
SOLUTIONS MANUAL
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essentials of
corporate finance
SEVENTH EDITION

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 can more safely meet short-term creditor demands. However, liquidity also has an opportunity cost. Firms generally reap higher returns by investing in illiquid, productive assets. 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 non-cash 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, capital outlays would typically 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 NWC 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 company.

11. The legal system thought it was fraud. Mr. Sullivan disregarded GAAP procedures, which is fraudulent. That fraudulent activity is unethical goes without saying.

12. By reclassifying costs as assets, it lowered costs when the lines were leased. This increased the net income for the company. It probably increased most future net income amounts, although not as much as you might think. Since the telephone lines were fixed assets, they would have been depreciated in the future. This depreciation would reduce the effect of expensing the telephone lines. The cash flows of the firm would basically be unaffected no matter what the accounting treatment of the telephone lines.

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.

<u>Basic</u>

1. The balance sheet for the company will look like this:

Balance sheet

Current assets	$2,170	Current liabilities	$1,350
Net fixed assets	9,300	Long-term debt	3,980
		Owner's equity	6,140
Total assets	$11,470	Total liabilities & Equity	$11,470

The owner’s equity is a plug variable. We know that total assets must equal total liabilities & owner’s equity. Total liabilities and equity is the sum of all debt and equity, so if we subtract debt from total liabilities and owner’s equity, the remainder must be the equity balance, so:

Owner's equity = Total liabilities & equity – Current liabilities – Long-term debt
Owner's equity = $11,470 – 1,350 – 3,980
Owner's equity = $6,140

Net working capital is current assets minus current liabilities, so:

NWC = Current assets – Current liabilities
NWC = $2,170 – 1,350
NWC = $820

2. The income statement starts with revenues and subtracts costs to arrive at EBIT. We then subtract out interest to get taxable income, and then subtract taxes to arrive at net income. Doing so, we get:

Income Statement	
Sales	$585,000
Costs	273,000
Depreciation	71,000
EBIT	$241,000
Interest	38,000
Taxable income	$203,000
Taxes	71,050
Net income	$131,950

3. The dividends paid plus addition to retained earnings must equal net income, so:

Net income = Dividends + Addition to retained earnings
Addition to retained earnings = $131,950 – 36,000
Addition to retained earnings = $95,950

4. Earnings per share is the net income divided by the shares outstanding, so:

EPS = Net income / Shares outstanding
EPS = $131,950 / 40,000
EPS = $3.30 per share

And dividends per share are the total dividends paid divided by the shares outstanding, so:

DPS = Dividends / Shares outstanding
DPS = $36,000 / 40,000
DPS = $0.90 per share

5. To find the book value of assets, we first need to find the book value of current assets. We are given the NWC. NWC is the difference between current assets and current liabilities, so we can use this relationship to find the book value of current assets. Doing so, we find:

NWC = Current assets – Current liabilities
Current assets = $130,000 + 710,000 = $840,000

Now we can construct the book value of assets. Doing so, we get:

Book value of assets	
Current assets	$ 840,000
Fixed assets	2,800,000
Total assets	$3,640,000

All of the information necessary to calculate the market value of assets is given, so:

Market value of assets	
Current assets	$ 825,000
Fixed assets	6,200,000
Total assets	$7,025,000

6. Using Table 2.3, we can see the marginal tax schedule. The first $50,000 of income is taxed at 15 percent, the next $25,000 is taxed at 25 percent, the next $25,000 is taxed at 34 percent, and the next $175,000 is taxed at 39 percent. So, the total taxes for the company will be:

Taxes = 0.15($50,000) + 0.25($25,000) + 0.34($25,000) + 0.39($275,000 – 100,000)
Taxes = $90,500

7. The average tax rate is the total taxes paid divided by net income, so:

Average tax rate = Total tax / Net income
Average tax rate = $90,500 / $275,000
Average tax rate = .3291 or 32.91%

The marginal tax rate is the tax rate on the next dollar of income. The company has net income of $275,000 and the 39 percent tax bracket is applicable to a net income up to $335,000, so the marginal tax rate is 39 percent.

8. To calculate the OCF, we first need to construct an income statement. The income statement starts with revenues and subtracts costs to arrive at EBIT. We then subtract out interest to get taxable income, and then subtract taxes to arrive at net income. Doing so, we get:

Income Statement	
Sales	$19,570
Costs	9,460
Depreciation	2,130
EBIT	$7,980
Interest	1,620
Taxable income	$6,360
Taxes (35%)	2,226
Net income	$4,134

Now we can calculate the OCF, which is:

OCF = EBIT + Depreciation – Taxes
OCF = $7,980 + 2,130 – 2,226
OCF = $7,884

9. Net capital spending is the increase in fixed assets, plus depreciation. Using this relationship, we find:

Net capital spending = NFA_{end} – NFA_{beg} + Depreciation
Net capital spending = $2,040,000 – 1,725,000 + 321,000
Net capital spending = $636,000

10. The change in net working capital is the end of period net working capital minus the beginning of period net working capital, so:

Change in NWC = NWC_{end} – NWC_{beg}
Change in NWC = (CA_{end} – CL_{end}) – (CA_{beg} – CL_{beg})
Change in NWC = ($1,230 – 905) – (1,015 – 905)
Change in NWC = $180

11. The cash flow to creditors is the interest paid, minus any net new borrowing, so:

Cash flow to creditors = Interest paid – Net new borrowing
Cash flow to creditors = Interest paid – (LTD_{end} – LTD_{beg})
Cash flow to creditors = $91,500 – ($1,530,000 – 1,375,000)
Cash flow to creditors = –$63,500

12. The cash flow to stockholders is the dividends paid minus any new equity raised. So, the cash flow to stockholders is: (Note that APIS is the additional paid-in surplus.)

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 = $140,000 – [($145,000 + 2,900,000) – ($135,000 + 2,600,000)]
Cash flow to stockholders = –$170,000

13. We know that cash flow from assets is equal to cash flow to creditors plus cash flow to stockholders. So, cash flow from assets is:

Cash flow from assets = Cash flow to creditors + Cash flow to stockholders
Cash flow from assets = –$63,500 – 170,000
Cash flow from assets = –$233,500

We also know that cash flow from assets is equal to the operating cash flow minus the change in net working capital and the net capital spending. We can use this relationship to find the operating cash flow. Doing so, we find:

Cash flow from assets = OCF – Change in NWC – Net capital spending
–$233,500 = OCF – (–$120,000) – (910,000)
OCF = –$233,500 – 120,000 + 910,000
OCF = $556,500

Intermediate

14. *a.* To calculate the OCF, we first need to construct an income statement. The income statement starts with revenues and subtracts costs to arrive at EBIT. We then subtract out interest to get taxable income, and then subtract taxes to arrive at net income. Doing so, we get:

Income Statement	
Sales	$153,000
Costs	81,900
Other Expenses	5,200
Depreciation	10,900
EBIT	$55,000
Interest	8,400
Taxable income	$46,600
Taxes	16,330
Net income	$30,270

Dividends	$7,200
Addition to retained earnings	23,070

Dividends paid plus addition to retained earnings must equal net income, so:

Net income = Dividends + Addition to retained earnings
Addition to retained earnings = $30,270 – 7,200
Addition to retained earnings = $23,070

So, the operating cash flow is:

OCF = EBIT + Depreciation – Taxes
OCF = $55,000 + 10,900 – 16,330
OCF = $49,570

b. The cash flow to creditors is the interest paid, minus any new borrowing. Since the company redeemed long-term debt, the net new borrowing is negative. So, the cash flow to creditors is:

Cash flow to creditors = Interest paid – Net new borrowing
Cash flow to creditors = $8,400 – (–$3,900)
Cash flow to creditors = $12,300

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

Cash flow to stockholders = Dividends paid – Net new equity
Cash flow to stockholders = $7,200 – 2,600
Cash flow to stockholders = $4,600

d. In this case, to find the addition to NWC, we need to find the cash flow from assets. We can then use the cash flow from assets equation to find the change in NWC. We know that cash flow from assets is equal to cash flow to creditors plus cash flow to stockholders. So, cash flow from assets is:

Cash flow from assets = Cash flow to creditors + Cash flow to stockholders
Cash flow from assets = $12,300 + 4,600
Cash flow from assets = $16,900

Net capital spending is equal to depreciation plus the increase in fixed assets, so:

Net capital spending = Depreciation + Increase in fixed assets
Net capital spending = $10,900 + 20,250
Net capital spending = $31,150

Now we can use the cash flow from assets equation to find the change in NWC. Doing so, we find:

Cash flow from assets = OCF – Change in NWC – Net capital spending
$16,900 = $49,570 – Change in NWC – $31,150
Change in NWC = $1,520

15. Here we need to work the income statement backward. Starting with net income, we know that net income is:

Net income = Dividends + Addition to retained earnings
Net income = $925 + 2,300
Net income = $3,225

Net income is also the taxable income, minus the taxable income times the tax rate, or:

Net income = Taxable income – (Taxable income)(Tax rate)
Net income = Taxable income(1 – Tax rate)

We can rearrange this equation and solve for the taxable income as:

Taxable income = Net income / (1 – Tax rate)
Taxable income = $3,225 / (1 – .40)
Taxable income = $5,375

EBIT minus interest equals taxable income, so rearranging this relationship, we find:

EBIT = Taxable income + Interest
EBIT = $5,375 + 1,580
EBIT = $6,955

Now that we have the EBIT, we know that sales minus costs minus depreciation equals EBIT. Solving this equation for EBIT, we find:

EBIT = Sales – Costs – Depreciation
$6,955 = $51,000 – 39,800 – Depreciation
Depreciation = $4,245

16. We can fill in the balance sheet with the numbers we are given. The balance sheet will be:

Balance Sheet			
Cash	$193,000	Accounts payable	$296,000
Accounts receivable	253,000	Notes payable	189,000
Inventory	538,000	Current liabilities	$485,000
Current assets	$984,000	Long-term debt	1,250,000
		Total liabilities	$1,735,000
Tangible net fixed assets	$5,100,000		
Intangible net fixed assets	847,000	Common stock	??
		Accumulated retained earnings	4,586,000
Total assets	$6,931,000	Total liabilities & owners' equity	$6,931,000

Owners' equity has to be total liabilities & equity minus accumulated retained earnings and total liabilities, so:

Owner's equity = Total liabilities & equity – Accumulated retained earnings – Total liabilities
Owners' equity = $6,931,000 – 4,586,000 – 1,735,000
Owners' equity = $610,000

17. Owner's equity is the maximum of total assets minus total liabilities, or zero. Although the book value of owners' equity can be negative, the market value of owners' equity cannot be negative, so:

Owners' equity = Max [(TA – TL), 0]

a. If total assets are $9,300, the owners' equity is:

Owners' equity = Max[($9,300 – 8,400), 0]
Owners' equity = $900

b. If total assets are $6,900, the owners' equity is:

Owners' equity = Max[($6,900 – 8,400), 0]
Owners' equity = $0

18. *a.* Using Table 2.3, we can see the marginal tax schedule. For Corporation Growth, the first $50,000 of income is taxed at 15 percent, the next $25,000 is taxed at 25 percent, and the next $14,000 is taxed at 34 percent. So, the total taxes for the company will be:

$\text{Taxes}_{\text{Growth}} = 0.15(\$50,000) + 0.25(\$25,000) + 0.34(\$14,000)$
$\text{Taxes}_{\text{Growth}} = \$18,510$

For Corporation Income, the first $50,000 of income is taxed at 15 percent, the next $25,000 is taxed at 25 percent, the next $25,000 is taxed at 34 percent, the next $235,000 is taxed at 39 percent, and the next $8,565,000 is taxed at 34 percent. So, the total taxes for the company will be:

$\text{Taxes}_{\text{Income}} = 0.15(\$50,000) + 0.25(\$25,000) + 0.34(\$25,000) + 0.39(\$235,000)$
$+ 0.34(\$8,565,000)$
$\text{Taxes}_{\text{Income}} = \$3,026,000$

b. The marginal tax rate is the tax rate on the next $1 of earnings. 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. *a.* The income statement starts with revenues and subtracts costs to arrive at EBIT. We then subtract interest to get taxable income, and then subtract taxes to arrive at net income. Doing so, we get:

Income Statement

Sales	$2,400,000
Cost of goods sold	1,425,000
Other expenses	435,000
Depreciation	490,000
EBIT	$ 50,000
Interest	215,000
Taxable income	–$165,000
Taxes (35%)	0
Net income	–$165,000

The taxes are zero since we are ignoring any carryback or carryforward provisions.

b. The operating cash flow for the year was:

OCF = EBIT + Depreciation – Taxes
OCF = $50,000 + 490,000 – 0
OCF = $540,000

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. The assumptions made in the question are:

Change in NWC = Net capital spending = Net new equity = 0

To find the new long-term debt, we first need to find the cash flow from assets. The cash flow from assets is:

Cash flow from assets = OCF – Change in NWC – Net capital spending
Cash flow from assets = $540,000 – 0 – 0
Cash flow from assets = $540,000

We can also find the cash flow to stockholders, which is:

Cash flow to stockholders = Dividends – Net new equity
Cash flow to stockholders = $400,000 – 0
Cash flow to stockholders = $400,000

Now we can use the cash flow from assets equation to find the cash flow to creditors. Doing so, we get:

Cash flow from assets = Cash flow to creditors + Cash flow to stockholders
$540,000 = Cash flow to creditors + $400,000
Cash flow to creditors = $140,000

Now we can use the cash flow to creditors equation to find:

Cash flow to creditors = Interest – Net new long-term debt
$140,000 = $215,000 – Net new long-term debt
Net new long-term debt = $75,000

21. *a.* To calculate the OCF, we first need to construct an income statement. The income statement starts with revenues and subtracts costs to arrive at EBIT. We then subtract out interest to get taxable income, and then subtract taxes to arrive at net income. Doing so, we get:

Income Statement	
Sales	$19,780
Cost of goods sold	13,980
Depreciation	2,370
EBIT	$ 3,430
Interest	345
Taxable income	$ 3,085
Taxes (35%)	1,080
Net income	$ 2,005

b. The operating cash flow for the year was:

OCF = EBIT + Depreciation – Taxes
OCF = $3,430 + 2,370 – 1,080 = $4,720

c. To calculate the cash flow from assets, we also need the change in net working capital and net capital spending. The change in net working capital was:

Change in NWC = $NWC_{end} - NWC_{beg}$
Change in NWC = $(CA_{end} - CL_{end}) - (CA_{beg} - CL_{beg})$
Change in NWC = ($3,280 – 2,160) – ($2,940 – 2,070)
Change in NWC = $250

And the net capital spending was:

Net capital spending = $NFA_{end} - NFA_{beg}$ + Depreciation
Net capital spending = $16,340 – 13,800 + 2,370
Net capital spending = $4,910

So, the cash flow from assets was:

Cash flow from assets = OCF – Change in NWC – Net capital spending
Cash flow from assets = $4,720 – 250 – 4,910
Cash flow from assets = –$440

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 fixed assets and net working capital; it had to raise a net $440 in funds from its stockholders and creditors to make these investments.

d. The cash flow to creditors was:

Cash flow to creditors = Interest – Net new LTD
Cash flow to creditors = $345 – 0
Cash flow to creditors = $345

Rearranging the cash flow from assets equation, we can calculate the cash flow to stockholders as:

Cash flow from assets = Cash flow to stockholders + Cash flow to creditors
–$440 = Cash flow to stockholders + $345
Cash flow to stockholders = –$785

Now we can use the cash flow to stockholders equation to find the net new equity as:

Cash flow to stockholders = Dividends – Net new equity
–$785 = $550 – Net new equity
Net new equity = $1,335

The firm had positive earnings in an accounting sense (NI > 0) and had positive cash flow from operations. The firm invested $250 in new net working capital and $4,910 in new fixed assets. The firm had to raise $440 from its stakeholders to support this new investment. It accomplished this by raising $1,335 in the form of new equity. After paying out $550 in the form of dividends to shareholders and $345 in the form of interest to creditors, $440 was left to just meet the firm's cash flow needs for investment.

22. *a.* To calculate owners' equity, we first need total liabilities and owners' equity. From the balance sheet relationship we know that this is equal to total assets. We are given the necessary information to calculate total assets. Total assets are current assets plus fixed assets, so:

Total assets = Current assets + Fixed assets = Total liabilities and owners' equity

For 2009, we get:

Total assets = $2,665 + 12,355
Total assets = $15,020

Now, we can solve for owners' equity as:

Total liabilities and owners' equity = Current liabilities + Long-term debt + Owners' equity
$15,020 = $1,151 + 6,739 + Owners' equity
Owners' equity = $7,130

For 2010, we get:

Total assets = $2,824 + 12,917
Total assets = $15,741

Now we can solve for owners' equity as:

Total liabilities and owners' equity = Current liabilities + Long-term debt + Owners' equity
$15,741 = $1,691 + 7,862 + Owners' equity
Owners' equity = $6,188

b. The change in net working capital was:

Change in NWC = $NWC_{end} – NWC_{beg}$
Change in NWC = $(CA_{end} – CL_{end}) – (CA_{beg} – CL_{beg})$
Change in NWC = ($2,824 – 1,691) – ($2,665 – 1,151)
Change in NWC = –$381

c. To find the amount of fixed assets the company sold, we need to find the net capital spending, The net capital spending was:

Net capital spending = $NFA_{end} – NFA_{beg}$ + Depreciation
Net capital spending = $12,917 – 12,355 + 3,367
Net capital spending = $3,929

To find the fixed assets sold, we can also calculate net capital spending as:

Net capital spending = Fixed assets bought – Fixed assets sold
$3,929 = $5,616 – Fixed assets sold
Fixed assets sold = $1,687

To calculate the cash flow from assets, we first need to calculate the operating cash flow. For the operating cash flow, we need the income statement. So, the income statement for the year is:

Income Statement	
Sales	$39,870
Costs	19,994
Depreciation	3,367
EBIT	$16,509
Interest	624
Taxable income	$15,885
Taxes (40%)	6,354
Net income	$ 9,531

Now we can calculate the operating cash flow which is:

OCF = EBIT + Depreciation – Taxes
OCF = $16,509 + 3,367 – 6,354 = $13,522

And the cash flow from assets is:

Cash flow from assets = OCF – Change in NWC – Net capital spending.
Cash flow from assets = $13,522 – (–$381) – 3,929
Cash flow from assets = $9,974

d. To find the cash flow to creditors, we first need to find the net new borrowing. The net new borrowing is the difference between the ending long-term debt and the beginning long-term debt, so:

Net new borrowing = $LTD_{Ending} – LTD_{Beginnning}$
Net new borrowing = $7,862 – 6,739
Net new borrowing = $1,123

So, the cash flow to creditors is:

Cash flow to creditors = Interest – Net new borrowing
Cash flow to creditors = $624 – 1,123 = –$499

The net new borrowing is also the difference between the debt issued and the debt retired. We know the amount the company issued during the year, so we can find the amount the company retired. The amount of debt retired was:

Net new borrowing = Debt issued – Debt retired
\$1,123 = \$1,690 – Debt retired
Debt retired = \$567

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

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

So, the operating cash flow is:

OCF = EBIT + Depreciation – Taxes
OCF = \$111,866 + 54,576 – 48,137
OCF = \$118,305

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

Change in NWC = NWC_{end} – NWC_{beg}
Change in NWC = (CA_{end} – CL_{end}) – (CA_{beg} – CL_{beg})
Change in NWC = (\$58,159 – 26,978) – (\$46,108 – 24,012)
Change in NWC = \$9,085

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

Net capital spending = NFA_{end} – NFA_{beg} + Depreciation
Net capital spending = \$406,311 – 344,426 + 54,576
Net capital spending = \$116,461

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

Cash flow from assets = OCF – Change in NWC – Net capital spending
Cash flow from assets = \$118,305 – 9,085 – 116,461
Cash flow from assets = –\$7,241

The company spent \$7,241 on its assets. The cash flow from operations was \$118,305, and the company spent \$9,085 on net working capital and \$116,461 in fixed assets.

The cash flow to creditors is:

Cash flow to creditors = Interest paid – New long-term debt
Cash flow to creditors = Interest paid – (Long-term $debt_{end}$ – Long-term $debt_{beg}$)
Cash flow to creditors = \$19,296 – (\$152,000 – 136,800)
Cash flow to creditors = \$4,096

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:

New equity = Ending equity – Beginning equity – Addition to retained earnings
New equity = \$285,492 – 229,722 – 34,833
New equity = \$20,937

What happened was the equity account increased by \$55,770. Of this increase, \$34,833 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:

Cash flow to stockholders = Dividends paid – Net new equity
Cash flow to stockholders = \$9,600 – 20,937
Cash flow to stockholders = –\$11,337

The company paid \$4,096 to creditors and raised \$11,337 from stockholders.

Finally, the cash flow identity is:

Cash flow from assets	=	Cash flow to creditors	+	Cash flow to stockholders
–\$7,241	=	\$4,096	+	–\$11,337

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

Challenge

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

25. *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%

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

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

Taxes = 0.34(\$10M) + 0.35(\$5M) + 0.38(\$3.333M) = \$6,416,667

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

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

c. At the end of the "tax bubble", the marginal tax rate on the next dollar should equal the average tax rate on all preceding dollars. Since the upper threshold of the bubble bracket is now \$200,000, the marginal tax rate on dollar \$200,001 should be 34 percent, and the total tax paid on the first \$200,000 should be \$200,000(.34). So, we get:

$$\begin{aligned}
\text{Taxes} &= 0.34(\$200\text{K}) = \$68\text{K} = 0.15(\$50\text{K}) + 0.25(\$25\text{K}) + 0.34(\$25\text{K}) + X(\$100\text{K}) \\
X(\$100\text{K}) &= \$68\text{K} - 22.25\text{K} = \$45.75\text{K} \\
X &= \$45.75\text{K} / \$100\text{K} \\
X &= 45.75\%
\end{aligned}$$