**End of Chapter Solutions**

***Corporate Finance: Core Principles and Applications***

**3rd edition**

***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.

**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, Ray Irani 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 simply 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 cash flows treat 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.

**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 unless the new accounting information caused stockholders to revalue the derivatives.

**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 owner’s equity, we must construct a balance sheet as follows:

Balance Sheet

CA $7,500 CL $5,900

NFA 28,900 LTD 18,700

OE ??

TA $36,400 TL & OE $36,400

We know that total liabilities and owner’s equity (TL & OE) must equal total assets of $36,400. We also know that TL & OE is equal to current liabilities plus long-term debt plus owner’s equity, so owner’s equity is:

OE = $36,400 –18,700 – 5,900 = $11,800

NWC = CA – CL = $7,500 – 5,900 = $1,600

**2.** The income statement for the company is:

Income Statement

Sales $753,000

Costs 308,000

Depreciation 46,000

EBIT $399,000

Interest 21,500

EBT $377,500

Taxes (35%) 132,125

Net income $245,375

One equation for net income is:

Net income = Dividends + Addition to retained earnings

Rearranging, we get:

Addition to retained earnings = Net income – Dividends

Addition to retained earnings = $245,375 – 67,000

Addition to retained earnings = $178,375

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

NWC = CA – CL

Rearranging to solve for current assets, we get:

CA = NWC + CL

CA = $750,000 + 1,800,000

CA = $2,550,000

So, the book value balance sheet will be:

Book Value Balance Sheet

Current assets $2,550,000

Fixed assets 4,500,000

Total assets $7,050,000

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

Market Value Balance Sheet

Current assets $2,700,000

Fixed assets 5,200,000

Total assets $7,900,000

**4.** Taxes = 0.15($50,000) + 0.25($25,000) + 0.34($25,000) + 0.39($285,000 – 100,000)

Taxes = $94,400

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

Average tax rate = $94,400 / $285,000

Average tax rate = .3312 or 33.12%

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

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

|  |  |  |
| --- | --- | --- |
|  | Income Statement | |
|  | Sales | $25,300 |
|  | Costs | 9,100 |
|  | Depreciation expense | 1,700 |
|  | EBIT | $14,500 |
|  | Interest expense | 950 |
|  | EBT | $13,550 |
|  | Taxes (40%) | 5,420 |
|  | Net income | $ 8,130 |

Using the equation for OCF, we get:

OCF = EBIT + Depreciation – Taxes

OCF = $14,500 + 1,700 – 5,420

OCF = $10,780

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

Net capital spending = NFAend – NFAbeg + Depreciation

Net capital spending = $5,300,000 – 4,700,000 + 760,000

Net capital spending = $1,360,000

**7.** The long-term debt account will increase by $6 million, the amount of the new long-term debt issue. Since the company sold 8 million new shares of stock with a $1 par value, the common stock account will increase by $8 million. The capital surplus account will increase by $21 million, the value of the new stock sold above its par value. Since the company had a net income of $7 million, and paid $2.5 million in dividends, the addition to retained earnings was $4.5 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 | $ 41,000,000 |
|  | Total long-term debt | $ 41,000,000 |
|  |  |  |
|  | Shareholders’ equity |  |
|  | Preferred stock | $ 4,000,000 |
|  | Common stock ($1 par value) | 19,000,000 |
|  | Capital surplus | 47,000,000 |
|  | Accumulated retained earnings | 79,500,000 |
|  | Total equity | $ 149,500,000 |
|  |  |  |
|  | Total Liabilities & Equity | $ 190,500,000 |

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

Cash flow to creditors = Interest paid – Net new borrowing

Cash flow to creditors = $195,000 – (LTDend – LTDbeg)

Cash flow to creditors = $195,000 – ($2,500,000 – 2,400,000)

Cash flow to creditors = $95,000

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

Cash flow to stockholders = Dividends paid – Net new equity

Cash flow to stockholders = $400,000 – [(Commonend + APISend) – (Commonbeg + APISbeg)]

Cash flow to stockholders = $400,000 – [($775,000 + 6,900,000) – ($730,000 + 6,200,000)]

Cash flow to stockholders = –$345,000

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:

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

Cash flow from assets = $95,000 – 345,000

Cash flow from assets = –$250,000

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:

Cash flow from assets = –$250,000 = OCF – Change in NWC – Net capital spending

–$250,000 = OCF – (–$85,000) – 810,000

Operating cash flow = $475,000

*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:

|  |  |  |
| --- | --- | --- |
|  | Statement of cash flows | |
|  | *Operations* |  |
|  | Net income | $71 |
|  | Depreciation | 50 |
|  | Changes in other current assets | 3 |
|  | Change in accounts payable | 3 |
|  |  |  |
|  | Total cash flow from operations | $127 |
|  |  |  |
|  | *Investing activities* |  |
|  | Acquisition of fixed assets | $(138) |
|  | Total cash flow from investing activities | $(138) |
|  |  |  |
|  | *Financing activities* |  |
|  | Proceeds of long-term debt | $40 |
|  | Dividends | (22) |
|  | Total cash flow from financing activities | $18 |
|  |  |  |
|  | Change in cash (on balance sheet) | $ 7 |

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

Change in NWC = NWCend – NWCbeg

= (CAend – CLend) – (CAbeg – CLbeg)

= [($45 + 140) – 143] – [($38 + 143) – 140)

= $42 – 41

= $1

*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:

|  |  |  |
| --- | --- | --- |
|  | *Operating cash flow* |  |
|  | EBT | $110 |
|  | Depreciation | 50 |
|  | –Taxes | 39 |
|  | Operating cash flow | $121 |

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

|  |  |  |
| --- | --- | --- |
|  | *Capital spending* |  |
|  | Ending fixed assets | $408 |
|  | –Beginning fixed assets | 320 |
|  | Depreciation | 50 |
|  | Capital spending | $138 |

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

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  | *Cash flow from assets* |  |
|  | Operating cash flow | $121 |
|  | Capital spending | (138) |
|  | Change in NWC | (1) |
|  | Cash flow from assets | –$18 |

Notice that the accounting statement of cash flows shows a small 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:

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 = NWCend – NWCbeg

Change in NWC = (CAend – CLend) – (CAbeg – CLbeg)

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 = NFAend – NFAbeg + 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 debtend – Long-term debtbeg)

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.

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

|  |  |  |
| --- | --- | --- |
|  | *Cash flows from the firm* |  |
|  | Capital spending | $(15,000) |
|  | Additions to NWC | (2,100) |
|  | Cash flows from the firm | $(17,100) |

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

|  |  |  |
| --- | --- | --- |
|  | *Cash flows to investors of the firm* |  |
|  | Sale of long-term debt | (12,000) |
|  | Sale of common stock | (3,000) |
|  | Dividends paid | 6,000 |
|  | Cash flows to investors of the firm | $(9,000) |

**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:

|  |  |  |
| --- | --- | --- |
|  | Income Statement | |
|  | Sales | $870,000 |
|  | Cost of goods sold | 280,000 |
|  | Selling expenses | 155,000 |
|  | Depreciation expense | 86,000 |
|  | EBIT | $349,000 |
|  | Interest expense | 39,000 |
|  | EBT | $310,000 |
|  | Taxes | 108,500 |
|  | Net income | $201,500 |

*b.* And the operating cash flow is:

OCF = EBIT + Depreciation – Taxes

OCF = $349,000 + 86,000 – 108,500

OCF = $326,500

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

|  |  |  |
| --- | --- | --- |
|  | Income Statement | |
|  | Sales | $193,000 |
|  | Costs | 96,500 |
|  | Other expenses | 5,100 |
|  | Depreciation expense | 13,800 |
|  | EBIT | $77,600 |
|  | Interest expense | 10,400 |
|  | EBT | $67,200 |
|  | Taxes | 23,520 |
|  | Net income | $43,680 |
|  | Dividends | $12,500 |
|  | Addition to retained earnings | $31,180 |

*a.* The operating cash flow was:

OCF = EBIT + Depreciation – Taxes

OCF = $77,600 + 13,800 – 23,520

OCF = $67,880

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

CFC = Interest – Net new LTD

CFC = $10,400 – (–$7,500)

CFC = $17,900

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 and net new equity, or:

CFS = Dividends – Net new equity

CFS = $12,500 – 6,000

CFS = $6,500

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

CFA = $17,900 + 6,500 = $24,400

CFA is also equal to (OCF – Net capital spending – Change in NWC). We already know OCF. Net capital spending is equal to:

Net capital spending = Increase in NFA + Depreciation

Net capital spending = $28,000 + 13,800

Net capital spending = $41,800

Now we can use:

CFA = OCF – Net capital spending – Change in NWC

$24,400 = $67,880 – $41,800 – Change in NWC.

Solving for the change in NWC gives $1,680, meaning the company increased its NWC by $1,680.

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

Net income = Dividends + Additions to retained earnings

Net income = $1,300 + 5,600

Net income = $6,900

Now, looking at the income statement:

EBT – (EBT × Tax rate) = Net income

Recognize that EBT × tax rate is simply the calculation for taxes. Solving this for EBT yields:

EBT = NI / (1– tax rate)

EBT = $6,900 / (1 – .35)

EBT = $10,615

Now we can calculate:

EBIT = EBT + Interest

EBIT = $10,615 + 1,900

EBIT = $12,515

The last step is to use:

EBIT = Sales – Costs – Depreciation

$12,515 = $43,000 – 26,000 – Depreciation

Depreciation = $4,485

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

Balance Sheet

Cash $175,000 Accounts payable $435,000

Accounts receivable 240,000 Notes payable 160,000

Inventory 405,000 Current liabilities $595,000

Current assets $820,000 Long-term debt 2,140,000

Total liabilities $2,735,000

Tangible net fixed assets 3,650,000

Intangible net fixed assets 730,000 Common stock ??

Accumulated ret. earnings 1,980,000

Total assets $5,200,000 Total liab. & owners’ equity $5,200,000

Total liabilities and owners’ equity is:

TL & OE = CL + LTD + Common stock

Solving for this equation for equity gives us:

Common stock = $5,200,000 – 1,980,000 – 2,735,000

Common stock = $485,000

**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: Shareholders’ equity = Max [(TA – TL), 0]. So, if TA is $15,100, equity is equal to $2,600, and if TA is $10,200, equity is equal to $0. We should note here that the book value of shareholders’ equity can be negative.

**19.** *a.* Taxes Growth = 0.15($50,000) + 0.25($25,000) + 0.34($11,000) = $17,490

Taxes Income = 0.15($50,000) + 0.25($25,000) + 0.34($25,000) + 0.39($235,000)

+ 0.34($8,600,000 – 335,000)

= $2,924,000

*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.

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

|  |  |  |
| --- | --- | --- |
|  | Income Statement | |
|  | Sales | $835,000 |
|  | Costs | 620,000 |
|  | Administrative and selling expenses | 120,000 |
|  | Depreciation expense | 85,000 |
|  | EBIT | 10,000 |
|  | Interest expense | $68,000 |
|  | EBT | –$58,000 |
|  | Taxes | 0 |
|  | Net income | –$58,000 |

*b.* OCF = EBIT + Depreciation – Taxes

OCF = $10,000 + 85,000 – 0

OCF = $95,000

*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 – Change in NWC – Net capital spending

Cash flow from assets = $95,000 – 0 – 0 = $95,000

Cash flow to stockholders = Dividends – Net new equity

Cash flow to stockholders = $45,000 – 0 = $45,000

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

Cash flow to creditors = $95,000 – 45,000

Cash flow to creditors = $50,000

Cash flow to creditors is also:

Cash flow to creditors = Interest – Net new LTD

So:

Net new LTD = Interest – Cash flow to creditors

Net new LTD = $68,000 – 50,000

Net new LTD = $18,000

**22.** *a.* The income statement is:

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Income Statement | |
|  |  | Sales | $25,700 |
|  |  | Cost of good sold | 18,400 |
|  |  | Depreciation | 3,450 |
|  |  | EBIT | $ 3,850 |
|  |  | Interest | 790 |
|  |  | Taxable income | $ 3,060 |
|  |  | Taxes (40%) | 1,224 |
|  |  | Net income | $ 1,836 |

*b.* OCF = EBIT + Depreciation – Taxes

OCF = $3,850 + 3,450 – 1,224

OCF = $6,076

*c.* Change in NWC = NWCend – NWCbeg

= (CAend – CLend) – (CAbeg – CLbeg)

= ($5,830 – 3,580) – ($5,100 – 3,400)

= $550

Net capital spending = NFAend – NFAbeg + Depreciation

= $23,650 – 19,280 + 3,450

= $7,820

CFA = OCF – Change in NWC – Net capital spending

= $6,076 – 550 – 7,820

= –$2,294

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 $2,294 in funds from its stockholders and creditors to make these investments.

*d.* Cash flow to creditors = Interest – Net new LTD

= $790 – 0

= $790

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

= –$2,294 – 790

= –$3,084

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 = $1,100 – (–3,084)

= $4,184

The firm had positive earnings in an accounting sense (NI > 0) and had positive cash flow from operations. The firm invested $550 in new net working capital and $7,820 in new fixed assets. The firm had to raise $2,294 from its stakeholders to support this new investment. It accomplished this by raising $4,184 in the form of new equity. After paying out $1,100 of this in the form of dividends to shareholders and $790 in the form of interest to creditors, $2,294 was left to meet the firm’s cash flow needs for investment.

**23.** *a.* Total assets 2009 = $740 + 3,600 = $4,340

Total liabilities 2009 = $330 + 2,000 = $2,330

Owners’ equity 2009 = $4,340 – 2,330 = $2,010

Total assets 2010 = $795 + 3,500 = $4,595

Total liabilities 2010 = $360 + 2,150 = $2,510

Owners’ equity 2010 = $4,595 – 2,510 = $2,085

*b.* NWC 2009 = CA09 – CL09 = $740 – 330 = $410

NWC 2010 = CA10 – CL10 = $795 – 360 = $435

Change in NWC = NWC10 – NWC09 = $435 – 410 = $25

*c.* We can calculate net capital spending as:

Net capital spending = Net fixed assets 2010 – Net fixed assets 2009 + Depreciation

Net capital spending = $3,800 – 3,600 + 930

Net capital spending = $1,130

So, the company had a net capital spending cash flow of $1,130. We also know that net capital spending is:

Net capital spending = Fixed assets bought – Fixed assets sold

$1,130 = $1,900 – Fixed assets sold

Fixed assets sold = $1,900 – 1,130

Fixed assets sold = $770

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):

EBIT = Sales – Costs – Depreciation

EBIT = $10,900 – 4,680 – 930

EBIT = $5,290

EBT = EBIT – Interest

EBT = $5,290 – 390

EBT = $4,900

Taxes = EBT × .35

Taxes = $4,900 × .35

Taxes = $1,715

OCF = EBIT + Depreciation – Taxes

OCF = $5,290 + 930 – 1,715

OCF = $4,505

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

Cash flow from assets = $4,505 – 25 – 1,130

Cash flow from assets = $3,350

*d.* Net new borrowing = LTD10 – LTD09

Net new borrowing = $2,150 – 2,000

Net new borrowing = $150

Net new borrowing = $150 = Debt issued – Debt retired

Debt retired = $440 – 150

Debt retired = $290

Cash flow to creditors = Interest – Net new LTD

Cash flow to creditors = $390 – 150

Cash flow to creditors = $240

**24.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Balance sheet as of Dec. 31, 2009 | | | | | | |
|  | Cash | $13,695 |  |  |  | Accounts payable | $14,885 |
|  | Accounts receivable | 18,130 |  |  |  | Notes payable | 2,645 |
|  | Inventory | 32,235 |  |  |  | Current liabilities | $17,530 |
|  | Current assets | $64,060 |  |  |  |  |  |
|  |  |  |  |  |  | Long-term debt | $45,865 |
|  | Net fixed assets | $114,850 |  |  |  | Owners' equity | 115,515 |
|  | Total assets | $178,910 |  |  |  | Total liab. & equity | $178,910 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Balance sheet as of Dec. 31, 2010 | | | | | | |
|  | Cash | $14,010 |  |  |  | Accounts payable | $13,950 |
|  | Accounts receivable | 20,425 |  |  |  | Notes payable | 2,485 |
|  | Inventory | 33,125 |  |  |  | Current liabilities | $16,435 |
|  | Current assets | $67,560 |  |  |  |  |  |
|  |  |  |  |  |  | Long-term debt | $53,510 |
|  | Net fixed assets | $117,590 |  |  |  | Owners' equity | 115,205 |
|  | Total assets | $185,150 |  |  |  | Total liab. & equity | $185,150 |

2009 Income Statement 2010 Income Statement

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Sales | $26,115.00 |  | Sales | $28,030.00 |
|  | COGS | 8,985.00 |  | COGS | 10,200.00 |
|  | Other expenses | 2,130.00 |  | Other expenses | 1,780.00 |
|  | Depreciation | 3,750.00 |  | Depreciation | 3,755.00 |
|  | EBIT | $11,250.00 |  | EBIT | $12,295.00 |
|  | Interest | 1,345.00 |  | Interest | 2,010.00 |
|  | EBT | $9,905.00 |  | EBT | $10,285.00 |
|  | Taxes (35%) | 3,466.75 |  | Taxes (35%) | 3,599.75 |
|  | Net income | $6,438.25 |  | Net income | $6,685.25 |
|  |  |  |  |  |  |
|  | Dividends | $3,184.00 |  | Dividends | $3,505.00 |
|  | Additions to RE | $3,254.25 |  | Additions to RE | 3,180.25 |

**25.** OCF = EBIT + Depreciation – Taxes

OCF = $12,295 + 3,755 – 3,599.75

OCF = $12,450.25

Change in NWC = NWCend – NWCbeg = (CA – CL) end – (CA – CL) beg

Change in NWC = ($67,560 – 16,435) – ($64,060 – 17,530)

Change in NWC = $4,595

Net capital spending = NFAend – NFAbeg + Depreciation

Net capital spending = $117,590 – 114,850 + 3,755

Net capital spending = $6,495

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

Cash flow from assets = $12,450.25 – 4,595 – 6,495

Cash flow from assets = $1,360.25

Cash flow to creditors = Interest – Net new LTD

Net new LTD = LTDend – LTDbeg

Cash flow to creditors = $2,010 – ($53,510 – 45,865)

Cash flow to creditors = –$5,635

Net new equity = Common stockend – Common stockbeg

Common stock + Retained earnings = Total owners’ equity

Net new equity = (OE – RE) end – (OE – RE) beg

Net new equity = OEend – OEbeg + REbeg – REend

REend= REbeg+ Additions to RE08

1. Net new equity = OEend – OEbeg+ REbeg – (REbeg + Additions to RE10)

= OEend – OEbeg – Additions to RE10

Net new equity = $115,205 – 115,515 – 3,180.25

Net new equity = –$3,490.25

Cash flow to stockholders = Dividends – Net new equity

Cash flow to stockholders = $3,505 – (–$3,490.25)

Cash flow to stockholders = $6,995.25

As a check, cash flow from assets is $1,360.25.

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

Cash flow from assets = –$5,635 + 6,995.25

Cash flow from assets = $1,360.25

*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 = $401 + 231 + 43 + 120

EBIT = $795

Now we can calculate the operating cash flow as:

|  |  |  |
| --- | --- | --- |
|  | *Operating cash flow* |  |
|  | Earnings before interest and taxes | $795 |
|  | Depreciation | 221 |
|  | Current taxes | (231) |
|  | Operating cash flow | $785 |

The cash flow from assets is found in the investing activities portion of the accounting statement of cash flows, so:

|  |  |  |
| --- | --- | --- |
|  | *Cash flow from assets* |  |
|  | Acquisition of fixed assets | $415 |
|  | Sale of fixed assets | (53) |
|  | Capital spending | $362 |

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 | $49 |
|  | Accounts receivable | 65 |
|  | Inventories | (51) |
|  | Accounts payable | (41) |
|  | Accrued expenses | 21 |
|  | Notes payable | (12) |
|  | Other | (5) |
|  | NWC cash flow | $26 |

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 | $120 |
|  | Retirement of debt | 240 |
|  | Debt service | $360 |
|  | Proceeds from sale of long-term debt | (131) |
|  | Total | $229 |

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 | $198 |
|  | Repurchase of stock | 32 |
|  | Cash to stockholders | $230 |
|  | Proceeds from new stock issue | (62) |
|  | Total | $168 |

**27.** Net capital spending = NFAend – NFAbeg + Depreciation

= (NFAend – NFAbeg) + (Depreciation + ADbeg) – ADbeg

= (NFAend – NFAbeg)+ ADend – ADbeg

= (NFAend + ADend) – (NFAbeg + ADbeg) = FAend – FAbeg

**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:

Taxes = 0.15($50,000) + 0.25($25,000) + 0.34($25,000) + 0.39($235,000)

Taxes = $113,900

Average tax rate = $113,900 / $335,000

Average tax rate = 0.34 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.

Taxes = 0.34($10,000,000) + 0.35($5,000,000) + 0.38($3,333,334)

Taxes = $6,416,667

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

Average tax rate = 0.35 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.

*c.* Taxes = 0.34($200,000) = $68,000

$68,000= 0.15($50,000) + 0.25($25,000) + 0.34($25,000) + X($100,000)

X($100,000) = $68,000 – 22,250 = $45,750

X = $45,750 / $100,000

X = 0.4575 or 45.75%