Financial Management Theory & Practice 17th edition Brigham Solutions Manual

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Chapter Overview and Outline

Chapter 2: Financial Statements, Cash Flow, and Taxes

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Purpose and Perspective of the Chapter

The purpose of this chapter is to give an overview of financial statements, cash flow and taxes. First, we will learn the four basic financial statements by outlining the components of a balance sheet, calculating net income, creating a statement of cash flows, and interpreting a statement of stockholders' equity. Next, we explain how to find net cash flow and how to calculate free cash flows. We will evaluate a company's operating performance and identify the major provisions in the corporate income tax code. Finally, we will illustrate how the personal tax code is progressive.

Chapter Objectives

The following objectives are addressed in this chapter:

2-1 Name the four basic financial statements.

2-2 Outline the categories reported on balance sheets.

2-3 Show how to calculate net income.

2-4 Create a statement of cash flows.

2-5 Interpret a statement of stockholders' equity.

2-6 Find net cash flow.

2-7 Explain how to calculate free cash flows.

2-8 Evaluate a company's operating performance.

2-9 Identify major provisions in the corporate income tax code.

2-10 Illustrate how the personal tax code is progressive.

What's New in This Chapter

The following elements are improvements in this chapter from the previous edition:

- Added learning outcomes section
- Added impact of coronavirus
- Integrated textbook and the accompanying excel tool kit
- Updated Figure 2.1 by adding a box explaining how to download financial statements directly into excel
- Swapped the sequence of coverage of the statement of cash flows and statement of equity.

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CHAPTER OUTLINE

I. Financial Statements and Reports (LO: 2-2)
   a. Assets
      i. Current Assets
      ii. Long-Term Assets
   b. Liabilities and Equity
      i. Current Liabilities
      ii. Long-Term Liabilities and Equity

II. The Income Statement (LO: 2-3)

III. Statement of Cash Flows (LO: 2-4)
   a. Operating Activities
      i. Noncash Adjustments
      ii. Changes in Working Capital
   b. Investing Activities
   c. Financing Activities
   d. Putting the Pieces Together

IV. Statement of Stockholders' Equity (LO: 2-5)

V. Net Cash Flow (LO: 2-6)

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VI. Free Cash Flow: The Cash Flow Available for Distribution to Investors (LO: 2-7)
   a. Net Operating Profit After Taxes (NOPAT)
   b. Net Operating Working Capital
   c. Total Net Operating Capital
   d. Net Investment in Operating Capital
   e. Calculating Free Cash Flow
   f. The Uses of FCF
   g. FCF and Corporate Value

VII. Performance Evaluation (LO: 2-8)
   a. The Return on Invested Capital
   b. Market Value Added (MVA)
   c. Economic Value Added (EVA)
   d. Intrinsic Value, MVA, and EVA

VIII. Corporate Income Taxes (LO: 2-9)
   a. Corporate Taxes: The Flat Corporate Tax Rate
   b. Corporate Taxes: Treatment of Investment Income Earned By a Corporation
      i. Corporate Taxes on Interest Income
      ii. Corporate Taxes: Treatment of Capital Gains From Sales of Financial Securities
      iii. Corporate Taxes: Treatments of Dividends Received from Another Company's Stock

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c. Corporate Taxes: Special Rules for Certain Expenses
   i. Limits on Interest Expense Deductions
   ii. Corporate Net Operating Loss (NOL) Carryforward
   iii. A Comparison of Pre-Tax Earnings Needed to Pay Interest and Dividends

d. Corporate Taxes: Miscellaneous Features
   i. Taxes on Overseas Income
   ii. Improper Accumulation to Avoid Payment of Dividends
   iii. Consolidated Corporate Tax Returns
   iv. Taxation of Pass-Through Entities
   v. The Corporate Alternative Minimum Tax

IX. Personal Taxes (LO: 2-10)
   a. Personal Taxes on Municipal Bonds and Corporate Bonds
   b. Personal Taxes on Capital Gains (or Losses) and Dividend Income

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Solution and Answer Guide

CHAPTER 2: FINANCIAL STATEMENTS, CASH FLOWS, AND TAXES

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ANSWERS TO END-OF-CHAPTER QUESTIONS

2-1 Define each of the following terms:

a. Annual report; balance sheet; income statement
b. Common stockholders' equity, or net worth; retained earnings
c. Statement of stockholders' equity; statement of cash flows
d. Depreciation; amortization; EBITDA
e. Operating current assets; operating current liabilities; net operating working capital; total net operating capital
f. Accounting profit; net cash flow; NOPAT; free cash flow; return on invested capital
g. Market Value Added; Economic Value Added
h. Progressive tax; taxable income; marginal and average tax rates
i. Capital gain or loss; tax loss carryforward
j. Improper accumulation; S corporation

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Answer:

a. The annual report is a report issued annually by a corporation to its stockholders. 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 stockholders. The bottom of the statement reports earnings and dividends per share.

b. Common stockholders' equity (net worth) is the capital supplied by common stockholders–capital stock, paid-in capital, retained earnings, and, occasionally,

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certain reserves. Paid-in capital is the difference between the stock's par value and what stockholders paid when they bought newly issued shares. Retained earnings is the portion of the firm's earnings that have been saved instead of paying out as dividends.

c. The statement of stockholders' equity shows how much of the firm's earnings were retained in the business rather than paid out in dividends. It also shows the resulting balance of the retained earnings account and the stockholders' equity account. 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. It shows the inflow and outflow of the cash occurred in an accounting year.

d. Depreciation is a non-cash expense 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 expense against intangible assets, such as goodwill. EBITDA is earnings before interest, taxes, depreciation, and amortization.

e. Operating current assets are the current assets used to support operating activites, 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 charges interest. 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. Return on invested capital is equal to NOPAT divided by total net operating capital. It shows the rate of return that is generated by assets.

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 stock) and the book value of the firm's common equity, debt, and preferred stock. If the book values of debt and preferred stock 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.

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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 which 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 backward for 2 years forward for indefinitely and used to offset future taxable income.

j. Improper accumulation is the retention of earnings by a business for the purpose of enabling stockholders to avoid personal income taxes on dividends. An S corporation is a small corporation which, under Subchapter S of the Internal Revenue Code, elects to be taxed as a proprietorship or a partnership yet retains limited liability and other benefits of the corporate form of organization.

2-2 What four statements are contained in most annual reports?

Answer:
The four financial statements contained in most annual reports are the balance sheet, income statement, statement of stockholders' equity, and statement of cash flows.

2-3 If a "typical" firm reports $20 million of retained earnings on its balance sheet, can the firm definitely pay a $20 million cash dividend?

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Answer:
No, because the $20 million of retained earnings doesn't mean the company has $20 million in cash. The retained earnings figure represents cumulative amount of net income that the firm has not paid out as dividends during its entire history. Thus, most of the reinvested earnings were probably spent on the firm's operating assets, such as buildings and equipment.

2-4 Explain the following statement: "Whereas the balance sheet can be thought of as a snapshot of the firm's financial position *at a point in time,* the income statement reports on operations *over a period of time*."

Answer:
The income statement shows the amount sales, costs, taxes, net income, and other items that have occurred during a specific time interval, such as a year, quarter, or month. For example, it would show the interest expense that a company paid in a year. In contrast, the balance sheet reports the actual amount of cash, inventory, fixed assets, and other assets that a company owns on a specific date. It also shows the amounts of current liabilities, debt, and other liabilities as of a specific date. For example, it might show the balance of accounts payable on the date the balance sheet was constructed.

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2-5 What is operating capital, and why is it important?

Answer:
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.

2-6 Explain the difference between NOPAT and net income. Which is a better measure of the performance of a company's operations?

Answer:
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.

2-7 What is free cash flow (FCF)? Why is it the most important measure of cash flow?

Answer:
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.

2-8 Explain the differences between net cash flow, cash flow from operations (also called operating cash flow), and free cash flow.

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Answer:
Net cash flow is net income plus non-cash expenses less non-cash income. Usually, this amounts to net income plus depreciation. It is an adjustment to net income that reflect non-cash items. Cash flow from operations is the cash flow given in the operating section of the statement of cash flows. It also adjusts net income for depreciation and other non-cash expenses but also adjusts for the required investment in current assets less cash provided by operating current liabilities. So, it extends the definition of cash flow to include some, but not all investments. Free cash flow is NOPAT minus investment in operating assets. FCC is different from net cash flow and operating cash flow as it starts with EBIT (not net income) and adjusts it for investment in all net operating assets (not just the short-term assets like in operating cash flow).

2-9 If you were starting a business, what tax considerations might cause you to prefer to set it up as a proprietorship or a partnership rather than as a corporation?

Answer:
If the business were organized as a partnership or a proprietorship, its income could be passed to the owners without being subject to taxation at the business level. 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 can be used to offset your other income and reduce your total tax bill. These factors would lead you to not incorporate the business. An alternative would be to organize as an S Corporation, if requirements are met.

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SOLUTIONS TO END-OF-CHAPTER PROBLEMS

EASY PROBLEMS 1-9

2-1 Personal After-Tax Yield. An investor recently purchased a corporate bond that yields 7.68%. The investor is in the 25% federal-plus-state tax bracket. What is the bond's after-tax yield to the investor?

Solution:
Corporate yield = 7.68%; Tax = 25%

After Tax yield = (Pre-tax yield) (1 – Tax)

= 7.68%(0.75) = 5.76%

2-2 Personal After-Tax Yield. Corporate bonds issued by Johnson Corporation currently yield 8.0%. Municipal bonds of equal risk currently yield 5.5%. At what personal tax rate would an investor be indifferent between these two bonds?

Solution:
Corporate bond yields 8%. Municipal bond yields 6%.

$$\text{Equivalent pretax yield on taxable bond} = \frac{\text{Yield on municipal bond}}{(1 - Tax)}$$

$$8\% = \frac{5.5\%}{(1-T)}$$

$$0.08 - 0.08T = 0.055$$

$$-0.08T = -0.025$$

$$T = .3125 = 31.25\%.$$

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2-3 Income Statement. Holly's Art Galleries recently reported $7.9 million of net income. Its EBIT was $13 million, and its federal tax rate was 21% (ignore any possible state corporate taxes). What was its interest expense? (Hint: Write out the headings for an income statement and then fill in the known values. Then divide $7.9 million net income by 1 – T = 0.79 to find the pre-tax income. The difference between EBIT and taxable income must be the interest expense. Use this procedure to work some of the other problems.)

Solution:
NI = $7,900,000; EBIT = $13,000,000; T = 21%; Interest = ?

Set up an income statement, plug in the given values, and work in the order of the steps shown below. (As with most problems, there are alternative ways of solving the problem.

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EBIT = $13,000,000 (Given)

(3) −Interest= 3,000,000

EBT =$10,000,000

(1) EBT = $10,000,000 $NI = EBT(1 - T) \Rightarrow EBT = \frac{NI}{(1-T)} = \frac{\$7,900,000}{0.79} = \$10,000,000$

(2) −Taxes (21%)= 2,100,000 = EBT(T)= $10,000,000) (0.21) = $2,100,000.

NI = $7,900,000 (Given)

More directly, use algebra to determine: Interest = EBIT − [NI/ (1 − T)] = $13,000,000 − $7,900,000/ (1 − 0.21) = $3,000,000.

2-4 Income Statement. Nicholas Health Care Systems recently reported an EBITDA of $25.0 million and net income of $15.8 million. It had $2.0 million of interest expense, and its federal tax rate was 21% (ignore any possible state corporate taxes). What was its charge for depreciation and amortization?

Solution:
EBITDA = $25,000,000; NI = $15,800,000; Int = $2,000,000; T = 21% ; D&A = ?

Set up an income statement, plug in the given values, and work in the order of the steps shown below. (As with most problems, there are alternative ways of solving the problem.

EBITDA = $25,000,000 (Given)

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(4) −D&A = 3,000,000 EBITDA − D&A = EBIT ⇒ D&A = EBITDA − EBIT

(3) EBIT = $22,000,000 EBIT = EBT + Int = $20,000,000 + $2,000,000

−Int = 2,000,000 (Given)

(1) EBT = $20,000,000 $NI = EBT(1 - T) \Rightarrow EBT = \frac{NI}{(1-T)} = \frac{\$15,800,000}{0.79} = \$20,000,000$

(2) −Taxes (21%) = 4,200,000

NI = $15,800,000 (Given)

More directly, D&A = EBITDA − Int − (NI/ (1 − T))

= $25,000,000 − $2,000,000 − ($15,800,000/ (1 − 0.21))

= $3,000,000.

2-5 Net Cash Flow. Kendall Corners Inc. recently reported net income of $3.1 million and depreciation of $500,000. What was its net cash flow? Assume it had no amortization expense.

Solution:
NI = $3,100,000; DEP = $500,000; AMORT = 0 ; NCF = ?

NCF = NI + DEP and AMORT = $3,100,000 + $500,000 = $3,600,000.

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2-6 Statement of Retained Earnings. In its most recent financial statements, Del-Castillo Inc. reported $70 million of net income and $900 million of retained earnings. The previous retained earnings were $855 million. How much in dividends did the firm pay to shareholders during the year?

Solution:
NI = $70,000,000; $R/E_{Y/E}$ = $900,000,000; $R/E_{B/Y}$ = $855,000,000; Dividends =?

$$R/E_{B/Y} + NI - Div = R/E_{Y/E}$$

$$\$855,000,000 + \$70,000,000 - Div = \$900,000,000$$

$$\$925,000,000 - Div = \$900,000,000$$

$$\$25,000,000 = Div$$

2-7 Net Operating Profit after Taxes (NOPAT). Zucker Inc. recently reported $4 million in earnings before interest and taxes (EBIT). Its federal-plus-state tax rate is 25%. What is its net operating profit after taxes (NOPAT)?

Solution:
NOPAT = EBIT (1 – T) = $4,000,000(1 – 0.25) = $3,000,000.

2-8 Total Net Operating Capital. Jenn Translation (JT) Inc. reported $10 million in operating current assets, $15 million in net fixed assets, and $3 million in operating current liabilities. How much total net operating capital does JT have?

Solution:
Total net operating capital = Net fixed assets + Net operating working capital

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= Net fixed assets + (Operating CA – Operating CL)

= $15,000,000 + ($10,000,000 – $3,000,000)

= $22,000,000.

2-9 Free Cash Flow (FCF). Carter Swimming Pools has $16 million in net operating profit after taxes (NOPAT) in the current year. Carter has $12 million in total net operating assets in the current year and had $10 million in the previous year. What is its free cash flow?

Solution:
Free cash flow = NOPAT – Net investment in total operating capital

= NOPAT – (Total net operating capital in current year

– Total net operating capital in previous year)

= $16,000,000 – ($12,000,000 – $10,000,000)

= $14,000,000.

INTERMEDIATE PROBLEMS 10-17

2-10 Corporate Tax Liability. The Talley Corporation had taxable operating income of $365,000 (i.e., earnings from operating revenues minus all operating costs). Talley

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also had (1) interest charges of $50,000, (2) dividends received of $15,000, and (3) dividends paid of $25,000. Its federal tax rate was 21% (ignore any possible state corporate taxes). Recall that 50% of dividends received are tax exempt. What is the taxable income? What is the tax expense? What is the after-tax income?

Solution:

Pre-tax operating earnings	$365,000
Less: Interest deduction	50,000
Plus: Taxable dividends received[a]	7,500
Taxable income	$322,500

[a]For a corporation, 50% of dividends received are excluded from taxes; therefore, taxable dividends are calculated as $15,000(1 – 0.5) = $7,500.

Tax expense = 21%($322,500) = $67,725.00.

After-tax income:

Taxable income	$322,500.00
Minus taxes	67,725.00
Net income before non-taxable dividends	$254,775.00
Plus taxable dividends received[b]	7,500.00
Net income	$262,275.00

[b]Non-taxable dividends are calculated as $15,000 – $7,500 = $7,500.

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2-11 Corporate Tax Liability. The Wendt Corporation reported $50 million of taxable income. Its federal tax rate was 21% (ignore any possible state corporate taxes).

a. What is the company's federal income tax bill for the year?
b. Assume the firm receives an additional $1 million of interest income from some bonds it owns. What is the additional tax on this interest income?
c. Now assume that Wendt does not receive the interest income but does receive an additional $1 million as dividends on some stock it owns. Recall that 50% of dividends received are tax exempt. What is the additional tax on this dividend income?

Solution:

a. Tax = $50,000,000)(0.21) = $10,500,000.

b. Tax = $1,000,000(0.21) = $210,000.

c. Tax = ($1,000,000)(1 – 0.50)(0.21) = $105,000.

2-12 Corporate After-Tax Yield. The Shrieves Corporation has $10,000 that it plans to invest in marketable securities. It is choosing among AT&T bonds (which yield 6.6%), AT&T preferred stock (with a dividend yield of 6.0%), and State of Florida municipal bonds (which yield 5% but are not taxable). The federal tax rate is 21% (ignore any possible state corporate taxes). Recall that 50% of dividends received are tax exempt. Find the after-tax rates of return on all three securities after paying federal corporate taxes.

Solution:

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A-T yield on AT&T bond = 6.6% − Taxes = 6.6% − 6.6%(0.21) = 5.214%.

Check: Invest $10,000 @ 6.6% = $660 interest.

Pay 21% tax, so A-T income = $660(1 − T) = $660(0.79) = $521.4.

A-T rate of return = $521.40/$10,000 = 5.214%.

A-T yield on AT&T preferred stock:

A-T yield = 6% − Taxes = 6% − (50%)(6%)(0.21) = 6% − 0.630% = 5.370%.

A-T yield on FLA bond = 5.000%.

Therefore, invest in AT&T preferred stock.

2-13 Net Cash Flows. The Moore Corporation has operating income (EBIT) of $750,000. Its depreciation expense is $200,000. Moore is 100% equity financed. The federal tax rate is 21% (ignore any possible state corporate taxes). What is the company's net income? What is its net cash flow?

Solution:
EBIT = $750,000; DEP = $200,000; 100% Equity; T = 21%

Set up an income statement, plug in the given values, and work in the order of the steps shown below. (As with most problems, there are alternative ways of solving the problem.)

EBIT	$750,000	Given
Interest	0	No debt with 100% equity
EBT	$750,000	
Taxes (21%)	157,500	
NI	$592,500	

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NCF = NI + DEP = $592,500 + $200,000 = $792,500.

2-14 Income and Cash Flow Analysis. The Berndt Corporation expects to have sales of $12 million. Costs other than depreciation are expected to be 75% of sales, and depreciation is expected to be $1.5 million. All sales revenues will be collected in cash, and costs other than depreciation must be paid for during the year. The federal tax rate is 21% (ignore any possible state corporate taxes). Berndt has no debt.

a. Set up an income statement. What is Berndt's expected net income? Its expected net cash flow?
b. Suppose Congress changed the tax laws so that Berndt's depreciation expenses doubled. No changes in operations occurred. What would happen to reported profit and to net cash flow?
c. Now suppose that Congress changed the tax laws such that, instead of doubling Berndt's depreciation, it was reduced by 50%. How would profit and net cash flow be affected?
d. If this were your company, would you prefer Congress to cause your depreciation expense to be doubled or halved? Why?

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Solution:

a. Income Statement

Sales revenues	$12,000,000	Given
Costs except depreciation	9,000,000	= 75%($12,000,000)
EBITDA	3,000,000	
Interest	0	
Depreciation	1,500,000	Given
EBT	$ 1,500,000	= Sales – (cost except depr) – depr
Taxes (21%)	315,000	
Net income	$ 1,185,000	
Add back depreciation	1,500,000	
Net cash flow	$ 2,685,000	

b. If depreciation doubled, depreciation would increase to 2($1,500,000) = $3,000,000. Taxable income (EBT) would fall EBITDA – Depr = $3,000,000 – $3,000,000 = 0; taxes would be zero. Thus, net income would decrease to zero, but net cash flow would rise to NI + Depr = $0 + $3,000,000. The company would save $315,000 in taxes, thus increasing its cash flow.

Alternatively:

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ΔCF = T(ΔDepreciation) = 0.21($1,500,000) = $315,000.

Net cash flow = Previous net cash flow + ΔCF

= $2,685,000 + $315,000 = $3,000,000.

c. If depreciation were halved, depreciation would fall to 0.5($1,500,000) = $750,000. Taxable income (EBT) would increase to EBITDA – Depr = $3,000,000 – $750,000 = $2,250,000; taxes would increase to T(EBT) = 0.21($2,250,000) = $472,500 Therefore, net income would rise to EBT – Tax = $2,250,000 – $472,500 = $1,177,500. However, net cash flow would fall to NI + Depr = $1,177,500 + $750,000 = $2,527,500.

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.

2-15 Net Operating Profit after Tax (NOPAT). Use the following income statement of Elliott Game Theory Consulting to determine its net operating profit after taxes (NOPAT). Use 25% as the tax rate.

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Elliot Game Theory Consulting: Income Statement for Year Ending December 31

	2023
Sales	$800,000
Operating costs excluding depreciation	700,000
Depreciation and amortization	20,000
Earnings before interest and taxes	$ 80,000
Less interest	2,000
Pre-tax income	$ 78,000
Taxes (25%)	19,500
Net income available to common stockholders	$ 58,500

Solution:
NOPAT = EBIT(1 – T) = $80,000(1 – 0.25) = $60,000.

2-16 Net Operating Working Capital (NOWC). Using the following balance sheets of Mimi's Gymnastics Inc., what is the net operating working capital (NOWC) for 2023?

Mimi's Gymnastics Inc.: Balance Sheets as of December 31 (Millions of Dollars)

	2023
Assets	
Cash	$ 90
Short-term investments	110
Accounts receivable	1,200
Inventories	900
Total current assets	$2,300
Net plant and equipment	2,200
Total assets	$4,500
Liabilities and Equity	
Accounts payable	$ 600
Accruals	200
Notes payable	180
Total current liabilities	$ 980
Long-term debt	800
Total liabilities	$ 1,780
Common stock	2,200
Retained earnings	520
Total common equity	$2,720
Total liabilities and equity	$4,500

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Solution:

NOWC = Operating CA – Operating CL

= (Cash + AR + INV) – (AP + Accruals)

= ($90 + $1,200 + $900) – ($600 + $200)

= $1,390 million.

2-17 Investment in Total Net Operating Capital. Athenian Venues Inc. just reported the following selected portion of its financial statements for the end of 2023. Your assistant has already calculated the 2023 end-of-year net operating working capital (NOWC) from the full set of financial statements (not shown here), which is $13 million. The total net operating capital for 2022 was $50 million. What was the 2023 net investment in operating capital?

Athenian Venues Inc.: Selected Balance Sheet Information as of December 31 (Millions of Dollars)

Assets	**2023**
Cash	$ 1
Short-term investments	4
Accounts receivable	8
Inventories	11
Total current assets	$24
Net plant and equipment	51
Total assets	$75

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Solution:

Net investment in operating capital = (NOWC + Op LT assets)

– (Total net Op Cap. in previous year)

= ($13 + $51) – ($50) = $14 million.

Challenging Problems 18–19

2-18 Free Cash Flows. Rhodes Corporation's financial statements are shown after part f. Suppose the federal-plus-state tax corporate tax is 25%. Answer the following questions:

a. What is the net operating profit after taxes (NOPAT) for 2023?
b. What are the amounts of net operating working capital for both years?
c. What are the amounts of total net operating capital for both years?
d. What is the free cash flow for 2023?
e. What is the ROIC for 2023?
f. How much of the FCF did Rhodes use for each of the following purposes: after-tax interest, net debt repayments, dividends, net stock repurchases, and net purchases of short-term investments? (*Hint:* Remember that a net use can be negative.)

Rhodes Corporation: Income Statements for Year Ending December 31

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(Millions of Dollars)

	2023	2022
Sales	$11,000	$10,000
Operating costs excluding depreciation	9,612	8,728
Depreciation and amortization	380	360
Earnings before interest and taxes	$ 1,008	$ 912
Less interest	120	100
Pre-tax income	$ 888	$812
Taxes (25%)	222	203
Net income available to common stockholders	$ 666	$ 609
Common dividends	$ 202	$ 200

Rhodes Corporation: Balance Sheets as of December 31 (Millions of Dollars)

	2023	2022
Assets		
Cash	$ 550	$ 500
Short-term investments	110	100
Accounts receivable	2,750	2,500
Inventories	1,650	1,500
Total current assets	$5,060	$4,600
Net plant and equipment	3,850	3,500
Total assets	$ 8,910	$ 8,100
Liabilities and Equity		
Accounts payable	$ 1,100	$ 1,000
Accruals	550	500
Notes payable	384	200
Total current liabilities	$2,034	$ 1,700
Long-term debt	1,100	1,000
Total liabilities	$ 3,134	$2,700
Common stock	4,312	4,400
Retained earnings	1,464	1,000
Total common equity	$ 5,776	$5,400
Total liabilities and equity	$ 8,910	$ 8,100

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Solution:

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a.

	2023
EBIT	$1,008
x (1 – Tax rate)	75.0%
Net operating profit after taxes (NOPAT)	$ 756

b.

	2023	2022
Cash	$ 550	$ 500
+ Accounts receivable	2,750	2,500
+ Inventories	1,650	1,500
Operating current assets	$4,950	$4,500
Accounts payable	$ 1,100	$ 1,000
+ Accruals	550	500
Operating current liabilities	$ 1,650	$ 1,500
Operating current assets	$4,950	$4,500
– Operating current liabilities	1,650	1,500
Net operating working capital (NOWC)	$3,300	$3,000

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c.

	2023	2022
Net operating working capital (NOWC)	$3,300	$3,000
+ Net plant and equipment	3,850	3,500
Total net operating capital	$ 7,150	$6,500

d.

	2023
NOPAT	$756
– Investment in total net operating capital	650
Free cash flow	$ 106

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e.

	2023
NOPAT	$756
÷ Total net operating capital	7,150
Return on invested capital (ROIC)	10.57%

f.

Uses of FCF	2023
After-tax interest payment =	$ 90
Reduction (increase) in debt =	-$284
Payment of dividends =	$202
Repurchase (Issue) stock =	$ 88
Purchase (Sale) of short-term investments =	$ 10
Total uses of FCF =	$106

2-19 Loss Carryforward. The Bookbinder Company had $500,000 cumulative operating losses prior to the beginning of *last* year. It had $100,000 in pre-tax earnings *last* year before using the past operating losses and has $300,000 in the *current* year before using any past operating losses. It projects $350,000 pre-tax earnings *next* year.

a. How much taxable income was there *last* year? How much, if any, cumulative losses remained at the end of the last year?
b. What is the taxable income in the *current* year? How much, if any, cumulative losses remain at the end of the current year?
c. What is the projected taxable income for *next* year? How much, if any, cumulative losses are projected to remain at the end of next year?

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Solution:

a. Last year:

Cumulative losses prior to beginning of last year =	$500,000
Last year's pre-tax earnings =	$100,000
Amount of last year's pre-tax earnings that may be offset by past operating losses = MIN[80% × $100,000, $500,000) =	$ 80,000
Last year's taxable earnings after offset =	$ 20,000
Remaining cumulative losses = MAX[0,Prior cumulative losses – amount of offset] =	$420,000

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b. Current year:

Cumulative losses prior to beginning of current year =	$420,000
Current year's pre-tax earnings =	$300,000
Amount of current year's pre-tax earnings that may be offset by past operating losses = MIN[80% × $300,000, $420,000) =	$240,000
Last year's taxable earnings after offset =	$ 60,000
Remaining cumulative losses = MAX[0,Prior cumulative losses – amount of offset] =	$ 180,000

c. Projections for next year:

Cumulative losses prior to end of next year =	$ 180,000
Next year's projected pre-tax earnings =	$350,000
Amount of next year's pre-tax earnings that may be offset by past operating losses = MIN[80% × $350,000, $180,000) =	$ 180,000
Next year's projected taxable income after offset =	$ 170,000
Remaining cumulative losses = MAX[0,Prior cumulative losses – amount of offset] =	$ 0

SOLUTION TO SPREADSHEET PROBLEM

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2-20 Build a Model: Financial Statements. Begin with the partial model in the file ***Ch02 P20 Build a Model.xlsx*** on the textbook's website.

a. Britton String Corp. manufactures specialty strings for musical instruments and tennis racquets. Its most recent sales were $880 million; operating costs (excluding depreciation) were equal to 85% of sales; net fixed assets were $300 million; depreciation amounted to 10% of net fixed assets; interest expenses were $22 million; the state-plus-federal corporate tax rate was 25%; and it paid 40% of its net income out in dividends. Given this information, construct its income statement. Also calculate total dividends and the addition to retained earnings. Report all dollar figures in millions.

b. Britton String's partial balance sheets follow. Britton issued $36 million of new common stock in the most recent year. Using this information and the results from part a, fill in the missing values for common stock, retained earnings, total common equity, and total liabilities and equity.

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Britton String Corp.: Balance Sheets as of December 31 (Millions of Dollars)

	2023	2022
Assets		
Cash and cash equivalents	$ 70	$ 60
Short-term investments	46	42
Accounts receivable	120	140
Inventories	264	196
Total current assets	$500	$438
Net fixed assets	300	262
Total assets	$800	$700
Liabilities and Equity		
Accounts payable	$ 73	$ 64
Accruals	49	60
Notes payable	30	39
Total current liabilities	$ 152	$ 163
Long-term debt	217	178
Total liabilities	$369	$ 341
Common stock	285	249
Retained earnings	146	110
Total common equity	$ 431	$359
Total liabilities and equity	$800	$700

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c. Construct the statement of cash flows for 2023.

Solution:
The detailed solution for the spreadsheet problem, ***Ch02 P20 Build a Model Solution.xlsx*** is available at the textbook's website.

2-21 Build a Model: Free Cash Flows, EVA, and MVA. Begin with the partial model in the file ***Ch02 P21 Build a Model.xlsx*** on the textbook's website.

a. Using the financial statements shown here for Lan & Chen Technologies, calculate net operating working capital, total net operating capital, net operating profit after taxes, free cash flow, and return on invested capital for 2023. The federal-plus-state tax rate is 25%.

b. Assume there were 15 million shares outstanding at the end of 2023, the year-end closing stock price was $65 per share, and the after-tax cost of capital was 10%. Calculate EVA and MVA for 2023.

Lan & Chen Technologies: Income Statements for Year Ending December 31 (Millions of Dollars)

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	2023	2022
Sales	$945,000	$900,000
Expenses excluding depreciation and amortization	812,700	774,000
EBITDA	$ 132,300	$ 126,000
Depreciation and amortization	33,100	31,500
EBIT	$ 99,200	$ 94,500
Interest expense	10,400	8,900
Pre-tax earnings	$ 88,800	$85,600
Taxes (25%)	22,200	21,400
Net income	$ 66,600	$ 64,200
Common dividends	$ 43,300	$ 41,230
Addition to retained earnings	$ 23,300	$ 22,970

Lan & Chen Technologies: December 31 Balance Sheets (Millions of Dollars)

	2024	2023
Assets		
Cash and cash equivalents	$ 47,250	$ 45,000
Short-term investments	3,800	3,600
Accounts receivable	283,500	270,000
Inventories	141,750	135,000
Total current assets	$476,300	$453,600
Net fixed assets	330,750	315,000
Total assets	$807,050	$768,600
Liabilities and Equity		
Accounts payable	$ 94,500	$ 90,000
Accruals	47,250	45,000
Notes payable	17,400	9,000
Total current liabilities	$ 159,150	$ 144,000
Long-term debt	90,000	90,000
Total liabilities	$ 249,150	$234,000
Common stock	444,600	444,600
Retained earnings	113,300	90,000
Total common equity	$557,900	$534,600
Total liabilities and equity	$807,050	$768,600

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Solution:
The detailed solution for the spreadsheet problem, ***Ch02 P21 Build a Model Solution.xlsx*** is available at the textbook's website.

MINI CASE

Jenny Cochran, a graduate of the University of Tennessee with 4 years of experience as an equities analyst, was recently brought in as assistant to the chairman of the board of Computron Industries, a manufacturer of computer components.

During the previous year, Computron had doubled its plant capacity, opened new sales offices outside its home territory, and launched an expensive advertising campaign. Cochran was assigned to evaluate the impact of the changes. She began by gathering financial statements and other data. Note: These are available in the file *Ch02 Tool Kit.xlsx* in the *Mini Case* tab.

Balance Sheets	**2022**	**2023**
Assets		
Cash and equivalents	$ 60	$ 50
Short-term investments	100	10
Accounts receivable	400	520
Inventories	620	820
Total current assets	$ 1,180	$ 1,400
Gross fixed assets	$3,900	$4,820
Less: Accumulated depreciation	1,000	1,320
Net plant and equipment	$2,900	$3,500
Total assets	$4,080	$4,900
Liabilities and Equity		
Accounts payable	$ 300	$ 400
Notes payable	50	250
Accruals	200	240
Total current liabilities	$550	$ 890
Long-term bonds	800	1,100
Total liabilities	$ 1,350	$1,990
Common stock	1,000	1,000
Retained earnings	1,730	1,910
Total equity	$ 2,730	$ 2,910
Total liabilities and equity	$4,080	$4,900

Income Statement	**2022**	**2023**

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Income Statement	2022	2023
Net sales	$5,500	$6,000
Cost of goods sold (Excluding depr. & amort.)	4,300	4,800
Depreciation and amortization[a]	290	320
Other operating expenses	350	420
Total operating costs	$4,940	$5,540
Earnings before interest and taxes (EBIT)	$ 560	$ 460
Less interest	68	108
Pre-tax earnings	$ 492	$ 352
Taxes (25%)	123	88
Net Income	$ 369	$ 264

Note:

[a]Computron has no amortization charges.

Other Data	2022	2023
Stock price	$50.00	$30.00
Shares outstanding	100	100
Common dividends	$ 90	$ 84
Tax rate	25%	25%
Weighted average cost of capital (WACC)	10.00%	10.00%

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Statement of Cash Flows	2023
Operating Activities	
Net Income before preferred dividends	$ 264
Noncash Adjustments	
Depreciation and amortization	320
Due to Changes in Working Capital	
Change in accounts receivable	(120)
Change in inventories	(200)
Change in accounts payable	100
Change in accruals	40
Net cash provided by operating activities	$ 404

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Statement of Cash Flows *(continued)*	**2023**
Investing Activities	
Cash used to acquire fixed assets	$(920)
Change in short-term investments	90
Net cash provided by investing activities	$(830)
Financing Activities	
Change in notes payable	$ 200
Change in long-term debt	300
Payment of cash dividends	(84)
Net cash provided by financing activities	$ 416
Net change in cash and equivalents	$ (10)
Cash and securities at beginning of the year	60
Cash and securities at end of the year	$ 50

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?

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Answer:
Sales increased by $500 million (9% growth), but net income fell by $105 million. Current assets and net plant and equipment each grew by over 20%. Large increases in debt funded the expansion, causing a 59% increase in interest payments.

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

Answer:
Net CF from operations was positive, but was dragged down by a large net increase in working capital. Net CF from investing was negative even though the firm sold short-term investments. This was because the expenditures in fixed assets were so high. Net CF from financing shows heavy borrowing. Even after borrowing, the cash account fell.

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 stockholders and debtholders) after making the necessary investments to support operations. A company's value depends upon the amount of FCF it can generate.

1. Pay interest on debt.
2. Pay back principal on debt.
3. Pay dividends.
4. Buy back stock.

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5. Buy nonoperating assets (e.g., marketable securities, investments in other companies, etc.)

d. What is Computron's net operating profit after taxes (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:
NOPAT = EBIT(1 – TAX RATE)

Current year:

NOPAT = 460(1 – 0.25)

= $345.

Previous year:

NOPAT = $420.

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

NOWC = operating CA – operating CL

Current year:

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NOWC = ($50 + $520 + 820) – ($400 + $240)

= $1,390 – $640

= $750.

Previous year:

NOWC = $580.

Total operating working capital = NOWC + net fixed assets.

Current year:

Operating capital = $750 + $3,500

= $4,250.

Previous year:

Operating capital = $3,480.

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e. What is Computron's free cash flow (FCF)? What are Computron's "net uses" of its FCF?

Answer:
FCF = NOPAT − Net investment in capital

= $345 − ($4,250 − $3,480)

= $345 − $770

= −$425.

Uses of FCF:

After-tax interest payment =	$ 81
Reduction (increase) in debt =	−$500
Payment of dividends =	$ 84
Repurchase (Issue) stock =	$ 0
Purchase (Sale) of short-term investments =	−$ 90
Total uses of FCF =	−$425

f. Calculate Computron's return on invested capital (ROIC). Computron has a 10% cost of capital (WACC). What caused the decline in the ROIC? Was it due to operating profitability or capital utilization? Do you think Computron's growth added value?

Answer:
ROIC = NOPAT/TOTAL NET OPERATING CAPITAL.

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Current year:

ROIC = $345/$4,250

= 8.1%.

Previous year:

ROIC = 12.1%.

Current year:

OP = $345/$6,000

= 5.8%.

Previous year:

OP = 7.0%.

Current year:

CR = $4,250/$6,000

= 70.8%.

Previous year:

CR = 58.0%.

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The current ROIC dropped from the previous year. This decline was due to worse operating profitability (5.8% versus 7.0%) and worse capital utilization (CR ratio of 70.8% versus a CR ratio of 58.0%). The ROIC 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 OK if ROIC > WACC.

g. Cochran also has asked you to estimate Computron's economic value added (EVA). She estimates that the after-tax cost of capital was 10% in both years.

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

Current year:

EVA = $345 − (0.1)($4,250)

= $345 − $425

= −$80.

Previous year:

EVA = $420 − (0.10)($3,480)

= $420 − $348

= $72.

h. What happened to Computron's market value added (MVA)?

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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.

Current year:

Market value of equity = (100)($30.00) = $3,000.

Book value of equity = $2,910.

MVA = $3,000 − $2,910 = $90.

Previous year:

MVA = 100($50.00) − $2,730 = $2,270.

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i. What are the differences between progressive tax rates and flat tax rates? Are U.S. corporate tax rates progressive or flat?

Answer:
Progressive tax rates increase as taxable income increases. Flat rates do not change as income increases.

Corporate tax rates were progressive before 2018, but the 2017 Tax Cuts and Jobs Act changed them to a flat rate.

A small corporation with a taxable income of $100,000 pays the same tax rate as a giant corporation with a taxable income of $100 million.

j. How are corporations taxed on: (1) pre-tax profits from operations (including sales of equipment that it no longer needs), (2) interest received from bank accounts and other investments that pay interest, (3) and capital gains from the sale of a financial security?

Answer:
The federal tax rate of 21% is applied to the following sources of pre-tax operating profits:

1. Sales of products to customers.
2. Services provided to customers.
3. Capital gains on sales of equipment that the company no longer needs.

k. What is the corporate net operating loss (NOL) carryforward provision?

Answer:
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Corporations can carry forward operating losses to reduce taxable income in current years:

1. Applies to cumulative past operating losses.
2. Carry forward to offset future taxable income and taxes.
3. Carry forward indefinitely.
4. Prior to TCJA:

   Could carry forward only 20 years).

   Could carry back losses and receive refunds from past paid taxes.

l. Suppose a company has taxable income of $80 billion. However, the company has $92 billion in prior unused net operating losses. What is the company's taxable income after the carryforward adjustment, the tax on the adjusted income, and any remaining unused prior loss? The corporate tax rate is 25% and the carryforward limitation percentage is 80%.

Answer:
The maximum amount of loss that can be carried forward in the current year is 80% of the taxable income of $80 billion:

80%($80) = $64 billion.

The remaining taxable income after the carryforward adjustment is:

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$92 − $80 = $16 billion

The tax on adjusted profit is:

25%($24) = $6 billion

The remaining unused prior loss that can be carried forward is:

$100 − $96 = $4 billion.

m. A corporation has $50 billion of earnings before interest and taxes (EBIT) and $20 billion in interest expenses this year. How much interest expense can the company deduct from its EBIT in the current year? What happens if the company can't deduct all of its interest expenses in the current year?

Answer:
Corporations can deduct interest expenses in a single year up to 30% of EBIT.

Deduction in current year = 30%($50) = $15 billion.

The company started with $20 billion in interest expenses. After deducting $15 billion, the company has $5 billion remaining unused interest expenses ($20 − $15 = $5). It can deduct the remaining unused interest expense in future years, subject to the 30% limitation.

n. Compare the corporate tax treatments of interest that a company pays versus dividends that a company pays. Do the tax treatments cause a company to prefer financing with equity or debt, all else held equal?

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Answer:
Companies can deduct interest payments, subject to the annual limit of 30% of EBIT. However, companies may not deduct dividends. All else held equal, companies have an incentive to finance with debt instead of equity.

o. How is a company taxed on interest it receives from bank accounts and other financial investments that pay interest? How is a company taxed on a capital gain if it sells a financial security for a profit? If a company owns shares of stock issued by another company, how is the company taxed on dividends it receives from those shares?

Answer:
A company pays the standard 21% tax rate on interest it receives.

It also pays 21% on capital gains from financial investments just like it does on capital gains from sales of operating assets.

The tax treatment of dividends is different. Suppose a company pays dividends from its after-tax income. Now suppose a second company owns some shares of the first company's stock. The dividends that this second company receives are part of its taxable income, so these dividends are taxed as part of the second company's taxable income. Notice that this is the second time that the original pre-tax income that the first company needed to pay a dividend has been taxed: It was taxed as part of the first company's taxable income, and it was taxed as part of the second company's taxable income.

Suppose the second company pays a dividend to its shareholders. A shareholder must pay tax on the dividend. This is the third time that a portion of the original

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company's income gets taxed: It was taxed as part of the first company's taxable income, it was taxed as part of the second company's taxable income, and it is taxed as part of the shareholder's income. This is called the triple taxation of *dividends*.

To mitigate the triple taxation of dividends, the second company can exclude from its own taxable income 50% of the dividends that it received from the first company.

p. A company has $40 million in cash and has decided to invest it in another company's bonds or preferred stock, which it considers to be equally risky. The bonds pay an interest rate of 5.4% and the preferred stock pays a dividend rate of 5%. The corporate tax rate is 25%. Which investment has the higher after-tax return?

Answer:
The preferred stock's total pre-tax dividend payments are: 5%($40) = $2.0 million. To mitigate triple taxation of dividends, 50% of dividends are exempt from taxation. Therefore, only 50%($2.0) = $1.0 million of the dividends will be taxed. The tax on these dividends is 25%($1.0) = $0.25 million. Therefore, the after-tax income from the preferred stock is $2.0 − $0.25 = $1.75 million. The after-tax rate of return is $1.75/$40 = 4.38%.

The total interest payments on the bonds equals 5.4%($40) = $2.16 million. The tax on the interest payments equals 25%($2.16) = $0.54 million. The after-tax payments equal $2.16 − $0.54 = $1.62 million. The after-tax rate of return on the bonds is: $1.62/$40 = 4.05%.

Therefore, the preferred stock has a higher after-tax return than the bond even though it has a lower pre-tax return.

In this example, the after-tax return on the preferred stock is greater than the after-tax return on the bond. An investor would be indifferent between preferred stock and a perpetual bond if they have the same risk and the same after-tax return. Let r_d be the expected return on the debt and r_{ps} be the expected return on the preferred stock. If both investments are selling at par, then r_d and r_{ps} the pre-tax expected returns. The interest rate on the bond that produces the same after-tax return as the after-tax return on the preferred stock is: $r_d = r_{ps} + \{[(r_{ps})(X)(T)]/(1 - T)\}$. Applying this formula to this example gives the result: $r_d = 0.05 + \{[(0.05)(0.5)(0.25)]/(1 - 0.25)\} = 0.0583 = 5.83\%$.

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q. A corporation has $166 million of taxable income from operations. It also received interest income of $20 million and dividend income of $28 million from an unrelated company. The federal tax rate is 21% and the dividend exclusion rate is 50%. What is the company's federal tax liability?

Answer:
Calculation of the company's tax liability:

Taxable dividend income = Dividends(1 − Exclusion rate)

= $28(1 − 0.5)

= $14

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Taxable operating income = $166 million

Taxable interest income = $20 million

Taxable dividend income = $14 million

Total taxable income = $200 million

Tax = 21%($200)= $42.0.

r. If a U.S. company has a foreign subsidiary, how are the subsidiary's profits taxed by the United States?

Answer:
Foreign profits are earned by a subsidiary of a U.S. company that is located overseas. They are taxed at subsidiary's legal residence (e.g., Ireland because it has favorable tax laws).

Before 2018, they were not taxed by the United States until they were repatriated to the United States, where they were taxed. Therefore, many companies kept their foreign profits overseas rather than bring them to the United States and get taxed.

The 2018 TCJA changed this and imposed a 15.5% tax on foreign profits held overseas as cash or cash equivalents. It imposed an 8% tax on foreign profits invested in other ways. Companies can spread the tax out between 2018 and 2025.

Now the United States doesn't tax a U.S. company on foreign profits earned after 2018.

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s. Briefly describe key provisions for personal taxes.

Answer:
The TCJA made changes to personal taxes for 2018–2025. Unless Congress acts, these changes will expire and the personal tax code will revert to its pre-TCJA form. Following are key provisions in the tax code for individual and married filers.

1. For most people, ordinary income comes primarily from wages.
2. The marginal tax rate is the rate applied to the next dollar of taxable income.
3. There are seven tax brackets. The marginal tax rate for taxable income within a bracket is constant. But as taxable income increases and goes into a higher bracket, the tax rate applied to taxable income within the bracket goes up.
4. Tax brackets with increasing tax rates cause personal taxes to be progressive, which means that the average tax rate "progresses" upward as taxable income increases. In other words, filers with higher taxable incomes pay higher proportions of their taxable income in taxes.
5. The top of the first bracket for 2022 is $10,275. Income below this is taxed at 10%. The bottom of the last bracket is $539,900. Income over this is taxed at a rate of 37%. Income within the other brackets is taxed at a rate between 12% and 35%.
6. Ordinary income consists of salary and wages. Short-term capital gains (assets are owned for less than a year) are taxed like ordinary income.

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7. Assets held for more than 1 year are taxed as long-term gains. If the gain is less than $41,675, then it is taxed at the ordinary income tax rate. There is a 15% tax on long-term gains that are between $41,675 and $459,750. The tax rate for gains over $459,750 is 20%.

8. The tax on dividends depends on whether it is "qualified" to be taxed as a capital gain or whether it is "ordinary." (The word "ordinary" has nothing to do with common stock versus preferred stock.) Loosely speaking, a qualified gain is one on a stock that was owned for at least 60 days before the dividend was paid and for at least 60 days after the dividend was paid. An "ordinary" dividend is one that is not qualified. An ordinary dividend is taxed as though it were ordinary income. There are exceptions, so be sure to consult a professional tax advisor.

t. Assume that you are in the 24% marginal tax bracket. You have narrowed your investment choices down to municipal bonds yielding 5% or equally risky corporate bonds with a yield of 6.4%. Which one should you choose and why? At what marginal personal tax rate would you be indifferent?

Answer:
After-tax return income at T = 24%:

After-tax interest on corporate bond = 0.064(1 – 0.24) = 0.0486 = 4.86%

This is less than the 5% rate on the muni because the muni isn't taxed.

Alternatively, calculate after-tax yields:

At what marginal tax rate would you be indifferent?

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Solve for T in this equation:

Muni yield = Corp yield(1 – T)

T = 1 – (Muni yield/Corp yield)

T = 1 – (5.0%/6.4%) = 21.88%.

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