon the amount of FCF it can generate. The five uses of FCF are:

1. Pay interest on debt.
2. Repay principal on debt.
3. Pay dividends.
4. Buy back stock.
5. Buy nonoperating assets (e.g., marketable securities, investments in other companies, etc.)

d. **What is Computron's net operating profit (NOPAT)? What are operating current assets? What are operating current liabilities? How much net operating working capital and total net operating capital does Computron have?**

Answer: Operating current assets are the current assets needed to support operations. Operating current assets include: cash, inventory, and receivables. Operating current assets exclude: short-term investments, because these are not a part of operations. Operating current liabilities are the current liabilities resulting as a normal part of operations. Operating current liabilities include accounts payable and accruals. Operating current liabilities exclude notes payable, because this is a source of financing, not a part of operations.

NOPAT = EBIT(1 – Tax rate)

$NOPAT_{12}$ = \$17,440(1 - 0.4)
= \$10,464.

$NOPAT_{11}$ = \$125,460.

NOWC = operating CA – operating CL

$NOWC_{12}$ = (\$7,282 + \$632,160 + \$1,287,360) - (\$324,000 + \$284,960)
= \$1,317,842.

$NOWC_{11}$ = \$793,800.

Total operating working capital = NOWC + net fixed assets.

Operating capital in 2012 = \$1,317,842 + \$939,790
= \$2,257,632.

Operating capital in 2011 = \$1,138,600.

e. **What is Computron's free cash flow (FCF)?**

Answer: FCF = NOPAT – Net investment in capital
= \$10,464 - (\$2,257,632 - \$1,138,600)
= \$10,464 - \$1,119,032
= -\$1,108,568.

f. **Calculate Computron's return on invested capital. Computron has a 10% cost of capital (WACC). Do you think Computron's growth added value?**

Answer: ROIC = NOPAT / Operating capital

$ROIC_{12}$ = \$10,464 / \$2,257,632
= 0.5%.

$ROIC_{11}$ = 11.0%.

The ROIC of 0.5% is less than the WACC of 10%. Investors did not get the return they require. Note: high growth usually causes negative FCF (due to investment in capital), but that's all right if ROIC > WACC.

g. **Jamison also has asked you to estimate Computron's EVA. She estimates that the after-tax cost of capital was 10% in both years.**

Answer: EVA = NOPAT - (WACC)(CAPITAL).

EVA_{12} = \$10,464 - (0.1)(\$2,257,632)
= \$10,464 - \$225,763
= -\$215,299.

EVA_{11} = \$125,460 - (0.10)(\$1,138,600)
= \$125,460 - \$113,860
= \$11,600.

h.	**What happened to Computron's Market Value Added (MVA)?**

Answer: MVA = market value of the firm - book value of the firm.

Market value = (# shares of stock)(price per share) + value of debt**.**

Book value = total common equity + value of debt.

If the market value of debt is close to the book value of debt, then MVA is market value of equity minus book value of equity. Assume market value of debt equals book value of debt.

Market value of equity 2012 = (100,000)($6.00) = $600,000.
Book value of equity 2012 = $557,632.
MVA_{12} = $600,000 - $557,632 = $42,368.

MVA_{11} = $850,000 - $663,768 = $186,232.

i.	**Given that Computron could have issued preferred shares yielding 6% net of costs, why did the company decide to borrow more from the bank at a rate of 7.5%?**

Answer: Although the pre-tax cost of debt is more expensive than the preferred shares, interest costs are tax deductible whereas dividends are not. Therefore, on an after-tax basis the debt would cost Computron 7.5% × (1 – 0.4) = 4.5%, which is cheaper than the 6% preferred share cost.