

## CHAPTER 1—AN OVERVIEW OF FINANCIAL MANAGEMENT AND THE FINANCIAL ENVIRONMENT

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### TRUE/FALSE

1. While skillful workers and adequate capital support good businesses, outside connection and networking play no role.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 3  
OBJ: (1.1) Successful Companies

2. The form of organizing a business is an unimportant issue, as this decision has very little effect on the income and wealth of the firm's owners.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 4–6  
OBJ: (1.2) Firm organization

3. There are three primary disadvantages of a regular partnership: (1) unlimited liability, (2) limited life of the organization, and (3) difficulty of transferring ownership. These combine to make it difficult for partnerships to attract large amounts of capital and thus to grow to a very large size.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 4  
OBJ: (1.2) Partnership

4. Two disadvantages of a proprietorship are (1) the relative difficulty of raising new capital and (2) the owner's unlimited personal liability for the business's debts.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 4  
OBJ: (1.2) Proprietorship

5. By being too involved in the business operation, limited partners can lose their limited liability status.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 4  
OBJ: (1.2) Limited partnership

6. The best way to maximize the intrinsic value of a company and thus shareholders' wealth is to maximize its earnings per share.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 6–10  
OBJ: (1.3) Value maximization

7. If Firm A's business is to obtain savings from individuals and then invest them in financial assets issued by other firms or individuals, Firm A is a financial intermediary.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 10–11  
OBJ: (1.4) Financial intermediaries

8. Today, trustee services can be arranged only with trust companies.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 16–18  
OBJ: (1.6) Financial institutions

9. If an individual investor trades currently outstanding common shares through a broker, this is a secondary market transaction.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 18–19  
OBJ: (1.7) Financial markets

10. Recently, Hale Corporation announced the sale of 2.5 million newly issued shares of its stock at a price of \$21 per share. Hale sold the stock to an investment banker, which in turn sold it to individual and institutional investors. This is a primary market transaction.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 18–19  
OBJ: (1.7) Financial markets

11. With the more formal nature of the partnership agreement and the commitment of all partners' personal assets, partnerships have no difficulty raising large amounts of capital as do proprietorships.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 4  
OBJ: (1.2) Partnership

12. Two key advantages to proprietorship are that, as a business, it pays no corporate income tax and is easily and inexpensively formed.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 4  
OBJ: (1.2) Proprietorship

13. Fighting recession with low interest rates is technically impossible when we have large trade deficits and huge national debt.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 14  
OBJ: (1.5) Trade deficit

## **MULTIPLE CHOICE**

1. Which of the following statements best describes firm organization?

- a. One of the disadvantages of incorporating a business is that the owners have personal liabilities when firm goes bankrupt.
- b. Sole proprietorships are subject to more regulations than corporations.
- c. In any type of partnership, every partner has the same rights, privileges, and liability exposure as every other partner.
- d. Sole proprietorships and partnerships generally have a tax advantage over corporations, especially large ones.

ANS: D

Sole proprietorships and partnerships pay personal income tax, but they avoid the corporate income tax.

PTS: 1                    DIF: EASY                    REF: 4                    OBJ: (1.2) Firm organization  
BLM: Remember

2. Which of the following statements best describes firm organization?
- One of the disadvantages of a sole proprietorship is that the proprietor is exposed to unlimited liability.
  - It is generally easier to transfer one's ownership interest in a partnership than in a corporation.
  - One of the advantages of the corporate form of organization is that it avoids double taxation.
  - One of the advantages of a corporation from a social standpoint is that every shareholder has equal voting rights, i.e., "one person, one vote."

ANS: A                    PTS: 1                    DIF: EASY                    REF: 4-6  
OBJ: (1.2) Firm organization                    BLM: Remember

3. Which of the following statements best describes firm organization?
- It is generally more expensive to form a proprietorship than a corporation because, with a proprietorship, extensive legal documents are required.
  - One disadvantage of operating a business as a sole proprietorship is that the firm is subject to double taxation, at both the firm level and the owner level.
  - One advantage of forming a corporation is that equity investors are usually exposed to less liability than in a regular partnership.
  - If a regular partnership goes bankrupt, each partner is exposed to liabilities only up to the amount of his or her investment in the business.

ANS: C  
Corporations have limited liability; however, they face more regulations than the other forms of organization.

PTS: 1                    DIF: EASY                    REF: 4-6                    OBJ: (1.2) Firm organization  
BLM: Understand

4. Cheers Inc. operates as a partnership. Now the partners have decided to convert the business into a regular corporation. Which statement about its new firm organization is true?
- Assuming Cheers is profitable, less of its income will be subject to taxes.
  - Cheers will now be subject to fewer regulations.
  - Cheers' shareholders (the ex-partners) will now be exposed to less liability.
  - Cheers will find it more difficult to raise additional capital.

ANS: C                    PTS: 1                    DIF: EASY                    REF: 4-6  
OBJ: (1.2) Firm organization                    BLM: Remember

5. Which of the following statements best describes firm organization?
- It is usually easier to transfer ownership in a corporation than it is to transfer ownership in a sole proprietorship.
  - Corporate shareholders are exposed to unlimited liability.
  - Corporations generally face fewer regulations than sole proprietorships.
  - Corporate shareholders are exposed to unlimited liability, and this factor may be compounded by the tax disadvantages of incorporation.

ANS: A

If ownership in a proprietorship or partnership is transferred, the basic documents under which the firm operates must be rewritten, whereas for a corporation the seller simply sells shares to a buyer, and the corporation records the transfer on its books.

PTS: 1                      DIF: EASY                      REF: 4–6                      OBJ: (1.2) Firm organization  
BLM: Understand

6. Which of the following could explain why a business might choose to operate as a corporation rather than as a sole proprietorship or a partnership?
- Less of a corporation's income is generally subjected to taxes than would be true if the firm were a partnership.
  - Corporate shareholders escape liability for the firm's debts, but this factor may be offset by the tax disadvantages of the corporate form of organization.
  - Corporate investors are exposed to limited growth potential.
  - Corporations generally face relatively few regulations.

ANS: B                      PTS: 1                      DIF: EASY                      REF: 4–6  
OBJ: (1.2) Corporate form of organization                      BLM: Understand

7. What should be done to maximize shareholder wealth and thus the value of the firm?
- Decrease the size of expected cash flow of the company.
  - Slow down the cash receipt of the organization.
  - Increase the risk level of the firm.
  - Raise the free cash flows of the business.

ANS: D                      PTS: 1                      DIF: EASY                      REF: 6–10  
OBJ: (1.3) Value maximization                      BLM: Understand

8. You recently sold 100 shares of your new company, XYZ Corporation, to your brother at a family reunion. At the reunion your brother gave you a cheque for the shares and you gave your brother the share certificates. Which statement best describes this transaction?
- This is an example of an exchange of physical assets.
  - This is an example of a primary market transaction.
  - This is an example of a direct transfer of capital.
  - This is an example of a money market transaction.

ANS: C                      PTS: 1                      DIF: EASY                      REF: 10–11  
OBJ: (1.4) Financial transactions                      BLM: Remember

9. Which of the following statements best describes interest rates?
- The cost of money to fund users is basically determined by the rate of return required by fund providers.
  - If individuals in general increase the percentage of their income that they save, interest rates are likely to increase.
  - If companies have fewer good investment opportunities, interest rates are likely to increase.
  - If expected inflation increases, interest rates are likely to decrease.

ANS: A                      PTS: 1                      DIF: EASY                      REF: 11–16  
OBJ: (1.5) Interest rates                      BLM: Understand

10. Which of the following statements best describes hedge funds?
- Hedge funds are risky, although they may be market-neutral.
  - Hedge funds are open to everyone.
  - Hedge funds have low risk because they hedge their investments.
  - Hedge funds are legal only in Canada, and they are not permitted to operate in Europe or Asia.

ANS: A                      PTS: 1                      DIF: EASY                      REF: 17  
OBJ: (1.6) Hedge funds                      BLM: Remember

11. What is traded on money markets?
- foreign stocks
  - consumer automobile loans
  - short-term debt securities
  - long-term bonds

ANS: C                      PTS: 1                      DIF: EASY                      REF: 18  
OBJ: (1.7) Money markets                      BLM: Remember

12. Which of the following is an example of a primary market transaction?
- You sell 200 shares of IBM stock on the TSX through your broker.
  - IBM issues 2,000,000 shares of new stock and sells them to the public through an investment banker.
  - One financial institution buys 200,000 shares of IBM share from another institution with help of an investment banker.
  - You invest \$10,000 in a mutual fund, which then uses the money to buy \$10,000 of IBM shares on the TSX.

ANS: B  
The answer “IBM issues 2,000,000 shares of new stock and sells them to the public through an investment banker” is a primary market transaction, since the money and the security pass directly between the issuing firm and the investor.

PTS: 1                      DIF: EASY                      REF: 19                      OBJ: (1.7) Financial markets  
BLM: Remember

13. Which of the following statements best describes financial markets?
- If Disney issues additional shares of common stock through an investment banker, this would be a secondary market transaction.
  - The IPO market is a major part of the secondary market.
  - Only institutions, not individuals, can participate in derivatives market transactions.
  - Money market transactions involve debt securities with maturities of less than one year.

ANS: D                      PTS: 1                      DIF: EASY                      REF: 18–19  
OBJ: (1.7) Financial markets                      BLM: Remember

14. You recently sold to your brother 200 shares of Disney stock; the transfer was made through a broker, and the trade occurred on the TSX. Which type of transaction is this an example of?
- a futures market transaction
  - a primary market transaction

- c. a secondary market transaction
- d. a money market transaction

ANS: C

It is a secondary market transaction because the share is transferred from one investor to another.

PTS: 1                      DIF: EASY                      REF: 18–19                      OBJ: (1.7) Financial markets  
BLM: Remember

15. Which of the following statements best describes financial markets?
- a. Capital market transactions involve only the purchase and sale of equity securities, i.e., common stocks.
  - b. If an investor sells shares of stock through a broker, then this would be an indirect finance transaction.
  - c. Money market mutual funds have high degree of default risk.
  - d. Commercial papers have maturities longer than one year.

ANS: B                      PTS: 1                      DIF: EASY                      REF: 11–15 | 18–19  
OBJ: (Comp: 1.5–1.7) Financial markets    BLM: Understand

16. Which of the following statements best describes financial markets?
- a. Capital market instruments include both long-term debt and common stocks.
  - b. Banker's acceptance has no default risk.
  - c. Foreign banks are more restricted from operating in Canada.
  - d. The original maturity of a commercial loan can go up to ten years.

ANS: A                      PTS: 1                      DIF: EASY                      REF: 11–15 | 18–19  
OBJ: (Comp: 1.5–1.7) Financial markets    BLM: Remember

17. Which of the following statements best describes financial markets?
- a. Rates of return on T-bill are the highest among all major financial securities.
  - b. Money market mutual funds are illiquid.
  - c. Money markets are markets for long-term debt and common stocks.
  - d. Euro-Canadian market time deposits are instruments issued by banks outside Canada.

ANS: D                      PTS: 1                      DIF: EASY                      REF: 11–15 | 18–19  
OBJ: (Comp: 1.5–1.7) Financial markets    BLM: Remember

18. What is one of the drawbacks of switching from a partnership to the corporate form of organization?
- a. It subjects the firm to additional regulations.
  - b. It makes it more difficult for the firm to raise additional capital.
  - c. It makes the firm's investors subject to greater potential personal liabilities.
  - d. It makes it more difficult for the firm's investors to transfer their ownership interests.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 4–6  
OBJ: (1.2) Corporate form of organization                      BLM: Understand

19. Which of the following statements best describes partnerships?
- a. In a regular partnership, liability for other partners' misdeeds is limited to the

amount of a particular partner's investment in the business.

- b. Partnerships have trouble attracting large capital due to such factors as unlimited liability, and the illiquidity of partnership interests.
- c. A slow-growth company, with little need for new capital, would be more likely to organize as a corporation than would a faster-growing company.
- d. A major disadvantage of all partnerships relative to all corporations is the fact that taxes must be paid by the partners rather than by the firm itself.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 4  
OBJ: (1.2) Partnership form of organization                      BLM: Understand

20. Which of the following statements best describes partnerships?
- a. Corporations are at a disadvantage relative to partnerships because they have to file more reports to regulatory agencies, even if they are not publicly owned.
  - b. In a regular partnership, liability for the firm's debts is limited to the amount a particular partner has invested in the business.
  - c. A fast-growth company would be more likely to set up as a partnership for its business organization than would a slow-growth company.
  - d. There must be at least one person acting as a general partner in a limited partnership.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 4  
OBJ: (1.2) Partnership form of organization                      BLM: Understand

21. Prior to changes in 2011, what was the main perceived attraction of income trusts?
- a. reducing double taxation
  - b. unregulated business environment
  - c. fewer layers in the organizational structure
  - d. maintenance-free business assets

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 6  
OBJ: (1.2) Rise and Fall of Income Trusts                      BLM: Remember

22. Which statement regarding corporations is most accurate?
- a. Due to limited liability, unlimited lives, and ease of ownership transfer, the vast majority of businesses are organized as corporations.
  - b. Due to legal considerations related to ownership transfers and limited liability, most business is conducted by corporations in spite of large corporations' often less favourable tax treatment.
  - c. Large corporations are taxed more favourably than sole proprietorships.
  - d. Corporate stockholders are exposed to unlimited liability.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 4-6  
OBJ: (1.2) Firm organization                      BLM: Understand

23. Which of the following statements best describes articles of incorporation and bylaws?
- a. The corporate bylaws are a standard set of rules established by the state of incorporation. These rules are identical for all corporations, and their purpose is to ensure that the firm's managers run the firm in accordance with government laws.
  - b. Companies must establish a home office in a particular province, and that province must be the one in which most of their business is conducted.
  - c. Attorney fees are generally involved when a company develops its articles of

incorporation and bylaws, but since these documents are voluntary, a new corporation can avoid these costs by deciding not to have any.

- d. The articles of incorporation are concerned with things like what business the company will engage in, whereas the bylaws are concerned with things like procedures for electing the board of directors.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 4–6  
OBJ: (1.2) Articles of incorporation and bylaws                      BLM: Understand

24. Which of the following statements would most people in business agree with?
- a. Firms should not be punished because they have unintentionally built incentive schemes that induce unethical behaviour.
  - b. Firms and government agencies almost always agree with one another regarding the restrictions that should be placed on hiring and firing employees.
  - c. Although moral characters are developed differently, it is useful to educate people about the adverse consequences of unethical behaviour to themselves, their firms, and the nation.
  - d. Because of the courage it takes to blow the whistle, “whistle blowers” are generally promoted more rapidly than other employees.

ANS: C

It is important to have a specific set of rules that all employees are expected to follow. This helps constrain actions, and it is also important to “prove” that the company is trying to do right if some employee does something wrong.

PTS: 1                      DIF: MEDIUM                      REF: 8                      OBJ: (1.3) Business ethics  
BLM: Understand

25. What should be the primary operating goal of a publicly owned firm interested in serving its shareholders?
- a. maximize the stock price per share over the long run, which is the stock’s intrinsic value
  - b. maximize the firm’s expected EPS
  - c. maximize the firm’s expected total income
  - d. maximize the stock price on a specific target date

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 6–10  
OBJ: (1.3) Goal of firm                      BLM: Remember

26. Which of the following statements best describes corporate goals?
- a. The proper goal of the financial manager should be to attempt to maximize the firm’s expected cash flows, because this will add the most to the wealth of the individual shareholders.
  - b. The financial manager should seek that combination of assets, liabilities, and capital that will generate the largest expected projected after-tax income over the relevant time horizon, generally the coming year.
  - c. The riskiness inherent in a firm’s earnings per share (EPS) depends on the characteristics of the projects the firm selects, and thus on the firm’s assets. However, EPS is not affected by the manner in which those assets are financed.
  - d. Potential agency problems can arise between shareholders and managers, because managers hired as agents to act on behalf of the owners may instead make



decisions favourable to themselves rather than the shareholders.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 6–10  
OBJ: (1.3) Corporate goals and control                      BLM: Understand

27. Suppose the Bank of Canada announces plans to issue \$50 billion of new bonds. Assuming the announcement was NOT expected, what effect, other things held constant, would that have on bond prices and interest rates?
- Prices and interest rates would both rise.
  - Prices would decline and interest rates would rise.
  - Prices and interest rates would both decline.
  - Prices would rise and interest rates would decline.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 12–15  
OBJ: (1.5) Security prices and interest rates                      BLM: Analyze

28. Which circumstance would be most likely to lead to higher interest rates on all debt securities in the economy?
- Households start saving a larger percentage of their income.
  - The economy moves from a boom to a recession.
  - The level of inflation begins to decline.
  - With expansion plans, corporate increase their demand for capital.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 12–15  
OBJ: (1.5) Interest rates                      BLM: Analyze

29. Which circumstance would be most likely to lead to an increase in interest rates in the economy?
- Households reduce their consumption and increase their savings.
  - The federal government decides to try to stimulate the economy.
  - There is an increase in expected inflation.
  - The economy falls into a recession.

ANS: C

To protect purchasing power, interest rates are driven by the expected inflation. Moreover, an increase in the demand for capital by businesses will increase interest rates in the economy.

PTS: 1                      DIF: MEDIUM                      REF: 12–15                      OBJ: (1.5) Interest rates  
BLM: Analyze

30. Which of the following financial intermediaries is NOT a depository institution?
- commercial bank
  - investment bank
  - trust company
  - credit union

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 16–18  
OBJ: (1.6) Financial institutions                      BLM: Remember

31. In 2011, the Canadian government made significant changes to its treatment of income trusts. What was the principal reason for this action?
- Trusts were becoming too large compared to corporations.
  - Trusts offered unfair tax advantages compared to corporations.

- c. The government did not have adequate legislative power to manage the activities of income trusts.
- d. Corporations were able to successfully influence government policymakers to bring about these changes.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 6  
OBJ: (1.2) Rise and Fall of Income Trusts                      BLM: Remember

32. In Canada, the Canadian Deposit Insurance Corporation (CDIC) insures personal bank account balances up to \$100,000. What is the primary reason for this provision?
- a. This can prevent a “bank run” in times of economic uncertainty.
  - b. This can provide additional support to the shareholders of banking institutions.
  - c. This provides an opportunity for the government to increase its influence over the banking system.
  - d. This mirrors practices followed in all other developed economies.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 16  
OBJ: (1.6) Financial institutions                      BLM: Remember

33. Which of the following statements is true regarding hedge funds and private equity funds?
- a. Both operate primarily by buying stock (equity) to gain controlling interest in companies.
  - b. Both have a limited number of investors
  - c. Hedge funds are highly regulated, while there are few controls over the activities of private equity funds.
  - d. The risks involved in investing in private equity funds are significantly less than the risks involved in investing in hedge funds.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 17–18  
OBJ: (1.6) Financial institutions                      BLM: Remember

34. Which of the following services will NOT be offered by insurance companies?
- a. taking deposits
  - b. selling policies with saving features
  - c. administrating pension funds
  - d. making payments to beneficiaries

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 17  
OBJ: (1.6) Financial institutions                      BLM: Remember

35. Which of the following statements is correct?
- a. A good goal for a firm’s management is maximization of expected EPS.
  - b. Like corporations, the board of directors for an income trust supervises the operating entity on behalf of unitholders.
  - c. There is a legal obligation to pay cash distributions for income trusts.
  - d. Agency conflicts easily arise between shareholders and managers.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 4–10  
OBJ: (Comp: 1.2, 1.3) Miscellaneous concepts                      BLM: Understand

36. Which of the following statements is NOT correct?
- a. When a corporation’s shares are owned by a few individuals and are not traded on

- public markets, we say that the firm is “closely, or privately, held.”
- b. “Going public” establishes a firm’s true intrinsic value, and it also ensures that a highly liquid market will always exist for the firm’s shares.
  - c. When stock in a closely held corporation is offered to the public for the first time, the transaction is called “going public,” and the market for such stock is called the new issue market.
  - d. Publicly owned companies have shares owned by investors who are not associated with management, and public companies must register with and report to a regulatory agency such as the SEC.

ANS: B                      PTS: 1                      DIF: MEDIUM | HARD  
REF: 18–19                      OBJ: (1.7) Ownership and going public                      BLM: Understand

37. Which of the following represents the most significant reason for the collapse of the U.S. banking system in 2008?
- a. In the 1990s, most large U.S. investment banks were reorganized into public trading companies.
  - b. In the 2000s, most investment banks started to generate most of their income from fees charged for underwriting, consulting, and brokerage activities.
  - c. New regulations introduced in the 2000s resulted in restrictions that restrained the operations of investment banks.
  - d. New regulations in the 2000s allowed investment banks to issue unprecedented amounts of debt to finance their operations.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 17  
OBJ: (1.6) Financial institutions                      BLM: Remember

## CHAPTER 2—FINANCIAL STATEMENTS, CASH FLOW, AND TAXES

### TRUE/FALSE

1. The annual report contains four basic financial statements: the income statement, balance sheet, statement of cash flows, and statement of retained earnings.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 24  
OBJ: (2.1) Annual report

2. The primary reason the annual report is important in finance is that it is used by investors when they form expectations about the firm's future earnings and dividends, and the riskiness of those cash flows.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 24  
OBJ: (2.1) Annual report and expectations

3. Consider the balance sheet of Wilkes Industries as shown below. Because Wilkes has \$800,000 of retained earnings, the company would be able to pay cash to buy an asset with a cost of \$200,000.

Cash	\$ 50,000	Accounts payable	\$ 100,000
Inventory	200,000	Accruals	<u>100,000</u>
Accounts receivable	<u>250,000</u>	Total CL	<u>\$ 200,000</u>
Total CA	<u>\$ 500,000</u>	Debt	200,000
Net fixed assets	\$ 900,000	Common stock	200,000
		Retained earnings	<u>800,000</u>
Total assets	<u>\$1,400,000</u>	Total L & E	<u>\$1,400,000</u>

ANS: F                      PTS: 1                      DIF: EASY                      REF: 25–27  
OBJ: (2.2) Retained earnings versus cash

4. On the balance sheet, total assets must always equal total liabilities plus equity.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 25–27  
OBJ: (2.2) Balance sheet

5. In Canada, amortization is a similar concept as depreciation and can be applied to both tangible and intangible assets.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 26  
OBJ: (2.2) Amortization/depreciation

6. The income statement shows the difference between a firm's income and its costs—i.e., its profits—during a specified period of time. However, not all reported income comes in the form of cash, and reported costs likewise may not correctly reflect cash outlays. Therefore, there may be a substantial difference between a firm's reported profits and its actual cash flow for the same period.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 27–29  
OBJ: (2.3) Income statement

7. Income statements must be prepared only on an annual basis.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 27–29

OBJ: (2.3) Income statement

8. Total net operating capital is equal to net fixed assets.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 36

OBJ: (2.7) Total net operating capital

9. Net operating profit after taxes (NOPAT) is the amount of net income a company would generate from its operations if it had no interest income or interest expense.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 34

OBJ: (2.7) Net operating profit after taxes (NOPAT)

10. The fact that interest income received by a corporation is 50% taxable encourages firms to use more debt financing than equity financing.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 43–45

OBJ: (2.9) Corporate interest income taxes

11. If the tax laws were changed so that \$0.50 out of every \$1.00 of interest paid by a corporation was allowed as a tax-deductible expense, this would probably encourage companies to use more debt financing than they currently do, other things held constant.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 43–45

OBJ: (2.9) Corporate income taxes: interest expense

12. The interest and dividends paid by a corporation are considered to be deductible operating expenses; hence, they decrease the firm's tax liability.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 43–45

OBJ: (2.9) Corporate taxes: interest expense and dividends

13. The balance sheet is a financial statement that measures the flow of funds into and out of various accounts over time, while the income statement measures the firm's financial position at a point in time.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 25–29

OBJ: (Comp: 2.2, 2.3) Financial statements

14. The FIFO method leads to a higher balance sheet inventory value but a lower cost of goods sold in the income statement.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 26

OBJ: (2.2) Inventory

15. The value of goodwill on intangible assets is calculated according to the impairment rule instead of a fixed annual charge.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 26

OBJ: (2.3) Goodwill

16. Retained earnings are the existing shareholders' reinvested profit and do not represent cash.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 29

OBJ: (2.4) Retained earnings

17. Since investors use net income to value the firm, cash flow becomes a secondary consideration simply because cash is for operation only.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 30–31

OBJ: (2.5) Cash flow and net income

18. To estimate the cash flow from operations, depreciation must be added back to net income because it is a non-cash charge that has been deducted from revenue.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 31

OBJ: (2.6) Statement of cash flows

19. The current cash flow from existing assets is highly relevant to the investor. However, since the value of the firm depends primarily upon its growth opportunities, profit projections from those opportunities are the only relevant future flows with which investors are concerned.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 36–39

OBJ: (2.7) Future cash flows

20. Interest paid by a corporation is a tax deduction for the paying corporation, but dividends paid are not deductible. This treatment, other things held constant, tends to encourage the use of debt financing by corporations.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 43–45

OBJ: (2.9) Corporate taxes: interest expense and dividends

21. The time dimension is important in financial statement analysis. The balance sheet shows the firm's financial position at a given point in time, the income statement shows results over a period of time, and the statement of cash flows reflects changes in the firm's accounts over that period of time.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 25 | 27 | 31

OBJ: (Comp: 2.1–2.3, 2.6) Financial statements: time dimension

## MULTIPLE CHOICE

1. Which statement about financial statements is correct?
- The balance sheet gives us a picture of the firm's financial position at a point in time.
  - The income statement gives us a picture of the firm's financial position at a point in time.
  - The statement of cash flows tells us how much cash the firm has in the form of currency and demand deposits.
  - The statement of cash needs tells us how much cash the firm will require during some future period, generally a month or a year.

ANS: A                      PTS: 1                      DIF: EASY                      REF: 24

OBJ: (2.1) Financial statements                      BLM: Understand

2. Which statement about the balance sheet is true?
- The balance sheet for a given year is designed to give us an idea of what happened to the firm during that year.
  - The balance sheet for a given year tells us how much money the company earned during that year.

- c. For most companies, the market value of the stock equals the book value of the stock as reported on the balance sheet.
- d. A balance sheet lists the assets that will be converted to cash first, and then goes on down to list the longest-lived ones last.

ANS: D                    PTS: 1                    DIF: EASY                    REF: 25–27  
 OBJ: (2.2) Balance sheet                    BLM: Understand

3. Other things held constant, which action would increase the amount of cash on a company's balance sheet?
- a. The company purchases a new piece of equipment.
  - b. The company pays a dividend.
  - c. The company issues new common stock.
  - d. The company gives customers more time to pay their bills.

ANS: C                    PTS: 1                    DIF: EASY                    REF: 25–27  
 OBJ: (2.2) Balance sheet                    BLM: Analyze

4. Which of the following items is NOT included in current assets?
- a. accounts receivable
  - b. inventory
  - c. bonds
  - d. cash

ANS: C                    PTS: 1                    DIF: EASY                    REF: 26  
 OBJ: (2.2) Current assets                    BLM: Remember

5. Which of the following items cannot be found on a firm's balance sheet under current liabilities?
- a. accounts payable
  - b. short-term notes payable to the bank
  - c. accrued wages
  - d. cost of goods sold

ANS: D                    PTS: 1                    DIF: EASY                    REF: 26–27  
 OBJ: (2.2) Current liabilities                    BLM: Remember

6. Which statement about the income statement is true?
- a. The focal point of the income statement is the cash account, because that account cannot be manipulated by “accounting tricks.”
  - b. EBITDA is a truer measure of financial strength than are net income and free cash flow.
  - c. If a firm follows the International Financial Reporting Standard (IFRS), its reported net income and net cash flow will be the same.
  - d. The income statement for a given year is designed to give us an idea of how much the firm earned during that year.

ANS: D                    PTS: 1                    DIF: EASY                    REF: 27–29  
 OBJ: (2.3) Income statement                    BLM: Understand

7. Below are the 2011 and 2012 year-end balance sheets for Wolken Enterprises:

<u>Assets:</u>	<u>2012</u>	<u>2011</u>
Cash	\$ 200,000	\$ 170,000
Accounts receivable	864,000	700,000
Inventories	<u>2,000,000</u>	<u>1,400,000</u>
Total current assets	\$ 3,064,000	\$2,270,000

Net fixed assets	<u>6,000,000</u>	<u>5,600,000</u>
Total assets	<u>\$ 9,064,000</u>	<u>\$7,870,000</u>
<u>Liabilities and equity:</u>		
Accounts payable	\$ 1,400,000	\$1,090,000
Notes payable	<u>1,600,000</u>	<u>1,800,000</u>
Total current liabilities	<u>\$ 3,000,000</u>	<u>\$2,890,000</u>
Long-term debt		2,400,000
	2,400,000	
Common stock		2,000,000
	3,000,000	
Retained earnings		580,000
	<u>664,000</u>	
Total common equity	<u>\$ 3,664,000</u>	\$2,580,000
Total liabilities and equity	<u>\$ 9,064,000</u>	<u>\$7,870,000</u>

Wolken has never paid a dividend on its common share, and it issued \$2,400,000 of 10-year non-callable, long-term debt in 2011. As of the end of 2012, none of the principal on this debt had been repaid. Assume that the company's sales in 2011 and 2012 were the same. Which of the following statements must be correct?

- Wolken increased its short-term bank debt in 2012.
- Wolken issued long-term debt in 2012.
- Wolken issued new common shares in 2012.
- Wolken repurchased some common shares in 2012.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 25–27  
 OBJ: (2.2) Balance sheet                      BLM: Analyze

- On its 2012 balance sheet, Barngrover Books showed \$510 million of retained earnings, and exactly that same amount was shown the following year. Assuming that no earnings restatements were issued, which of the following statements is correct?
  - Although the company lost money in 2012, it must have paid dividends.
  - The company must have had zero net income in 2012.
  - The company must have paid no dividends in 2012.
  - Dividends could have been paid in 2012, with amounts equal to the earnings for the year.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 25–27  
 OBJ: (2.2) Balance sheet                      BLM: Analyze

- Below is the common equity section (in millions) of Teweles Technology's last two year-end balance sheets:

	<u>2012</u>	<u>2011</u>
Common share	\$2,000	\$1,000
Retained earnings	<u>2,000</u>	<u>2,340</u>
Total common equity	<u>\$4,000</u>	<u>\$3,340</u>

Teweles has never paid a dividend to its common shareholders. Which of the following statements is correct?

- The company's net income in 2012 was higher than in 2011.
- Teweles issued common stock in 2012.
- The market price of Teweles's stock doubled in 2012.
- The company has more equity than debt on its balance sheet.



ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 26–27  
OBJ: (2.2) Balance sheet                      BLM: Analyze

10. Which of the following statements is correct?
- Typically, a firm's DPS should exceed its EPS.
  - Typically, a firm's EBIT should exceed its EBITDA.
  - With an excellent profit record, a firm stock price exceeds its book value per share.
  - The more depreciation a firm has in a given year, the higher its EPS, other things held constant.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 28  
OBJ: (2.3) EPS, DPS, BVPS, and stock price                      BLM: Understand

11. Which statement about depreciation is true?
- The more depreciation a firm reports, the higher its tax bill, other things held constant.
  - Depreciation reduces a firm's cash balance, so an increase in depreciation would normally lead to a reduction in the firm's net cash flow.
  - Net Cash Flow = Net Income + Depreciation and Amortization Charges.
  - Depreciation and amortization are not cash charges, so neither of them has an effect on a firm's reported profits.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 31–33  
OBJ: (2.5) Depreciation, amortization, and net cash flow                      BLM: Understand

12. What would be most likely to occur in the year when companies have to depreciate equipment over longer lives? Assume that sales, other operating costs, and tax rates are not affected, and the same depreciation method is used for tax and shareholder reporting purposes.
- Companies' NOPAT would decline.
  - Companies' physical stocks of fixed assets would increase.
  - Companies' net cash flows would increase.
  - Companies' cash positions would decline.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 30–31  
OBJ: (2.5) Changes in depreciation                      BLM: Analyze

13. Which factor could explain why Dellva Energy had a negative net cash flow last year, even though the cash on its balance sheet increased?
- The company sold a new issue of bonds.
  - The company made a large investment in new plant and equipment.
  - The company paid a large dividend.
  - The company had high amortization expenses.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 31–33  
OBJ: (2.6) Net cash flow                      BLM: Understand

14. Analysts who follow Howe Industries recently noted that, relative to the previous year, the company's operating net cash flow *increased*, yet cash as reported on the balance sheet *decreased*. Which factor could explain this situation?
- The company cut its dividend.
  - The company made a large investment in a profitable new plant.
  - The company sold a division and received cash in return.
  - The company issued new long-term debt.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 31–33  
OBJ: (2.6) Net cash flow                      BLM: Analyze

15. A security analyst obtained the following information from Prestopino Products' financial statements:
- Retained earnings at the end of 2011 were \$700,000, but retained earnings at the end of 2012 had declined to \$320,000.
  - The company does not pay dividends.
  - The company's depreciation expense is its only non-cash expense; it has no amortization charges.
  - The company has no non-cash revenues.
  - The company's net cash flow (NCF) for 2012 was \$150,000.

On the basis of this information, which of the following statements is correct?

- a. Prestopino had negative net income in 2012.
- b. Prestopino's depreciation expense in 2012 was less than \$150,000.
- c. Prestopino had positive net income in 2012, but its income was less than its 2011 income.
- d. Prestopino's NCF in 2012 must be higher than its NCF in 2011.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 31–33  
OBJ: (2.6) Net cash flow and net income                      BLM: Analyze

16. Aubey Aircraft recently announced that its net income increased sharply from the previous year, yet its net cash flow from operations declined. What could explain this performance?
- a. The company's operating income declined.
  - b. The company's expenditures on fixed assets declined.
  - c. The company's cost of goods sold increased.
  - d. The company's depreciation and amortization expenses declined.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 31–33  
OBJ: (2.6) Net cash flow and net income                      BLM: Understand

17. Which statement regarding the statement of cash flows is correct?
- a. The statement of cash flows reflects cash flows from operations, but it does not reflect the effects of buying or selling fixed assets.
  - b. The statement of cash flows reflects cash flows from continuing operations, but it does not reflect the effects of changes in working capital.
  - c. The statement of cash flows reflects cash flows from operations and from borrowings, but it does not reflect cash obtained by selling new common stock.
  - d. The statement of cash flows shows how much the firm's cash—the total of currency, bank deposits, and short-term liquid securities (or cash equivalents)—increased or decreased during a given year.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 31–33  
OBJ: (2.6) Statement of cash flows                      BLM: Understand

18. Which statement regarding the statement of cash flows is true?
- a. In the statement of cash flows, a *decrease* in accounts receivable is reported as a use of cash.
  - b. In the statement of cash flows, a *decrease* in accounts payable is reported as a use of cash.
  - c. In the statement of cash flows, depreciation charges are reported as a use of cash.
  - d. In the statement of cash flows, a *decrease* in inventories is reported as a use of cash.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 31–33  
OBJ: (2.6) Statement of cash flows                      BLM: Understand

19. The standard financial statements prepared by accountants have to be modified for managerial purposes. Related to these modifications, which of the following statements is correct?

- a. The standard statements make adjustments to reflect the effects of inflation on asset values, and these adjustments are normally carried into any adjustment that managers make to the standard statements.
- b. The standard statements focus on accounting income for the entire corporation, not cash flows, and the two can be quite different during any given accounting period. However, for valuation purposes we need to discount cash flows, not accounting income. Moreover, since many firms have a number of separate divisions, and since division managers should be compensated on their divisions' performance, not that of the entire firm, information that focuses on the divisions is needed. These factors have led to the development of information that is focused on cash flows and the operations of individual units.
- c. The standard statements provide useful information on the firm's individual operating units, but management needs more information on the firm's overall operations than the standard statements provide.
- d. The standard statements focus on cash flows, but managers are less concerned with cash flows than with accounting income as defined by GAAP.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 33–39  
 OBJ: (2.7) Modifying accounting data for managerial purposes  
 BLM: Evaluate

20. Which of the following statements is correct?
- a. Changes in working capital have no effect on free cash flow.
  - b. Free cash flow (FCF) is defined as follows:  

$$\text{FCF} = \text{EBIT}(1 - T) + \text{Depreciation and Amortization} - \text{Capital expenditures required to sustain operations} - \text{Required changes in net operating working capital}$$
  - c. Free cash flow (FCF) is defined as follows:  

$$\text{FCF} = \text{EBIT}(1 - T) + \text{Depreciation and Amortization} + \text{Capital expenditures}$$
  - d. Operating cash flow is the same as free cash flow (FCF).

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 33–39  
 OBJ: (2.7) Depreciation, amortization, and free cash flow                      BLM: Remember

21. Which of the following statements is correct?
- a. MVA gives us an idea about how much value a firm's management has added during the last year.
  - b. MVA stands for market value added, and it is defined as follows:  

$$\text{MVA} = (\text{Shares outstanding}) \times (\text{Stock price}) + \text{Book value of common equity}$$
  - c. EVA stands for economic value added, and it is defined as follows:  

$$\text{EVA} = (\text{Operating capita}) \times (\text{ROIC} - \text{WACC})$$
  - d. EVA gives us an idea about how much value a firm's management has added over the firm's life.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 40–42  
 OBJ: (2.8) MVA and EVA                      BLM: Remember

22. Which statement regarding the tax system is true?
- a. Since companies can deduct dividends paid but not interest paid, such a tax system favours the use of equity financing over debt financing.
  - b. Interest paid to an individual is counted as income for tax purposes and taxed at the individual's regular tax rate.
  - c. The maximum federal personal tax rate in 2012 is 35%.
  - d. Ordinary corporate operating losses can be carried back to each of the preceding 10 years and forward for the next 3 years and used to offset taxable income in those years.

ANS: B                      PTS: 1                      DIF: MEDIUM              REF: 43–47  
OBJ: (2.9) Tax system                      BLM: Remember

23. Which statement regarding the tax system is true?
- For small Canadian-controlled private corporations, income less than \$400,000 is exempt from taxes. Thus, government receives no tax revenue from these businesses.
  - All businesses, regardless of their legal form of organization, are taxed by the Canada Revenue Agency (CRA).
  - Corporate income taxes are influenced by the size and location of the companies and their income types.
  - All corporations other than non-profit corporations are subject to corporate income taxes, which are 26.5% for the lowest amounts of income and 32.5% for the highest amounts of income.

ANS: C                      PTS: 1                      DIF: MEDIUM              REF: 43–47  
OBJ: (2.9) Tax system                      BLM: Remember

24. Last year, Tucker Technologies had (1) a negative net cash flow from operations, (2) a negative free cash flow, and (3) an increase in cash as reported on its balance sheet. Which factor could explain this situation?
- The company had a sharp increase in its inventories.
  - The company had a sharp increase in its accrued liabilities.
  - The company sold a new issue of common stock.
  - The company made a large capital investment early in the year.

ANS: C                      PTS: 1                      DIF: MEDIUM              REF: 31–39  
OBJ: (Comp: 2.6, 2.7) NCF, FCF, and cash                      BLM: Analyze

25. Assume that Bev’s Beverages Inc. (BBI) can double its depreciation expense for the upcoming year while sales revenue and tax rate remain unchanged. Prior to the change, BBI’s net income after taxes was forecasted to be \$4 million. What impact will this change have on BBI’s financial statements? Assume that the company uses the same depreciation method for tax and shareholder reporting purposes.
- The provision will reduce the company’s net cash flow.
  - The provision will increase the company’s tax payments.
  - Net fixed assets on the balance sheet will increase.
  - Net fixed assets on the balance sheet will decrease.

ANS: D                      PTS: 1                      DIF: MEDIUM              REF: 26 | 27 | 31 | 44  
OBJ: (Comp: 2.2, 2.3, 2.6, 2.9) Changes in depreciation                      BLM: Analyze

26. The Nantell Corporation just purchased an expensive piece of equipment. Originally, the firm planned to depreciate the equipment over 5 years on a straight-line basis, but now wants to depreciate the equipment on a straight-line basis over 7 years. Other things held constant, what will occur as a result of this change? Assume that the company uses the same depreciation method for tax and stockholder reporting purposes.
- Nantell’s taxable income will be lower.
  - Nantell’s net fixed assets as shown on the balance sheet will be higher at the end of the year.
  - Nantell’s cash position will improve (increase).
  - Nantell’s tax liability for the year will be lower.

ANS: B                      PTS: 1                      DIF: MEDIUM              REF: 26 | 27 | 31 | 44  
OBJ: (Comp: 2.2, 2.3, 2.6, 2.9) Changes in depreciation                      BLM: Analyze

27. Assume that Pappas Company commenced operations on January 1, 2011, and it was granted permission to use the same depreciation calculations for shareholder reporting and income tax purposes. The company planned to depreciate its fixed assets over 15 years, but in December 2008 management realized that the assets would last for only 10 years. The firm's accountants plan to report the 2011 financial statements based on this new information. How would the new depreciation assumption affect the company's financial statements?
- The firm's reported net fixed assets would increase.
  - The firm's EBIT would increase.
  - The firm's reported 2011 earnings per share would increase.
  - The firm's cash position in 2011 and 2012 would increase.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 26 | 27 | 31  
OBJ: (Comp: 2.2, 2.3, 2.6) Changes in depreciation                      BLM: Analyze

28. A start-up firm is making an initial investment in new plant and equipment. Assume that currently its equipment must be depreciated on a straight-line basis over 10 years, but now the company is allowed to depreciate the equipment over 7 years. What would occur in the year following the change?
- The firm's operating income (EBIT) would increase.
  - The firm's net cash flow would increase.
  - The firm's tax payments would increase.
  - The firm's reported net income would increase.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 26 | 27 | 31 | 44  
OBJ: (Comp: 2.2, 2.3, 2.9) Changes in depreciation                      BLM: Analyze

29. Which statement regarding financial statements is true?
- Dividends paid reduce the net income that is reported on a company's income statement.
  - If a company uses some of its bank deposits to buy short-term, highly liquid marketable securities, this will cause a decline in its current assets as shown on the balance sheet.
  - If a company issues new long-term bonds during the current year, this will increase its reported current liabilities at the end of the year.
  - If a company pays more in dividends than it generates in net income, its retained earnings as reported on the balance sheet will decline from the previous year's balance.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 24–29 | 31–33  
OBJ: (Comp: 2.1, 2.3, 2.6) Financial statements                      BLM: Understand

30. Which statement regarding EVA is true?
- One way to increase EVA is to achieve the same level of operating income but with more investor-supplied capital.
  - If a firm reports positive net income, its EVA must also be positive.
  - One drawback of EVA as a performance measure is that it mistakenly assumes that equity capital is free.
  - One way to increase EVA is to generate the same level of operating income but with less investor-supplied capital.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 30–33 | 40–42  
OBJ: (Comp: 2.5, 2.6, 2.8) EVA, CF, and net income                      BLM: Understand

31. Which statement regarding retained earnings is true?
- Since depreciation is a source of funds, the more depreciation a company has, the larger its retained earnings will be, other things held constant.
  - A firm can show a large amount of retained earnings on its balance sheet yet need to borrow cash to make required payments.

- c. The retained earnings account as shown on the balance sheet shows the amount of cash that is available for paying dividends.
- d. If a firm reports a loss on its income statement, then the retained earnings account as shown on the balance sheet will be negative.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 26 | 27 | 31–33  
 OBJ: (Comp: 2.2, 2.3, 2.6) Retained earnings                      BLM: Understand

32. The CFO of Shalit Industries plans to have the company issue \$300 million of new common stock and use the proceeds to pay off some of its outstanding bonds. Assume that the company, which does not pay any dividends, takes this action, and that total assets, operating income (EBIT), and its tax rate all remain constant. Which of the following would occur?
- a. The company's taxable income would fall.
  - b. The company would have less common equity than before.
  - c. The company's net income would increase.
  - d. The company would have to pay less tax.

ANS: C                      PTS: 1                      DIF: MEDIUM | HARD  
 REF: 26 | 27 | 43–45                      OBJ: (Comp: 2.2, 2.3, 2.9) Changes in leverage  
 BLM: Analyze

33. Last year Roussakis Company's operations provided a negative net cash flow, yet the cash shown on its balance sheet increased. What action could explain the increase in cash, assuming the company's financial statements were prepared under generally accepted accounting principles?
- a. The company repurchased some of its common stock.
  - b. The company retired a large amount of its long-term debt.
  - c. The company sold some of its fixed assets.
  - d. The company had high depreciation expenses.

ANS: C                      PTS: 1                      DIF: HARD                      REF: 30–31  
 OBJ: (2.5) Net cash flow                      BLM: Understand

34. Tucker Electronic System's current balance sheet shows total common equity of \$3,125,000. The company has 125,000 shares of stock outstanding, and they sell at a price of \$52.50 per share. By how much do the firm's market and book values per share differ?
- a. \$27.50
  - b. \$28.88
  - c. \$30.32
  - d. \$31.83

ANS: A

Shares outstanding	125,000
Price per share	\$52.50
Total book common equity	\$3,125,000
Book value per share	\$25.00
Difference between book and market values	<b>\$27.50</b>

PTS: 1                      DIF: EASY                      REF: 25–27  
 OBJ: (2.2) Balance sheet: market value versus book value                      BLM: Analyze

35. Hunter Manufacturing Inc.'s December 31, 2011 balance sheet showed total common equity of \$2,050,000 and 100,000 shares of stock outstanding. During 2012, Hunter had \$250,000 of net income, and it paid out \$100,000 as dividends. What was the book value per share at 12/31/12, assuming that Hunter neither issued nor retired any common stock during 2009?
- a. \$20.90

- b. \$22.00
- c. \$23.10
- d. \$24.26

ANS: B

12/31/11 common equity	\$2,050,000
2012 net income	\$250,000
2012 dividends	\$100,000
2012 addition to retained earnings	\$150,000
12/31/12 common equity	\$2,200,000
Shares outstanding	100,000
12/31/12 BVPS	\$22.00

PTS: 1                    DIF: EASY                    REF: 25–27

OBJ: (2.2) Balance sheet: change in BVPS from RE addition                    BLM: Analyze

36. Companies generate income from their “regular” operations and from other sources such as interest earned on the securities they hold, which is called non-operating income. Lindley Textiles recently reported \$12,500 of sales, \$7,250 of operating costs other than depreciation, and \$1,000 of depreciation. The company had no amortization charges and no non-operating income. It had \$8,000 of bonds outstanding that carry a 7.5% interest rate, and its combined federal and provincial income tax rate was 40%. How much was Lindley’s operating income, or EBIT?
- a. \$3,644
  - b. \$3,836
  - c. \$4,038
  - d. \$4,250

ANS: D

Sales	\$12,500
Operating costs excluding depreciation	\$7,250
Depreciation	\$1,000
Operating income (EBIT)	\$4,250

PTS: 1                    DIF: EASY                    REF: 27–28

OBJ: (2.3) Income statement: EBIT                    BLM: Analyze

37. Frederickson Office Supplies recently reported \$12,500 of sales, \$7,250 of operating costs other than depreciation, and \$1,250 of depreciation. The company had no amortization or depreciation charges and no nonoperating income. It had \$8,000 of bonds outstanding that carry a 7.5% interest rate, and its combined federal and provincial income tax rate was 40%. How much was the firm’s taxable income, or earnings before taxes (EBT)?
- a. \$3,230.00
  - b. \$3,400.00
  - c. \$3,570.00
  - d. \$3,748.50

ANS: B

Bonds	\$8,000.00
Interest rate	7.50%
Sales	\$12,500.00
Operating costs excluding depreciation	\$7,250.00
Depreciation	\$1,250.00
Operating income (EBIT)	\$4,000.00
Interest charges	–\$600.00
Taxable income	\$3,400.00

PTS: 1                    DIF: EASY                    REF: 27

OBJ: (2.3) Income statement: taxable income

BLM: Analyze

38. JBS Inc. recently reported net income of \$4,750 and depreciation of \$885. How much was its net cash flow, assuming it had no amortization expense and sold none of its fixed assets?
- a. \$4,831.31
  - b. \$5,085.59
  - c. \$5,353.25
  - d. \$5,635.00

ANS: D

Net income	\$4,750.00
Depreciation	\$885.00
NCF	\$5,635.00

PTS: 1

DIF: EASY

REF: 30–31

OBJ: (2.5) Net cash flow

BLM: Analyze

39. Swinnerton Clothing Company's balance sheet showed total current assets of \$2,250, all of which were required in operations. Its current liabilities consisted of \$575 of accounts payable, \$300 of 6% short-term notes payable to the bank, and \$145 of accrued wages and taxes. What was its net operating working capital that was financed by investors?
- a. \$1,454
  - b. \$1,530
  - c. \$1,607
  - d. \$1,771

ANS: B

Current assets	\$2,250
Accounts payable	\$575
Accrued wages and taxes	\$145
Net operating working capital	\$1,530

Note that NOWC represents the current assets required in operations that are financed by investors, given that payables and accruals are generated spontaneously by operations and are thus "free."

PTS: 1

DIF: EASY

REF: 35–36

OBJ: (2.7) Net operating working capital

BLM: Analyze

40. Over the years, Janjigian Corporation's shareholders have provided \$15,250 of capital, part when they purchased new issues of stock and part when they allowed management to retain some of the firm's earnings. The firm now has 1,000 shares of common share outstanding, and it sells at a price of \$42.00 per share. How much value has Janjigian's management added to stockholder wealth over the years, i.e., what is Janjigian's MVA?
- a. \$22,935
  - b. \$24,142
  - c. \$25,413
  - d. \$26,750

ANS: D

Total book value of equity	\$15,250
Stock price per share	\$42.00
Shares outstanding	1,000
Market value of equity	42,000



MVA = 26,750

PTS: 1 DIF: EASY REF: 40–42 OBJ: (2.8) MVA  
BLM: Analyze

41. An individual made \$48,000 last year paying \$12,480 in taxes. What is the taxpayer's average tax rate?
- a. 17.4%
  - b. 22.1%
  - c. 26.0%
  - d. 30.9%

ANS: C  
Average tax rate =  $12,480/48,000 = 0.26$

PTS: 1 DIF: EASY REF: 45–47 OBJ: (2.9) Taxes  
BLM: Understand

42. Meric Mining Inc. recently reported \$15,000 of sales, \$7,500 of operating costs other than depreciation, and \$1,200 of depreciation. The company had no amortization charges, it had outstanding \$6,500 of bonds that carry a 6.25% interest rate, and its combined federal and provincial income tax rate was 35%. How much was the firm's net income after taxes? Meric uses the same depreciation expense for tax and shareholder reporting purposes.
- a. \$3,284.55
  - b. \$3,457.42
  - c. \$3,639.39
  - d. \$3,830.94

ANS: D

Bonds	\$6,500
Interest rate	6.25%
Tax rate	35%
Sales	\$15,000
Operating costs excluding depreciation	\$7,500
Depreciation	<u>\$1,200</u>
Operating income (EBIT)	\$6,300.00
Interest charges	<u>-\$406.25</u>
Taxable income	\$5,893.75
Taxes	<u>-\$2,062.81</u>
Net income	\$3,830.94

PTS: 1 DIF: EASY | MEDIUM REF: 27–28  
OBJ: (2.3) Income statement: net after-tax income BLM: Analyze

43. On 12/31/12, Heaton Industries Inc. reported retained earnings of \$675,000 on its balance sheet, and it reported that it had \$172,500 of net income during the year. On its previous balance sheet, at 12/31/11, the company had reported \$555,000 of retained earnings. No shares were repurchased during 2012. How much in dividends did Heaton pay during 2012?
- a. \$47,381
  - b. \$49,875
  - c. \$52,500
  - d. \$55,125

ANS: C  
12/31/12 RE \$675,000

12/31/11 RE	\$555,000
Change in RE	\$120,000
Net income for 2012	\$172,500
Dividends = net income – change	\$52,500

PTS: 1                    DIF: EASY | MEDIUM                    REF: 29  
 OBJ: (2.4) Statement of change in equity: dividends                    BLM: Analyze

44. During 2012, Bascom Bakery Inc. paid out \$21,750 of common dividends. It ended the year with \$187,500 of retained earnings versus the prior year's retained earnings of \$132,250. How much net income did the firm earn during the year?
- \$77,000
  - \$80,850
  - \$84,893
  - \$89,137

ANS: A

Net income = The change in retained earnings plus the dividends paid:

Current RE	\$187,500
Previous RE = Current RE – increment	\$132,250
Change in RE	\$55,250
Plus dividends paid	\$21,750
= Net income	\$77,000

PTS: 1                    DIF: EASY | MEDIUM                    REF: 29  
 OBJ: (2.4) Statement of change in equity: NI                    BLM: Analyze

45. NNR Inc.'s balance sheet showed total current assets of \$1,875,000 plus \$4,225,000 of net fixed assets. All of these assets were required in operations. The firm's current liabilities consisted of \$475,000 of accounts payable, \$375,000 of 6% short-term notes payable to the bank, and \$150,000 of accrued wages and taxes. Its remaining capital consisted of long-term debt and common equity. What was NNR's total investor-provided operating capital?
- \$4,694,128
  - \$4,941,188
  - \$5,201,250
  - \$5,475,000

ANS: D

Operating Capital = Operating Assets – Operating current Liabilities

$$\text{Op. Cap} = 1,875,000 + 4,225,000 = 6,100,000$$

$$\text{Op. Liab.} = 475,000 + 150,000 = 625,000$$

$$\text{Op. Cap.} = 6,100,000 - 625,000 = \$5,475,000$$

PTS: 1                    DIF: EASY | MEDIUM                    REF: 36  
 OBJ: (2.7) Total operating capital                    BLM: Understand

46. Last year Tiemann Technologies reported \$10,500 of sales, \$6,250 of operating costs other than depreciation, and \$1,300 of depreciation. The company had no amortization charges, it had \$5,000 of bonds that carry a 6.5% interest rate, and its combined federal and provincial income tax rate was 35%. This year's data are expected to remain unchanged except for one item, depreciation, which is expected to increase by \$750. By how much will net after-tax income change as a result of the change in depreciation? The company uses the same depreciation calculations for tax and stockholder reporting purposes.

- a. -463.13
- b. -487.50
- c. -511.88
- d. -537.47

ANS: B

This problem can be worked very easily—just multiply the increase in depreciation by  $(1 - T)$  to get the decrease in net income:

Change in depreciation	\$750
Tax rate	35%
Reduction in net income	-\$487.50

We can also get the answer a longer way, which explains things more clearly:

Item	<u>Old</u>	<u>New</u>	<u>Change</u>
Bonds	\$ 5,000.00	\$ 5,000.00	\$ 0.00
Interest rate	6.5%	6.5%	0.0%
Tax rate	35%	35%	0%
Sales	\$10,500.00	\$10,500.00	\$ 0.00
Operating costs excluding depreciation	\$ 6,250.00	\$ 6,250.00	\$ 0.00
Depreciation	<u>\$ 1,300.00</u>	<u>\$ 2,050.00</u>	<u>\$ 750.00</u>
Operating income (EBIT)	\$ 2,950.00	\$ 2,200.00	-\$ 750.00
Interest charges	<u>\$ 325.00</u>	<u>\$ 325.00</u>	<u>\$ 0.00</u>
Taxable income	\$ 2,625.00	\$ 1,875.00	-\$ 750.00
Taxes	<u>\$ 918.75</u>	<u>\$ 656.25</u>	<u>-\$ 262.50</u>
Net income	<u>\$ 1,706.25</u>	<u>\$ 1,218.75</u>	<u>-\$ 487.50</u>

PTS: 1                      DIF: MEDIUM                      REF: 27–28

OBJ: (2.3) Income statement: change in net income

BLM: Analyze

47. TSW Inc. had the following data for last year: Net income = \$800; Net operating profit after taxes (NOPAT) = \$700; Total assets = \$3,000; and Total operating capital = \$2,000. Information for the just-completed year is as follows: Net income = \$1,000; Net operating profit after taxes (NOPAT) = \$925; Total assets = \$2,600; and Total operating capital = \$2,500. How much free cash flow did the firm generate during the just-completed year?
- a. \$383
  - b. \$425
  - c. \$468
  - d. \$514

ANS: B

<u>Prior Year</u>	<u>Current Year</u>	
NOPAT = EBIT(1 - T)	\$700	\$925
Total operating capital	\$2,000	\$2,500

FCF this year = NOPAT - Net investment in new operating capital

FCF this year = \$925 - \$500

FCF this year = \$425

PTS: 1                      DIF: MEDIUM                      REF: 36–39

OBJ: (2.7) Free cash flow

BLM: Analyze

48. Rao Corporation has the following balance sheet. How much net operating working capital does the firm have?

Cash	\$ 10	Accounts payable	\$ 20
Short-term investments	30	Accruals	20
Accounts receivable	50	Notes payable	<u>50</u>
Inventory	<u>40</u>	Current liabilities	\$ 90
Current assets	\$130	Long-term debt	0
Net fixed assets	<u>100</u>	Common equity	30
		Retained earnings	<u>50</u>
Total assets	<u>\$230</u>	Total liab. & equity	<u>\$230</u>

- a. \$54.00  
b. \$60.00  
c. \$66.00  
d. \$72.60

ANS: B

Net operating working capital = Operating current assets – Operating current liabilities

NOWC = \$100.00 – \$40.00

NOWC = \$60.00

PTS: 1 DIF: MEDIUM REF: 35

OBJ: (2.7) Net operating working capital

BLM: Understand

49. Bae Inc. has the following income statement. How much net operating profit after taxes (NOPAT) does the firm have?

Sales	\$2,000.00
Costs	1,200.00
Depreciation	<u>100.00</u>
EBIT	\$ 700.00
Interest expense	<u>200.00</u>
EBT	\$ 500.00
Taxes (35%)	<u>175.00</u>
Net income	<u>\$ 325.00</u>

- a. \$390.11  
b. \$410.64  
c. \$432.25  
d. \$455.00

ANS: D

EBIT \$700.00

Tax rate 35%

NOPAT = \$455.00

PTS: 1 DIF: MEDIUM REF: 35

OBJ: (2.7) Net operating working capital

BLM: Understand

50. EP Enterprises has the following income statement. How much net operating profit after taxes (NOPAT) does the firm have?

Sales	\$1,800.00
Costs	1,400.00
Depreciation	<u>250.00</u>
EBIT	\$ 150.00
Interest expense	<u>70.00</u>
EBT	\$ 80.00
Taxes (40%)	<u>32.00</u>
Net income	<u>\$ 48.00</u>

- a. \$81.23
- b. \$85.50
- c. \$90.00
- d. \$94.50

ANS: C

EBIT	\$150.00
Tax rate	40%
NOPAT =	\$90.00

PTS: 1                    DIF: MEDIUM      REF: 34

OBJ: (2.7) Net operating profit after taxes (NOPAT)

BLM: Understand

51. Tibbs Inc. had the following data for the year ending 12/31/12: Net income = \$300; Net operating profit after taxes (NOPAT) = \$400; Total assets = \$2,500; Short-term investments = \$200; Shareholders' equity = \$1,800; Total debt = \$700; and Total operating capital = \$2,300. What was its return on invested capital (ROIC)?

- a. 14.91%
- b. 15.70%
- c. 16.52%
- d. 17.39%

ANS: D

NOPAT	\$400
Total operating capital	\$2,300

ROIC = NOPAT/ Total operating capital

ROIC = \$400/\$2,300

ROIC = 17.39%

PTS: 1                    DIF: MEDIUM      REF: 39

OBJ: (2.7) Return on invested capital (ROIC)

BLM: Understand

52. Zumbahlen Inc. has the following balance sheet. How much total operating capital does the firm have?

Cash	\$ 20.00	Accounts payable	\$ 30.00
Short-term investments	50.00	Accruals	50.00
Accounts receivable	20.00	Notes payable	<u>30.00</u>
Inventory	<u>60.00</u>	Current liabilities	\$110.00
Current assets	\$150.00	Long-term debt	70.00
Gross fixed assets	\$140.00	Common stock	30.00
Accumulated depreciation	<u>40.00</u>	Retained earnings	<u>40.00</u>
Net fixed assets	<u>\$100.00</u>	Total common equity	<u>\$ 70.00</u>
Total assets	<u>\$250.00</u>	Total liability & equity	<u>\$250.00</u>

- a. \$114.00
- b. \$120.00
- c. \$126.00
- d. \$132.30

ANS: B

Total op. capital = Operating current assets – Operating current liabilities + Net fixed assets

Total operating capital = \$100.00 – \$80.00 + \$100.00

Total operating capital = \$120.00

PTS: 1                      DIF: MEDIUM      REF: 36                      OBJ: (2.7) Total operating capital  
BLM: Understand

53. Barnes' Brothers has the following data for the year ending 12/31/07: Net income = \$600; Net operating profit after taxes (NOPAT) = \$700; Total assets = \$2,500; Short-term investments = \$200; Stockholders' equity = \$1,800; Total debt = \$700; and Total operating capital = \$2,100. Barnes' weighted average cost of capital is 10%. What is its economic value added (EVA)?
- a. \$420.11
  - b. \$442.23
  - c. \$465.50
  - d. \$490.00

ANS: D

NOPAT	\$700
Total operating capital	\$2,100
WACC	10.00%

EVA = NOPAT – Total operating capital × WACC

EVA = \$700.00 – \$2,100.00 × 10.00%

EVA = \$490.00

PTS: 1                      DIF: MEDIUM      REF: 40–42                      OBJ: (2.8) Economic Value Added (EVA)                      BLM: Understand

54. If a local Firm X owns 35% of the shares of a Canadian-owned Firm Y, and Y pays dividends to all of its shareholders, what percentage of the dividends received by X can be exempted from its taxable income?
- a. 0%
  - b. 35%
  - c. 65%
  - d. 100%

ANS: D

If a Canadian company earns dividend income on common stock of another Canadian corporation, those earnings face no taxation. It means 100% is exempted from its taxable income.

PTS: 1                      DIF: MEDIUM      REF: 43–44                      OBJ: (2.9) Taxes  
BLM: Remember

55. What is the tax liability for a small Canadian-controlled private corporation (CCPC) located in British Columbia having earnings before taxes (EBT) of \$480,000? The relevant combined federal and provincial corporate income tax rate is 13.5% for taxable income up to \$400,000 and 26.5 for the amount exceeding \$400,000.

- a. \$64,800
- b. \$75,200
- c. \$96,000
- d. \$127,200

ANS: B

$$\text{Tax} = (\$400,000)(0.135) + (\$480,000 - \$400,000)(0.265) = \$75,200$$

PTS: 1                    DIF: MEDIUM      REF: 43–44                    OBJ: (2.9) Taxes

BLM: Understand

56. Formed in 2008, ABC Ltd. had taxable income of \$95,000 in 2008; \$70,000 in 2009; \$55,000 in 2010; \$80,000 in 2011, and –\$150,000 in 2012. What is the adjusted corporate tax payment in 2012? Assume that ABC is a CCPC in Manitoba with a combined federal and provincial corporate income tax rate of 13%.
- a. \$17,150.00
  - b. \$18,100.00
  - c. \$19,500.00
  - d. \$20,550.00

ANS: C

Ordinary corporate operating losses can be carried back to each of the preceding 3 years. The loss of \$150,000 in 2012 is written off for \$80,000 in 2011, \$55,000 in 2010, and \$15,000 in 2009. The firm can receive a total of  $(0.13) \times (\$150,000) = \$19,500$  in tax refund after the adjustment.

PTS: 1                    DIF: MEDIUM      REF: 44

OBJ: (2.9) Taxes: Loss carry-back, carry-forward                    BLM: Remember

57. Formed in 2012, the ABC Ltd. had an operating loss of \$95,000, with projected taxable income of \$70,000 in 2013, \$55,000 in 2014, and \$80,000 in 2015. What will the corporate tax liability be in 2015? Assume that ABC is a CCPC in Quebec with a combined federal and provincial corporate income tax rate of 19%.
- a. \$15,200.00
  - b. \$16,250.00
  - c. \$17,700.00
  - d. \$18,500.00

ANS: A

Ordinary corporate operating losses can also be carried forward for the next 10 years to offset future taxable income in those years. The loss of \$95,000 in 2012 writes off the entire \$70,000 income in 2013. The remaining \$25,000 reduces the income of \$55,000 to \$30,000 in 2014. Nothing will be left for 2015. Thus, taxes =  $(0.19) \times (\$80,000) = \$15,200$ .

PTS: 1                    DIF: MEDIUM      REF: 44

OBJ: (2.9) Taxes: Loss carry-back, carry-forward                    BLM: Understand

58. In 2012, XYZ Inc. located in Ontario had income from operation of \$3,850,000, received interest of \$150,000, paid \$200,000 in interest, received dividends from another Canadian corporation of \$100,000, and paid \$400,000 in dividends to its common shareholders. If the applicable income tax rate is 33%, what is the corporation's tax liability?
- a. \$1,155,000
  - b. \$1,254,000
  - c. \$1,287,000
  - d. \$1,353,000

ANS: B

2012 taxable income is calculated as follows: Income from operations (\$3.85m) + Fully taxable interest income (\$0.15m) – Fully deductible interest expenses (\$0.2m) + Nontaxable dividend income (\$0) = \$3.8m. Note: dividends are paid from after-tax income and do not affect taxable income). Based on the tax rate of 33%, taxes =  $(0.33) \times (\$3.8m) = \$1.254m$ .

PTS: 1                    DIF: MEDIUM      REF: 43–45                    OBJ: (2.9) Taxes  
BLM: Analyze

59. An individual living in Alberta with wage earnings of \$65,000 has invested \$25,000 for 1 year in corporate bonds yielding 6%. What is the after-tax return? The relevant federal and provincial tax rates are 22% and 10%.
- \$480
  - \$880
  - \$1,020
  - \$1,500

ANS: C

Interest income received by individuals is taxed at the marginal tax rate after accounting for taxes paid on employment income. In this case the marginal tax rate is 22% + 10%. Receipt =  $(0.06) (\$25,000) = \$1,500$ . Taxes =  $\$1,500 \times (0.22 + 0.1) = (\$1,500)(0.32) = \$1,020$ .

PTS: 1                    DIF: MEDIUM      REF: 45–47                    OBJ: (2.9) Taxes  
BLM: Understand

60. Wells Water Systems recently reported \$8,250 of sales, \$4,500 of operating costs other than depreciation, and \$950 of depreciation. The company had no amortization charges, it had \$3,250 of outstanding bonds that carry a 6.75% interest rate, and its combined federal and provincial income tax rate was 35%. In order to sustain its operations and thus generate sales and cash flows in the future, the firm was required to spend \$750 to buy new fixed assets and to invest \$250 in net operating working capital. How much free cash flow did Wells generate?
- \$1,770.00
  - \$1,858.50
  - \$1,951.43
  - \$2,049.00

ANS: A

Bonds	\$3,250.00
Interest rate	6.75%
Tax rate	35%
Required addition to net operating working capital	\$250.00
Required capital expenditures (fixed assets)	\$750.00
Sales	\$8,250.00
Operating costs excluding depreciation	\$4,500.00
Depreciation	\$950.00
Operating income (EBIT)	<u>\$2,800.00</u>

$$\text{FCF} = \text{EBIT}(1 - T) + \text{Depr.} - \text{Cap Ex} - \text{Net Op WC}$$

$$\text{FCF} = \$1,820 + \$950 - \$750 - \$250 = \$1,770.00$$

PTS: 1                    DIF: MEDIUM      REF: 27–28 | 36–39  
OBJ: (Comp:2.3, 2.7) Income statement: free cash flow                    BLM: Understand



61. HHH Inc. reported \$12,500 of sales and \$7,025 of operating costs (including depreciation). The company had \$18,750 of investor-supplied operating assets (or capital), the weighted average cost of that capital (the WACC) was 9.5%, and the combined federal and provincial income tax rate was 40%. How much value did management add to shareholders' wealth during the year?
- \$1,357.13
  - \$1,428.56
  - \$1,503.75
  - \$1,578.94

ANS: C

Sales	\$12,500
Operating costs	\$7,025
Operating income (EBIT)	\$5,475
WACC	9.5%
Tax rate	40%
Investor-supplied capital	\$18,750

$$\text{EVA} = \text{EBIT}(1 - T) - \text{Investor Capital} \times \text{WACC}$$

$$\text{EVA} = \$3,285.00 - \$1,781.25$$

$$\text{EVA} = \$1,503.75$$

PTS: 1                      DIF: HARD                      REF: 40–42                      OBJ: (2.8) EVA  
 BLM: Understand

62. Last year, Michelson Manufacturing reported \$10,250 of sales, \$3,500 of operating costs other than depreciation, and \$1,250 of depreciation. The company had no amortization charges, it had \$3,500 of bonds outstanding that carry a 6.5% interest rate, and its combined federal and provincial income tax rate was 35%. This year's data are expected to remain unchanged except for one item, depreciation, which is expected to increase by \$725. By how much will the depreciation change cause the firm's net after-tax income and its net cash flow to change? Note that the company uses the same depreciation calculations for tax and stockholder reporting purposes.
- \$404.04; \$217.56
  - \$425.30; \$229.01
  - \$447.69; \$241.06
  - \$471.25; \$253.75

ANS: D

This problem can be worked very easily—just multiply the increase in depreciation by  $(1 - T)$  to get the decrease in net income, and then add to the change in income the change in depreciation to get the change in net cash flow:

Change in depreciation	\$725
Tax rate	35.00%
Reduction in net income = Change in Depr'n $(1 - \text{Tax rate})$	-\$471.25
Increase in net cash flow = Change in Depr'n - reduction in NI	\$253.75

We can also get the answer the long way, which explains things in more detail:

	Old	New	Change
Bonds	\$3,500	\$3,500	\$0.00
Interest rate	6.50%	6.50%	\$0.00
Tax rate	35%	35%	\$0.00
Sales	\$10,250	\$10,250	\$0.00
Operating costs excluding depreciation	\$3,500	\$3,500	\$0.00

Depreciation	\$1,250	\$1,975	\$725.00
Operating income (EBIT)	\$5,500	\$4,775	-\$725.00
Interest charges	\$228	\$228	\$0.00
Taxable income	\$5,273	\$4,548	-\$725.00
Taxes	\$1,845	\$1,592	-\$253.75
Net income after taxes	\$3,427	\$2,956	-\$471.25
Net cash flow	\$4,677	\$4,931	\$253.75
Check on NCF: $\Delta \text{NCF} = \text{change in depreciation} \times \text{tax rate}$			\$253.75

We like this problem because it illustrates that an increase in depreciation will *decrease* the firm's net income yet *increase* its net cash flow, and cash is king.

PTS: 1                      DIF: HARD                      REF: 27–28 | 36–39  
 OBJ: (Comp: 2.3, 2.7) Changes in net income and NCF                      BLM: Analyze

63. Bartling Energy Systems recently reported \$9,250 of sales, \$5,750 of operating costs other than depreciation, and \$700 of depreciation. The company had no amortization charges, it had \$3,200 of outstanding bonds that carry a 5% interest rate, and its combined federal and provincial income tax rate was 35%. In order to sustain its operations and thus generate sales and cash flows in the future, the firm was required to make \$1,250 of capital expenditures on new fixed assets and to invest \$300 in net operating working capital. By how much did the firm's net income exceed its free cash flow?
- \$673.27
  - \$708.70
  - \$746.00
  - \$783.30

ANS: C

Bonds	\$3,200.00
Interest rate	5.00%
Tax rate	35.00%
Required capital expenditures (fixed assets)	\$1,250.00
Required addition to net operating working capital	\$300.00
Sales	\$9,250.00
Operating costs excluding depreciation	\$5,750.00
Depreciation	\$700.00
Operating income (EBIT)	\$2,800.00
Interest charges	\$160.00
Taxable income (EBT)	\$2,640.00
Taxes	\$924.00
Net income after taxes	\$1,716.00

$$\text{FCF} = \text{EBIT}(1 - T) + \text{Depr}'\text{n} - \text{Cap Ex} - \Delta \text{Net Op WC}$$

$$\text{FCF} = \$1,820 + \$700 - \$1,250 - \$300$$

$$\text{FCF} = \$970.00$$

$$\text{Difference between net income and FCF} = \$746.00$$

PTS: 1                      DIF: HARD                      REF: 27–28 | 36–39  
 OBJ: (Comp: 2.3, 2.7) Income statement: FCF versus net income  
 BLM: Analyze

64. Mr. X lives in Saskatchewan. In 2011, he had employment income of \$80,000 and income from capital gains of \$10,000. What is his total tax liability? The applicable tax tables are as follows:

Federal Rate  
Tax Bracket  
Provincial Rate  
Tax Bracket

Fed. 15%  
\$0 – \$41,544  
Sask. 11%  
\$0 – \$40,919

Fed. 22%  
\$41,544 – \$83,088  
Sask. 13%  
\$40,919 – \$116,911

Fed. 26%  
\$83,088 – \$128,800  
Sask. 15%  
Over \$116,911

Fed. 29%  
Over \$128,800

- a. \$20,774
- b. \$24,274
- c. \$26,100
- d. \$28,050

ANS: C

Capital gains are taxed at 50% of the amount received. Therefore Mr. X's total income for tax purposes is  $\$80,000 + .5(\$10,000) = 85,000$ .

Tax Liability:

$$\text{Fed.} = .15(41,544) + .22(83,088 - 41,544) + .26(85,000 - 83,088) = 15,868$$

$$\text{Sask.} = .11(40,919) + .13(85,000 - 40,919) = 10,232$$

$$\text{Total Tax Liability} = 15,868 + 10,231 = \$26,100$$

PTS: 1

DIF: HARD

REF: 45–47

OBJ: (2.9) Personal taxes

BLM: Understand

## CHAPTER 3—ANALYSIS OF FINANCIAL STATEMENTS

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### TRUE/FALSE

1. Ratio analysis involves analyzing financial statements in order to appraise a firm's financial position and strength.  
  
ANS: T                    PTS: 1                    DIF: EASY                    REF: 57  
OBJ: (3.1) Ratio analysis
2. Current ratio and quick ratio both help us measure the firm's liquidity. The current ratio measures the relationship of a firm's current assets to its current liabilities, while the quick ratio subtracts inventory from other current assets.  
  
ANS: T                    PTS: 1                    DIF: EASY                    REF: 59  
OBJ: (3.2) Liquidity ratios
3. Although a full liquidity analysis requires the use of a cash budget, the current and quick ratios provide fast and easy-to-use measures of a firm's liquidity position.  
  
ANS: T                    PTS: 1                    DIF: EASY                    REF: 57–59  
OBJ: (3.2) Liquidity ratios
4. High current and quick ratios *always* indicate that a firm is managing its liquidity position well.  
  
ANS: F                    PTS: 1                    DIF: EASY                    REF: 59  
OBJ: (3.2) Current ratio
5. The inventory turnover ratio and days sales outstanding (DSO) are two ratios that are used to assess how effectively a firm is managing its assets.  
  
ANS: T                    PTS: 1                    DIF: EASY                    REF: 60–61  
OBJ: (3.3) Asset management ratios
6. “Mark to Market” is the process of adjusting the valuation of assets from their recorded accounting value to a valuation based on market prices.  
  
ANS: T                    PTS: 1                    DIF: EASY                    REF: 61  
OBJ: (3.3) Asset management ratios
7. The average collection period tells how many days it takes a business to pay money for trade credits to its suppliers.  
  
ANS: F                    PTS: 1                    DIF: EASY                    REF: 62  
OBJ: (3.3) Average payables period
8. A decline in a firm's inventory turnover ratio suggests that it is managing its inventory more efficiently and also that its liquidity position is improving, i.e., it is becoming more liquid.  
  
ANS: F                    PTS: 1                    DIF: EASY                    REF: 60  
OBJ: (3.3) Inventory turnover ratio

9. Debt management ratios show the extent to which a firm's managers are attempting to magnify returns on owners' capital through the use of financial leverage.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 63–65  
OBJ: (3.4) Debt management ratios

10. U.S. regulators are fundamentally opposed to changing from Generally Accepted Accounting Principles (GAPP) to International Financial Reporting Standards (IFRS).

ANS: F  
The primary reason appears to be the substantial cost such a move would impose on firms during the current period of poor performance and economic uncertainty.

PTS: 1                      DIF: EASY                      REF: 65  
OBJ: (3.4) Debt management ratios

11. The times-interest-earned ratio is one, but not the only, indication of a firm's ability to meet its long-term and short-term debt obligations.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 64  
OBJ: (3.4) TIE ratio

12. Profitability ratios show the combined effects of liquidity, asset management, and debt management on operating results.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 66–67  
OBJ: (3.5) Profitability ratios

13. Market value ratios provide management with an indication of how investors view the firm's past performance and especially its future prospects.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 68–70  
OBJ: (3.6) Market value ratios

14. Determining whether a firm's financial position is improving or deteriorating requires analyzing more than the ratios for a given year. Trend analysis is one method of measuring changes in a firm's performance over time.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 71–73  
OBJ: (3.7) Trend analysis

15. The "apparent," but not the "true," financial position of a company whose sales are seasonal can differ dramatically, depending on the time of year when the financial statements are constructed.

ANS: T  
Many of the ratios show sales over some past period, such as the last 12 months, divided by an asset, such as inventories as of a specific date. Assets, like inventories, vary at different times of the year for a seasonal business, thus leading to big changes in the ratio.

PTS: 1                      DIF: EASY                      REF: 76                      OBJ: (3.10) Balance sheet changes

16. Significant variations in accounting methods among firms make meaningful ratio comparisons between firms more difficult than if all firms used similar accounting methods.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 76

OBJ: (3.10) Limitations of ratio analysis

17. The basic earning power ratio (BEP) shows the earning power of a firm's assets after giving consideration to financial leverage and tax effects.

ANS: F

BEP = EBIT/Assets. This is before the effects of leverage (interest) and taxes, so the statement is false.

PTS: 1                      DIF: EASY                      REF: 66

OBJ: (3.5) Basic earning power ratio

18. The inventory turnover and current ratio are related. The combination of a high current ratio and a low inventory turnover ratio, relative to industry norms, suggests that the firm has an above-average inventory level and/or that part of the inventory is obsolete or damaged.

ANS: T

A high current ratio is consistent with a lot of inventory. A low inventory turnover is also consistent with a lot of inventory. If the CR exceeds industry norms and the turnover is below the norms, then the firm has more inventory than most other firms, given its sales. It could just be carrying a lot of good inventory, but it might also have a normal amount of "good" inventory plus some "bad" inventory that has not been written off. So the statement is true.

PTS: 1                      DIF: MEDIUM                      REF: 60

OBJ: (3.3) Inventory turnover ratio

19. To take full advantage of the credit term provided, management should try to lengthen the average payables period with cautions.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 62

OBJ: (3.3) Average payables period

20. It is appropriate to use the fixed assets turnover ratio to appraise firms' effectiveness in managing their fixed assets *if and only if* all the firms being compared have the same proportion of fixed assets to total assets.

ANS: F

The FA turnover is Sales/FA, and it gives an indication of how effectively the firm utilizes its FA. The proportion of FA to TA is not relevant to this usage.

PTS: 1                      DIF: MEDIUM                      REF: 62                      OBJ: (3.3) Fixed assets turnover

21. Since the ROA measures the firm's effective utilization of assets (without considering how these assets are financed), two firms with the same EBIT must have the same ROA.

ANS: F

EBIT = Sales revenues – Operating costs

Net income = EBIT – Interest – Taxes = (EBIT – Interest) × (1 – T)

ROA = Net income after taxes/Assets

Two firms could have identical EBITs but very different amounts of interest, different tax rates, and different assets, and thus very different ROAs.

PTS: 1                      DIF: MEDIUM      REF: 67                      OBJ: (3.5) ROA

22. Other things held constant, a decline in sales and a simultaneous increase in financial leverage must result in a lower profit margin.

ANS: F

PM = NI/Sales. A decrease in sales would, other things held constant, increase the PM. An increase in financial leverage would lead to higher interest charges, which would decrease net income, which would decrease the PM. So, the net effect could be either an increase or a decrease in the PM.

PTS: 1                      DIF: MEDIUM      REF: 66  
OBJ: (3.5) Profit margin and leverage

23. Suppose firms follow similar financing policies, face similar risks, have equal access to capital, and operate in competitive product and capital markets. Under these conditions, then firms that have high profit margins will tend to have high asset turnover ratios, and firms with low profit margins will tend to have low turnover ratios.

ANS: F

Think about the Du Pont equation: ROE = PM × TATO × Equity multiplier. Similar financing policies will lead to similar equity multipliers. Moreover, competition in the capital markets will cause ROEs to be similar, because otherwise capital would flow to industries with high ROEs and drive returns down toward the average, given similar risks. To have similar ROEs, firms with relatively high PMs must have relatively low TATOs, and vice versa. Therefore, the statement is false.

PTS: 1                      DIF: MEDIUM      REF: 73–74                      OBJ: (3.8) Du Pont equation

24. Even though Firm A's current ratio exceeds that of Firm B, Firm B's quick ratio might exceed that of A. However, if A's quick ratio exceeds B's, then we can be certain that A's current ratio is also larger than that of B.

ANS: F

This question can be answered by thinking carefully about the ratios:

Demonstration that the first sentence is true:	CR = C + A/R + Inv	$\frac{A > B}{CL}$	QR =	$\frac{C + A/R}{CL}$	$\frac{B > A}{CL}$
QR(B) > QR(A)	A:	$\frac{1 + 1 + 3}{3}$		$\frac{1 + 1}{3}$	0.67
	B:	$\frac{1 + 1 + 1}{2}$		$\frac{1 + 1}{2}$	1.00

Demonstration that the second sentence is false:	CR = C + A/R + Inv	$\frac{A > B}{CL}$	QR =	$\frac{C + A/R}{CL}$	$\frac{B > A}{CL}$
QR(B) < QR(A)	A:	$\frac{1 + 1 + 1}{3}$		$\frac{1 + 1}{3}$	0.67
	B:	$\frac{1 + 1 + 4}{4}$		$\frac{1 + 1}{4}$	0.50

The key is inventory, which is in the CR but not in the QR. The firm with more inventory can have the higher CR but the lower QR.

PTS: 1                      DIF: HARD                      REF: 57–60                      OBJ: (3.2) Liquidity ratios

25. Firms A and B have the same current ratio, 0.75, the same amount of sales, and the same amount of current liabilities. However, Firm A has a higher inventory than B. Therefore, we can conclude that A's quick ratio must be smaller than B's.

ANS: F

Firm A has the higher inventory turnover, so given the same sales, it must have less inventory. Thus, since the two firms have the same CR, then A must have the higher QR, not the lower one. Therefore, the statement is false.

PTS: 1                      DIF: HARD                      REF: 57–60                      OBJ: (3.2) Liquidity ratios

26. Suppose a firm wants to maintain a specific TIE ratio. It knows the amount of its debt, the interest rate on that debt, the applicable tax rate, and its operating costs. With this information, the firm can calculate the amount of sales required to achieve its target TIE ratio.

ANS: T

$TIE = EBIT/Interest = (Sales - Op\ cost)/(Debt \times Interest\ rate)$ . If we know the op. costs, the amount of debt, and the interest rate, then we can solve for the sales level required to achieve the target TIE.

PTS: 1                      DIF: HARD                      REF: 64                      OBJ: (3.4) TIE ratio

27. Suppose Firms A and B have the same amount of assets, pay the same interest rate on their debt, have the same basic earning power (BEP), and have the same tax rate. However, Firm A has a higher debt ratio. If BEP is *greater* than the interest rate on debt, Firm A will have a *higher* ROE as a result of its higher debt ratio.

ANS: T

The easiest way to think about this is to realize that if you can borrow at a cost of 10% and invest the proceeds to earn 11%, you'll earn a surplus. If you were previously earning an ROE of 10%, then after raising and investing additional funds, your income will be higher, your equity will be the same, and thus your ROE will increase. Similarly, if a firm earns more on assets than the interest rate, there will be a surplus after paying interest on the debt that will go to the equity, thus increasing the ROE. So, if  $BEP > r_d$ , then the firm can increase its expected ROE by using more debt leverage.

The answer can also be seen by working out an example. The one below shows that leverage increases ROE if  $BEP > r_d$ , but it could be varied to show no difference in ROE if interest rates and BEP are the same, and a reduction in ROE if the interest rate exceeds the BEP.

Firm A		Firm B	
Assets	100%	Assets	100%
Debt	60%	Debt	0%
Equity	40%	Equity	100%
BEP	15%	BEP	15%
Interest rate, $r_d$	10%	Interest rate, $r_d$	10%
Tax rate	40%	Tax rate	40%
EBIT = BEP × Assets	15.0	EBIT = BEP × Assets	15.0
Interest	6.0	Interest	0
Taxable income	9.0	Taxable income	15.0
Taxes	3.6	Taxes	6.0
NI	5.4	NI	9.0
ROE	13.50%	ROE	9.00%

PTS: 1                      DIF: HARD                      REF: 66–67                      OBJ: (3.5) BEP and ROE



28. If a firm finances with only debt and common equity, and if its equity multiplier is 3.0, then its debt ratio must be 0.667.

ANS: T

Equity multiplier = Assets/Equity = 3.0, so Assets/Equity =  $1/3.0 = 0.333$ .

By definition, Equity/Assets + Debt/Assets = 1.00, so  $0.333 + \text{Debt/Assets} = 1.0$ .

Therefore, Debt/Assets =  $1.0 - 0.333 = 0.667$ . Thus, the statement is true.

PTS: 1                      DIF: HARD                      REF: 73                      OBJ: (3.8) Equity multiplier

29. One problem with ratio analysis is that relationships can be manipulated. For example, if our current ratio is greater than 1.5, then borrowing on a short-term basis and using the funds to build up our cash account would cause the current ratio to increase.

ANS: F

The key here is to recognize that if the CR is greater than 1.0, then a given increase in both current assets and current liabilities would lead to a decrease in the CR. The reverse would hold if the initial CR were less than 1.0. Here the initial CR is greater than 1.0, so borrowing on a short-term basis to build the cash account would lower the CR. For example:

Original CA/CL	Plus \$1	New CA/CL	Old CR	New CR	
3/2	1/1	4/3	1.50	1.33	CR falls if initial CR is greater than 1.0
2/3	1/1	3/4	0.67	0.75	CR rises if initial CR is less than 1.0

PTS: 1                      DIF: HARD                      REF: 76

OBJ: (3.10) Limitations of ratio analysis

30. One problem with ratio analysis is that relationships can be manipulated. For example, we know that if our current ratio is less than 1.0, then using some of our cash to pay off some of our current liabilities would cause the current ratio to increase and thus make the firm look stronger.

ANS: F

The key here is to recognize that if the CR is less than 1.0, then a given reduction in both current assets and current liabilities would lead to a decrease in the CR. The reverse would hold if the initial CR were greater than 1.0. In the question, the initial CR is less than 1.0, so using cash to reduce current liabilities would lower the CR. If the CR were greater than 1.0, the statement would have been true. Here's an illustration:

Original CA/CL	Less \$1	New CA/CL	Old CR	New CR	
2/3	-1/-1	1/2	0.67	0.50	CR falls if initial CR is less than 1.0
3/2	-1/-1	2/1	1.5	2.0	CR rises if initial CR is greater than 1.0

PTS: 1                      DIF: HARD                      REF: 76

OBJ: (3.10) Limitations of ratio analysis

## MULTIPLE CHOICE

1. Considered alone, which of the following would increase a company's current ratio?
- an increase in net fixed assets
  - an increase in accrued liabilities
  - an increase in notes payable
  - an increase in accounts receivable

ANS: D                      PTS: 1                      DIF: EASY                      REF: 59  
OBJ: (3.2) Current ratio                      BLM: Understand

2. Which of the following would, generally, indicate an improvement in a company's financial position, other things held constant?
- The TIE declines.
  - The DSO increases.
  - The EBITDA coverage ratio increases.
  - The current and quick ratios both decline.

ANS: C                      PTS: 1                      DIF: EASY                      REF: 59  
OBJ: (3.2) Current ratio                      BLM: Understand

3. A firm wants to strengthen its financial position. Which action would increase its current ratio?
- Use cash to repurchase some of the company's own stock.
  - Borrow using short-term debt and use the proceeds to repay debt that has a maturity of more than 1 year.
  - Issue new stock and then use some of the proceeds to purchase additional inventory and hold the remainder as cash.
  - Use cash to increase inventory holdings.

ANS: C                      PTS: 1                      DIF: EASY                      REF: 59  
OBJ: (3.2) Current ratio                      BLM: Understand

4. Which statement about inventories is correct?
- A reduction in inventories held would have no effect on the current ratio.
  - An increase in inventories would have no effect on the current ratio.
  - If a firm increases its sales while holding its inventories constant, then, other things held constant, its inventory turnover ratio will increase.
  - A reduction in the inventory turnover ratio will generally lead to an increase in the ROE.

ANS: C                      PTS: 1                      DIF: EASY                      REF: 60  
OBJ: (3.3) Inventories                      BLM: Remember

5. Companies E and P each reported the same earnings per share (EPS), but Company E's stock trades at a higher price. Which of the following statements is correct?
- Company E probably has fewer growth opportunities than company P.
  - Company E is probably judged by investors to be riskier than company P.
  - Company E must pay a lower dividend than company P.
  - Company E trades at a higher P/E ratio than company P.

ANS: D                      PTS: 1                      DIF: EASY                      REF: 68–70  
OBJ: (3.6) Financial statement analysis                      BLM: Understand

6. Which of the following statements is correct?
- If a firm has the highest price/earnings ratio of any firm in its industry, then, other things

- held constant, this suggests that the board of directors should fire the president.
- If a firm has the highest market/book ratio of any firm in its industry, then, other things held constant, this suggests that the board of directors should fire the president.
  - Other things held constant, the higher a firm's expected future growth rate, the lower its P/E ratio is likely to be.
  - The higher the market/book ratio, then, other things held constant, the higher one would expect to find the Market Value Added (MVA).

ANS: D                      PTS: 1                      DIF: EASY                      REF: 68–70

OBJ: (3.6) Market value ratios                      BLM: Understand

- Which of the following is an example of window dressing?
  - Borrowing on a long-term basis and using the proceeds to retire short-term debt would improve the current ratio and thus could be considered to be an example of window dressing.
  - Offering discounts to customers who pay with cash rather than buy on credit and then using the funds that come in quicker to purchase additional inventories is an example of window dressing.
  - Using some of the firm's cash to reduce long-term debt is an example of window dressing.
  - Window dressing is any action that improves a firm's fundamental, long-run position and thus increases its intrinsic value.

ANS: A                      PTS: 1                      DIF: EASY                      REF: 76

OBJ: (3.10) Window dressing                      BLM: Remember

- Casey Communications recently issued new common stock and used the proceeds to pay off some of its short-term notes payable. This action had no effect on the company's total assets or operating income. What would occur as a result of this action?
  - The company's current ratio would increase.
  - The company's times-interest-earned ratio would decrease.
  - The company's basic earning power ratio would increase.
  - The company's equity multiplier would increase.

ANS: A                      PTS: 1                      DIF: EASY                      REF: 59 | 64 | 66 | 73

OBJ: (Comp: 3.2, 3.4, 3.5, 3.8) Miscellaneous ratios                      BLM: Understand

- A firm's new president wants to strengthen the company's financial position. Which action would make it financially stronger?
  - Increase accounts receivable while holding sales constant.
  - Increase EBIT while holding sales constant.
  - Increase accounts payable while holding sales constant.
  - Increase notes payable while holding sales constant.

ANS: B                      PTS: 1                      DIF: EASY                      REF: 59 | 61–62 | 66

OBJ: (Comp: 3.2, 3.3, 3.5) Miscellaneous ratios                      BLM: Understand

- If the CEO of a large, diversified firm were filling out a fitness report on a division manager (i.e., "grading" the manager), which of the following situations would be likely to cause the manager to receive a better grade? In all cases, assume that other things are held constant.
  - The division's basic earning power ratio is above the average of other firms in its industry.
  - The division's total assets turnover ratio is below the average for other firms in its industry.
  - The division's debt ratio is above the average for other firms in the industry.
  - The division's inventory turnover is 6, whereas the average for its competitors is 8.

ANS: A                      PTS: 1                      DIF: EASY                      REF: 60 | 62 | 63–66  
OBJ: (Comp: 3.3–3.5) Miscellaneous ratios                      BLM: Understand

11. Which of the following would indicate an improvement in a company's financial position, other things held constant?
- The debt ratio increases.
  - The profit margin declines.
  - The EBITDA coverage ratio declines.
  - The current and quick ratios both increase.

ANS: D                      PTS: 1                      DIF: EASY                      REF: 59 | 63–67  
OBJ: (Comp: 3.2–3.5) Miscellaneous ratios                      BLM: Remember

12. If a bank loan officer were considering a company's request for a loan, which of the following statements is correct?
- The lower the company's EBITDA coverage ratio, other things held constant, the lower the interest rate the bank would charge the firm.
  - Other things held constant, the higher the debt ratio, the lower the interest rate the bank would charge the firm.
  - Other things held constant, the lower the debt ratio, the lower the interest rate the bank would charge the firm.
  - The lower the company's TIE ratio, other things held constant, the lower the interest rate the bank would charge the firm.

ANS: C                      PTS: 1                      DIF: EASY                      REF: 57–59 | 63–65  
OBJ: (Comp: 3.2, 3.4) Miscellaneous ratios                      BLM: Understand

13. Which of the following statements is correct?
- The use of debt financing will tend to lower the basic earning power ratio, other things held constant.
  - A firm that employs financial leverage will have a higher equity multiplier than an otherwise identical firm that has no debt in its capital structure.
  - If two firms have identical sales, interest rates paid, operating costs, and assets, but differ in the way they are financed, the firm with less debt will generally have the higher expected ROE.
  - Holding bonds is better than holding stock for investors because income from bonds is taxed on a more favourable basis than income from stock.

ANS: B                      PTS: 1                      DIF: EASY                      REF: 63–67 | 73  
OBJ: (Comp: 3.4, 3.5, 3.8) Effects of leverage                      BLM: Understand

14. A firm wants to strengthen its financial position. Which action would increase its quick ratio?
- Offer price reductions along with generous credit terms that would (1) enable the firm to sell some of its excess inventory and (2) lead to an increase in accounts receivable.
  - Issue new common stock and use the proceeds to increase inventories.
  - Speed up the collection of receivables and use the cash generated to increase inventories.
  - Use some of its cash to purchase additional inventories.

ANS: A                      PTS: 1                      DIF: EASY | MEDIUM  
REF: 59                      OBJ: (3.2) Quick ratio                      BLM: Remember

15. Amram Company's current ratio is 1.9. Considered alone, which action would reduce the company's current ratio?
- Borrow using short-term notes payable and use the proceeds to reduce accruals.
  - Borrow using short-term notes payable and use the proceeds to reduce long-term debt.

- c. Use cash to reduce short-term notes payable.
- d. Use cash to reduce accounts payable.

ANS: B

- (a) would leave the CR unchanged.
- (b) would indeed reduce the CR.
- (c) is false, given that the initial CR > 1.0.
- (d) is false, given that the initial CR > 1.0.

Original		New				
CA/CL	Minus .5	CA/CL	Old CR	New CR		
1.9/1	0/0.5	1.9/1.5	1.90	1.27		CR falls if initial CR is greater than 1.0

PTS: 1                      DIF: MEDIUM              REF: 59                      OBJ: (3.2) Current ratio  
 BLM: Analyze

16. Which statement about accounts receivable is correct?
- a. If a security analyst saw that a firm's DSO was higher than the industry average and was also increasing and trending still higher, this would be interpreted as a sign of strength.
  - b. If a firm increases its sales while holding its accounts receivable constant, then, other things held constant, its DSO will increase.
  - c. There is no relationship between the DSO and the ACP. These ratios measure entirely different things.
  - d. If a firm increases its sales while holding its accounts receivable constant, then, other things held constant, its days' sales outstanding will decline.

ANS: D                      PTS: 1                      DIF: MEDIUM              REF: 61  
 OBJ: (3.3) Accounts receivable                      BLM: Understand

17. Which of the following statements is correct?
- a. If one firm has a higher debt ratio than another, we can be certain that the firm with the higher debt ratio will have the lower TIE ratio, as that ratio depends entirely on the amount of debt a firm uses.
  - b. If two firms differ only in their use of debt—i.e., they have identical assets, sales, operating costs, interest rates on their debt, and tax rates—but one firm has a higher debt ratio, the firm that uses more debt will have a lower profit margin on sales.
  - c. The debt ratio as it is generally calculated makes an adjustment for the use of assets leased under operating leases, so the debt ratios of firms that lease different percentages of their assets are still comparable.
  - d. If two firms differ only in their use of debt—i.e., they have identical assets, sales, operating costs, and tax rates—but one firm has a higher debt ratio, the firm that uses more debt will have a higher profit margin on sales.

ANS: B  
 (a) is false, because the TIE also depends on the interest rate and EBIT.  
 (b) is correct, because the more interest the lower the profits, hence the lower the profit margin.  
 (c) is simply incorrect.  
 (d) is incorrect. The reverse is true.

PTS: 1                      DIF: MEDIUM              REF: 63–65  
 OBJ: (3.4) Leverage effects; debt management                      BLM: Understand

18. Which of the following statements is correct?
- a. If Firms X and Y have the same P/E ratios, then their market-to-book ratios must also be

the same.

- b. If Firms X and Y have the same net income, number of shares outstanding, and price per share, then their P/E ratios must also be the same.
- c. If Firms X and Y have the same earnings per share and market-to-book ratio, they must have the same price earnings ratio.
- d. If Firm X's P/E ratio exceeds that of Firm Y, then Y is likely to be less risky and also to be expected to grow at a faster rate.

ANS: B

No reason for (a) to be true.

(b) must be true, as EPS and P will be the same.

No reason for (c) to be true.

(d) is wrong, because high risk and low growth lead to low P/Es.

PTS: 1

DIF: MEDIUM

REF: 66–67

OBJ: (3.6) Market value ratios

BLM: Understand

19. Which of the following might represent a major distortion brought about by a move to implement “mark to market” accounting?
- a. A rise or fall in the market value of assets will not afford investors a better basis for assessing the future value of their investments.
  - b. Uncertainty regarding whether the adjusted market prices reflect temporary or permanent changes to the asset's value may result in ambiguous signals when financial ratios are prepared.
  - c. Financial statements represent historical information in that they reflect collective past performance (balance sheet) and the most recent past performance (income statement). As such, it is not necessary to adjust asset valuation to reflect current market values.
  - d. Since prices change over time, “mark to market” is inferior to current accounting methods because a move to “mark to market” asset valuation will create a disconnect between past and future financial information.

ANS: B

PTS: 1

DIF: MEDIUM

REF: 65

OBJ: (3.4) Financial statement analysis BLM: Remember

20. Many countries, including Canada, have replaced Generally Accepted Accounting Principles (GAPP) with International Financial Reporting Standards (IFRS). To date, the U.S. has not made this change. What is a major reason why the U.S. has made this decision?
- a. There is a fear that such a move would distort the analysis of a firm's performance over time.
  - b. Moving to this new accounting standard would impose major financial costs on U.S. firms during the current period of poor performance and economic uncertainty.
  - c. U.S. companies are, by and large, unaffected by activities in other jurisdictions, and as such, the change in accounting practices would result in only minor adjustments to financial statements.
  - d. The change to IFRS practices would have a major affect on financial statements, but investors do not rely heavily on financial statement information in making future investment decisions.

ANS: B

PTS: 1

DIF: EASY

REF: 65

OBJ: (3.4) Financial statement analysis BLM: Remember

21. Which statement regarding the Du Pont analysis is correct?
- a. Suppose a firm's total assets turnover ratio falls from 1.0 to 0.9, but at the same time its profit margin rises from 9% to 10% and its debt increases from 40% of total assets to 60%. Under these conditions, the ROE will increase.

- b. Suppose a firm's total assets turnover ratio falls from 1.0 to 0.9, but at the same time its profit margin rises from 9% to 10% and its debt increases from 40% of total assets to 60%. Without additional information, we cannot tell what will happen to the ROE.
- c. The modified Du Pont equation provides information about how operations affect the ROE, but the equation does not include the effects of debt on the ROE.
- d. Suppose a firm's total assets turnover ratio falls from 1.0 to 0.9, but at the same time its profit margin rises from 9% to 10%, and its debt increases from 40% of total assets to 60%. Under these conditions, the ROE will decrease.

ANS: A

	PM	×	TATO	×	Eq mult.	=	ROE
Old	9%		1.0		1.666667		15%
New	10%		0.9		2.5		23%

We see that (a) is true, thus (b) must be false.

We can also see that (c) and (d) are false.

PTS: 1                      DIF: MEDIUM              REF: 73–74                      OBJ: (3.8) Du Pont analysis  
BLM: Analyze

22. You observe that a firm's ROE is above the industry average, but its profit margin and debt ratio are both below the industry average. Which of the following statements is correct?
- Its total assets turnover must be above the industry average.
  - Its return on assets must equal the industry average.
  - Its TIE ratio must be below the industry average.
  - Its total assets turnover must be below the industry average.

ANS: A

Thinking through the Du Pont equation, we can see that if the firm's PM and equity multiplier are below the industry average, then the only way its ROE can exceed the industry average is if its equity multiplier exceeds the industry average. The following data illustrate this point:

	ROE	=	PM	×	TATO	×	Eq mult.	ROA
Firm	30%		9%		2.0		1.67	18%
Industry	25%		10%		1		2.50	10%

The above demonstrates that (a) is correct, and that makes (d) incorrect.

Now consider the following:

$$\text{NI/Assets} = \text{NI/Sales} \times \text{Sales/Assets}$$

$$\text{ROA} = \text{PM} \times \text{TATO}$$

If its ROA were equal to the industry average, then with its low debt ratio (hence, low equity multiplier) its ROE would also be below the industry average. So (b) is incorrect. With its debt ratio below the industry average, its interest charges should also be low, which would increase its TIE ratio, making (c) incorrect.

PTS: 1                      DIF: MEDIUM              REF: 73–74                      OBJ: (3.8) Du Pont analysis  
BLM: Analyze

23. Companies HD and LD are both profitable, and they have the same total assets (TA), Sales (S), return on assets (ROA), and profit margin (PM). However, Company HD has the higher debt ratio. Which of the following statements is correct?
- Company HD has a lower total assets turnover than Company LD.





OBJ: (Comp: 3.3–3.5) Financial statement analysis

BLM: Analyze

26. HD Corp. and LD Corp. have identical assets, sales, interest rates paid on their debt, tax rates, and EBIT. However, HD uses more debt than LD. Which of the following statements is correct?
- HD would have the lower equity multiplier for use in the Du Pont equation.
  - HD would have to pay more in income taxes.
  - HD would have the lower net income as shown on the income statement.
  - HD would have the higher net income as shown on the income statement.

ANS: C

More debt would mean more interest, hence a lower NI, given a constant EBIT, so (c) is correct. Also, we can rule out (d), and HD would also have the higher multiplier, which rules out (a). And with more interest, HD would have to pay less taxes, not more.

PTS: 1 DIF: MEDIUM REF: 63–67 | 73–74

OBJ: (Comp: 3.4, 3.5, 3.8) Financial statement analysis BLM: Analyze

27. Other things held constant, which of the following alternatives would increase a company's cash flow for the current year?
- Pay down the accounts payables.
  - Reduce the days' sales outstanding (DSO) without affecting sales or operating costs.
  - Pay workers more frequently to decrease the accrued wages balance.
  - Reduce the inventory turnover ratio without affecting sales or operating costs.

ANS: B

- Paying down accounts payable would use cash and thus reduce cash flow.
- Reducing the DSO would require collecting receivables faster, which would indeed increase cash flow.
- Decreasing accruals would lower cash flow.
- Reducing inventory turnover would mean increasing inventories, which would use cash.

PTS: 1 DIF: MEDIUM REF: 59–62

OBJ: (Comp: 3.2, 3.3) Cash flows

BLM: Analyze

28. Companies HD and LD have the same sales, tax rate, interest rate on their debt, total assets, and basic earning power. Both companies have positive net incomes. Company HD has a higher debt ratio and, therefore, a higher interest expense. Which of the following statements is correct?
- Company HD pays less in taxes than Company LD.
  - Company HD has a lower equity multiplier than Company LD.
  - Company HD has a higher ROA than Company LD.
  - Company HD has more net income than Company LD.

ANS: A

Under the stated conditions, HD would have more interest charges, thus lower taxable income and taxes. Thus, (a) is correct. All of the other statements are incorrect.

PTS: 1 DIF: MEDIUM REF: 63–66 | 73–74

OBJ: (Comp: 3.4, 3.5, 3.8) Leverage, taxes, and ratios BLM: Analyze

29. Companies HD and LD have the same tax rate, sales, total assets, and basic earning power. Both companies have positive net incomes. Company HD has a higher debt ratio and, therefore, a higher interest expense. Which of the following statements is correct?
- Company HD has a lower equity multiplier than Company LD.
  - Company HD has more net income than Company LD.
  - Company HD pays more in taxes than Company LD.

d. Company HD has a lower times-interest-earned (TIE) ratio than Company LD.

ANS: D

HD has higher interest charges. Basic earning power equals EBIT/Assets, and since assets are equal, EBIT must also be equal.  $TIE = EBIT/Interest$ . Therefore, HD's higher interest charges means that its TIE must be lower. Thus, (d) is correct. All of the other statements are incorrect.

PTS: 1                      DIF: MEDIUM              REF: 63–66 | 73–74

OBJ: (Comp: 3.4, 3.5, 3.8) Leverage, taxes, and ratios                      BLM: Analyze

30. Walter Industries' current ratio is 0.5. Considered alone, which of the following actions would increase the company's current ratio?
- Borrow using short-term notes payable and use the cash to increase inventories.
  - Use cash to reduce accruals.
  - Use cash to reduce accounts payable.
  - Use cash to reduce short-term notes payable.

ANS: A

The key here is to recognize that if the CR is less than 1.0, then a given increase in both current assets and current liabilities would lead to an increase in the CR. The reverse would hold if the initial CR were greater than 1.0. Here the initial CR is less than 1.0, so borrowing on a short-term basis to build inventories would increase the CR. For example:

Original CA/CL	Plus \$1	New CA/CL	Old CR	New CR	
1/2	1/1	2/3	0.50	0.67	CR rises if initial CR is less than 1.0

All of the other statements are incorrect, although (b), (c), and (d) would be correct if the initial CR had been  $>1.0$ .

PTS: 1                      DIF: MEDIUM | HARD                      REF: 59

OBJ: (3.2) Current ratio                      BLM: Analyze

31. Safeco's current assets total \$20 million, versus \$10 million of current liabilities, while Risco's current assets are \$10 million, versus \$20 million of current liabilities. Both firms would like to "window dress" their end-of-year financial statements, and to do so they tentatively plan to borrow \$10 million on a short-term basis and to then hold the borrowed funds in their cash accounts. Which statement below best describes the results of these transactions?
- The transactions would raise Safeco's financial strength as measured by its current ratio but lower Risco's current ratio.
  - The transactions would lower Safeco's financial strength as measured by its current ratio but raise Risco's current ratio.
  - The transactions would lower both firms' financial strength as measured by their current ratios.
  - The transactions would improve both firms' financial strength as measured by their current ratios.

ANS: B

The key here is to recognize that if the CR is less than 1.0, then a given increase to both current assets and current liabilities will increase the CR, while the reverse will hold if the initial CR is greater than 1.0. Thus, the transaction would make Risco look stronger but Safeco look weaker. Here's an illustration:

Original	New
----------	-----

	CA/CL	Plus \$10	CA/CL	Old CR	New CR	
Safeco	20/10	10/10	30/20	2.00	1.50	CR falls because initial CR is greater than 1.0

	Original CA/CL	Plus \$10	New CA/CL	Old CR	New CR	
Risco	10/20	10/10	20/30	0.50	0.67	CR rises because initial CR is less than 1.0

All except (b) are incorrect.

PTS: 1                      DIF: MEDIUM | HARD                      REF: 59  
 OBJ: (3.2) Current ratio                      BLM: Evaluate

32. Companies HD and LD have the same total assets, sales, operating costs, and tax rates, and they pay the same interest rate on their debt. However, company HD has a higher debt ratio. Which of the following statements is correct?
- Company LD has a higher basic earning power ratio (BEP) than Company HD.
  - Company HD has a higher basic earning power ratio (BEP) than Company LD.
  - If the interest rate the companies pay on their debt is *more than* their basic earning power (BEP), then Company HD will have the higher ROE.
  - If the interest rate the companies pay on their debt is *less than* their basic earning power (BEP), then Company HD will have the higher ROE.

ANS: D

The companies have the same EBIT and assets, hence the same BEP ratio. If the interest rate is less than the BEP, then using more debt will raise the ROE. Therefore, (d) is correct. The others are all incorrect.

PTS: 1                      DIF: MEDIUM | HARD                      REF: 64 | 66  
 OBJ: (Comp: 3.4, 3.5) Effects of financial leverage                      BLM: Analyze

33. Arshadi Corp.'s sales last year were \$52,000, and its total assets were \$22,000. What was its total assets turnover ratio (TATO)?
- 2.03
  - 2.13
  - 2.25
  - 2.36

ANS: D

Sales	\$52,000
Total assets	\$22,000
TATO	2.36

PTS: 1                      DIF: EASY                      REF: 62–63                      OBJ: (3.3) Total assets turnover  
 BLM: Remember

34. Beranek Corp. has \$410,000 of assets, and it uses no debt—it is financed only with common equity. The new CFO wants to employ enough debt to bring the debt/assets ratio to 40%, using the proceeds from the borrowing to buy back common stock at its book value. How much must the firm borrow to achieve the target debt ratio?
- \$155,800
  - \$164,000
  - \$172,200

d. \$180,810

ANS: B

Total assets	\$410,000
Target debt ratio	40%
Debt to achieve target ratio = amount borrowed	\$164,000

PTS: 1                    DIF: EASY                    REF: 63–65

OBJ: (3.4) Debt ratio: find the debt, given the D/A ratio                    BLM: Understand

35. Orono Corp.'s sales last year were \$435,000, its operating costs were \$362,500, and its interest charges were \$12,500. What was the firm's times-interest-earned (TIE) ratio?

- a. 4.97
- b. 5.23
- c. 5.51
- d. 5.80

ANS: D

Sales	\$435,000
Operating costs	362,500
Operating income (EBIT)	<u>72,500</u>
Interest charges	\$ 12,500
TIE ratio	5.80

PTS: 1                    DIF: EASY                    REF: 64

OBJ: (3.4) Times interest earned

BLM: Understand

36. Rappaport Corp.'s sales last year were \$320,000, and its net income after taxes was \$23,000. What was its profit margin on sales?

- a. 6.49%
- b. 6.83%
- c. 7.19%
- d. 7.55%

ANS: C

Sales	\$320,000
Net income	\$23,000
Profit margin	7.19%

PTS: 1                    DIF: EASY                    REF: 66

OBJ: (3.5) Profit margin on sales

BLM: Remember

37. Branch Corp.'s total assets at the end of last year were \$315,000 and its net income after taxes was \$22,750. What was its return on total assets?

- a. 7.22%
- b. 7.58%
- c. 7.96%
- d. 8.36%

ANS: A

Total assets	\$315,000
Net income	\$22,750
ROA	7.22%

PTS: 1                    DIF: EASY                    REF: 67

OBJ: (3.5) Return on total assets (ROA) BLM: Remember

38. Chambliss Corp.'s total assets at the end of last year were \$305,000 and its EBIT was 62,500. What was its basic earning power (BEP)?
- 18.49%
  - 19.47%
  - 20.49%
  - 21.52%

ANS: C

Total assets	\$305,000
EBIT	\$62,500
BEP	20.49%

PTS: 1 DIF: EASY REF: 66

OBJ: (3.5) Basic earning power (BEP) BLM: Remember

39. Nikko Corp.'s total common equity at the end of last year was \$305,000, and its net income after taxes was \$60,000. What was its ROE?
- 16.87%
  - 17.75%
  - 18.69%
  - 19.67%

ANS: D

Common equity	\$305,000
Net income	\$60,000
ROE	19.67%

PTS: 1 DIF: EASY REF: 67

OBJ: (3.5) Return on equity (ROE) BLM: Remember

40. An investor is considering starting a new business. The company would require \$475,000 of assets, and it would be financed entirely with common stock. The investor will go forward only if she thinks the firm can provide a 13.5% return on the invested capital, which means that the firm must have an ROE of 13.5%. How much net income must be expected to warrant starting the business?
- \$54,979
  - \$57,873
  - \$60,919
  - \$64,125

ANS: D

Assets = equity	\$475,000
Target ROE	13.5%
Required net income	\$64,125

PTS: 1 DIF: EASY REF: 67

OBJ: (3.5) Return on equity (ROE): finding net income BLM: Understand

41. Vang Corp.'s stock price at the end of last year was \$33.50 and its earnings per share for the year were \$2.30. What was its P/E ratio?
- 13.84
  - 14.57
  - 15.29
  - 16.06

ANS: B  
 Stock price \$33.50  
 EPS \$2.30  
 P/E 14.57

PTS: 1 DIF: EASY REF: 68  
 OBJ: (3.6) Price/Earnings ratio (P/E) BLM: Remember

42. Lindley Corp.'s stock price at the end of last year was \$33.50, and its book value per share was \$25.00. What was its market/book ratio?
- 1.34
  - 1.41
  - 1.48
  - 1.55

ANS: A  
 Stock price \$33.50  
 Book value per share \$25.00  
 M/B ratio 1.34

PTS: 1 DIF: EASY REF: 68  
 OBJ: (3.6) Price/Earnings ratio (P/E) BLM: Remember

43. Northwest Lumber had a profit margin of 5.25%, a total assets turnover of 1.5, and an equity multiplier of 1.8. What was the firm's ROE?
- 12.79%
  - 13.47%
  - 14.18%
  - 14.88%

ANS: C  
 Profit margin 5.25%  
 TATO 1.50  
 Equity multiplier 1.80  
 ROE 14.18%

PTS: 1 DIF: EASY REF: 73–74  
 OBJ: (3.8) Du Pont equation: basic calculation BLM: Analyze

44. Pace Corp.'s assets are \$625,000, and its total debt outstanding is \$185,000. The new CFO wants to employ a debt ratio of 55%. How much debt must the company add or subtract to achieve the target debt ratio?
- \$158,750
  - \$166,688
  - \$175,022
  - \$183,773

ANS: A  
 Total assets \$625,000  
 Present debt \$185,000  
 Target debt ratio 55%  
 Target amount of debt \$343,750  
 Change in amount of debt outstanding \$158,750

PTS: 1                    DIF: EASY | MEDIUM                    REF: 63–65  
 OBJ: (3.4) Debt ratio                    BLM: Analyze

45. Helmuth Inc.'s latest net income was \$1,250,000, and it had 225,000 shares outstanding. The company wants to pay out 45% of its income. What dividend per share should it declare?
- \$2.14
  - \$2.26
  - \$2.38
  - \$2.50

ANS: D

Net income	\$1,250,000
Shares outstanding	225,000
Payout ratio	45%
EPS	\$5.56
DPS	\$2.50

PTS: 1                    DIF: EASY | MEDIUM                    REF: 70  
 OBJ: (3.6) EPS, DPS, and payout                    BLM: Analyze

46. Aziz Industries has sales of \$100,000 and accounts receivable of \$11,500, and it gives its customers 30 days to pay. The industry average DSO is 27 days, based on a 365-day year. If the company changes its credit and collection policy sufficiently to cause its DSO to fall to the industry average, and if it earns 8.0% on any cash freed up by this change, how would that affect its net income, assuming other things are held constant?
- \$281.41
  - \$296.22
  - \$311.81
  - \$328.22

ANS: D

Rate of return on cash generated	8.0%
Sales	\$100,000
A/R	\$11,500
Days in year	365
Sales/day	\$273.97
Company DSO	42.0
Industry DSO	<u>27.0</u>
Excess DSO	15.0
Cash flow from reducing the DSO	\$4,102.74

Alternative calculation:

A/R at industry DSO	\$7,397.26
Change in A/R	\$4,102.74
Additional Net Income	\$328.22

PTS: 1                    DIF: MEDIUM                    REF: 61  
 OBJ: (3.3) Effect of lowering the DSO on net income                    BLM: Evaluate

47. ABC Inc. has a 59-day average payables period. The account payables are \$2,737.50 at the beginning and \$3,589.50 at the end of the covering year. What is the annual cost of goods sold? Use a 365-day year when calculating the APP.
- \$17,265
  - \$18,992

- c. \$19,571
- d. \$20,123

ANS: C

APP = payables/(annual COGS/365). Payables =  $(2,737.5 + 3,589.5)/2 = \$3,163.5$ . Let X be the annual COGS. It follows that  $59 = 3,163.5/(X/365)$ . Solve for  $(X/365) = 3,163.5/59 = 53.6186$ .  
 $X = \$19,570.805$ .

PTS: 1                    DIF: MEDIUM            REF: 61

OBJ: (3.3) Days sales outstanding (DSO)

BLM: Analyze

48. Heaton Corp. sells on terms that allow customers 45 days to pay for merchandise. Its sales last year were \$425,000, and its year-end receivables were \$60,000. If its DSO is less than the 45-day credit period, then customers are paying on time. Otherwise, they are paying late. By how much are customers paying early or late? Base your answer on this equation: DSO – Credit period = days early or late, and use a 365-day year when calculating the DSO. A positive answer indicates late payments, while a negative answer indicates early payments.
- a. 6.20
  - b. 6.53
  - c. 6.86
  - d. 7.20

ANS: B

Credit period	45
Sales	\$425,000
Sales/Day	\$1,164
Receivables	\$60,000
DSO	51.53
Credit period – DSO = Days early (+) or late (–)	6.53

PTS: 1                    DIF: MEDIUM            REF: 61

OBJ: (3.3) Days sales outstanding (DSO)

BLM: Analyze

49. Harper Corp.'s sales last year were \$395,000, and its year-end receivables were \$42,500. Harper sells on terms that call for customers to pay 30 days after the purchase, but many delay payment beyond Day 30. On average, how many days late do customers pay? Base your answer on this equation: DSO – Allowed credit period = Average days late, and use a 365-day year when calculating the DSO.
- a. 7.95
  - b. 8.37
  - c. 8.81
  - d. 9.27

ANS: D

Sales	\$395,000
Sales/Day	\$1,082
Receivables	\$42,500
DSO	39.27
Credit period	30
Credit period – DSO = Days late	9.27

PTS: 1                    DIF: MEDIUM            REF: 61

OBJ: (3.3) DSO: days of free credit

BLM: Analyze



50. Bonner Corp.'s sales last year were \$415,000, and its year-end total assets were \$355,000. The average firm in the industry has a total assets turnover ratio (TATO) of 2.4. Bonner's new CFO believes the firm has excess assets that can be sold so as to bring the TATO down to the industry average without affecting sales. By how much must the assets be reduced to bring the TATO to the industry average, holding sales constant?
- \$164,330
  - \$172,979
  - \$182,083
  - \$191,188

ANS: C

Sales	\$415,000
Total assets	\$355,000
Target TATO	2.40
Target assets = Sales/Target TATO	\$172,917
Asset reduction	\$182,083

PTS: 1                    DIF: MEDIUM      REF: 62

OBJ: (3.3) Total assets turnover ratio (TATO)

BLM: Analyze

51. A new firm is developing its business plan. It will require \$565,000 of assets, and it projects \$452,800 of sales and \$354,300 of operating costs for the first year. Management is quite sure of these numbers because of contracts with its customers and suppliers. It can borrow at a rate of 7.5%, but the bank requires it to have a TIE of at least 4.0, and if the TIE falls below this level the bank will call in the loan and the firm will go bankrupt. What is the maximum debt ratio the firm can use? (Hint: Find the maximum dollars of interest, then the debt that produces that interest, and then the related debt ratio.)
- 49.82%
  - 52.45%
  - 55.21%
  - 58.11%

ANS: D

Assets	\$565,000
Sales	\$452,800
Operating costs	<u>354,300</u>
Operating income (EBIT)	\$ 98,500
TIE	4.00
Maximum interest expense = EBIT/TIE	\$24,625
Interest rate	7.50%
Max. debt = Max interest/Interest rate	\$328,333
Maximum debt ratio = Debt/Assets	58.11%

PTS: 1                    DIF: MEDIUM      REF: 63–65

OBJ: (3.4) Max debt ratio consistent with given TIE ratio

BLM: Analyze

52. Ziebart Corp.'s EBITDA last year was \$390,000 (= EBIT + depreciation + amortization), its interest charges were \$9,500, it had to repay \$26,000 of long-term debt, and it had to make a payment of \$17,400 under a long-term lease. The firm had no amortization charges. What was the EBITDA coverage ratio?
- 7.32
  - 7.70
  - 8.09
  - 8.49

ANS: B

EBITDA	\$390,000
Interest charges	\$9,500
Repayment of principal	\$26,000
Lease payments	\$17,400
Total financial charges	\$52,900
Funds avail for fin charges (EBITDA + Lease pmts)	\$407,400
EBITDA coverage	7.70

PTS: 1                    DIF: MEDIUM      REF: 64                    OBJ: (3.4) EBITDA coverage  
 BLM: Analyze

53. LeCompte Corp. has \$312,900 of assets, and it uses only common equity capital (zero debt). Its sales for the last year were \$620,000, and its net income after taxes was \$24,655. Stockholders recently voted in a new management team that has promised to lower costs and get the return on equity up to 15%. What profit margin would LeCompte need in order to achieve the 15% ROE, holding everything else constant?
- 7.57%
  - 7.95%
  - 8.35%
  - 8.76%

ANS: A

Total assets = equity	\$312,900
Sales	\$620,000
Net income	\$24,655
Target ROE	15.00%
Net income req'd to achieve target ROE	\$46,935
Profit margin needed to achieve target ROE	7.57%

PTS: 1                    DIF: MEDIUM      REF: 66–67                    OBJ: (3.5) Profit margin and ROE  
 BLM: Analyze

54. Last year Urbana Corp. had \$197,500 of assets, \$307,500 of sales, \$19,575 of net income, and a debt-to-total-assets ratio of 37.5%. The new CFO believes a new computer program will enable it to reduce costs and thus raise net income to \$33,000. Assets, sales, and the debt ratio would not be affected. By how much would the cost reduction improve the ROE?
- 9.32%
  - 9.82%
  - 10.33%
  - 10.88%

ANS: D

Assets	\$197,500
Debt ratio	37.5%
Debt	\$74,063
Equity	\$123,438
Sales	\$307,500
Old net income	\$19,575
New net income	\$33,000
New ROE	26.734%
Old ROE	15.858%
Increase in ROE	10.88%

PTS: 1                    DIF: MEDIUM      REF: 67

OBJ: (3.5) Effect of reducing costs on the ROE

BLM: Analyze

55. Stewart Inc.'s latest EPS was \$3.50, its book value per share was \$22.75, it had 215,000 shares outstanding, and its debt ratio was 46%. How much debt was outstanding?
- \$3,572,356
  - \$3,760,375
  - \$3,958,289
  - \$4,166,620

ANS: D

EPS	\$3.50
BVPS	\$22.75
Shares outstanding	215,000
Debt ratio	46.0%
Total equity	\$4,891,250
Total assets	\$9,057,870
Total debt	\$4,166,620

PTS: 1 DIF: MEDIUM REF: 68–70

OBJ: (3.6) EPS, book value, and debt ratio

BLM: Analyze

56. Last year Vaughn Corp. had sales of \$315,000 and a net income of \$17,832, and its year-end assets were \$210,000. The firm's total-debt-to-total-assets ratio was 42.5%. Based on the Du Pont equation, what was Vaughn's ROE?
- 14.77%
  - 15.51%
  - 16.28%
  - 17.10%

ANS: A

Sales	\$315,000
Assets	\$210,000
Net income	\$17,832
Debt ratio	42.5%
Debt	\$89,250
Equity	\$120,750
Profit margin	5.66%
TATO	1.50
Equity multiplier	1.74
ROE	14.77%

PTS: 1 DIF: MEDIUM REF: 73–74

OBJ: (3.8) Du Pont equation: basic calculation

BLM: Analyze

57. Last year Central Chemicals had sales of \$205,000, assets of \$127,500, a profit margin of 5.3%, and an equity multiplier of 1.2. The CFO believes that the company could reduce its assets by \$21,000 without affecting either sales or costs. Had it reduced its assets in this amount, and had the debt ratio, sales, and costs remained constant, by how much would the ROE have changed?
- 1.81%
  - 2.02%
  - 2.22%
  - 2.44%

ANS: B

Old

New

Sales	\$205,000	\$205,000
Original assets	\$127,500	
Reduction in assets		<u>\$ 21,000</u>
New assets		\$106,500
TATO	1.61	1.92
Profit margin	5.30%	5.30%
Equity multiplier	1.20	1.20
ROE	10.23%	12.24%
Change in ROE		2.02%

PTS: 1            DIF: MEDIUM    REF: 73–74  
 OBJ: (3.8) Du Pont equation: effect of reducing assets on ROE  
 BLM: Analyze

58. Last year Mason Inc. had a total assets turnover of 1.33 and an equity multiplier of 1.75. Its sales were \$195,000 and its net income was \$10,549. The CFO believes that the company could have operated more efficiently, lowered its costs, and increased its net income by \$5,250 without changing its sales, assets, or capital structure. Had it cut costs and increased its net income in this amount, by how much would the ROE have changed?
- 5.66%
  - 5.95%
  - 6.27%
  - 6.58%

ANS: C

	<u>Old</u>	<u>New</u>
Sales	\$195,000	\$195,000
Original net income	\$ 10,549	\$ 10,549
Increase in net income	<u>\$0</u>	<u>\$ 5,250</u>
New net income	\$ 10,549	\$ 15,799
Profit margin	5.41%	8.10%
TATO	1.33	1.33
Equity multiplier	1.75	1.75
ROE	12.59%	18.86%
Change in ROE		6.27%

PTS: 1            DIF: MEDIUM    REF: 73–74  
 OBJ: (3.8) Du Pont equation: effect of reducing costs on ROE    BLM: Analyze

59. Last year Rosenberg Corp. had \$195,000 of assets, \$18,775 of net income, and a debt-to-total-assets ratio of 32%. Now suppose the new CFO convinces the president to increase the debt ratio to 48%. Sales and total assets will not be affected, but interest expenses would increase. However, the CFO believes that better cost controls would be sufficient to offset the higher interest expense and thus keep net income unchanged. By how much would the change in the capital structure improve the ROE?
- 4.36%
  - 4.57%
  - 4.80%
  - 5.04%

ANS: A

Assets	\$195,000
Old debt ratio	32%
Old debt	\$62,400
Old equity	\$132,600

New debt ratio	48%
New debt	\$93,600
New Equity	\$101,400
Net income	\$18,775
New ROE	18.52%
Old ROE	14.16%
Increase in ROE	4.36%

PTS: 1                    DIF: MEDIUM      REF: 73–74

OBJ: (3.8) Du Pont equation: changing the debt ratio

BLM: Analyze

60. Last year Altman Corp. had \$205,000 of assets, \$303,500 of sales, \$18,250 of net income, and a debt-to-total-assets ratio of 41%. The new CFO believes the firm has excessive fixed assets and inventory that could be sold, enabling it to reduce its total assets to \$152,500. Sales, costs, and net income would not be affected, and the firm would maintain the 41% debt ratio. By how much would the reduction in assets improve the ROE?
- 4.69%
  - 4.93%
  - 5.19%
  - 5.45%

ANS: C

	<u>Old</u>	<u>New</u>
Assets	\$205,000	\$152,500
Sales	\$303,500	\$303,500
Net income	\$18,250	\$18,250
Debt ratio	41.00%	41.00%
Debt	\$84,050	\$62,525
Equity	\$120,950	\$89,975
ROE	15.089%	20.283%
Increase in ROE		5.19%

PTS: 1                    DIF: MEDIUM      REF: 60 | 62 | 67

OBJ: (Comp: 3.3–3.5) Asset reduction: turnover and ROE

BLM: Analyze

61. Muscarella Inc. has the following balance sheet and income statement data:

Cash	\$ 14,000	Accounts payable	\$ 42,000
Receivables	70,000	Other current liabilities	<u>28,000</u>
Inventories	<u>210,000</u>	Total CL	\$ 70,000
Total CA	\$294,000	Long-term debt	70,000
Net fixed assets	<u>126,000</u>	Common equity	<u>280,000</u>
Total assets	<u>\$420,000</u>	Total liab. and equity	<u>\$420,000</u>
Sales	\$280,000		
Net income	\$ 21,000		

The new CFO thinks that inventories are excessive and could be lowered sufficiently to cause the current ratio to equal the industry average, 2.70, without affecting either sales or net income. Assuming that inventories are sold off and not replaced to get the current ratio to the target level, and that the funds generated are used to buy back common stock at book value, by how much would the ROE change?

- 4.28%
- 4.50%

- c. 4.73%
- d. 4.96%

ANS: B

Sales	\$280,000
Net income	\$21,000
Actual current ratio	4.20
Target current ratio	2.70

ORIGINAL BALANCE SHEET

Cash	\$14,000	Accounts payable	\$42,000
Receivables	\$70,000	Other current liabilities	\$28,000
Inventories	\$210,000	Long-term debt	\$70,000
Net fixed assets	<u>\$126,000</u>	Common equity	<u>\$280,000</u>
Total assets	<u>\$420,000</u>	Total liab. and equity	<u>\$420,000</u>

NI/Equity = ROE:	7.50%	
Inv. at target CR	\$105,000	
Reduction in inv & equity	\$105,000	= inventories and common equity decrease by this amount
New common equity	\$175,000	
New ROE	12.00%	
Δ ROE	4.50%	

PTS: 1                      DIF: HARD                      REF: 61

OBJ: (3.3) DSO and its effect on net income

BLM: Analyze

62. Last year Swensen Corp. had sales of \$303,225, operating costs of \$267,500, and year-end assets of \$195,000. The debt-to-total-assets ratio was 27%, the interest rate on the debt was 8.2%, and the firm's tax rate was 37%. The new CFO wants to see how the ROE would have been affected if the firm had used a 45% debt ratio. Assume that sales and total assets would not be affected, and that the interest rate and tax rate would both remain constant. By how much would the ROE change in response to the change in the capital structure?
- a. 2.08%
  - b. 2.32%
  - c. 2.57%
  - d. 2.86%

ANS: D

	<u>Old</u>	<u>New</u>
Interest rate	8.2%	8.2%
Tax rate	37%	37%
Assets	\$195,000	\$195,000
Debt ratio	27%	45%
Debt	\$52,650	\$87,750
Equity	\$142,350	\$107,250
Sales	\$303,225	\$303,225
Operating costs	<u>\$267,500</u>	<u>\$267,500</u>
EBIT	\$35,725	\$35,725
Interest paid	<u>\$4,317</u>	<u>\$7,196</u>
Taxable income	\$31,408	\$28,530
Taxes	<u>\$11,621</u>	<u>\$10,556</u>
Net income	<u>\$19,787</u>	<u>\$17,974</u>

ROE	13.90%	16.76%
Change in ROE		2.86%

PTS: 1                    DIF: HARD                    REF: 63–65 | 67  
 OBJ: (Comp: 3.4, 3.5) ROE changing with debt ratio                    BLM: Analyze

63. Quigley Inc. is considering two financial plans for the coming year. Management expects sales to be \$301,770, operating costs to be \$266,545, assets to be \$200,000, and its tax rate to be 35%. Under Plan A it would use 25% debt and 75% common equity. The interest rate on the debt would be 8.8%, but the TIE ratio would have to be kept at 4.00 or more. Under Plan B the maximum debt that met the TIE constraint would be employed. Assuming that sales, operating costs, assets, the interest rate, and the tax rate would all remain constant, by how much would the ROE change in response to the change in the capital structure?
- 3.83%
  - 4.02%
  - 4.22%
  - 4.43%

ANS: A

Answer: Work down the Plan A column, find the Max Debt, then use it to complete Plan B and the ROEs.

	<u>Plan A</u>	<u>Plan B</u>	
Interest rate	8.80%	8.80%	
Tax rate	35%	35%	
Assets	\$200,000	\$200,000	
Debt ratio	25%		
Debt	\$50,000	\$100,071	
Equity	\$150,000	\$99,929	
Sales	\$301,770	\$301,770	Constant
Operating costs	\$266,545	\$266,545	Constant
EBIT	\$35,225	\$35,225	Constant
Interest	<u>\$4,400</u>	<u>\$8,806</u>	
Taxable income	\$30,825	\$26,419	
Taxes	<u>\$10,789</u>	<u>\$9,247</u>	
Net income	<u>\$20,036</u>	<u>\$17,172</u>	
ROE	13.36%	17.18%	
TIE	8.01		
Minimum TIE	4.00		
Interest consistent with minimum TIE = EBIT/Min TIE	\$8,806		
Max debt = Interest/interest rate	\$100,071		
Change in ROE	3.83%		

PTS: 1                    DIF: HARD                    REF: 64 | 66–67  
 OBJ: (Comp: 3.4, 3.5) Maximum debt constrained by TIE                    BLM: Analyze

**Scenario: Pettijohn Inc.**

The balance sheet and income statement shown below are for Pettijohn Inc. Note that the firm has no amortization charges, it does not lease any assets, none of its debt must be retired during the next 5 years, and the notes payable will be rolled over.

Balance Sheet (Millions of \$)

Assets	2007
Cash and securities	\$1,554.0
Accounts receivable	9,660.0
Inventories	13,440.0
Total current assets	\$24,654.0
Net plant and equipment	17,346.0
Total assets	\$42,000.0
Liabilities and Equity	
Accounts payable	\$7,980.0
Notes payable	5,880.0
Accruals	4,620.0
Total current liabilities	\$18,480.0
Long-term bonds	10,920.0
Total debt	\$29,400.0
Common stock	3,360.0
Retained earnings	9,240.0
Total common equity	\$12,600.0
Total liabilities and equity	\$42,000.0

<u>Income Statement (Millions of \$)</u>	<u>2007</u>
Net sales	\$58,800.00
Operating costs except depr'n	\$54,978.0
Depreciation	\$1,029.0
Earnings before interest and taxes (EBIT)	\$2,793.0
Less interest	1,050.0
Earnings before taxes (EBT)	\$1,743.0
Taxes	\$610.1
Net income	\$1,133.0
<u>Other data:</u>	
Shares outstanding (millions)	175.00
Common dividends	\$509.83
Interest rate on notes payable & L-T bonds	6.25%
Federal plus state income tax rate	35%
Year-end stock price	\$77.69

64. Refer to Scenario: Pettijohn Inc. What is the firm's current ratio?
- 0.97
  - 1.08
  - 1.20
  - 1.33

ANS: D

Current ratio = Current assets/Current liabilities = 1.33

PTS: 1 DIF: MEDIUM REF: 59

OBJ: (3.2) Calculating ratios given financial statements

BLM: Understand

65. Refer to Scenario: Pettijohn Inc. What is the firm's quick ratio?
- 0.49
  - 0.61
  - 0.73
  - 0.87

ANS: B



$$\text{Quick ratio} = (\text{CA} - \text{Inventory})/\text{CL} = 0.61$$

PTS: 1                    DIF: MEDIUM    REF: 59

OBJ: (3.2) Calculating ratios given financial statements                    BLM: Understand

66. Refer to Scenario: Pettijohn Inc. What is the firm's days sales outstanding? Assume a 360-day year for this calculation.
- 50.71
  - 53.38
  - 56.19
  - 59.14

ANS: D

$$\text{DSO} = \text{Accounts receivable}/(\text{Sales}/360) = 59.14$$

PTS: 1                    DIF: MEDIUM    REF: 61

OBJ: (3.3) Calculating ratios given financial statements                    BLM: Understand

67. Refer to Scenario: Pettijohn Inc. What is the firm's total assets turnover?
- 0.90
  - 1.12
  - 1.40
  - 1.68

ANS: C

$$\text{Total assets turnover ratio} = \text{Sales}/\text{Total assets} = 1.40$$

PTS: 1                    DIF: MEDIUM    REF: 62

OBJ: (3.3) Calculating ratios given financial statements                    BLM: Understand

68. Refer to Scenario: Pettijohn Inc. What is the firm's inventory turnover ratio?
- 4.38
  - 4.59
  - 4.82
  - 5.06

ANS: A

$$\text{Inventory turnover ratio} = \text{Sales}/\text{Inventory} = 4.38$$

PTS: 1                    DIF: MEDIUM    REF: 60

OBJ: (3.3) Calculating ratios given financial statements                    BLM: Understand

69. Refer to Scenario: Pettijohn Inc. What is the firm's TIE?
- 1.94
  - 2.15
  - 2.39
  - 2.66

ANS: D

$$\text{TIE} = \text{EBIT}/\text{Interest charges} = 2.66$$

PTS: 1                    DIF: MEDIUM    REF: 64

OBJ: (3.4) Calculating ratios given financial statements                    BLM: Understand

70. Refer to Scenario: Pettijohn Inc. What is the firm's EBITDA coverage?
- a. 3.29
  - b. 3.46
  - c. 3.64
  - d. 3.82

ANS: C

EBITDA coverage =  $(\text{EBITDA} + \text{lease}) / (\text{Interest} + \text{principal} + \text{lease}) = 3.64$

PTS: 1                    DIF: MEDIUM      REF: 64

OBJ: (3.4) Calculating ratios given financial statements                    BLM: Understand

71. Refer to Scenario: Pettijohn Inc. What is the firm's debt ratio?
- a. 51.03%
  - b. 56.70%
  - c. 63.00%
  - d. 70.00%

ANS: D

Debt ratio =  $\text{Total debt} / \text{Total assets} = 70.0\%$

PTS: 1                    DIF: MEDIUM      REF: 63

OBJ: (3.4) Calculating ratios given financial statements                    BLM: Understand

72. Refer to Scenario: Pettijohn Inc. What is the firm's ROA?
- a. 2.70%
  - b. 2.97%
  - c. 3.26%
  - d. 3.59%

ANS: A

ROA =  $\text{Net income} / \text{Total assets} = 2.70\%$

PTS: 1                    DIF: MEDIUM      REF: 67

OBJ: (3.5) Calculating ratios given financial statements                    BLM: Understand

73. Refer to Scenario: Pettijohn Inc. What is the firm's ROE?
- a. 8.54%
  - b. 8.99%
  - c. 9.44%
  - d. 9.91%

ANS: B

ROE =  $\text{Net income} / \text{Common equity} = 8.99\%$

PTS: 1                    DIF: MEDIUM      REF: 67

OBJ: (3.5) Calculating ratios given financial statements                    BLM: Understand

74. Refer to Scenario: Pettijohn Inc. What is the firm's BEP?
- a. 6.00%
  - b. 6.32%
  - c. 6.65%
  - d. 6.98%

ANS: C

$$\text{BEP} = \text{EBIT}/\text{Total assets} = 6.65\%$$

PTS: 1                    DIF: MEDIUM      REF: 66

OBJ: (3.5) Calculating ratios given financial statements                    BLM: Understand

75. Refer to Scenario: Pettijohn Inc. What is the firm's profit margin?

- a. 1.40%
- b. 1.56%
- c. 1.73%
- d. 1.93%

ANS: D

$$\text{Profit margin} = \text{Net income}/\text{Sales} = 1.93\%$$

PTS: 1                    DIF: MEDIUM      REF: 66

OBJ: (3.5) Calculating ratios given financial statements                    BLM: Understand

76. Refer to Scenario: Pettijohn Inc. What is the firm's dividends per share?

- a. \$2.62
- b. \$2.91
- c. \$3.20
- d. \$3.53

ANS: B

$$\text{DPS} = \text{Common dividends paid}/\text{Shares outstanding} = \$2.91$$

PTS: 1                    DIF: MEDIUM      REF: 70

OBJ: (3.5) Calculating ratios given financial statements                    BLM: Understand

77. Refer to Scenario: Pettijohn Inc. What is the firm's cash flow per share?

- a. \$10.59
- b. \$11.15
- c. \$11.74
- d. \$12.35

ANS: D

$$\text{CFPS} = (\text{Net income} + \text{Depreciation})/\text{Shares outstanding} = \$12.35$$

PTS: 1                    DIF: MEDIUM      REF: 66

OBJ: (3.5) Calculating ratios given financial statements                    BLM: Understand

78. Refer to Scenario: Pettijohn Inc. What is the firm's EPS?

- a. \$5.84
- b. \$6.15
- c. \$6.47
- d. \$6.80

ANS: C

$$\text{EPS} = \text{Net income}/\text{common shares outstanding} = \$6.47$$

PTS: 1                    DIF: MEDIUM      REF: 68–70

OBJ: (3.6) Calculating ratios given financial statements                    BLM: Understand

79. Refer to Scenario: Pettijohn Inc. What is the firm's P/E ratio?

- a. 12.0

- b. 12.6
- c. 13.2
- d. 13.9

ANS: A

$P/E \text{ ratio} = \text{Price per share} / \text{Earnings per share} = 12.0$

PTS: 1                    DIF: MEDIUM      REF: 68

OBJ: (3.6) Calculating ratios given financial statements                    BLM: Understand

80. Refer to Scenario: Pettijohn Inc. What is the firm's book value per share?
- a. \$61.73
  - b. \$64.98
  - c. \$68.40
  - d. \$72.00

ANS: D

$BVPS = \text{Common equity} / \text{Shares outstanding} = \$72.00$

PTS: 1                    DIF: MEDIUM      REF: 68–69

OBJ: (3.6) Calculating ratios given financial statements                    BLM: Understand

81. Refer to Scenario: Pettijohn Inc. What is the firm's market-to-book ratio?
- a. 0.66
  - b. 0.78
  - c. 0.92
  - d. 1.08

ANS: D

$\text{Market/book ratio (M/B)} = \text{Price per share} / BVPS = 1.08$

PTS: 1                    DIF: MEDIUM      REF: 69

OBJ: (3.6) Calculating ratios given financial statements                    BLM: Understand

82. Refer to Scenario: Pettijohn Inc. What is the firm's equity multiplier?
- a. 3.33
  - b. 3.50
  - c. 3.68
  - d. 3.86

ANS: A

$\text{Equity multiplier} = \text{Total assets} / \text{Common equity} = 3.33$

PTS: 1                    DIF: MEDIUM      REF: 73

OBJ: (3.8) Calculating ratios given financial statements                    BLM: Understand

## CHAPTER 4—TIME VALUE OF MONEY

### TRUE/FALSE

1. One potential benefit from starting to invest early for retirement is that the investor can expect greater benefits from the compounding of interest.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 91  
OBJ: (4.2) Compounding

2. If the discount (or interest) rate is positive, the present value of an expected series of payments will always exceed the future value of the same series.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 93  
OBJ: (4.3) PV versus FV

3. Disregarding risk, if money has time value, it is impossible for the present value of a given sum to exceed its future value.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 93  
OBJ: (4.3) PV versus FV

4. If a bank compounds savings accounts quarterly, the nominal rate will exceed the effective annual rate.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 110  
OBJ: (4.15) Effective annual rate

5. The payment made each period on an amortized loan is constant, and it consists of some interest and some principal. The closer we are to the end of the loan's life, the greater the percentage of the payment that will be a repayment of principal.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 113–114  
OBJ: (4.17) Amortization

6. The greater the number of compounding periods within a year, then (1) the greater the future value of a lump sum investment at Time 0 and (2) the greater the present value of a given lump sum to be received at some future date.

ANS: F                    PTS: 1                    DIF: MEDIUM                    REF: 92  
OBJ: (4.2) Compounding

7. Suppose an investor plans to invest a given sum of money. She can earn an effective annual rate of 5% on Security A, while Security B will provide an effective annual rate of 12%. Within 11 years' time, the compounded value of Security B will be more than twice the compounded value of Security A. (Ignore risk, and assume that compounding occurs annually.)

ANS: T

Work out the numbers with a calculator:

PV	1,000	$FV_A =$	\$1,710.34
Rate on A	5%	$2 \times FV_A =$	\$3,420.68
Rate on B	12%	$FV_B =$	\$3,478.55
Years	11	$FV_B > 2 * FV_A,$	so TRUE

PTS: 1                    DIF: MEDIUM      REF: 91  
OBJ: (4.2) Comparative compounding

8. The present value of a future sum decreases as either the discount rate or the number of periods per year increases.

ANS: T                    PTS: 1                    DIF: MEDIUM      REF: 93  
OBJ: (4.3) PV of a sum

9. All other factors held constant, the present value of a given annual annuity decreases as the number of discounting periods per year increases.

ANS: T  
One could make up an example and see that the statement is true. Alternatively, one could simply recognize that the PV of an annuity declines as the discount rate increases and recognize that more frequent compounding increases the effective rate.

PTS: 1                    DIF: MEDIUM      REF: 100–101      OBJ: (4.9) PV of an annuity

10. As a result of compounding, the effective annual rate on a bank deposit (or a loan) is always equal to or greater than the nominal rate on the deposit (or loan).

ANS: T                    PTS: 1                    DIF: MEDIUM      REF: 109–111  
OBJ: (4.15) Effective and nominal rates

11. If we are given a periodic interest rate, say a monthly rate, we can find the nominal annual rate by multiplying the periodic rate by the number of periods per year.

ANS: T                    PTS: 1                    DIF: MEDIUM      REF: 109  
OBJ: (4.15) Periodic and nominal rates

12. When a loan is amortized, a relatively high percentage of the payment goes to reduce the outstanding principal in the early years, and the principal repayment's percentage declines in the loan's later years.

ANS: F                    PTS: 1                    DIF: MEDIUM      REF: 113–114  
OBJ: (4.17) Amortization

13. Midway through the life of an amortized loan, the percentage of the payment that represents interest is equal to the percentage that represents principal repayment. This is true regardless of the original life of the loan.

ANS: F  
There is no reason to think that this statement would be true. Each portion of the payment representing interest declines, while each portion representing principal repayment increases. Therefore, the statement is clearly false. We could also work out some numbers to prove this point. Here's an example for a 3-year loan at a 10% annual interest rate. The interest component is never equal to the principal repayment component.

Original loan	1,000
Rate	10%
Life	3
Payment	\$402.11

	Beg. Balance	Interest	Principal	Ending Bal.
1	\$1,000.00	\$100.00	\$302.11	\$697.89
2	\$697.89	\$69.79	\$332.33	\$365.56
3	\$365.56	\$36.56	\$365.56	\$0.00

PTS: 1                    DIF: MEDIUM      REF: 113–114      OBJ: (4.17) Amortization

14. When inputting information into a financial calculator, one of the cash flow components must be negative since the calculator is set up to solve an equation equal to zero.

ANS: T

For example, in a question seeking future value—given the present value, period, and interest rate—the equation is:

$$FV_n = PV(1+i)^n$$

However, the calculator is set to solve the following rearranged equation:

$$0 = PV(1+i)^n - FV_n$$

PTS: 1                    DIF: EASY            REF: 89                    OBJ: (4.2) Financial Calculators

15. Calculating present value and future value using simple interest will result in a smaller PV and FV than the same calculation using compound interest.

ANS: F

Using simple interest rates, the present value will be larger, and the future value will be smaller.

PTS: 1                    DIF: MEDIUM      REF: 92  
OBJ: (4.2) Simple Interest versus Compound Interest

## MULTIPLE CHOICE

1. Which of the following statements is NOT correct?
- A time line is meaningful only if all cash flows occur annually.
  - Time lines can be constructed even in situations where some of the cash flows occur annually but others occur quarterly.
  - Time lines can be constructed for annuities where the payments occur at either the beginning or the end of periods.
  - The cash flows shown on a time line can be in the form of annuity payments, but they can also be uneven amounts.

ANS: A                    PTS: 1                    DIF: EASY            REF: 86  
OBJ: (4.1) Time lines                    BLM: Remember

2. Which statement best describes time lines?
- A time line is not meaningful unless all cash flows occur annually.
  - Time lines are useful for visualizing complex problems prior to doing actual calculations.
  - Time lines cannot be constructed to deal with situations where some of the cash flows occur annually but others occur quarterly.
  - Time lines can be constructed only for annuities where the payments occur at the ends of the periods, i.e., for ordinary annuities.

ANS: B                    PTS: 1                    DIF: EASY            REF: 86

OBJ: (4.1) Time lines

BLM: Remember

3. You are analyzing the value of a potential investment by calculating the sum of the present values of its expected cash flows. Which circumstance would lower the calculated value of the investment?
- The discount rate increases.
  - The riskiness of the investment's cash flows decreases.
  - The total amount of cash flows remains the same, but more of the cash flows are received in the earlier years and less are received in the later years.
  - The discount rate decreases.

ANS: A

PTS: 1

DIF: EASY

REF: 93–94

OBJ: (4.3) Effects of factors on PVs

BLM: Understand

4. Which statement best describes annuities?
- The cash flows for an ordinary (or deferred) annuity all occur at the beginning of the periods.
  - If a series of unequal cash flows occurs at regular intervals, such as once a year, then the series is by definition an annuity.
  - The cash flows for an annuity due must all occur at the ends of the periods.
  - The cash flows for an annuity must all be equal, and they must occur at regular intervals, such as once a year or once a month.

ANS: D

PTS: 1

DIF: EASY

REF: 97

OBJ: (4.6) Annuities

BLM: Remember

5. Which of the following statements is correct?
- If you have a series of cash flows, all of which are positive, you can solve for I, where the solution value of I causes the PV of the cash flows to equal the cash flow at Time 0.
  - To solve for I, one must identify the value of I that causes the PV of the positive CFs to equal the absolute value of the PV of the negative CFs. This is, essentially, a trial-and-error procedure that is easy with a computer or financial calculator but quite difficult otherwise.
  - If you solve for I and get a negative number, then you must have made a mistake.
  - If  $CF_0$  is positive and all the other CFs are negative, then you cannot solve for I.

ANS: B

PTS: 1

DIF: MEDIUM

REF: 108

OBJ: (4.14) Solving for I with uneven cash flows

BLM: Understand

6. Which of the following bank accounts has the highest effective annual return?
- an account that pays 8% nominal interest with monthly compounding
  - an account that pays 7% nominal interest with daily (365-day) compounding
  - an account that pays 7% nominal interest with monthly compounding
  - an account that pays 8% nominal interest with daily (365-day) compounding

ANS: D

By inspection, we can see that (d) dominates (a), and that (b) dominates (c) because, with the same interest rate, the account with the most frequent compounding has the highest EFF percentage. Thus, the correct statement must be either (d) or (b). Moreover, we can see by inspection that since (b) and (d) have the same compounding frequency yet (d) has the higher nominal rate, (d) must have the higher EFF percentage. You could also prove that (d) is the correct choice by calculating the EFF percentages:

- $8.300\% = (1+0.08/12)^{12} - 1$
- $7.250\% = (1+0.07/365)^{365} - 1$
- $7.229\% = (1+0.07/12)^{12} - 1$



d.  $8.328\% = (1+0.08/365)^{365} - 1$

PTS: 1                    DIF: MEDIUM      REF: 110                    OBJ: (4.15) Effective annual rate  
BLM: Understand

7. Your bank account pays a 6% nominal rate of interest. The interest is compounded quarterly. Which of the following statements is correct?
- The periodic rate of interest is 1.5% and the effective rate of interest is 3%.
  - The periodic rate of interest is 6% and the effective rate of interest is greater than 6%.
  - The periodic rate of interest is 1.5% and the effective rate of interest is greater than 6%.
  - The periodic rate of interest is 3% and the effective rate of interest is 6%.

ANS: C                    PTS: 1                    DIF: MEDIUM      REF: 111  
OBJ: (4.15) Quarterly compounding      BLM: Understand

8. A \$50,000 loan is to be amortized over 7 years, with annual end-of-year payments. Which of these statements is correct?
- The annual payments would be larger if the interest rate were lower.
  - If the loan were amortized over 10 years rather than 7 years, and if the interest rate were the same in either case, the first payment would include more dollars of interest under the 7-year amortization plan.
  - The proportion of each payment that represents interest as opposed to repayment of principal would be lower if the interest rate were lower.
  - The last payment would have a higher proportion of interest than the first payment.

ANS: C  
(a) and (d) can be ruled out as incorrect by simple reasoning. (b) is incorrect because interest in the first year would be Loan amount  $\times$  interest rate regardless of the life of the loan. That makes (c) the “logical guess.” It is also logical that the percentage of interest in each payment would be higher if the interest rate were higher. Think about the situation where  $r = 0\%$ , so interest would be zero. One could also set up an amortization schedule and change the numbers to confirm that only (c) is correct.

PTS: 1                    DIF: MEDIUM      REF: 113–114                    OBJ: (4.17) Amortization  
BLM: Understand

9. Which of the following statements regarding a 15-year (180-month) \$125,000 fixed-rate mortgage is NOT correct? (Ignore all taxes and transactions costs.)
- The remaining balance after 3 years will be \$125,000 less the total amount of interest paid during the first 36 months.
  - Because it is a fixed-rate mortgage, the monthly loan payments (which include both interest and principal payments) are constant.
  - The proportion of the monthly payment that goes toward repayment of principal will be higher 10 years from now than it will be the first year.
  - The outstanding balance gets paid off at a faster rate in the later years of a loan’s life.

ANS: A  
(a) is incorrect because we would subtract principal repaid, not interest paid. Thus (a) is the correct answer to this question. (b) is correct by definition. (c) is clearly correct, as is (d). One could also set up an amortization schedule to prove that the above statements are correct.

PTS: 1                    DIF: MEDIUM      REF: 113–114                    OBJ: (4.17) Amortization  
BLM: Understand

10. Which of the following statements regarding a 30-year monthly payment amortized mortgage with a nominal interest rate of 10% is correct?

- a. The monthly payments will decline over time.
- b. A smaller proportion of the last monthly payment will be interest, and a larger proportion will be principal, than for the first monthly payment.
- c. The amount representing interest in the first payment would be higher if the nominal interest rate were 7% rather than 10%.
- d. Exactly 10% of the first monthly payment represents interest.

ANS: B

(b) is correct. (a) is clearly wrong, as is (c). It is not obvious whether (d) is correct or not, but we could set up an example to see:

Loan	100,000	Term	30
Rate	10%	Periods/Year	12
Periodic rate	0.0083333	Total periods	360
Payment	-\$877.57	Interest month 1	\$833.33
Interest as % of total payment: 95%, which is much larger than 10%.			

PTS: 1                    DIF: MEDIUM      REF: 113–114      OBJ: (4.17) Amortization  
BLM: Analyze

11. Which investment will have the *highest future value* at the end of 10 years? Assume that the effective annual rate for all investments is the same.
  - a. Investment A pays \$250 at the beginning of every year for the next 10 years (a total of 10 payments).
  - b. Investment B pays \$125 at the end of every 6-month period for the next 10 years (a total of 20 payments).
  - c. Investment C pays \$125 at the beginning of every 6-month period for the next 10 years (a total of 20 payments).
  - d. Investment D pays \$2,500 at the end of 10 years (a total of one payment).

ANS: A

You could just reason this out, or you could do calculations to manually see which one is largest, as we show below:

A dominates B because it receives the same total amount, but gets it faster; hence, it can earn more interest over the 10 years. A also dominates C for the same reason, and it dominates D because with D no interest whatsoever is earned. We could also do these calculations to answer the question:

A	\$4,382.79	Largest	EFF%	10.00%	10	250
B	\$4,081.59		NOM%	9.76%		125
C	\$4,280.81					125
D	\$2,500.00					2,500

PTS: 1                    DIF: MEDIUM      REF: 88 | 97–100  
OBJ: (Comp: 4.2, 4.7, 4.8) Time value concepts                    BLM: Analyze

12. A Canada government bond promises to pay a lump sum of \$1,000 exactly 3 years from today. The nominal interest rate is 6%, semiannual compounding. Which of the following statements is correct?
  - a. The periodic interest rate is greater than 3%.
  - b. The periodic rate is less than 3%.
  - c. The present value would be greater if the lump sum were discounted back for more periods.
  - d. The present value of the \$1,000 would be smaller if interest were compounded monthly rather than semiannually.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 93–94 | 100–101 | 109–111  
OBJ: (Comp: 4.3, 4.9, 4.15) Various concepts                      BLM: Understand

13. Which of the following statements is correct, assuming positive interest rates and other things held constant?
- A 5-year, \$250 annuity due will have a lower present value than a similar ordinary annuity.
  - A 30-year, \$150,000 amortized mortgage will have larger monthly payments than an otherwise similar 20-year mortgage.
  - A typical investment's nominal interest rate will always be equal to or less than its effective annual rate.
  - If an investment pays 10% interest, compounded annually, its effective annual rate will be less than 10%.

ANS: C                      PTS: 1                      DIF: MEDIUM  
REF: 88 | 100–101 | 109–111 | 113–114                      OBJ: (Comp: 4.2, 4.9, 4.15, 4.17) Various concepts  
BLM: Understand

14. Which of the following statements is NOT correct?
- The present value of a 3-year, \$150 annuity due will exceed the present value of a 3-year, \$150 ordinary annuity.
  - If a loan has a nominal annual rate of 8%, then the effective rate can never be less than 8%.
  - If a loan or investment has annual payments, then the effective, periodic, and nominal rates of interest will all be the same.
  - An investment that has a nominal rate of 6% with semiannual payments will have an effective rate that is less than 6%.

ANS: D                      PTS: 1                      DIF: MEDIUM  
REF: 100–101 | 109–111 | 113–114                      OBJ: (Comp: 4.9, 4.15, 4.17) Various concepts  
BLM: Understand

15. You are considering two equally risky annuities, each of which pays \$5,000 per year for 10 years. Investment ORD is an ordinary (or deferred) annuity, while Investment DUE is an annuity due. Which of the following statements is correct?
- The present value of ORD must exceed the present value of DUE, but the future value of ORD may be less than the future value of DUE.
  - The present value of DUE exceeds the present value of ORD, while the future value of DUE is less than the future value of ORD.
  - The present value of ORD exceeds the present value of DUE, and the future value of ORD also exceeds the future value of DUE.
  - The present value of DUE exceeds the present value of ORD, and the future value of DUE also exceeds the future value of ORD.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 97–102  
OBJ: (Comp: 4.7, 4.8, 4.9) Annuities                      BLM: Understand

16. You plan to invest some money in a bank account. Which of the following banks provides you with the highest effective rate of interest?
- Bank 1; 6.0% with monthly compounding
  - Bank 2; 6.0% with annual compounding
  - Bank 3; 6.0% with quarterly compounding
  - Bank 4; 6.0% with daily (365-day) compounding

ANS: D

By inspection, we can see that (d) dominates (a), (b), and (c) because, with the same interest rate, the account with the most frequent compounding has the highest EFF percentage. Thus, the correct statement must be (d).

$$\text{EFF}\% = (1 + 0.06/365)^{365} - 1 = 6.183\%$$

PTS: 1                    DIF: HARD                    REF: 110                    OBJ: (4.15) Effective annual rates  
BLM: Understand

17. What would the future value of \$125 be after 8 years at 8.5% compound interest?
- \$205.83
  - \$216.67
  - \$228.07
  - \$240.08

ANS: D

N	8
I/YR	8.5%
PV	\$125
PMT	\$0
FV	\$240.08

PTS: 1                    DIF: EASY                    REF: 88                    OBJ: (4.2) FV of a lump sum  
BLM: Understand

18. Suppose you have \$1,500 and plan to purchase a 5-year certificate of deposit (CD) that pays 3.5% interest, compounded annually. How much will you have when the CD matures?
- \$1,781.53
  - \$1,870.61
  - \$1,964.14
  - \$2,062.34

ANS: A

N	5
I/YR	3.5%
PV	\$1,500
PMT	\$0
FV	\$1,781.53

PTS: 1                    DIF: EASY                    REF: 88                    OBJ: (4.2) FV of a lump sum  
BLM: Understand

19. Last year Toto Corporation's sales were \$225 million. If sales grow at 6% per year, how large (in millions) will they be 5 years later?
- \$271.74 million
  - \$286.05 million
  - \$301.10 million
  - \$316.16 million

ANS: C

N	5
I/YR	6.0%
PV	\$225.00
PMT	\$0.00
FV	\$301.10

PTS: 1                    DIF: EASY                    REF: 88                    OBJ: (4.2) FV of a lump sum  
BLM: Understand

20. How much would \$1, growing at 3.5% per year, be worth after 75 years?
- a. \$12.54
  - b. \$13.20
  - c. \$13.86
  - d. \$14.55

ANS: B

N	75
I/YR	3.5%
PV	\$1.00
PMT	\$0.00
FV	\$13.20

PTS: 1                    DIF: EASY                    REF: 88                    OBJ: (4.2) FV of a lump sum  
BLM: Understand

21. You deposit \$1,000 today in a savings account that pays 3.5% interest, compounded annually. How much will your account be worth at the end of 25 years?
- a. \$2,245.08
  - b. \$2,363.24
  - c. \$2,481.41
  - d. \$2,605.48

ANS: B

N	25
I/YR	3.5%
PV	\$1,000
PMT	\$0
FV	\$2,363.24

PTS: 1                    DIF: EASY                    REF: 88                    OBJ: (4.2) FV of a lump sum  
BLM: Understand

22. Suppose a Government of Canada bond promises to pay \$1,000 five years from now. If the going interest rate on 5-year government bonds is 5.5%, how much is the bond worth today?
- a. \$765.13
  - b. \$803.39
  - c. \$843.56
  - d. \$885.74

ANS: A

N	5
I/YR	5.5%
PMT	\$0
FV	\$1,000.00
PV	\$765.13

PTS: 1                    DIF: EASY                    REF: 93                    OBJ: (4.3) PV of a lump sum  
BLM: Understand

23. How much would \$5,000 due in 50 years be worth today if the discount rate were 7.5%?

- a. \$109.51
- b. \$115.27
- c. \$127.72
- d. \$134.45

ANS: D

N	50
I/YR	7.5%
PMT	\$0
FV	\$5,000
PV	\$134.45

PTS: 1                    DIF: EASY                    REF: 93                    OBJ: (4.3) PV of a lump sum  
 BLM: Understand

24. Suppose a Government of Canada bond will pay \$2,500 five years from now. If the going interest rate on 5-year treasury bonds is 4.25%, how much is the bond worth today?
- a. \$1,928.78
  - b. \$2,030.30
  - c. \$2,131.81
  - d. \$2,238.40

ANS: B

N	5
I/YR	4.25%
PMT	\$0
FV	\$2,500.00
PV	\$2,030.30

PTS: 1                    DIF: EASY                    REF: 93                    OBJ: (4.3) PV of a lump sum  
 BLM: Understand

25. Suppose the Government of Canada offers to sell you a bond for \$747.25. No payments will be made until the bond matures 5 years from now, at which time it will be redeemed for \$1,000. What interest rate would you earn if you bought this bond at the offer price?
- a. 4.37%
  - b. 4.86%
  - c. 5.40%
  - d. 6.00%

ANS: D

N	5
PV	\$747.25
PMT	\$0
FV	\$1,000.00
I/YR	6.00%

PTS: 1                    DIF: EASY                    REF: 95  
 OBJ: (4.4) Interest rate on a lump sum                    BLM: Understand

26. Ten years ago, Levin Inc. earned \$0.50 per share. Its earnings this year were \$2.20 per share. What was the growth rate in Levin's earnings per share (EPS) over the 10-year period?
- a. 15.97%
  - b. 16.77%
  - c. 17.61%

d. 18.49%

ANS: A

N	10
PV	\$0.50
PMT	\$0
FV	\$2.20
I/YR	15.97%

PTS: 1                    DIF: EASY                    REF: 95                    OBJ: (4.4) Growth rate  
BLM: Understand

27. How many years would it take \$50 to triple if it were invested in a bank that pays 3.8% per year?
- a. 25.26
  - b. 26.58
  - c. 27.98
  - d. 29.46

ANS: D

I/YR	3.8%
PV	\$50.00
PMT	\$0
FV	\$150.00
N	29.46

PTS: 1                    DIF: EASY                    REF: 96                    OBJ: (4.5) Number of periods  
BLM: Understand

28. Last year Mason Corp's earnings per share were \$2.50, and its growth rate during the prior 5 years was 9.0% per year. If that growth rate were maintained, how many years would it take for Mason's EPS to double?
- a. 5.86
  - b. 6.52
  - c. 7.24
  - d. 8.04

ANS: D

I/YR	9.0%
PV	\$2.50
PMT	\$0
FV	\$5.00
N	8.04

PTS: 1                    DIF: EASY                    REF: 96                    OBJ: (4.5) Number of periods  
BLM: Understand

29. You plan to invest in securities that pay 9.0%, compounded annually. If you invest \$5,000 today, how many years will it take for your investment account to grow to \$9,140.20?
- a. 4.59
  - b. 5.10
  - c. 6.30
  - d. 7.00

ANS: D

I/YR	9.0%
------	------

PV	\$5,000.00
PMT	\$0
FV	\$9,140.20
N	7.00

PTS: 1                    DIF: EASY                    REF: 96                    OBJ: (4.5) Number of periods  
 BLM: Understand

30. You want to buy a new sports car 3 years from now, and you plan to save \$4,200 per year, beginning 1 year from today. You will deposit your savings in an account that pays 5.2% interest. How much will you have just after you make the third deposit, 3 years from now?
- \$11,973.07
  - \$12,603.23
  - \$13,266.56
  - \$13,929.88

ANS: C

N	3
I/YR	5.2%
PV	\$0.00
PMT	\$4,200
FV	\$13,266.56

PTS: 1                    DIF: EASY                    REF: 97–99  
 OBJ: (4.7) FV of an ordinary annuity                    BLM: Understand

31. You want to go to Europe 5 years from now, and you can save \$3,100 per year, beginning 1 year from today. You plan to deposit the funds in a mutual fund that you expect to return 8.5% per year. Under these conditions, how much will you have just after you make the fifth deposit, 5 years from now?
- \$18,368.66
  - \$19,287.09
  - \$20,251.44
  - \$21,264.02

ANS: A

N	5
I/YR	8.5%
PV	\$0.00
PMT	\$3,100
FV	\$18,368.66

PTS: 1                    DIF: EASY                    REF: 97–99  
 OBJ: (4.7) FV of an ordinary annuity                    BLM: Understand

32. You want to buy a new sports car 3 years from now, and you plan to save \$4,200 per year, *beginning immediately*. You will make three deposits in an account that pays 5.2% interest. Under these assumptions, how much will you have 3 years from today?
- \$13,956.42
  - \$14,654.24
  - \$15,386.95
  - \$16,156.30

ANS: A

N	3
I/YR	5.2%



PV \$0.00  
PMT \$4,200  
FV \$13,956.42

PTS: 1 DIF: EASY REF: 99 OBJ: (4.8) FV of an annuity due  
BLM: Understand

33. You want to go to Europe 5 years from now, and you can save \$3,100 per year, *beginning immediately*. You plan to deposit the funds in a mutual fund that you expect to return 8.5% per year. Under these conditions, how much will you have just after you make the fifth deposit, 5 years from now?
- a. \$17,986.82
  - b. \$18,933.49
  - c. \$19,929.99
  - d. \$20,926.49

ANS: C

N 5  
I/YR 8.5%  
PV \$0.00  
PMT \$3,100  
FV \$19,929.99

PTS: 1 DIF: EASY REF: 99 OBJ: (4.8) FV of an annuity due  
BLM: Understand

34. What is the PV of an ordinary annuity with 10 payments of \$2,700 if the appropriate interest rate is 6.5%?
- a. \$16,641.51
  - b. \$17,517.38
  - c. \$18,439.35
  - d. \$19,409.84

ANS: D

N 10  
I/YR 6.5%  
PMT \$2,700  
FV \$0.00  
PV \$19,409.84

PTS: 1 DIF: EASY REF: 100–101  
OBJ: (4.9) PV of an ordinary annuity BLM: Understand

35. You have a chance to buy an annuity that pays \$1,200 at the end of each year for 3 years. You could earn 5.5% on your money in other investments with equal risk. What is the most you should pay for the annuity?
- a. \$2,775.77
  - b. \$2,921.86
  - c. \$3,075.64
  - d. \$3,237.52

ANS: D

N 3  
I/YR 5.5%  
PMT \$1,200

FV \$0.00  
PV \$3,237.52

PTS: 1 DIF: EASY REF: 100–101  
OBJ: (4.9) PV of an ordinary annuity BLM: Understand

36. Your aunt is about to retire, and she wants to buy an annuity that will supplement her income by \$65,000 per year for 25 years, beginning a year from today. The going rate on such annuities is 6.25%. How much would it cost her to buy such an annuity today?
- \$770,963.15
  - \$811,540.16
  - \$852,117.17
  - \$894,723.02

ANS: B  
N 25  
I/YR 6.25%  
PMT \$65,000  
FV \$0.00  
PV \$811,540.16

PTS: 1 DIF: EASY REF: 100–101  
OBJ: (4.9) PV of an ordinary annuity BLM: Understand

37. What is the PV of an annuity due with 10 payments of \$2,700 at an interest rate of 6.5%?
- \$20,671.48
  - \$21,705.06
  - \$22,790.31
  - \$23,929.82

ANS: A  
N 10  
I/YR 6.5%  
PMT \$2,700  
FV \$0.00  
PV \$20,671.48

PTS: 1 DIF: EASY REF: 100–101 OBJ: (4.9) PV of an annuity due  
BLM: Understand

38. You have a chance to buy an annuity that pays \$550 at the *beginning* of each year for 3 years. You could earn 5.5% on your money in other investments with equal risk. What is the most you should pay for the annuity?
- \$1,412.84
  - \$1,487.20
  - \$1,565.48
  - \$1,643.75

ANS: C  
N 3  
I/YR 5.5%  
PMT \$550  
FV \$0.00  
PV \$1,565.48

PTS: 1                    DIF: EASY                    REF: 101                    OBJ: (4.9) PV of an annuity due  
BLM: Understand

39. Your aunt is about to retire, and she wants to buy an annuity that will provide her with \$65,000 of income a year for 25 years, with the first payment coming *immediately*. The going rate on such annuities is 6.25%. How much would it cost her to buy the annuity today?
- a. \$739,281.38
  - b. \$778,190.93
  - c. \$819,148.35
  - d. \$862,261.42

ANS: D

N	25
I/YR	6.25%
PMT	\$65,000
FV	\$0.00
PV	\$862,261.42

PTS: 1                    DIF: EASY                    REF: 101                    OBJ: (4.9) PV of an annuity due  
BLM: Understand

40. You own an oil well that will pay you \$30,000 per year for 10 years, with the first payment being made today. If you think a fair return on the well is 8.5%, how much should you ask for if you decide to sell it?
- a. \$202,893
  - b. \$213,572
  - c. \$224,250
  - d. \$235,463

ANS: B

N	10
I/YR	8.5%
PMT	\$30,000
FV	\$0.00
PV	\$213,572

PTS: 1                    DIF: EASY                    REF: 101                    OBJ: (4.9) PV of an annuity due  
BLM: Understand

41. What's the present value of a 4-year ordinary annuity of \$2,250 per year plus an additional \$3,000 at the end of Year 4 if the interest rate is 5%?
- a. \$8,956.56
  - b. \$9,427.96
  - c. \$9,924.17
  - d. \$10,446.50

ANS: D

N	4
I/YR	5.0%
PMT	\$2,250
FV	\$3,000
PV	\$10,446.50

PTS: 1                    DIF: EASY                    REF: 100-101  
OBJ: (4.9) PV of an ordinary annuity plus an ending payment    BLM: Understand

42. Suppose you inherited \$275,000 and invested it at 8.25% per year. How much could you withdraw at the end of each of the next 20 years?
- \$28,532.45
  - \$29,959.08
  - \$31,457.03
  - \$33,029.88

ANS: A

N	20
I/YR	8.25%
PV	\$275,000
FV	\$0.00
PMT	\$28,532.45

PTS: 1                    DIF: EASY                    REF: 100–101

OBJ: (4.10) Payments on an ordinary annuity                    BLM: Understand

43. Your uncle has \$375,000 and wants to retire. He expects to live for another 25 years and to be able to earn 7.5% on his invested funds. How much could he withdraw at the end of each of the next 25 years and end up with zero in the account?
- \$28,843.38
  - \$30,361.46
  - \$31,959.43
  - \$33,641.50

ANS: D

N	25
I/YR	7.5%
PV	\$375,000
FV	\$0.00
PMT	\$33,641.50

PTS: 1                    DIF: EASY                    REF: 100–101

OBJ: (4.10) Payments on an ordinary annuity                    BLM: Understand

44. Your uncle has \$375,000 and wants to retire. He expects to live for another 25 years, and he also expects to earn 7.5% on his invested funds. How much could he withdraw at the *beginning* of each of the next 25 years and end up with zero in the account?
- \$28,243.21
  - \$29,729.70
  - \$31,294.42
  - \$32,859.14

ANS: C

N	25
I/YR	7.5%
PV	\$375,000
FV	\$0.00
PMT	\$31,294.42

PTS: 1                    DIF: EASY                    REF: 102–103

OBJ: (4.10) Payments on an annuity due                    BLM: Understand

45. Suppose you inherited \$275,000 and invested it at 8.25% per year. How much could you withdraw at the *beginning* of each of the next 20 years?
- \$22,598.63
  - \$23,788.03
  - \$25,040.03
  - \$26,357.92

ANS: D

N	20
I/YR	8.25%
PV	\$275,000
FV	\$0.00
PMT	\$26,357.92

PTS: 1                    DIF: EASY                    REF: 102–103  
 OBJ: (4.10) Payments on an annuity due    BLM: Understand

46. Your uncle has \$375,000 invested at 7.5%, and he now wants to retire. He wants to withdraw \$35,000 at the end of each year, beginning at the end of this year. How many years will it take to exhaust his funds, i.e., run the account down to zero?
- 22.50
  - 23.63
  - 24.81
  - 26.05

ANS: A

I/YR	7.5%
PV	\$375,000
PMT	\$35,000
FV	\$0.00
N	22.50

PTS: 1                    DIF: EASY                    REF: 102–103  
 OBJ: (4.10) Years to deplete an ordinary annuity                    BLM: Understand

47. Your uncle has \$500,000 invested at 7.5%, and he now wants to retire. He wants to withdraw \$40,000 at the *beginning* of each year, beginning immediately. How many years will it take to exhaust his funds, i.e., run the account down to zero?
- 24.38
  - 25.66
  - 27.01
  - 28.44

ANS: D

I/YR	7.5%
PV	\$500,000
PMT	\$40,000
FV	\$0.00
N	28.44

PTS: 1                    DIF: EASY                    REF: 102–103  
 OBJ: (4.10) Years to deplete an annuity due                    BLM: Understand

48. You just won the lottery, and you have a choice between receiving \$3,500,000 today or a 10-year annuity of \$500,000, with the first payment coming 1 year from today. What rate of return is built into the annuity?
- 6.72%
  - 7.07%
  - 7.43%
  - 7.80%

ANS: B

N	10
PV	\$3,500,000
PMT	\$500,000
FV	\$0.00
I/YR	7.07%

PTS: 1                    DIF: EASY                    REF: 102–103

OBJ: (4.10) Interest rate implicit in an annuity                    BLM: Understand

49. Your friend just won the lottery. She has the choice of \$15,000,000 today or a 20-year annuity of \$1,050,000, with the first payment coming 1 year from today. What rate of return is built into the annuity?
- 2.79%
  - 3.10%
  - 3.44%
  - 3.79%

ANS: C

N	20
PV	\$15,000,000
PMT	\$1,050,000
FV	\$0.00
I/YR	3.44%

PTS: 1                    DIF: EASY                    REF: 102–103

OBJ: (4.10) Interest rate implicit in an annuity                    BLM: Understand

50. Assume that you own an annuity that will pay you \$15,000 per year for 12 years, with the first payment being made today. Your uncle offers to give you \$120,000 for the annuity. If you sell it, what rate of return would your uncle earn on his investment?
- 6.85%
  - 7.21%
  - 7.59%
  - 8.41%

ANS: D

N	12
PV	\$120,000
PMT	\$15,000
FV	\$0.00
I/YR	8.41%

PTS: 1                    DIF: EASY                    REF: 102–103

OBJ: (4.10) Interest rate implicit in an annuity due                    BLM: Understand

51. What's the present value of a perpetuity that pays \$250 per year if the appropriate interest rate is 5%?

- a. \$4,750.00
- b. \$5,000.00
- c. \$5,250.00
- d. \$5,512.50

ANS: B

I/YR                            5.0%  
 PMT                            \$250  
 PV                              \$5,000.00

PTS: 1                    DIF: EASY            REF: 104            OBJ: (4.11) PV of a perpetuity  
 BLM: Understand

52. What's the rate of return you would earn if you paid \$950 for a perpetuity that pays \$85 per year?
- a. 6.52%
  - b. 7.25%
  - c. 8.95%
  - d. 9.84%

ANS: C

Cost (PV)                    \$950  
 PMT                            \$85  
 I/YR                            8.95%

PTS: 1                    DIF: EASY            REF: 104  
 OBJ: (4.11) Rate of return on a perpetuity                    BLM: Understand

53. At a rate of 6.25%, what is the present value of the following cash flow stream: \$0 at Time 0; \$75 at the end of Year 1; \$225 at the end of Year 2; \$0 at the end of Year 3; and \$300 at the end of Year 4?
- a. \$433.23
  - b. \$456.03
  - c. \$480.03
  - d. \$505.30

ANS: D

I/YR = 6.25%

	0	1	2	3	4
CFs:	\$0	\$75	\$225	\$0	\$300
PV of CFs:	\$0	\$71	\$199	\$0	\$235

PV = \$505.30    Find the individual PVs and sum them. Automate the process using Excel or a calculator by inputting the data into the cash flow register and pressing the NPV key.

PTS: 1                    DIF: EASY            REF: 105–106  
 OBJ: (4.12) PV of an uneven cash flow stream                    BLM: Understand

54. What is the present value of the following cash flow stream at an interest rate of 12.0% per year: \$0 at Time 0; \$1,500 at the end of Year 1; \$3,000 at the end of Year 2; \$4,500 at the end of Year 3; and \$6,000 at the end of Year 4?
- a. \$10,209.64
  - b. \$10,746.99
  - c. \$11,284.34
  - d. \$11,848.55

ANS: B  
I/YR = 12.0%

	0	1	2	3	4
CFs:	\$0	\$1,500	\$3,000	\$4,500	\$6,000
PV of CFs:	\$0	\$1,339	\$2,392	\$3,203	\$3,813

PV = \$10,746.99 Found using the Excel NPV function  
 PV = \$10,746.99 Found by summing individual PVs  
 PV = \$10,746.99 Found using the calculator NPV key

PTS: 1 DIF: EASY REF: 105–106  
 OBJ: (4.12) PV of an uneven cash flow stream BLM: Understand

55. An investment promises the following cash flow stream: \$750 at Time 0; \$2,450 at the end of Year 1 (or at  $t = 1$ ); \$3,175 at the end of Year 2; and \$4,400 at the end of Year 3. At a discount rate of 8.0%, what is the present value of the cash flow stream?
- \$7,916.51
  - \$8,333.17
  - \$8,771.76
  - \$9,233.43

ANS: D  
I/YR = 8.0%

	0	1	2	3
CFs:	\$750	\$2,450	\$3,175	\$4,400
PV of CFs:	\$750	\$2,269	\$2,722	\$3,493

PV = \$9,233.43 Found by summing individual PVs  
 PV = \$9,233.43 Found with a calculator or Excel to automate the process. With a calculator, input the cash flows and I into the cash flow register, then press the NPV key.

PTS: 1 DIF: EASY | MEDIUM REF: 105–106  
 OBJ: (4.12) PV of an uneven cash flow stream BLM: Analyze

56. What is the present value of the following cash flow stream if the interest rate is 6.0% per year: 0 at Time 0; \$1,000 at the end of Year 1; and \$2,000 at the end of Years 2, 3, and 4?
- \$5,986.81
  - \$6,286.16
  - \$6,600.46
  - \$6,930.4

ANS: A  
I/YR = 6.0%

	0	1	2	3	4
CFs:	\$0	\$1,000	\$2,000	\$2,000	\$2,000
PV of CFs:	\$0	\$943	\$1,780	\$1,679	\$1,584

PV = \$5,986.81 Found using the Excel NPV function  
 PV = \$5,986.81 Found by summing individual PVs  
 PV = \$5,986.81 Found using the calculator NPV key

PTS: 1 DIF: EASY | MEDIUM REF: 105–106



OBJ: (4.12) PV of an uneven cash flow stream

BLM: Analyze

57. What's the future value of \$1,500 after 5 years if the appropriate interest rate is 6%, compounded semiannually?
- a. \$1,819.33
  - b. \$1,915.08
  - c. \$2,015.87
  - d. \$2,116.67

ANS: C

Years	5
Periods/yr	2
Nom. I/YR	6.0%

N = Periods	10
PMT	\$0
I = I/Period	3.0%
PV	\$1,500
FV	\$2,015.87

Could be found using a calculator, the equation, or Excel  
Note that we must first convert to periods and rate per period.

PTS: 1

DIF: EASY | MEDIUM

REF: 109–111

OBJ: (4.15) FV of a lump sum, semiannual compounding

BLM: Analyze

58. What's the present value of \$1,500 discounted back 5 years if the appropriate interest rate is 6%, compounded semiannually?
- a. \$956.95
  - b. \$1,007.32
  - c. \$1,060.33
  - d. \$1,116.14

ANS: D

Years	5
Periods/yr	2
Nom. I/YR	6.0%

FV	\$1,500
N = Periods	10
PMT	\$0
I = I/Period	3.0%
PV	\$1,116.14

Could be found using a calculator, the equation, or Excel  
Note that we must first convert to periods and rate per period.

PTS: 1

DIF: EASY | MEDIUM

REF: 109–111

OBJ: (4.15) PV of a lump sum, semiannual compounding

BLM: Analyze

59. Your uncle has \$300,000 invested at 7.5%, and he now wants to retire. He wants to withdraw \$35,000 at the *end* of each year, beginning at the end of this year. He also wants to have \$25,000 left to give you when he ceases to withdraw funds from the account. For how many years can he make the \$35,000 withdrawals and still have \$25,000 left in the end?
- a. 14.96
  - b. 15.71
  - c. 16.49
  - d. 17.32

ANS: A  
I/YR 7.50%  
PV \$300,000  
PMT \$35,000  
FV \$25,000  
N 14.96

PTS: 1 DIF: MEDIUM REF: 102–103

OBJ: (4.10) Years to deplete an ordinary annuity

BLM: Analyze

60. Your uncle has \$300,000 invested at 7.5%, and he now wants to retire. He wants to withdraw \$35,000 at the *beginning* of each year, beginning immediately. He also wants to have \$25,000 left to give you when he ceases to withdraw funds from the account. For how many years can he make the \$35,000 withdrawals and still have \$25,000 left in the end?
- 11.98
  - 12.61
  - 13.27
  - 14.63

ANS: C  
I/YR 7.5%  
PV \$300,000  
PMT \$35,000  
FV \$25,000  
N 13.27

PTS: 1 DIF: MEDIUM REF: 102–103

OBJ: (4.10) Years to deplete an annuity due

BLM: Analyze

61. You agree to make 24 deposits of \$500 at the *beginning* of each month into a bank account. At the end of the 24th month, you will have \$13,000 in your account. If the bank compounds interest monthly, what nominal annual interest rate will you be earning?
- 7.62%
  - 8.00%
  - 8.40%
  - 8.82%

ANS: A  
N 24  
PV \$0  
PMT \$500  
FV \$13,000  
I/YR 7.62%

PTS: 1 DIF: MEDIUM REF: 102–103

OBJ: (4.10) Interest rate implicit in an annuity due

BLM: Analyze

62. What annual payment would you have to receive in order to earn a 7.5% rate of return on a perpetuity that has a cost of \$1,250?
- \$89.06
  - \$93.75
  - \$98.44
  - \$103.36

ANS: B

Cost (PV) \$1,250  
 I/YR 7.5%  
 PMT \$93.75 Multiply cost by I.

PTS: 1 DIF: MEDIUM REF: 104  
 OBJ: (4.11) Payments on a perpetuity BLM: Understand

63. At a rate of 6.5%, what is the future value of the following cash flow stream: \$0 at Time 0; \$75 at the end of Year 1; \$225 at the end of Year 2; \$0 at the end of Year 3; and \$300 at the end of Year 4?
- \$526.01
  - \$553.69
  - \$613.51
  - \$645.80

ANS: D  
 I/YR = 6.5%

	0	1	2	3	4
CFs:	\$0	\$75	\$225	\$0	\$300
FV of CFs:	\$0	\$91	\$255	\$0	\$300

FV = \$645.80 Found by summing individual FVs  
 FV = \$645.80 Found with the NFV key in some calculators  
 FV = \$645.80 Found with a calculator by first finding the PV of the stream, then finding the FV of that PV

PV of the stream: \$501.99  
 FV of the PV: \$645.80

PTS: 1 DIF: MEDIUM REF: 107  
 OBJ: (4.13) FV of an uneven cash flow stream BLM: Analyze

64. An investment costs \$1,000 (CF at  $t = 0$ ) and is expected to produce cash flows of \$75 at the end of each of the next 5 years, then an additional lump sum payment of \$1,000 at the end of the 5th year. What is the expected rate of return on this investment?
- 6.77%
  - 7.13%
  - 7.50%
  - 7.88%

ANS: C

	0	1	2	3	4	5
CFs:	-\$1,000	\$75	\$75	\$75	\$75	\$75
						\$1,000
	-\$1,000	\$75	\$75	\$75	\$75	\$1,075

I/YR 7.50% I is the discount rate that causes the PV of the inflows to equal the initial negative CF, and is found with Excel's IRR function or by inputting the CFs into a calculator and pressing the IRR key.

PTS: 1 DIF: MEDIUM REF: 108  
 OBJ: (4.14) Interest rate built into uneven CF stream BLM: Analyze

65. An investment costs \$725 and is expected to produce cash flows of \$75 at the end of Year 1, \$100 at the end of Year 2, \$85 at the end of Year 3, and \$625 at the end of Year 4. What rate of return would you earn if you bought this investment?
- 5.19%
  - 5.46%
  - 5.75%
  - 6.05%

ANS: D

	0	1	2	3	4
CFs:	-\$725	\$75	\$100	\$85	\$625
I/YR	6.05%	I is the discount rate that causes the PV of the positive inflows to equal the initial negative CF. I can be found using Excel's IRR function or by inputting the CFs into a calculator and pressing the IRR key.			

PTS: 1                      DIF: MEDIUM              REF: 108

OBJ: (4.14) Interest rate built into uneven CF stream

BLM: Analyze

66. What's the future value of \$1,500 after 5 years if the appropriate interest rate is 6%, compounded monthly?
- \$1,922.11
  - \$2,023.28
  - \$2,124.44
  - \$2,230.66

ANS: B

Years	5
Periods/yr	12
Nom. I/YR	6.0%

N = Periods	60
PMT	\$0
I/Period	0.5%
PV	\$1,500
FV	\$2,023.28

Could be found using a calculator, the equation, or Excel. Note that we must first convert to periods and rate per period.

PTS: 1                      DIF: MEDIUM              REF: 109–111

OBJ: (4.15) FV of a lump sum, monthly compounding

BLM: Analyze

67. What's the present value of \$1,525 discounted back 5 years if the appropriate interest rate is 6%, compounded monthly?
- \$969.34
  - \$1,020.36
  - \$1,074.06
  - \$1,130.59

ANS: D

Years	5
Periods/yr	12
Nom. I/YR	6.0%

N = Periods	60
-------------	----

PMT	\$0
I/Period	0.5%
FV	\$1,525
PV	\$1,130.59

Could be found using a calculator, the equation, or Excel. Note that we must first convert to periods and rate per period.

PTS: 1                    DIF: MEDIUM       REF: 109–111

OBJ: (4.15) PV of a lump sum, monthly compounding                    BLM: Analyze

68. By law, credit card issuers must print the Annual Percentage Rate (APR) on their monthly statements. If the APR is stated to be 18.00%, with interest paid monthly, what is the card's EFF percentage?

- a. 18.58%
- b. 19.56%
- c. 20.54%
- d. 21.57%

ANS: B

APR	18.00%
Periods/yr	12
EFF%	19.56%

PTS: 1                    DIF: MEDIUM       REF: 110

OBJ: (4.15) APR versus EAR

BLM: Understand

69. East Coast Bank offers to lend you \$25,000 at a nominal rate of 7.5%, compounded monthly. The loan (principal plus interest) must be repaid at the end of the year. Midwest Bank also offers to lend you the \$25,000, but it will charge an annual rate of 8.3%, with no interest due until the end of the year. What is the difference in the effective annual rates charged by the two banks?

- a. 0.93%
- b. 0.77%
- c. 0.64%
- d. 0.54%

ANS: D

This problem can be worked most easily using the interest conversion feature of a calculator. It could also be worked using the conversion formula. We used the conversion formula.

Nominal rate, East Coast Bank	7.5%
Nominal rate, Midwest Bank	8.3%
Periods/yr, East Coast	12
Periods/yr, Midwest	1
EFF% East Coast	7.76%
EFF% Midwest	8.30%
Difference	0.54%

PTS: 1                    DIF: MEDIUM       REF: 110

OBJ: (4.15) Comparing the effective cost of two bank loans                    BLM: Understand

70. Suppose a bank offers to lend you \$10,000 for one year at a nominal annual rate of 10.25%, but you must make interest payments at the end of each *quarter* and then pay off the \$10,000 principal amount at the end of the year. What is the effective annual rate on the loan?

- a. 7.76%
- b. 8.63%

- c. 9.59%
- d. 10.65%

ANS: D

Nominal I/YR	10.25%	
Periods/yr	4	
EFF%	10.65%	Using conversion formula

You could also find the EFF% as follows:

$$\text{Interest paid each quarter} = \text{Loan} \times \text{rate}/4 = \text{quarterly PMT} = \$256.25$$

Then find the IRR as a quarterly rate and convert to an annual rate. This procedure is obviously longer.

	0	1	2	3	4
CFs:	10,000.00	-256.25	-256.25	-256.25	-256.25
					-10,000.00
	<u>10,000.00</u>	<u>-256.25</u>	<u>-256.25</u>	<u>-256.25</u>	<u>-10,256.25</u>

$$\text{IRR (quarterly)} = 2.56\%$$

$$\text{Annual effective rate} = 10.65\% \text{ versus nominal rate} = 10.25\%$$

PTS: 1                    DIF: MEDIUM            REF: 109–110

OBJ: (4.15) Nominal rate versus EFF%    BLM: Analyze

71. Suppose a bank offers to lend you \$10,000 for 1 year on a loan contract that calls for you to make interest payments of \$250.00 at the end of each *quarter* and then pay off the principal amount at the end of the year. What is the effective annual rate on the loan?
- a. 8.46%
  - b. 9.37%
  - c. 9.86%
  - d. 10.38%

ANS: D

Interest payment:                    \$250.00

	0	1	2	3	4
CFs:	10,000.00	-250.00	-250.00	-250.00	-250.00
					-10,000.00
	<u>10,000.00</u>	<u>-250.00</u>	<u>-250.00</u>	<u>-250.00</u>	<u>-10,250.00</u>

$$\text{IRR (quarterly)} = 2.50\%$$

$$\text{Annual effective rate} = 10.38\% \text{ versus nominal rate} = 10.00\%$$

PTS: 1                    DIF: MEDIUM            REF: 109–110

OBJ: (4.15) Nominal rate versus EFF%    BLM: Analyze

72. If a bank pays a 4.50% nominal rate, with monthly compounding on deposits, what effective annual rate (EFF%) does the bank pay?
- a. 3.35%
  - b. 3.72%
  - c. 4.13%
  - d. 4.59%

ANS: D

Nominal I/YR	4.50%
Periods/yr	12
EFF%	4.59%

PTS: 1                    DIF: MEDIUM      REF: 110  
 OBJ: (4.15) Nominal rate versus EAR      BLM: Understand

73. Suppose your credit card issuer states that it charges a 15.00% nominal annual rate. If you must make monthly payments, which amounts to monthly compounding, what is the effective annual rate?
- 15.27%
  - 16.08%
  - 17.72%
  - 18.61%

ANS: B

Nominal I/YR	15.00%
Periods/yr	12
EFF%	16.08%

PTS: 1                    DIF: MEDIUM      REF: 110  
 OBJ: (4.15) Nominal rate versus EAR      BLM: Understand

74. Pace Co. borrowed \$25,000 at a rate of 7.25%, *simple interest*, with interest paid at the end of each month. The bank uses a 360-day year. How much interest would Pace have to pay in a 30-day month?
- \$136.32
  - \$143.49
  - \$151.04
  - \$158.59

ANS: C

Nominal I/YR	7.25%	Days in month	30
Days/yr	360	Daily rate	0.020139%
Amount borrowed	\$25,000	Interest per day	\$5.03472
Interest per month	\$151.04		

PTS: 1                    DIF: MEDIUM      REF: 112–113  
 OBJ: (4.16) Interest charges, simple interest                    BLM: Analyze

75. Suppose you deposited \$5,000 in a bank account that pays 5.25% with daily compounding and a 360-day year. How much could you withdraw after 8 months, assuming each month has 30 days?
- \$5,178.09
  - \$5,436.99
  - \$5,708.84
  - \$5,994.28

ANS: A

Nominal I/YR	5.25%	Rate/day	0.0146%
Number of months	8	Days on deposit	240
Days in year	360		
Days in month	30		
Amount deposited	\$5,000		
Ending amount	\$5,178.09		

PTS: 1                    DIF: MEDIUM      REF: 112–113  
 OBJ: (4.16) Fractional time periods                    BLM: Analyze

76. Suppose you borrowed \$12,000 at a rate of 9% and must repay it in 4 equal installments at the end of each of the next 4 years. How much would your payments be?
- \$3,704.02
  - \$3,889.23
  - \$4,083.69
  - \$4,287.87

ANS: A

I/YR	9.0%	
Years	4	
Amount borrowed	\$12,000	
Payments	\$3,704.02	Found with a calculator, as the PMT

PTS: 1                    DIF: MEDIUM      REF: 113–114

OBJ: (4.17) Loan amortization: payment    BLM: Analyze

77. Suppose you are buying your first house for \$210,000, and are making a \$20,000 down payment. You have arranged to finance the remaining amount with a 30-year, monthly payment, amortized mortgage at a 6.5% nominal interest rate. What will your equal monthly payments be?
- \$1,083.84
  - \$1,140.88
  - \$1,200.93
  - \$1,260.98

ANS: C

Years	30	Payments/year	12
N	360	Nominal rate	6.50%
Periodic rate	0.54%	Purchase price	\$210,000
PV	\$190,000	Down payment	\$20,000
FV	\$0.00		
PMT	\$1,200.93		

PTS: 1                    DIF: MEDIUM      REF: 113–114

OBJ: (4.17) Loan amortization: payment    BLM: Analyze

78. Suppose you borrowed \$12,000 at a rate of 9% and must repay it in 4 equal installments at the end of each of the next 4 years. How much interest would you have to pay in the first year?
- \$925.97
  - \$974.70
  - \$1,026.00
  - \$1,080.00

ANS: D

I/YR	9.0%	
Years	4	
Amount borrowed	\$12,000	
Interest in Year 1	\$1,080.00	Simply multiply the rate times the amount borrowed.

PTS: 1                    DIF: MEDIUM      REF: 113–114

OBJ: (4.17) Loan amortization: interest    BLM: Understand

79. You plan to borrow \$30,000 at a 7% annual interest rate. The terms require you to amortize the loan with six equal end-of-year payments. How much interest would you be paying in Year 2?
- \$1,548.79



- b. \$1,630.30
- c. \$1,716.11
- d. \$1,806.43

ANS: D

Find the required payment:

N	6
I	7.0%
PV	\$30,000
FV	\$0
PMT	\$6,293.87

Amortization schedule (first 2 years)

Year	Beg. Balance	Payment	Interest	Principal	End. Balance
1	30,000.00	6,293.87	2,100.00	4,193.87	25,806.13
2	25,806.13	6,293.87	1,806.43	4,487.45	21,318.68

PTS: 1                    DIF: MEDIUM            REF: 113–114

OBJ: (4.17) Loan amortization: interest    BLM: Analyze

80. You plan to borrow \$75,000 at a 7% annual interest rate. The terms require you to amortize the loan with 10 equal end-of-year payments. How much interest would you be paying in Year 2?
- a. \$4,395.19
  - b. \$4,626.52
  - c. \$4,870.02
  - d. \$5,113.52

ANS: C

Find the required payment:

N	10
I	7.0%
PV	\$75,000
FV	\$0
PMT	\$10,678.31

Amortization schedule (first 2 years)

Year	Beg. Balance	Payment	Interest	Principal	End. Balance
1	75,000.00	10,678.31	5,250.00	5,428.31	69,571.69
2	69,571.69	10,678.31	4,870.02	5,808.29	63,763.39

PTS: 1                    DIF: MEDIUM            REF: 113–114

OBJ: (4.17) Loan amortization: interest    BLM: Analyze

81. Suppose you take out a \$10,000 loan at a 6% nominal annual rate. The terms of the loan require you to make 12 equal end-of-month payments each year for 4 years, and then an additional final (balloon) payment of \$4,000 at the end of the last month. What will your equal monthly payments be?
- a. \$137.96
  - b. \$145.22
  - c. \$152.86
  - d. \$160.91

ANS: D

Years	4	Nominal rate	6.0%
N	48	Payments/year	12

I	0.5%	Monthly annuity, so interest must be calculated on monthly basis
PV	\$10,000	
FV	\$4,000	
PMT	\$160.91	

PTS: 1                    DIF: MEDIUM      REF: 113–114  
 OBJ: (4.17) Loan amortization: payment    BLM: Analyze

82. You plan to make annual deposits into a bank account that pays a 5.00% nominal annual rate. You think inflation will amount to 2.50% per year. What is the expected annual real rate at which your money will grow?
- 1.98%
  - 2.20%
  - 2.44%
  - 2.68%

ANS: C

$r_{\text{NOM}}$	5.00%
Inflation	2.50%
$r_r = [(1 + r_{\text{NOM}})/(1 + \text{Inflation})] - 1$	
$r_r = 2.44\%$	

PTS: 1                    DIF: MEDIUM      REF: 114–115  
 OBJ: (4.18) Growing annuity: calculating the real rate                    BLM: Analyze

83. Your father now has \$1,000,000 invested in an account that pays 9.00%. He expects inflation to average 3%, and he wants to make annual constant dollar (*real*) *beginning-of-year withdrawals* over each of the next 20 years and end up with a zero balance after the 20th year. How large will his initial withdrawal (and thus constant dollar [real] withdrawals) be?
- \$69,636.40
  - \$73,301.47
  - \$77,159.45
  - \$81,220.47

ANS: D

$r_{\text{NOM}}$	9.00%	Initial sum	1,000,000
Inflation	3.00%	Years	20
$r_r = [(1 + r_{\text{NOM}})/(1 + \text{growth})] - 1$			
$r_r = 5.825243\%$			
PMT = \$81,220.47			

PTS: 1                    DIF: MEDIUM      REF: 114–115  
 OBJ: (4.18) Growing annuity due: withdraw constant real amount  
 BLM: Analyze

84. You are considering investing in a Third World bank account that pays a nominal annual rate of 18%, compounded *monthly*. If you invest \$5,000 at the *beginning* of each month, how many months will it take for your account to grow to \$250,000? Round fractional years up.
- 23
  - 27
  - 32
  - 38

ANS: D

I/YR	18.0%	
I/MO	1.5%	Monthly annuity due, so interest must be calculated on monthly basis
PV	\$0	
PMT	\$5,000	
FV	\$250,000	
N	37.16	Rounded up: 38

PTS: 1            DIF: MEDIUM    REF: 102–103 | 109–111  
 OBJ: (Comp: 4.10, 4.15) Annuity due, N, monthly compounding  
 BLM: Analyze

85. You are considering investing in a bank account that pays a nominal annual rate of 6%, compounded monthly. If you invest \$5,000 at the *end* of each month, how many months will it take for your account to grow to \$200,000? Round fractional years up.
- 33
  - 37
  - 41
  - 45

ANS: B

I/YR	6.0%	
I/MO	0.5%	Monthly annuity, so interest must be calculated on monthly basis
PV	\$0	
PMT	\$5,000	
FV	\$200,000	
N	36.56	Rounded up: 37

PTS: 1            DIF: MEDIUM    REF: 102–103 | 109–111  
 OBJ: (Comp: 4.10, 4.15) Annuity, N, monthly compounding    BLM: Analyze

86. Your child’s orthodontist offers you two alternative payment plans. The first plan requires a \$4,000 immediate up-front payment. The second plan requires you to make monthly payments of \$137.41, payable at the end of each month for 3 years. What nominal annual interest rate is built into the monthly payment plan?
- 12.31%
  - 12.96%
  - 13.64%
  - 14.36%

ANS: D

N	36	
PV	\$4,000	
PMT	\$137.41	
FV	\$0	
I/MO	1.20%	Monthly annuity, so interest must be calculated on monthly basis
I/YR	14.36%	

PTS: 1            DIF: MEDIUM    REF: 102–103 | 109–111  
 OBJ: (Comp: 4.10, 4.15) Interest rate, annuity, mos compounding  
 BLM: Analyze

87. Your subscription to *Investing Wisely Weekly* is about to expire. You plan to subscribe to the magazine for the rest of your life, and you can renew it by paying \$75 annually, beginning immediately, or you can get a lifetime subscription for \$750, also payable immediately. Assuming you can earn 5.5% on your funds and the annual renewal rate will remain constant, how many years must you live to make the lifetime subscription the better buy? Round fractional years up. (Hint: Be sure to remember that you are solving for how many years you must live, not for how many payments must be made.)
- 10
  - 11
  - 12
  - 13

ANS: D

Find N for an annuity due with the indicated terms to determine how long you must live to make the lifetime subscription worthwhile.

Interest rate	5.5%	
Annual cost	\$75	
Lifetime subscription cost	\$750	
Number of payments made	13.76	Rounded up: 14

Recall that we used BEGIN mode (because it is an annuity due), so it takes 14 payments to make the lifetime subscription better. Since the 1st payment occurs today, the 14th payment occurs at  $t = 13$ , which is 13 years from now.

So, you must live for:  $14 - 1 = 13$  years. 13

PTS: 1 DIF: MEDIUM | HARD REF: 102–103  
 OBJ: (4.10) N, lifetime versus annual pmts BLM: Analyze

88. You just deposited \$2,500 in a bank account that pays a 12% nominal interest rate, compounded quarterly. If you also add another \$5,000 to the account one year (12 months) from now and another \$7,500 to the account 2 years from now, how much will be in the account 3 years (12 quarters) from now?
- \$17,422.59
  - \$18,339.57
  - \$19,256.55
  - \$20,219.37

ANS: B

Interest rate	12.0%			
Periods/year	4			
Quarterly rate	3.0%	<u>Years on</u>	<u>Quarters</u>	<u>Ending</u>
1st deposit	\$2,500	<u>Deposit</u>	<u>on Deposit</u>	<u>Amount</u>
2nd deposit	\$5,000	3	12	\$3,564.40
3rd deposit	\$7,500	2	8	\$6,333.85
		1	4	\$8,441.32
				\$18,339.57

PTS: 1 DIF: MEDIUM | HARD REF: 111  
 OBJ: (4.15) Non-annual compounding BLM: Analyze

89. Merchants Bank offers to lend you \$30,000 at a nominal rate of 6.0%, simple interest, with interest paid quarterly. Gold Coast Bank offers to lend you the \$30,000, but it will charge 7.0%, simple interest, with interest paid at the end of the year. What's the *difference* in the effective annual rates charged by the two banks?
- 1.49%

- b. 1.24%
- c. 1.04%
- d. 0.86%

ANS: D

Students must understand that “simple interest with interest paid quarterly” means that the bank gets the interest at the end of each quarter, hence it can invest it, presumably at the same nominal rate. This results in the same effective rate as if it were stated as “6%, quarterly compounding.”

Nominal rate, Merchants Bank	6.0%
Periods/yr, Merchants	4
Nominal rate, Gold Coast Bank	7.0%
Periods/yr, Gold Coast	1
EFF% Merchants	6.14%
EFF% Gold coast	7.00%
Difference	0.86%

PTS: 1                      DIF: MEDIUM | HARD                      REF: 109–111  
 OBJ: (4.15) Compare effective cost of two bank loans                      BLM: Analyze

90. Suppose you borrowed \$12,000 at a rate of 9% and must repay it in 4 equal installments at the end of each of the next 4 years. By how much would you reduce the amount you owe in the first year?
- a. \$2,492.82
  - b. \$2,624.02
  - c. \$2,755.23
  - d. \$2,892.99

ANS: B

Interest rate	9.0%
Years	4
Amount borrowed	\$12,000

Step 1: Find the PMT	\$3,704.02
Step 2: Find the first year’s interest	\$1,080.00
Step 3: Subtract the interest from the payment; this is repayment of principal	\$2,624.02

PTS: 1                      DIF: MEDIUM | HARD                      REF: 113–114  
 OBJ: (4.17) Loan amortization: principal repayment                      BLM: Analyze

91. Suppose you borrowed \$12,000 at a rate of 9% and must repay it in 4 equal installments at the end of each of the next 4 years. How much would you still owe at the end of the first year, after you have made the first payment?
- a. \$7,636.79
  - b. \$8,038.73
  - c. \$8,461.82
  - d. \$9,375.98

ANS: D

Interest rate	9.0%
Years	4
Amount borrowed	\$12,000

Step 1: Find the PMT	\$3,704.02
Step 2: Find the first year’s interest	\$1,080.00
Step 3: Subtract the interest from the payment; this is repayment of principal	\$2,624.02

Step 4: Subtract the repayment of principal from the beginning amount owed \$9,375.98

PTS: 1                    DIF: MEDIUM | HARD                    REF: 113–114  
 OBJ: (4.17) Loan amortization: ending balance                    BLM: Analyze

92. Your sister turned 35 today, and she is planning to save \$5,000 per year for retirement, with the first deposit to be made 1 year from today. She will invest in a mutual fund that will provide a return of 8% per year. She plans to retire 30 years from today, when she turns 65, and she expects to live for 25 years after retirement, to age 90. Under these assumptions, how much can she spend in each year after she retires? Her first withdrawal will be made at the *end* of her first retirement year.
- \$47,888
  - \$50,408
  - \$53,061
  - \$55,714

ANS: C

Interest rate	8.0%
Years to retirement	30
Years in retirement	25
Amount saved per year	\$5,000

Step 1: Find the amount at age 65; use the FV function                    \$566,416  
 Step 2: Find the PMT for a 25-year ordinary annuity using that FV as the PV                    \$53,061

PTS: 1                    DIF: MEDIUM | HARD                    REF: 88 | 102–103  
 OBJ: (Comp: 4.2, 4.10) Retirement planning                    BLM: Analyze

93. Your company has just taken out a 1-year installment loan for \$72,500. The nominal rate is 12.0%, but with equal end-of-month payments. What percentage of the *second* monthly payment will go toward the repayment of principal?
- 76.85%
  - 80.89%
  - 85.15%
  - 89.63%

ANS: D

N	12
$r_{NOM}$	12.0%
Periodic r	1.0%
PV	\$72,500
PMT	\$6,442
FV	\$0      % paid toward prin. = 89.63%

Amortization schedule (first 4 years)

Month	Beg. Balance	Payment	Interest	Principal	Ending Balance
1	72,500.00	6,441.54	725.00	5,716.54	66,783.46
2	66,783.46	6,441.54	667.83	5,773.70	61,009.76
3	61,009.76	6,441.54	610.10	5,831.44	55,178.32
4	55,178.32	6,441.54	551.78	5,889.75	49,288.57

PTS: 1                    DIF: HARD                    REF: 113–114  
 OBJ: (4.17) Loan amort: int rate, % of pmt toward principal                    BLM: Analyze

94. A homeowner just obtained a 30-year amortized mortgage loan for \$150,000 at a nominal annual rate of 6.5%, with 360 end-of-month payments. What percentage of the total payments made during the *first 3 months* will go toward payment of interest?
- 81.34%
  - 85.62%
  - 89.90%
  - 94.40%

ANS: B

Years	30	Periods/yr	12
Nominal r	6.50%	N (12 mo.)	360
PV	\$150,000	I	0.54%
FV	\$0	Total pmts	\$2,844.31
PMT	\$948.10	Interest	\$2,435.29
		% interest	85.62%

Amortization schedule (first 3 months)

Year	Beg. Balance	Payment	Interest	Principal	Ending Balance
1	150,000.00	948.10	812.50	135.60	149,864.40
2	149,864.40	948.10	811.77	136.34	149,728.06
3	149,728.06	948.10	811.03	137.08	149,590.99
Total payments:		2,844.31	2,435.29	409.01	

PTS: 1            DIF: HARD            REF: 113–114  
 OBJ: (4.17) Loan amort: pmt and % of pmt toward interest            BLM: Analyze

95. Your father now has \$1,000,000 invested in an account that pays 9.00%. He expects inflation to average 3%, and he wants to make annual constant dollar (real) end-of-year withdrawals over each of the next 20 years and end up with a zero balance after the 20th year. How large will his initial withdrawal (and thus constant dollar [real] withdrawals) be?
- \$71,725.49
  - \$75,500.52
  - \$79,474.23
  - \$83,657.08

ANS: D

$r_{\text{NOM}}$	9.00%	Initial sum	1,000,000
Inflation	3.00%	Years	20

$$r_r = [(1 + r_{\text{NOM}})/(1 + \text{growth})] - 1$$

$$r_r = 5.825243\%$$

$$\text{PMT} = \$81,220.47$$

$$\text{Adj. PMT} = \$83,657.08$$

PTS: 1            DIF: HARD            REF: 114–115  
 OBJ: (4.18) Growing annuity: withdrawing constant real amt            BLM: Analyze

96. You anticipate that you will need \$1,500,000 when you retire 30 years from now. You plan to make 30 deposits, beginning today, in a bank account that will pay 6% interest, compounded annually. You expect to receive annual raises of 4%, so you will increase the amount you deposit each year by 4%. (That is, your second deposit will be 4% greater than your first, the third will be 4% greater than the second, etc.) How much must your first deposit be if you are to meet your goal?
- \$10,216.60
  - \$10,754.31
  - \$11,320.33

d. \$11,886.35

ANS: C

Step 1. Calculate the purchasing power of \$1,500,000 in 30 years at an inflation rate of 4%:

N	30
I/YR	4.0%
PMT	\$0.00
FV	\$1,500,000
PV	\$462,478.00

Step 2. Calculate the real rate of return on the growing annuity:

$r_{\text{NOM}}$	6.0%
Inflation	4.0%
$r_f = [(1 + r_{\text{NOM}})/(1 + \text{Inflation})] - 1$	
$r_f$	1.92308%

Step 3. Calculate the required initial payment of the growing annuity by using inputs converted to “real” terms:

N	30
I/YR	1.92308%
PV	\$0.00
FV	462,478.00
PMT	\$11,320.33

PTS: 1      DIF: HARD      REF: 114–115      OBJ: (4.18) Growing annuity  
BLM: Analyze

97. You want to accumulate \$2,500,000 in your RRSP by your retirement date, which is 35 years from now. You will make 30 deposits into your plan, with the first deposit occurring today. The plan’s rate of return typically averages 9%. You expect to increase each deposit by 2% as your income grows with inflation. (That is, your second deposit will be 2% greater than your first, the third will be 2% greater than the second, etc.) How much must your first deposit at  $t = 0$  be to enable you to meet your goal?
- a. \$8,718.90
  - b. \$9,154.84
  - c. \$9,612.58
  - d. \$10,093.21

ANS: A

Step 1. Calculate the purchasing power of \$2,500,000 in 35 years at an inflation rate of 2%:

N	35
I/YR	2.0%
PMT	\$0.00
FV	\$2,500,000
PV	\$1,250,069.03

Step 2. Calculate the real rate on the growing annuity:

$r_{\text{NOM}}$	9.0%
Inflation	2.0%



$$r_f = [(1 + r_{NOM}) / (1 + \text{Inflation})] - 1$$

$$r_f = 6.86275\%$$

Step 3. Calculate the required initial payment of the growing annuity by using inputs converted to “real” terms:

N	35
I/YR	6.86275%
PV	\$0.00
FV	1,250,069.03
PMT	\$8,718.90

PTS: 1                    DIF: HARD                    REF: 114–115                    OBJ: (4.18) Growing annuity  
BLM: Analyze

98. Steve and Ed are cousins who were both born on the same day. Both turned 25 today. Their grandfather began putting \$2,500 per year into a trust fund for Steve on his 20th birthday, and he just made a sixth payment into the fund. The grandfather (or his estate’s trustee) will continue with these \$2,500 payments until a 46th and final payment is made on Steve’s 65th birthday. The grandfather set things up this way because he wants Steve to work, not to be a “trust fund baby,” but he also wants to ensure that Steve is provided for in his old age.

Until now, the grandfather has been disappointed with Ed, hence has not given him anything. However, they recently reconciled, and the grandfather decided to make an equivalent provision for Ed. He will make the first payment to a trust for Ed later today, and he has instructed his trustee to make additional equal annual payments each year until Ed turns 65, when the 41st and final payment will be made. If both trusts earn an annual return of 8%, how much must the grandfather put into Ed’s trust today and each subsequent year to enable him to have the same retirement nest egg as Steve after the last payment is made on their 65th birthday?

- \$3,726
- \$3,912
- \$4,107
- \$4,313

ANS: A

<u>Steve’s retirement account</u>		<u>Ed’s retirement account</u>	
No. of payments thus far, at end of day	6		1
Number of remaining payments	40		40
N	46	N	41
I/YR	8.0%	I/YR	8.0%
PV	\$0	PV	\$0
PMT	\$2,500	FV	\$1,046,065
FV	Ed’s FV should equal this: \$1,046,065	PMT	\$3,726

PTS: 1                    DIF: HARD                    REF: 97–99 | 102–103  
OBJ: (Comp: 4.7, 4.10) Retirement planning                    BLM: Analyze

99. After graduation, you plan to work for Dynamo Corporation for 12 years and then start your own business. You expect to save and deposit \$7,500 a year for the first 6 years and \$15,000 annually for the following 6 years, with the first deposit being made a year from today. In addition, your grandfather just gave you a \$25,000 graduation gift, which you will deposit immediately. If the account earns 9%, compounded annually, how much will you have when you start your business 12 years from now?

- a. \$238,176
- b. \$250,712
- c. \$263,907
- d. \$277,797

ANS: D

There are three cash flow streams: the gift and the two annuities. The gift will grow for 12 years. Then there is a 6-year annuity that will compound for an additional 6 years. Finally, there is a second 6-year annuity. The sum of the compounded values of those three sets of cash flows is the final amount.

		Amount at Year <u>6</u>	Amount at Year <u>12</u>
Interest rate	9.0%		
1st annuity	\$7,500	\$56,425	\$94,630
2nd annuity	\$15,000	NA	\$112,850
Gift	\$25,000	NA	<u>\$70,317</u>
Total years	12		
Annuity years	6		Final amt: \$277,797

PTS: 1                      DIF: HARD                      REF: 88 | 97-99

OBJ: (Comp: 4.2, 4.7) FV of uneven CF stream

BLM: Analyze

100. You are negotiating to make a 7-year loan of \$25,000 to Breck Inc. To repay you, Breck will pay \$2,500 at the end of Year 1, \$5,000 at the end of Year 2, and \$7,500 at the end of Year 3, plus a fixed but currently unspecified cash flow, X, at the end of Years 4 through 7. Breck is essentially riskless, so you are confident the payments will be made, and you regard 8% as an appropriate rate of return on low risk 7-year loans. What cash flow must the investment provide at the end of each of the final four years, that is, what is X?
- a. \$4,271.67
  - b. \$4,496.49
  - c. \$4,733.15
  - d. \$4,969.81

ANS: C

This is a relatively easy problem to work with Excel, but it is quite difficult to work it with a calculator because it is hard to conceptualize how to set it up for an efficient calculator solution. We would not use it for a regular classroom exam, but it might be appropriate for a take-home or online exam.

I = 8%

0	1	2	3	4	5	6	7
-\$25,000	\$2,500	\$5,000	\$7,500	X	X	X	X

Calculator solution:

- |   |              |
|---|--------------|
| Step 1. Use the CF register to find the NPV of the 4 known cash flows, CF <sub>0</sub> to CF <sub>3</sub> : | -\$12,444.75 |
| Step 2. Find the FV of this NPV at the end of period 3, i.e., compound the NPV for 3 years:                 | -\$15,676.80 |
| Step 3. Now find the PMT for a 4-year annuity with this PV.   | \$4,733.15   |

Excel solution:

Set the problem up as shown below. Put a guess—we initially guessed \$5,000—in the boxed cell under the first X. The IRR initially is greater than 8%, so lower the guess, and keep iterating until IRR = 8%. This value of X is the required payment for the investment to provide the 8% rate of return. The problem can be worked faster if you use Goal Seek. Here you would highlight the cell with the IRR, then tell Excel to change the Year 4 cell reference to the value that causes IRR = 8%. It turns out to be \$4,733.15. If input values are changed, PMT does not change automatically; you must repeat this step again.

0	1	2	3	4	5	6	7
-\$25,000	\$2,500	\$5,000	\$7,500	\$4,733.15	\$4,733.15	\$4,733.15	\$4,733.15

IRR = 8.00%

PTS: 1                      DIF: HARD                      REF: 88 | 93–94 | 102–103 | 105–106  
 OBJ: (Comp: 4.2, 4.3, 4.10, 4.12) Find CF for given return                      BLM: Analyze

101. John and Daphne are saving for their daughter Ellen’s university education. Ellen is now 10 years old and will be entering university 8 years from now ( $t = 8$ ). University tuition and expenses at City U. are currently \$14,500 a year, but they are expected to increase at a rate of 3.5% a year. John and Daphne expect Ellen to graduate in four years. (If Ellen wants to go to graduate school, she will be on her own.) Tuition and other costs will be due at the beginning of each school year (at  $t = 8, 9, 10,$  and  $11$ ). So far, John and Daphne have accumulated \$15,000 in the university savings account. Their long-run financial plan is to add an additional \$5,000 at the beginning of each of the next 4 years (at  $t = 0, 1, 2,$  and  $3$ ). Then they plan to make four equal annual contributions at the end of each of the following five years ( $t = 4, 5, 6, 7,$  and  $8$ ). They expect their investment account to earn 9%. How large must the annual payments be at  $t = 4, 5, 6, 7,$  and  $8$  to meet Ellen’s anticipated university costs?
- \$818.91
  - \$862.01
  - \$907.38
  - \$955.13

ANS: D

Current university costs	\$14,500
College cost inflation	3.5%
Account return	9.0%
First 4 payments	\$5,000
Current account balance	\$15,000

First, determine each year of university’s costs.

Year 1 of university ( $t = 8$ ) = 19,093.73  
 Year 2 of university ( $t = 9$ ) = 19,762.01  
 Year 3 of university ( $t = 10$ ) = 20,453.68  
 Year 4 of university ( $t = 11$ ) = 21,169.56

The PV (at  $t = 8$ ) of all university costs is: 70,786.26. This is what they need at  $t = 8$ .

After the first four payments, the college account will have (at  $t = 3$ ): \$42,291.08

Five more contributions are left in order to get the required funds for university costs.

N	5
I	9.0%
PV	\$42,291

FV                                 \$70,786.26  
PMT                                 \$955.13

This problem can also be solved with Excel using Goal Seek:

Period = t	University Costs:	Need to Have at t = 8	FV of Initial Balance	Payments:	FV of Pmts
now	0	14,500.00	15,000.00	5,000.00	9,962.81
	1	15,007.50		5,000.00	9,140.20
	2	15,532.76		5,000.00	8,385.50
	3	16,076.41		5,000.00	7,693.12
	4	16,639.08		955.13	1,348.25
	5	17,221.45		955.13	1,236.92
	6	17,824.20		955.13	1,134.79
	7	18,448.05		955.13	1,041.09
	8	19,093.73	70,786.26	955.13	955.13
	9	19,762.01			40,897.82
	10	20,453.68			
	11	21,169.56			

Amt. needed – FV initial bal – FV of Pmts = 0.00

Use Goal Seek to set blue pmt such that we get zero for the pink sum. Note that the Goal Seek solution step must be repeated again if input values change. It doesn't change automatically with input changes.

PTS: 1                     DIF: HARD             REF: 88 | 93–94 | 102–103 | 105–106  
OBJ: (Comp: 4.2, 4.3, 4.10, 4.12) Saving for university             BLM: Analyze

102. One of the contributing factors in the 2007 U.S. residential housing collapse was the use of Option Reset Adjustable Rate Mortgages (ARMs). Which of the following best describes this financial vehicle?
- Mortgage payments were set based on prevailing market interest rates but on only a portion of the value of the mortgage. The unpaid balance was deferred for payment in a future period.
  - The payment on the mortgage, at prevailing market rates, was based on the full value of the mortgage but was split between a portion of the payment made by the property owner, with the balance paid by a third-party financial institution.
  - Payments made on the full value of the mortgage were based on below-market interest rates. Balances owing as a result of the difference between this rate and the prevailing market interest rate were carried forward and ultimately resulted in significantly higher future payments.
  - Lending authorities initially allowed for the issuance of adjustable rate mortgages but subsequently disallowed them when it "tightened the rules." The new requirement that all mortgages be on a fixed rate basis resulted in the exclusion of many potential new home buyers, thus drying up demand in the residential housing market.

ANS: C                     PTS: 1                     DIF: MEDIUM             REF: 112  
OBJ: (4.15) Adjustable Rate Mortgages             BLM: Understand

**TRUE/FALSE**

1. Pro forma financial statements are used primarily to assess a firm's historical performance.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 126–127  
OBJ: (5.1) Pro forma statements

2. High performance companies are likely to place more emphasis on forecasting, planning, and business strategy than on cost management and cost accounting.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 125  
OBJ: (Intro.) Business strategy

3. The first, and most critical, step in constructing a set of pro forma financial statements is the sales forecast.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 128–129  
OBJ: (5.2) Pro forma statements

4. A typical sales forecast, though concerned with future events, will usually be based on recent historical trends and events as well as on forecasts of economic prospects.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 128–129  
OBJ: (5.2) Sales forecast

5. Errors in the sales forecast can be offset by similar errors in costs and income forecasts. Thus, as long as the errors are not large, sales forecast accuracy is not critical to the firm.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 128–129  
OBJ: (5.2) Sales forecast

6. As a firm's sales grow, its current assets also tend to increase. For instance, as sales increase, the firm's inventories generally increase, and purchases of inventories result in more accounts payable. Thus, spontaneously generated funds arise from transactions brought on by sales increases.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 129–131  
OBJ: (5.3) Spontaneously generated funds

7. The term "spontaneously generated funds" generally refers to increases in the cash account that result from growth in sales, assuming the firm is operating with a positive profit margin.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 130  
OBJ: (5.3) Spontaneously generated funds

8. A rapid build-up of inventories normally requires additional financing, unless the increase is matched by an equally large decrease in some other asset.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 129–131  
OBJ: (5.3) Asset increase

9. When a firm wants to maintain its ratios at their existing levels, if it has a positive sales growth rate of any amount, it will require some amount of external funding.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 129–131  
OBJ: (5.3) Additional funds needed

10. To determine the amount of additional funds needed (AFN), you may subtract the expected increase in liabilities, which represents a source of funds, from the sum of the expected increases in retained earnings and assets, both of which are uses of funds.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 129–131  
OBJ: (5.3) Additional funds needed

11. One of the key steps in the development of pro forma financial statements is to identify those assets and liabilities that increase spontaneously with sales.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 131–132  
OBJ: (5.4) Pro forma statements

12. Suppose a firm with a positive net worth is operating its fixed assets at full capacity, its dividend payout ratio is 100%, and it wants to hold all financial ratios constant. Then, for any positive growth rate in sales, it will require external financing.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 138  
OBJ: (5.3) Additional funds needed

13. Suppose that a firm's profit margin is 5%, its debt/assets ratio is 56%, and its dividend payout ratio is 40%. If the firm is operating at less than full capacity, then sales could increase to some extent without the need for external funds; however, if it is operating at full capacity with respect to all assets, including fixed assets, then any positive growth in sales will require some external financing.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 138  
OBJ: (5.3) Additional funds needed

14. Two firms with identical capital intensity ratios are generating the same amount of sales. However, Firm A is operating at full capacity, while Firm B is operating below capacity. If the two firms expect the same growth in sales during the next period, then Firm A is likely to need more additional funds than Firm B, other things held constant.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 130  
OBJ: (5.3) Capital intensity ratio

15. If a firm's capital intensity ratio ( $A^*/S_0$ ) *decreases* as sales increase, use of the AFN formula is likely to *understate* the amount of additional funds required, other things held constant.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 130  
OBJ: (5.3) Capital intensity ratio

16. The fact that long-term debt and common stock are raised infrequently and in large amounts lessens the need for the firm to forecast those accounts on a continual basis.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 137  
OBJ: (5.4) Financial forecasting

17. When we use the AFN formula to forecast the additional funds needed, we are implicitly assuming that all financial ratios are constant. This means, for example, that if you plotted a graph of inventories versus sales, the regression line would be linear and would have a positive (non zero) Y-intercept.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 141–143  
OBJ: (5.5) AFN formula and linear regression

18. The AFN formula would be appropriate if, in a regression of each asset and spontaneous liability on sales, the regression line was linear and passed through the origin.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 141–143  
OBJ: (5.5) AFN formula and linear regression

19. By developing a financial plan, a firm benefits by being forced to think about and forecast the future, set goals and establish priorities, and make sure that goals are internally consistent.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 141–143  
OBJ: (5.5) Forecasting requirement

### MULTIPLE CHOICE

1. Which of the following is NOT a key element in strategic planning as it is described in the text?
- the mission statement
  - the statement of the corporation's scope
  - the statement of cash flows
  - the statement of corporate objectives

ANS: C                      PTS: 1                      DIF: EASY                      REF: 126–127  
OBJ: (5.1) Strategic planning                      BLM: Remember

2. Which assumption is embodied in the AFN formula forecasting method?
- All balance sheet accounts are tied directly to sales.
  - Accounts payable and accruals are tied directly to sales.
  - Common stock and long-term debt are tied directly to sales.
  - Fixed assets, but not current assets, are tied directly to sales.

ANS: B                      PTS: 1                      DIF: EASY                      REF: 131–132  
OBJ: (5.4) AFN formula method                      BLM: Remember

3. Jefferson City Computers has developed a forecasting model to estimate its AFN for the upcoming year. All else being equal, which factor is most likely to lead to an *increase* of the additional funds needed?
- a sharp increase in its forecasted sales
  - a sharp reduction in its forecasted sales
  - a reduction in its dividend payout ratio
  - excess capacity in its fixed assets

ANS: A                      PTS: 1                      DIF: EASY | MEDIUM  
REF: 129–131                      OBJ: (5.3) Additional funds needed                      BLM: Understand

4. Which of the following best defines the term “additional funds needed (AFN)”?
- funds that are obtained automatically from routine business transactions
  - funds that a firm must raise externally from nonspontaneous sources, i.e., by borrowing or by selling new stock to support operations

- c. the amount of internally generated cash in a given year minus the amount of cash needed to acquire the new assets needed to support growth
- d. a forecasting approach in which the forecasted percentage of sales for each balance sheet account is held constant

ANS: B                      PTS: 1                      DIF: EASY | MEDIUM  
 REF: 129–131              OBJ: (5.3) Additional funds needed              BLM: Remember

5. Which of the following best defines the term “capital intensity ratio”?
- a. sales divided by total assets, i.e., the total assets turnover ratio
  - b. the percentage of liabilities that increase spontaneously as a percentage of sales
  - c. the ratio of current assets to sales
  - d. the amount of assets required per dollar of sales, or  $A^*/S_0$

ANS: D                      PTS: 1                      DIF: EASY | MEDIUM  
 REF: 130                      OBJ: (5.3) Capital intensity ratio                      BLM: Remember

6. Which of the following is NOT one of the steps taken in the financial planning process?
- a. Forecast financial statements and use these projections to analyze the likely effects of the operating plan on profits and various financial ratios.
  - b. Forecast the funds that will be needed to support the 5-year plan.
  - c. Develop a cash budget for use in determining when funds will be needed or when surplus funds will be available for investment.
  - d. Consult with key competitors about the optimal set of prices to charge, i.e., the prices that will maximize profits for our firm and its competitors.

ANS: D                      PTS: 1                      DIF: MEDIUM              REF: 126–127  
 OBJ: (5.1) Financial planning                      BLM: Understand

7. Which of the following statements is correct?
- a. The most important step when developing pro forma financial statements is to determine the breakdown of common equity between common stock and retained earnings.
  - b. The first, and perhaps the most critical, step in forecasting financial requirements is to forecast future sales.
  - c. In a financial plan, the way that liabilities and owner’s equity are projected to change depends on the firm’s sales forecast.
  - d. The capital intensity ratio gives us an idea of the physical condition of the firm’s fixed assets.

ANS: B                      PTS: 1                      DIF: MEDIUM              REF: 128–129  
 OBJ: (5.2) Forecasting concepts                      BLM: Understand

8. Which of the following best defines the term “spontaneously generated funds”?
- a. the amount of assets required per dollar of sales
  - b. a forecasting approach in which the forecasted percentage of sales for each item is held constant
  - c. funds that a firm must raise externally through borrowing or by selling new common or preferred stock
  - d. funds that are obtained automatically from normal operations, which include spontaneous increases in accounts payable and accruals, plus additions to retained earnings

ANS: D                      PTS: 1                      DIF: MEDIUM              REF: 129–131  
 OBJ: (5.3) Spontaneously generated funds                      BLM: Remember



9. A company expects sales to increase during the coming year, and it is using the AFN equation to forecast the additional capital that it must raise. Which of the following conditions would cause the AFN to *increase*?
- The company increases its dividend payout ratio.
  - The company begins to pay employees monthly rather than weekly.
  - The company's profit margin increases.
  - The company decides to stop taking discounts on purchased materials.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 129–131

OBJ: (5.3) Additional funds needed                      BLM: Understand

10. Which factors are used to determine the level of sales that a firm can generate without having to raise any external funds (self-supporting growth rate)?
- profits retained from sales, and assets and liabilities tied to sales
  - total profit from sales, and assets and liabilities tied to sales
  - profits retained from sales, and total assets and liabilities
  - total sales, and total assets and liabilities

ANS: A                      PTS: 1                      DIF: EASY                      REF: 131

OBJ: (5.3) Self-supporting growth rate                      BLM: Remember

11. Which of the following is NOT an issue in the process of the FFS method?
- analyzing the interaction of all decisions of the firm
  - projecting the consequences of decisions to avoid surprises
  - establishing capital budgeting procedures
  - measuring performance against the plan

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 131–132

OBJ: (5.4) Forecasted financial statement method                      BLM: Remember

12. Which term best describes a relationship in which very large increases in sales require very little additional inventory?
- Lumpiness
  - Curvilinear
  - declining ratio
  - constant ratio

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 141–143

OBJ: (5.5) Balance sheet ratio                      BLM: Remember

13. Other things being equal, firms pursuing which type of working capital strategy will need what type of long-term external financing?
- aggressive, less
  - conservation, less
  - moderate, less
  - aggressive, more

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 141–143

OBJ: (5.5) Financing requirement                      BLM: Understand

14. Which of the following statements is correct?
- Once a firm has defined its purpose, scope, and objectives, it must develop a strategy, or strategies, for achieving its goals. The statement of corporate strategies sets forth detailed plans rather than broad approaches.
  - A firm's corporate purpose states the general philosophy of the business and provides

managers with specific operational objectives.

- c. Operating plans provide detailed guidance, consistent with the corporate strategy, to help operating managers meet the corporate objectives. These operating plans can be developed for any time horizon, but many companies use a 5-year horizon.
- d. A firm's mission statement defines its lines of business and geographic area of operations.

ANS: C                      PTS: 1                      DIF: MEDIUM | HARD  
REF: 126–127              OBJ: (5.1) Operating plans and corporate strategies  
BLM: Understand

15. Which of the following statements is correct?
- a. Since accounts payable and accrued liabilities must eventually be paid off, as these accounts increase, AFN as calculated by the AFN equation must also increase.
  - b. Suppose a firm is operating its fixed assets at below 100% of capacity, but it has no excess current assets. Based on the AFN equation, its AFN will be larger than if it had been operating with excess capacity in both fixed and current assets.
  - c. If a firm retains all of its earnings, then it cannot require any additional funds to support sales growth.
  - d. Additional funds needed (AFN) are typically raised using a combination of notes payable, long-term debt, and common stock. Such funds are nonspontaneous in the sense that they require explicit financing decisions to obtain them.

ANS: D                      PTS: 1                      DIF: MEDIUM | HARD  
REF: 129–131              OBJ: (5.3) Additional funds needed              BLM: Understand

16. Which of the following statements is correct?
- a. When we use the AFN formula, we assume that the ratios of assets and liabilities to sales ( $A^*/S_0$  and  $L^*/S_0$ ) vary from year to year in a stable, predictable manner.
  - b. Firms whose fixed assets are “lumpy” frequently have excess capacity, and this should be accounted for in the financial forecasting process.
  - c. For a firm that uses lumpy assets, it is impossible to have small increases in sales without expanding fixed assets.
  - d. When fixed assets are added in large, discrete units as a company grows, the assumption of constant ratios is more appropriate than if assets are relatively small and can be added in small increments as sales grow.

ANS: B                      PTS: 1                      DIF: MEDIUM | HARD  
REF: 141–143              OBJ: (5.5) Forecasting financial requirements  
BLM: Analyze

17. Which of the following statements is correct?
- a. Because the process of planning involves long periods of time, only long-term considerations are involved.
  - b. Financial planning is built upon the assumption of the target capital structure being made.
  - c. If total assets increase by the same percentage as sales increase, then assets and sales will increase by same dollar amounts.
  - d. Financial planning models always include the three basic elements of firm value: cash flow size, risk, and timing.

ANS: B                      PTS: 1                      DIF: MEDIUM | HARD  
REF: 141–143              OBJ: (5.5) Forecasting financial requirements  
BLM: Understand

18. Suppose that Kamath-Meier Corporation's CFO uses this equation, which was developed by regressing inventories on sales over the past 5 years, to forecast inventory requirements:  $\text{Inventories} = \$22.0 + 0.125(\text{Sales})$ . The company expects sales of \$400 million during the current year, and it expects sales to grow by 30% next year. All dollars are in millions. What is the inventory forecast for next year?
- \$74.6
  - \$78.5
  - \$82.7
  - \$87.0

ANS: D

Current year's sales	\$400.0
Growth rate	30%
Projected Sales	\$520.0

$$\begin{aligned} \text{Required inventories} &= \$22.0 + 0.125 \times \text{Projected Sales} \\ &= \$22.0 + 0.125 \times \$520.0 \\ &= \$87.0 \end{aligned}$$

PTS: 1

DIF: EASY

REF: 136–137

OBJ: (5.4) Forecasting inventories—regression analysis

BLM: Analyze

19. Last year Godinho Corp. had \$250 million of sales, and it had \$75 million of fixed assets that were being operated at 80% of capacity. In millions, how large could sales have been if the company had operated at full capacity?
- \$312.5
  - \$328.1
  - \$344.5
  - \$361.8

ANS: A

Sales	\$250.0
Fixed assets	\$75.0
% of capacity utilized	80.0%

$$\text{Full capacity sales} = \text{Actual sales} / \% \text{ of capacity used} = \$312.5$$

PTS: 1

DIF: EASY

REF: 141–143

OBJ: (5.5) Excess capacity and potential sales

BLM: Analyze

20. Fairchild Garden Supply expects \$600 million of sales this year, and it forecasts a 15% increase for next year. The CFO uses this equation to forecast inventory requirements at different levels of sales:  $\text{Inventories} = \$30.2 + 0.25(\text{Sales})$ . All dollars are in millions. What is the projected inventory turnover ratio for the coming year?
- 3.40
  - 3.57
  - 3.75
  - 3.94

ANS: A

Current year's sales	\$600
Growth rate	15%
Projected Sales	\$69

$$\text{Required inventories} = \$30.2 + 0.25 \times \text{Projected Sales}$$

$$= \$30.2 + 0.25 \times \$690.0$$

$$= \$202.7$$

Inventory turnover = Sales/Inventories = 3.40

PTS: 1                    DIF: MEDIUM      REF: 136–137

OBJ: (5.4) Forecasting inventories and turnover                    BLM: Analyze

21. Last year Wei Guan Inc. had \$350 million of sales, and it had \$270 million of fixed assets that were used at 65% of capacity. In millions, by how much could Wei Guan's sales increase before it is required to increase its fixed assets?
- \$170.1
  - \$179.0
  - \$188.5
  - \$197.9

ANS: C

Sales	\$350	
Fixed assets (not used in calculations)		\$270
% of capacity utilized		65%

Sales at full capacity = Actual sales/% of capacity used = \$538

Additional sales without adding FA = full capacity sales – actual sales = \$188.5

PTS: 1                    DIF: MEDIUM      REF: 141–143

OBJ: (5.5) Excess capacity and sales growth                    BLM: Analyze

22. Last year Handorf-Zhu Inc. had \$850 million of sales, and it had \$425 million of fixed assets that were used at only 60% of capacity. What is the maximum sales growth rate the company could achieve before it had to increase its fixed assets?
- 57.16%
  - 60.17%
  - 63.33%
  - 66.67%

ANS: D

Sales	\$850
Fixed assets (not used in calculations)	\$425
% of capacity utilized	60%

Sales at full capacity = Actual sales/% of capacity used = \$1,417

Additional sales without adding FA = full capacity sales – actual sales = \$567

Percent growth in sales = additional sales/old sales = 66.67%

PTS: 1                    DIF: MEDIUM      REF: 141–143

OBJ: (5.5) Excess capacity and sales growth                    BLM: Analyze

23. Last year Jain Technologies had \$250 million of sales and \$100 million of fixed assets, so its FA/Sales ratio was 40%. However, its fixed assets were used at only 75% of capacity. Now the company is developing its financial forecast for the coming year. As part of that process, the company wants to set its target Fixed Assets/Sales ratio at the level it would have had had it been operating at full capacity. What target FA/Sales ratio should the company set?
- 28.5%
  - 30.0%

- c. 31.5%
- d. 33.1%

ANS: B

Sales	\$250
Fixed assets	\$100
% of capacity utilized	75%

Sales at full capacity = Actual sales/% of capacity used = \$333

Target FA/Sales ratio = Full capacity FA/Sales = FA/capacity sales = 30.0%

PTS: 1                      DIF: MEDIUM      REF: 141–143

OBJ: (5.5) Finding the target fixed assets/sales ratio                      BLM: Analyze

24. ABC Co. is planning its operations for next year, and Ronnie Clayton, the CEO, wants you to forecast the firm's additional funds needed (AFN). Data for use in your forecast are shown below. Based on the AFN equation, what is the AFN for the coming year? Dollars are in millions.

Last year's sales = $S_0$	\$350	Last year's accounts payable	\$40
Sales growth rate = $g$	30%	Last year's notes payable (to bank)	\$50
Last year's total assets = $A_0$	\$500	Last year's accruals	\$30
Last year's profit margin = $M$	5%	Target payout ratio	60%

- a. \$102.8
- b. \$108.2
- c. \$113.9
- d. \$119.9

ANS: D

Last year's sales = $S_0$	\$350
Sales growth rate = $g$	30%
Forecasted sales = $S_0 \cdot (1 + g)$	\$455
$\Delta S$ = change in sales = $S_1 - S_0 = S_0 \cdot g$	\$105
Last year's total assets = $A_0 = A^*$ since full capacity	\$500
Forecasted total assets = $A_1 = A_0 \cdot (1 + g)$	\$650
Last year's accounts payable	\$40
Last year's notes payable. Not spontaneous, so does not enter AFN calculation	\$50
Last year's accruals	\$30
$L^*$ = payables + accruals	\$70
Profit margin = $M$	5.0%
Target payout ratio	60.0%
Retention ratio = $(1 - \text{Payout})$	40.0%

$$\begin{aligned} \text{AFN} &= (A^*/S_0)\Delta S - (L^*/S_0)\Delta S - \text{Margin} \cdot S_1 \cdot (1 - \text{Payout}) \\ &= \$150 - \$21 - \$9.1 = \$119.9 \end{aligned}$$

PTS: 1                      DIF: MEDIUM | HARD                      REF: 129–131

OBJ: (5.3) Additional funds needed—positive AFN                      BLM: Analyze

25. Chua Chang & Wu Inc. is planning its operations for next year, and the CEO wants you to forecast the firm's additional funds needed (AFN). Data for use in your forecast are shown below. Based on the AFN equation, what is the AFN for the coming year?

Last year's sales = $S_0$	\$200,000	Last year's accounts payable	\$50,000
Sales growth rate = $g$	40%	Last year's notes payable (to bank)	\$15,000
Last year's total assets = $A_0$	\$135,000	Last year's accruals	\$20,000
Last year's profit margin = $M$	20.0%	Target payout ratio	25.0%

- \$14,440
- \$15,200
- \$16,000
- \$17,640

ANS: C

Last year's sales = $S_0$	\$200,000
Sales growth rate = $g$	40%
Forecasted sales = $S_0 \cdot (1 + g)$	\$280,000
$\Delta S$ = change in sales = $S_1 - S_0 = S_0 \cdot g$	\$80,000
Last year's total assets = $A_0 = A^*$ since full capacity	\$135,000
Forecasted total assets = $A_1 = A_0 \cdot (1 + g)$	\$189,000
Last year's accounts payable	\$50,000
Last year's notes payable. Not spontaneous, so does not enter AFN calculation	\$15,000
Last year's accruals	\$20,000
$L^*$ = payables + accruals	\$70,000
Profit margin = $M$	20.0%
Target payout ratio	25.0%
Retention ratio = $(1 - \text{Payout})$	75.0%

$$\begin{aligned} \text{AFN} &= (A^*/S_0)\Delta S - (L^*/S_0)\Delta S - \text{Margin} \cdot S_1 \cdot (1 - \text{Payout}) \\ &= \$54,000 - \$28,000 - \$42,000 = -\$16,000 \end{aligned}$$

PTS: 1                      DIF: MEDIUM | HARD                      REF: 129–131  
 OBJ: (5.3) Additional funds needed—negative AFN                      BLM: Analyze

26. Suppose a firm has net income of \$8 on sales of \$40, fixed assets of \$75, and total assets of \$90. The firm retains 50% of its earnings. If the firm is operating at 80% capacity, what are the full capacity sales?
- \$40
  - \$48
  - \$50
  - \$72

ANS: C

Full capacity sales = sales/current capacity =  $\$40/0.8 = \$50$

PTS: 1                      DIF: MEDIUM | HARD                      REF: 141–143  
 OBJ: (5.5) Under capacity                      BLM: Analyze

27. Howton & Howton Worldwide (HHW) is planning its operations for the coming year, and the CEO wants you to forecast the firm's additional funds needed (AFN). Data for use in the forecast are shown below. However, the CEO is concerned about the impact of a change in the payout ratio from the 10% that was used in the past to 50%, which the firm's investment bankers have recommended. Based on the AFN equation, by how much would the AFN for the coming year change if HHW increased the payout from 10% to the new and higher level? All dollars are in millions.

Last year's sales = $S_0$	\$300.0	Last year's accounts payable	\$50.0
Sales growth rate = $g$	40%	Last year's notes payable (to bank)	\$15.0

Last year's total assets = $A_0$	\$500.0	Last year's accruals	\$20.0
Last year's profit margin = $M$	20.0%	Initial payout ratio	10.0%
		New payout ratio	50.0%

- a. \$31.9
- b. \$33.6
- c. \$35.3
- d. \$37.0

ANS: B

Last year's sales = $S_0$	\$300
Sales growth rate = $g$	40%
Forecasted sales = $S_0 \cdot (1 + g)$	\$420
$\Delta S$ = change in sales = $S_1 - S_0 = S_0 \cdot g$	\$120
Last year's total assets = $A_0 = A^*$ since full capacity	\$500
Forecasted total assets = $A_1 = A_0 \cdot (1 + g)$	\$700
Last year's accounts payable	\$50
Last year's notes payable. Not spontaneous, so does not enter AFN calculation	\$15
Last year's accruals	\$20
$L^*$ = payables + accruals	\$70
Profit margin = $M$	20%
Initial payout ratio	10%
New payout ratio	50%
Initial retention ratio = $(1 - \text{Payout})$	90%
New retention ratio = $(1 - \text{Payout})$	50%

$$\text{AFN} = (A^*/S_0)\Delta S - (L^*/S_0)\Delta S - \text{Margin} \cdot S_1 \cdot (1 - \text{Payout})$$

$$\text{Old AFN} = \$200.0 - \$28.0 - \$75.6 = \$96.4$$

$$\text{New AFN} = \$200.0 - \$28.0 - \$42.0 = \$130.0$$

$$\text{Change in AFN} = \$33.6$$

PTS: 1                      DIF: MEDIUM | HARD                      REF: 129–131  
 OBJ: (5.3) Additional funds needed—changing dividend payout  
 BLM: Analyze

28. Last year Emery Industries had \$450 million of sales and \$225 million of fixed assets, so its FA/Sales ratio was 50%. However, its fixed assets were used at only 65% of capacity. If the company had been able to sell off enough of its fixed assets at book value so that it was operating at full capacity, with sales held constant at \$450 million, how much cash (in millions) would it have generated?
- a. \$74.81
  - b. \$78.75
  - c. \$82.69
  - d. \$86.82

ANS: B

Sales	\$450
Fixed assets	\$225
% of capacity utilized	65%

$$\text{Sales at full capacity} = \text{Actual sales} / \% \text{ of capacity used} = \$692$$

$$\text{Target FA/Sales ratio} = \text{Full capacity FA/Sales} = \text{FA/capacity sales} = 32.50\%$$

$$\text{Optimal FA} = \text{Sales} \cdot \text{target FA/Sales ratio} = \$146.25$$

$$\text{Cash generated} = \text{Actual FA} - \text{Optimal FA} = \$78.75$$

PTS: 1                    DIF: HARD                    REF: 141-143

OBJ: (5.5) Finding the target fixed assets/sales ratio

BLM: Analyze



## CHAPTER 6—BONDS, BOND VALUATION, AND INTEREST RATES

### TRUE/FALSE

1. Maple bonds are issued by the government of Canada in Canadian dollars but only sold to foreign investors.

ANS: F

Maple bonds are issued by foreigners in Canadian dollars and in Canada. The advantage is no foreign interest-rate risk for investors.

PTS: 1                      DIF: EASY                      REF: 155–156                      OBJ: (6.1) Bond issuer

2. If a firm raises capital by selling new bonds, it is called the “issuing firm,” and the coupon rate is generally set equal to the required rate on bonds of equal risk.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 156–157

OBJ: (6.2) Issuing bonds

3. A call provision gives bondholders the right to demand, or “call for,” repayment of a bond. Typically, calls are exercised if interest rates rise, because when rates rise the bondholder can get the principal amount back and reinvest it elsewhere at higher rates.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 157–158

OBJ: (6.2) Call provision

4. Sinking funds are devices used to force companies to retire bonds on a scheduled basis prior to their maturity. Many bond indentures allow the company to acquire bonds for a sinking fund by either purchasing bonds in the market or selecting the bonds to be acquired by a lottery administered by the trustee through a call at face value.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 158

OBJ: (6.2) Sinking fund

5. A zero coupon bond is a bond that pays no interest and is offered (and subsequently sells initially) at par. These bonds provide compensation to investors in the form of capital appreciation.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 157

OBJ: (6.2) Zero coupon bond

6. The desire for floating-rate bonds, and consequently their increased usage, arose out of the experience of the early 1980s, when inflation pushed interest rates up to very high levels.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 156–157

OBJ: (6.2) Floating-rate debt

7. The market value of any financial asset may be estimated by determining future cash flows and then discounting them back to the present.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 159–161

OBJ: (6.3) Discounted cash flows

8. For bonds, price sensitivity to a given change in interest rates is generally greater the longer before the bond matures.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 159–161  
OBJ: (6.3) Bond prices and interest rates

9. As a general rule, a company's debentures have higher required interest rates than its mortgage bonds because mortgage bonds are backed by specific assets while debentures are unsecured.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 172  
OBJ: (6.11) Mortgage bond

10. Other things being equal, a firm will have to pay a higher coupon rate on its subordinated debentures than on its second mortgage bonds.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 172  
OBJ: (6.11) Debt coupon rate

11. There is an inverse relationship between bonds' quality ratings and their required rates of return.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 172–174  
OBJ: (6.11) Bond ratings and required returns

12. A bond that had a 20-year original maturity with 1 year left to maturity has more interest rate price risk than a 10-year original maturity bond with 1 year left to maturity. (Assume that the bonds have equal default risk and equal coupon rates, and they cannot be called.)

ANS: F                      PTS: 1                      DIF: EASY                      REF: 175–176  
OBJ: (6.13) Interest rate risk

13. The risk in bond prices due to fluctuations in interest rates is called reinvestment risk.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 175–176  
OBJ: (6.13) Interest rate risk

14. Junk bonds are high-risk, high-yield debt instruments. They are often used to finance leveraged buyouts and mergers, and to provide financing to companies of questionable financial strength.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 179  
OBJ: (6.15) Junk bond

15. Although Maple bonds are foreign bonds, they have no currency risk.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 156  
OBJ: (6.1) Maple bond

16. With no interim interest payment, zero bonds are not a good investment kept in the RRSP account.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 157  
OBJ: (6.2) Zero bond

17. The Canada call feature stops a bond being called prior to its maturity because a higher buyback price is involved.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 157–158  
OBJ: (6.2) Provisions to call

18. When interest rates fall, investors have more incentive to sell their retractable bonds back to the issuer.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 158  
OBJ: (6.2) Retractable bond

19. Under no circumstances are bondholders allowed to turn in their holdings unless the bonds are retractable.

ANS: F  
Bondholders are sometimes allowed to turn in their holdings to the issuers at par in the event of a takeover, merger, or recapitalization.

PTS: 1                      DIF: MEDIUM                      REF: 158                      OBJ: (6.2) Super poison put

20. A bond that is callable has a chance of being retired earlier than its stated term to maturity. Therefore, if the yield curve is upward sloping, an outstanding callable bond should have a lower yield to maturity than an otherwise identical noncallable bond.

ANS: F  
The callable bond will be called if rates fall far enough below the coupon rate, but it will not be called otherwise. Thus, the call provision can harm only bondholders. Therefore, callable bonds sell at higher yields than noncallable bonds, regardless of the slope of the yield curve.

PTS: 1                      DIF: MEDIUM                      REF: 157–158                      OBJ: (6.2) Callable bonds

21. Income bonds pay interest only if the issuing company actually earns the indicated interest. Thus, these securities cannot bankrupt a company, and this makes them safer from an investor's perspective than regular bonds.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 159  
OBJ: (6.2) Income bond

22. Suppose you are considering two bonds that will be issued tomorrow. Both are rated triple B (BBB, the lowest investment-grade rating), both mature in 20 years, both have a 10% coupon, neither can be called except for sinking fund purposes, and both are offered to you at their \$1,000 par values. However, Bond SF has a sinking fund while Bond NSF does not. Under the sinking fund, the company must call and pay off 5% of the bonds at par each year. The yield curve at the time is upward sloping. The bond's prices, being equal, are probably not in equilibrium, as Bond SF, which has the sinking fund, would generally be expected to have a higher yield than Bond NSF.

ANS: F  
The sinking fund would give Bond SF a lower average maturity, and it would also lower its risk. Therefore, Bond SF should have a lower, not a higher, yield.

PTS: 1                      DIF: MEDIUM                      REF: 158                      OBJ: (6.2) Sinking fund

23. Issued by the government of Canada, real return bonds are free from default risk. However, they are still subject to interest rate risk.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 159  
OBJ: (6.2) Real return bond

24. Floating-rate debt is advantageous to investors because the interest rate moves up if market rates rise. Since floating-rate debt shifts interest rate risk to companies, it offers no advantages to issuers.

ANS: F

Floating rates can benefit issuers if rates decline, so a company that thinks rates are likely to fall would want to issue such bonds.

PTS: 1                    DIF: MEDIUM      REF: 157                    OBJ: (6.2) Floating-rate debt

25. A bond has a \$1,000 par value, makes annual interest payments of \$100, has 5 years to maturity, cannot be called, and is not expected to default. The bond should sell at a premium if interest rates are below 10% and at a discount if interest rates are greater than 10%.

ANS: T                    PTS: 1                    DIF: MEDIUM      REF: 159–161

OBJ: (6.3) Bond premiums and discounts

26. You have funds that you want to invest in bonds, and you just noticed in the financial pages of the local newspaper that you can buy a \$1,000 par value bond for \$800. The coupon rate is 10% (with annual payments), and there are 10 years before the bond will mature and pay off its \$1,000 par value. You should buy the bond if your required return on bonds with this risk is 12%.

ANS: T

The bond's expected return (YTM) is 13.81%, which exceeds the 12% required return, so buy the bond.

PTS: 1                    DIF: MEDIUM      REF: 159–161

OBJ: (6.3) Bond value—annual payment

27. If the required rate of return on a bond ( $r_d$ ) is greater than its coupon interest rate and will remain above that rate, then the market value of the bond will always be below its par value until the bond matures, at which time its market value will equal its par value. (Accrued interest between interest payment dates should not be considered when answering this question.)

ANS: T                    PTS: 1                    DIF: MEDIUM      REF: 165–167

OBJ: (6.5) Bond value

28. “Restrictive covenants” are designed primarily to protect bondholders by constraining the actions of managers. Such covenants are spelled out in bond indentures.

ANS: T                    PTS: 1                    DIF: MEDIUM      REF: 171

OBJ: (6.11) Restrictive covenants

29. A bond rating agency will rely exclusively on quantitative data to determine the risk that a firm may default on its debt servicing obligations.

ANS: F                    PTS: 1                    DIF: EASY            REF: 172–174

OBJ: (6.11) Bond ratings

30. Bond spread is the premium in interest rate that must be paid on a security that carries some risk that the issuer may not be able to meet all of its debt servicing obligations.

ANS: T                    PTS: 1                    DIF: EASY            REF: 172–174

OBJ: (6.11) Bond ratings

31. The prices of high-coupon bonds tend to be less sensitive to a given change in interest rates than low-coupon bonds, other things held constant.

ANS: T

The reason for this is that more of the cash flows of a low-coupon bond comes late in the bond's life (as the maturity payment), and later cash flows are impacted most heavily by changing market rates.

PTS: 1                      DIF: MEDIUM                      REF: 175–177

OBJ: (6.13) Prices and interest rates

32. Because short-term interest rates are much more volatile than long-term rates, you would, in the real world, generally be subject to much more interest rate price risk if you purchased a 30-day bond than if you bought a 30-year bond.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 175–177

OBJ: (6.13) Interest rate risk

### MULTIPLE CHOICE

1. Suppose a Chinese company in Canada issues a bond that is denominated in Canadian dollars. What is this an example of?
- a domestic bond
  - a global bond
  - a foreign bond
  - a Eurobond

ANS: C                      PTS: 1                      DIF: EASY                      REF: 156

OBJ: (6.1) Maple bond                      BLM: Remember

2. A 15-year corporate bond was issued 10 years ago. What is it today?
- a long-term bond with 5 years to maturity
  - a medium-term bond with 5 years to maturity
  - a long-term bond with 15 years to maturity
  - a medium-term bond with 15 years to maturity

ANS: B                      PTS: 1                      DIF: EASY                      REF: 157

OBJ: (6.2) Maturity                      BLM: Remember

3. Which statement regarding bond maturity is true?
- Any maturity is legally permissible.
  - The longest term of maturity for corporate bonds is 50 years.
  - Real return bonds have the shortest term of maturity.
  - Perpetuity bonds must have a specified maturity date.

ANS: A                      PTS: 1                      DIF: EASY                      REF: 157

OBJ: (6.2) Maturity                      BLM: Remember

4. In corporate bonds, what is a “Canada call” used for calculating?
- the maturity date
  - the default probability
  - the market risk
  - the buy-back price

ANS: D                      PTS: 1                      DIF: EASY                      REF: 157–158  
OBJ: (6.2) Callable bond                      BLM: Remember

5. Which of the following statements best describes interest rates?
- You hold two bonds. One is a 10-year, zero coupon issue, and the other is a 10-year bond that pays a 6% annual coupon. The same market rate, 6%, applies to both bonds. If the market rate rises from the current level, the zero coupon bond will experience the *larger* percentage decline.
  - The time to maturity does not affect the change in the value of a bond in response to a given change in interest rates.
  - The shorter the time to maturity, the greater the change in the value of a bond in response to a given change in interest rates.
  - The longer the time to maturity, the smaller the change in the value of a bond in response to a given change in interest rates.

ANS: A                      PTS: 1                      DIF: EASY                      REF: 165–167  
OBJ: (6.5) Interest rates                      BLM: Understand

6. Which event would make it more likely that a company would choose to call its outstanding callable bonds?
- The company's bonds are downgraded.
  - Market interest rates decline sharply.
  - The company's financial situation deteriorates significantly.
  - Inflation increases significantly.

ANS: B                      PTS: 1                      DIF: EASY                      REF: 158  
OBJ: (6.2) Callable bond                      BLM: Understand

7. A 10-year bond with a 9% annual coupon has a yield to maturity of 8%. Which statement about this bond is correct?
- The bond is selling below its par value.
  - The bond is selling at a discount.
  - If the yield to maturity remains constant, the bond's price 1 year from now will be lower than its current price.
  - The bond's current yield is greater than 9%.

ANS: C                      PTS: 1                      DIF: EASY                      REF: 159–165  
OBJ: (Comp: 6.3, 6.4) Bond concepts                      BLM: Understand

8. Which of the following statements is correct?
- All else being equal, senior debt generally has a lower yield to maturity than subordinated debt.
  - The expected return on a corporate bond will generally exceed the bond's yield to maturity.
  - If a bond's coupon rate exceeds its yield to maturity, then its expected return to investors exceeds the yield to maturity.
  - Under our bankruptcy laws, any firm that is in financial distress will be forced to declare bankruptcy and then be liquidated.

ANS: A                      PTS: 1                      DIF: EASY  
REF: 163–165 | 172–174 | 179–180                      OBJ: (Comp: 6.4, 6.11, 6.16) Bonds, default risk  
BLM: Understand

9. Tucker Corporation is planning to issue new 20-year bonds. Initially, the plan was to make the bonds non-callable. If the bonds were made callable after 5 years at a 5% call premium, how would this affect their required rate of return?
- Because of the call premium, the required rate of return would decline.
  - There is no reason to expect a change in the required rate of return.
  - The required rate of return would decline because the bond would then be less risky to a bondholder.
  - The required rate of return would increase because the bond would then be more risky to a bondholder.

ANS: D                      PTS: 1                      DIF: EASY | MEDIUM  
REF: 157–158              OBJ: (6.2) Call provision                      BLM: Understand

10. Under normal conditions, which action would be most likely to increase the coupon rate required to enable a bond to be issued at par?
- adding additional restrictive covenants that limit management's actions
  - adding a call provision
  - the rating agencies changing the bond's rating from Baa to Aaa
  - adding a sinking fund

ANS: B                      PTS: 1                      DIF: EASY | MEDIUM  
REF: 157–158 | 172–174                      OBJ: (6.2, 611) Bond coupon rate  
BLM: Understand

11. Which bond would have the greatest percentage increase in value if all interest rates fall by 1%?
- 10-year, zero coupon bond
  - 20-year, 10% coupon bond
  - 20-year, 5% coupon bond
  - 20-year, zero coupon bond

ANS: D                      PTS: 1                      DIF: EASY | MEDIUM  
REF: 175–176              OBJ: (6.13) Interest rate risk                      BLM: Understand

12. Assume that all interest rates in the economy decline from 10% to 9%. Which bond would have the *largest* percentage increase in price?
- a 1-year bond with a 15% coupon
  - a 3-year bond with a 10% coupon
  - an 8-year bond with a 9% coupon
  - a 10-year zero coupon bond

ANS: D                      PTS: 1                      DIF: EASY | MEDIUM  
REF: 175–176              OBJ: (6.13) Interest rate risk                      BLM: Understand

13. Which bond has the greatest interest rate price risk?
- a 10-year \$100 annuity
  - a 10-year, \$1,000 face value, zero coupon bond
  - a 10-year, \$1,000 face value, 10% coupon bond with annual interest payments
  - All 10-year bonds have the same price risk since they have the same maturity.

ANS: B                      PTS: 1                      DIF: EASY | MEDIUM  
REF: 175–176              OBJ: (6.13) Interest rate risk                      BLM: Understand

14. If its yield to maturity declined by 1%, which bond would have the largest percentage increase in value?
- a 1-year zero coupon bond

- b. a 1-year bond with an 8% coupon
- c. a 10-year bond with an 8% coupon
- d. a 10-year zero coupon bond

ANS: D                      PTS: 1                      DIF: EASY | MEDIUM  
 REF: 175–176              OBJ: (6.13) Interest rate risk                      BLM: Understand

15. Which statement regarding sinking funds is true?
- a. Sinking fund provisions sometimes adversely affect bondholders, and this is most likely to occur if interest rates decline after the bond has been issued.
  - b. Most sinking funds require the issuer to provide funds to a trustee, which saves the money so that it will be available to pay off bondholders when the bonds mature.
  - c. A sinking fund provision makes a bond more risky to investors at the time of issuance.
  - d. Sinking fund provisions never require companies to retire their debt; they only establish “targets” for the company to reduce its debt over time.

ANS: A                      PTS: 1                      DIF: MEDIUM              REF: 158  
 OBJ: (6.2) Sinking funds                      BLM: Remember

16. Amram Inc. can issue a 20-year bond with a 6% annual coupon. This bond is not convertible, is not callable, and has no sinking fund. Alternatively, Amram could issue a 20-year bond that is convertible into common equity, may be called, and has a sinking fund. What is the coupon rate that Amram would have to pay on the *convertible, callable* bond?
- a. It could be less than, equal to, or greater than 6%.
  - b. It is greater than 6%.
  - c. It is exactly equal to 6%.
  - d. It is less than 6%.

ANS: A                      PTS: 1                      DIF: MEDIUM              REF: 157–159  
 OBJ: (6.2) Convertible, callable bonds                      BLM: Analyze

17. Three \$1,000 face value bonds that mature in 10 years have the same level of risk, hence their YTM's are equal. Bond A has an 8% annual coupon, Bond B has a 10% annual coupon, and Bond C has a 12% annual coupon. Bond B sells at par. Assuming interest rates remain constant for the next 10 years, which statement about these bonds is true?
- a. Bond A's current yield will increase each year.
  - b. Bond C sells at a premium (its price is greater than par), and its price is expected to increase over the next year.
  - c. Bond A sells at a discount (its price is less than par), and its price is expected to increase over the next year.
  - d. Over the next year, prices of Bond A, B, and C are expected to decrease, stay the same, and increase, respectively.

ANS: C  
 Note that Bond B sells at par, so the required return on all these bonds is 10%. Bond B's price will remain constant; Bond A will sell initially at a discount and will rise, and Bond C will sell initially at a premium and will decline. Note too that since it has larger cash flows from its higher coupons, Bond C would be less sensitive to interest rate changes, i.e., it has less interest rate risk. Perhaps it has less default risk.

PTS: 1                      DIF: MEDIUM              REF: 159–161              OBJ: (6.3) Bond concepts  
 BLM: Analyze

18. A 10-year corporate bond has an annual coupon of 9%. The bond is currently selling at par (\$1,000). Which of the following statements is NOT correct?



- a. The bond's expected capital gains yield is positive.
- b. The bond's yield to maturity is 9%.
- c. The bond's current yield is 9%.
- d. The bond's current yield exceeds its capital gains yield.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 163–164  
 OBJ: (6.4) Bond yields                      BLM: Analyze

19. Which statement regarding bond yields is true?
- a. A zero coupon bond's current yield is equal to its yield to maturity.
  - b. If a bond's yield to maturity exceeds its coupon rate, the bond will sell at par.
  - c. All else being equal, if a bond's yield to maturity increases, its price will fall.
  - d. If a bond's yield to maturity exceeds its coupon rate, the bond will sell at a premium over par.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 163–164  
 OBJ: (6.4) Bond yields                      BLM: Understand

20. A 15-year bond with a face value of \$1,000 currently sells for \$850. Which statement regarding the bond's yield is true?
- a. The bond's coupon rate exceeds its current yield.
  - b. The bond's current yield exceeds its yield to maturity.
  - c. The bond's yield to maturity is greater than its coupon rate.
  - d. The bond's current yield is equal to its coupon rate.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 163–164  
 OBJ: (6.4) Bond yields                      BLM: Understand

21. A 10-year bond pays an annual coupon, its YTM is 8%, and it currently trades at a premium. Which statement regarding the bond's yield is true?
- a. The bond's current yield is less than 8%.
  - b. If the yield to maturity remains at 8%, then the bond's price will decline over the next year.
  - c. The bond's coupon rate is less than 8%.
  - d. If the yield to maturity remains at 8%, then the bond's price will remain constant over the next year.

ANS: B  
 (c) and (d) are clearly wrong, and (b) is clearly correct. (a) is also wrong, but this is not obvious to most people. We can demonstrate that (a) is incorrect by using the following example.

Par	\$1,000	
YTM	8.00%	
Maturity	10	
Price	\$1,100	
Payment	\$94.90	
Coupon rate	9.49%	
Current yield	8.63%	The current yield is greater than 8%.

PTS: 1                      DIF: MEDIUM                      REF: 163–164                      OBJ: (6.4) Bond yields  
 BLM: Analyze

22. What does the yield to maturity on bonds refer to?
- a. the number of years before the bond's maturity
  - b. the amount of interest income received by investors each year

- c. the promised rate of return on the bonds if purchased at current price and held to maturity
- d. the capital gain that investors can get in relation to the average industry price of the bonds

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 163–164  
OBJ: (6.4) Bond yields                      BLM: Remember

23. Which of the following statements about bond yields is true?
- a. If a bond is selling at a discount, the yield to call is a better measure of return than the yield to maturity.
  - b. On an expected yield basis, the expected capital gains yield will always be positive because an investor would not purchase a bond with an expected capital loss.
  - c. If a coupon bond is selling at par, its current yield equals its yield to maturity.
  - d. The current yield on Bond A exceeds the current yield on Bond B; therefore, Bond A must have a higher yield to maturity than Bond B.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 163–164  
OBJ: (6.4) Bond yields                      BLM: Remember

24. A 12-year bond has an annual coupon rate of 9%. The coupon rate will remain fixed until the bond matures. The bond has a yield to maturity of 7%. Which statement regarding the bond's price is true?
- a. If market interest rates decline, the price of the bond will also decline.
  - b. The bond is currently selling at a price below its par value.
  - c. If market interest rates remain unchanged, the bond's price one year from now will be lower than it is today.
  - d. The bond should currently be selling at its par value.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 157  
OBJ: (6.5) Interest rates and bond prices                      BLM: Understand

25. A 10-year Treasury bond has an 8% coupon, and an 8-year Treasury bond has a 10% coupon. Both bonds have the same yield to maturity. If the yield to maturity of both bonds increases by the same amount, which of the following statements would be correct?
- a. The prices of both bonds will decrease by the same amount.
  - b. Both bonds would decline in price, but the 10-year bond would have the greater percentage decline in price.
  - c. The prices of both bonds would increase by the same amount.
  - d. One bond's price would increase, while the other bond's price would decrease.

ANS: B

We can tell by inspection that (a), (c), and (d) are all incorrect. That leaves (b) as the only possibly correct statement. Recognize that longer-term bonds, and ones where payments come late (like low coupon bonds) are most sensitive to changes in interest rates. Thus, the 10-year, 8% coupon bond should be more sensitive to a decline in rates. You could also do some calculations to confirm that (b) is correct.

PTS: 1                      DIF: MEDIUM                      REF: 165–167  
OBJ: (6.5) Interest rates and bond prices                      BLM: Analyze

26. You are considering two bonds. Bond A has a 9% annual coupon while Bond B has a 6% annual coupon. Both bonds have a 7% yield to maturity, and the YTM is expected to remain constant. Which of the following statements is correct?
- a. The price of Bond B will decrease over time, but the price of Bond A will increase over time.
  - b. The prices of both bonds will remain unchanged.
  - c. The price of Bond A will decrease over time, but the price of Bond B will increase over

time.

- d. The prices of both bonds will increase over time, but the price of Bond A will increase by more.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 165–167  
OBJ: (6.5) Bond yields and prices                      BLM: Analyze

27. Assume that interest rates on 20-year Treasury and corporate bonds with different ratings, all of which are noncallable, are as follows:

T-bond = 7.72%    A = 9.64%  
AAA = 8.72%    BBB = 10.18%

What most probably caused the differences in rates among these issues?

- a. real risk-free rate differences  
b. default risk differences  
c. maturity risk differences  
d. inflation differences

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 169  
OBJ: (6.7) Interest rates                      BLM: Analyze

28. Which statement regarding reinvestment rate risk is true?  
a. All else equal, high-coupon bonds have less reinvestment rate risk than low-coupon bonds.  
b. All else equal, low-coupon bonds have less reinvestment rate risk than high-coupon bonds.  
c. All else equal, short-term bonds have less reinvestment rate risk than long-term bonds.  
d. All else equal, long-term bonds have less reinvestment rate risk than short-term bonds.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 177  
OBJ: (6.13) Interest versus reinvestment rate risk                      BLM: Remember

29. Which statement regarding interest rate risk is true?  
a. If the market interest rate for a bond is less than the bond's coupon rate, the bond will sell at a premium.  
b. If the market interest rate for a bond is greater than the bond's coupon rate, the bond will sell at a premium.  
c. If the market interest rate for a bond is less than the bond's coupon rate, the bond will sell at a discount.  
d. If the market interest rate for a bond is greater than the bond's coupon rate, the bond will sell at a discount.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 175–177  
OBJ: (6.13) Interest rate risk                      BLM: Understand

30. Which statement regarding interest rate risk is true?  
a. One advantage of a zero coupon Treasury bond is that no one who owns the bond has to pay any taxes on it until it matures or is sold.  
b. Long-term bonds have less interest rate price risk but more reinvestment rate risk than short-term bonds.  
c. If interest rates increase, all bond prices will increase, but the increase will be greater for bonds that have less interest rate risk.  
d. Relative to a coupon-bearing bond with the same maturity, a zero coupon bond has more interest rate price risk but less reinvestment rate risk.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 177

OBJ: (6.13) Interest versus reinvestment rate risk

BLM: Remember

31. Which of the following statements is correct?
- If the maturity risk premium were zero and interest rates were expected to decrease in the future, then the yield curve for government securities would, other things held constant, have an upward slope.
  - Liquidity premiums are generally higher on government than corporate bonds.
  - Default risk premiums are generally lower on corporate than on government bonds.
  - Reinvestment rate risk is lower, other things held constant, on long-term than on short-term bonds.

ANS: D

PTS: 1

DIF: MEDIUM

REF: 175–177

OBJ: (6.14) Term structure of interest rates

BLM: Remember

32. Which statement regarding bond prices is true?
- If a coupon bond is selling at par, its current yield equals its yield to maturity.
  - If a coupon bond is selling at a discount, its price will continue to decline until it reaches its par value at maturity.
  - If interest rates increase, the price of a 10-year coupon bond will decline by a greater percentage than the price of a 10-year zero coupon bond.
  - If a bond's yield to maturity exceeds its annual coupon, then the bond will trade at a premium.

ANS: A

PTS: 1

DIF: MEDIUM

REF: 159–167

OBJ: (Comp: 6.3–6.5) Bond concepts

BLM: Remember

33. A government bond has an 8% annual coupon and a 7.5% yield to maturity. Which statement regarding this bond is correct?
- The bond sells at a price below par.
  - The bond has a current yield greater than 8%.
  - The bond's required rate of return is less than 7.5%.
  - If the yield to maturity remains constant, the price of the bond will decline over time.

ANS: D

PTS: 1

DIF: MEDIUM

REF: 159–165

OBJ: (Comp: 6.3, 6.4) Bond concepts

BLM: Understand

34. An investor is considering buying one of two 10-year, \$1,000 face value bonds: Bond A has a 7% annual coupon, while Bond B has a 9% annual coupon. Both bonds have a yield to maturity of 8%, which is expected to remain constant for the next 10 years. Which statement regarding these bonds is correct?
- Bond B has a higher price than Bond A today, but one year from now the bonds will have the same price.
  - One year from now, Bond A's price will be higher than it is today.
  - Bond A's current yield is greater than 8%.
  - Bond A has a higher price than Bond B today, but one year from now the bonds will have the same price.

ANS: B

PTS: 1

DIF: MEDIUM

REF: 159–165

OBJ: (Comp: 6.4, 6.5) Bond concepts

BLM: Analyze

35. Which of the following statements regarding bond current yields is NOT true?
- If a bond is selling at a discount to par, then its current yield will be less than its yield to maturity.
  - If a bond is selling at its par value, then its current yield equals its yield to maturity.
  - If a bond is selling at a premium, then its current yield will be greater than its yield to maturity.

maturity.

- d. A bond's current yield will remain unchanged as the bond's term to maturity changes.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 159–165

OBJ: (Comp: 6.3, 6.4) Bond concepts                      BLM: Remember

36. A bond with a par value of \$1,000 has an annual interest payment of \$85. The bond currently sells for \$850 and has 8 years to maturity. Which of the following is true?
- The current yield on the bond must be 8.5%.
  - The investor's required rate of return must be 8.5%.
  - The coupon rate must be 8.5%.
  - The yield to maturity must be 8.5%.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 159–167

OBJ: (Comp: 6.3, 6.4, 6.5) Bond concepts                      BLM: Analyze

37. Which statement regarding bonds is true?
- If a 10-year, \$1,000 par, 10% coupon bond were issued at par, and if interest rates then dropped to the point where  $r_d = YTM = 5\%$ , we could be sure that the bond would sell at a premium above its \$1,000 par value.
  - Other things held constant, a corporation would rather issue noncallable bonds than callable bonds.
  - Other things held constant, a callable bond would have a lower required rate of return than a noncallable bond.
  - Reinvestment rate risk is worse from an investor's standpoint than interest rate price risk if the investor has a short investment time horizon.

ANS: A                      PTS: 1                      DIF: MEDIUM

REF: 156–163 | 166–167 | 177–178                      OBJ: (Comp: 6.2, 6.3, 6.5, 6.13) Bond concepts

BLM: Analyze

38. Which statement regarding bonds is true?
- The total yield on a bond is derived from dividends plus changes in the price of the bond.
  - Bonds are riskier than common stocks and therefore have higher required returns.
  - Bonds issued by larger companies always have lower yields to maturity (less risk) than bonds issued by smaller companies.
  - The market value of a bond will always approach its par value as its maturity date approaches, provided the bond's required return remains constant.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 163–167

OBJ: (Comp: 6.4, 6.5) Bond concepts                      BLM: Understand

39. Which statement regarding bonds is true?
- If a coupon bond is selling at par, its current yield equals its yield to maturity.
  - If rates fall after its issue, a zero coupon bond could trade at a price above its par value.
  - If rates fall rapidly, a zero coupon bond's expected appreciation could become negative.
  - If a firm moves from a position of strength toward financial distress, its bonds' yield to maturity would probably decline.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 159–167

OBJ: (Comp: 6.3–6.5) Bond concepts                      BLM: Understand

40. What effect would a 100 basis point drop in yield have on bond prices?
- It would have a larger impact on bond prices when yields are high.
  - It would have a larger impact on bond prices when yields are low.

- c. It would have the same impact on bond prices regardless of whether yields are high or low.
- d. It would cause bond prices to fall in general.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 159–167  
OBJ: (Comp: 6.3–6.5) Bond concepts                      BLM: Understand

41. Bond X has an 8% annual coupon, Bond Y has a 10% annual coupon, and Bond Z has a 12% annual coupon. Each of the bonds has a maturity of 10 years and a yield to maturity of 10%. Which statement regarding bonds is true?
- a. If the bonds' market interest rate remains at 10%, Bond Z's price will be lower 1 year from now than it is today.
  - b. Bond X has the greatest reinvestment rate risk.
  - c. If market interest rates remain at 10%, Bond Z's price will be 10% higher 1 year from today.
  - d. If market interest rates increase, Bond X's price will increase, Bond Z's price will decline, and Bond Y's price will remain the same.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 165–167 | 175–177  
OBJ: (Comp: 6.5, 6.13) Bond concepts                      BLM: Analyze

42. Bonds A, B, and C all have a maturity of 10 years and a yield to maturity of 7%. Bond A's price exceeds its par value, Bond B's price equals its par value, and Bond C's price is less than its par value. Which statement regarding bonds is true?
- a. If the yield to maturity on each bond decreases to 6%, Bond A will have the largest percentage increase in its price.
  - b. Bond A has the most interest rate risk.
  - c. If the yield to maturity on the three bonds remains constant, the prices of the three bonds will remain the same over the next year.
  - d. If the yield to maturity on each bond increases to 8%, the prices of all three bonds will decline.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 159–167 | 175–177  
OBJ: (Comp: 6.3–6.5, 6.13) Bond concepts                      BLM: Analyze

43. Which statement regarding bonds is true?
- a. 10-year, zero coupon bonds have higher reinvestment rate risk than 10-year, 10% coupon bonds.
  - b. A 10-year, 10% coupon bond has less reinvestment rate risk than a 10-year, 5% coupon bond (assuming all else is equal).
  - c. The total return on a bond during a given year is the sum of the coupon interest payments received during the year and the change in the value of the bond from the beginning to the end of the year.
  - d. The price of a 20-year, 10% bond is less sensitive to changes in interest rates than the price of a 5-year, 10% bond.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 157 | 163–167 | 175–177  
OBJ: (Comp: 6.2, 6.4, 6.5, 6.13) Bond concepts                      BLM: Understand

44. Which statement regarding bond yields is true?
- a. The yield to maturity for a coupon bond that sells at a premium consists entirely of a positive capital gains yield; it has a zero current interest yield.
  - b. The market value of a bond will always approach its par value as its maturity date approaches. This holds true even if the firm has filed for bankruptcy.
  - c. Rising inflation makes the actual yield to maturity on a bond greater than a quoted yield to

maturity that is based on market prices.

- d. The yield to maturity on a coupon bond that sells at its par value consists entirely of a current interest yield; it has a zero expected capital gains yield.

ANS: D                    PTS: 1                    DIF: MEDIUM            REF: 159–165  
OBJ: (Comp: 6.3, 6.4) Bond yields            BLM: Understand

45. Which statement regarding bond yields is true?
- If a coupon bond is selling at a premium, then the bond's current yield is zero.
  - If a bond is selling at a discount, the yield to call is a better measure of the expected return than the yield to maturity.
  - The current yield on Bond A exceeds the current yield on Bond B. Therefore, Bond A must have a higher yield to maturity than Bond B.
  - If a coupon bond is selling at par, its current yield equals its yield to maturity.

ANS: D                    PTS: 1                    DIF: MEDIUM            REF: 159–165  
OBJ: (Comp: 6.3, 6.4) Bond yields            BLM: Understand

46. Which statement regarding the yield curve is true?
- If inflation is expected to increase in the future, and if the maturity risk premium (MRP) is greater than zero, then the yield curve will have an upward slope.
  - If the maturity risk premium (MRP) is greater than zero, then the yield curve must have an upward slope.
  - If the maturity risk premium (MRP) equals zero, the yield curve must be flat.
  - The yield curve can never be downward sloping.

ANS: A

The slope of the yield curve depends primarily on expected inflation and the MRP. The greater the expected increase in inflation, and the higher the MRP, the steeper the slope of the yield curve. If inflation is expected to decline, then even if the MRP is positive, the curve could still have a downward slope.

PTS: 1                    DIF: MEDIUM            REF: 169 | 170 | 175–178  
OBJ: (Comp: 6.7, 6.9, 6.13, 6.14) Yield curve            BLM: Understand

47. Assume that the current corporate bond yield curve is upward sloping. Under this condition, what could we be sure of?
- Inflation is expected to decline in the future.
  - Long-term bonds are a better buy than short-term bonds.
  - Maturity risk premiums could help to explain the yield curve's upward slope.
  - Long-term interest rates are more volatile than short-term rates.

ANS: C                    PTS: 1                    DIF: MEDIUM            REF: 169 | 170 | 175–178  
OBJ: (Comp: 6.7, 6.9, 6.13, 6.14) Yield curve            BLM: Remember

48. Short Corp. just issued bonds that will mature in 10 years, and Long Corp. issued bonds that will mature in 20 years. Both bonds promise to pay a semiannual coupon, they are not callable or convertible, and they are equally liquid. Further, assume that the yield curve is based only on expectations about future inflation, i.e., that the maturity risk premium is zero for government bonds. Under these conditions, which of the following statements is correct?
- If the yield curve is upward sloping and Short has less default risk than Long, then Short's bonds must have the lower yield under all conditions.
  - If the yield curve is downward sloping, Long's bonds must have the lower yield under all conditions.
  - If the yield curve is flat, Short's bond must have the same yield as Long's bonds under all

conditions.

- d. If Long's and Short's bonds have the same default risk, their yields must be equal under all conditions.

ANS: A                      PTS: 1                      DIF: MEDIUM

REF: 169 | 170 | 172–173 | 175–178

OBJ: (Comp: 6.7, 6.9, 6.11, 6.13, 6.14) Corporate yield curve      BLM: Understand

49. Bond A has a 9% annual coupon, while Bond B has a 7% annual coupon. Both bonds have the same maturity, a face value of \$1,000, and an 8% yield to maturity. Which of the following statements is correct?
- Bond A's capital gains yield is greater than Bond B's capital gains yield.
  - Bond A trades at a discount, whereas Bond B trades at a premium.
  - If the yield to maturity for both bonds immediately decreases to 6%, Bond A's bond will have a larger percentage increase in value.
  - Bond A's current yield is greater than that of Bond B.

ANS: D                      PTS: 1                      DIF: MEDIUM      REF: 159–167

OBJ: (Comp: 6.3–6.5) Bond rates and prices                      BLM: Analyze

50. Which statement regarding callable bonds is true?
- Two bonds have the same maturity and the same coupon rate. However, one is callable and the other is not. The difference in prices between the bonds will be greater if the current market interest rate is below the coupon rate than if it is above the coupon rate.
  - Corporate treasurers dislike issuing callable bonds because these bonds may require the company to raise additional funds earlier than would be true if noncallable bonds with the same maturity were used.
  - Two bonds have the same maturity and the same coupon rate. However, one is callable and the other is not. The difference in prices between the bonds will be greater if the current market interest rate is above the coupon rate than if it is below the coupon rate.
  - The actual life of a callable bond will always be equal to or less than the actual life of a noncallable bond with the same maturity. Therefore, if the yield curve is upward sloping, the required rate of return will be lower on the callable bond.

ANS: A                      PTS: 1                      DIF: MEDIUM      REF: 157–158 | 163–167

OBJ: (Comp: 6.2, 6.4, 6.5) Callable bond                      BLM: Analyze

51. A company is planning to raise \$1 million to finance a new plant. Which statement regarding the cost of debt is true?
- The company would be especially eager to have a call provision included in the indenture if its management thinks that interest rates are almost certain to rise in the foreseeable future.
  - If debt is used to raise the \$1 million, with \$500,000 as first mortgage bonds on the new plant and \$500,000 as debentures, the interest rate would be lower than it would be if the entire \$1 million were raised by selling first mortgage bonds.
  - If two tiers of debt are used (with one senior and one subordinated debt class), the subordinated debt will carry a lower interest rate.
  - If debt is used to raise the \$1 million, the cost of the debt would be lower if the debt were in the form of a fixed-rate bond rather than a floating-rate bond.

ANS: B





56. Which of the following statements is correct?
- A bond is likely to be called if its coupon rate is below its YTM.
  - A bond is likely to be called if its market price is below its par value.
  - Even if a bond's YTC exceeds its YTM, an investor with an investment horizon longer than the bond's maturity would be worse off if the bond were called.
  - A bond is likely to be called if its market price is equal to its par value.

ANS: C

A bond would not be called unless the current rate was below the YTM. The investor would get the funds, then reinvest at the new market rate. Thus, the investor would end up earning less than the YTM, even after receiving the call premium.

PTS: 1

DIF: MEDIUM | HARD

REF: 159–167

OBJ: (Comp: 6.3, 6.4) Call provision BLM: Analyze

57. Which statement regarding yield is true?
- A bond's current yield must always be either equal to its yield to maturity or between its yield to maturity and its coupon rate.
  - If a bond sells at par, then its current yield will be less than its yield to maturity.
  - If a bond sells for less than par, then its yield to maturity is less than its coupon rate.
  - A discount bond's price declines each year until it matures, when its value equals its par value.

ANS: A

(b) is incorrect because a bond selling at par must have a current yield equal to its YTM.

(c) is incorrect because a bond selling at below par must have a YTM > the coupon rate.

(d) is incorrect because a discount bond's price must rise over time.

That leaves (a) as the only possibly correct answer. Note that  $YTM = Cur\ Yld +/\- Cap\ gains\ Yld$ , so  $Cur\ Yld = YTM +/\- Cap\ gains\ Yld$ . The cap gains yld will be positive or negative depending on whether the coupon rate is above or below the YTM. That means that the Cur Yld must either equal the YTM or be between the YTM and the coupon rate. (a)'s correctness is also demonstrated below:

	<u>Par bond</u>	<u>Premium</u>	<u>Discount</u>	
Par	1000	1000	1000	
Maturity	10	10	10	
Coup rate	10%	11%	9%	
YTM	10.00%	10.00%	10.00%	
Ann coup	\$100.00	\$110.00	\$90.00	
Price	\$1,000.00	\$1,061.45	\$938.55	
Cur Yield	10.00%	10.36%	9.59%	Equal to or between YTM and coupon rate.
Cap gain	0.00%	-0.36%	0.41%	

PTS: 1

DIF: HARD

REF: 163–165

OBJ: (6.4) Current yield and yield to maturity

BLM: Analyze

58. Assume that a 10-year Treasury bond has a 12% annual coupon, while a 15-year T-bond has an 8% annual coupon. Assume also that the yield curve is flat, and all Treasury securities have a 10% yield to maturity. Which of the following statements is correct?
- If interest rates decline, the prices of both bonds will increase, but the 15-year bond would have a larger percentage increase in price.
  - If interest rates decline, the prices of both bonds will increase, but the 10-year bond would

- have a larger percentage increase in price.
- The 10-year bond would sell at a discount, while the 15-year bond would sell at a premium.
  - The 10-year bond would sell at a premium, while the 15-year bond would sell at par.

ANS: A

We can tell by inspection that (c) and (d) are incorrect. That leaves (a) and (b) as the only possibly correct statements. Also, recognize that longer-term bonds, and ones where payments come late (like low coupon bonds) are most sensitive to changes in interest rates. Thus, the 15-year, 8% coupon bond should be more sensitive to a decline in rates. Finally, we can do some calculations to confirm that (a) is the correct answer:

	Current situation		Rates decline	
	10-year	15-year	10-year	15-year
Par	1000	1000	1000	1000
Maturity	10	15	10	15
Coup rate	12%	8%	12%	8%
YTM	10.00%	10.00%	9.00%	9.00%
Ann coup	120	80	120	80
Price	\$1,122.89	\$847.88	\$1,192.53	\$919.39
% Gain			6.2%	8.4%

PTS: 1                      DIF: HARD                      REF: 165–167

OBJ: (6.5) Effect of interest rate on bond prices                      BLM: Analyze

- The following are some provisions that are often found in a bond indenture. Which of these provisions would probably NOT reduce the yield-to-maturity that investors would otherwise require on a newly issued bond?
  - Assets are used as security for the bond.
  - The bond has a sinking fund.
  - The bond is subordinate to other classes of debt.
  - The indenture contains covenants that prevent the issuance of additional debt.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 171

OBJ: (6.11) Bond indenture BLM: Remember

- Which of the following is NOT an action or consequence of the activities of bond rating agencies?
  - In assessing the rating, the agency examines financial ratios, contract terms (restrictive covenants), and important qualitative factors.
  - When a material change is identified in any of the factors used to measure a bond's default risk, the agency will immediately announce a change in the rating.
  - With respect to qualitative factors, the agency will pay particular attention to ratios, measuring return on assets, interest coverage, and operating profit margins.
  - While it is the mandate of the agency to report on the credit worthiness of securities held by bondholders, their findings are also relevant to the firm's shareholders.

ANS: B

Agencies must be very cautious in their decision to change a rating since it can have a dramatic impact on the yield of the firm's bonds and, indirectly, on the value of the firm's shares.

PTS: 1                      DIF: MEDIUM                      REF: 174                      OBJ: (6.11) Bond rating agencies

BLM: Remember

61. Suppose a new company decides to raise a total of \$200 million, with \$100 million as common equity and \$100 million as long-term debt. The debt can be mortgage bonds or debentures, but by an ironclad provision in its charter, the company can never raise any additional debt beyond the original \$100 million. Given these conditions, which of the following statements is correct?
- The higher the percentage of debt represented by mortgage bonds, the riskier both types of bonds will be and, consequently, the higher the firm's total dollar interest charges will be.
  - If the debt were raised by issuing \$50 million of debentures and \$50 million of first mortgage bonds, we could be certain that the firm's total interest expense would be lower than if the debt were raised by issuing \$100 million of debentures.
  - In this situation, we cannot tell for sure how, or whether, the firm's total interest expense on the \$100 million of debt would be affected by the mix of debentures versus first mortgage bonds. The interest rate on each of the two types of bonds would increase as the percentage of mortgage bonds used was increased, but the result might well be such that the firm's total interest charges would not be affected materially by the mix between the two.
  - The higher the percentage of debentures, the greater the risk borne by each debenture, and thus the higher the required rate of return on the debentures.

ANS: C

The higher the percentage of mortgage bonds, the less the collateral backing each bond, so the bonds' risk and thus required return would be higher. Also, the higher the percentage of mortgage bonds, the less free assets would be backing the debentures, so their risk and required return would also be higher. However, mortgage bonds are less risky than debentures, so mortgage bond rates are lower than rates on debentures. We end up with a situation where the greater the percentage of mortgage bonds, the higher the rate on both types of bonds, but the average cost to the company could be higher, lower, or constant. Note that we could draw a graph of the situation, with percentage of mortgage on the horizontal axis and rates on the vertical axis, then the graph would look like the WACC graph in the cost of capital chapter.

PTS: 1                    DIF: HARD                    REF: 171–174

OBJ: (6.11) Types of debt and their relative costs

BLM: Analyze

62. Which statement regarding rate risk is true?
- A zero coupon bond of any maturity will have more interest rate price risk than any coupon bond, even a perpetuity.
  - If their maturities and other characteristics were the same, a 5% coupon bond would have more interest rate price risk than a 10% coupon bond.
  - A 10-year coupon bond would have more reinvestment rate risk than a 5-year coupon bond, but all 10-year coupon bonds have the same amount of reinvestment rate risk.
  - If their maturities and other characteristics were the same, a 5% coupon bond would have less interest rate price risk than a 10% coupon bond.

ANS: B                    PTS: 1                    DIF: HARD                    REF: 175–177

OBJ: (6.13) Interest rate and reinvestment rate risk

BLM: Analyze

63. Which of the following statements is correct?
- If two bonds have the same maturity, the same yield to maturity, and the same level of risk, the bonds should sell for the same price regardless of the bond's coupon rates.
  - All else being equal, an increase in interest rates will have a greater effect on the prices of short-term than long-term bonds.
  - All else being equal, an increase in interest rates will have a greater effect on higher-coupon bonds than it will have on lower-coupon bonds.
  - If a bond's yield to maturity exceeds its coupon rate, the bond's price must be less than its maturity value.

ANS: D                      PTS: 1                      DIF: HARD                      REF: 163–167  
OBJ: (Comp: 6.4, 6.5) Bond yields and prices                      BLM: Analyze

64. Assuming all else is constant, which of the following statements is correct?
- A 20-year zero coupon bond has more reinvestment rate risk than a 20-year coupon bond.
  - For any given maturity, a 1.0 percentage point decrease in the market interest rate would cause a smaller dollar capital gain than the capital loss stemming from a 1.0 percentage point increase in the interest rate.
  - Price sensitivity as measured by the percentage change in price due to a given change in the required rate of return decreases as a bond's maturity increases.
  - For a bond of any maturity, a 1.0 percentage point increase in the market interest rate ( $r_d$ ) causes a larger dollar capital loss than the capital gain stemming from a 1.0 percentage point decrease in the interest rate.

ANS: D

It is relatively easy to eliminate (a) and (c). When choosing between (b) and (d), think about the graph that shows the relationship between a bond's price and the going interest rate. This curve is concave, indicating that at any interest rate, the decline in price from an increase in rates is less than the gain in price from a similar interest rate decline. It would be easy to confirm this statement with an example.

PTS: 1                      DIF: HARD                      REF: 157 | 165–167 | 176  
OBJ: (Comp: 6.2, 6.5, 6.13) Bond concepts                      BLM: Analyze

65. If the yield to maturity is 5.5%, what is the price of a 15-year, zero-coupon bond with a par value of \$1,000?
- \$413.35
  - \$429.48
  - \$447.93
  - \$469.72

ANS: C

$$P_0 = \frac{\$1,000}{(1.055)^{15}} = \$447.93$$

PTS: 1                      DIF: EASY                      REF: 160–161                      OBJ: (6.3) Bond valuation  
BLM: Understand

66. What is the semiannual coupon payment for a 12% bond with a \$1,000 par?
- \$60
  - \$120
  - \$600
  - \$1,200

ANS: A

Annual interest received =  $(0.12) \times (\$1,000) = \$120$ . Semiannual coupon means  $\$120/2 = \$60$  each payment.

PTS: 1                      DIF: EASY                      REF: 162                      OBJ: (6.3) Bond valuation  
BLM: Understand

67. The Morrissey Company's bonds mature in 7 years, have a par value of \$1,000, and make an annual coupon payment of \$70. The market interest rate for the bonds is 8.5%. What is the bond's price?
- \$923.22
  - \$946.30

- c. \$969.96
- d. \$994.21

ANS: A

N	7
I/YR	8.5%
PMT	\$70
FV	\$1,000
PV	\$923.22

PTS: 1                    DIF: EASY                    REF: 159–163                    OBJ: (6.3) Bond valuation  
 BLM: Understand

68. D. J. Masson Inc. recently issued noncallable bonds that mature in 10 years. They have a par value of \$1,000 and an annual coupon of 5.5%. If the current market interest rate is 7.0%, at what price should the bonds sell?
- a. \$829.21
  - b. \$850.47
  - c. \$872.28
  - d. \$894.65

ANS: D

Coupon rate	5.5%
PMT	\$55
N	10
I/YR	7.0%
FV	\$1,000
PV	\$894.65

PTS: 1                    DIF: EASY                    REF: 159–163                    OBJ: (6.3) Bond valuation  
 BLM: Understand

69. Ezzell Enterprises' noncallable bonds currently sell for \$1,165. They have a 15-year maturity, an annual coupon of \$95, and a par value of \$1,000. What is their yield to maturity?
- a. 6.53%
  - b. 6.87%
  - c. 7.24%
  - d. 7.62%

ANS: D

N	15
PV	\$1,165
PMT	\$95
FV	\$1,000
I/YR	7.62%

PTS: 1                    DIF: EASY                    REF: 163–164                    OBJ: (6.4) Yield to maturity  
 BLM: Understand

70. Quigley Inc.'s bonds currently sell for \$1,080 and have a par value of \$1,000. They pay a \$100 annual coupon and have a 15-year maturity, but they can be called in 5 years at \$1,125. What is their yield to maturity (YTM)?
- a. 8.56%
  - b. 9.01%
  - c. 9.46%

d. 9.93%

ANS: B

N	15
PV	\$1,080
PMT	\$10
FV	\$1,000
I/YR	9.01%= YTM

PTS: 1            DIF: EASY            REF: 163–164            OBJ: (6.4) Yield to maturity  
BLM: Understand

71. Consider some bonds with one annual coupon payment of 7.25%. The bonds have a par value of \$1,000, a current price of \$1,125, and they will mature in 13 years. What is the yield to maturity on these bonds?

- a. 5.56%
- b. 5.85%
- c. 6.14%
- d. 6.45%

ANS: B

Coupon rate	7.25%
N	13
PV = Price	\$1,125
PMT	\$72.50
FV = Par	\$1,000
I/YR	5.85%= YTM

PTS: 1            DIF: EASY            REF: 163–164            OBJ: (6.4) Yield to maturity  
BLM: Understand

72. Sadik Inc.'s bonds currently sell for \$1,280 and have a par value of \$1,000. They pay a \$135 annual coupon and have a 15-year maturity, but they can be called in 5 years at \$1,050. What is their yield to call (YTC)?

- a. 6.39%
- b. 6.72%
- c. 7.08%
- d. 7.45%

ANS: D

N	5
PV	\$1,280
PMT	\$135
FV	\$1,050
I/YR = YTC	7.45%

PTS: 1            DIF: EASY            REF: 164            OBJ: (6.4) Yield to call  
BLM: Understand

73. Garvin Enterprises' bonds currently sell for \$1,150. They have a 6-year maturity, an annual coupon of \$85, and a par value of \$1,000. What is their current yield?

- a. 7.39%
- b. 7.76%
- c. 8.15%
- d. 8.56%

ANS: A	
N	6
PV	\$1,150
PMT	\$85
FV	\$1,000
Current yield =	7.39%

PTS: 1            DIF: EASY            REF: 165            OBJ: (6.4) Current yield  
 BLM: Understand

74. Assume that you are considering the purchase of a 15-year bond with an annual coupon rate of 9.5%. The bond has face value of \$1,000 and makes semiannual interest payments. If you require an 11.0% nominal yield to maturity on this investment, what is the maximum price you should be willing to pay for the bond?
- \$891.00
  - \$913.27
  - \$936.10
  - \$959.51

ANS: A	
Par value	\$1,000
Coupon rate	9.5%
Periods/year	2
Yrs to maturity	15
N = periods	30
Annual rate	11.0%
Periodic rate	5.50%
PMT/period	\$47.50
FV	\$1,000
PV	\$891.00

PTS: 1            DIF: EASY            REF: 168  
 OBJ: (6.6) Bond valuation: semiannual coupons            BLM: Analyze

75. If 10-year T-bonds have a yield of 6.2%, 10-year corporate bonds yield 8.5%, the maturity risk premium on all 10-year bonds is 1.3%, and corporate bonds have a 0.4% liquidity premium versus a zero liquidity premium for T-bonds, what is the default risk premium on the corporate bond?
- 1.90%
  - 2.09%
  - 2.30%
  - 2.53%

ANS: A		
T-bond yield	6.20%	
Corporate yield	8.50%	
MRP	Included in both bonds	1.30%
LP	Included in corporate	0.40%
DRP		1.90%

PTS: 1            DIF: EASY            REF: 174  
 OBJ: (6.11) Default risk premium (DRP)            BLM: Understand



76. Wachowicz Corporation issued 15-year, noncallable, 7.5% annual coupon bonds at their par value of \$1,000 one year ago. Today, the market interest rate on these bonds is 5.5%. What is the current price of the bonds, given that they now have 14 years to maturity?
- \$1,104.62
  - \$1,132.95
  - \$1,162.00
  - \$1,191.79

ANS: D

Par value	\$1,000
Coupon rate	7.5%
N	14
I/YR	5.5%
PMT	\$75
FV	\$1,000
PV	\$1,191.79

PTS: 1                      DIF: MEDIUM              REF: 159–163

OBJ: (6.3) Bond valuation: annual coupons

BLM: Analyze

77. McCue Inc.'s bonds currently sell for \$1,250. They pay a \$120 annual coupon, have a 15-year maturity, and a \$1,000 par value, but they can be called in 5 years at \$1,050. Assume that no costs other than the call premium would be incurred to call and refund the bonds, and also assume that the yield curve is horizontal, with rates expected to remain at current levels on into the future. What is the difference between this bond's YTM and its YTC? (Subtract the YTC from the YTM.)
- 2.11%
  - 2.32%
  - 2.55%
  - 2.80%

ANS: A

If held to maturity:		If called in 5 years:	
N = Maturity	15	N = Call	5
PV	\$1,250	PV	\$1,250
PMT	\$120	PMT	\$120
FV = Par	\$1,000	FV = Call Price	\$1,050
I/YR = YTM	8.91%	I/YR = YTC	6.81%

Difference:                      2.11%

PTS: 1                      DIF: MEDIUM              REF: 163–165

OBJ: (6.4) Yields to maturity and call              BLM: Analyze

78. Taussig Corp.'s bonds currently sell for \$1,150. They have a 6.75% annual coupon rate and a 15-year maturity, but they can be called in 6 years at \$1,067.50. Assume that no costs other than the call premium would be incurred to call and refund the bonds, and also assume that the yield curve is horizontal, with rates expected to remain at current levels on into the future. Under these conditions, what rate of return should an investor expect to earn if he or she purchases these bonds, the YTC or the YTM?
- 4.12%
  - 4.34%
  - 4.57%
  - 4.81%

ANS: D

If the coupon rate exceeds the YTM, then it is likely that the bonds will be called and replaced with new, lower coupon bonds. In that case, the YTC will be earned. Otherwise, one should expect to earn the YTM.

If held to maturity:		If called:	
Par value	\$1,000	Par value	\$1,000
Coupon	6.75%	Coupon	6.75%
N	15	N	6
PV	\$1,150.00	PV	\$1,150.00
PMT	\$67.50	PMT	\$67.50
FV	\$1,000.00	FV	\$1,067.50
I/YR	5.28% YTM	I/YR	4.81% YTC

Expected rate of return: 4.81% YTC

PTS: 1                    DIF: MEDIUM        REF: 163–165  
 OBJ: (6.4) Yields to maturity and call        BLM: Analyze

79. Moerdyk Corporation's bonds have a 10-year maturity, a 6.25% semiannual coupon, and a par value of \$1,000. The going interest rate ( $r_d$ ) is 4.75%, based on semiannual compounding. What is the bond's price?
- 1,063.09
  - 1,090.35
  - 1,118.31
  - 1,146.27

ANS: C

Par value	\$1,000
Coupon rate	6.25%
Periods/year	2
Yrs to maturity	10
N = periods	20
Annual rate	4.75%
Periodic rate	2.38%
PMT/period	\$31.25
FV	\$1,000
PV	\$1,118.31

PTS: 1                    DIF: MEDIUM        REF: 168  
 OBJ: (6.6) Bond valuation: semiannual coupons                    BLM: Analyze

80. In order to accurately assess the capital structure of a firm, it is necessary to convert its balance sheet figures to a market value basis. KJM Corporation's balance sheet as of today is as follows:

Long-term debt (bonds, at par)	\$10,000,000
Preferred stock	2,000,000
Common stock (\$10 par)	10,000,000
Retained earnings	<u>4,000,000</u>
Total debt and equity	<u>\$26,000,000</u>

The bonds have a 4.0% coupon rate, payable semiannually, and a par value of \$1,000. They mature exactly 10 years from today. The yield to maturity is 12%, so the bonds now sell below par. What is the current market value of the firm's debt?

- a. \$5,276,731
- b. \$5,412,032
- c. \$5,547,332
- d. \$7,706,000

ANS: B

Calculate the price of each bond:

Coupon rate	4.0%
Par value	\$1,000
Maturity (Yrs)	10
Periods/Yr.	2
YTM	12.0%

N	20
I/YR	6.0%
PMT	\$20.00
FV	\$1,000
PV	\$541.20

Determine the number of bonds:

Book value on balance sheet	\$10,000,000
Par value	\$1,000
Number of bonds = Book value/Par value	10,000

Calculate the market value of bonds:

Mkt value = PV × Number of bonds = \$5,412,032

PTS: 1                    DIF: MEDIUM            REF: 168

OBJ: (6.6) Market value of semiannual bonds

BLM: Analyze

81. Five-year Treasury bonds yield 5.5%. The inflation premium (IP) is 1.9%, and the maturity risk premium (MRP) on 5-year bonds is 0.4%. What is the real risk-free rate,  $r^*$ ?
- a. 2.59%
  - b. 2.88%
  - c. 3.20%
  - d. 3.52%

ANS: C

$r_{T\text{-bond}}$		5.50%
IP	Included in both bonds	1.90%
MRP	Included in both bonds	0.40%
$r^*$		3.20%

PTS: 1                    DIF: MEDIUM            REF: 169–170            OBJ: (6.8) Real risk-free rate,  $r^*$

BLM: Analyze

82. Crockett Corporation's 5-year bonds yield 6.85%, and 5-year government bonds yield 4.75%. The real risk-free rate is  $r^* = 2.80\%$ , the default risk premium for Crockett's bonds is  $DRP = 0.85\%$  versus zero for T-bonds, the liquidity premium on Crockett's bonds is  $LP = 1.25\%$ , and the maturity risk premium for all bonds is found with the formula  $MRP = (t - 1) \times 0.1\%$ , where  $t =$  number of years to maturity. What is the inflation premium (IP) on 5-year bonds?
- a. 1.40%
  - b. 1.55%
  - c. 1.71%

d. 1.88%

ANS: B

Maturity		5
$r_{\text{Crockett}}$		6.85%
$r_{\text{T-bond}}$		4.75%
$r^*$	Included in both bonds	2.80%
LP	Included in corp. only	1.25%
DRP	Included in corp. only	0.85%
MRP	Included in both bonds	0.40%
IP		1.55%

PTS: 1                      DIF: MEDIUM      REF: 170                      OBJ: (6.9) Inflation premium (IP)  
BLM: Analyze

83. Keys Corporation's 5-year bonds yield 7.00%, and 5-year T-bonds yield 5.15%. The real risk-free rate is  $r^* = 3.00\%$ , the inflation premium for 5-year bonds is  $IP = 1.75\%$ , the liquidity premium for Keys' bonds is  $LP = 0.75\%$  versus zero for T-bonds, and the maturity risk premium for all bonds is found with the formula  $MRP = (t - 1) \times 0.1\%$ , where  $t =$  number of years to maturity. What is the default risk premium (DRP) on Keys' bonds?
- 0.99%
  - 1.10%
  - 1.21%
  - 1.33%

ANS: B

Maturity		5
$r_{\text{Keys}}$		7.00%
$r_{\text{T-bond}}$		5.15%
$r^*$	Included in both bonds	3.00%
IP	Included in both bonds	1.75%
LP	Included in corp. only	0.75%
MRP	Included in both bonds	0.40%
DRP		1.10%

PTS: 1                      DIF: MEDIUM      REF: 174                      OBJ: (6.11) Default risk premium (DRP)                      BLM: Analyze

84. Niendorf Corporation's 5-year bonds yield 6.75%, and 5-year T-bonds yield 4.80%. The real risk-free rate is  $r^* = 2.75\%$ , the inflation premium for 5-year bonds is  $IP = 1.65\%$ , the default risk premium for Niendorf's bonds is  $DRP = 1.20\%$  versus zero for T-bonds, and the maturity risk premium for all bonds is found with the formula  $MRP = (t - 1) \times 0.1\%$ , where  $t =$  number of years to maturity. What is the liquidity premium (LP) on Niendorf's bonds?
- 0.49%
  - 0.55%
  - 0.68%
  - 0.75%

ANS: D

Maturity		5
$r_{\text{Nie}}$		6.75%
$r_{\text{T-bond}}$		4.80%
$r^*$	Included in both bonds	2.75%
IP	Included in both bonds	1.65%
DRP	Included in corp. only	1.20%

MRP	Included in both bonds	0.40%
LP		0.75%

PTS: 1                    DIF: MEDIUM            REF: 175  
 OBJ: (6.12) Liquidity premium (LP)            BLM: Analyze

85. O'Brien Ltd.'s outstanding bonds have a \$1,000 par value, and they mature in 25 years. Their nominal yield to maturity is 9.25%, they pay interest semiannually, and they sell at a price of \$850. What is the bond's nominal (annual) coupon interest rate?
- 6.27%
  - 6.60%
  - 6.95%
  - 7.70%

ANS: D

First, use the data provided to find the dollar coupon payment per 6 months, then multiply by 2 to get the annual coupon, and then divide by the par value to find the coupon rate. One could use the indicated data and solve for the price. It would be \$850, which confirms the rate.

Par value	\$1,000
Maturity	25
Periods/year	2
N	50
YTM	9.25%
Periodic rate	4.63%
PV	\$850.00
PMT	\$38.50
Coupon rate =	7.70%

PTS: 1                    DIF: MEDIUM | HARD                    REF: 163–164  
 OBJ: (6.4) Determining the coupon rate            BLM: Analyze

86. Keenan Industries has a bond outstanding with 15 years to maturity, an 8.75% coupon paid semiannually, and a \$1,000 par value. The bond has a 6.50% nominal yield to maturity, but it can be called in 6 years at a price of \$1,050. What is the bond's nominal yield to call?
- 5.01%
  - 5.27%
  - 5.54%
  - 5.81%

ANS: B

First, use the given data to find the bond's current price. Then use that price to find the YTC.

Coupon rate	8.75%	Yrs to call	6
YTM	6.50%	Call price	\$1,050.00
Maturity	15		
Par value	\$1,000		
Periods/year	2	Determine the bond's YTC	
Determine the bond's price		N	12
PMT/period	\$43.75	PV	\$1,213.55
N	30	PMT	\$43.75
I/YR	3.25%	FV	\$1,050.00
FV	\$1,000.00	I/YR	2.64%
PV = Price	\$1,213.55	Nom. YTC	5.27%

PTS: 1                    DIF: MEDIUM | HARD                    REF: 163–165  
 OBJ: (6.4) Yields to maturity and call                    BLM: Analyze

87. A 25-year, \$1,000 par value bond has an 8.5% annual coupon. The bond currently sells for \$875. If the yield to maturity remains at its current rate, what will the price be 5 years from now?
- \$839.31
  - \$860.83
  - \$882.90
  - \$904.97

ANS: C

First find the YTM at this time, then use the YTM with the other data to find the bond's price 5 years hence.

Par value	\$1,000		
Coupon rate	8.50%	Value in 5 years	
N	25	N	20
PV	\$875	I/YR	9.86%
PMT	\$85	PMT	\$85
FV	\$1,000	FV	\$1,000
I/YR	9.86%	PV	\$882.90

PTS: 1                    DIF: MEDIUM | HARD                    REF: 165–167  
 OBJ: (6.5) Bond value in future time periods                    BLM: Analyze

88. Zumwalt Corporation's Class S bonds have a 12-year maturity, \$1,000 par value, and a 5.75% coupon paid *semiannually* (2.875% each 6 months), and those bonds sell at their par value. Zumwalt's Class A bonds have the same risk, maturity, and par value, but the A bonds pay a 5.75% *annual* coupon. Neither bond is callable. At what price should the *annual payment* bond sell?
- \$943.98
  - \$968.18
  - \$993.01
  - \$1,017.83

ANS: C

These two bonds should provide the same EFF%. Therefore, we can find the EFF% for the semiannual bond and then use it as the YTM for the annual payment bond. At the calculated price, the two bonds will have YTM's with the same EFF%. Note too that the semiannual payment bond must have a higher price than the annual bond because then it receives the same cash flow, but faster. Therefore, Bond A must sell at a price below the \$1,000 par value at which S sells.

Semiannual bond:		Annual bond:	
Par value	\$1,000	Par value	\$1,000
Coupon rate = Nominal rate	5.75%	Coupon rate	5.75%
Payment per period	\$28.75	Pmt/Period	\$57.50
Years to maturity	12	Yrs to maturity	12
Periods/year	2	Periods/year	1
Total periods	24	Total periods	12
EFF%	5.833%	EFF% = YTM	5.833%
Price	\$1,000.00	Price	\$993.01

PTS: 1                    DIF: MEDIUM | HARD                    REF: 168  
 OBJ: (6.6) Bond valuation: effective rates                    BLM: Analyze

89. ABC Inc. issued at par value a 15-year 6% semiannual coupon bond with a par value of \$1,000. At the end of 2 years the market interest increases to 7%. One year later, the market interest is 8%. If an investor purchases the bond at the end of year 2 and sold it 1 year later, how much is the capital gain or loss?
- +\$10.00
  - \$68.02
  - \$84.75
  - \$91.56

ANS: B

Find the initial purchase price using financial calculator with inputs:  $N = 26$ ,  $I/Y = 3.5$ ,  $PMT = 30$ ,  $FV = 1,000$ .  $PV = -\$915.55$ . Find the selling price 1 year later with inputs:  $N = 24$ ,  $I/Y = 4$ ,  $PMT = 30$ ,  $FV = 1,000$ .  $PV = -\$847.53$ . Price change =  $847.53 - 915.55 = -\$68.02$  (capital loss).

PTS: 1                      DIF: HARD                      REF: 168

OBJ: (6.6) Bond valuation: capital gain/loss

BLM: Analyze

90. Cosmic Communications Inc. is planning two new issues of 25-year bonds. Bond Par will be sold at its \$1,000 par value, and it will have a 10% semiannual coupon. Bond OID will be an Original Issue Discount bond, and it will also have a 25-year maturity and a \$1,000 par value, but its semiannual coupon will be only 6.25%. If both bonds are to provide investors with the same effective yield, how many of the OID bonds must Cosmic issue to raise \$3,000,000? Disregard flotation costs, and round your final answer *up* to a whole number of bonds.
- 4,228
  - 4,337
  - 4,448
  - 4,562

ANS: D

The par bond has a coupon rate of 10% and a periodic rate of 5%, and it sells at par. Therefore, the going nominal rate must be 10%. The OID bond must provide the same EFF%, because it is equally risky. Therefore, it must be evaluated with the parameters shown below to find its price, which is then used to find the number of bonds issued.

Bond A: Issued at par		Bond B: Issued at a discount (OID bonds)	
Par value	\$1,000	Par value	\$1,000
Coupon rate	10.00%	Coupon rate	6.25%
Maturity yrs	25	Maturity yrs	25
Periods/year	2	Periods/year	2
N	50	N	50
Periodic rate	5.00%	Periodic rate	5.00%
PMT	\$50.00	PMT	\$31.25
PV = Price	\$1,000.00	PV = Price	\$657.70

Funds needed	\$3,000,000
Number of bonds	4,561.34
Rounded up	4,562

PTS: 1                      DIF: HARD                      REF: 168

OBJ: (6.6) Bond valuation: original issue discount bonds

BLM: Analyze

## CHAPTER 7—RISK, RETURN, AND THE CAPITAL ASSET PRICING MODEL

### TRUE/FALSE

1. Dollar return fails to consider the scale and timing of investments.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 189–190  
OBJ: (7.1) Investment returns

2. A payoff matrix shows the set of possible rates of return on an investment, along with their probabilities of occurrence, and the investment's expected rate of return is found by multiplying each outcome or "state" by its probability.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 192  
OBJ: (7.2) Payoff matrix

3. For diversified investors, the appropriate measure of risk is how the return on an individual stock moves with the returns of other assets in the portfolio.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 196–197  
OBJ: (7.2) Portfolio risk

4. Diversification can reduce the riskiness of a portfolio of stocks.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 196–197  
OBJ: (7.2) Portfolio risk

5. The realized return on a stock portfolio is the weighted average of the expected returns on the stocks in the portfolio.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 192–193  
OBJ: (7.2) Portfolio return

6. Standard deviation is a measure of market risk.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 193–195  
OBJ: (7.2) Standard deviation

7. The coefficient of variation, calculated as the standard deviation of expected returns divided by the expected return, is a standardized measure of the risk per unit of expected return.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 196–197  
OBJ: (7.2) Coefficient of variation

8. The standard deviation is a better measure of risk than the coefficient of variation if the expected returns of the securities being compared differ significantly.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 197  
OBJ: (7.2) CV versus SD

9. Risk-averse investors require higher rates of return on investments whose returns are highly uncertain.



ANS: T                    PTS: 1                    DIF: EASY                    REF: 197–198  
OBJ: (7.2) Risk aversion

10. Companies should under no conditions take actions that increase their risk relative to the market, regardless of how much those actions would increase the firm's expected rate of return.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 199  
OBJ: (7.3) Risk and expected return

11. One key conclusion of the Capital Asset Pricing Model is that the value an asset should be measured by considering both the risk and the expected return of the asset assuming that the asset is held in a well-diversified portfolio. The risk of the asset held in isolation is not relevant under the CAPM.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 207–208  
OBJ: (7.3) CAPM and risk

12. According to the Capital Asset Pricing Model, investors are primarily concerned with portfolio risk, not the risks of individual stocks held in isolation. Thus, the relevant risk of a stock is the stock's contribution to the riskiness of a well-diversified portfolio.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 207–208  
OBJ: (7.3) CAPM and risk

13. Efficient portfolio has the best risk and expected return combination for any given level of risk or return.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 203–205  
OBJ: (7.3) Efficient portfolio

14. Market risk refers to the tendency of a stock to move with the general stock market. A stock with above-average market risk will tend to be more volatile than an average stock, and its beta will be greater than 1.0.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 205–207  
OBJ: (7.3) Market risk

15. An individual stock's diversifiable risk, which is measured by the stock's beta, can be lowered by adding more stocks to the portfolio in which the stock is held.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 205–207  
OBJ: (7.3) Market risk

16. A stock's beta measures its diversifiable (or company-specific) risk relative to the diversifiable risks of other firms.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 208–210  
OBJ: (7.3) Beta coefficient

17. A stock's beta is more relevant as a measure of risk to an investor who holds only one stock than to an investor who holds a well-diversified portfolio.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 208–210  
OBJ: (7.3) Beta coefficient

18. A firm can change its beta through managerial decisions, including capital budgeting and capital structure decisions.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 214  
OBJ: (7.4) Changes in beta

19. Behavioural finance—mixing finance with psychology—tries to explain the occurrence and persistence of securities mispricing.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 216  
OBJ: (7.4) Behavioural finance

20. The slope of the SML is determined by the value of beta.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 211–212  
OBJ: (7.4) SML

21. The slope of the SML is determined by investors' aversion to risk. The greater the marginal investor's risk aversion, the steeper the SML.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 211–212  
OBJ: (7.4) SML

22. If investors become less averse to risk, the slope of the Security Market Line (SML) will increase.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 214  
OBJ: (7.4) SML and risk aversion

23. Variance is a measure of the variability of returns, and since it involves squaring the deviation of each actual return from the expected return, it is always larger than its square root, its standard deviation.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 193–195  
OBJ: (7.2) Variance

24. If the expected rate of return for a particular stock, as seen by the marginal investor, exceeds its required rate of return, we should soon observe an increase in demand for the stock, and the price will likely increase until a price is established that equates the expected return with the required return. The sooner this equilibrium is reached, the more efficient the market is judged to be.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 194  
OBJ: (7.2) Expected return

25. Because of differences in the expected returns of different investments, the standard deviation is not always an adequate measure of risk. However, the coefficient of variation adjusts for differences in expected returns and thus allows investors to make better comparisons of investments' stand-alone risk.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 196–197  
OBJ: (7.2) Coefficient of variation

26. "Risk aversion" implies that investors require higher expected returns on risky securities if they are to be induced to purchase them.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 197–198

OBJ: (7.2) Risk aversion

27. Risk aversion is a general dislike for risk, and a preference for certainty. If risk aversion exists in the market, then investors in general are willing to accept somewhat lower returns on less risky securities. Different investors have different degrees of risk aversion, and the end result is that investors with greater risk aversion tend to hold lower-risk (and therefore lower-expected-return) securities than investors who have more tolerance for risk.

ANS: T                      PTS: 1                      DIF: MEDIUM              REF: 197

OBJ: (7.2) Risk premiums and risk aversion

28. Portfolio A has but one security, while Portfolio B has 100 securities. Because of diversification effects, we would expect Portfolio B to have the lower risk. However, it is possible for Portfolio A to be less risky.

ANS: T                      PTS: 1                      DIF: MEDIUM              REF: 199–202

OBJ: (7.3) Portfolio risk

29. Diversifiable risk is the only risk that affects the required rate of return because nondiversifiable risk can be eliminated.

ANS: F                      PTS: 1                      DIF: MEDIUM              REF: 205–207

OBJ: (7.3) Diversifiable risk

30. If any two assets are perfectly negatively correlated, an equal weighted portfolio of these two assets will result in a portfolio return of zero.

ANS: F                      PTS: 1                      DIF: MEDIUM              REF: 199

OBJ: (7.3) Portfolio return

31. A portfolio's risk is measured by the weighted average of the standard deviations of the securities in the portfolio. It is this aspect of portfolios that allows investors to combine stocks and actually reduce the riskiness of a portfolio.

ANS: F                      PTS: 1                      DIF: MEDIUM              REF: 199–202

OBJ: (7.3) Portfolio risk

32. The distributions of rates of return for Companies AA and BB are given below:

<u>State of Economy</u>	<u>Probability of State Occurring</u>	<u>AA</u>	<u>BB</u>
Boom	0.2	30%	-10%
Normal	0.6	10%	5%
Recession	0.2	-5%	50%

We can conclude from the above information that any rational risk-averse investor will add Security AA to a well-diversified portfolio over Security BB.

ANS: F

	<u>AA</u>	<u>BB</u>
Expected return	11.00%	11.00%
SD	11.14%	20.35%
CV	1.01	1.85

Superficially, it appears that AA is better. However, the SD and CV measure the stock's stand-alone risk, not the more relevant market risk as measured by beta. We have no data that can be used to calculate the betas, so we can reach no conclusion as to which stock is really preferable. If BB's returns were negatively correlated with the market, then it would be less risky in spite of its high SD and CV.

PTS: 1                      DIF: MEDIUM      REF: 199–202      OBJ: (7.3) Portfolio risk

33. Even if the correlation between the returns on two securities is +1.0, if the securities are combined in the correct proportions, the resulting two-asset portfolio will have less risk than either security held alone.

ANS: F                      PTS: 1                      DIF: MEDIUM      REF: 200  
OBJ: (7.3) Correlation coefficient and risk

34. Bad managerial judgments or unforeseen negative events that happen to a firm are defined as “company-specific,” or “unsystematic,” events, and their effects on investment risk can in theory be diversified away.

ANS: T                      PTS: 1                      DIF: MEDIUM      REF: 199–202  
OBJ: (7.3) Company-specific risk

35. Assume that two investors each hold a portfolio, and that portfolio is their only asset. Investor A's portfolio has a beta of *minus* 2.0, while Investor B's portfolio has a beta of *plus* 2.0. Assuming that the unsystematic risks of the stocks in the two portfolios are the same, then the two investors face the same amount of risk. However, the holders of either portfolio could lower their risks, and by exactly the same amount, by adding some “normal” stocks with beta = 1.0.

ANS: T  
The owners do now face the same amount of risk, as their portfolios would be equally volatile. However, if Investor A added stocks with  $b = +1.0$ , then those stocks would be negatively correlated with his or her other stocks, so this would have a large risk reduction effect relative to the effect on the B portfolio.

PTS: 1                      DIF: MEDIUM      REF: 208                      OBJ: (7.3) Beta coefficient

36. We will generally find that the beta of a single security is more stable over time than the beta of a diversified portfolio.

ANS: F                      PTS: 1                      DIF: MEDIUM      REF: 210  
OBJ: (7.3) Portfolio beta

37. If an investor buys enough stocks, he or she can, through diversification, eliminate all of the market risk inherent in owning stocks, but as a general rule it will not be possible to eliminate all company-specific risk.

ANS: F                      PTS: 1                      DIF: MEDIUM      REF: 207–210  
OBJ: (7.3) Diversification effects

38. The CAPM is built on historic conditions, although in most cases we use expected future data in applying it. Because betas used in the CAPM are calculated using expected future data, they are not subject to changes in future volatility. This is one of the strengths of the CAPM.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 207–210  
OBJ: (7.4) CAPM

39. If the price of money (e.g., interest rates and equity capital costs) increases due to an increase in anticipated inflation, the risk-free rate will also increase. If there is no change in investors' risk aversion, then the market risk premium ( $r_M - r_{RF}$ ) will remain constant. Also, if there is no change in stocks' betas, then the required rate of return on each stock as measured by the CAPM will increase by the same amount as the increase in expected inflation.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 213–214  
OBJ: (7.4) CAPM and inflation

40. Since the market return represents the expected return on an average stock, that return has a certain amount of risk. As a result, there exists a market risk premium, which is the amount over and above the risk-free rate, which is required to compensate stock investors for assuming an average amount of risk.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 211–212  
OBJ: (7.4) Market risk premium

41. If you plotted the returns of a given stock against those of the market, and if you found that the slope of the regression line was *negative*, the CAPM would indicate that the required rate of return on the stock should be greater than the risk-free rate for a well-diversified investor, assuming that the observed relationship is expected to continue into the future.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 211–212  
OBJ: (7.4) SML

42. The Y-axis intercept of the SML represents the required return of a portfolio with a beta of zero, or the risk-free rate.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 211–212  
OBJ: (7.4) SML

43. Any change in beta is likely to affect the required rate of return on a stock, which implies that a change in beta will likely have an impact on the stock's price.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 214  
OBJ: (7.4) Changes in beta

44. Unless assets are negatively correlated, combining assets into a portfolio will not reduce portfolio risk.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 211–213  
OBJ: (7.4) Portfolio risk

45. If an incorrect proxy market portfolio is used when developing the security market line, the slope of the line (i.e., beta) will tend to be overestimated.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 226–228  
OBJ: (Appendix 7A) Estimating beta

46. Characteristic line is used to estimate the market risk with the best fit for a scatter diagram showing the rates of return of an individual risky asset and the market portfolio of risky assets over time.

ANS: T                    PTS: 1                    DIF: MEDIUM            REF: 226–228  
OBJ: (Appendix 7A) Estimating beta

47. Diversifiable risk is an important factor in the arbitrage pricing model.

ANS: F                    PTS: 1                    DIF: MEDIUM            REF: 229–231  
OBJ: (Appendix 7B) Arbitrage pricing theory

48. The CAPM can be viewed as an APT model with one factor.

ANS: T                    PTS: 1                    DIF: MEDIUM            REF: 229–231  
OBJ: (Appendix 7B) Arbitrage pricing theory

49. Diversification obtained within an indexed mutual fund can protect investors from losses during an economic downturn.

ANS: F                    PTS: 1                    DIF: MEDIUM            REF: 202  
OBJ: (7.3) Portfolio diversification

50. Diversification among various types of investments (e.g., stocks, bonds, money market securities) provides more protection from economic uncertainty than a diversified portfolio based on holdings only within one of these investment groups.

ANS: T                    PTS: 1                    DIF: MEDIUM            REF: 202  
OBJ: (7.3) Portfolio diversification

## MULTIPLE CHOICE

1. A highly risk-averse investor is considering adding one additional stock to a three-stock portfolio, to form a four-stock portfolio. The three stocks currently held all have  $b = 1.0$  and a perfect positive correlation with the market. Potential new Stocks A and B both have expected returns of 15%, and both are equally correlated with the market, with  $r = 0.75$ . However, Stock A's standard deviation of returns is 12% versus 8% for Stock B. Which stock should this investor add to his or her portfolio, or does the choice matter?
  - a. either A or B, i.e., the investor should be indifferent as to which of the two
  - b. Stock A
  - c. Stock B
  - d. neither A nor B, as neither has a return sufficient to compensate for risk

ANS: C

With identical expected returns and correlation coefficients, A and B would have identical betas. Thus they would contribute equally to the risk of well-diversified portfolios. However, they will be part of a portfolio with only four stocks, which will be subject to unsystematic risk. Therefore, Stock B would be the better choice for a risk-averse investor.

PTS: 1                    DIF: MEDIUM            REF: 193–195            OBJ: (7.2) Standard deviation  
BLM: Understand

2. What is the effect on portfolio beta of a larger number of assets in a portfolio and a longer time period?
  - a. It is less stable.
  - b. It is more stable.
  - c. It is more consistent.

d. It is less consistent.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 210  
OBJ: (7.3) Portfolio beta                      BLM: Remember

3. Which type of correlation will a completely diversified portfolio have with the market portfolio?
- less than one, because it carries only market risk
  - less than one, because it carries only diversifiable risk
  - equal to one, because it carries only diversifiable risk
  - equal to one, because it carries only market risk

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 205–207  
OBJ: (7.3) Market portfolio                      BLM: Remember

4. Which asset mix would be the best representation of the true market portfolio?
- bonds, stocks, foreign securities, derivatives, and real estate
  - bonds, stocks, foreign securities, and derivatives
  - bonds, stocks, and foreign securities
  - bonds and stocks

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 205–207  
OBJ: (7.3) Market portfolio                      BLM: Remember

5. Stocks A and B both have an expected return of 10% and a standard deviation of returns of 25%. Stock A has a beta of 0.8 and Stock B has a beta of 1.2. The correlation coefficient,  $r$ , between the two stocks is 0.6. Portfolio P is a portfolio with 50% invested in Stock A and 50% invested in B. Which of the following statements is correct?
- Portfolio P has a standard deviation of 25% and a beta of 1.0.
  - Based on the information we are given, and assuming those are the views of the marginal investor, it is apparent that the two stocks are in equilibrium.
  - Portfolio P has more market risk than Stock A but less market risk than Stock B.
  - Stock A should have a higher expected return than Stock B as viewed by the marginal investor.

ANS: C

Because the correlation between the two stocks is less than 1, the portfolio's standard deviation will be less than 25%. Therefore, (a) is false. (b) and (d) are false, because Stock B has a higher beta and consequently a higher required return, but the stocks have the same expected returns. Remember, market risk is measured by beta. The beta of the portfolio will be the weighted average of the two betas; therefore, it will be less than the beta of the high-beta stock (B), but more than the beta of the low-beta stock (A). Therefore, the market risk of the portfolio will be higher than A's, but lower than B's, meaning that (c) is correct. Note that the standard deviation of the portfolio will be less than the weighted average of the two stocks' standard deviations because the correlation coefficient is less than one. Therefore, although the expected return on the portfolio will be the weighted average of the two returns (10%), the CV will not be equal to 25%/10%.

PTS: 1                      DIF: MEDIUM                      REF: 199–202                      OBJ: (7.3) Portfolio risk  
BLM: Analyze

6. Which statement about risk is true?
- An investor can eliminate virtually all market risk if he or she holds a very large and well-diversified portfolio of stocks.
  - The higher the correlation between the stocks in a portfolio, the lower the risk inherent in the portfolio.
  - It is impossible to have a situation where the market risk of a single stock is less than that

of a portfolio that includes the stock.

- d. An investor can eliminate virtually all diversifiable risk if he or she holds a very large, well-diversified portfolio of stocks.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 199–202  
OBJ: (7.3) Portfolio risk                      BLM: Remember

7. Stock A has a beta = 0.8, while Stock B has a beta = 1.6. Which of the following statements is correct?
- Stock B's required return is double that of Stock A's.
  - If the marginal investor becomes more risk averse, the required return on Stock B will increase by more than the required return on Stock A.
  - An equally weighted portfolio of Stocks A and B will have a beta lower than 1.2.
  - If the risk-free rate increases but the market risk premium remains constant, the required return on Stock A will increase by more than that on Stock B.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 210  
OBJ: (7.3) Portfolio risk and beta                      BLM: Understand

8. What happens to the amount of market risk as the number of assets in a portfolio increases?
- It decreases.
  - It increases.
  - It remains constant.
  - It changes randomly.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 208  
OBJ: (7.3) Market risk                      BLM: Remember

9. What happens to portfolios that cannot be dominated?
- They lie on the efficient frontier.
  - They are minimum risk portfolios.
  - They have low correlations.
  - They have maximum expected returns.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 203–205  
OBJ: (7.3) Efficient portfolio                      BLM: Remember

10. Which of the following statements is correct?
- If you add enough randomly selected stocks to a portfolio, you can completely eliminate all of the market risk from the portfolio.
  - If you formed a portfolio that consisted of all stocks with betas less than 1.0, which is about half of all stocks, the portfolio would itself have a beta coefficient that is equal to the weighted average beta of the stocks in the portfolio, and that portfolio would have less risk than a portfolio that consisted of all stocks in the market.
  - Market risk can be eliminated by forming a large portfolio, and if some Treasury bonds are held in the portfolio, the portfolio can be made to be completely riskless.
  - A portfolio that consists of all stocks in the market would have a required return that is equal to the riskless rate.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 210  
OBJ: (7.3) Portfolio risk and beta                      BLM: Understand

11. Which statement best characterizes economic events such as inflation, recession, and high interest rates?
- They are systematic risk factors that can be diversified away.
  - They are company-specific risk factors that can be diversified away.



- c. They are among the factors that are responsible for market risk.
- d. They are risks that are beyond the control of investors and thus should not be considered by security analysts or portfolio managers.

ANS: C                      PTS: 1                      DIF: MEDIUM              REF: 205–207  
OBJ: (7.3) Market risk                      BLM: Understand

12. Which of the following statements is correct?
- a. The beta of a portfolio of stocks is always smaller than the beta of any of the individual stocks.
  - b. If you found a stock with a zero historical beta and held it as the only stock in your portfolio, you would by definition have a riskless portfolio.
  - c. The beta coefficient of a stock is normally found by regressing past returns on a stock against past market returns. One could also construct a scatter diagram of returns on the stock versus those on the market, estimate the slope of the line of best fit, and use it as beta. However, this historical beta may differ from the beta that exists in the future.
  - d. It is theoretically possible for a stock to have a beta of 1.0. If a stock did have a beta of 1.0, then, at least in theory, its required rate of return would be equal to the risk-free (default-free) rate of return,  $r_{RF}$ .

ANS: C                      PTS: 1                      DIF: MEDIUM              REF: 208–210  
OBJ: (7.3) Beta coefficients                      BLM: Understand

13. Which of the following statements is correct?
- a. Collections Inc. is in the business of collecting past-due accounts for other companies, i.e., it is a collection agency. Collections' revenues, profits, and stock price tend to rise during recessions. This suggests that Collections Inc.'s beta should be quite high, say 2.0, because it does so much better than most other companies when the economy is weak.
  - b. Suppose the returns on two stocks are negatively correlated. One has a beta of 1.2 as determined in a regression analysis using data for the last 5 years, while the other has a beta of  $-0.6$ . The returns on the stock with the negative beta will be negatively correlated with returns on most other stocks in the market during that 5-year period.
  - c. Suppose you are managing a stock portfolio, and you have information that leads you to believe the stock market is likely to be very strong in the immediate future. That is, you are convinced that the market is about to rise sharply. You should sell your high-beta stocks and buy low-beta stocks in order to take advantage of the expected market move.
  - d. You think that investor sentiment is about to change, and investors are about to become more risk averse. This suggests that you should rebalance your portfolio to include more high-beta stocks.

ANS: B                      PTS: 1                      DIF: MEDIUM              REF: 208–210  
OBJ: (7.3) Beta coefficients                      BLM: Understand

14. Which of the following statements is correct?
- a. If a company with a high-beta stock merges with a low-beta company, the best estimate of the new merged company's beta is 1.0.
  - b. The beta of an "average stock," or "the market," can change over time, sometimes drastically.
  - c. If a newly issued stock does not have a past history that can be used as a basis for calculating beta, then we should always estimate that its beta will turn out to be 1.0. This is especially true if the company finances with more debt than the average firm.
  - d. During a period when a company is undergoing a change such as increasing its use of leverage or taking on riskier projects, the calculated historical beta may be drastically different than the "true" or "expected future" beta.

ANS: D                      PTS: 1                      DIF: MEDIUM      REF: 208–210  
OBJ: (7.3) Beta coefficients                      BLM: Understand

15. What is implied when an asset has a negative beta value?
- It implies that the asset can't exist because negative beta assets are theoretically impossible.
  - It implies that the asset is a necessary component for achieving a fully diversified portfolio.
  - It implies that the asset is a risk-reducing property when added to a portfolio.
  - It implies that the asset has a higher expected return.

ANS: C                      PTS: 1                      DIF: MEDIUM      REF: 208–210  
OBJ: (7.3) Beta coefficients                      BLM: Remember

16. Stock A's beta is 1.5 and Stock B's beta is 0.5. Which of the following statements *must* be true, assuming the CAPM is correct.
- Stock A would be a more desirable addition to a portfolio than Stock B.
  - In equilibrium, the expected return on Stock B will be greater than that on Stock A.
  - Stock B would be a more desirable addition to a portfolio than Stock A.
  - In equilibrium, the expected return on Stock A will be greater than that on Stock B.

ANS: D                      PTS: 1                      DIF: MEDIUM      REF: 208–210  
OBJ: (7.3) Beta coefficients                      BLM: Understand

17. Stock X has a beta of 0.5 and Stock Y has a beta of 1.5. Which of the following statements *must* be true, according to the CAPM?
- Stock Y's return during the coming year will be higher than Stock X's return.
  - If expected inflation increases but the market risk premium is unchanged, the required returns on the two stocks will increase by the same amount.
  - Stock Y's return has a higher standard deviation than Stock X.
  - If the market risk premium declines, but the risk-free rate is unchanged, Stock X will have a larger decline in its required return than will Stock Y.

ANS: B  
(a) is false; Y has a higher required return because it is more risky, but it may still end up actually earning a lower return than X. (b) is correct from the CAPM:  $r_s = r_{RF} + (r_M - r_{RF})b$ . (c) is false; beta tells us about the covariance of the stock with the market. It tells us nothing about the stocks' individual standard deviations. (d) is false from the CAPM.

PTS: 1                      DIF: MEDIUM      REF: 208–210      OBJ: (7.3) Beta coefficients  
BLM: Understand

18. Consider the following information for three stocks, A, B, and C, and portfolios of these stocks. The stocks' returns are positively but not perfectly positively correlated with one another, i.e., the correlation coefficients are all between 0 and 1.

Stock	Expected Return	Standard Deviation	Beta
Stock A	10%	20%	1.0
Stock B	10	10	1.0
Stock C	12	12	1.4

- Portfolio AB has half of its funds invested in Stock A and half in Stock B. Portfolio ABC has one third of its funds invested in each of the three stocks. The risk-free rate is 5%, and the market is in equilibrium, so required returns equal expected returns. Which of the following statements is correct?
- Portfolio AB has a standard deviation of 20%.
  - Portfolio AB's coefficient of variation is greater than 2.0.
  - Portfolio AB's required return is greater than the required return on Stock A.
  - Portfolio ABC's expected return is 10.67%.

ANS: D

(a) is incorrect. Since the correlation is not 1.00, the standard deviation of the portfolio is less than 20%. Since Portfolio AB's standard deviation is less than 20%, its CV is less than 2.0. So, (b) is incorrect. (c) is incorrect because Portfolio AB's required return equals that of Stock A. Portfolio ABC's required return =  $(10\% + 10\% + 12\%)/3 = 10.67\%$ . So, (d) is the correct choice. Some calculations, which are not really needed, are shown below.

<u>Stock</u>	<u>Beta</u>	<u>Expected Return</u>	<u>Standard Deviation</u>
Stock A	1.0	10.00%	20.00%
Stock B	1.0	10.00%	10.00%
Stock C	1.4	12.00%	12.00%

	<u>Portfolio AB</u>	<u>Portfolio ABC</u>
Expected return	10.00%	10.67%
SD	0.00%	0.94%
CV	0.00	0.09
Beta	1.00	1.13

PTS: 1      DIF: MEDIUM      REF: 200–207      OBJ: (7.3) Portfolio risk concepts  
 BLM: Analyze

19. Which of the following statements is correct?
- A portfolio with a large number of randomly selected stocks would have more market risk than a single stock that has a beta of 0.5, assuming that the stock's beta was correctly calculated and is stable.
  - If a stock has a negative beta, its expected return must be negative.
  - A portfolio with a large number of randomly selected stocks would have less market risk than a single stock that has a beta of 0.5.
  - According to the CAPM, stocks with higher standard deviations of returns must also have higher expected returns.

ANS: A

(a) is correct. (b) is false, because a stock can have a negative beta and still have a positive return because  $r_s = r_{RF} + (r_M - r_{RF})\beta$ . (c) is obviously false. (d) is also false, because betas are a measure of market risk, while standard deviation is a measure of stand-alone risk—but not a good measure.

PTS: 1      DIF: MEDIUM      REF: 199 | 207–210  
 OBJ: (7.3) Portfolio return, CAPM, and beta      BLM: Understand

20. Which of the following statements is correct?
- A stock's beta is less relevant as a measure of risk to an investor with a well-diversified portfolio than to an investor who holds only that one stock.
  - If an investor buys enough stocks, he or she can, through diversification, eliminate all of the diversifiable risk inherent in owning stocks. Therefore, if a portfolio contained all publicly traded stocks, it would be essentially riskless.

- c. Portfolio diversification reduces the variability of returns (as measured by the standard deviation) of each individual stock held in a portfolio.
- d. A security's beta measures its nondiversifiable, or market, risk relative to that of an average stock.

ANS: D

A stock's beta is more relevant as a measure of risk to an investor with a well-diversified portfolio than to an investor who holds only that one stock. An investor, through diversification, can eliminate company-specific risk; however, a portfolio containing all publicly traded stocks would still be exposed to market risk. The CAPM specifies a stock's required return as:  $r_s = r_{RF} + (r_M - r_{RF})\beta$ . Thus, the risk-free rate and the market risk premium are needed, along with a stock's beta, to determine its required return. The standard deviations of the individual assets do not change; rather, the portfolio's standard deviation declines with diversification.

PTS: 1                      DIF: MEDIUM      REF: 203–207

OBJ: (7.3) Risk analysis and portfolio diversification

BLM: Understand

21. Which of the following statements is correct?
- a. A large portfolio of randomly selected stocks will always have a standard deviation of returns that is less than the standard deviation of a portfolio with fewer stocks, regardless of how the stocks in the smaller portfolio are selected.
  - b. Company-specific (or diversifiable) risk can be reduced by forming a large portfolio, but normally even highly diversified portfolios are subject to market (or systematic) risk.
  - c. A large portfolio of randomly selected stocks will have a standard deviation of returns that is greater than the standard deviation of a one-stock portfolio if that one stock has a beta less than 1.0.
  - d. If you add enough randomly selected stocks to a portfolio, you can completely eliminate all of the market risk from the portfolio.

ANS: B

(b) is correct. The other statements are not always correct. For example, (a) is incorrect because a small set of companies with very low SDs could have a lower SD than a large portfolio of stocks with higher SDs.

PTS: 1                      DIF: MEDIUM      REF: 203–207

OBJ: (7.3) Risk analysis and portfolio diversification

BLM: Understand

22. Which of the following statements is correct?
- a. A two-stock portfolio will always have a lower standard deviation than a one-stock portfolio.
  - b. A portfolio that consists of 40 stocks that are not highly correlated with the market will probably be less risky than a portfolio of 40 stocks that are highly correlated with the market, assuming the stocks all have the same standard deviations.
  - c. A two-stock portfolio will always have a lower beta than a one-stock portfolio.
  - d. If portfolios are formed by randomly selecting stocks, a 10-stock portfolio will always have a lower beta than a one-stock portfolio.

ANS: B

First, note that (b) is correct. Also, we can eliminate the other choices. (a) will be false if one stock has a very low SD and the other a very high one, and they are highly correlated. (c) is false because a portfolio's beta is not dependent on the number of stocks in the portfolio. (d) is false for the same reason that (c) is false. That leaves (b) as the only possibly correct choice.

PTS: 1                      DIF: MEDIUM      REF: 203–210

OBJ: (7.3) Portfolio risk, return, and beta

BLM: Understand

23. Stock A has an expected return of 12%, a beta of 1.2, and a standard deviation of 20%. Stock B also has a beta of 1.2, an expected return of 10%, and a standard deviation of 15%. Portfolio AB has \$900,000 invested in Stock A and \$300,000 invested in Stock B. The correlation between the two stocks' returns is zero (that is,  $r_{A,B} = 0$ ). Which of the following statements is correct?
- The stocks are not in equilibrium based on the CAPM; if A is valued correctly, then B is overvalued.
  - The stocks are not in equilibrium based on the CAPM; if A is valued correctly, then B is undervalued.
  - Portfolio AB's expected return is 11.0%.
  - Portfolio AB's beta is less than 1.2.

ANS: A

Since the stocks have the same betas and thus the same required returns under the CAPM, but different expected returns, the markets are not in equilibrium. If Stock A is fairly priced, then all beta = 1.2 stocks should have an expected return of 12%. But Stock B returns only 10%, which shows it is overpriced. Therefore, (a) is correct.

PTS: 1                      DIF: MEDIUM              REF: 199–202

OBJ: (7.3) Portfolio risk and return              BLM: Analyze

24. For a portfolio of 40 randomly selected stocks, which of the following is most likely to be true?
- The riskiness of the portfolio is greater than the riskiness of each of the stocks if each was held in isolation.
  - The riskiness of the portfolio is the same as the riskiness of each of the stocks if each was held in isolation.
  - The beta of the portfolio is less than the average of the betas of the individual stocks.
  - The beta of the portfolio is equal to the average of the betas of the individual stocks.

ANS: D                      PTS: 1                      DIF: MEDIUM              REF: 199–202

OBJ: (7.3) Portfolio risk and return              BLM: Understand

25. What should you expect to happen if you randomly select stocks and add them to your portfolio?
- This will reduce the portfolio's unsystematic, or diversifiable, risk.
  - This will increase the portfolio's expected rate of return.
  - This will reduce the portfolio's beta coefficient and thus its systematic risk.
  - This will have no effect on the portfolio's risk.

ANS: A                      PTS: 1                      DIF: MEDIUM              REF: 199–202

OBJ: (7.3) Portfolio risk and return              BLM: Remember

26. Bob has a \$50,000 stock portfolio with a beta of 1.2, an expected return of 10.8%, and a standard deviation of 25%. Becky also has a \$50,000 portfolio, but it has a beta of 0.8, an expected return of 9.2%, and a standard deviation that is also 25%. The correlation coefficient,  $r$ , between Bob's and Becky's portfolios is zero. If Bob and Becky marry and combine their portfolios, which statement about their combined \$100,000 portfolio is true?
- The combined portfolio's expected return will be *less than* the simple weighted average of the expected returns of the two individual portfolios, 10.0%.
  - The combined portfolio's beta will be *equal to* a simple average of the betas of the two individual portfolios, 1.0; its expected return will be *equal to* a simple weighted average of the expected returns of the two individual portfolios, 10.0%; and its standard deviation will be *less than* the simple average of the two portfolios' standard deviations, 25%.
  - The combined portfolio's expected return will be *greater than* the simple weighted average of the expected returns of the two individual portfolios, 10.0%.
  - The combined portfolio's standard deviation will be *greater than* the simple average of the

two portfolios' standard deviations, 25%.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 208–210  
OBJ: (7.3) Portfolio risk and return                      BLM: Analyze

27. Your portfolio consists of \$50,000 invested in Stock X and \$50,000 invested in Stock Y. Both stocks have an expected return of 15%, betas of 1.6, and standard deviations of 30%. The returns of the two stocks are independent, so the correlation coefficient between them,  $r_{XY}$ , is zero. Which statement best describes the characteristics of your two-stock portfolio?
- Your portfolio has a standard deviation of 30%, and its expected return is 15%.
  - Your portfolio has a standard deviation less than 30%, and its beta is greater than 1.6.
  - Your portfolio has a beta equal to 1.6, and its expected return is 15%.
  - Your portfolio has a beta greater than 1.6, and its expected return is greater than 15%.

ANS: C

The portfolio will have an expected return equal to the weighted average of the individual stocks' returns. The portfolio's beta will also be equal to the weighted average of the individual stocks' betas. The standard deviation of the portfolio will be less than 30%, because the stocks have a correlation coefficient of less than 1.0. Therefore, the portfolio's beta will equal 1.6, its standard deviation is less than 30%, and its expected return is 15%. The correct answer must be (c).

PTS: 1                      DIF: MEDIUM                      REF: 208–210  
OBJ: (7.3) Portfolio risk and return                      BLM: Analyze

28. What does portfolio effect mean in investment decisions?
- the degree of correlation between various assets
  - the level of independence between asset returns
  - the relationship between assets and market movements
  - the risk-adjusted discount rates

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 205–207  
OBJ: (7.3) Diversifiable risk                      BLM: Remember

29. Which of the following is most likely to occur as you add randomly selected stocks to your portfolio, which currently consists of three average stocks?
- The diversifiable risk of your portfolio will likely decline, but the market risk should not be expected to change.
  - The diversifiable risk will remain the same, but the market risk will likely decline.
  - Both the diversifiable risk and the market risk of your portfolio are likely to decline.
  - The total risk of your portfolio should decline, and as a result, the expected rate of return on the portfolio should also decline.

ANS: A

If we randomly add stocks to the portfolio, the diversifiable risk will decline because the standard deviation of the portfolio will be declining. However, the market risk (as measured by beta) will tend to remain the same. Therefore, (a) is correct. Since we are randomly adding stocks, eventually your portfolio will have the same expected return as the market, on average. Therefore, unless we are told that the current expected return is higher than the market average, we have no reason to believe that the expected return will decline. Also, we know there is no reason to believe that the market risk of the portfolio (as measured by beta) will decline. Therefore, (b) is false. The diversifiable risk (as measured by the standard deviation of the portfolio) will decline and market risk is not expected to change. Therefore, (c) is false. (d) is incorrect because, while the total risk of the portfolio should decline, market risk should not change, and that's what affects expected returns.

PTS: 1                      DIF: MEDIUM                      REF: 205–207

OBJ: (7.3) Portfolio risk and return      BLM: Analyze

30. Stock X has a beta of 0.7 and Stock Y has a beta of 1.3. The standard deviation of each stock's returns is 20%. The stocks' returns are independent of each other, i.e., the correlation coefficient,  $r$ , between them is zero. Portfolio P consists of 50% X and 50% Y. Given this information, which of the following statements is correct?
- The required return on Portfolio P is equal to the market risk premium ( $r_M - r_{RF}$ ).
  - Portfolio P has a beta of 0.7.
  - Portfolio P has a beta of 1.0 and a required return that is equal to the riskless rate,  $r_{RF}$ .
  - Portfolio P has the same required return as the market ( $r_M$ ).

ANS: D

Since the beta of the portfolio is equal to 1.0, as is the beta of the market, (d) is correct. The other statements are all false.

PTS: 1      DIF: MEDIUM      REF: 210  
OBJ: (7.3) Portfolio risk and return      BLM: Analyze

31. Jane has a portfolio of 20 average stocks, and Dick has a portfolio of 2 average stocks. Assuming the market is in equilibrium, which of the following statements is correct?
- Jane's portfolio will have less diversifiable risk and also less market risk than Dick's portfolio.
  - The required return on Jane's portfolio will be lower than that on Dick's portfolio because Jane's portfolio will have less total risk.
  - Dick's portfolio will have more diversifiable risk, the same market risk, and thus more total risk than Jane's portfolio, but the required (and expected) returns will be the same on both portfolios.
  - The expected return on Jane's portfolio must be lower than the expected return on Dick's portfolio because Jane is more diversified.

ANS: C

Choice (c) is correct, because equilibrium required and expected returns are equal, and they are dependent on beta, which will be 1.0 in both cases. The other statements are all false.

PTS: 1      DIF: MEDIUM      REF: 208–210  
OBJ: (7.3) Portfolio risk and return      BLM: Analyze

32. In the absence of a risk-free rate, what is the minimum variance portfolio?
- It is always efficient.
  - It is never efficient.
  - It is usually efficient.
  - It is usually the optimal portfolio.

ANS: A      PTS: 1      DIF: MEDIUM      REF: 203–205  
OBJ: (7.3) Efficient portfolio      BLM: Remember

33. Stocks A and B each have an expected return of 12%, a beta of 1.2, and a standard deviation of 25%. The returns on the two stocks have a correlation of 0.6. Portfolio P has 50% in Stock A and 50% in Stock B. Which of the following statements is correct?
- Portfolio P has a beta that is greater than 1.2.
  - Portfolio P has a standard deviation that is greater than 25%.
  - Portfolio P has a standard deviation that is less than 25%.
  - Portfolio P has a beta that is less than 1.2.

ANS: C

An equally weighted two-stock portfolio's beta and expected return will be weighted averages of the component stocks' betas and expected returns. However, its standard deviation will be less than the average standard deviation. Therefore, the correct answer is (c).

PTS: 1                    DIF: MEDIUM            REF: 193–196 | 208–210  
OBJ: (7.3) Portfolio risk and return            BLM: Analyze

34. Stocks A, B, and C all have an expected return of 10% and a standard deviation of 25%. Stocks A and B have returns that are *independent* of one another, i.e., their correlation coefficient,  $r$ , equals zero. Stocks A and C have returns that are *negatively correlated* with one another, i.e.,  $r$  is less than 0. Portfolio AB is a portfolio with half of its money invested in Stock A and half in Stock B. Portfolio AC is a portfolio with half of its money invested in Stock A and half invested in Stock C. Which of the following statements is correct?
- Portfolio AC has an expected return that is greater than 25%.
  - Portfolio AB has a standard deviation that is greater than 25%.
  - Portfolio AB has a standard deviation that is equal to 25%.
  - Portfolio AC has a standard deviation that is less than 25%.

ANS: D

Combining two stocks with a correlation coefficient less than 1.0 will result in a portfolio whose SD is less than the average of the two stocks. A and C have such a correlation. Therefore, Portfolio AC will have a SD that is less than 25%, so (d) is correct. The other statements are all false.

PTS: 1                    DIF: MEDIUM            REF: 199–202  
OBJ: (7.3) Portfolio risk and return            BLM: Analyze

35. Stocks A and B each have an expected return of 15%, a standard deviation of 20%, and a beta of 1.2. The returns on the two stocks have a correlation coefficient of +0.6. You have a portfolio that consists of 50% A and 50% B. Which of the following statements is correct?
- The portfolio's beta is less than 1.2.
  - The portfolio's expected return is 15%.
  - The portfolio's standard deviation is greater than 20%.
  - The portfolio's beta is greater than 1.2.

ANS: B                    PTS: 1                    DIF: MEDIUM            REF: 193–196 | 208–210  
OBJ: (7.3) Portfolio risk and return            BLM: Analyze

36. Stocks A, B and C have betas of 0.8, 1.0, and 1.2. Portfolio P has 1/3 of its value invested in each stock. Each stock has a standard deviation of 25%, and their returns are independent of one another, i.e., the correlation coefficients between each pair of stock is zero. If market is in equilibrium, which of the following is correct?
- Portfolio P's expected return is greater than the expected return on Stock B.
  - Portfolio P's expected return is equal to the expected return on Stock A.
  - Portfolio P's expected return is less than the expected return on Stock B.
  - Portfolio P's expected return is equal to the expected return on Stock B.

ANS: D

The portfolio's beta will be 1.0, the average of the three. That is B's beta, so the portfolio's expected return will be the same as B's. Therefore, the correct answer is (d).

PTS: 1                    DIF: MEDIUM            REF: 193–196 | 208–210  
OBJ: (7.3) Portfolio risk and return            BLM: Analyze

37. Which of the following statements is correct? (Assume that the risk-free rate is a constant.)
- If the market risk premium increases by 1%, then the required return will increase for



stocks that have a beta greater than 1.0, but it will decrease for stocks that have a beta less than 1.0.

- b. The effect of a change in the market risk premium depends on the slope of the yield curve.
- c. If the market risk premium increases by 1%, then the required return on all stocks will rise by 1%.
- d. If the market risk premium increases by 1%, then the required return will increase by 1% for a stock that has a beta of 1.0.

ANS: D

Return =  $r_{RF} + b(RP_M)$ . Look at this equation when thinking about the answers. Visualize data from the statements in the equation. (d) is correct, because if beta is 1.0, then the required return will increase with the increase in the  $RP_M$ . All of the other answers are incorrect.

PTS: 1                      DIF: MEDIUM              REF: 211–213              OBJ: (7.4) Market risk premium  
BLM: Analyze

38. Over the past 75 years, we have observed that investments with the highest average annual returns also tend to have the highest standard deviations of annual returns. This observation supports the notion that there is a positive correlation between risk and return. Which of the following options correctly ranks investments from *highest to lowest* risk (and return), where the security with the highest risk is shown first, the one with the lowest risk last?
- a. small-company stocks, long-term corporate bonds, large-company stocks, long-term government bonds, Treasury bills
  - b. large-company stocks, small-company stocks, long-term corporate bonds, Treasury bills, long-term government bonds
  - c. small-company stocks, large-company stocks, long-term corporate bonds, long-term government bonds, Treasury bills
  - d. large-company stocks, small-company stocks, long-term corporate bonds, long-term government bonds, Treasury bills

ANS: C

Stocks are riskier than bonds, and small-company stocks are riskier than large-company stocks. Also, corporate bonds are riskier than government bonds, and longer-term government bonds are riskier than shorter-term ones.

PTS: 1                      DIF: MEDIUM              REF: 211–213              OBJ: (7.4) Risk and return  
BLM: Understand

39. During the next year, the market risk premium,  $(r_M - r_{RF})$ , is expected to fall, while the risk-free rate,  $r_{RF}$ , is expected to remain the same. Given this forecast, which of the following statements is correct?
- a. The required return will increase for stocks with a beta less than 1.0 and will decrease for stocks with a beta greater than 1.0.
  - b. The required return will fall for all stocks, but it will fall *more* for stocks with higher betas.
  - c. The required return for all stocks will fall by the same amount.
  - d. The required return will fall for all stocks, but it will fall *less* for stocks with higher betas.

ANS: B

The easiest way to see this is to write out the CAPM:  $r_s = r_{RF} + (r_M - r_{RF})b$ . Clearly, a change in the market risk premium is going to have the most effect on firms with high betas. Consequently, (b) is the correct choice. Figures 7-11 and 7-12 could be used to help understand this question.

PTS: 1                      DIF: MEDIUM              REF: 211–213              OBJ: (7.4) Required return  
BLM: Understand

40. The long-run nominal growth rate of the economy is a good measure of which of the following?

- a. the inflation rate
- b. the government deficit
- c. the risk-free interest rate
- d. the foreign trade surplus

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 211–214  
 OBJ: (7.4) CAPM: RF                      BLM: Remember

41. Assume that in recent years both expected inflation and the market risk premium ( $r_M - r_{RF}$ ) have declined. Assume also that all stocks have positive betas. Which of the following would be most likely to have occurred as a result of these changes?
- a. The required returns on all stocks would have fallen, but the decline would have been greater for stocks with lower betas.
  - b. The required returns on all stocks would have fallen, but the fall would have been greater for stocks with higher betas.
  - c. Required returns would have increased for stocks with betas greater than 1.0 but would have declined for stocks with betas less than 1.0.
  - d. The required returns on all stocks would have fallen by the same amount.

ANS: B  
 We can see from the SML equation,  $r_s = r_{RF} + (r_M - r_{RF})b$ , that (b) is the only correct answer.

PTS: 1                      DIF: MEDIUM                      REF: 211–214  
 OBJ: (7.4) CAPM and required return                      BLM: Understand

42. Assume that the risk-free rate is 5%. Which statement about a stock's beta is correct?
- a. If a stock has a negative beta, its required return under the CAPM would be less than 5%.
  - b. If a stock's beta doubled, its required return under the CAPM would also double.
  - c. If a stock's beta were less than 1.0, its required return under the CAPM would be less than 5%.
  - d. If a stock's beta were 1.0, its required return under the CAPM would be 5%.

ANS: A  
 We can see from the SML equation,  $r_s = r_{RF} + (r_M - r_{RF})b$ , that (a) is the only correct answer.

PTS: 1                      DIF: MEDIUM                      REF: 211–214  
 OBJ: (7.4) CAPM and required return                      BLM: Understand

43. Stock HB has a beta of 1.5 and Stock LB has a beta of 0.5. The market is in equilibrium, with required returns equalling expected returns. Which of the following statements is correct?
- a. If expected inflation remains constant but the market risk premium ( $r_M - r_{RF}$ ) declines, the required return of Stock LB will decline but the required return of Stock HB will increase.
  - b. If both expected inflation and the market risk premium ( $r_M - r_{RF}$ ) increase, the required return on Stock HB will increase by more than that of Stock LB.
  - c. If both expected inflation and the market risk premium ( $r_M - r_{RF}$ ) increase, the required returns of both stocks will increase by the same amount.
  - d. If expected inflation remains constant but the market risk premium ( $r_M - r_{RF}$ ) declines, the required return on Stock HB will decline but the required return of Stock LB will increase.

ANS: B  
 We can see from the SML equation,  $r_s = r_{RF} + (r_M - r_{RF})b$ , that (b) is the only correct answer.

PTS: 1                      DIF: MEDIUM                      REF: 211–214  
 OBJ: (7.4) CAPM and required return                      BLM: Understand

44. Stock A has a beta of 0.8, Stock B has a beta of 1.0, and Stock C has a beta of 1.2. Portfolio P has equal amounts invested in each of the three stocks. Each of the stocks has a standard deviation of 25%. The returns on the three stocks are independent of one another (i.e., the correlation coefficients all equal zero). Assume that there is an increase in the market risk premium, but the risk-free rate remains unchanged. Which of the following statements is correct?
- The required return of all stocks will remain unchanged since there was no change in their betas.
  - The required return on Stock A will increase by less than the increase in the market risk premium, while the required return on Stock C will increase by more than the increase in the market risk premium.
  - The required return on the average stock will remain unchanged, but the returns of riskier stocks (such as Stock C) will increase while the returns of safer stocks (such as Stock A) will decrease.
  - The required return on the average stock will remain unchanged, but the returns of riskier stocks (such as Stock C) will decrease while the returns on safer stocks (such as Stock A) will increase.

ANS: B

We can see from the SML equation,  $r_s = r_{RF} + (r_M - r_{RF})b$ , that (b) is the only correct answer.

PTS: 1                      DIF: MEDIUM              REF: 211–214

OBJ: (7.4) CAPM and required return              BLM: Analyze

45. Which of the following statements is correct?
- If a company's beta doubles, then its required rate of return will also double.
  - Other things held constant, if investors suddenly became convinced that there would be deflation in the economy, then the required returns on all stocks should increase.
  - If a company's beta were cut in half, then its required rate of return would also be halved.
  - If the risk-free rate rises by 0.5% but the market risk premium declines by that same amount, then the required rates of return on an average stock will remain unchanged, but required returns on stocks with betas less than 1.0 will rise.

ANS: D

(d) is correct, because (1) the required return on an average ( $b = 1$ ) stock will rise by 0.5% but also decline by this same amount, and (2) the intercept of the SML will rise but its slope will decline, causing required returns on low beta stocks to rise and those on high beta stocks to decline.

PTS: 1                      DIF: MEDIUM              REF: 211–214

OBJ: (7.4) CAPM and required return              BLM: Analyze

46. As investors become \_\_\_\_ risk averse, the market risk premium \_\_\_\_ and SML becomes \_\_\_\_.
- More, increases, steeper.
  - More, decreases, flatter
  - Less, increases, flatter.
  - Less, decreases, steeper.

ANS: A

See Figure 7-12 for the explanation.

PTS: 1                      DIF: MEDIUM              REF: 211–214              OBJ: (7.4) SML and risk aversion

BLM: Remember

47. Currently, the risk-free rate is 6% and the market risk premium is 5%. Given this information, which of the following statements is correct?
- An index fund with  $\beta = 1.0$  should have a required return of 11%.

- b. An index fund with  $\beta = 1.0$  should have a required return less than 11%.
- c. If a stock's beta doubles, its required return must also double.
- d. An index fund with  $\beta = 1.0$  should have a required return greater than 11%.

ANS: A

The required return on the market must be 11.0%. The index fund with  $\beta = 1.0$  must also have a required return of 11%, so (a) is correct. The other answers are incorrect.

PTS: 1                      DIF: MEDIUM                      REF: 211–214

OBJ: (7.4) CAPM, beta, and required return                      BLM: Understand

48. Which of the following statements is correct?
- a. The slope of the security market line is equal to the market risk premium.
  - b. Lower beta stocks have higher required returns.
  - c. A stock's beta indicates its company-specific risk.
  - d. Two securities with the same stand-alone risk will have the same betas.

ANS: A

$r_s = r_{RF} + (r_M - r_{RF})\beta = \text{SML}$ . The  $RP_M$  is the slope of the SML. So (a) is correct. The other answers are incorrect.

PTS: 1                      DIF: MEDIUM                      REF: 211–214                      OBJ: (7.4) SML

BLM: Understand

49. Which of the following statements is correct?
- a. If the risk-free rate rises, then the market risk premium will also rise.
  - b. If a company's beta is halved, then its required return will also be halved.
  - c. If a company's beta doubles, then its required return will also double.
  - d. The slope of the security market line is equal to the market risk premium,  $(r_M - r_{RF})$ .

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 211–214

OBJ: (7.4) SML                      BLM: Understand

50. Stock A has a beta of 1.2 and a standard deviation of 20%. Stock B has a beta of 0.8 and a standard deviation of 25%. Portfolio P has \$200,000 consisting of \$100,000 invested in Stock A and \$100,000 in Stock B. Which of the following statements is correct? (Assume that stocks are in equilibrium.)
- a. Stock A's returns are less highly correlated with the returns on most other stocks than are B's returns.
  - b. Stock B has a higher required rate of return than Stock A.
  - c. Portfolio P has a standard deviation of 22.5%.
  - d. Portfolio P has a beta equal to 1.0.

ANS: D

An equally weighted two-stock portfolio's beta and expected return will be weighted averages of the component stocks' betas and expected returns. However, its standard deviation will be less than the average standard deviation. Therefore, the correct answer is (d).

PTS: 1                      DIF: MEDIUM                      REF: 211–214                      OBJ: (7.4) SML

BLM: Analyze

51. Nile Foods' stock has a beta of 1.4, while Elba Eateries' stock has a beta of 0.7. Assume that the risk-free rate,  $r_{RF}$ , is 5.5% and the market risk premium,  $(r_M - r_{RF})$ , equals 4%. Which of the following statements is correct?
- a. If the risk-free rate increases but the market risk premium remains unchanged, the required return will increase for both stocks but the increase will be larger for Nile since it has a

- higher beta.
- If the market risk premium *increases* but the risk-free rate remains unchanged, Nile's required return will increase because it has a beta greater than 1.0 but Elba's will decline because it has a beta less than 1.0.
  - Since Nile's beta is twice that of Elba's, its required rate of return will also be twice that of Elba's.
  - If the risk-free rate increases while the market risk premium remains constant, then the required return on an average stock will increase.

ANS: D

We can see from the SML equation,  $r_s = r_{RF} + (r_M - r_{RF})b$ , that (d) is the only correct answer.

PTS: 1                    DIF: MEDIUM      REF: 211–214      OBJ: (7.4) SML

BLM: Analyze

52. Stock X has a beta of 0.6, while Stock Y has a beta of 1.4. Which of the following statements is correct?
- A portfolio consisting of \$50,000 invested in Stock X and \$50,000 invested in Stock Y will have a required return that exceeds that of the overall market.
  - Stock Y must have a higher expected return and a higher standard deviation than Stock X.
  - If expected inflation increases (but the market risk premium is unchanged), the required return on both stocks will decrease by the same amount.
  - If the market risk premium decreases but expected inflation is unchanged, the required return on both stocks will decrease, but the decrease will be greater for Stock Y.

ANS: D

We can see from the SML equation,  $r_s = r_{RF} + (r_M - r_{RF})b$ , that (d) is correct. Note that we are implicitly holding other things, including the real risk-free rate, constant in this and other questions.

PTS: 1                    DIF: MEDIUM      REF: 211–214      OBJ: (7.4) SML

BLM: Analyze

53. Stock A has a beta of 0.8 and Stock B has a beta of 1.2. Fifty percent of Portfolio P is invested in Stock A and 50% is invested in Stock B. If the market risk premium ( $r_M - r_{RF}$ ) were to increase but the risk-free rate ( $r_{RF}$ ) remained constant, which of the following would occur?
- The required return will increase for both stocks but the increase will be greater for Stock B than for Stock A.
  - The required return will decrease by the same amount for both Stock A and Stock B.
  - The required return will increase for Stock A but will decrease for Stock B.
  - The required return on Portfolio P will remain unchanged.

ANS: A

We can see from the SML equation,  $r_s = r_{RF} + (r_M - r_{RF})b$ , that (a) is correct. The other answers are incorrect.

PTS: 1                    DIF: MEDIUM      REF: 211–214      OBJ: (7.4) SML

BLM: Analyze

54. Stock A has a beta of 0.7, whereas Stock B has a beta of 1.3. Portfolio P has 50% invested in both A and B. Which of the following would occur if the market risk premium increased by 1%? (Assume that the risk-free rate remains constant.)
- The required return on Portfolio P would increase by 1%.
  - The required return on both stocks would increase by 1%.
  - The required return on Portfolio P would remain unchanged.
  - The required return on Stock A would increase by more than 1%, while the return on

Stock B would increase by less than 1%.

ANS: A

The portfolio's beta is 1.0. Therefore, its required return should increase by 1.0%, so (a) is correct. The other answers are incorrect.

PTS: 1                      DIF: MEDIUM      REF: 211–214      OBJ: (7.4) SML  
BLM: Understand

55. Assume that the risk-free rate remains constant, but the market risk premium declines. Which of the following is most likely to occur?
- The required return on a stock with beta greater than 1.0 will increase.
  - The return on the market will remain constant.
  - The return on the market will increase.
  - The required return on a stock with beta less than 1.0 will decline.

ANS: D

We can see from the SML equation,  $r_s = r_{RF} + (r_M - r_{RF})b$ , that (d) is correct. The other answers are incorrect.

PTS: 1                      DIF: MEDIUM      REF: 211–214      OBJ: (7.4) SML  
BLM: Understand

56. Which of the following statements is correct?
- The slope of the SML is determined by the value of beta.
  - The SML shows the relationship between companies' required returns and their diversifiable risks. The slope and intercept of this line cannot be influenced by a firm's managers, but the position of the company on the line can be influenced by managers.
  - Suppose you plotted the returns of a given stock against those of the market, and you found that the slope of the regression line was negative. The CAPM would indicate that the required rate of return on the stock should be less than the risk-free rate for a well-diversified investor, assuming investors in the market expect the observed relationship to continue on into the future.
  - If investors become less risk averse, the slope of the SML will increase.

ANS: C                      PTS: 1                      DIF: MEDIUM      REF: 211–214  
OBJ: (7.4) SML      BLM: Understand

57. Other things held constant, in which way would the Security Market Line shift if the expected inflation rate *decreases* and investors also become *more* risk averse?
- It would shift down and have a steeper slope.
  - It would shift up and have a less steep slope.
  - It would shift up and keep the same slope.
  - It would shift down and keep the same slope.

ANS: A

Analyze

PTS: 1                      DIF: MEDIUM      REF: 211–214      OBJ: (7.4) SML  
BLM: Understand

58. Assume that the risk-free rate,  $r_{RF}$ , increases but the market risk premium,  $(r_M - r_{RF})$  declines, with the net effect being that the overall required return on the market,  $r_M$ , remains constant. Which of the following statements is correct?
- The required return of all stocks will increase by the amount of the increase in the risk-free

rate.

- b. The required return will decline for stocks that have a beta less than 1.0 but will increase for stocks that have a beta greater than 1.0.
- c. Since the overall return on the market stays constant, the required return on each individual stock will remain constant.
- d. The required return will increase for stocks that have a beta less than 1.0 but decline for stocks that have a beta greater than 1.0.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 211–214

OBJ: (7.4) SML                      BLM: Understand

59. Suppose you have an asset with a return that rises as GDP increases. How will the asset's return be affected if the government announces that GDP is unexpectedly higher than was previously thought?
- a. The return will increase.
  - b. The return will remain unchanged.
  - c. The return will decrease.
  - d. It is undetermined and more information is needed.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 211–214

OBJ: (7.4) SML                      BLM: Remember

60. Which statement about a stock's beta is correct?
- a. If a stock has a beta equal to 1.0, its required rate of return will be unaffected by changes in the market risk premium.
  - b. A stock with a negative beta must in theory have a negative required rate of return.
  - c. If a stock's beta doubles, its required rate of return must also double.
  - d. If a stock's returns are negatively correlated with returns on most other stocks, the stock's beta will be negative.

ANS: D

(d) is correct; the others are all false.

PTS: 1                      DIF: MEDIUM                      REF: 211–214                      OBJ: (7.4) SML, CAPM, and beta

BLM: Understand

61. Assume that investors have recently become more risk averse, so the market risk premium has increased. Also, assume that the risk-free rate and expected inflation have not changed. Which of the following is most likely to occur?
- a. The required rate of return for an average stock will increase by an amount equal to the increase in the market risk premium.
  - b. The required rate of return will decline for stocks whose betas are less than 1.0.
  - c. The required rate of return on the market,  $r_M$ , will not change as a result of these changes.
  - d. The required rate of return for each individual stock in the market will increase by an amount equal to the increase in the market risk premium.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 211–214

OBJ: (7.4) SML and risk aversion                      BLM: Understand

62. Which of the following statements is correct?
- a. A graph of the SML as applied to individual stocks would show required rates of return on the vertical axis and standard deviations of returns on the horizontal axis.
  - b. The CAPM has been thoroughly tested, and the theory has been confirmed beyond any reasonable doubt.
  - c. If investors become more risk averse, then (1) the slope of the SML would increase and (2) the required rate of return on low-beta stocks would increase by more than the required

return on high-beta stocks.

- d. An increase in expected inflation, combined with a constant *real* risk-free rate and a constant market risk premium, would lead to identical increases in the required return on a riskless asset and on an average stock, other things held constant.

ANS: D

An increase in expected inflation would lead to an increase in  $r_{RF}$ , the intercept of the SML. If risk aversion were unchanged, then the slope of the SML would remain constant. Therefore, there would be a parallel upward shift in the SML, which would result in an increase in  $r_M$  that is equal to the increase in expected inflation.

PTS: 1                      DIF: MEDIUM              REF: 211–214

OBJ: (7.4) SML, CAPM, and portfolio risk

BLM: Analyze

63. Which of the following statements is correct?
- When company-specific risk has been diversified away, the inherent risk that remains is market risk, which is constant for all stocks in the market.
  - Portfolio diversification reduces the variability of returns on an individual stock.
  - Risk refers to the chance that some unfavourable event will occur, and a probability distribution is completely described by a listing of the likelihoods of unfavourable events.
  - The SML relates a stock's required return to its market risk. The slope and intercept of this line cannot be controlled by the firms' managers, but managers can influence their firms' positions on the line.

ANS: D                      PTS: 1                      DIF: MEDIUM              REF: 203–207

OBJ: (Comp: 7.1–7.4) Risk concepts              BLM: Understand

64. You observe the following information regarding Companies X and Y:

- Company X has a higher expected return than Company Y.
- Company X has a lower standard deviation of returns than Company Y.
- Company X has a higher beta than Company Y.

Given this information, which of the following statements is correct?

- Company X has more company-specific risk than Company Y.
- Company X has a lower coefficient of variation than Company Y.
- Company X has less market risk than Company Y.
- Company X's returns will be negative when Y's returns are positive.

ANS: B

(b) is correct, since the coefficient of variation is equal to the standard deviation divided by the expected return. The remaining statements are false.

PTS: 1                      DIF: MEDIUM              REF: 193–198

OBJ: (Comp: 7.2, 7.3) Risk measures              BLM: Understand

65. The risk-free rate is 6% and the market risk premium is 5%. Your \$1 million portfolio consists of \$700,000 invested in a stock that has a beta of 1.2 and \$300,000 invested in a stock that has a beta of 0.8. Which of the following statements is correct?
- If the stock market is efficient, your portfolio's expected return should equal the expected return on the market, which is 11%.
  - The required return on the market is 10%.
  - The portfolio's required return is less than 11%.
  - If the risk-free rate remains unchanged but the market risk premium increases by 2%, your portfolio's required return will increase by more than 2%.



ANS: D

(a) is false. Market efficiency states that the portfolio's expected return should equal the portfolio's required return. (b) is false, since  $r_M = 6\% + 5\% = 11\%$ . (c) is false, since  $r_p = 6\% + (5\%)b_p$ . The portfolio's beta is calculated as  $0.7(1.2) + 0.3(0.8) = 1.08$ . Therefore,  $r_p = 6\% + 5\%(1.08) = 11.4\%$ . (d) is correct. If the market risk premium increases by 2% and  $r_{RF}$  remains unchanged, then the portfolio's return will increase by  $2\%(1.08) = 2.16\%$ .

PTS: 1

DIF: HARD

REF: 199

OBJ: (7.3) Portfolio return

BLM: Analyze

66. Stock A has an expected return of 10% and a standard deviation of 20%. Stock B has an expected return of 13% and a standard deviation of 30%. The risk-free rate is 5% and the market risk premium,  $r_M - r_{RF}$ , is 6%. Assume that the market is in equilibrium. Portfolio AB has 50% invested in Stock A and 50% invested in Stock B. The returns of Stock A and Stock B are independent of one another, i.e., the correlation coefficient between them is zero. Which of the following statements is correct?
- Stock A's beta is 0.8333.
  - Since the two stocks have zero correlation, Portfolio AB is riskless.
  - Stock B's beta is 1.0000.
  - Portfolio AB's required return is 11%.

ANS: A

Here are some figures. We see that A's beta is 0.8333, so (a) is correct. We also see that (c) is incorrect, and we should know that (b) and (d) are both incorrect.

	Return	SD	$r_{RF} =$	5%
A	10%	20%	$RP_M =$	<u>6%</u>
B	13%	30%	$r_{Market} =$	<u>11%</u>

Return = risk free +  $b(RP_M)$

$beta_a = (Return\ A - r_{RF})/RP_M = 0.83$

$beta_B = (Return\ B - r_{RF})/RP_M = 1.33$

PTS: 1

DIF: HARD

REF: 198–205

OBJ: (7.3) Portfolio risk and return

BLM: Analyze

67. Stock A has a beta of 1.2 and a standard deviation of 25%. Stock B has a beta of 1.4 and a standard deviation of 20%. Portfolio AB was created by investing in a combination of Stocks A and B. Portfolio AB has a beta of 1.25 and a standard deviation of 18%. Which of the following statements is correct?
- Stock A has more market risk than Portfolio AB.
  - Stock A has more market risk than Stock B but less stand-alone risk.
  - Portfolio AB has more money invested in Stock A than in stock B.
  - Portfolio AB has the same amount of money invested in each of the two stocks.

ANS: C

Since A's beta and standard deviation are larger than B's beta and standard deviation, we know that (a) and (b) are incorrect. We also know that the portfolio's beta is a weighted average of the betas of its stocks, and if the stocks were equally weighted, the portfolio beta would be 1.3. But it is 1.25, so it must contain more of the low-beta stock, A. Therefore, (c) is correct. This means that (d) is incorrect.

PTS: 1

DIF: HARD

REF: 198–205

OBJ: (7.3) Portfolio risk and return

BLM: Analyze

68. Which of the following statements is correct?
- If investors become more risk averse but  $r_{RF}$  does not change, then the required rate of

return on high-beta stocks will rise and the required return on low-beta stocks will decline, but the required return on an average-risk stock will not change.

- b. An investor who holds just one stock will generally be exposed to more risk than an investor who holds a portfolio of stocks, assuming the stocks are all equally risky.
- c. The slope of the yield curve has no effect on the slope of the SML.
- d. Assume that the required rate of return on the market,  $r_M$ , is given and fixed at 10%. If the yield curve were upward sloping, then the Security Market Line (SML) would have a steeper slope if 1-year Treasury securities were used as the risk-free rate than if 30-year Treasury bonds were used for  $r_{RF}$ .

ANS: D

(d) is correct, because with a steep yield curve, T-bill rates would be lower than long-term T-bond rates, hence the SML's intercept would be lower if T-bills were used for  $r_{RF}$ , hence the slope of the SML would be steeper.

PTS: 1                      DIF: HARD                      REF: 207–213                      OBJ: (7.3) SML  
 BLM: Analyze

69. J. Harper Inc.'s stock has a 50% chance of producing a 35% return, a 30% chance of producing a 10% return, and a 20% chance of producing a -28% return. What is Harper's expected return?
- a. 14.16%
  - b. 14.53%
  - c. 14.90%
  - d. 15.27%

ANS: C

<u>Conditions</u>	<u>Probability</u>	<u>Return</u>	<u>Probability ? Return</u>
Good	0.50	35.0%	17.50%
Average	0.30	10.0%	3.00%
Poor	<u>0.20</u>	-28.0%	<u>-5.60%</u>
	<u>1.00</u>		<u>14.90%</u> = Expected return

PTS: 1                      DIF: EASY                      REF: 199                      OBJ: (7.2) Expected return  
 BLM: Understand

70. Rosenberg Inc. is considering a capital budgeting project that has an expected return of 20% and a standard deviation of 25%. What is the project's coefficient of variation?
- a. 1.25
  - b. 1.31
  - c. 1.38
  - d. 1.45

ANS: A

Expected return	20.0%
Standard deviation	25.0%
Coefficient of variation	1.25

PTS: 1                      DIF: EASY                      REF: 196–197                      OBJ: (7.2) Coefficient of variation  
 BLM: Understand

71. Keith Johnson has \$100,000 invested in a two-stock portfolio. Thirty thousand dollars is invested in Potts Manufacturing and the remainder is invested in Stohs Corporation. Potts' beta is 1.60 and Stohs' beta is 0.60. What is the portfolio's beta?
- a. 0.66
  - b. 0.74

- c. 0.82
- d. 0.90

ANS: D

<u>Company</u>	<u>Investment</u>	<u>Port. weight</u>	<u>Beta</u>	<u>Weight ? beta</u>
Potts	\$ 30,000	0.30	1.60	0.48
Stohs	<u>\$ 70,000</u>	<u>0.70</u>	0.60	<u>0.42</u>
	<u>\$100,000</u>	<u>1.00</u>		<u>0.90</u> = Portfolio beta

PTS: 1                    DIF: EASY                    REF: 208–210                    OBJ: (7.3) Portfolio beta  
 BLM: Understand

72. Rick Kish has a \$100,000 stock portfolio. Thirty-two thousand dollars is invested in a stock with a beta of 0.75 and the remainder is invested in a stock with a beta of 1.38. These are the only two investments in his portfolio. What is his portfolio's beta?
- a. 1.18
  - b. 1.24
  - c. 1.30
  - d. 1.36

ANS: A

<u>Company</u>	<u>Investment</u>	<u>Port. weight</u>	<u>Beta</u>	<u>Weight ? beta</u>
Stock 1	\$ 32,000	0.32	0.75	0.24
Stock 2	<u>\$ 68,000</u>	<u>0.68</u>	1.38	<u>0.94</u>
	\$100,000	1.00		<u>1.18</u> = Portfolio beta

PTS: 1                    DIF: EASY                    REF: 208–210                    OBJ: (7.3) Portfolio beta  
 BLM: Understand

73. A stock has an expected return of 12.60%. Its beta is 1.49 and the risk-free rate is 5.00%. What is the market risk premium?
- a. 5.10%
  - b. 5.23%
  - c. 5.36%
  - d. 5.49%

ANS: A

Use CAPM to determine the market risk premium with data given

$$r_s = r_{RF} + RP_M \times b_{\text{Stock}}$$

$$12.60\% = 5.00\% + RP_M \times 1.49$$

$$7.60\% = RP_M \times 1.49$$

$$5.10\% = RP_M$$

PTS: 1                    DIF: EASY                    REF: 208–210                    OBJ: (7.4) Market risk premium  
 BLM: Understand

74. Ritter Company's stock has a beta of 1.40, the risk-free rate is 4.25%, and the market risk premium is 5.50%. What is Ritter's required rate of return?
- a. 11.36%
  - b. 11.65%
  - c. 11.95%
  - d. 12.25%

ANS: C



Old market risk premium	4.75%
New market risk premium	6.75%
Old required return	11.50%
Beta	1.26 Intermediate step: $b = (\text{old return} - r_{RF})/\text{old } RP_M$
New required return	14.03%

PTS: 1                    DIF: MEDIUM      REF: 211–214      OBJ: (7.4) CAPM  
 BLM: Analyze

77. Hocking Manufacturing Company has a beta of 0.65, while Levine Industries has a beta of 1.40. The required return on the stock market is 11.00%, and the risk-free rate is 4.25%. What is the difference between Hocking's and Levine's required rates of return? (Hint: First find the market risk premium, then find the required returns on the stocks.)
- 4.34%
  - 4.57%
  - 4.81%
  - 5.06%

ANS: D

Beta: Hocking	0.65
Beta: Levine	1.40
Market return	11.00%
Risk-free rate	4.25%
Market risk premium	6.75% Intermediate step
Required return: Hocking	8.64% Intermediate step
Required return: Levine	13.70% Intermediate step
Difference	5.06%

PTS: 1                    DIF: MEDIUM      REF: 211–214      OBJ: (7.4) CAPM  
 BLM: Analyze

78. Rodriguez Roofing's stock has a beta of 1.23, its required return is 11.25%, and the risk-free rate is 4.30%. What is the required rate of return on the stock market? (Hint: First find the market risk premium.)
- 9.95%
  - 10.20%
  - 10.45%
  - 10.72%

ANS: A

Beta	1.23
Risk-free rate	4.30%
Required return on stock	11.25%
Market risk premium	5.65% Intermediate step: $RP_M = (r_{\text{stock}} - r_{RF})/\text{beta}$
Required return on market	9.95%

PTS: 1                    DIF: MEDIUM      REF: 211–214      OBJ: (7.4) CAPM  
 BLM: Analyze

79. Vera Paper's stock has a beta of 1.40, and its required return is 12.00%. Dell Dairy's stock has a beta of 0.80. If the risk-free rate is 4.75%, what is the required rate of return on Dell's stock?
- 8.45%
  - 8.67%
  - 8.89%

d. 9.12%

ANS: C

Beta: Vera 1.40

Beta: Dell 0.80

Vera's Required return 12.00%

Risk-free rate 4.75%

Market risk premium 5.18% Intermediate step:  $RP_M = (Vera's\ return - R_{RF})/beta_{Vera}$

Dell's required return 8.89%

PTS: 1 DIF: MEDIUM REF: 211-214 OBJ: (7.4) CAPM

BLM: Analyze

80. The real risk-free rate is 2%, the expected inflation rate is 3.00%, the market risk premium is 4.70%, and Kohers Enterprises has a beta of 1.10. What is the required rate of return on Kohers' stock?

a. 9.43%

b. 9.67%

c. 9.92%

d. 10.17%

ANS: D

Real risk-free rate 2.00%

Expected inflation 3.00%

Market risk premium 4.70%

Beta 1.10

Risk-free rate 5.00% Intermediate step: real risk-free rate + inflation

Required return on stock 10.17%

PTS: 1 DIF: MEDIUM REF: 211-214 OBJ: (7.4) CAPM

BLM: Analyze

81. ABC Co. has a beta of 1.30 and an expected dividend growth rate of 5.00% per year. The T-bill rate is 3.00%, and the T-bond rate is 6.00%. The annual return on the stock market during the past three years was 15.00%. Investors expect the annual future stock market return to be 12.00%. Using the SML, what is ABC's required return?

a. 12.8%

b. 13.1%

c. 13.5%

d. 13.8%

ANS: D

Use CAPM to determine the market risk premium:

$$r_s = r_{RF} + RP_M \times b_{Market}$$

$$12.00\% = 6.00\% + RP_M \times 1.00$$

$$6.00\% = RP_M$$

Use CAPM to determine Millar's required return using  $RP_M$  calculated above

$$r_s = r_{RF} + RP_M \times b_{Millar}$$

$$r_s = 6.00\% + 6.00\% \times 1.30$$

$$r_s = 13.80\%$$

PTS: 1 DIF: MEDIUM REF: 211-214

OBJ: (7.4) Required return on stock BLM: Analyze

82. Bertin Bicycles has a beta of 0.88 and an expected dividend growth rate of 4.00% per year. The T-bill rate is 4.00%, and the T-bond rate is 5.25%. The annual return on the stock market during the past 4 years was 10.25%. Investors expect the average annual future return on the market to be 11.50%. Using the SML, what is Bertin's required rate of return?
- 10.48%
  - 10.75%
  - 11.02%
  - 11.29%

ANS: B

Use SML to determine the market risk premium with market data

$$r_s = r_{RF} + RP_M \times b_{Market}$$

$$11.50\% = 5.25\% + RP_M \times 1.00$$

$$RP_M = 6.25\%$$

Use SML to determine Bertin's required return using  $RP_M$  calculated above

$$r_s = r_{RF} + RP_M \times b_{Bertin}$$

$$r_s = 5.25\% + 6.25\% \times 0.88$$

$$r_s = 10.75\%$$

PTS: 1                      DIF: MEDIUM                      REF: 211–214  
 OBJ: (7.4) Required return on stock                      BLM: Analyze

83. Suppose you hold a diversified portfolio consisting of a \$10,000 investment in each of 12 different common stocks. The portfolio's beta is 1.25. Now suppose you decided to sell one of your stocks that has a beta of 1.00 and use the proceeds to buy a replacement stock with a beta of 1.34. What would the portfolio's new beta be?
- 1.15
  - 1.21
  - 1.28
  - 1.34

ANS: C

Number of stocks	12
Portfolio beta	1.25
Stock that's sold	1.00
Stock that's bought	1.34
New portfolio beta	1.28

PTS: 1                      DIF: MEDIUM | HARD                      REF: 210  
 OBJ: (7.3) Portfolio beta                      BLM: Analyze

84. Returns for the Shields Company over the last three years are shown below. What's the standard deviation of Shields' returns? (Hint: This is a sample, not a complete population, so the sample standard deviation formula should be used.)

Year	Return
2009	21.50%
2008	-12.50%
2007	24.20%

- 19.94%
- 20.45%

- c. 20.97%
- d. 21.49%

ANS: B

This is a relatively technical problem. It should be used only if calculations are emphasized in class, or on a take-home exam where students have time to look up formulas or to use Excel or their calculator functions.

<u>Year</u>	<u>Return</u>	<u>Deviation from Mean</u>	<u>Squared Deviation</u>
2009	21.50%	10.43%	1.09%
2008	-12.50%	-23.57%	5.55%
2007	24.20%	13.13%	1.72%
Expected return	11.07%		8.37%
			4.18% Sum/(N - 1)

$\sigma = 20.45%$  Sqrt of above 20.45% by Excel

PTS: 1 DIF: HARD REF: 193-196  
 OBJ: (7.2) Standard deviation, historical returns (sample SD) BLM: Analyze

85. Your firm's analyst believes that economic conditions during the next year will be either strong, normal, or weak, and she thinks that Crary Inc.'s returns will have the probability distribution shown below. What's the standard deviation of Crary's returns as estimated by your analyst? (Hint: Use the formula for the standard deviation of a population, not a sample.)

<u>Economic Conditions</u>	<u>Prob.</u>	<u>Return</u>
Strong	30%	32.50%
Normal	40%	10.25%
Weak	30%	-15.75%

- a. 17.77%
- b. 18.71%
- c. 19.65%
- d. 20.63%

ANS: B

This is a relatively technical problem. It should be used only if calculations are emphasized in class, or on a take-home exam where students have time to look up formulas or to use Excel or their calculator functions.

<u>Economic Conditions</u>	<u>Prob.</u>	<u>Return this state</u>	<u>Dev. from Mean</u>	<u>Squared Dev.</u>	<u>Sqd dev × Prob</u>
Strong	30%	32.50%	23.38%	5.46%	1.64%
Normal	40%	10.25%	1.13%	0.01%	0.01%
Weak	30%	-15.75%	-24.88%	6.19%	1.86%
	100%	9.13%		Variance	3.50%

$\sigma = \text{Sqrt of variance}$  18.71% 18.71% by Excel

PTS: 1 DIF: HARD REF: 193-196  
 OBJ: (7.2) Standard deviation, prob. data (population  $\sigma$ ) BLM: Analyze



86. Assume that you are the portfolio manager of the Coastal Fund, a \$3 million hedge fund that contains the following stocks. The required rate of return on the market is 14.00% and the risk-free rate is 6.00%. What rate of return should investors expect (and require) on this fund?

	Amount	Beta
Stock A	\$1,075,000	1.20
Stock B	675,000	0.50
Stock C	750,000	1.40
Stock D	<u>500,000</u>	0.75
	<u>\$3,000,000</u>	

- a. 13.44%  
 b. 13.79%  
 c. 14.14%  
 d. 14.49%

ANS: C

Company	Amount	Weight	Beta	Wt * beta	
Stock A	\$1,075,000	0.358	1.20	0.43	
Stock B	675,000	0.225	0.50	0.11	
Stock C	750,000	0.250	1.40	0.35	
Stock D	<u>500,000</u>	<u>0.167</u>	0.75	<u>0.13</u>	
	<u>\$3,000,000</u>	<u>1.000</u>	$b_{\text{Portfolio}} =$	<u>1.02</u>	Intermediate step

Required market return:	14.00%	
Risk free rate:	6.00%	
Market risk premium	8.00%	Intermediate step
Portfolio's required return:	14.14%	

PTS: 1                      DIF: HARD                      REF: 210

OBJ: (7.3) Portfolio beta and required return

BLM: Analyze

87. Campbell's father holds just one stock, East Coast Bank (ECB), which he thinks is a very low-risk security. Campbell agrees that the stock is relatively safe, but he wants to demonstrate that his father's risk would be even lower if he were more diversified. Campbell obtained the following returns data shown for West Coast Bank (WCB). Both have had less variability than most other stocks over the past 5 years. Measured by the standard deviation of returns, by how much would his father's historical risk have been reduced if he had held a portfolio consisting of 60% ECB and the remainder in WCB? (Hint: Use the sample standard deviation formula.)

Year	ECB	WCB
2002	40.00%	40.00%
2003	-10.00%	15.00%
2004	35.00%	-5.00%
2005	-5.00%	-10.00%
2006	15.00%	35.00%
Average return =	15.00%	15.00%
Standard deviation =	22.64%	22.64%

- a. 3.56%  
 b. 3.65%  
 c. 3.74%

d. 3.84%

ANS: D

This is a relatively technical problem. It should be used only if calculations are emphasized in class or on a take-home exam where students have time to look up formulas or to use Excel or their calculator functions.

<u>% ECB:</u>	<u>Year</u>	<u>ECB</u>	<u>WCB</u>	<u>Portfolio ECB/WCB</u>
60%	2002	40.00%	40.00%	40.00%
	2003	-10.00%	15.00%	0.00%
	2004	35.00%	-5.00%	19.00%
	2005	-5.00%	-10.00%	-7.00%
	2006	15.00%	35.00%	23.00%
	Average return =	15.00%	15.00%	15.00%
	Standard deviation =	22.64%	22.64%	18.80%
				Reduction in the SD versus ECB's SD: 3.84%

PTS: 1                    DIF: HARD                    REF: 199-205                    OBJ: (7.3) Portfolio risk reduction  
BLM: Analyze

88. Assume that you manage a \$10.75 million mutual fund that has a beta of 1.05 and a 9.50% required return. The risk-free rate is 4.20%. You now receive another \$5.25 million, which you invest in stocks with an average beta of 0.65. What is the required rate of return on the new portfolio? (Hint: You must first find the market risk premium, then find the new portfolio beta.)
- a. 9.07%
  - b. 9.30%
  - c. 9.53%
  - d. 9.77%

ANS: A

Old funds (millions)	\$10.75
New funds (millions)	\$5.25
Total portfolio	\$16.00
Req'd return, old stocks	9.50%
Risk-free rate	4.20%
Market risk premium	5.30% Intermediate step

New portfolio	
Old portfolio's beta	1.05
New stocks' beta	0.65
New portfolio beta	0.919 Intermediate step
New portfolio required return	9.07%

PTS: 1                    DIF: HARD                    REF: 208-210                    OBJ: (7.3) Portfolio beta  
BLM: Analyze

89. A mutual fund manager has a \$20 million portfolio with a beta of 1.00. The risk-free rate is 4.25%, and the market risk premium is 6.00%. The manager expects to receive an additional \$25.50 million, which she plans to invest in additional stocks. After investing the additional funds, she wants the fund's required and expected return to be 13.00%. What must the average beta of the new stocks be to achieve the target required rate of return?
- a. 1.73
  - b. 1.82
  - c. 1.91

d. 2.00

ANS: B

Old funds (millions)	\$20.00	
New funds (millions)	<u>\$25.50</u>	
Total new funds	<u>\$45.50</u>	
Beta on existing portfolio	1.00	
Risk-free rate	4.25%	
Market risk premium	6.00%	
Desired required return	13.00%	$13\% = r_{RF} + b(RP_M); b = (13\% - r_{RF})/RP_M$
Required new portfolio beta	1.4583	$\text{beta} = (\text{return} - \text{risk-free})/RP_M$
Required beta on new stocks	1.82	$\text{Req } b = (\text{old}\$/\text{total}\$) \times \text{old } b + (\text{new}\$/\text{total}\$) \times \text{new } b$
		$\text{Beta on new stocks} = (\text{Req } b - (\text{old}\$/\text{total}\$) \times \text{old } b)/(\text{new}\$/\text{total}\$)$

PTS: 1                    DIF: HARD                    REF: 208–210                    OBJ: (7.3) Portfolio beta

BLM: Analyze

90. You are given the following returns on the Market and on Stock A. Calculate Stock A's beta coefficient.

Year	Market	Stock A
2005	-5.00%	-15.00%
2006	11.00%	12.00%
2007	25.00%	40.00%

- a. 1.74  
b. 1.83  
c. 1.92  
d. 2.02

ANS: B

$\text{beta}_A = 1.83$

Calculated with Excel, but could also be calculated with a calculator. This is a relatively technical problem. It should be used only if calculations are emphasized in class, or on a take-home exam where students have time to look up formulas and to use Excel or their calculator functions.

PTS: 1                    DIF: MEDIUM                    REF: 226–228

OBJ: (Appendix 7A) Calculating betas                    BLM: Analyze

## CHAPTER 8—STOCKS, STOCK VALUATION, AND STOCK MARKET EQUILIBRIUM

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### TRUE/FALSE

1. A proxy is a document giving one party the authority to act for another party, including the power to vote. Thus, a proxy can be an important tool relating to control of the firm.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 233  
OBJ: (8.1) Proxy

2. The preemptive right gives current shareholders the right to purchase, on a pro rata basis, any new shares sold by the firm. This right helps protect them against both dilution of control and dilution of value.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 233  
OBJ: (8.1) Preemptive right

3. If a firm's shareholders are given the preemptive right, this means that they have the right to call for a meeting to vote to replace the management. Without the preemptive right, dissident shareholders would have to seek a change in management through a proxy fight.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 233  
OBJ: (8.1) Preemptive right

4. When a corporation's shares are owned by a few individuals who are associated with the firm's management, we say that the share is "closely held."

ANS: T                      PTS: 1                      DIF: EASY                      REF: 233  
OBJ: (8.1) Closely held stock

5. A publicly owned corporation is a company whose shares are held by the investing public, which may include other corporations as well as institutional investors.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 233  
OBJ: (8.1) Public company

6. Dual-class shares differentiate different classes of common share. They are issued by companies to meet special needs, such as when owners of a start-up firm need additional equity capital but don't want to relinquish voting control.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 234–235  
OBJ: (8.2) Dual-class shares

7. Founders' shares are a type of dual-class shares owned by the firm's founders, generally with more votes per share than the other classes of common shares.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 234–235  
OBJ: (8.2) Founders' shares

8. The total return on a share of stock refers to the dividend yield less any commissions paid when the stock is purchased and sold.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 237–238  
OBJ: (8.4) Total stock returns

9. The cash flows associated with common shares are more difficult to estimate than those related to bonds due to the residual claims against the company.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 238  
OBJ: (8.4) Common stock cash flows

10. According to the basic DCF stock valuation model, the value an investor should assign to a share of stock is dependent on the length of time he or she plans to hold the stock.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 238  
OBJ: (8.4) Stock valuation

11. The constant growth DCF model used to evaluate the prices of common shares is essentially the same as the model used to find the price of perpetual preferred stock or any other perpetuity.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 239–240  
OBJ: (8.5) Constant growth model

12. According to the nonconstant growth model, the discount rate used to find the present value of the expected cash flows during the initial growth period is the same as the discount rate used to find the PVs of cash flows during the subsequent constant growth period.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 243–245  
OBJ: (8.7) Nonconstant growth model

13. When a new issue of common share is brought to market, it is the marginal investor who determines the price at which trade occurs.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 250–252  
OBJ: (8.11) Marginal investor and price

14. If security markets were truly strong-form efficient, one could never earn a realized return on a stock greater than the marginal investor's expected (and required) rate of return on the stock.

ANS: F  
Realized returns are often different from expected returns, so the statement is false.

PTS: 1                    DIF: EASY                    REF: 252–254  
OBJ: (8.12) Efficient markets hypothesis

15. A proxy fight generally is a battle between management and a group of shareholders who want to install a new management team that will operate the firm differently, or possibly break it up or sell it. Under most companies' bylaws, the dissident group must obtain 80% or more of the votes in order to prevail.

ANS: F                    PTS: 1                    DIF: MEDIUM                    REF: 233  
OBJ: (8.1) Proxy fight

16. The existence of dual-class shares allows a minority shareholder to have a big control of the firm.

ANS: T

Since the voting rights can be granted or restricted in many ways, dual-class shares enable minority shareholders to obtain strong control of their firm.

PTS: 1                      DIF: MEDIUM      REF: 233                      OBJ: (8.1) Dual-class shares

17. If two firms have the same current dividend and the same expected dividend growth rate, their stocks must sell at the same current price or else the market will not be in equilibrium.

ANS: F                      PTS: 1                      DIF: MEDIUM      REF: 250–252

OBJ: (8.11) Stock market equilibrium

18. A significant difference between a stock's market value and its intrinsic value indicates that financial markets are basically inefficient.

ANS: F

The difference may represent a period in which the market is moving towards market equilibrium (market value equals intrinsic value).

PTS: 1                      DIF: EASY                      REF: 235

OBJ: (8.2) Stock market equilibrium

19. Closing stock market quotes as published in the business section of major newspapers represent the most reliable source of information used in choosing to buy or sell stock.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 235

OBJ: (8.3) Stock market reporting

## MULTIPLE CHOICE

1. What would a firm's required rate of return do as a result of an increase in a firm's expected growth rate?
- Increase
  - Decrease
  - remain constant
  - possibly increase, possibly decrease, or possibly have no effect

ANS: D                      PTS: 1                      DIF: EASY                      REF: 237–238

OBJ: (8.4) Required return                      BLM: Remember

2. In the opinion of a given investor, a share's expected return exceeds its required return. What does this suggest?
- The investor thinks the share is experiencing supernormal growth.
  - The investor thinks the share should be sold.
  - The investor thinks the share is a good buy.
  - The investor thinks dividends are not likely to be declared.

ANS: C                      PTS: 1                      DIF: EASY                      REF: 237–238

OBJ: (8.4) Required return                      BLM: Remember

3. Which of the following statements is correct?
- Growth stocks usually have relatively high payout ratio.
  - The stock valuation model,  $P_0 = D_1/(r_s - g)$ , can be used for firms that have expected negative, but constant, growth rates.

- c. The price of a stock is the present value of all expected future dividends, discounted at the dividend growth rate.
- d. The constant growth model cannot be used for a zero growth stock, where the dividend is expected to remain constant over time.

ANS: B                    PTS: 1                    DIF: EASY                    REF: 239–242  
OBJ: (8.5) Constant growth model                    BLM: Understand

4. Which statement regarding market efficiency is true?
- a. Semistrong-form market efficiency implies that as soon as any public or private information comes into being it is incorporated into stock prices.
  - b. Weak-form market efficiency implies that recent trends in stock prices are of no use in predicting future stock prices.
  - c. Market efficiency implies that all stocks should have the same expected return.
  - d. According to strong-form market efficiency, insiders would find it possible to consistently earn abnormal returns in the stock market even if they have superior knowledge about the company.

ANS: B                    PTS: 1                    DIF: EASY                    REF: 252–254  
OBJ: (8.12) Efficient markets hypothesis                    BLM: Remember

5. Which statement regarding the Efficient Markets Hypothesis is true?
- a. The Efficient Markets Hypothesis suggests that the market does not price stocks fairly; hence, managers should make decisions based on the premise that firms' stocks are undervalued or overvalued.
  - b. An individual who has information about past stock prices would be able to profit from this information if weak-form market efficiency exists.
  - c. For the Efficient Markets Hypothesis to hold true, every individual investor must be "rational."
  - d. Semistrong-form market efficiency means that stock prices reflect all public, but not necessarily all private, information.

ANS: D                    PTS: 1                    DIF: EASY                    REF: 252–254  
OBJ: (8.12) Efficient markets hypothesis                    BLM: Remember

6. Most studies of stock market efficiency suggest that the stock market is highly efficient in the weak form and reasonably efficient in the semistrong form. Based on these findings, which of the following statements is correct?
- a. Information disclosed in companies' most recent annual reports can be used to consistently beat the market.
  - b. The stock price for a company has been increasing for the past 6 months. Based on this information, it must be true that the stock price will also increase during the current month.
  - c. Information you read in a daily newspaper such as *National Post* today cannot be used to select stocks that will consistently beat the market.
  - d. Managers who have inside information that is not available to the public cannot consistently earn abnormal returns, i.e., returns that are higher than those predicted by the SML.

ANS: C                    PTS: 1                    DIF: EASY                    REF: 252–254  
OBJ: (8.12) Efficient markets hypothesis                    BLM: Remember

7. Stock A has a required return of 10% and a price of \$25, and its dividend is expected to grow at a constant rate of 7% per year. Stock B has a required return of 12% and a price of \$40, and its dividend is expected to grow at a constant rate of 9% per year. Which of the following statements is correct?

- a. If the stock market were efficient, these two stocks would have the same price.
- b. The two stocks have the same dividend yield.
- c. If the stock market were efficient, these two stocks would have the same expected return.
- d. The two stocks have the same expected capital gains yield.

ANS: B

The following calculations show that (b) is correct.

	<u>A</u>	<u>B</u>	
Return	10%	12%	(expected dividend yield + growth)
Growth	7%	9%	
Price	\$25.00	\$40.00	
D/P	3%	3%	(expected dividend yield)

PTS: 1                      DIF: EASY | MEDIUM                      REF: 237–239  
 OBJ: (8.4) Required return                      BLM: Analyze

8. Why is the preemptive right important to shareholders?
  - a. It allows managers to buy additional shares below the current market price.
  - b. It results in higher dividends per share.
  - c. It is included in every article of incorporation.
  - d. It protects the current shareholders against a dilution of their ownership interests.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 233  
 OBJ: (8.1) Preemptive right                      BLM: Remember

9. Companies can issue different classes of common share. Which of the following statements concerning share classes is correct?
  - a. All common shares, regardless of class, must have the same voting rights.
  - b. All firms have several classes of common share.
  - c. All common shares, regardless of class, must pay the same dividend.
  - d. Some class or classes of common share may be entitled to more votes per share than other classes.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 234–235  
 OBJ: (8.2) Dual-class shares                      BLM: Remember

10. Stocks A and B have the same price, but Stock A has the higher required rate of return. Which of the following statements is correct?
  - a. If Stock A has a lower dividend yield than Stock B, its expected capital gains yield must be higher than Stock B's.
  - b. Stock B must have a higher dividend yield than Stock A.
  - c. Stock A must have a higher dividend yield than Stock B.
  - d. If Stock A has a higher dividend yield than Stock B, its expected capital gains yield must be lower than Stock B's.

ANS: A

(a) is true, because if the required return for Stock A is higher than that of Stock B, and if the dividend yield for Stock A is lower than Stock B's, the growth rate for Stock A must be higher to offset this.

PTS: 1                      DIF: MEDIUM                      REF: 238                      OBJ: (8.4) Dividend yield and g  
 BLM: Understand



11. A stock is expected to pay a year-end dividend of \$2.00, i.e.,  $D_1 = \$2.00$ . The dividend is expected to decline at a rate of 5% a year forever ( $g = -5\%$ ). If the company's expected and required rate of return is 15%, which of the following statements is correct?
- The company's current stock price is \$20.
  - The company's dividend yield 5 years from now is expected to be 10%.
  - The constant growth model cannot be used because the growth rate is negative.
  - The company's stock price next year is expected to be \$9.50.

ANS: D

Note that  $P_0 = \$2/(0.15 + 0.05) = \$10$ . That price is expected to decline by 5% each year, so  $P_1$  must be  $\$10(0.95) = \$9.50$ . Therefore, (d) is correct, while the others are all false.

PTS: 1                      DIF: MEDIUM      REF: 239–241

OBJ: (8.5) Declining constant growth stock                      BLM: Analyze

12. If two constant growth stocks have the same price and the same required rate of return, which of the following statements is correct?
- If one stock has a higher dividend yield, it will also have a lower dividend growth rate.
  - The two stocks have the same dividend growth rate.
  - The two stocks have the same dividend yield.
  - The stock with the higher dividend yield will have the higher dividend growth rate.

ANS: A                      PTS: 1                      DIF: MEDIUM      REF: 241–242

OBJ: (8.5) Constant growth: dividend yield and g                      BLM: Understand

13. Which of the following statements is correct?
- The dividend yield on a constant growth stock must be equal to the stock's expected total return less its expected capital gains return.
  - A stock's dividend yield can never exceed its expected growth rate.
  - A required condition for one to use the constant growth model is that the stock's expected growth rate exceeds its required rate of return.
  - Other things held constant, the higher a company's beta coefficient, the lower its required rate of return.

ANS: A                      PTS: 1                      DIF: MEDIUM      REF: 241–242

OBJ: (8.5) Constant growth: dividend yield and g                      BLM: Understand

14. Which of the following statements is correct?
- The constant growth model takes into consideration the capital gains investors expect to earn on a stock.
  - Two firms with the same expected dividend and growth rate must also have the same stock price.
  - It is appropriate to use the constant growth model to estimate stock value even if the growth rate is never expected to become constant.
  - The price of a stock is the present value of all expected future dividends, discounted at the dividend growth rate.

ANS: A

(a) is true, because the expected growth rate is also the expected capital gains yield. All the other statements are false.

PTS: 1                      DIF: MEDIUM      REF: 239–242      OBJ: (8.5) Constant growth model

BLM: Understand

15. If a stock's dividend is expected to grow at a constant rate of 5% a year, which of the following statements is correct?
- The expected return on the stock is 5% a year.
  - The stock's dividend yield is 5%.
  - The stock's required return must be equal to or less than 5%.
  - The stock's price 1 year from now is expected to be 5% above the current price.

ANS: D

(d) is true, because the stock price is expected to grow at the dividend growth rate.

PTS: 1                      DIF: MEDIUM      REF: 239–242                      OBJ: (8.5) Constant growth model  
BLM: Understand

16. Stocks A and B have the same required return and the same price, \$25. Stock A's dividend is expected to grow at a constant rate of 10% per year, while Stock B's dividend is expected to grow at a constant rate of 5% per year. Which of the following statements is correct?
- Stock A's expected dividend at  $t = 1$  is only half that of Stock B.
  - Stock A has a higher dividend yield than Stock B.
  - Currently the two stocks have the same price, but over time Stock B's price passes that of Stock A.
  - Since Stock A's growth rate is twice that of Stock B, Stock A's future dividends will always be twice as high as Stock B's.

ANS: A

(a) is correct, because if both stocks have the same price and the same required return, and A's growth rate is twice that of B, then A's dividend and dividend yield must be half that of B. This point is illustrated with the following example.

	<u>A</u>	<u>B</u>
g	10%	5%
r	15%	15%
Price	\$25	\$25
Div. Yield	5%	10%
$D_1$	\$1.25	\$2.50

PTS: 1                      DIF: MEDIUM      REF: 239–242                      OBJ: (8.5) Constant growth model  
BLM: Analyze

17. Stocks X and Y sell at the same price. Stock X has a required return of 12% while Stock Y's required return is 10%. Stock X's dividend is expected to grow at a constant rate of 6% a year, while Stock Y's dividend is expected to grow at a constant rate of 4%. If the market is in equilibrium so that expected returns equal required returns, which of the following statements is correct?
- Stock X has a higher dividend yield than Stock Y.
  - Stock Y has a higher dividend yield than Stock X.
  - One year from now, Stock X's price is expected to be higher than Stock Y's price.
  - Stock Y has a higher capital gains yield.

ANS: C

The correct answer is (c). Both prices are currently the same, but X's price should grow at 6% versus 4% for Y, so X's price should be higher a year from now.

PTS: 1                      DIF: MEDIUM      REF: 239–242                      OBJ: (8.5) Constant growth model  
BLM: Analyze

18. Stock X is expected to pay a dividend of \$3.00 at the end of the year, i.e.,  $D_1 = \$3.00$ , and that dividend is expected to grow at a constant rate of 6% a year. The stock currently trades at a price of \$50 a share. Assume that the stock is in equilibrium, i.e., the stock's price equals its intrinsic value. Which of the following statements is correct?
- The stock's required return is 10%.
  - The stock's expected dividend yield and growth rate are equal.
  - The stock's expected dividend yield is 5%.
  - The stock's expected capital gains yield is 5%.

ANS: B

One could quickly calculate the dividend yield and see that it equals the growth rate, but here are some numbers that provide more information.

$D_1$	\$3.00
$P_0$	\$50.00
$g$	6.0%
$D_1/P_0$	6.0%
$r_X$	12.0%

The correct answer is (b).

PTS: 1                      DIF: MEDIUM                      REF: 239–242                      OBJ: (8.5) Constant growth model  
BLM: Analyze

19. Stock X has a required return of 12% and a dividend yield of 5%, and its dividend is expected to grow at a constant rate forever. Stock Y has a required return of 10%, a dividend yield of 3%, and its dividend is expected to grow at a constant rate forever. Both stocks currently sell for \$25 per share. Which of the following statements is correct?
- Stock Y pays a higher dividend per share than Stock X.
  - Stock X pays a higher dividend per share than Stock Y.
  - Stock Y has a lower expected growth rate than Stock X.
  - Stock Y has the higher expected capital gains yield.

ANS: B

Dividend = Yield  $\times$  Price:                      X dividend = \$1.25                      Y dividend = \$0.75

Stock X has a dividend yield of 5% versus a yield of 3% for Stock Y. Since they both have the same stock price, Stock X must pay a higher dividend.

PTS: 1                      DIF: MEDIUM                      REF: 239–242                      OBJ: (8.5) Constant growth model  
BLM: Analyze

20. The expected return on Northeast Corporation's stock is 14%. The stock's dividend is expected to grow at a constant rate of 8%, and it currently sells for \$50 a share. Which of the following statements is correct?
- The stock's dividend yield is 7%.
  - The stock's dividend yield is 8%.
  - The current dividend per share is \$4.00.
  - The stock price is expected to be \$54 a share 1 year from now.

ANS: D

$P_1 = P_0(1 + g) = \$54$ . Therefore, (d) is correct. All the other answers are false.

PTS: 1                      DIF: MEDIUM                      REF: 239–242                      OBJ: (8.5) Constant growth model  
BLM: Analyze

21. Stock A has a beta of 1.1 and Stock B's beta is 0.9. The market risk premium is 6%, and the risk-free rate is 6.3%. Both stocks have a constant dividend growth rate of 7%. If the market is in equilibrium, which of the following statements is correct?
- Stock A must have a higher stock price than Stock B.
  - Stock A must have a higher dividend yield than Stock B.
  - Stock B must have the higher required return.
  - Stock B could have the higher expected return.

ANS: B

(b) is true, because Stock A has a higher required return but the stocks have the same growth rate, so Stock A must have the higher dividend yield. Here are some calculations to demonstrate the point.

	$r_{RF}$		beta		$RP_M$	=	$r_{Stock}$
A	6.30%	+	1.10	*	6.00%	=	12.90%
B	6.30%	+	0.90	*	6.00%	=	11.70%

	Div Yld		g		$r_{Stock}$		$r_{Stock} D_1/P_0 = r - g$
A	$D_1/P_0$	+	7.00%	=	12.90%		5.90%
B	$D_1/P_0$	+	7.00%	=	11.70%		4.70%

PTS: 1                      DIF: MEDIUM              REF: 239–242

OBJ: (8.5) Constant growth model and CAPM

BLM: Analyze

22. Which statement regarding preferred stocks is true?
- Preferred stockholders have a priority to income but not to liquidation proceeds over bondholders in the event of bankruptcy.
  - The preferred stock of a given firm is generally less risky to investors than the same firm's common stock.
  - Preferred dividends are not generally cumulative.
  - A big advantage of preferred stock is that dividends on preferred stocks are tax deductible by the issuing corporation.

ANS: B                      PTS: 1                      DIF: MEDIUM              REF: 247–249

OBJ: (8.10) Preferred stock concepts              BLM: Understand

23. Which statement regarding preferred stock is true?
- A major disadvantage of financing with preferred stock is that preferred stockholders typically have super-normal voting rights.
  - Preferred stock is normally expected to provide steadier, more reliable income to investors than the same firm's common stock, and as a result, the expected after-tax yield on the preferred is lower than the after-tax expected return on the common.
  - The preemptive right is a provision in all corporate charters that gives preferred stockholders the right to purchase (on a pro rata basis) new issues of preferred stock.
  - One of the disadvantages to a corporation of owning preferred stock is that 70% of the dividends received represent taxable income to the corporate recipient, whereas interest income would be tax free.

ANS: B                      PTS: 1                      DIF: MEDIUM              REF: 247–249

OBJ: (8.10) Preferred stock concepts              BLM: Understand

24. If markets are in equilibrium, which of the following will occur?
- Each stock's expected return should equal its realized return as seen by the marginal investor.
  - Each stock's expected return should equal its required return as seen by the marginal

investor.

- c. All stocks should have the same expected return as seen by the marginal investor.
- d. The expected and required returns on stocks and bonds should be equal.

ANS: B

(b) is true, because if the expected return does not equal the required return, then markets are not in equilibrium.

PTS: 1                    DIF: MEDIUM            REF: 250–252            OBJ: (8.11) Market equilibrium

BLM: Understand

25. What must occur for a stock to be in equilibrium, that is, for there to be no consistent pressure for its price to depart from its current level?
- a. The expected future return must be less than the most recent past realized return.
  - b. The past realized return must be equal to the expected return during the same period.
  - c. The required return must equal the realized return in all periods.
  - d. The expected future returns must be equal to the required return.

ANS: D                    PTS: 1                    DIF: MEDIUM            REF: 250–252

OBJ: (8.11) Market equilibrium            BLM: Understand

26. Which of the following statements is correct?
- a. If a stock's beta increased but its growth rate remained the same, then the new equilibrium price of the stock will be higher (assuming dividends continue to grow at the constant growth rate).
  - b. Market efficiency says that the actual realized returns on all stocks will be equal to the expected rates of return.
  - c. Weak-form efficiency suggests that tape watchers and chartists can earn profits by discovering patterns as to when stock prices rise or fall.
  - d. An implication of the semistrong form of the efficient markets hypothesis is that you cannot consistently benefit from trading on information published in the company annual reports.

ANS: D                    PTS: 1                    DIF: MEDIUM            REF: 252–254

OBJ: (8.12) Market efficiency and stock returns            BLM: Understand

27. Which statement regarding the efficient markets hypothesis is true?
- a. If a market is strong-form efficient, this implies that the returns on a firm's bonds and stocks should be identical.
  - b. If a market is weak-form efficient, this implies that all public information is rapidly incorporated into market prices.
  - c. If your uncle earned a return higher than the overall stock market last year, this is evidence that the stock market is inefficient.
  - d. If a market is weak-form efficient, this implies that analyzing its past price history will not enable one to earn an above-normal rate of return on the stock in the future.

ANS: D                    PTS: 1                    DIF: MEDIUM            REF: 252–254

OBJ: (8.12) Efficient markets hypothesis            BLM: Understand

28. Which statement regarding the efficient markets hypothesis is true?
- a. If the stock market is weak-form efficient, then one cannot outperform the market even if he or she has private information.
  - b. If the stock market is semistrong-form efficient, then the expected return on stocks and bonds must be the same.
  - c. If the stock market is strong-form efficient, then high beta stocks must have the same

expected return as low beta stocks.

- d. Even though the Efficient Markets Hypothesis (EMH) assumes that markets behave as if all investors were rational, under the EMH it is still possible to have some irrational investors in a rational market.

ANS: D

The EMH assumes that markets are efficient, even though some participants may not be rational. This assumption is questioned by behavioural economists, who argue that the entire market can behave in an irrational manner, as when bubbles occur.

PTS: 1                      DIF: MEDIUM      REF: 252–254

OBJ: (8.12) Efficient markets hypothesis

BLM: Understand

29. If the stock market is semistrong efficient, which of the following statements is correct?
- All stocks should have the same expected returns; however, they may have different realized returns.
  - Investors can outperform the market if they have access to information that has not yet been publicly revealed.
  - In equilibrium, stocks and bonds should have the same expected returns.
  - All stocks should have the same expected return.

ANS: B                      PTS: 1                      DIF: MEDIUM      REF: 253

OBJ: (8.12) Semistrong-form efficiency      BLM: Understand

30. Assuming that markets are semistrong efficient, which of the following statements is correct?
- All stocks should have the same expected return.
  - Past stock prices can be successfully used to forecast future stock returns.
  - Investors' most likely returns are those predicted by the SML, but one should not expect to do any better unless he or she has either good luck or access to information that is not publicly available.
  - Investors should expect to earn more than the returns that are predicted by the SML, because if they do not, they should not invest in the stock market.

ANS: C                      PTS: 1                      DIF: MEDIUM      REF: 253

OBJ: (8.12) Semistrong-form efficiency      BLM: Understand

31. Assume that markets are semistrong efficient, but not strong-form efficient. Which of the following statements is correct?
- Each common stock has an expected return equal to that of the overall market.
  - Investors may be able to earn returns above those predicted by the SML if they have access to information that has not been publicly revealed.
  - Investors can expect to earn returns above those predicted by the SML if they have access to public information.
  - Investors should expect to earn more than the returns that are predicted by the SML, because if they do not, they should not invest in the stock market.

ANS: B

(b) is correct; (c) would be correct if we changed “public” to private.

PTS: 1                      DIF: MEDIUM      REF: 253

OBJ: (8.12) Semistrong-form efficiency      BLM: Understand

32. Which of the following statements is correct?
- A tracking, or target, stock is the same as the stock of an independent stand-alone company.

- b. If a company has dual-class shares, Class A and Class B, the shares may pay different dividends, but they must have the same voting rights.
- c. The preemptive right is a provision in the article of incorporation that gives common shareholders the right to purchase (on a pro rata basis) new issues of the firm's common stock.
- d. The stock valuation model,  $P_0 = D_1/(r_s - g)$ , cannot be used for firms that have negative growth rates.

ANS: C

Statement a is false—for example, Hughes Aircraft was tracked as the Class H common stock of General Motors (GMH). However, General Motors (GM) was the independent, stand-alone company and GMH was the tracking stock. (b) is false, because different classes of stock often have different voting policies. (c) is true. (d) is false, because the constant growth model can be used anytime as long as the constant growth rate is less than the required return (even if the growth rate is negative).

PTS: 1                      DIF: MEDIUM      REF: 233–234 | 239–240  
 OBJ: (Comp: 8.1, 8.2, 8.5) Common share concepts                      BLM: Understand

33. Stock X has a required return of 10%, while Stock Y has a required return of 12%. Which of the following statements is correct?
- a. If the market is in equilibrium, and if Stock Y has the *lower* expected dividend yield, then it must have the *higher* expected growth rate.
  - b. If Stock X and Stock Y have the same current dividend and the same expected dividend growth rate, then Stock Y must sell for a higher price.
  - c. The stocks must sell for the same price.
  - d. Stock Y must have a higher dividend yield than Stock X.

ANS: A

Since X has the lower required return, if Y has a lower dividend yield it must have a higher expected growth rate.

PTS: 1                      DIF: MEDIUM      REF: 237–238 | 250–252  
 OBJ: (Comp: 8.4, 8.11) Common share concepts                      BLM: Analyze

34. A stock is expected to pay a dividend of \$0.75 at the end of the year. The required rate of return is  $r_s = 12.5\%$ , and the expected constant growth rate is  $g = 8.5\%$ . What is its current price?
- a. \$17.82
  - b. \$18.28
  - c. \$18.75
  - d. \$19.22

ANS: C

$D_1$	\$0.75
$r_s$	12.5%
$g$	8.5%
$P_0 = D_1/(r_s - g)$	\$18.75

PTS: 1                      DIF: EASY                      REF: 239–240  
 OBJ: (8.5) Constant growth valuation                      BLM: Remember

35. A common share just paid a dividend of  $D_0 = \$1.75$ . The required rate of return is  $r_s = 12.0\%$ , and the constant growth rate is  $g = 4.0\%$ . What is the current share price?
- a. \$21.09
  - b. \$21.63
  - c. \$22.18

d. \$22.75

ANS: D

$D_0$	\$1.75
$r_s$	12.0%
$g$	4.0%
$D_1 = D_0(1 + g) =$	\$1.82 Intermediate step used to find answer
$P_0 = D_1/(r_s - g)$	\$22.75

PTS: 1                    DIF: EASY                    REF: 239–240  
OBJ: (8.5) Constant growth valuation                    BLM: Remember

36. A share of common stock has just paid a dividend of \$2.00. If the expected long-run growth rate for this stock is 5.0%, and if investors' required rate of return is 10.5%, what is the stock price?
- \$35.39
  - \$36.30
  - \$37.23
  - \$38.18

ANS: D

Last dividend ( $D_0$ )	\$2.00
Long-run growth rate	5.0%
Required return	10.5%
$D_1 = D_0(1 + g) =$	\$2.10 Intermediate step used to find answer
$P_0 = D_1/(r_s - g)$	\$38.18

PTS: 1                    DIF: EASY                    REF: 239–240  
OBJ: (8.5) Constant growth valuation                    BLM: Remember

37. If  $D_1 = \$1.75$ ,  $g$  (which is constant) = 4.5%, and  $P_0 = \$46$ , what is the stock's expected dividend yield for the coming year?
- 3.26%
  - 3.43%
  - 3.61%
  - 3.80%

ANS: D

$D_1$	\$1.75
$g$	4.5%
$P_0$	\$46.00
Dividend yield = $D_1/P_0 =$	3.80%

PTS: 1                    DIF: EASY                    REF: 242–243  
OBJ: (8.6) Expected dividend yield                    BLM: Remember

38. If  $D_0 = \$2.25$ ,  $g$  (which is constant) = 3.5%, and  $P_0 = \$50$ , what is the stock's expected dividend yield for the coming year?
- 4.42%
  - 4.66%
  - 4.89%
  - 5.13%

ANS: B

$D_0$	\$2.25
$g$	3.5%



$P_0$	\$50.00
$D_1 = D_0(1 + g) =$	\$2.33 Intermediate step
Dividend yield = $D_1/P_0 =$	4.66%

PTS: 1                    DIF: EASY                    REF: 242–243  
 OBJ: (8.6) Expected dividend yield                    BLM: Remember

39. If  $D_1 = \$1.50$ ,  $g$  (which is constant) = 6.5%, and  $P_0 = \$56$ , what is the stock's expected capital gains yield for the coming year?
- 6.50%
  - 6.83%
  - 7.17%
  - 7.52%

ANS: A

$D_1$	\$1.50
$g$	6.5%
$P_0$	\$56.00
Capital gains yield = $g =$	6.50%

PTS: 1                    DIF: EASY                    REF: 242–243  
 OBJ: (8.6) Expected return, dividend and capital gains yields                    BLM: Remember

40. If  $D_1 = \$1.25$ ,  $g$  (which is constant) = 5.5%, and  $P_0 = \$44$ , what is the stock's expected total return for the coming year?
- 7.73%
  - 7.93%
  - 8.13%
  - 8.34%

ANS: D

$D_1$	\$1.25
$g$	5.5%
$P_0$	\$44.00
Total return = $r_s = D_1/P_0 + g$	8.34%

PTS: 1                    DIF: EASY                    REF: 242–243                    OBJ: (8.6) Expected total return  
 BLM: Remember

41. If  $D_0 = \$2.75$ ,  $g$  (which is constant) = 3%, and  $P_0 = \$36$ , what is the stock's expected total return for the coming year?
- 10.07%
  - 10.33%
  - 10.60%
  - 10.87%

ANS: D

$D_0$	\$2.75
$g$	3.0%
$P_0$	\$36.00
$D_1 = D_0(1 + g) =$	\$2.83 Intermediate step used to find answer
Total return = $r_s = D_1/P_0 + g$	10.87%

PTS: 1                    DIF: EASY                    REF: 242–243                    OBJ: (8.6) Expected total return  
 BLM: Remember

42. McDonnell Manufacturing is expected to pay a dividend of \$1.50 per share at the end of the year ( $D_1 = \$1.50$ ). The stock sells for \$34.50 per share, and its required rate of return is 11.5%. The dividend is expected to grow at some constant rate,  $g$ , forever. What is the equilibrium expected growth rate?
- 6.63%
  - 6.80%
  - 6.97%
  - 7.15%

ANS: D

Stock price	\$34.50
Required return	11.5%
Dividend yield	4.35%
Growth rate = $r_s - D_1/P_0 =$	7.15%

PTS: 1                    DIF: EASY                    REF: 242–243                    OBJ: (8.6) Constant growth rate  
BLM: Understand

43. Ewert Enterprises' stock currently sells for \$30.50 per share. The stock's dividend is projected to increase at a constant rate of 4.50% per year. The required rate of return on the stock,  $r_s$ , is 10.00%. What is Ewert's expected price 3 years from today?
- \$31.61
  - \$32.43
  - \$33.26
  - \$34.81

ANS: D

Stock price	\$30.50
Growth rate	4.50%
Years in the future	3
$P_3 = P_0(1 + g)^3 =$	\$34.81

PTS: 1                    DIF: EASY                    REF: 242–243  
OBJ: (8.6) Future price of a constant growth stock                    BLM: Understand

44. E.M. Roussakis Inc.'s stock currently sells for \$45 per share. The stock's dividend is projected to increase at a constant rate of 3.75% per year. The required rate of return on the stock,  $r_s$ , is 15.50%. What is Roussakis' expected price 5 years from now?
- \$50.14
  - \$51.42
  - \$52.74
  - \$54.09

ANS: D

Growth rate	3.75%
Years in the future	5
Stock price	\$45.00
$P_5 = P_0(1 + g)^5 =$	\$54.09

PTS: 1                    DIF: EASY                    REF: 242–243  
OBJ: (8.6) Future price of a constant growth stock                    BLM: Understand

45. Gary Wells Inc. plans to issue perpetual preferred stock with an annual dividend of \$6.50 per share. If the required return on this preferred stock is 6.5%, at what price should the stock sell?
- \$92.69

- b. \$95.06
- c. \$97.50
- d. \$100.00

ANS: D

Preferred dividend	\$6.50
Required return	6.5%
Preferred price = $D_P/r_P =$	\$100.00

PTS: 1                    DIF: EASY                    REF: 247–249  
 OBJ: (8.10) Preferred stock valuation                    BLM: Understand

46. The Zumwalt Company is expected to pay a dividend of \$2.25 per share at the end of the year, and that dividend is expected to grow at a constant rate of 5.00% per year in the future. The company's beta is 1.15, the market risk premium is 5.50%, and the risk-free rate is 4.00%. What is the company's current stock price?
- a. \$42.25
  - b. \$43.31
  - c. \$44.39
  - d. \$45.50

ANS: A

$D_1$	\$2.25
b	1.15
$r_{RF}$	4.00%
$RP_M$	5.50%
g	5.00%
$r_s = r_{RF} + b(RP_M) =$	10.33% Intermediate step
$P_0 = D_1/(r_s - g)$	\$42.25

PTS: 1                    DIF: MEDIUM                    REF: 239–240  
 OBJ: (8.5) Constant growth valuation: CAPM                    BLM: Analyze

47. The Isberg Company just paid a dividend of \$0.80 per share, and that dividend is expected to grow at a constant rate of 6.00% per year in the future. The company's beta is 1.25, the market risk premium is 5.00%, and the risk-free rate is 4.00%. What is the company's current stock price?
- a. \$19.95
  - b. \$20.45
  - c. \$20.96
  - d. \$21.49

ANS: A

$D_0$	\$0.80
b	1.25
$r_{RF}$	4.0%
$RP_M$	5.0%
g	6.0%
$D_1 = D_0(1 + g) =$	\$0.85 Intermediate step
$r_s = r_{RF} + b(RP_M) =$	10.3% Intermediate step
$P_0 = D_1/(r_s - g)$	\$19.95

PTS: 1                    DIF: MEDIUM                    REF: 239–240  
 OBJ: (8.5) Constant growth valuation: CAPM                    BLM: Analyze

48. Schnusenberg Corporation just paid a dividend of \$0.65 per share, and that dividend is expected to grow at a constant rate of 7.00% per year in the future. The company's beta is 0.95, the required return on the market is 10.50%, and the risk-free rate is 5.00%. What is the company's current stock price?
- \$21.57
  - \$22.11
  - \$22.66
  - \$23.22

ANS: A

$D_0$	\$0.65
b	0.95
$r_{RF}$	5.0%
$r_M$	10.5%
g	7.0%
$D_1 = D_0(1 + g) =$	\$0.70 Intermediate step
$r_s = r_{RF} + b(r_M - R_{RF}) =$	10.2% Intermediate step
$P_0 = D_1/(r_s - g)$	\$21.57

PTS: 1                      DIF: MEDIUM      REF: 239–240

OBJ: (8.5) Constant growth valuation: CAPM                      BLM: Analyze

49. Goode Inc.'s stock has a required rate of return of 11.50%, and it sells for \$25.00 per share. Goode's dividend is expected to grow at a constant rate of 7.00% per year. What was Goode's *last* dividend,  $D_0$ ?
- \$0.95
  - \$1.05
  - \$1.16
  - \$1.27

ANS: B

Stock price	\$25.00
Required return	11.50%
Growth rate	7.00%
$P_0 = D_1/(r_s - g)$ , so $D_1 = P_0(r_s - g) =$	\$1.13 Intermediate step
Last dividend = $D_1/(1 + g)$	\$1.05

PTS: 1                      DIF: MEDIUM      REF: 239–241

OBJ: (8.5) Constant growth dividend                      BLM: Analyze

50. McLaughlin Inc.'s stock has a required rate of return of 10.50%, and it sells for \$67.50 per share. McLaughlin's dividend is expected to grow at a constant rate of 7.00% per year. What is the expected year-end dividend,  $D_1$ ?
- \$2.13
  - \$2.36
  - \$2.60
  - \$2.86

ANS: B

Stock price	\$67.50
Required return	10.5%
Growth rate	7.00%
Dividend yield = $r_s - g =$	3.50% Intermediate step
Expected dividend = $P_0 * \text{Yield} =$	\$2.36

PTS: 1                      DIF: MEDIUM      REF: 239–241

OBJ: (8.5) Constant growth dividend      BLM: Analyze

51. Sorenson Corp.'s expected year-end dividend is  $D_1 = \$1.50$ , its required return is  $r_s = 12.00\%$ , its dividend yield is  $8.00\%$ , and its growth rate is expected to be constant in the future. What is Sorenson's expected stock price in 7 years, i.e., what is  $P_7$ ?
- a. \$24.67
  - b. \$25.91
  - c. \$27.20
  - d. \$28.56

ANS: A

Net expected dividend ( $D_1$ )	\$1.50
Required return	12.0%
Dividend yield	8.0%
Growth rate	4.0% Intermediate step
$P_0 = D_1/(r_s - g) =$	18.75 Intermediate step
Years in the future	7
$P_7 = P_0(1 + g)^7$	\$24.67

PTS: 1      DIF: MEDIUM      REF: 239–241

OBJ: (8.6) Future price of a constant growth stock      BLM: Analyze

52. You must estimate the intrinsic value of Tsetseko Technologies' stock. Tsetseko's end-of-year free cash flow (FCF) is expected to be \$17.50 million, and it is expected to grow at a constant rate of 7.00% a year thereafter. The company's WACC is 10.00%. Tsetseko has \$125.00 million of long-term debt plus preferred stock, and there are 15.00 million shares of common stock outstanding. What is Tsetseko's estimated intrinsic value per share of common stock?
- a. \$28.16
  - b. \$29.33
  - c. \$30.56
  - d. \$31.78

ANS: C

FCF <sub>1</sub>	\$17.50
Constant growth rate	7.0%
WACC	10.0%
Debt & preferred stock	\$125
Shares outstanding	15
Total firm value = $FCF_1/(WACC - g) =$	\$583.33 Intermediate step
Less: Value of debt & preferred stock	-\$125.00
Value of equity	\$458.33 Intermediate step
Number of shares	15
Value per share = Equity value/Shares =	\$30.56

PTS: 1      DIF: MEDIUM      REF: 246–247      OBJ: (8.8) Free cash flow model

BLM: Analyze

53. You have been assigned the task of using the free cash flow model to estimate Petry Corporation's intrinsic value. Petry's WACC is 10.00%, its end-of-year free cash flow (FCF) is expected to be \$150.0 million, the FCFs are expected to grow at a constant rate of 6.00% a year in the future, the company has \$200 million of long-term debt plus preferred stock, and it has 50 million shares of common stock outstanding. What is Petry's estimated intrinsic value per share of common stock?
- a. \$66.12
  - b. \$68.52

- c. \$71.00
- d. \$73.49

ANS: C

FCF <sub>1</sub>	\$150.00	
Constant growth rate	6.0%	
WACC	10.0%	
Debt & preferred stock	\$200	
Shares outstanding	50	
Total firm value = FCF <sub>1</sub> /(WACC – g) =	\$3,750.00	Intermediate step
Less: Value of debt & preferred stock	–\$200.00	
Value of equity	\$3,550.00	Intermediate step
Number of shares	50	
Value per share = Equity value/Shares =	\$71.00	

PTS: 1                      DIF: MEDIUM      REF: 246–247      OBJ: (8.8) Free cash flow model  
 BLM: Analyze

54. Carter’s preferred stock pays a dividend of \$1.00 per quarter. If the price of the stock is \$50.00, what is its *nominal* (NOT effective) annual rate of return?
- a. 7.41%
  - b. 7.61%
  - c. 7.80%
  - d. 8.00%

ANS: D

Pref. quarterly dividend	\$1.00
Preferred stock price	\$50.00
Nom. required return = (Qt Div * 4)/Price =	8.00%

PTS: 1                      DIF: MEDIUM      REF: 247–249  
 OBJ: (8.10) Preferred required return      BLM: Analyze

55. Clinton’s preferred stock pays a dividend of \$1.00 per quarter. If the price of the stock is \$50.00, what is its *effective* annual (NOT nominal) rate of return?
- a. 7.52%
  - b. 7.76%
  - c. 8.00%
  - d. 8.24%

ANS: D

Pref. quarterly dividend	\$1.00
Preferred stock price	\$50.00
Eff% required return = (1+ (Qt Div/P)) <sup>N-1</sup> =	8.24%

PTS: 1                      DIF: MEDIUM      REF: 247–249  
 OBJ: (8.10) Preferred required return      BLM: Analyze

56. WWW Servers just paid a dividend of D<sub>0</sub> = \$1.00. Analysts expect the company’s dividend to grow by 30% this year, by 10% in Year 2, and at a constant rate of 5% in Year 3 and thereafter. The required return on WWW’s stock is 9.00%. What is the best estimate of the stock’s current intrinsic value?
- a. \$31.50
  - b. \$32.31
  - c. \$33.14
  - d. \$33.99

ANS: D

$r_s = 9.0\%$

Year	0	1	2	3
Growth rates:		30.0%	10.0%	5.0%
Dividend	\$1.00	\$1.30	\$1.43	\$1.50
Terminal value = $D_3/(r_s - g_3) =$			\$37.54	
Total CFs		\$1.30	\$38.97	
PV of CFs		\$1.19	\$32.80	
Stock price	\$33.99			

PTS: 1 DIF: MEDIUM | HARD

REF: 243–245

OBJ: (8.7) Nonconstant growth valuation

BLM: Analyze

57. Rentz RVs Inc. (RRV) is currently enjoying relatively high growth because of a surge in the demand for recreational vehicles. Management expects earnings and dividends to grow at a rate of 25% for the next 4 years, after which high gas prices will probably reduce the growth rate in earnings and dividends to zero, i.e.,  $g = 0$ . The company's last dividend,  $D_0$ , was \$1.25. RRV's beta is 1.20, the market risk premium is 5.50%, and the risk-free rate is 3.00%. What is the current price of the common stock?

- a. \$26.77
- b. \$27.89
- c. \$29.05
- d. \$30.21

ANS: C

Last dividend ( $D_0$ )	\$1.25
Short-run growth rate	25%
Long-run growth rate	0%
Beta	1.20
Market risk premium	5.50%
Risk-free rate	3.00%
Required return = $r_s = r_{RF} + b(RP_M) =$	9.60% Intermediate step

Year	0	1	2	3	4	5
Dividend	\$1.25	\$1.56	\$1.95	\$2.44	\$3.05	\$3.05
Terminal value = $D_5/(r_s - g_5) =$					\$31.79	
Total CFs		\$1.56	\$1.95	\$2.44	\$34.84	
PV of the CFs		\$1.43	\$1.63	\$1.85	\$24.15	
Price = Sum of PVs	\$29.05					

PTS: 1 DIF: HARD REF: 243–245

OBJ: (8.7) Nonconstant growth valuation

BLM: Analyze

58. The Upton Company's last dividend was \$1.75. Its dividend growth rate is expected to be constant at 18.00% for 2 years, after which dividends are expected to grow at a rate of 6.00% forever. Upton's required return ( $r_s$ ) is 12.00%. What is Upton's current stock price?

- a. \$37.15
- b. \$38.10
- c. \$39.06
- d. \$40.03

ANS: B

Last dividend ( $D_0$ )	\$1.75
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Short-run growth rate	18.00%
Long-run growth rate	6.00%
Required return	12.00%

Year	0	1	2	3
		18.00%	18.00%	6.00%
Dividend	\$1.75	\$2.07	\$2.44	\$2.58
Terminal value = $D_3/(r_s - g_3) =$			\$43.05	
Total CFs		\$2.07	\$45.49	
PV of CFs		\$1.84	\$36.26	
Price = Sum of PVs	\$38.10			

PTS: 1            DIF: HARD            REF: 243–245

OBJ: (8.7) Nonconstant growth valuation

BLM: Analyze

59. The Wei Company's last dividend was \$1.75. The dividend growth rate is expected to be constant at 1.50% for 2 years, after which dividends are expected to grow at a rate of 8.00% forever. Wei's required return ( $r_s$ ) is 12.00%. What is Wei's current share price?
- \$41.83
  - \$43.08
  - \$44.38
  - \$45.71

ANS: A

Last dividend ( $D_0$ )	\$1.75
Short-run growth rate	1.50%
Long-run growth rate	8.00%
Required return	12.00%

Year	0	1	2	3
		1.50%	1.50%	8.00%
Dividend	\$1.75	\$1.78	\$1.80	\$1.95
Terminal value = $D_3/(r_s - g_3) =$			\$48.68	
Total CFs		\$1.78	\$50.48	
PV of CFs		\$1.59	\$40.24	
Price = Sum of PVs	\$41.83			

PTS: 1            DIF: HARD            REF: 243–245

OBJ: (8.7) Nonconstant growth valuation

BLM: Analyze

60. The Nikko Company's last dividend was \$1.50. The dividend growth rate is expected to be constant at 15% for 3 years, after which dividends are expected to grow at a rate of 6% forever. If Nikko's required return ( $r_s$ ) is 11%, what is the company's current share price?
- \$36.69
  - \$37.82
  - \$38.99
  - \$40.20

ANS: D

Required return	11.00%
Short-run growth rate	15.00%
Long-run growth rate	6.00%
Last dividend ( $D_0$ )	\$1.50

Year	0	1	2	3	4
Dividend	\$1.50	\$1.73	\$1.98	\$2.28	\$2.42



Terminal value = $P_2 = D_3 / (r_s - g_3)$ :			\$48.36
Total CFs	\$1.73	\$1.98	\$50.65
PV of CFs	\$1.55	\$1.61	\$37.03
Price = Sum of PVs	\$40.20		

PTS: 1                    DIF: HARD                    REF: 243–245

OBJ: (8.7) Nonconstant growth valuation

BLM: Analyze

61. Prock Petroleum's stock has a required return of 13%, and the stock sells for \$50 per share. The firm just paid a dividend of \$1.00, and the dividend is expected to grow by 30% per year for the next 4 years, so  $D_4 = \$1.00(1.30)^4 = \$2.8561$ . After  $t = 4$ , the dividend is expected to grow at a constant rate of  $X\%$  per year forever. What is the stock's expected constant growth rate after  $t = 4$ , i.e., what is  $X$ ?
- 7.46%
  - 7.85%
  - 8.26%
  - 8.70%

ANS: D

Stock price	\$50.00
Paid dividend ( $D_0$ )	\$1.00
Short-run growth rate	30.0%
Required return	13.0%
Forecasted LR growth rate, $X$	8.70%

Year	0	1	2	3	4	5
Dividend	\$1.0000	\$1.3000	\$1.6900	\$2.1970	\$2.8561	\$3.1045
Terminal value = $P_4 = D_5 / (r_s - g_5)$ :					\$72.15	
Total CFs		\$1.30	\$1.69	\$2.20	\$75.01	
PV of CFs		\$1.15	\$1.32	\$1.52	\$46.00	
Stock price	\$50.00					

We must solve for the long-run growth rate. We can forecast the dividends in Years 1–4, so they are inserted in the time line. We need a growth rate to find  $D_5$  and the TV. We begin with a guess of say 5.0%, which we insert in the forecast cell. We then find the PV of the forecasted CFs and sum them. If the sum equals the given price, then our growth rate would be correct. If not, we need to substitute in different  $g$ 's until we find the one that works. We used Excel's Goal Seek function to simplify the process.

PTS: 1                    DIF: HARD                    REF: 243–245

OBJ: (8.7) Nonconstant growth rate—nonalgebraic

BLM: Analyze

62. Beranek Technologies was founded 10 years ago. It has been profitable for the last 5 years, but it has needed all of its earnings to support growth and thus has never paid a dividend. Management has indicated that it plans to pay a \$0.50 dividend 3 years from today, then to increase it at a relatively rapid rate for 2 years, and then to increase it at a constant rate of 8.00% thereafter. The forecast of the future dividend stream, along with the forecasted growth rates, is shown below. With a required return of 11.00%, what is the current intrinsic value?

Year	0	1	2	3	4	5	6	7
Growth rate	NA	NA	NA	NA	50.00%	25.00%	8.00%	8.00%
Dividend	\$0.00	\$0.00	\$0.00	\$0.50	\$0.75	\$0.94	\$1.01	\$1.09

- a. \$19.88
- b. \$20.39
- c. \$20.91
- d. \$21.44

ANS: D

Required return 11%

Year	0	1	2	3	4	5	6	7
Dividend	\$0.00	\$0.00	\$0.00	\$0.50	\$0.75	\$0.94	\$1.01	\$1.09
Terminal value = $P_5 = D_6 / (r_s - g_6) =$						\$33.75		
Total CFs		\$0.00	\$0.00	\$0.50	\$0.75	\$34.69		
PV of CFs		\$0.00	\$0.00	\$0.37	\$0.49	\$20.59		
Price =	\$21.44							

PTS: 1

DIF: HARD

REF: 243–245

OBJ: (8.7) Zero current div, nonconstant then constant growth BLM: Analyze

63. The S.P. Whitman Company's last dividend was \$1.00. The dividend growth rate is expected to be constant at 10% for 3 years, after which dividends are expected to grow at a rate of 6% forever. The current stock price is \$15.00. What is Whitman's required return,  $r_s$ ? (Hint: Forecast the dividends for Years 1 to 4. Then you must find the discount rate that causes the PVs of the dividends at  $t = 1$ ,  $t = 2$ , and  $t = 3$  plus the price at  $t = 3$ ,  $P_3$ , to equal the actual known price. However, you must first estimate  $P_3$ , and that requires an estimate of  $r_s$ . You can make a guess as to  $r_s$ , find  $P_3$  using it, then discount the dividends and the estimated  $P_3$  at that rate. If the sum does not equal the known price, then change the value used for  $r_s$ , and continue until you get  $P_0$ . This is a laborious, time-consuming process with a calculator, but it's easy with Excel.)
- a. 12.63%
  - b. 13.02%
  - c. 13.42%
  - d. 13.84%

ANS: D

Finding the discount rate when we know the dividends and the actual stock price is complicated if the growth rate is not constant, and an iterative solution is required.

Actual Price,  $P_0$  \$15.00  
 Estimated  $r_s =$  13.84%

We begin with a guess as to  $r_s$ . If the Calculated price does not equal the Actual price, then use a higher or lower value for Estimated  $r_s$ , continuing until an equality is reached. This is correct value of  $r_s$ . We actually used Excel's Goal Seek to find  $r_s$ .

Year	0	1	2	3	4
Dividends:	\$1.00	\$1.100	\$1.210	\$1.331	\$1.411
Terminal value = $P_2 = D_3 / (r_s - g_3):$				\$18.00	
Total CFs:		\$1.100	\$1.210	\$19.327	
PV of CFs discounted at Estimated $r_s$ :		\$0.966	\$0.934	\$13.100	
Calculated Price = Sum of PVs:	\$15.00				

PTS: 1

DIF: VERY HARD

REF: 243–245

OBJ: (8.7) Nonconstant g, required return—nonalgorithmic

BLM: Analyze

## CHAPTER 9—THE COST OF CAPITAL

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### TRUE/FALSE

1. “Capital” is sometimes defined as the funds supplied by investors.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 263  
OBJ: (9.1) Capital

2. The cost of capital should reflect the average cost of the various sources of long-term funds a firm uses to acquire assets.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 265  
OBJ: (9.1) Cost of capital

3. The component costs of capital are market-determined variables in the sense that they are based on investors’ required returns.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 265  
OBJ: (9.1) Component costs of capital

4. The *before-tax* cost of debt, which is lower than the *after-tax* cost, is used as the component cost of debt for purposes of developing the firm’s WACC.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 264–265  
OBJ: (9.2) Cost of debt

5. The cost of debt is equal to one minus the marginal tax rate multiplied by the average coupon rate on all outstanding debt.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 264–265  
OBJ: (9.2) Cost of debt

6. The cost of preferred stock to a firm must be adjusted to an after-tax figure because dividends received by a corporation may be excluded from the receiving corporation’s taxable income.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 266  
OBJ: (9.3) Cost of preferred stock

7. The cost of common stock is the rate of return the marginal shareholder requires on the firm’s common stock.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 267  
OBJ: (9.4) Cost of common stock

8. For capital budgeting and cost of capital purposes, the firm should always consider retained earnings as the first source of capital, i.e., use these funds first, because retained earnings have no cost to the firm.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 267  
OBJ: (9.4) Cost of retained earnings

9. Funds acquired by the firm through retaining earnings have no cost because there are no dividend or interest payments associated with them, and no flotation costs are required to raise them, but capital raised by selling new common shares or bonds does have a cost.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 267  
 OBJ: (9.4) Cost of retained earnings

10. The cost of equity raised by retaining earnings can be less than, equal to, or greater than the cost of external equity raised by selling new issues of common stock, depending on tax rates, flotation costs, the attitude of investors, and other factors.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 267  
 OBJ: (9.4) Cost of retained earnings

11. The firm's cost of external equity raised by issuing new stock is the same as the required rate of return on the firm's outstanding common stock.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 274–275  
 OBJ: (9.9) Cost of new common equity

12. The cost of external equity capital raised by issuing new common stock ( $r_e$ ) is defined as follows, in words: "The cost of external equity equals the cost of equity capital from retaining earnings ( $r_s$ ), divided by one minus the percentage flotation cost required to sell the new stock ( $1 - F$ )."

ANS: F

This statement is true only if the expected growth rate is zero. Here are some illustrative numbers that show that the statement is true if  $g = 0$  but false otherwise.

	<u>Positive g</u>	<u>Zero g</u>	
Price:	\$10.00	\$10.00	
Dividend:	\$1.00	\$1.00	
Growth:	8.00%	0.00%	
Flotation:	5.00%	5.00%	
$r_s = D_1/P_0 + g$	18.00%	10.00%	
$r_e = D_1/P_0(1 - F) + g$	18.526%	10.526%	} Equal only if $g = \text{zero}$ .
$r_e/(1 - F)$	18.947%	10.526%	

PTS: 1                      DIF: EASY                      REF: 274–275  
 OBJ: (9.9) Cost of new common equity

13. If the expected dividend growth rate is zero, then the cost of external equity capital raised by issuing new common stock ( $r_e$ ) is equal to the cost of equity capital from retaining earnings ( $r_s$ ) divided by one minus the percentage flotation cost required to sell the new stock,  $(1 - F)$ . If the expected growth rate is not zero, then the cost of external equity must be found using a different procedure.

ANS: T

This statement is true. Here are some illustrative numbers to demonstrate this point.

	Positive g	Zero g	
Price:	\$10.00	\$10.00	
Dividend:	\$1.00	\$1.00	
Growth:	8.00%	0.00%	
Flotation:	5.00%	5.00%	
$r_s = D_1/P_0 + g$	18.00%	10.00%	
$r_e = D_1/P_0(1 - F) + g$	18.526%	10.526%	} Equal only if g = zero.
$r_d/(1 - F)$	18.947%	10.526%	

PTS: 1                      DIF: EASY                      REF: 274–275

OBJ: (9.9) Cost of new common equity

14. Suppose you are the president of a small, publicly traded corporation. Since you believe that your firm's share price is temporarily depressed, all additional capital funds required during the current year will be raised using debt. Thus, the appropriate marginal cost of capital for use in capital budgeting during the current year is the after-tax cost of debt.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 275–276

OBJ: (9.10) Specific source capital cost

15. The higher the firm's flotation cost for new common equity, the more likely the firm is to use preferred stock, which has no flotation cost, and retained earnings, whose cost is the average return on assets.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 266 | 274–275

OBJ: (Comp: 9.3, 9.9) Flotation and capital choice

16. If a firm's marginal tax rate is increased, and other things held constant, this would lower the cost of debt used to calculate its WACC.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 265

OBJ: (9.2) After-tax cost of debt

17. In general, firms should use their WACC to evaluate capital budgeting projects because most projects are funded with general corporate funds, which come from a variety of sources. However, if the firm plans to use only debt or only equity to fund a particular project, it should use the after-tax cost of that specific type of capital to evaluate that project.

ANS: F

In general, this statement is false, because the firm should be viewed as an ongoing entity, and using debt (or equity) to fund a given project will change the capital structure, and this factor is recognized by basing the cost of capital for all projects on a target capital structure. Under some special circumstances, where a project is set up as a separate entity, then "project financing" is used, and only the project's specific situation is considered. This is a specialized topic, however.

PTS: 1                      DIF: MEDIUM                      REF: 275–276

OBJ: (9.10) Specific source capital cost

18. Suppose the debt ratio (D/TA) is 10%, the current cost of debt is 8%, the current cost of equity is 16%, and the tax rate is 40%. An increase in the debt ratio to 20% would have to decrease the WACC.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 277–278

OBJ: (9.11) Factors affecting WACC

19. The cost of debt,  $r_d$ , is normally less than  $r_s$ , so  $r_d(1 - T)$  will normally be less than  $r_s$ . Therefore, as long as the firm is not completely debt financed, the WACC will normally be greater than  $r_d(1 - T)$ .

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 265 | 267 | 275–276  
OBJ: (Comp: 9.2, 9.4, 9.10) WACC

20. The lower the firm's tax rate, the lower its after-tax cost of debt and WACC will be, other things held constant.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 265 | 275–276  
OBJ: (Comp: 9.2, 9.10) Taxes,  $r_d(1 - T)$ , and WACC

21. Given that Firms X and Y are two separate entities, the cost of debt for X can be greater than the cost of equity for Y.

ANS: T  
If Firm A carries more risk than Firm B, then A's cost of debt can possibly be greater than B's cost of equity.

PTS: 1                      DIF: MEDIUM                      REF: 265 | 267  
OBJ: (Comp: 9.2, 9.4) Cost of equity

22. If expectations for long-term inflation rose, but the slope of the SML remained constant, this would have a greater impact on the required rate of return on equity,  $r_s$ , than on the interest rate on long-term debt,  $r_d$ , for most firms. Therefore, the percentage point increase in the cost of equity would be greater than the increase in the interest rate on long-term debt.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 265 | 267–270  
OBJ: (Comp: 9.2, 9.5) Inflation effects

23. To estimate the required rate of return on common equity, the DCF method can be used only for constant growth stocks.

ANS: F  
The method can also be used for nonconstant growth stocks, but the procedure is more involved.

PTS: 1                      DIF: MEDIUM                      REF: 267–273  
OBJ: (Comp: 9.5, 9.6) Cost of equity

24. The component costs of capital are based on embedded costs.

ANS: F  
Embedded costs are historical costs. The component costs reflect the current cost of current borrowing, earnings retention or share sales.

PTS: 1                      DIF: MEDIUM                      REF: 264–265 | 268 | 272  
OBJ: (Comp: 9.2, 9.5, 9.6) Historical data

25. If investors' aversion to risk rose, causing the slope of the SML to increase, this would have a greater impact on the required rate of return on equity,  $r_s$ , than on the interest rate on long-term debt,  $r_d$ , for most firms. Other things held constant, this would lead to an increase in the use of debt and a decrease in the use of equity. However, other things would not stay constant if firms used a lot more debt, as that would increase the riskiness of both debt and equity and thus limit the shift toward debt.

ANS: T                    PTS: 1                    DIF: MEDIUM            REF: 264–265  
OBJ: (Comp: 9.2, 9.5) Inflation effects

## MULTIPLE CHOICE

1. Which of the following is NOT a capital component when calculating the WACC?
- long-term debt
  - accounts payable
  - retained earnings
  - preferred stock

ANS: B                    PTS: 1                    DIF: EASY                REF: 263  
OBJ: (9.1) Capital components                    BLM: Remember

2. Among various sources of financing, which one will receive favourable tax treatments by issuers?
- long-term debt
  - common stock
  - retained earnings
  - preferred stock

ANS: A                    PTS: 1                    DIF: EASY                REF: 264–265  
OBJ: (9.2) After-tax cost of debt                    BLM: Remember

3. For a typical firm, which sequence is correct? All rates are after taxes, and assume the firm operates at its target capital structure.
- $r_e > r_s > WACC > r_d$
  - $r_s > r_e > r_d > WACC$
  - $WACC > r_e > r_s > r_d$
  - $r_d > r_e > r_s > WACC$

ANS: A                    PTS: 1                    DIF: EASY                REF: 263 | 265–267  
OBJ: (Comp: 9.1–9.4) Capital components                    BLM: Understand

4. Bankston Corporation forecasts that if all of its existing financial policies are adhered to, its proposed capital budget would be so large that it would have to issue new common stock. Since new stock has a higher cost than retained earnings, Bankston would like to avoid issuing new stock. Which action would reduce its need to issue new common stock?
- increasing the percentage of debt in the target capital structure
  - increasing the dividend payout ratio for the upcoming year
  - increasing the proposed capital budget
  - reducing the amount of short-term bank debt in order to increase the current ratio

ANS: A  
(a) is correct, because if more debt is used, then less equity will be needed to fund the capital budget, so the need for a stock issue would be reduced.

PTS: 1                    DIF: EASY                REF: 277–278  
OBJ: (9.11) Internal versus external common equity                    BLM: Understand

5. Schalheim Sisters Inc. has always paid out all of its earnings as dividends, and hence has no retained earnings. This same situation is expected to persist in the future. The company uses the CAPM to calculate its cost of equity. Its target capital structure consists of common stock, preferred stock, and debt. Which circumstance would reduce the WACC?
- The market risk premium declines.

- b. The flotation costs associated with issuing new common stock increase.
- c. The company's beta increases.
- d. Expected inflation increases.

ANS: A                      PTS: 1                      DIF: EASY                      REF: 277–278  
 OBJ: (9.11) Factors affecting WACC                      BLM: Understand

6. When working with the CAPM, which factor can be determined with the most precision?
- a. the market risk premium ( $RP_M$ )
  - b. the beta coefficient,  $b_i$ , of a relatively safe stock
  - c. the most appropriate risk-free rate,  $r_{RF}$
  - d. the beta coefficient of “the market,” which is the same as the beta of an average stock

ANS: D

By definition, both the market and an average stock have betas of 1.0. Since we know this to be the case, we can obviously determine beta for the market or an average stock with precision.

PTS: 1                      DIF: MEDIUM                      REF: 267–270                      OBJ: (9.5) Cost of equity: CAPM  
 BLM: Understand

7. Jackson Inc. uses only equity capital, and it has two equally sized divisions. Division A's cost of capital is 10.0%, Division B's cost is 14.0%, and the composite WACC is 12.0%. All of Division A's projects have the same risk, as do all of Division B's projects. However, the projects in Division A have less risk than those in Division B. Which of the following projects should Jackson accept?
- a. a Division B project with a 13% return
  - b. a Division B project with a 12% return
  - c. a Division A project with an 11% return
  - d. a Division A project with a 9% return

ANS: C

The correct answer is (c). Division A should accept only projects with a return greater than 10%, and Division B should accept only projects with a return greater than 14%. Only (c) meets this criterion.

PTS: 1                      DIF: MEDIUM                      REF: 278–279                      OBJ: (9.12) Divisional risk  
 BLM: Analyze

8. Vang Inc. estimates that its average-risk projects have a WACC of 10%, its below-average risk projects have a WACC of 8%, and its above-average risk projects have a WACC of 12%. Which project (A, B, C, or D) should the company accept?
- a. Project B is of below-average risk and has a return of 8.5%.
  - b. Project C is of above-average risk and has a return of 11%.
  - c. Project A is of average risk and has a return of 9%.
  - d. Project A has a below-average risk and has a return of 7.5%.

ANS: A

Project B has a return greater than its risk-adjusted cost of capital, so it should be accepted.

PTS: 1                      DIF: MEDIUM                      REF: 280  
 OBJ: (9.12) Risk and project selection                      BLM: Understand

9. Nelson Enterprises, an all-equity firm, has a beta of 2.0. Nelson's chief financial officer is evaluating a project with an expected return of 21%, before any risk adjustment. The risk-free rate is 7%, and the market risk premium is 6%. The project being evaluated is riskier than Nelson's average project, in terms of both its beta risk and its total risk. Which of the following statements is correct?
- a. The project should definitely be accepted because its expected return (before any risk



- adjustments) is greater than its required return.
- The project should definitely be rejected because its expected return (before risk adjustments) is less than its required return.
  - Riskier-than-average projects should have their expected returns increased to reflect their higher risk. Clearly, this would make the project acceptable regardless of the amount of the adjustment.
  - The accept/reject decision depends on the firm's risk-adjustment policy. If Nelson's policy is to increase the required return on a riskier-than-average project to 3% over  $r_s$ , then it should reject the project.

ANS: D

(d) is correct. Here is the proof:

$$r_s = 7\% + 6\%(2.0) = 7\% + 12\% = 19\%$$

$$\text{Required return for risky projects} = 19\% + 3\% = 22\%$$

Project return = 21% < adjusted  $r_s$  = 22%. Thus, the project should be rejected.

PTS: 1                      DIF: MEDIUM              REF: 278–280

OBJ: (9.12) Risk and project selection              BLM: Analyze

- The McCue Company has equal amounts of low-risk, average-risk, and high-risk projects. McCue estimates that its overall WACC is 12%. The CFO believes that this is the correct WACC for the company's average-risk projects, but that a lower rate should be used for lower-risk projects and a higher rate for higher-risk projects. The CEO disagrees on the grounds that, even though projects have different risks, the WACC used to evaluate each project should be the same because the company obtains capital for all projects from the same sources. If the CEO's position is accepted, what is likely to happen over time?
  - The company will take on too many high-risk projects and reject too many low-risk projects.
  - The company will take on too many low-risk projects and reject too many high-risk projects.
  - Things will generally even out over time, and therefore the firm's risk should remain constant over time.
  - The company's overall WACC should decrease over time because its stock price should be increasing.

ANS: A

Low-risk projects will tend to have low expected returns and vice versa for high-risk projects due to competition in the economy. By not adjusting the cost of capital for project risk, the firm will tend to reject low-risk projects even though they earn more than their risk-adjusted costs of capital, and vice versa for high-risk projects. Therefore, (a) is correct.

PTS: 1                      DIF: MEDIUM              REF: 278–280

OBJ: (9.12) Risk-adjusted cost of capital                                      BLM: Evaluate

- What will happen if a typical company uses the same cost of capital to evaluate all projects?
  - The firm will likely become riskier over time, but its intrinsic value will be maximized.
  - The firm will likely become riskier over time, and its intrinsic value will not be maximized.
  - The firm will likely become less risky over time, and its intrinsic value will not be maximized.
  - The firm will likely become less risky over time, and its intrinsic value will be maximized.

ANS: B                      PTS: 1                      DIF: MEDIUM              REF: 278–280

OBJ: (9.12) Risk-adjusted cost of capital                                      BLM: Understand

12. Which of the following statements is correct?
- All else being equal, an increase in a company's stock price will increase its marginal cost of retained earnings,  $r_s$ .
  - All else being equal, an increase in a company's stock price will increase its marginal cost of new common equity,  $r_e$ .
  - Since the money is readily available, the after-tax cost of retained earnings is usually much lower than the after-tax cost of debt.
  - If a company's tax rate increases but the YTM of its noncallable bonds remains the same, the after-tax cost of its debt will fall.

ANS: D

(d) is true, because the after-tax cost of debt is  $r_d(1 - T)$ . So, if  $r_d$  remains constant but  $T$  increases,  $r_d(1 - T)$  decreases. The other statements are false.

PTS: 1                      DIF: MEDIUM      REF: 263–267

OBJ: (Comp: 9.1–9.4) Capital components                      BLM: Understand

13. Unless substantial amounts of capital are needed, if a firm obtains all of its common equity from retained earnings, what will happen to its marginal cost of capital curve?
- It will stay flat.
  - It will rise.
  - It will fall.
  - It will be U-shaped.

ANS: A                      PTS: 1                      DIF: MEDIUM      REF: 263–267

OBJ: (Comp: 9.1–9.4) MCC curve                      BLM: Understand

14. Which of the following statements is correct?
- When calculating the cost of debt, a company needs to adjust for taxes, because interest payments are deductible by the paying corporation.
  - When calculating the cost of preferred stock, companies must adjust for taxes, because dividends paid on preferred stock are deductible by the paying corporation.
  - Because of tax effects, an increase in the risk-free rate will have a greater effect on the after-tax cost of debt than on the cost of common stock.
  - If a company's beta increases, this will increase the cost of equity used to calculate the WACC, but only if the company does not have enough retained earnings to take care of its equity financing and hence needs to issue new stock.

ANS: A

(a) is true, because interest payments on debt are tax deductible. The other statements are false.

PTS: 1                      DIF: MEDIUM      REF: 263–267 | 274–275

OBJ: (Comp: 9.1–9.4, 9.9) Capital components                      BLM: Understand

15. Which of the following statements is correct?
- We should use historical measures of the component costs from prior financings when estimating a company's WACC for capital budgeting purposes.
  - The cost of new equity ( $r_e$ ) could possibly be lower than the cost of retained earnings ( $r_s$ ) if the market risk premium, risk-free rate, and the company's beta all decline by a sufficiently large amount.
  - The cost of retained earnings is the rate of return shareholders require on a firm's common stock.
  - The component cost of preferred stock is expressed as  $r_p(1 - T)$ , because preferred stock dividends are treated as fixed charges, similar to the treatment of interest on debt.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 263–267 | 275–276  
OBJ: (Comp: 9.1–9.5, 9.10) Capital components                      BLM: Understand

16. Which of the following statements is correct?
- The WACC as used in capital budgeting is an estimate of a company's before-tax cost of capital.
  - The percentage flotation costs associated with issuing new common equity are typically smaller than the flotation costs for new debt.
  - The WACC, as used in capital budgeting, is an estimate of the cost of all the capital a company has raised to acquire its assets.
  - There is an "opportunity cost" associated with using retained earnings, hence they are not "free."

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 265  
OBJ: (Comp: 9.1, 9.4, 9.9, 9.10) WACC                      BLM: Understand

17. Which statement about WACC is true?
- A change in a company's target capital structure cannot affect its WACC.
  - WACC calculations should be based on the before-tax costs of all the individual capital components.
  - Flotation costs associated with issuing new common stock normally reduce the WACC.
  - If a company's tax rate increases, then, all else equal, its WACC will decline.

ANS: D  
(d) is true, because the cost of debt for WACC purposes =  $r_d(1 - T)$ , so if  $T$  increases, then  $r_d(1 - T)$  declines.

PTS: 1                      DIF: MEDIUM                      REF: 275–276  
OBJ: (Comp: 9.1, 9.4, 9.9–9.11) WACC                      BLM: Understand

18. Which of the following statements is correct?
- The WACC is calculated using before-tax costs for all components.
  - The after-tax cost of debt usually exceeds the after-tax cost of equity.
  - Retained earnings that were generated in the past and are reflected on the firm's balance sheet are generally available to finance the firm's capital budget during the coming year.
  - The WACC that should be used in capital budgeting is the firm's marginal, after-tax cost of capital.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 263–267 | 275–276  
OBJ: (Comp: 9.1–9.4, 9.10) WACC and capital components                      BLM: Understand

19. Suppose a company's target capital structure calls for 50% debt and 50% common equity. Which of the following statements is correct?
- The cost of equity is always equal to, or greater than, the cost of debt.
  - The WACC is calculated on a before-tax basis.
  - The WACC exceeds the cost of equity.
  - The cost of retained earnings typically exceeds the cost of new common stock.

ANS: A  
(a) is true, because equity is more risky than debt, and hence investors require a higher return on equity. Also, interest on debt is deductible, and this further reduces the cost of debt. The other statements are false.

PTS: 1                      DIF: MEDIUM                      REF: 263–267 | 275–276

OBJ: (Comp: 9.1–9.4, 9.10) WACC and capital components      BLM: Understand

20. What are flotation costs?
- They are part of the capital cost calculations for all debt and equity components.
  - They are normally ignored for long-term debt.
  - They are not considered for retained earnings.

ANS: B

(b) is true, because analysts ignore flotation costs when estimating the after-tax of debt. The flotation cost may be a concern when the life debt is shorter. Flotation costs of the retained earnings had been considered when the shares were previously issued. The remaining statement is false because flotation costs are treated as fixed costs for equity issues.

PTS: 1                      DIF: MEDIUM      REF: 263–267 | 274–276

OBJ: (Comp: 9.1–9.4, 9.9, 9.10) Flotation costs                      BLM: Remember

21. Suppose a firm uses a single source of capital to fund a project. Which of the following statements is correct?
- Only the cost of that source should be used to evaluate the project.
  - This project should still be evaluated using the firm's WACC.
  - The average cost of all previously raised capital should be used for evaluation.
  - Book values of the funding source should be used in calculating WACC.

ANS: B                      PTS: 1                      DIF: MEDIUM      REF: 263–267 | 275–276

OBJ: (Comp: 9.1–9.4, 9.10) WACC and capital components      BLM: Understand

22. Which statement regarding cost of capital is true?
- If a company assigns the same cost of capital to all of its projects regardless of each project's risk, then the company is likely to reject some safe projects that it actually should accept and to accept some risky projects that it should reject.
  - Because of the risk of bankruptcy, the cost of debt is always higher than the cost of equity capital.
  - Because no flotation costs are required to obtain capital as retained earnings, the cost of retained earnings is generally lower than the after-tax cost of debt.
  - Higher flotation costs tend to reduce the cost of equity capital.

ANS: A                      PTS: 1                      DIF: MEDIUM

REF: 263–267 | 274–275 | 278–280                      OBJ: (Comp: 9.1–9.4, 9.9, 9.12) Cost of capital

BLM: Understand

23. Crary Consolidated has two divisions of equal size: a computer division and a restaurant division. Its CFO believes that stand-alone restaurant companies typically have a WACC of 8%, and stand-alone computer companies typically have a 12% WACC. He also believes that Crary's restaurant and computer divisions have the same risk as their typical peers. Consequently, Crary estimates that its composite, or corporate, WACC is 10%. A consultant has suggested using an 8% hurdle rate for the restaurant division and a 12% hurdle rate for the computer division. However, Crary's CFO disagrees, and he has assigned a 10% WACC to all projects in both divisions. Which of the following statements is correct?
- While Crary's decision not to use risk-adjusted WACCs will result in its accepting more projects in the computer division and fewer projects in its restaurant division than if it followed the consultant's recommendation, this should not affect the firm's intrinsic value.
  - Crary's decision not to adjust for risk means, in effect, that it is favouring the restaurant division. Therefore, that division is likely to become a larger part of the consolidated company over time.
  - Crary's decision not to adjust for risk means that the company will accept too many

projects in the computer business and too few projects in the restaurant business. This will lead to a reduction in the firm's intrinsic value over time.

- d. Crary's decision to not risk adjust means that the company will accept too many projects in the restaurant business and too few projects in the computer business. This will lead to a reduction in its intrinsic value over time.

ANS: C

By not making the risk adjustment, Crary will accept too many projects in the computer division and too few in the restaurant division. As a result, the company will become riskier overall, raising its cost of capital. Investors will discount their cash flows at a higher rate, and the firm's value will fall. Therefore, (c) is true and all other statements are false.

PTS: 1                    DIF: HARD                    REF: 278–280

OBJ: (9.12) Risk-adjusted cost of capital                    BLM: Evaluate

24. Safeco Company and Risco Inc. are identical in size and capital structure. However, the riskiness of their assets and cash flows are somewhat different, resulting in Safeco having a WACC of 10% and Risco a 12% WACC. Safeco is considering Project X, which has an IRR of 10.5% and is of the same risk as a typical Safeco project. Risco is considering Project Y, which has an IRR of 11.5% and is of the same risk as a typical Risco project.

Now assume that the two companies merge and form a new company, Safeco/Risco Inc. Moreover, the new company's market risk is an average of the pre-merger companies' market risks, and the merger has no impact on either the cash flows or the risks of Projects X and Y. Which of the following statements is correct?

- a. If the firm evaluates these projects and all other projects at the new overall corporate WACC, it will become riskier over time.  
b. If evaluated using the correct post-merger WACC, Project X would have a negative NPV.  
c. After the merger, Safeco/Risco would have a corporate WACC of 11%. Therefore, it should reject Project X but accept Project Y.  
d. Safeco/Risco's WACC, as a result of the merger, would be 10%.

ANS: A                    PTS: 1                    DIF: HARD                    REF: 278–280

OBJ: (9.12) Divisional risk and project selection                    BLM: Evaluate

25. Which of the following statements is correct?
- a. A cost should be assigned to retained earnings due to the opportunity cost principle, which refers to the fact that the firm's stockholders could themselves earn a return on earnings if they were paid out rather than retained and reinvested.  
b. No cost should be assigned to retained earnings because the firm does not have to pay anything to raise them—they are generated as cash flows by operating assets that were raised in the past; hence, they are "free."  
c. Suppose a firm has been losing money and thus is not paying taxes, and this situation is expected to persist into the foreseeable future. In this case, the firm's before-tax and after-tax costs of debt will both be equal to the interest rate on the firm's currently outstanding debt, provided that debt was issued during the past 5 years.  
d. If a firm has enough retained earnings to fund its capital budget for the coming year, then there is no need to estimate either a cost of equity or a WACC.

ANS: A                    PTS: 1                    DIF: HARD                    REF: 263–267

OBJ: (Comp: 9.1–9.4) Capital components                    BLM: Understand

26. Which of the following statements is correct?
- a. The cost of capital used to evaluate a project should be the cost of the specific type of financing used to fund that project, i.e., it is the after-tax cost of debt, if debt is to be used to finance the project, or the cost of equity, if the project will be financed with equity.

- b. The after-tax cost of debt that should be used as the component cost when calculating the WACC is the average after-tax cost of all of the firm's outstanding debt.
- c. The cost of equity is generally harder to measure than the cost of debt because there is no stated, contractual cost number on which to base the cost of equity.
- d. The bond-yield-plus-risk-premium approach is the most sophisticated and objective method for estimating a firm's cost of equity capital.

ANS: C                      PTS: 1                      DIF: HARD  
 REF: 263–271 | 273–274 | 275–276                      OBJ: (Comp: 9.1–9.5, 9.7, 9.10) Cost of capital  
 BLM: Understand

27. Which of the following statements is correct?
- a. Surveys indicate that the CAPM is the most widely used method for estimating the cost of equity. However, other methods are also used because CAPM estimates may be subject to error, and people like to use different methods as checks on one another. If all of the methods produce similar results, then decision makers can have more confidence in the estimated cost of equity.
  - b. The DCF model is generally preferred by academics and financial executives over other models for estimating the cost of equity. This is because of the DCF model's logical appeal and also because accurate estimates for its key inputs, the dividend yield and the growth rate, are easy to obtain.
  - c. The bond-yield-plus-risk-premium approach to estimating the cost of equity may not always be accurate, but it has the advantage that its two key inputs, the firm's own cost of debt and its risk premium, can be found by using standardized and objective procedures.
  - d. Although some methods used to estimate the cost of equity are subject to severe limitations, the CAPM is a simple, straightforward, and reliable model that consistently produces accurate cost of equity estimates. In particular, academics and corporate finance people generally agree that its key inputs—beta, the risk-free rate, and the market risk premium—can be estimated with little error.

ANS: A                      PTS: 1                      DIF: HARD                      REF: 267–274  
 OBJ: (Comp: 9.5–9.8) Cost of equity                      BLM: Evaluate

28. Which of the following statements is correct?
- a. The discounted cash flow method of estimating the cost of equity cannot be used unless the growth rate,  $g$ , is expected to be constant forever.
  - b. If the calculated beta underestimates the firm's true investment risk, i.e., if the forward-looking beta that investors think exists exceeds the historical beta, then the CAPM method based on the historical beta will produce an estimate of  $r_s$  and thus a WACC that is too high.
  - c. Beta measures market risk, which is the most relevant risk measure for a publicly owned firm that seeks to maximize its intrinsic value. This is true even if not all of the firm's stockholders are well diversified.
  - d. The specific risk premium used in the CAPM is the same as the risk premium used in the bond-yield-plus-risk-premium approach.

ANS: C                      PTS: 1                      DIF: HARD                      REF: 267–273  
 OBJ: (Comp: 9.5, 9.6) CAPM and DCF                      BLM: Evaluate

29. Which of the following statements is correct?
- a. The bond-yield-plus-risk-premium approach to estimating the cost of common equity involves adding a risk premium to the interest rate on the company's own long-term bonds. The size of the risk premium for bonds with different ratings is published daily in *The Wall Street Journal*.
  - b. The WACC is calculated using a before-tax cost for debt equal to the interest rate that

must be paid on new debt, along with the after-tax costs for common stock and for preferred stock if it is used.

- c. An increase in the risk-free rate is likely to reduce the marginal costs of both debt and equity.
- d. The WACC can change depending on the amount of funds a firm raises during a given year. Moreover, the WACC at each level of funds raised is a weighted average of the marginal costs of each capital component, with the weights based on the firm's target capital structure.

ANS: D

(d) is correct—the WACC will increase if the firm raises more funds than can be supported by retained earnings.

PTS: 1                      DIF: HARD                      REF: 267–271 | 273–276

OBJ: (Comp: 9.5, 9.7, 9.10) WACC                      BLM: Evaluate

30. Which of the following statements is correct?
- a. An increase in the flotation cost required to sell a new issue of stock will increase the cost of retained earnings.
  - b. An increase in a firm's tax rate will increase the component cost of debt, provided the YTM on the firm's bonds is not affected.
  - c. When the WACC is calculated, it should reflect the cost of new common stock, retained earnings, preferred stock, long-term debt, short-term bank loans if the firm normally finances with bank debt, and accounts payable if the firm normally has accounts payable on its balance sheet.
  - d. If a firm has been suffering accounting losses that are expected to continue into the foreseeable future, and therefore its tax rate is zero, then it is possible for the after-tax cost of preferred stock to be less than the after-tax cost of debt.

ANS: D

(d) is true. The firm would get no tax savings on interest, so its cost of debt would not be reduced by the tax factor.

PTS: 1                      DIF: HARD                      REF: 264–266 | 274–276

OBJ: (Comp: 9.2–9.3, 9.9–9.10) WACC                      BLM: Evaluate

31. Suppose a firm is a publicly owned corporation and is seeking to maximize shareholder wealth. Which of the following statements is correct?
- a. If a firm has a beta that is less than 1.0, say 0.9, this would suggest that the expected returns on its assets are negatively correlated with the returns on most other firms' assets.
  - b. If a firm's managers want to maximize the value of the stock, they should, in theory, concentrate on project risk as measured by the standard deviation of the project's expected future cash flows.
  - c. If a firm evaluates all projects using the same cost of capital, and the CAPM is used to help determine that cost, then its risk as measured by beta will probably decline over time.
  - d. Project A has a standard deviation of expected returns of 20%, while Project B's standard deviation is only 10%. A's returns are negatively correlated with both the firm's other assets and the returns on most stocks in the economy, while B's returns are positively correlated. Therefore, Project A is less risky to a firm and should be evaluated with a lower cost of capital.

ANS: D

The fact that A's returns are negatively correlated means that it serves as a sort of insurance policy to the firm. The fact that its SD is high is actually good, because the negative correlation will cause the project's beta—versus the market and in relation to the firm's other assets—to be relatively low, denoting a low risk and thus justifying a relatively low cost of capital. This answer is theoretically always true, and it is especially true if the firm is large, has many projects, and Project A is not a “bet the company” project.

PTS: 1                    DIF: HARD                    REF: 267–271 | 278–280  
 OBJ: (Comp: 9.5, 9.12) Beta and project risk                    BLM: Analyze

32. Hettenhouse Company's perpetual preferred stock sells for \$102.50 per share, and it pays a \$9.50 annual dividend. If the company were to sell a new preferred issue, it would incur a flotation cost of 4.00% of the price paid by investors. What is the company's cost of preferred stock for use in calculating the WACC?
- 9.27%
  - 9.65%
  - 10.04%
  - 10.44%

ANS: B

Preferred stock price	\$102.50
Preferred dividend	\$9.50
Flotation cost	4.00%
$r_p = D_p / (P_p(1 - F))$	9.65%

PTS: 1                    DIF: EASY                    REF: 266  
 OBJ: (9.3) Component cost of preferred stock                    BLM: Remember

33. A company's perpetual preferred stock currently trades at \$87.50 per share, and it pays an \$8.00 annual dividend. If the company were to sell a new preferred issue, it would incur a flotation cost of 5.00% of the issue price. What is the firm's cost of preferred stock?
- 8.25%
  - 8.69%
  - 9.14%
  - 9.62%

ANS: D

Preferred stock price	\$87.50
Preferred dividend	\$8.00
Flotation cost	5.00%
$r_p = D_p / (P_p(1 - F))$	9.62%

PTS: 1                    DIF: EASY                    REF: 266  
 OBJ: (9.3) Component cost of preferred stock                    BLM: Remember

34. You have the following data:  $r_{RF} = 4.00%$ ;  $RP_M = 5.00%$ ; and  $b = 1.15$ . What is the cost of equity from retained earnings based on the CAPM approach?
- 9.75%
  - 10.04%
  - 10.34%
  - 10.65%

ANS: A

$r_{RF}$	4.00%
$RP_M$	5.00%



b	1.15
$r_s = r_{RF} + (RP_M \times b)$	9.75%

PTS: 1                    DIF: EASY                    REF: 271  
 OBJ: (9.5) Component cost of retained earnings: CAPM                    BLM: Remember

35. Scanlon Inc.'s CFO hired you as a consultant to help her estimate the cost of capital. You have been provided with the following data:  $r_{RF} = 5.00\%$ ;  $RP_M = 6.00\%$ ; and  $b = 0.90$ . Based on the CAPM approach, what is the cost of equity from retained earnings?
- 9.49%
  - 9.79%
  - 10.09%
  - 10.40%

ANS: D

$r_{RF}$	5.00%
$RP_M$	6.00%
b	0.90
$r_s = r_{RF} + (RP_M \times b)$	10.40%

PTS: 1                    DIF: EASY                    REF: 271  
 OBJ: (9.5) Component cost of retained earnings: CAPM                    BLM: Remember

36. You have the following data:  $D_1 = \$1.30$ ;  $P_0 = \$42.50$ ; and  $g = 7.00\%$  (constant). What is the cost of equity from retained earnings based on the DCF approach?
- 9.08%
  - 9.56%
  - 10.06%
  - 10.56%

ANS: C

$D_1$	\$1.30
$P_0$	\$42.50
g	7.00%
$r_s = D_1/P_0 + g$	10.06%

PTS: 1                    DIF: EASY                    REF: 271–273  
 OBJ: (9.6) Component cost of retained earnings: DCF, D1                    BLM: Understand

37. You have the following data:  $D_1 = \$0.80$ ;  $P_0 = \$22.50$ ; and  $g = 5.00\%$  (constant). Based on the DCF approach, what is the cost of equity from retained earnings?
- 7.34%
  - 7.72%
  - 8.13%
  - 8.56%

ANS: D

$D_1$	\$0.80
$P_0$	\$22.50
g	5.00%
$r_s = D_1/P_0 + g$	8.56%

PTS: 1                    DIF: EASY                    REF: 271–273  
 OBJ: (9.6) Component cost of retained earnings: DCF, D1                    BLM: Understand

38. P. Lange Inc. hired your consulting firm to help the company estimate the cost of equity. The yield on Lange's bonds is 7.25%, and your firm's economists believe that the cost of equity can be estimated using a risk premium of 3.50% over a firm's own cost of debt. What is an estimate of Lange's cost of equity from retained earnings?
- 10.75%
  - 11.18%
  - 11.63%
  - 12.09%

ANS: A

Bond yield	7.25%
Risk premium	3.50%
$r_e = r_d + \text{Risk Premium}$	10.75%

PTS: 1                      DIF: EASY                      REF: 273–274

OBJ: (9.7) rs: Bond-yield-plus-risk premium                      BLM: Understand

39. You were hired as a consultant to Kroncke Company, whose target capital structure is 40% debt, 10% preferred, and 50% common equity. The after-tax cost of debt is 6.00%, the cost of preferred is 7.50%, and the cost of retained earnings is 13.25%. The firm will not be issuing any new stock. What is its WACC?
- 9.48%
  - 9.78%
  - 10.07%
  - 10.37%

ANS: B

<u>Weights</u>	<u>Costs</u>	
Debt	40%	6.00%
Preferred	10%	7.50%
Common	50%	13.25%
$WACC = w_d \times r_d(1 - T) + w_p \times r_p + w_c \times r_s$		9.78%

PTS: 1                      DIF: EASY                      REF: 275–276                      OBJ: (9.10) WACC

BLM: Understand

40. To help finance a major expansion, Delano Development Company sold a noncallable bond several years ago that now has 15 years to maturity. This bond has a 10.25% annual coupon, paid semiannually, it sells at a price of \$1,025, and it has a par value of \$1,000. If Delano's tax rate is 40%, what component cost of debt should be used in the WACC calculation?
- 5.11%
  - 5.37%
  - 5.66%
  - 5.96%

ANS: D

Coupon rate	10.25%
Periods/year	2
Maturity (yr)	15
Bond price	\$1,025.00
Par value	\$1,000
Tax rate	40%

Calculator inputs:

$N = 2 \times 15$

30

PV = Bond's price	-\$1,025.00
PMT = coupon rate/2	\$51.25
FV = Par = Maturity value	\$1,000
I/YR	4.96%
times periods/yr = before-tax cost of debt	9.93%
= After-tax cost of debt $(A - T r_d)$ for use in WACC	5.96%

PTS: 1                    DIF: MEDIUM        REF: 264–266  
 OBJ: (9.2) Component cost of debt        BLM: Analyze

41. Several years ago the Pettijohn Company sold a \$1,000 par value, noncallable bond that now has 15 years to maturity and a 7.00% annual coupon that is paid semiannually. The bond currently sells for \$925, and the company's tax rate is 40%. What is the component cost of debt for use in the WACC calculation?
- 4.35%
  - 4.53%
  - 4.72%
  - 4.90%

ANS: C

Coupon rate	7.00%
Periods/year	2
Maturity (yr)	15
Bond price	\$925.00
Par value	\$1,000
Tax rate	40%

Calculator inputs:

$N = 2 \times 15$	30
PV = Bond's price	-\$925.00
PMT = coupon rate/2	\$35
FV = Par = Maturity value	\$1,000
I/YR	3.93%
times periods/yr = before-tax cost of debt	7.86%
= After-tax cost of debt $(A - T r_d)$ for use in WACC	4.72%

PTS: 1                    DIF: MEDIUM        REF: 267–271  
 OBJ: (9.5) Component cost of retained earnings: CAPM        BLM: Analyze

42. Assume that Considine Inc. hired you as a consultant to help estimate its cost of capital. You have been provided with the following data:  $D_0 = \$0.90$ ;  $P_0 = \$22.50$ ; and  $g = 7.00\%$  (constant). Based on the DCF approach, what is Considine's cost of equity from retained earnings?
- 9.98%
  - 10.40%
  - 10.83%
  - 11.28%

ANS: D

$D_0$	\$0.90
$P_0$	\$22.50
$g$	7.00%
$D_1 = D_0 \times (1 + g)$	\$0.96 Intermediate step
$r_s = D_1/P_0 + g$	11.28%

PTS: 1                    DIF: MEDIUM      REF: 273  
OBJ: (9.6) Component cost of retained earnings: DCF, D0                    BLM: Analyze

43. Chambliss Inc. hired you as a consultant to help estimate its cost of capital. You have been provided with the following data:  $D_0 = \$0.90$ ;  $P_0 = \$27.50$ ; and  $g = 8.00\%$  (constant). Based on the DCF approach, what is the cost of equity from retained earnings?
- 10.41%
  - 10.96%
  - 11.53%
  - 12.11%

ANS: C

$D_0$	\$0.90
$P_0$	\$27.50
$g$	8.00%
$D_1 = D_0 \times (1 + g)$	\$0.97 Intermediate step
$r_s = D_1/P_0 + g$	11.53%

PTS: 1                    DIF: MEDIUM      REF: 273  
OBJ: (9.6) Component cost of retained earnings: DCF, D0                    BLM: Analyze

44. Kovach Lumber Company hired you to help estimate its cost of capital. You were provided with the following data:  $D_1 = \$1.10$ ;  $P_0 = \$27.50$ ;  $g = 6.00\%$  (constant); and  $F = 5.00\%$ . What is the cost of equity raised by selling new common stock?
- 9.41%
  - 9.80%
  - 10.21%
  - 10.62%

ANS: C

$D_1$	\$1.10
$P_0$	\$27.50
$g$	6.00%
$F$	5.00%
$r_e = D_1/(P_0 \times (1 - F)) + g$	10.21%

PTS: 1                    DIF: MEDIUM      REF: 274–275                    OBJ: (9.9) re based on DCF, D1  
BLM: Analyze

45. You were recently hired by Nast Media Inc. to estimate its cost of capital. You were provided with the following data:  $D_1 = \$2.00$ ;  $P_0 = \$55.00$ ;  $g = 8.00\%$  (constant); and  $F = 5.00\%$ . What is the cost of equity raised by selling new common stock?
- 11.24%
  - 11.83%
  - 12.42%
  - 13.04%

ANS: B

$D_1$	\$2.00
$P_0$	\$55.00
$g$	8.00%
$F$	5.00%
$r_e = D_1/(P_0 \times (1 - F)) + g$	11.83%

PTS: 1                    DIF: MEDIUM      REF: 274–275            OBJ: (9.9) re based on DCF, D1  
 BLM: Analyze

46. LePage Co. expects to earn \$2.50 per share during the current year, its expected payout ratio is 55%, its expected constant dividend growth rate is 6.0%, and its common stock currently sells for \$22.50 per share. New stock can be sold to the public at the current price, but a flotation cost of 5% would be incurred. What would be the cost of equity from new common stock?
- 11.81%
  - 12.43%
  - 13.05%
  - 14.39%

ANS: B

Expected EPS <sub>1</sub>	\$2.50	
Payout ratio	55%	
Expected dividend, D <sub>1</sub> = EPS × Payout	\$1.38	Intermediate step
Current stock price	\$22.50	
g	6.00%	
F	5.00%	
$r_e = D_1 / (P_0 \times (1 - F)) + g$	12.43%	

PTS: 1                    DIF: MEDIUM      REF: 274–275  
 OBJ: (9.9) Cost of new common stock: DCF and payout ratio      BLM: Analyze

47. Schadler Systems is expected to pay a \$3.50 dividend at year end (D<sub>1</sub> = \$3.50), the dividend is expected to grow at a constant rate of 6.50% a year, and the common stock currently sells for \$62.50 a share. The before-tax cost of debt is 7.50%, and the tax rate is 40%. The target capital structure consists of 40% debt and 60% common equity. What is the company's WACC if all equity is from retained earnings?
- 8.35%
  - 8.70%
  - 9.06%
  - 9.42%

ANS: C

D <sub>1</sub>	\$3.50
P <sub>0</sub>	\$62.50
g	6.50%
r <sub>d</sub>	7.50%
Tax rate	40%
Weight debt	40%
Weight equity	60%
r <sub>d</sub> (1 - T)	4.50%
r <sub>s</sub> = D <sub>1</sub> /P <sub>0</sub> + g	12.1%
WACC = w <sub>d</sub> (r <sub>d</sub> )(1 - T) + w <sub>c</sub> (r <sub>s</sub> ) =	9.06%

PTS: 1                    DIF: MEDIUM      REF: 275–276            OBJ: (9.10) WACC  
 BLM: Analyze

48. You were hired as a consultant to Quigley Company, whose target capital structure is 40% debt, 10% preferred, and 50% common equity. The interest rate on new debt is 6.50%, the yield on the preferred is 6.00%, the cost of retained earnings is 12.25%, and the tax rate is 40%. The firm will not be issuing any new stock. What is Quigley's WACC?
- 8.29%

- b. 8.62%
- c. 9.32%
- d. 9.69%

ANS: A

Tax rate	40%		
	<u>Weights</u>	<u><math>r_d</math></u>	<u>AT Costs</u>
Debt	40%	6.50%	3.90%
Preferred	10%		6.00%
Common	50%		12.25%
WACC			8.29%

PTS: 1                    DIF: MEDIUM            REF: 275–276

OBJ: (9.10) WACC based on target capital structure

BLM: Analyze

49. Grunewald Co.'s common stock currently sells for \$60.00 per share, the company expects to earn \$3.00 per share during the current year, its expected payout ratio is 40%, and its expected constant growth rate is 7.00%. New stock can be sold to the public at the current price, but a flotation cost of 9% would be incurred. By how much would the cost of new stock exceed the cost of retained earnings?
- a. 0.05%
  - b. 0.10%
  - c. 0.20%
  - d. 0.30%

ANS: C

Expected $EPS_1$	\$3.00
Payout ratio	40%
Current stock price	\$60.00
$g$	7.00%
$F$	9.00%
$D_1$	\$1.20
$r_s = D_1/P_0 + g$	9.00%
$r_e = D_1/(P_0 \times (1 - F)) + g$	9.20%
Difference = $r_e - r_s$	0.20%

PTS: 1                    DIF: HARD                    REF: 274–275            OBJ: (9.9)  $r_s$  versus  $r_e$

BLM: Analyze

50. Bruner Breakfast Foods' (BBF) balance sheet shows a total of \$20 million long-term debt with a coupon rate of 8.00%. The yield to maturity on this debt is 10.00%, and the debt has a total current market value of \$18 million. The balance sheet also shows that the company has 10 million shares of stock, and total of common equity (common stock plus retained earnings) is \$30 million. The current stock price is \$4.50 per share, and stockholders' required rate of return,  $r_s$ , is 12.25%. The company recently decided that its target capital structure should have 50% debt, with the balance being common equity. The tax rate is 40%. Calculate WACCs based on target, book, and market value capital structures, and then find the sum of these three WACCs.
- a. 27.04%
  - b. 28.17%
  - c. 29.34%
  - d. 30.51%

ANS: C

The WACC should be based on the target weights, which differ from both book and market weights. The book and market WACCs are shown for comparison.

$w_d$	50.00%			<u>% Cap. Structure</u>
$w_{ce}$	50.00%	Book debt	\$20	40.00%
YTM = $r_d$	10.00%	Book equity	\$30	60.00%
$r_s$	12.25%	Total book value	\$50	100.00%
Tax rate	40%	Market debt	\$18	28.57%
Shares	10	Market equity	\$45	71.43%
Price	\$4.50	Total market value	\$63	100.00%

		<u>Target</u>	<u>Book</u>	<u>Market</u>
$w_d$		50.00%	40.00%	28.57%
$w_c$		50.00%	60.00%	71.43%
WACC = $w_d(r_d)(1 - T) + w_c(r_s) =$		9.13%	9.75%	10.46%
Sum of the three WACCs:		29.34%		

PTS: 1                      DIF: HARD                      REF: 275–276  
 OBJ: (9.10) WACC based on target, book, and mkt cap. struc.      BLM: Analyze

51. Malitz Inc. recently hired you as a consultant to estimate the company's WACC. You have obtained the following information.
- Malitz's noncallable bonds mature in 25 years, have an 8.00% annual coupon, a par value of \$1,000, and a market price of \$1,075.00.
  - The company's tax rate is 40%.
  - The risk-free rate is 4.50%, the market risk premium is 5.50%, and the stock's beta is 1.20.
  - The target capital structure consists of 35% debt and the balance as common equity. Malitz uses the CAPM to estimate the cost of equity, and it does not expect to issue any new common stock. What is its WACC?
- a. 7.51%
  - b. 7.90%
  - c. 8.32%
  - d. 8.76%

ANS: D

Coupon rate	8.00%
Maturity	25
Bond price	\$1,075.00
Par value	\$1,000
Tax rate	40%
$r_{RF}$	4.50%
$RP_M$	5.50%
b	1.20
Weight debt	35%
Weight equity	65%
Bond yield	7.34%
A – T cost of debt	4.40%
Cost of equity, $r_s = r_{RF} + b(RP_M)$	11.10%
WACC = $w_d(r_d)(1 - T) + w_c(r_s) =$	8.76%

PTS: 1                      DIF: HARD                      REF: 275–276  
 OBJ: (9.10) WACC, equity from retained earnings, must find YTM  
 BLM: Analyze

52. Assume that you are on the financial staff of Michelson Inc., and you have collected the following data:
- The yield on the company’s outstanding bonds is 8.00%, and its tax rate is 40%.
  - The next expected dividend is \$0.65 a share, and the dividend is expected to grow at a constant rate of 6.00% a year.
  - The price of Michelson’s stock is \$17.50 per share, and the flotation cost for selling new shares is  $F = 10\%$ .
  - The target capital structure is 45% debt and the balance is common equity. What is Michelson’s WACC, assuming it must issue new stock to finance its capital budget?
- a. 6.63%
  - b. 6.98%
  - c. 7.34%
  - d. 7.73%

ANS: D

YTM	8.00%
Tax rate	40%
$D_1$	\$0.65
$g$	6.00%
$P_0$	\$17.50
$F$	10.0%
Weight debt	45%
Weight equity	55%

A – T cost of debt	4.80%
$r_e = D_1 / (P_0 \times (1 - F)) + g$	10.13%
$WACC = w_d(r_d)(1 - T) + w_c(r_s) =$	7.73%

PTS: 1                      DIF: HARD                      REF: 275–276

OBJ: (9.10) WACC, equity from retained earnings, uses DCF      BLM: Analyze

53. Durst Enterprises, which is debt-free and finances only with equity from retained earnings, is considering five large capital budgeting projects. Its CFO hired you to assist in deciding whether none, one, two, three, four, or five projects should be accepted. You have the following information:
- $r_{RF} = 4.00\%$ ;  $RP_M = 5.50\%$ ; and  $b = 1.00$ .
  - The company adds 5%, 3%, 1%, 0%, or –1% to the corporate WACC when it evaluates projects that differ in risk.
  - Project A is in the –1% category, B is in the 0% group, C is in the +1% group, D is in the +3% group, and E is in the most risky +5% group.
  - Each project has a cost of \$25,000.
  - The projects’ expected returns are as follows: A = 8.7%, B = 9.60%, C = 10.30%, D = 13.80%, and E = 14.70%. If these are the only projects under consideration, how large should Durst’s capital budget be?
- a. \$100,000
  - b. \$75,000
  - c. \$50,000
  - d. \$25,000

ANS: A

$r_{RF}$	4.00%		
$RP_M$	5.50%		
$b$	1.00		
Cost of equity, $r_s = r_{RF} + b(RP_M)$	9.50%		
	Capital	Expected	Amount



	<u>Costs</u>	<u>Returns</u>	<u>Invested</u>
A Required return = $r_s - 1\%$	8.50%	8.70%	\$25,000
B Required return = $r_s$	9.50%	9.60%	\$25,000
C Required return = $r_s + 1\%$	10.50%	10.30%	\$0
D Required return = $r_s + 3\%$	12.50%	13.80%	\$25,000
	Total capital budget:		\$100,000

PTS: 1 DIF: HARD REF: 278–280

OBJ: (9.12) Project risk—nonalgorithmic

BLM: Analyze

54. Mihov Inc. hired you as a consultant to help estimate its cost of capital. You have been provided with the following data. (1)  $r_d$  = yield on the firm's bonds = 7.00%, and the risk premium over its own debt cost = 4.00%. (2)  $r_{RF}$  = 5.00%,  $RP_M$  = 6.00%, and  $b$  = 1.25. (3)  $D_1$  = \$1.20;  $P_0$  = \$35.00 and  $g$  = 8.00% (constant). You were asked to estimate the cost of equity based on the three most commonly used methods and then to indicate the difference between the highest and lowest of these estimates. What is that difference?
- 1.13%
  - 1.50%
  - 1.88%
  - 2.34%

ANS: B

Bond yield	7.00%
Risk premium	4.00%
$r_e$	11.00%

$r_{RF}$	5.00%
$RP_M$	6.00%
$b$	1.25
$r_s$	12.50%

$D_1$	\$1.20
$P_0$	\$35.00
$g$	8.00%
$r_e$	11.43%

Max	12.50%
Min	11.00%
Difference	1.50%

PTS: 1 DIF: HARD REF: 267–274

OBJ: (Comp: 9.5–9.8) Risk premium, CAPM, and DCF

BLM: Analyze

You are employed by CGT, a Fortune 500 firm that is a major producer of chemicals and plastics, including plastic grocery bags, Styrofoam cups, and fertilizers. You are on the corporate staff as an assistant to the CFO. This is a position with high visibility and the opportunity for rapid advancement, providing you make the right decisions. Your boss has asked you to estimate the WACC for the company. The balance sheet and some other information about CGT follow below.

Assets	
Current assets	\$ 38,000,000
Net plant, property, and equipment	<u>101,000,000</u>
Total assets	<u>\$139,000,000</u>

Liabilities and equity	
Accounts payable	\$ 10,000,000
Accruals	<u>9,000,000</u>
Current liabilities	\$ 19,000,000
Long-term debt (40,000 bonds, \$1,000 par value)	<u>40,000,000</u>
Total liabilities	59,000,000
Common stock (10,000,000 shares)	30,000,000
Retained earnings	<u>50,000,000</u>
Total shareholders' equity	80,000,000
Total liabilities and shareholders' equity	<u>\$139,000,000</u>

You check *The Wall Street Journal* and see that CGT stock is currently selling for \$7.50 per share and that CGT bonds are selling for \$875.00 per bond. The bonds have a \$1,000 par value, a 7.25% annual coupon rate, semiannual payments, a 20-year maturity, and are not callable. CGT's beta is 1.25, the yield on a 6-month Treasury bill is 3.50%, and the yield on a 20-year Treasury bond is 5.50%. The expected return on the stock market is 11.50%, but the market has had an average annual return of 14.50% during the past 5 years. CGT is in the 40% tax bracket.

55. What is the best estimate of the after-tax cost of debt for CGT?
- 4.64%
  - 4.88%
  - 5.14%
  - 5.40%

ANS: C

Coupon rate	7.25%
Periods/year	2
Maturity (yr)	20
Bond price	\$875
Par value	\$1,000
Tax rate	40%

Calculator inputs:

N	40
PV	-\$875.00
PMT = (coupon rate × Par)/2	\$36.25
FV = Par	\$1,000
Yield = I/YR (solved for)	4.28% times 2 = 8.57% = $r_d$ = Before-tax cost of debt

After-tax cost of debt for use in WACC =  $r_d(1 - T) = 5.14\%$

PTS: 1      DIF: MEDIUM      REF: 264–266      OBJ: (9.2) After-tax cost of debt  
BLM: Understand

56. Using the CAPM approach, what is the best estimate of the cost of equity for CGT?
- 13.00%
  - 13.52%
  - 14.06%
  - 14.62%

ANS: A

$r_{RF}$	5.50%
Expected $r_M$	11.50%
b	1.25
$RP_M = \text{Expected return on Market} - r_{RF} =$	6.00%

$$r_s = r_{RF} + r_{RF}(RP_M \times b) \qquad 13.00\%$$

PTS: 1                      DIF: MEDIUM      REF: 267–271      OBJ: (9.5) CAPM cost of equity  
 BLM: Understand

57. Which of the following is the best estimate for the weights to be used when calculating the WACC?

- a.  $w_c = 68.2\%$        $w_d = 31.8\%$
- b.  $w_c = 69.9\%$        $w_d = 30.1\%$
- c.  $w_c = 71.6\%$        $w_d = 28.4\%$
- d.  $w_c = 73.4\%$        $w_d = 26.6\%$

ANS: A

Bond price	\$875.00
Number of bonds	40,000
Market value of debt	\$35,000,000
$P_0$	\$7.50
Shares outstanding	10,000,000
Market value of equity	\$75,000,000
$w_d$	31.8%
$w_c$	68.2%

PTS: 1                      DIF: MEDIUM      REF: 263 | 275–276  
 OBJ: (Comp: 9.1, 9.10) Weights for WACC                      BLM: Analyze

58. What is the best estimate of the WACC for CGT?

- a. 9.88%
- b. 10.18%
- c. 10.50%
- d. 11.14%

ANS: C

$w_d$	31.8%
$r_d(1 - T)$	5.14%
$w_c$	68.2%
$r_s$	13.00%
$WACC = w_d(r_d)(1 - T) + w_c(r_s) =$	10.50%

PTS: 1                      DIF: MEDIUM      REF: 275–276      OBJ: (9.10) WACC  
 BLM: Analyze

## CHAPTER 10—THE BASICS OF CAPITAL BUDGETING: EVALUATING CASH FLOWS

### TRUE/FALSE

1. A firm should never undertake an investment if accepting the project would lead to an increase in the firm's cost of capital.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 292–293  
OBJ: (10.1) Capital budget

2. Because “present value” refers to the value of cash flows that occur at different points in time, a series of present values should not be summed to determine the value of a capital budgeting project.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 294–296  
OBJ: (10.2) PV of cash flows

3. Assuming that their NPVs based on the firm's cost of capital are equal, the NPV of a project whose cash flows accrue relatively rapidly will be more sensitive to changes in the discount rate than the NPV of a project whose cash flows come in later in its life.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 295  
OBJ: (10.2) NPV

4. The IRR is that discount rate that equates the present value of the cash outflows (or costs) with the present value of the cash inflows.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 296–297  
OBJ: (10.3) IRR

5. Other things held constant, an *increase* in the cost of capital will result in a *decrease* in a project's IRR.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 296–297  
OBJ: (10.3) IRR

6. If a project's NPV exceeds its IRR, then the project should be accepted.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 298–299  
OBJ: (10.4) NPV and IRR

7. Conflicts between two mutually exclusive projects, where the NPV method chooses one project but the IRR method chooses the other, should generally be resolved in favour of the project with the higher NPV.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 299–300  
OBJ: (10.4) Mutually exclusive projects

8. The NPV method's assumption that cash inflows are reinvested at the cost of capital is more reasonable than the IRR's assumption that cash flows are reinvested at the IRR. This is an important reason that the NPV method is generally preferred over the IRR method.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 300  
OBJ: (10.4) Reinvestment rate assumption

9. Under certain conditions, a project may have more than one IRR. One such condition is when, in addition to the initial investment at time = 0, a negative cash flow (or cost) occurs at the end of the project's life.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 300–301  
OBJ: (10.5) Multiple IRRs

10. The phenomenon called “multiple internal rates of return” arises when two or more mutually exclusive projects that have different lives are being compared.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 300–301  
OBJ: (10.5) Multiple IRRs

11. The MIRR method has wide appeal for professors, but most business executives prefer the NPV method to either the regular IRR or MIRR.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 302–303  
OBJ: (10.6) Modified IRR

12. When evaluating mutually exclusive projects, the MIRR always leads to the same capital budgeting decisions as the NPV method, regardless of the relative lives or sizes of the projects being evaluated.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 302–303  
OBJ: (10.6) Modified IRR

13. One advantage of the payback method for evaluating potential investments is that it provides some information about a project's liquidity and risk.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 304–306  
OBJ: (10.8) Payback

14. In theory, any capital budgeting investment rule should depend solely on forecasted cash flows and the opportunity cost of capital. The rule itself should not be affected by managers' tastes, the choice of accounting method, or the profitability of other independent projects.

ANS: T                    PTS: 1                    DIF: MEDIUM                    REF: 293  
OBJ: (10.1) Ranking methods

15. The level of detail needed to determine capital budget expenditures related to compliance with safety and/or environmental issues varies depending on the size and scope of the project(s).

ANS: T                    PTS: 1                    DIF: EASY                    REF: 292–293  
OBJ: (10.1) Capital budget analysis

16. A decision to undertake significant downsizing to control fixed costs is usually made by senior management, with the decision reported to the firm's board of directors.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 293  
OBJ: (10.1) Capital budget analysis

17. When considering two mutually exclusive projects, the firm should always select that project whose IRR is the highest *provided the projects have the same initial cost*. This statement is true regardless of whether the projects can be repeated or not.

ANS: F

Think about the following equally risky projects. The cost of capital is WACC = 10%.

	0	1	2	3	4	5	6
S	-1,000.00	1,400.00					
L	-1,000.00	378.34	378.34	378.34	378.34	378.34	378.34

IRR<sub>S</sub> = 40.0%      NPV<sub>S</sub> = \$272.73

IRR<sub>L</sub> = 30.0%      NPV<sub>L</sub> = \$647.77

S has the higher IRR, but L has a much higher NPV and is therefore preferable. If the project could be repeated, though, S would turn out to be better—it would have both a higher NPV and IRR.

PTS: 1                      DIF: MEDIUM      REF: 299–300

OBJ: (10.4) Mutually exclusive projects

18. The primary reason that the NPV method is conceptually superior to the IRR method for evaluating mutually exclusive investments is that multiple IRRs may exist.

ANS: F                      PTS: 1                      DIF: MEDIUM      REF: 298–300

OBJ: (10.4) NPV versus IRR

19. The NPV and IRR methods, when used to evaluate *independent and equally risky* projects, will lead to different accept/reject decisions if their IRRs are greater than the cost of capital.

ANS: F                      PTS: 1                      DIF: MEDIUM      REF: 298–300

OBJ: (10.4) NPV versus IRR

20. If the IRR of normal Project X is greater than the IRR of mutually exclusive Project Y (also normal), we can conclude that the firm should select X rather than Y if X has NPV > 0.

ANS: F

We do not know if the cost of capital is to the right or left of the crossover point. Therefore, NPV<sub>X</sub> may be either higher or lower than NPV<sub>Y</sub>.

PTS: 1                      DIF: MEDIUM      REF: 298–300      OBJ: (10.4) IRR and NPV

21. Small businesses make less use of DCF capital budgeting techniques than large businesses. This may reflect a lack of knowledge on the part of small firms' managers, but it may also reflect a rational conclusion that the costs of using DCF analysis outweigh the benefits of these methods for very small firms.

ANS: T                      PTS: 1                      DIF: MEDIUM      REF: 309

OBJ: (10.10) Small business practices

22. Financing pressure or liquidity can explain the popular use of payback period in project appraisals for small firms.

ANS: T                      PTS: 1                      DIF: MEDIUM      REF: 309

OBJ: (10.10) Small business practices

23. Selecting the project that has the highest equivalent annual annuity seems to be the rule for comparing projects with different lives. This rule should apply to both independent and mutually exclusive projects.

ANS: F

Different lives are not a concern for independent projects. Unequal lives become a significant issue only for mutually exclusive projects.

PTS: 1                      DIF: MEDIUM              REF: 310–311

OBJ: (10.11) Equivalent annual annuity

24. If a firm is experiencing no capital rationing, it should accept all investment proposals whose accounting rate of return is equal to or greater than the weighted average cost of capital.

ANS: F

Accept only projects with a benefit/cost ratio greater than one.

PTS: 1                      DIF: MEDIUM              REF: 312–313              OBJ: (10.12) capital rationing

25. A decrease in the firm's discount rate ( $r$ , or WACC) will *increase* projects' NPVs, which could change the accept/reject decision for any potential project. However, such a change would have no impact on the project's IRR; therefore, the accept/reject decision under the IRR method is independent of the cost of capital.

ANS: F                      PTS: 1                      DIF: MEDIUM              REF: 295 | 296–297

OBJ: (Comp: 10.2, 10.3) NPV and IRR

26. Normal Projects Q and R have the same NPV when the discount rate is zero. However, Project Q's cash flows come in faster than those of R. Therefore, we know that at any discount rate greater than zero, R will have a higher NPV than Q.

ANS: F                      PTS: 1                      DIF: MEDIUM              REF: 295 | 298–300

OBJ: (Comp: 10.2, 10.4) NPV

27. Project S has a pattern of high cash flows in its early life, while Project L has a longer life, with large cash flows late in its life. Neither has negative cash flows after Year 0, and at the current cost of capital, the two projects have identical NPVs. Now, suppose interest rates and money costs decline. Other things held constant, this change will cause L to become preferred to S.

ANS: T                      PTS: 1                      DIF: MEDIUM              REF: 295 | 298–300

OBJ: (Comp: 10.2, 10.4) NPV

28. If you were evaluating two mutually exclusive projects for a firm with a zero cost of capital, the payback method and NPV method would always lead to the same decision on which project to undertake.

ANS: F                      PTS: 1                      DIF: MEDIUM              REF: 295 | 304–306

OBJ: (Comp: 10.2, 10.8) Ranking methods

29. The IRR of normal Project X is greater than the IRR of normal Project Y, and both IRRs are greater than zero. Also, the NPV of X is greater than the NPV of Y at the cost of capital. If the two projects are mutually exclusive, Project X should definitely be selected, and the investment made, provided we have confidence in the data. Put another way, it is impossible to draw NPV profiles that would suggest *not accepting* Project X.

ANS: F

Project X may have a negative NPV if  $r > \text{IRR}$ . The NPV profile line crosses the horizontal axis, and the NPV at the cost of capital is in the lower right quadrant.

PTS: 1                      DIF: HARD                      REF: 298                      OBJ: (10.4) NPV profile

30. Theoretically speaking, hard capital rationing does not exist.

ANS: T

If the project return is attractive, firm is so willing to invest and there is always a market for lending. In theory, firms can probably raise the money from the market, at a significant cost.

PTS: 1                      DIF: MEDIUM                      REF: 312–313                      OBJ: (10.12) Hard rationing

### MULTIPLE CHOICE

1. Which of the following statements is correct? Assume that the project being considered has normal cash flows, with one outflow followed by a series of inflows.
- The lower the WACC used to calculate it, the lower the calculated NPV will be.
  - If a project's NPV is less than zero, then its IRR must be less than the WACC.
  - If a project's NPV is greater than zero, then its IRR must be less than zero.
  - The NPV of a relatively low risk project should be found using a relatively high WACC.

ANS: B                      PTS: 1                      DIF: EASY                      REF: 294–296  
OBJ: (10.2) NPV                      BLM: Remember

2. Which statement regarding the IRR method is correct?
- One defect of the IRR method is that it does not take account of cash flows over a project's full life.
  - One defect of the IRR method is that it does not take account of the time value of money.
  - One defect of the IRR method is that it does not take account of the cost of capital.
  - One defect of the IRR method is that it does not assume that the cash flows to be received from a project can be reinvested at a rate other than the IRR itself.

ANS: D

The IRR assumes reinvestment at the IRR, and that is generally not as valid as assuming reinvestment at the WACC, as with the NPV.

PTS: 1                      DIF: EASY                      REF: 296–297                      OBJ: (10.3) IRR  
BLM: Remember

3. Which of the following statements is correct? Assume that the project being considered has normal cash flows, with one outflow followed by a series of inflows.
- A project's regular IRR is found by discounting the cash inflows at the WACC to find the present value (PV), then compounding this PV to find the IRR.
  - If a project's IRR is greater than the WACC, then its NPV must be negative.
  - To find a project's IRR, we must solve for the discount rate that causes the PV of the inflows to equal the PV of the project's costs.



d. To find a project's IRR, we must find a discount rate that is equal to the WACC.

ANS: C                      PTS: 1                      DIF: EASY                      REF: 296–297  
OBJ: (10.3) IRR            BLM: Understand

4. Which of the following statements is correct? Assume that the project being considered has normal cash flows, with one outflow followed by a series of inflows.
- A project's regular IRR is found by compounding the initial cost at the WACC to find the terminal value (TV), then discounting the TV at the WACC.
  - A project's regular IRR is found by compounding the cash inflows at the WACC to find the present value (PV), then discounting to find the IRR.
  - If a project's IRR is smaller than the WACC, then its NPV will be positive.
  - A project's IRR is the discount rate that causes the PV of the inflows to equal the project's cost.

ANS: D                      PTS: 1                      DIF: EASY                      REF: 296–297  
OBJ: (10.3) IRR            BLM: Understand

5. Which statement regarding normal cash flows is correct?
- If a project has "normal" cash flows, then its IRR must be positive.
  - If a project has "normal" cash flows, then its MIRR must be positive.
  - If a project has "normal" cash flows, then it will have exactly two real IRRs.
  - If a project has "normal" cash flows, then it can have only one real IRR, whereas a project with "non-normal" cash flows might have more than one real IRR.

ANS: D                      PTS: 1                      DIF: EASY                      REF: 300–301  
OBJ: (10.5) Normal versus non-normal cash flows            BLM: Remember

6. Which statement regarding normal cash flows is correct?
- Projects with "normal" cash flows can have only one real IRR.
  - Projects with "normal" cash flows can have two or more real IRRs.
  - The "multiple IRR problem" can arise if a project's cash flows are "normal."
  - Projects with "non-normal" cash flows are almost never encountered in the real world.

ANS: A                      PTS: 1                      DIF: EASY                      REF: 300–301  
OBJ: (10.5) Normal versus non-normal cash flows            BLM: Remember

7. Which statement regarding payback is true?
- The regular payback method recognizes all cash flows over a project's life.
  - The discounted payback method recognizes all cash flows over a project's life, and it also adjusts these cash flows to account for the time value of money.
  - The regular payback method was widely used years ago, but virtually no companies even calculate the payback today.
  - The regular payback is useful as an indicator of a project's liquidity because it gives managers an idea of how long it will take to recover the funds invested in a project.

ANS: D

The payback does indicate how long it should take to recover the investment; hence, it is a measure of liquidity.

PTS: 1                      DIF: EASY                      REF: 304–306                      OBJ: (10.8) Payback  
BLM: Remember

8. Which of the following statements is correct? Assume that the project being considered has normal cash flows, with one outflow followed by a series of inflows.

- a. The longer a project's payback period, the more desirable the project is normally considered to be by this criterion.
- b. One drawback of the payback criterion for evaluating projects is that this method does not properly account for the time value of money.
- c. If a project's payback is positive, then the project should be rejected because it must have a negative NPV.
- d. The regular payback ignores cash flows beyond the payback period, but the discounted payback method overcomes this problem.

ANS: B                      PTS: 1                      DIF: EASY                      REF: 304–306  
 OBJ: (10.8) Payback                      BLM: Understand

9. Which statement regarding payback is true?
  - a. The shorter a project's payback period, the less desirable the project is normally considered to be by this criterion.
  - b. One drawback of the payback criterion for evaluating projects is that this method does not take account of cash flows beyond the payback period.
  - c. If a project's payback is positive, then the project should be accepted because it must have a positive NPV.
  - d. The regular payback ignores cash flows beyond the payback period, but the discounted payback method overcomes this problem.

ANS: B                      PTS: 1                      DIF: EASY                      REF: 304–306  
 OBJ: (10.8) Payback                      BLM: Understand

10. Assume a project has normal cash flows. All else being equal, which of the following statements is correct?
  - a. The project's IRR increases as the WACC declines.
  - b. The project's NPV increases as the WACC declines.
  - c. The project's MIRR is unaffected by changes in the WACC.
  - d. The project's regular payback increases as the WACC declines.

ANS: B                      PTS: 1                      DIF: EASY                      REF: 295–297 | 302–305  
 OBJ: (Comp: 10.2, 10.3, 10.6, 10.8) Ranking methods                      BLM: Understand

11. Which of the following statements is correct?
  - a. The IRR is generally regarded by academics as being the best single method for evaluating capital budgeting projects.
  - b. The payback method is generally regarded by academics as being the best single method for evaluating capital budgeting projects.
  - c. The discounted payback method is generally regarded by academics as being the best single method for evaluating capital budgeting projects.
  - d. The NPV is generally regarded by academics as being the best single method for evaluating capital budgeting projects.

ANS: D                      PTS: 1                      DIF: EASY                      REF: 295–297 | 302–305  
 OBJ: (Comp: 10.2, 10.3, 10.6, 10.8) Ranking methods                      BLM: Remember

12. Which statement about an NPV profile graph is true?
  - a. An NPV profile graph shows how a project's payback varies as the cost of capital changes.
  - b. The NPV profile graph for a normal project will generally have a positive (upward) slope as the life of the project increases.
  - c. An NPV profile graph is designed to give decision makers an idea about how a project's risk varies with its life.

- d. An NPV profile graph is designed to give decision makers an idea about how a project's contribution to the firm's value varies with the cost of capital.

ANS: D                      PTS: 1                      DIF: EASY | MEDIUM  
REF: 300–301              OBJ: (10.5) Normal versus non-normal cash flows  
BLM: Remember

13. Which statement about the NPV is true?
- The NPV method was once the favourite of academics and business executives, but today most authorities regard the MIRR as being the best indicator of a project's profitability.
  - The NPV method is regarded by most academics as being the best indicator of a project's profitability; hence, most academics recommend that firms use only this one method.
  - A project's NPV depends on the total amount of cash flows the project produces, but because the cash flows are discounted at the WACC, it does not matter if the cash flows occur early or late in the project's life.
  - The NPV and IRR methods may give different recommendations regarding which of two mutually exclusive projects should be accepted, but they always give the same recommendation regarding the acceptability of a normal, independent project.

ANS: D  
If you draw an NPV profile for one project, you will see that if the WACC is less than the IRR, the NPV will be positive.

PTS: 1                      DIF: MEDIUM              REF: 294–296              OBJ: (10.2) NPV  
BLM: Understand

14. Which of the following statements is correct? Assume that the project being considered has normal cash flows, with one outflow followed by a series of inflows.
- The higher the WACC used to calculate the NPV, the lower the calculated NPV will be.
  - If a project's NPV is greater than zero, then its IRR must be less than the WACC.
  - If a project's NPV is greater than zero, then its IRR must be less than zero.
  - The NPVs of relatively risky projects should be found using relatively low WACCs.

ANS: A                      PTS: 1                      DIF: MEDIUM              REF: 294–296  
OBJ: (10.2) NPV              BLM: Understand

15. Which of the following statements is correct?
- The NPV method assumes that cash flows will be reinvested at the WACC, while the IRR method assumes reinvestment at the IRR.
  - The NPV method assumes that cash flows will be reinvested at the risk-free rate, while the IRR method assumes reinvestment at the IRR.
  - The NPV method assumes that cash flows will be reinvested at the WACC, while the IRR method assumes reinvestment at the risk-free rate.
  - The NPV method does not consider all relevant cash flows, particularly cash flows beyond the payback period.

ANS: A                      PTS: 1                      DIF: MEDIUM              REF: 299–300  
OBJ: (10.4) Ranking conflicts              BLM: Understand

16. Which of the following statements is correct? Assume that the project being considered has normal cash flows, with one outflow followed by a series of inflows.
- If Project A has a higher IRR than Project B, then Project A must have the lower NPV.
  - If Project A has a higher IRR than Project B, then Project A must also have a higher NPV.
  - The IRR calculation implicitly assumes that all cash flows are reinvested at the WACC.
  - If a project has normal cash flows and its IRR exceeds its WACC, then the project's NPV

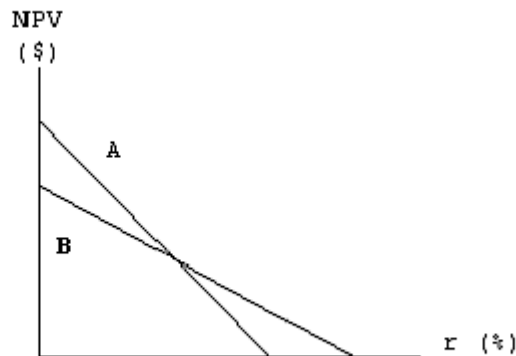
must be positive.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 299–300  
OBJ: (10.4) NPV and IRR                      BLM: Understand

17. With respect to the required level of capital budget analysis, \_\_\_\_\_ would likely require the least level of investigation while \_\_\_\_\_ would likely require the greatest level of analysis.
1. expansion into new products or markets
  2. contract decisions
  3. replacement needs to continue profitable operations
  4. expansion into existing products or markets
- a. 4,1  
b. 3,2  
c. 1,2  
d. 4,2

ANS: B                      PTS: 1                      DIF: EASY                      REF: 292–293  
OBJ: (10.1) Capital budget analysis                      BLM: Understand

18. Projects A and B have identical expected lives and identical initial cash outflows (costs). However, most of one project's cash flows come in the early years, while most of the other project's cash flows occur in the later years. The two NPV profiles are given below:



- Which of the following statements is correct?
- a. More of Project A's cash flows occur in the later years.
  - b. More of Project B's cash flows occur in the later years.
  - c. We must have information on the cost of capital in order to determine which project has the larger early cash flows.
  - d. The NPV profile graph is inconsistent with the statement made in the problem.

ANS: A  
Distant cash flows are more severely penalized by high discount rates, so if the NPV profile line has a steep slope, this indicates that cash flows occur relatively late.

PTS: 1                      DIF: MEDIUM                      REF: 298                      OBJ: (10.4) NPV profiles  
BLM: Understand

19. Projects S and L both have an initial cost of \$10,000, followed by a series of positive cash inflows. Project S's undiscounted net cash flows total \$20,000, while L's total undiscounted flows are \$30,000. At a WACC of 10%, the two projects have identical NPVs. Which project's NPV is more sensitive to changes in the WACC?
- Project S
  - Project L
  - Both projects are equally sensitive to changes in the WACC since their NPVs are equal at all costs of capital.
  - Neither project is sensitive to changes in the discount rate, since both have NPV profiles that are horizontal.

ANS: B

Since Project L's undiscounted CFs are larger, they must occur in the more distant future, and since distant cash flows are impacted more by changes in the discount rate, L's NPV profile must be steeper. One can also see this in an NPV profile graph such as the one in Question 45. The higher y-axis intercept indicates more undiscounted CFs, and for the profiles to cross, the one with the higher intercept must be steeper.

PTS: 1                      DIF: MEDIUM      REF: 298                      OBJ: (10.4) NPV profiles  
BLM: Analyze

20. Projects C and D are mutually exclusive and have normal cash flows. Project C has a higher NPV if the WACC is less than 12%, whereas Project D has a higher NPV if the WACC exceeds 12%. Which of the following statements is correct?
- Project D has a higher IRR.
  - Project D is probably larger in scale than Project C.
  - Project C probably has a faster payback.
  - Project C has a higher IRR.

ANS: A

The NPV profiles cross at 12%. To the left, or at lower discount rates, C has the higher NPV, so its slope is steeper, causing its profile to hit the x-axis sooner. This means that C has the lower IRR; hence, D has the higher one.

PTS: 1                      DIF: MEDIUM      REF: 298                      OBJ: (10.4) NPV profiles  
BLM: Analyze

21. Which statement about multiple IRRs is true?
- For a project to have more than one IRR, both IRRs must be greater than the WACC.
  - If two projects are mutually exclusive, then they are likely to have multiple IRRs.
  - If a project is independent, then it cannot have multiple IRRs.
  - Multiple IRRs can occur only if the signs of the cash flows change more than once.

ANS: D                      PTS: 1                      DIF: MEDIUM      REF: 300–301  
OBJ: (10.5) Multiple IRRs                      BLM: Remember

22. The regular payback method has a number of disadvantages, some of which are listed below. Which of these items is NOT a disadvantage of this method?
- It lacks an objective, market-determined benchmark for making decisions.
  - It ignores cash flows beyond the payback period.
  - It does not directly account for the time value of money.
  - It does not provide any indication regarding a project's liquidity.

ANS: D                      PTS: 1                      DIF: MEDIUM      REF: 304–306  
OBJ: (10.8) Payback                      BLM: Remember

23. Which of the following statements is correct?
- If a project with normal cash flows has an IRR greater than the WACC, the project must have a positive NPV.
  - If Project A's IRR exceeds Project B's, then A must have the higher NPV.
  - A project's MIRR can never exceed its IRR.
  - If a project with normal cash flows has an IRR less than the WACC, the project must have a positive NPV.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 294–300 | 301–303  
OBJ: (Comp: 10.2–10.4, 10.6) NPV, IRR, and MIRR                      BLM: Understand

24. Which of the following statements is correct?
- The MIRR and NPV decision criteria can never conflict.
  - The IRR method can never be subject to the multiple IRR problem, while the MIRR method can be.
  - One reason some people prefer the MIRR to the regular IRR is that the MIRR is based on what is generally a more reasonable assumption about the reinvestment rate than the regular IRR.
  - The higher the WACC, the shorter the discounted payback period.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 294–300 | 301–303  
OBJ: (Comp: 10.2–10.4, 10.6) NPV, IRR, and MIRR                      BLM: Understand

25. Which of the following statements is correct?
- For independent projects, the NPV, IRR, MIRR, and discounted payback (using a payback requirement of three years or less) methods always lead to the same accept/reject decisions for a given project.
  - For mutually exclusive projects with normal cash flows, the NPV and MIRR methods can never conflict, but their results could conflict with the discounted payback and the regular IRR methods.
  - Multiple IRRs can exist, but not multiple MIRRs. This is one reason some people favour the MIRR over the regular IRR.
  - If a firm uses the discounted payback method with a required payback of four years, then it will accept more projects than if it used as its cutoff criterion a regular payback of four years.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 294–306  
OBJ: (Comp: 10.2–10.6, 10.8) NPV, IRR, and MIRR                      BLM: Understand

26. Which of the following statements is correct?
- For a project with normal cash flows, any change in the WACC will change both the NPV and the IRR.
  - To find the MIRR, we first compound cash flows at the regular IRR to find the TV, and then we discount the TV at the WACC to find the PV.
  - The NPV and IRR methods both assume cash flows can be reinvested at the WACC. However, the MIRR method assumes reinvestment at the MIRR itself.
  - If two projects have the same cost, and if their NPV profiles cross in the upper right quadrant, then the project with the *lower* IRR probably has more of its cash flows coming in the later years.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 294–300 | 301–303  
OBJ: (Comp: 10.2–10.4, 10.6) NPV, IRR, and MIRR                      BLM: Understand

27. Which of the following statements is correct?

- a. One advantage of the NPV over the IRR is that NPV takes account of cash flows over a project's full life whereas IRR does not.
- b. One advantage of the NPV over the IRR is that NPV assumes that cash flows will be reinvested at the WACC, whereas IRR assumes that cash flows are reinvested at the IRR. The NPV assumption is generally more likely to be appropriate.
- c. One advantage of the NPV over the MIRR method is that NPV takes account of cash flows over a project's full life whereas MIRR does not.
- d. One advantage of the NPV over the MIRR method is that NPV discounts cash flows whereas the MIRR is based on undiscounted cash flows.

ANS: B

Cash flows from a project can be used to replace funds that would be raised in the market at the WACC, so the WACC is the opportunity cost for reinvested cash flows. Since the NPV assumes reinvestment at the WACC while the IRR assumes reinvestment at the IRR, NPV is generally the better method.

PTS: 1                      DIF: MEDIUM              REF: 294–300 | 301–303

OBJ: (Comp: 10.2–10.4, 10.6) NPV, IRR, and MIRR                      BLM: Understand

28. Which of the following statements is correct?
  - a. The IRR method appeals to some managers because it gives an estimate of the rate of return on projects rather than a dollar amount, which the NPV method provides.
  - b. The discounted payback method eliminates all of the problems associated with the payback method.
  - c. When evaluating independent projects, the NPV and IRR methods often yield conflicting results regarding a project's acceptability.
  - d. To find the MIRR, we discount the TV at the IRR.

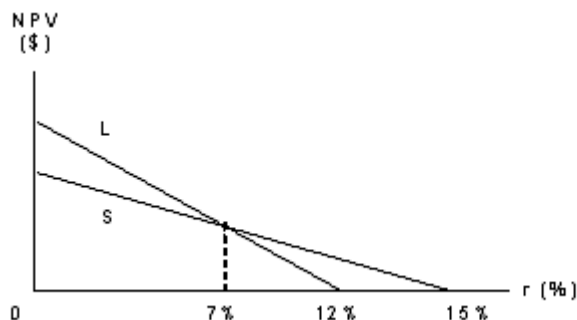
ANS: A                      PTS: 1                      DIF: MEDIUM              REF: 294–300 | 301–309

OBJ: (Comp: 10.2–10.4, 10.6, 10.8, 10.9) Misc. concepts                      BLM: Understand

29. Projects S and L are equally risky, mutually exclusive, and have normal cash flows. Project S has an IRR of 15%, while Project L's IRR is 12%. The two projects have the same NPV when the WACC is 7%. Which of the following statements is correct?
  - a. If the WACC is 10%, both projects will have positive NPVs.
  - b. If the WACC is 6%, Project S will have the higher NPV.
  - c. If the WACC is 13%, Project S will have the lower NPV.
  - d. If the WACC is 10%, both projects will have a negative NPV.

ANS: A

The easiest way to think about this question is to begin by drawing an NPV profile as shown below, then using it to decide which statement is correct.

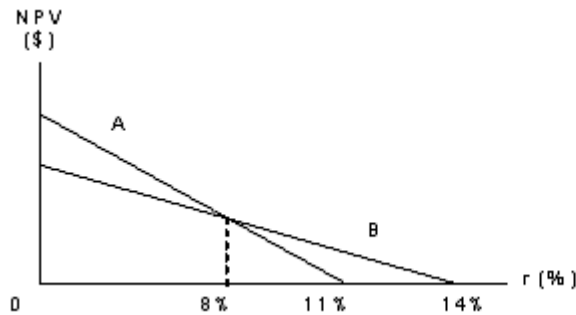


(a) is true, because both projects have an IRR greater than the WACC and thus will have a positive NPV. (b) is false, because at 6%, the WACC is less than the crossover rate and Project L has a higher NPV than S. (c) is false, because at 13% the WACC is greater than the crossover rate and S would have a higher NPV than L. (d) is false, because of reasons mentioned for (a).

PTS: 1                      DIF: MEDIUM | HARD                      REF: 298–300  
 OBJ: (10.4) NPV profiles                      BLM: Analyze

30. Westchester Corp. is considering two equally risky, mutually exclusive projects, both of which have normal cash flows. Project A has an IRR of 11%, while Project B's IRR is 14%. When the WACC is 8%, the projects have the same NPV. Given this information, which of the following statements is correct?
- If the WACC is 13%, Project A's NPV will be higher than Project B's.
  - If the WACC is 9%, Project A's NPV will be higher than Project B's.
  - If the WACC is 6%, Project B's NPV will be higher than Project A's.
  - If the WACC is 9%, Project B's NPV will be higher than Project A's.

ANS: D



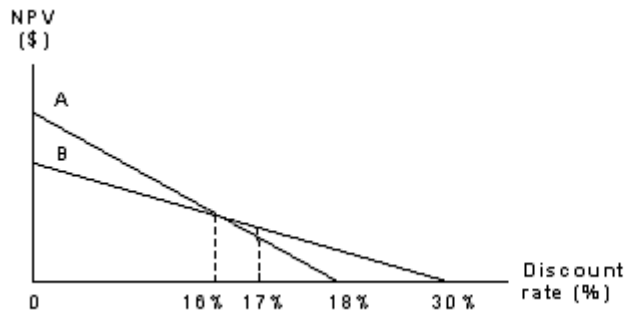
PTS: 1                      DIF: MEDIUM | HARD                      REF: 298–300  
 OBJ: (10.4) NPV profiles                      BLM: Analyze

31. You are considering two mutually exclusive, equally risky, projects. Both have IRRs that exceed the WACC that is used to evaluate them. Which of the following statements is correct? Assume that the projects have normal cash flows, with one outflow followed by a series of inflows.
- If the two projects' NPV profiles do not cross in the upper right quadrant, then there will be a sharp conflict as to which one should be selected.
  - If the cost of capital is greater than the crossover rate, then the IRR and the NPV criteria will not result in a conflict between the projects. One project will rank higher by both criteria.
  - For a conflict to exist between NPV and IRR, the initial investment cost of one project must exceed the cost of the other.
  - For a conflict to exist between NPV and IRR, one project must have an increasing stream of cash flows over time while the other has a decreasing stream. If both sets of cash flows are increasing or decreasing, then it would be impossible for a conflict to exist, even if one project is larger than the other.

ANS: B

Again, it is useful to draw NPV profiles that fit the description given in the question. Any number that meets the criteria will do.





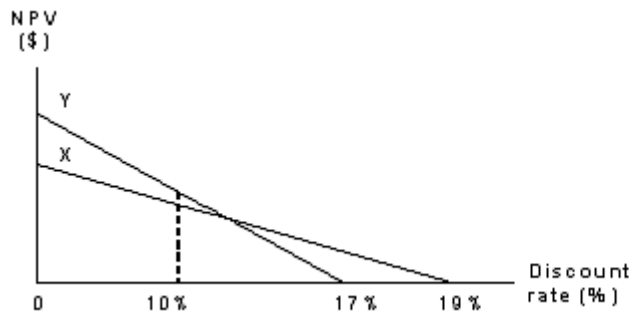
(a) is false, because if the profiles do not cross, then one will dominate the other, with both a higher IRR and a higher NPV at every discount rate. (b) is true. (c) is false because a conflict can result from differences in the timing of the cash flows. (d) is false because scale differences can result in profile crossovers and thus conflicts.

PTS: 1                      DIF: MEDIUM | HARD                      REF: 298–300  
 OBJ: (10.4) NPV profiles                      BLM: Analyze

32. Project X's IRR is 19% and Project Y's IRR is 17%. The projects have the same risk and the same lives, and each has constant cash flows during each year of their lives. If the WACC is 10%, Project Y has a higher NPV than X. Given this information, which of the following statements is correct?
- The crossover rate between the two projects must be less than 10%.
  - The crossover rate between the two projects must be greater than 10%.
  - If the WACC is 8%, Project X will have the higher NPV.
  - If the WACC is 18%, Project Y will have the higher NPV.

ANS: B

Again, it is useful to draw NPV profiles that fit the description given in the question. Any number that meets the criteria will do.

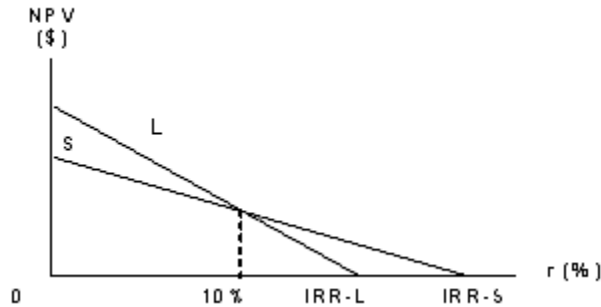


PTS: 1                      DIF: MEDIUM | HARD                      REF: 298–300  
 OBJ: (10.4) NPV profiles                      BLM: Analyze

33. Projects S and L both have normal cash flows, and the projects have the same risk; hence, both are evaluated with the same WACC, 10%. However, S has a higher IRR than L. Which of the following statements is correct?
- Project S must have a higher NPV than Project L.
  - If Project S has a positive NPV, then Project L must also have a positive NPV.
  - If the WACC falls, then each project's IRR will increase.
  - If Projects S and L have the same NPV at the current WACC, 10%, then Project L, the one with the lower IRR, would have a higher NPV if the WACC used to evaluate the projects declined.

ANS: D

Refer to the NPV profile below. (a) is false, because you do not know which project has the higher NPV unless you know the WACC. (b) is false, because if the WACC is greater than  $IRR_L$  but less than  $IRR_S$  then Project S will have a positive NPV and Project L's NPV will be negative. (c) is false, because IRR is independent of WACC. (d) is true, because Project S has the higher IRR, so Project L's NPV profile is above Project S's when the WACC is less than the crossover.



PTS: 1  
BLM: Analyze

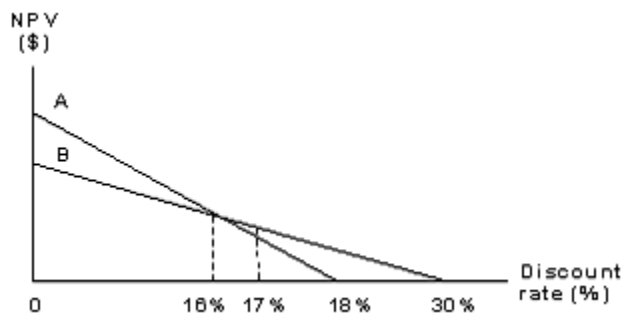
DIF: HARD

REF: 298–300

OBJ: (10.4) NPV profiles

34. Which statement about a project's IRR is correct? Assume that all projects being considered have normal cash flows and are equally risky.
- If a project's IRR is equal to its WACC, then, under all reasonable conditions, the project's NPV must be negative.
  - If a project's IRR is equal to its WACC, then, under all reasonable conditions, the project's IRR must be negative.
  - If a project's IRR is equal to its WACC, then, under all reasonable conditions, the project's NPV must be zero.
  - There is no necessary relationship between a project's IRR, its WACC, and its NPV.

ANS: C



Recall that the very definition of the IRR is the discount rate at which the NPV is zero.

PTS: 1  
BLM: Understand

DIF: HARD

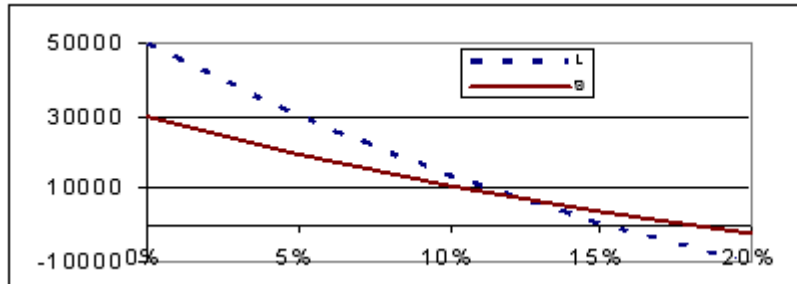
REF: 298–300

OBJ: (10.4) NPV profiles

35. A company is choosing between two projects. The larger project has an initial cost of \$100,000, annual cash flows of \$30,000 for 5 years, and an IRR of 15.24%. The smaller project has an initial cost of \$50,000, annual cash flows of \$16,000 for 5 years, and an IRR of 16.63%. The projects are equally risky. Which of the following statements is correct?
- Since the smaller project has the higher IRR, the two projects' NPV profiles cannot cross,

- and the smaller project's NPV will be higher at all positive values of WACC.
- Since the smaller project has the higher IRR, the two projects' NPV profiles will cross, and the larger project will look better based on the NPV at all positive values of WACC.
  - Since the smaller project has the higher IRR but the larger project has the higher NPV at a zero discount rate, the two projects' NPV profiles will cross, and the larger project will have the higher NPV if the WACC is less than the crossover rate.
  - Since the smaller project has the higher IRR and the larger NPV at a zero discount rate, the two projects' NPV profiles will cross, and the larger smaller project will look better if the WACC is less than the crossover rate.

ANS: C



PTS: 1      DIF: HARD      REF: 298–300      OBJ: (10.4) NPV profiles  
BLM: Analyze

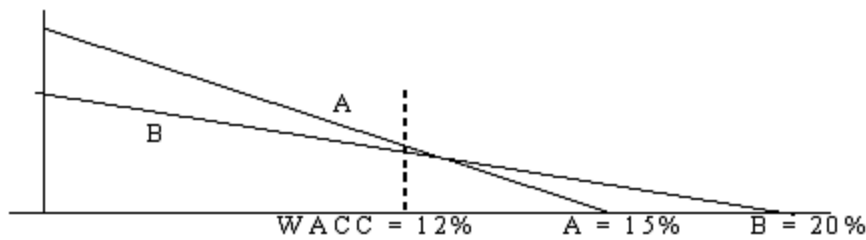
- McCall Manufacturing has a WACC of 10%. The firm is considering two normal, equally risky, mutually exclusive, but not repeatable projects. The two projects have the same investment costs, but Project A has an IRR of 15%, while Project B has an IRR of 20%. Which of the following statements is correct?
  - Each project must have a negative NPV.
  - Since the projects are mutually exclusive, the firm should always select Project B.
  - If the crossover rate is 8%, Project B will have the higher NPV.
  - If the crossover rate is 8%, Project A will have a higher NPV than Project B.

ANS: C      PTS: 1      DIF: HARD      REF: 298–300  
OBJ: (10.4) NPV and mutually exclusive projects      BLM: Analyze

- Projects A and B are mutually exclusive and have normal cash flows. Project A has an IRR of 15% and Project B's IRR is 20%. The company's WACC is 12%, and at that rate Project A has the higher NPV. Which of the following statements is correct?
  - The crossover rate for the two projects must be less than 12%.
  - Assuming the timing pattern of the two projects' cash flows is the same, Project B probably has a higher cost (and larger scale).
  - Assuming the two projects have the same scale, Project B probably has a faster payback than Project A.
  - Since B has the higher IRR, then it must also have the higher NPV if the crossover rate is less than the WACC of 12%.

ANS: C

Consider the following NPV profile graph:



We can see that statements (a) and (d) are incorrect. (b) is also incorrect, because if the projects have the same timing pattern, then A must have the higher cost. That leaves (c) as correct, and that conclusion is confirmed by noting that since A has the steeper slope, its cash flows must come in slower; hence, B has the faster cash flows and thus the faster payback.

PTS: 1                      DIF: HARD                      REF: 299  
 OBJ: (10.4) Choosing among mutually exclusive projects                      BLM: Analyze

38. You are on the staff of Camden Inc. The CFO believes project acceptance should be based on the NPV, but Steve Camden, the president, insists that no project can be accepted unless its IRR exceeds the project's risk-adjusted WACC. Now you must make a recommendation on a project that has a cost of \$15,000 and two cash flows: \$110,000 at the end of Year 1 and -\$100,000 at the end of Year 2. The president and the CFO both agree that the appropriate WACC for this project is 10%. At 10%, the NPV is \$2,355.37, but you find two IRRs, one at 6.33% and one at 5.27%, and a MIRR of 11.32%. Which of the following statements best describes your optimal recommendation, i.e., the analysis and recommendation that is best for the company and least likely to get you in trouble with either the CFO or the president?
- You should recommend that the project be rejected because its NPV is negative and its IRR is less than the WACC.
  - You should recommend that the project be rejected because, although its NPV is positive, it has an IRR that is less than the WACC.
  - You should recommend that the project be accepted because (1) its NPV is positive and (2) although it has two IRRs, in this case it would be better to focus on the MIRR, which exceeds the WACC. You should explain this to the president and tell him that that the firm's value will increase if the project is accepted.
  - You should recommend that the project be rejected because (1) its NPV is positive and (2) it has two IRRs, one of which is less than the WACC, which indicates that the firm's value will decline if the project is accepted.

ANS: C  
 You could calculate the two IRRs and the MIRR, but the data in the problem are correct, so this is not necessary.

PTS: 1                      DIF: HARD                      REF: 300–301                      OBJ: (10.5) Multiple IRRs  
 BLM: Evaluate

39. Which statement about a project's MIRR is correct? Assume that the project being considered has normal cash flows, with one outflow followed by a series of inflows.
- A project's MIRR is always greater than its regular IRR.
  - A project's MIRR is always less than its regular IRR.
  - If a project's IRR is greater than its WACC, then the MIRR will be less than the IRR.
  - If a project's IRR is greater than its WACC, then the MIRR will be greater than the IRR.

ANS: C

Recall that (1) if the IRR is equal to the WACC, then the MIRR and the IRR will be equal, (2) if the IRR is greater than the WACC, the MIRR will be less than the IRR, and (3) the MIRR will be greater than the IRR if the IRR is less than the WACC. This situation exists because the MIRR assumes reinvestment at the WACC and therefore compounds at that rate, while the IRR assumes reinvestment at the IRR itself and therefore compounds at the IRR. Therefore, if the IRR exceeds the WACC, the TV found under the IRR method will be larger, and vice versa. The IRR and the MIRR are found as the rate that causes the PV of the TV to equal the cost. Therefore, if the IRR exceeds the WACC, causing the IRR's TV to be larger, then the IRR will exceed the MIRR, and vice versa.

Note too that (c) could also be confirmed with a numerical example.

PTS: 1                    DIF: HARD                    REF: 301–303                    OBJ: (10.6) MIRR  
 BLM: Understand

40. Which statement about a project's MIRR is correct? Assume that the project being considered has normal cash flows, with one cash outflow at  $t = 0$  followed by a series of positive cash flows.
- A project's MIRR is always greater than its regular IRR.
  - A project's MIRR is always less than its regular IRR.
  - To find a project's MIRR, we compound cash inflows at the regular IRR and then find the discount rate that causes the PV of the terminal value to equal the initial cost.
  - To find a project's MIRR, the textbook procedure compounds cash inflows at the WACC and then finds the discount rate that causes the PV of the terminal value to equal the initial cost.

ANS: D

See the answer to Question 67 for a detailed discussion of the MIRR versus the IRR, and note that (d) is essentially the definition of the MIRR; hence, it is correct.

PTS: 1                    DIF: HARD                    REF: 301–303                    OBJ: (10.6) MIRR  
 BLM: Analyze

41. Edmondson Electric Systems is considering a project that has the following cash flow and WACC data. What is the project's NPV? Note that if a project's projected NPV is negative, it should be rejected.

WACC:	10.00%			
Year:	0	1	2	3
Cash flows:	-\$1,000	\$500	\$500	\$500

- \$243.43
- \$255.60
- \$268.38
- \$281.80

ANS: A

WACC: 10.00%

Year:	0	1	2	3
Cash flows:	-\$1,000	\$500	\$500	\$500

NPV = \$243.43

PTS: 1                    DIF: EASY                    REF: 294–296  
 OBJ: (10.2) NPV (constant cash flows; 3 years)                    BLM: Understand

42. Johnson Enterprises is considering a project that has the following cash flow and WACC data. What is the project's NPV? Note that if a project's projected NPV is negative, it should be rejected.

WACC:	10.00%				
Year:	0	1	2	3	4
Cash flows:	<u>-\$1,000</u>	<u>\$350</u>	<u>\$350</u>	<u>\$350</u>	<u>\$350</u>

- a. \$98.78
- b. \$103.98
- c. \$109.45
- d. \$114.93

ANS: C

WACC: 10.00%

Year:	0	1	2	3	4
Cash flows:	<u>-\$1,000</u>	<u>\$350</u>	<u>\$350</u>	<u>\$350</u>	<u>\$350</u>

NPV = \$109.45

PTS: 1                    DIF: EASY                    REF: 294–296

OBJ: (10.2) NPV (constant cash flows; 4 years)

BLM: Understand

43. Humboldt Inc. is considering a project that has the following cash flow and WACC data. What is the project's NPV? Note that if a project's projected NPV is negative, it should be rejected.

WACC:	9.00%					
Year:	0	1	2	3	4	5
Cash flows:	<u>-\$1,000</u>	<u>\$300</u>	<u>\$300</u>	<u>\$300</u>	<u>\$300</u>	<u>\$300</u>

- a. \$135.94
- b. \$143.09
- c. \$150.62
- d. \$166.90

ANS: D

WACC: 9.00%

Year:	0	1	2	3	4	5
Cash flows:	<u>-\$1,000</u>	<u>\$300</u>	<u>\$300</u>	<u>\$300</u>	<u>\$300</u>	<u>\$300</u>

NPV = \$166.90

PTS: 1                    DIF: EASY                    REF: 294–296

OBJ: (10.2) NPV (constant cash flows; 5 years)

BLM: Understand

44. Tucker Corp. is considering a project that has the following cash flow data. What is the project's IRR? Note that a project's projected IRR can be negative, in which case it will be rejected.

Year:	0	1	2	3
Cash flows:	<u>-\$1,000</u>	<u>\$450</u>	<u>\$450</u>	<u>\$450</u>

- a. 15.82%
- b. 16.65%

- c. 17.48%
- d. 18.36%

ANS: B

Year:	0	1	2	3
Cash flows:	-\$1,000	\$450	\$450	\$450

IRR = 16.65%

PTS: 1                    DIF: EASY                    REF: 296

OBJ: (10.3) IRR (constant cash flows; 3 years)

BLM: Understand

45. Levin Company is considering a project that has the following cash flow data. What is the project's IRR? Note that a project's projected IRR can be negative, in which case it will be rejected.

Year:	0	1	2	3	4
Cash flows:	-\$1,000	\$400	\$400	\$400	\$400

- a. 15.94%
- b. 17.71%
- c. 19.68%
- d. 21.86%

ANS: D

Year:	0	1	2	3	4
Cash flows:	-\$1,000	\$400	\$400	\$400	\$400

IRR = 21.86%

PTS: 1                    DIF: EASY                    REF: 296-297

OBJ: (10.3) IRR (constant cash flows; 4 years)

BLM: Understand

46. Frye Foods is considering a project that has the following cash flow data. What is the project's IRR? Note that a project's projected IRR can be negative, in which case it will be rejected.

Year:	0	1	2	3	4	5
Cash flows:	-\$1,000	\$325	\$325	\$325	\$325	\$325

- a. 18.72%
- b. 19.65%
- c. 20.64%
- d. 21.67%

ANS: A

Year:	0	1	2	3	4	5
Cash flows:	-\$1,000	\$325	\$325	\$325	\$325	\$325

IRR = 18.72%

PTS: 1                    DIF: EASY                    REF: 296

OBJ: (10.3) IRR (constant cash flows; 5 years)

BLM: Understand

47. Wells Inc. is considering a project that has the following cash flow data. What is the project's payback?

Year:	0	1	2	3
Cash flows:	-\$1,000	\$500	\$500	\$500

- a. 1.62 years
- b. 1.80 years
- c. 2.00 years
- d. 2.20 years

ANS: C

Year:	0	1	2	3
Cash flows:	-\$1,000	\$500	\$500	\$500
Cumulative CF	-\$1,000	-\$500	\$0	\$500
Payback = 2.00	—	—	2.00	—

PTS: 1                      DIF: EASY                      REF: 304–306  
 OBJ: (10.8) Payback (constant cash flows; 3 years)                      BLM: Understand

48. Van Auken Inc. is considering a project that has the following cash flows:

<u>Year</u>	<u>Cash Flow</u>
0	-\$1,000
1	\$400
2	\$300
3	\$500
4	\$400

The company's WACC is 10%. What are the project's payback, IRR, and NPV?

- a. payback = 2.4, IRR = 10.00%, NPV = \$600
- b. payback = 2.4, IRR = 21.22%, NPV = \$260
- c. payback = 2.6, IRR = 21.22%, NPV = \$300
- d. payback = 2.6, IRR = 21.22%, NPV = \$260

ANS: D

Payback = 2 + \$300/\$500 = 2.6 years  
 Using the cash flow register, calculate NPV and IRR:  
 IRR = 21.22%  
 NPV = \$260.43 ~ \$260

PTS: 1                      DIF: EASY                      REF: 294–297 | 304–306  
 OBJ: (Comp: 10.2, 10.3, 10.8) NPV, IRR, and payback—nonalgorithmic  
 BLM: Understand

49. Adler Enterprises is considering a project that has the following cash flow and WACC data. What is the project's NPV? Note that a project's projected NPV can be negative, in which case it will be rejected.

WACC:	10.00%			
Year:	0	1	2	3
Cash flows:	-\$1,000	\$450	\$460	\$470



- a. \$142.37
- b. \$149.49
- c. \$156.97
- d. \$164.82

ANS: A

WACC: 10.00%

Year:	0	1	2	3
Cash flows:	-\$1,000	\$450	\$460	\$470

NPV = \$142.37

PTS: 1

DIF: EASY | MEDIUM

REF: 294–296

OBJ: (10.2) NPV (uneven cash flows; 3 years)

BLM: Understand

50. Babcock Inc. is considering a project that has the following cash flow and WACC data. What is the project's NPV? Note that a project's projected NPV can be negative, in which case it will be rejected.

WACC: 10.00%

Year:	0	1	2	3
Cash flows:	-\$950	\$500	\$400	\$300

- a. \$54.62
- b. \$57.49
- c. \$60.52
- d. \$63.54

ANS: C

WACC: 10.00%

Year:	0	1	2	3
Cash flows:	-\$950	\$500	\$400	\$300

NPV = \$60.52

PTS: 1

DIF: EASY | MEDIUM

REF: 294–296

OBJ: (10.2) NPV (uneven cash flows; 3 years)

BLM: Understand

51. Rappaport Enterprises is considering a project that has the following cash flow and WACC data. What is the project's NPV? Note that a project's projected NPV can be negative, in which case it will be rejected.

WACC: 10.00%

Year:	0	1	2	3	4
Cash flows:	-\$1,000	\$400	\$405	\$410	\$415

- a. \$211.29
- b. \$234.77
- c. \$260.85
- d. \$289.84

ANS: D

WACC: 10.00%

Year:	0	1	2	3	4
Cash flows:	-\$1,000	\$400	\$405	\$410	\$415

$$\text{NPV} = \$289.84$$

PTS: 1                    DIF: EASY | MEDIUM  
 OBJ: (10.2) NPV (uneven cash flows; 4 years)

REF: 294–296  
 BLM: Understand

52. Barry Company is considering a project that has the following cash flow and WACC data. What is the project's NPV? Note that a project's projected NPV can be negative, in which case it will be rejected.

WACC:	10.00%					
Year:	0	1	2	3	4	5
Cash flows:	-\$1,200	\$400	\$395	\$390	\$385	\$380

- a. \$253.81
- b. \$282.01
- c. \$310.21
- d. \$341.23

ANS: B

WACC: 10.00%

Year:	0	1	2	3	4	5
Cash flows:	-\$1,200	\$400	\$395	\$390	\$385	\$380

$$\text{NPV} = \$282.01$$

PTS: 1                    DIF: EASY | MEDIUM  
 OBJ: (10.2) NPV: (uneven cash flows; 3 years)

REF: 294–296  
 BLM: Understand

53. Choi Computer Systems is considering a project that has the following cash flow data. What is the project's IRR? Note that a project's projected IRR can be less than the WACC (and even negative), in which case it will be rejected.

Year:	0	1	2	3
Cash flows:	-\$1,000	\$450	\$470	\$490

- a. 13.89%
- b. 15.43%
- c. 17.15%
- d. 19.05%

ANS: D

Year:	0	1	2	3
Cash flows:	-\$1,000	\$450	\$470	\$490

$$\text{IRR} = 19.05\%$$

PTS: 1                    DIF: EASY | MEDIUM  
 OBJ: (10.3) IRR (uneven cash flows; 3 years)

REF: 296–297  
 BLM: Understand

54. Rentz Recreation Inc. is considering a project that has the following cash flow data. What is the project's IRR? Note that a project's projected IRR can be less than the WACC (and even negative), in which case it will be rejected.

Year:	0	1	2	3	4
Cash flows:	-\$650	\$250	\$230	\$210	\$190

- a. 14.04%
- b. 15.44%
- c. 16.99%
- d. 18.69%

ANS: A

Year:	0	1	2	3	4
Cash flows:	-\$650	\$250	\$230	\$210	\$190

IRR = 14.04%

PTS: 1                    DIF: EASY | MEDIUM                    REF: 296–297  
 OBJ: (10.3) IRR (uneven cash flows; 4 years)                    BLM: Understand

55. Thompson Stores is considering a project that has the following cash flow data. What is the project’s IRR? Note that a project’s projected IRR can be less than the WACC (and even negative), in which case it will be rejected.

Year:	0	1	2	3	4	5
Cash flows:	-\$1,000	\$300	\$295	\$290	\$285	\$270

- a. 11.16%
- b. 12.40%
- c. 13.78%
- d. 15.16%

ANS: C

Year:	0	1	2	3	4	5
Cash flows:	-\$1,000	\$300	\$295	\$290	\$285	\$270

IRR = 13.78%

PTS: 1                    DIF: EASY | MEDIUM                    REF: 296–297  
 OBJ: (10.3) IRR (uneven cash flows; 5 years)                    BLM: Understand

56. ZumBahlen Inc. is considering the following mutually exclusive projects:

<u>Year</u>	<u>Project A Cash Flow</u>	<u>Project B Cash Flow</u>
0	-\$5,000	-\$5,000
1	200	3,000
2	800	3,000
3	3,000	800
4	5,000	200

At what cost of capital will the NPV of the two projects be the same? (That is, what is the “crossover” rate?)

- a. 16.15%
- b. 16.74%
- c. 17.33%
- d. 17.80%

ANS: A

Find the differences between the two projects' respective cash flows as follows:

(CFA – CFB)

$$CF_0 = -5,000 - (-5,000) = 0$$

$$CF_1 = 200 - 3,000 = -2,800$$

$$CF_2 = -2,200$$

$$CF_3 = 2,200$$

$$CF_4 = 4,800$$

Enter these CFs and find the IRR/YR = 16.15%, which is the crossover rate.

PTS: 1                      DIF: MEDIUM      REF: 298–300

OBJ: (10.4) Crossover rate—nonalgorithmic

BLM: Analyze

57. Steve Hawke is a football star who has been offered contracts by two different teams. The payments (in millions of dollars) under the two contracts are shown below:

	Team A	Team B
<u>Year</u>	<u>Cash Payment</u>	<u>Cash Payment</u>
0	\$8.0	\$2.5
1	4.0	4.0
2	4.0	4.0
3	4.0	8.0
4	4.0	8.0

Steve plans to accept the contract that provides him with the highest NPV. At what discount rate would he be indifferent between the two contracts?

- a. 10.85%
- b. 11.35%
- c. 12.66%
- d. 13.98%

ANS: B

First, find the differential CFs by subtracting Team A cash flows from Team B cash flows (or vice versa). Enter these into the cash flow register; then solve to find IRR/YR to get the discount rate at which the two NPVs are the same, 11.35%.

PTS: 1                      DIF: MEDIUM      REF: 298–300

OBJ: (10.4) Crossover rate—nonalgorithmic

BLM: Analyze

58. Aubey Inc. is considering two projects that have the following cash flows:

	Project 1	Project 2
<u>Year</u>	<u>Cash Flow</u>	<u>Cash Flow</u>
0	-\$2,000	-\$1,900
1	500	1,100
2	700	900
3	800	800
4	1,000	600
5	1,100	400

At what cost of capital would the two projects have the same NPV?

- a. 4.73%

- b. 5.85%
- c. 6.70%
- d. 7.50%

ANS: B

Subtract Project 2 cash flows from Project 1 cash flows:

$$CF_0 = -100$$

$$CF_1 = -600$$

$$CF_2 = -200$$

$$CF_3 = 0$$

$$CF_4 = 400$$

$$CF_5 = 700$$

Put these in the cash flow register and solve for IRR/YR, which is 5.85%.

PTS: 1                      DIF: MEDIUM      REF: 298–300

OBJ: (10.4) Crossover rate—nonalgorithmic

BLM: Analyze

59. Anderson Associates is considering two mutually exclusive projects that have the following cash flows:

<u>Year</u>	<u>Project A</u> <u>Cash Flow</u>	<u>Project B</u> <u>Cash Flow</u>
0	-\$10,000	-\$8,000
1	1,000	7,000
2	2,000	1,000
3	6,000	1,000
4	6,000	1,000

At what cost of capital do the two projects have the same NPV? (That is, what is the crossover rate?)

- a. 11.20%
- b. 12.26%
- c. 13.03%
- d. 14.15%

ANS: C

Find the differential cash flows by subtracting B's cash flows from A's cash flows for each year.

$$CF_0 = -2,000$$

$$CF_1 = -6,000$$

$$CF_2 = 1,000$$

$$CF_3 = 5,000$$

$$CF_4 = 5,000$$

Enter these cash flows and solve for the IRR/YR = crossover rate = 13.03%.

PTS: 1                      DIF: MEDIUM      REF: 298–300

OBJ: (10.4) Crossover rate—nonalgorithmic

BLM: Analyze

60. Flint Fruits is considering two equally risky, mutually exclusive projects, Projects A and B, that have the following cash flows:

<u>Year</u>	<u>Project A</u>	<u>Project B</u>
0	-\$100,000	-\$100,000
1	40,000	30,000

2	25,000	15,000
3	70,000	80,000
4	40,000	55,000

At what WACC would the two projects have the same NPV?

- a. 9.56%
- b. 10.33%
- c. 11.21%
- d. 12.55%

ANS: C

The crossover rate is the point where the two projects will have the same NPV. To find the crossover rate, subtract  $CF_B$  from  $CF_A$ :

$$-\$100,000 - (-\$100,000) = 0$$

$$\$40,000 - \$30,000 = \$10,000$$

$$\$25,000 - \$15,000 = \$10,000$$

$$\$70,000 - \$80,000 = -\$10,000$$

$$\$40,000 - \$55,000 = -\$15,000$$

Enter these into your CF register and solve for IRR/YR = 11.21%.

PTS: 1                      DIF: MEDIUM      REF: 298-300

OBJ: (10.4) Crossover rate—nonalgorithmic

BLM: Analyze

61. Rivoli Roofing is considering mutually exclusive Projects A and B, which have the following cash flows:

<u>Year</u>	<u>Project A Cash Flow</u>	<u>Project B Cash Flow</u>
0	-\$200	-\$300
1	20	90
2	30	70
3	40	60
4	50	50
5	60	40

At what cost of capital would the two projects have the same NPV?

- a. 6.22%
- b. 7.11%
- c. 8.45%
- d. 9.32%

ANS: D

Find the differential cash flows to compute the crossover rate. Subtracting Project A cash flows from Project B cash flows, we obtain the following differential cash flows:

<u>Year</u>	<u>B - A Cash Flow</u>
0	-\$100
1	70
2	40
3	20
4	0
5	-20

Input the cash flows into your calculator's cash flow register and solve for IRR/YR to obtain the crossover rate of 9.32%.

PTS: 1                    DIF: MEDIUM    REF: 298–300  
 OBJ: (10.4) Crossover rate—nonalgorithmic                    BLM: Analyze

62. Edelman Electric Systems is considering a project that has the following cash flow and WACC data. What is the project's MIRR? Note that a project's projected MIRR can be less than the WACC (and even negative), in which case it will be rejected.

WACC:	10.00%			
Year:	0	1	2	3
Cash flows:	-\$800	\$350	\$350	\$350

- a. 9.58%
- b. 10.64%
- c. 11.82%
- d. 13.14%

ANS: D

WACC: 10.00%

Year:	0	1	2	3	
Cash flows:	-\$800	\$350	\$350	\$350	TV = Sum of compounded inflows:

Compounded values, FVs: \$423.50    \$385.00    \$350.00    \$1,158.50

MIRR = 13.14%    Found as discount rate that equates PV of TV to cost, discounted back 3 years @ 10%

MIRR = 13.14%    Alternative calculation, using Excel's MIRR function

PTS: 1                    DIF: MEDIUM    REF: 301–303  
 OBJ: (10.6) MIRR (constant cash flows; 3 years)                    BLM: Analyze

63. Hindelang Inc. is considering a project that has the following cash flow and WACC data. What is the project's MIRR? Note that a project's projected MIRR can be less than the WACC (and even negative), in which case it will be rejected.

WACC:	10.00%				
Year:	0	1	2	3	4
Cash flows:	-\$900	\$300	\$320	\$340	\$360

- a. 12.61%
- b. 14.01%
- c. 15.41%
- d. 16.95%

ANS: B

WACC: 10.00%

Year:	0	1	2	3	4	
Cash flows:	-\$900	\$300	\$320	\$340	\$360	TV = Sum of compounded inflows:

Compounded values: \$399.30    \$387.20    \$374.00    \$360.00    \$1,520.50

MIRR = 14.01% Found as discount rate that equates PV of TV to cost, discounted back 4 years @ 10%

MIRR = 14.01% Alternative calculation, using Excel's MIRR function

PTS: 1 DIF: MEDIUM REF: 301–303

OBJ: (10.6) MIRR (uneven cash flows; 4 years)

BLM: Analyze

64. Stewart Associates is considering a project that has the following cash flow data. What is the project's payback?

Year:	0	1	2	3	4	5
Cash flows:	-\$1,000	\$300	\$310	\$320	\$330	\$340

- a. 2.34 years
- b. 2.60 years
- c. 2.89 years
- d. 3.21 years

ANS: D

Year:	0	1	2	3	4	5
Cash flows:	-\$1,000	\$300	\$310	\$320	\$330	\$340
Cumulative CF	-\$1,000	-\$700	-\$390	-\$70	\$260	\$600
Payback = 3.21	—	—	—	—	3.21	—

PTS: 1 DIF: MEDIUM REF: 304–305

OBJ: (10.8) Payback (uneven cash flows; 5 years)

BLM: Analyze

65. Garvin Enterprises is considering a project that has the following cash flow and WACC data. What is the project's discounted payback?

WACC:	10.00%			
Year:	0	1	2	3
Cash flows:	-\$1,000	\$500	\$500	\$500

- a. 2.12 years
- b. 2.35 years
- c. 2.59 years
- d. 2.85 years

ANS: B

WACC: 10.00%

Year:	0	1	2	3
Cash flows:	-\$1,000	\$500	\$500	\$500
PV of CFs	-\$1,000	\$455	\$413	\$376
Cumulative CF	-\$1,000	-\$545	-\$132	\$243
Payback = 2.35	—	—	—	2.35

PTS: 1 DIF: MEDIUM REF: 306

OBJ: (10.8) Discounted payback (constant CFs; 3 years)

BLM: Analyze

66. Bey Bikes is considering a project that has the following cash flow and WACC data. What is the project's discounted payback?

WACC: 10.00%



Year:	0	1	2	3	4
Cash flows:	-\$1,000	\$525	\$485	\$445	\$405

- a. 1.72 years
- b. 1.92 years
- c. 2.13 years
- d. 2.36 years

ANS: D

WACC: 10.00%

Year:	0	1	2	3	4
Cash flows:	-\$1,000	\$525	\$485	\$445	\$405
PV of CFs	-\$1,000	\$477	\$401	\$334	\$277
Cumulative CF	-\$1,000	-\$523	-\$122	\$212	\$489
Payback = 2.36	—	—	—	2.36	—

PTS: 1                      DIF: MEDIUM      REF: 298–300

OBJ: (10.4) Crossover rate—nonalgorithmic

BLM: Analyze

67. Walker & Campsey wants to invest in a new computer system, and management has narrowed the choice to Systems A and B.

System A requires an up-front cost of \$100,000, after which it generates positive after-tax cash flows of \$60,000 at the end of each of the next two years. System B also requires an up-front cost of \$100,000, after which it generates positive after-tax cash flows of \$48,000 at the end of each of the next three years. The company's cost of capital is 11%. Based on the equivalent annual annuity, which system will be chosen?

- a. A,\$1,622.88
- b. B,\$1,622.88
- c. A,\$7,083.47
- d. B,\$7,083.47

ANS: D

To find the NPV of the systems we must use the replacement chain approach.

<u>Time</u>	<u>System A</u>	<u>System B</u>
0	-\$100,000	-\$100,000
1	60,000	48,000
2	60,000	48,000
3		48,000

Use the CF key to enter the cash flows for each period. I/YR = 11. This should give the following NPVs:

$$NPV_A = \$2,780, NPV_B = \$17,312. EAA_A = \$1,622.88. EAA_B = \$7,083.47$$

Computer B is chosen due to its higher equivalent annual annuity, so the correct answer is (d).

PTS: 1                      DIF: MEDIUM      REF: 305

OBJ: (10.8) Discounted payback (uneven CFs, 4 years)

BLM: Analyze

68. Mountain Fresh Water Company is considering two mutually exclusive machines. Machine A has an up-front cost of \$100,000 ( $CF_0 = -100,000$ ), and it produces positive after-tax cash inflows of \$40,000 a year at the end of each of the next six years. Machine B has an up-front cost of \$50,000 ( $CF_0 = -50,000$ ), and it produces after-tax cash inflows of \$30,000 a year at the end of the next three years. The company's cost of capital is 10.5%. Based on the equivalent annual annuity, which machine will be chosen?
- A, \$71,687
  - A, \$16,702
  - B, \$23,954
  - B, \$9,718

ANS: B

The CFs and NPVs (calculated with I/YR = 10.5%) are as follows:

<u>Time</u>	<u>Project A</u>	<u>Project B</u>
0	-\$100,000	-\$50,000
1	40,000	30,000
2	40,000	30,000
3	40,000	30,000
4	40,000	
5	40,000	
6	40,000	

$$\begin{aligned} \text{NPV} & \quad \$71,687.18 \sim \$71,687 & \quad \$23,953.70 \sim \$23,954 \\ \text{EAA}_A & = \$16,702.47. \quad \text{EAA}_B = \$9,717.53 \end{aligned}$$

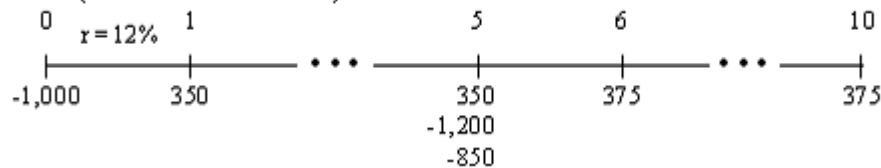
PTS: 1                      DIF: MEDIUM                      REF: 310-311

OBJ: (10.11) Equivalent annual annuity—nonalgorithmic                      BLM: Analyze

69. A small manufacturer is considering two alternative machines. Machine A costs \$1.0 million, has an expected life of 5 years, and generates after-tax cash flows of \$350,000 per year. At the end of 5 years, the salvage value of the machine is zero, but the company will be able to purchase another Machine A at a cost of \$1.2 million. The second Machine A will generate after-tax cash flows of \$375,000 a year for another 5 years, at which time its salvage value will again be zero. Alternatively, the company can buy Machine B at a cost of \$1.5 million today. Machine B will produce after-tax cash flows of \$400,000 a year for 10 years, after which it will have an after-tax salvage value of \$100,000. Assume that the cost of capital is 12%. Based on the equivalent annual annuity, if the company chooses the machine that adds the most value to the firm, by how much will the company's value increase per year?
- \$792,286.54
  - \$347,802.00
  - \$140,227.71
  - \$61,557.88

ANS: C

Machine A (Time Line in thousands):



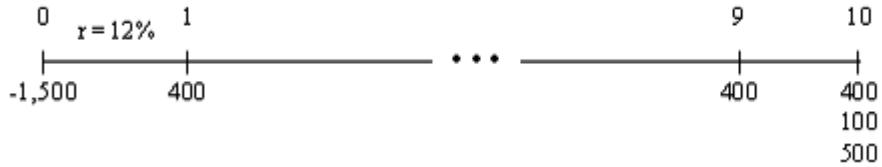
With a financial calculator input the following:

$$CF_0 = -1,000,000$$

$$CF_{1-4} = 350,000$$

$CF_5 = -850,000$   
 $CF_{6-10} = 375,000$   
 $I/YR = 12\%$   
 Solve for  $NPV_A = \$347,802.00$ .  $EAA_A = \$61,557.88$

Machine B (Time Line in thousands):



$CF_0 = -1,500,000$   
 $CF_{1-9} = 400,000$   
 $CF_{10} = 500,000$   
 $I/YR = 12\%$   
 Solve for  $NPV_B = \$792,286.54$ .  $EAA_B = \$140,227.71$

PTS: 1                      DIF: MEDIUM      REF: 310–311  
 OBJ: (10.11) Equivalent annual annuity—nonalgorithmic                      BLM: Analyze

70. Pinkerton Truck Rental is considering two mutually exclusive engine development projects. The RPX design has an expected life of four years and projected cash inflows are \$3.6 million at the end of each of the first two years and \$1.8 million in each of the next two years. The RPB design is more flexible and has an eight-year life. The projected end-of-year flows from the RPB design are \$2.4 million in each of the first two years and \$2.0 million in each of the next six years. Both projects require an initial investment of \$5.4 million, and Pinkerton’s cost of capital is 12%. What is the NPV (on an eight-year extended basis) of the project with the most value to the company?
- \$3.976 million
  - \$4.325 million
  - \$5.085 million
  - \$5.211 million

ANS: D

The CFs and NPVs (dollars in millions) calculated with  $I/YR = 12\%$  are as follows:

Year	RPX	RPB
0	-\$5.4	-\$5.4
1	3.6	2.4
2	3.6	2.4
3	1.8	2.0
4	$1.8 - 5.4 = -3.6$	2.0
5		2.0
6		2.0
7		2.0
8		2.0
NPV	\$5.085	\$5.211

PTS: 1                      DIF: MEDIUM      REF: 311  
 OBJ: (10.11) Extended NPV—nonalgorithmic                      BLM: Analyze

71. Mills Corp. is considering two mutually exclusive machines. Machine A requires an up-front expenditure at  $t = 0$  of \$450,000, has an expected life of two years, and will generate positive after-tax cash flows of \$350,000 per year (all cash flows are realized at the end of the year) for two years. At the end of two years, the machine will have zero salvage value, but every two years the company can purchase a replacement machine with the same cost and identical cash inflows.

Alternatively, it can choose Machine B, which requires an expenditure of \$1 million at  $t = 0$ , has an expected life of four years, and will generate positive after-tax cash flows of \$350,000 per year (all cash flows are realized at year end). At the end of four years, Machine B will have an after-tax salvage value of \$100,000.

The cost of capital is 10%. What is the NPV (on an extended four-year life) of the better machine?

- \$157,438
- \$177,754
- \$287,552
- \$355,508

ANS: C

Machine A:

Step 1: Find  $NPV_A$ :

$$CF_0 = -450,000$$

$$CF_{1-2} = 350,000$$

$$I/YR = 10$$

$$\text{Solve for } NPV_A = \$157,438.02.$$

Step 2: Find NPV of extended life:

$$\begin{aligned} \text{Extended NPV} &= \$157,438.02 + \$157,438.02/(1 + 0.10)^2 \\ &= \$287,552.09 \end{aligned}$$

Machine B:

Step 1: Find  $NPV_B$ :

$$CF_0 = -1,000,000$$

$$CF_{1-3} = 350,000$$

$$CF_4 = 450,000$$

$$I/YR = 10$$

$$\text{Solve for } NPV_B = \$177,754.25.$$

PTS: 1                    DIF: MEDIUM            REF: 311

OBJ: (10.11) Extended NPV—nonalgorithmic

BLM: Analyze

72. Last month, Smith Systems Inc. decided to accept the project whose cash flows are shown below. However, before actually starting the project, the Bank of Canada took actions that lowered interest rates and therefore Smith's WACC. By how much did the change in the WACC affect the project's forecasted NPV? Assume that the Bank of Canada's action does not affect the cash flows, and note that a project's projected NPV can be negative, in which case it should be rejected.

New WACC:	8.00%	Old WACC:	11.00%
Year:	0	1	2
Cash flows:	-\$1,000	\$500	\$500

- \$57.18
- \$60.19

- c. \$63.36
- d. \$66.69

ANS: D

New WACC: 8.00%    Old WACC: 11.00%

Year:	0	1	2	3
Cash flows:	-\$1,000	\$500	\$500	\$500

New NPV = \$288.55

Old NPV = \$221.86

Change = \$66.69

PTS: 1                    DIF: MEDIUM    REF: 294–300

OBJ: (Comp: 10.2–10.4) NPV versus IRR (constant CFs; 3 years)

BLM: Analyze

73. The Bank of Canada recently shifted its monetary policy, causing Lasik Vision’s WACC to change. Lasik had recently analyzed the project whose cash flows are shown below. However, the CFO wants to reconsider this and all other proposed projects in view of the Bank of Canada’s action. How much did the changed WACC cause the forecasted NPV to change? Assume that the Bank of Canada’s action does not affect the cash flows, and note that a project’s projected NPV can be negative, in which case it should be rejected.

New WACC: 7.00%    Old WACC: 10.00%

Year:	0	1	2	3
Cash flows:	-\$1,000	\$500	\$520	\$540

- a. \$72.27
- b. \$75.88
- c. \$79.68
- d. \$83.66

ANS: A

\$2,761.32

New WACC: 7.00%    Old WACC: 10.00%

Year:	0	1	2	3
<u>Cash</u> flows:	-\$1,000	\$500	\$520	\$540

New NPV = \$362.28

Old NPV = \$290.01

Change = \$72.27

PTS: 1                    DIF: MEDIUM    REF: 294–300

OBJ: (Comp: 10.2–10.4) NPV versus IRR (uneven CFs; 3 yrs)    BLM: Analyze

74. Sorenson Stores is considering a project that has the following cash flows:

Year	Cash Flow
0	CF <sub>0</sub> = ?
1	\$2,000
2	3,000
3	3,000
4	1,500

The project has a payback of 2.5 years, and the firm's cost of capital is 12%. What is the project's NPV?

- a. \$577.68
- b. \$765.91
- c. \$1,049.80
- d. \$2,761.32

ANS: B

First, find the missing  $t = 0$  cash flow. If payback = 2.5 years, this implies that the  $t = 0$  cash flow must be

$CF_0 + \$2,000 + \$3,000 + (0.5)\$3,000 = 0$ , so

$CF_0 = -\$2,000 - \$3,000 - (0.5)\$3,000 = -\$6,500$ . Then

$$\begin{aligned} NPV &= -\$6,500 + \frac{\$2,000}{1.12} + \frac{\$3,000}{(1.12)^2} + \frac{\$3,000}{(1.12)^3} + \frac{\$1,500}{(1.12)^4} \\ &= \$765.91 \end{aligned}$$

PTS: 1                      DIF: MEDIUM                      REF: 295 | 304–305

OBJ: (Comp: 10.2, 10.8) NPV and payback—nonalgorithmic                      BLM: Analyze

75. A firm is considering Projects S and L, whose cash flows are shown below. These projects are mutually exclusive, equally risky, and not repeatable. The CEO wants to use the IRR criterion, while the CFO favours the NPV method, and you were hired to advise the firm on the best procedure. If the CEO's preferred criterion is used, how much value will the firm lose as a result of this decision?

WACC:                      13.00%

	0	1	2	3	4
$CF_S$	-\$1,025	\$375	\$380	\$385	\$390
$CF_L$	-\$2,150	\$750	\$759	\$768	\$777

- a. \$5.83
- b. \$6.14
- c. \$6.46
- d. \$6.79

ANS: C

WACC: 13.000%

	0	1	2	3	4
$CF_S$	-\$1,025	\$375	\$380	\$385	\$390
$CF_L$	-\$2,150	\$750	\$759	\$768	\$777

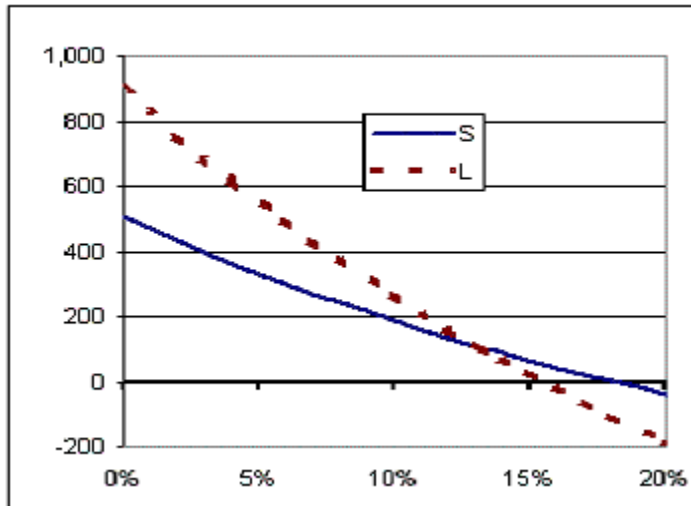
IRR, L = 15.577%

IRR, S = 18.059%

NPV, L = \$116.94

NPV, S = \$110.47

\$6.46 = Value lost if the IRR criterion is used



	S	L
	110.5	116.9
0%	505.0	904.0
2%	431.0	756.4
4%	362.5	619.8
6%	299.1	493.3
8%	240.3	375.9
10%	185.6	266.8
12%	134.6	165.2
13.275%	104.0	104.0
14%	87.1	70.3
16%	42.7	-18.2
18%	1.2	-101.1
20%	-37.7	-178.8
22%	-74.2	-251.6
24%	-108.6	-320.1

Note that the WACC is constrained to be less than the crossover point, so there is a conflict between NPV and IRR; hence, following the IRR rule results in a loss of value. In the next problem, the constraint is relaxed. Graphs such as this one could be created for the following problems, but we do not show them.

PTS: 1                      DIF: MEDIUM | HARD                      REF: 298–300  
 OBJ: (10.4) NPV versus IRR (size differential & conflict)                      BLM: Analyze

76. Scanlon Inc. is considering Projects S and L, whose cash flows are shown below. These projects are mutually exclusive, equally risky, and not repeatable. If the decision is made by choosing the project with the higher IRR, how much value will be forgone? Note that under certain conditions, choosing projects on the basis of the IRR will not cause any value to be lost because the one with the higher IRR will also have the higher NPV, so no value will be lost if the IRR method is used.

WACC: 10.00%

	0	1	2	3	4
CF <sub>S</sub>	-\$2,050	\$750	\$760	\$770	\$780
CF <sub>L</sub>	-\$4,300	\$1,500	\$1,518	\$1,536	\$1,554

- a. \$146.59
- b. \$154.30
- c. \$162.42
- d. \$178.67

ANS: C  
 WACC: 10.000%

	0	1	2	3	4
CF <sub>S</sub>	-\$2,050	\$750	\$760	\$770	\$780
CF <sub>L</sub>	-\$4,300	\$1,500	\$1,518	\$1,536	\$1,554

IRR, L = 15.577%  
 IRR, S = 18.059%

NPV, L = \$533.60  
 NPV, S = \$371.18

\$162.42 = Value lost if the IRR criterion is used

Note that the WACC is *not* constrained to be less than the crossover point, so there may *not* be a conflict between NPV and IRR; hence, following the IRR rule may not result in a loss of value. In that case, the correct answer is \$0.00.

PTS: 1                      DIF: MEDIUM | HARD                      REF: 298–300  
 OBJ: (10.4) NPV versus IRR (size differential, may be conflict)  
 BLM: Analyze

77. Moerdyk & Co. is considering Projects S and L, whose cash flows are shown below. These projects are mutually exclusive, equally risky, and not repeatable. If the decision is made by choosing the project with the higher IRR, how much value will be forgone? Note that under certain conditions choosing projects on the basis of the IRR will not cause any value to be lost because the one with the higher IRR will also have the higher NPV, i.e., no conflict will exist.

WACC:                      12.00%

	0	1	2	3	4
CF <sub>S</sub>	-\$1,025	\$650	\$450	\$250	\$50
CF <sub>L</sub>	-\$1,025	\$100	\$300	\$500	\$700

- a. -\$1.44
- b. -\$1.30
- c. -\$1.17
- d. \$0.00

ANS: D  
 WACC: 12.000%

	0	1	2	3	4
CF <sub>S</sub>	-\$1,025	\$650	\$450	\$250	\$50
CF <sub>L</sub>	-\$1,025	\$100	\$300	\$500	\$700

IRR, L = 15.7%  
 IRR, S = 19.9%

NPV, L \$104.20  
 NPV, S \$123.82

\$0.00 = Value lost if the IRR criterion is used

Note that the WACC is *not* constrained to be less than the crossover point, so there may *not* be a conflict between NPV and IRR; hence, following the IRR rule may not result in a loss of value. In that case, the correct answer is \$0.00.

PTS: 1                      DIF: MEDIUM | HARD                      REF: 298–300  
 OBJ: (10.4) NPV versus IRR (timing differences, may be conflict)  
 BLM: Analyze

78. Sadik Company is considering Projects S and L, whose cash flows are shown below. These projects are mutually exclusive, equally risky, and are not repeatable. If the decision is made by choosing the project with the higher IRR, how much value will be forgone? Note that under some conditions choosing projects on the basis of the IRR will cause \$0.00 value to be lost.

WACC:                      8.00%

	0	1	2	3	4
CF <sub>S</sub>	-\$1,050	\$675	\$650		



CF<sub>L</sub>                    -\$1,050     \$360     \$360     \$360     \$360

- a. \$9.09
- b. \$10.10
- c. \$11.10
- d. \$12.22

ANS: B

WACC: 8.00%

	0	1	2	3	4
CF <sub>S</sub>	-\$1,050	\$675	\$650		
CF <sub>L</sub>	-\$1,050	\$360	\$360	\$360	\$360

IRR, L 14.0%

IRR, S 17.1%

NPV, L \$142.37

NPV, S \$132.27

\$10.10 = Value lost the IRR criterion is used

Note that the WACC is *not* constrained to be less than the crossover point, so there may *not* be a conflict between NPV and IRR; hence, following the IRR rule may not result in a loss of value. In that case, the correct answer is \$0.00.

PTS: 1

DIF: MEDIUM | HARD

REF: 298–300

OBJ: (10.4) NPV versus IRR (timing differences, may be conflict)

BLM: Analyze

79. Nast Inc. is considering Projects S and L, whose cash flows are shown below. These projects are mutually exclusive, equally risky, and not repeatable. If the decision is made by choosing the project with the higher MIRR rather than the one with the higher NPV, how much value will be forgone? Note that under some conditions choosing projects on the basis of the MIRR will cause \$0.00 value to be lost.

WACC: 9.00%

	0	1	2	3	4
CF <sub>S</sub>	-\$1,100	\$375	\$375	\$375	\$375
CF <sub>L</sub>	-\$2,200	\$725	\$725	\$725	\$725

- a. \$24.71
- b. \$27.46
- c. \$30.51
- d. \$33.90

ANS: D

WACC: 9.000%

	0	1	2	3	4	TV	MIRR
CF <sub>S</sub>	-\$1,100	\$375	\$375	\$375	\$375		
		485.64	445.54	408.75	375.00	\$1,714.92	11.74%
CF <sub>L</sub>	-\$2,200	\$725	\$725	\$725	\$725		
		938.90	861.37	790.25	725.00	\$3,315.52	10.80%

MIRR, L = 10.80%

MIRR, S = 11.74%

NPV, L = \$148.80

NPV, S = \$114.89

\$33.90 = Value lost if the IRR criterion is used

Note that the WACC is *not* constrained to be less than the crossover point, so there may *not* be a conflict between NPV and IRR; hence, following the MIRR rule may not result in a loss of value. In that case, the correct answer is \$0.00.

PTS: 1

DIF: MEDIUM | HARD

REF: 295 | 302–303

OBJ: (Comp: 10.2, 10.6) NPV versus MIRR (size differences)

BLM: Analyze

80. Yonan Inc. is considering Projects S and L, whose cash flows are shown below. These projects are mutually exclusive, equally risky, and not repeatable. If the decision is made by choosing the project with the shorter payback, some value may be forgone. How much value will be lost in this instance? Note that under some conditions choosing projects on the basis of the shorter payback will not cause value to be lost.

WACC: 10.00%

	0	1	2	3	4
CF <sub>S</sub>	-\$1,000	\$500	\$800	\$0	\$0
CF <sub>L</sub>	-\$2,100	\$400	\$800	\$800	\$1,000

- a. \$55.16
- b. \$66.42
- c. \$78.79
- d. \$93.16

ANS: D

WACC: 10.00%

	0	1	2	3	4
CF <sub>S</sub>	-\$1,000	\$500	\$800		
CF <sub>L</sub>	-\$2,100	\$400	\$800	\$800	\$1,000
Cumulative CF, S	-\$1,000	-\$500	\$300	\$300	\$300
Cumulative CF, L	-\$2,100	-\$1,700	-\$900	-\$100	\$900
Payback S = 1.63	—	—	1.63	—	—
Payback L = 3.10	—	—	—	—	3.10

NPV, L = \$208.86

NPV, S = \$115.70

\$93.16 = Value lost

Note that the WACC is *not* constrained to be less than the crossover point, so there may *not* be a conflict between NPV and payback; hence, following the IRR rule may not result in a loss of value, so the correct answer may be \$0.00.

PTS: 1

DIF: MEDIUM | HARD

REF: 295 | 304–306

OBJ: (Comp: 10.2, 10.8) NPV versus payback

BLM: Analyze

81. Pappas Products is considering Projects S and L, whose cash flows are shown below. These projects are mutually exclusive, equally risky, and not repeatable. The CEO believes the IRR is the best selection criterion, while the CFO advocates the MIRR. If the decision is made by choosing the project with the higher IRR rather than the one with the higher MIRR, how much, if any, value will be forgone? Note that under some conditions the choice will have no effect on the value gained or lost.

WACC: 11.00%

	0	1	2	3	4
CF <sub>S</sub>	-\$1,100	\$550	\$600	\$100	\$100
CF <sub>L</sub>	-\$2,700	\$650	\$725	\$800	\$1,400

- a. -\$1.60
- b. -\$1.44
- c. -\$1.30
- d. \$0.00

ANS: D

First, recognize that NPV makes theoretically correct capital budgeting decisions, so the highest NPV tells us how much value could be added. We calculate the two projects' NPVs, IRRs, and MIRR. We then see what NPV would result if the decision were based on the IRR and the MIRR. Under some conditions, MIRR will choose the project with the higher NPV while the IRR chooses the lower NPV project. Then, the difference between the NPV is the loss incurred if the IRR criterion is used. Of course, it's possible that both the MIRR and the IRR could choose the wrong project. This problem shows that that could happen, but does not directly address it.

WACC: 11.000%

	0	1	2	3	4	TV	MIRR
CF <sub>S</sub>	-\$1,100	\$550	\$600	\$100	\$100		
		752.20	739.26	111.00	100.00	\$1,702.46	11.5375%
CF <sub>L</sub>	-\$2,700	\$650	\$725	\$800	\$1,400		
		888.96	893.27	888.00	1,400.00	\$4,070.23	10.8062%

NPV, L = -\$18.81

MIRR, L = 10.806%

IRR, L = 10.712%

NPV, S = \$21.46

MIRR, S = 11.537%

IRR, S = 12.242%

-0.7313%

-1.530%

NPV if decided based on IRR: 21.46

NPV if decided based on MIRR: 21.46

Lost value using IRR versus MIRR criterion: 0.00

With the cash flows given here, the IRR and MIRR will make the same decision with any WACC above 7.895% but different decisions and thus an advantage to MIRR below that rate. Note also that both the IRR and MIRR choose the wrong project at WACCs about 7.986%. So, MIRR is better at low rates, but both are wrong at high rates.

Note that the WACC is *not* constrained to be less than the crossover point, so there may *not* be a conflict between MIRR and IRR; hence, following the IRR rule may not result in a loss of value. In that case, the correct answer is \$0.00. Note, though, that both IRR and MIRR can lead to incorrect decisions vis à vis the NPV method.

PTS: 1 DIF: MEDIUM | HARD  
 OBJ: (Comp: 10.3, 10.6) IRR versus MIRR

REF: 296–297 | 301–303  
 BLM: Analyze

## CHAPTER 11—CASH FLOW ESTIMATION AND RISK ANALYSIS

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### TRUE/FALSE

1. Since the focus of capital budgeting is on cash flows rather than on net income, changes in noncash balance sheet accounts such as inventory are not relevant in a capital budgeting analysis.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 324  
OBJ: (11.1) Relevant cash flows

2. If an investment project would make use of land that the firm currently owns, the project should be charged with the opportunity cost of the land.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 324  
OBJ: (11.1) Relevant cash flows

3. When the cash flows for a project are estimated, interest payments should be included if debt is to be used to help finance the project.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 324  
OBJ: (11.1) Relevant cash flows

4. Any cash flow that can be classified as incremental to a particular project is relevant in a capital budgeting analysis.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 324  
OBJ: (11.1) Relevant cash flows

5. Changes in net operating working capital do not need to be considered in a capital budgeting cash flow analysis because capital budgeting relates to fixed assets, not working capital.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 324–325  
OBJ: (11.1) Net operating working capital

6. Because of improvements in forecasting techniques, estimating the cash flows associated with a project has become the easiest step in the capital budgeting process.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 324–325  
OBJ: (11.1) Cash flow estimation

7. Estimating project cash flows is generally the most important but also the most difficult step in the capital budgeting process. Methodology, such as the use of NPV versus IRR, is important, but less so than estimating projects' cash flows.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 324–325  
OBJ: (11.1) Cash flow estimation

8. Although it is extremely difficult to make accurate forecasts of the revenues that a project will generate, the project's initial outlays and subsequent costs for large projects can be forecasted with great accuracy.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 324–325



OBJ: (11.9) Risk-adjusted discount rate

17. Using the same discount rate to evaluate projects with differing degrees of risk would, over time, cause the firm to accept too many high-risk projects and to reject too many low-risk proposals.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 344

OBJ: (11.9) Risk-adjusted discount rate

18. The two cardinal rules that financial analysts follow to avoid capital budgeting errors are (1) capital budgeting decisions must be based on accounting income, and (2) all incremental cash flows should be considered when making accept/reject decisions.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 324

OBJ: (11.1) Relevant cash flows

19. Superior analytical techniques, such as NPV, used in combination with cost of capital adjustments, can overcome the problem of poor cash flow estimation and lead to generally correct accept/reject decisions.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 324–325

OBJ: (11.1) Cash flow estimation

20. It is extremely difficult to estimate the revenues and costs associated with large, complex projects that take several years to develop. This is why subjective judgment instead of a discounted cash flow analysis is recommended for such projects.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 324–325

OBJ: (11.1) Cash flow estimation

21. Opportunity costs include those cash inflows that could be generated from assets the firm already owns, if those assets were not used for the project being evaluated.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 335–336

OBJ: (11.5) Opportunity costs

22. Suppose Walker Publishing Company is considering bringing out a new finance text whose projected sales include sales that will be taken away from another of Walker's books. The lost sales on the existing book are a sunk cost and as such should not be considered in the analysis of the new book.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 335

OBJ: (11.5) Sunk costs

23. The change in net operating working capital associated with new projects is always positive, because new projects mean that more working capital will be required. This situation is true for both expansion and replacement projects.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 335

OBJ: (11.5) Net Operating Working capital

24. After a project has been terminated, a firm cannot receive CCA deductions from it, and thus the CCA tax shield stops too.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 331–333

OBJ: (11.4) CCA Tax Shield

25. Sensitivity analysis measures the stand-alone risk of a project by showing how much the project's NPV is affected by a small change in one of the input variables, such as sales. Other things held constant, with the independent variable graphed on the horizontal axis, the steeper the graph of the relationship line, the more risky the project.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 338  
OBJ: (11.6) Sensitivity analysis

26. When determining the present value of the tax shield for assets being replaced rather than bought new, the calculation must reflect the cash flow difference (incremental cash flow) generated by the new and old assets.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 342–343  
OBJ: (11.8) Replacement analysis

### MULTIPLE CHOICE

1. Which of the following is NOT a cash flow and thus should not be reflected in the analysis of a capital budgeting project?
- changes in net operating working capital
  - shipping and installation costs
  - cannibalization effects
  - sunk costs that have been expensed for tax purposes

ANS: D                      PTS: 1                      DIF: EASY                      REF: 335  
OBJ: (11.5) Cash flow issues                      BLM: Remember

2. What is the best approach to take into account the relative risk of a proposed project?
- adjusting the discount rate upward if the project is judged to have above-average risk
  - reducing the NPV by 10% for risky projects
  - picking a risk factor equal to the average discount rate
  - ignoring risk because project risk cannot be measured accurately

ANS: A                      PTS: 1                      DIF: EASY                      REF: 344  
OBJ: (11.9) Risk adjustment                      BLM: Understand

3. Suppose Tapley Corporation uses a WACC of 8% for below-average risk projects, 10% for average risk projects, and 12% for above-average risk projects. Which independent project should Tapley accept, assuming that the company uses the NPV method when choosing projects?
- Project A, which has average risk and an IRR of 9%
  - Project B, which has below-average risk and an IRR of 8.5%
  - Project C, which has above-average risk and an IRR of 11%
  - Without information about the projects' NPVs we cannot determine which one(s) should be accepted

ANS: B                      PTS: 1                      DIF: EASY                      REF: 344  
OBJ: (11.9) Risk and project selection                      BLM: Understand

4. Which of the following statements best describes a sunk cost?
- A sunk cost is any cost that must be expended in order to complete a project and bring it into operation.
  - A sunk cost is any cost that was expended in the past but can be recovered if the firm decides not to go forward with the project.

- c. A sunk cost is a cost that was incurred and expensed in the past and cannot be recovered if the firm decides not to go forward with the project.
- d. A sunk cost is any cost not directly related to the physical work required to complete the project.

ANS: C                      PTS: 1                      DIF: EASY | MEDIUM  
REF: 335                      OBJ: (11.5) Sunk costs                      BLM: Remember

5. Which of the following statements best describes a situation involving sunk costs?
- a. An example of a sunk cost is the cost associated with restoring the site of a strip mine once the ore has been depleted.
  - b. Sunk costs must be considered if the IRR method is used but not if the firm relies on the NPV method.
  - c. A good example of a sunk cost is money that a banking corporation spent last year to investigate the site for a new office, then expensed those funds for tax purposes, and now is deciding whether to go forward with the project.
  - d. If sunk costs are considered and reflected in a project's cash flows, then the project's calculated NPV will be higher than it otherwise would be.

ANS: C                      PTS: 1                      DIF: EASY | MEDIUM  
REF: 335                      OBJ: (11.5) Sunk costs                      BLM: Understand

6. Which of the following statements best describes externalities?
- a. An externality is a situation where a project would have an adverse effect on some other part of the firm's overall operations. If the project would have a favourable effect on other operations, then this is not an externality.
  - b. An example of an externality is a situation where a bank opens a new office, and that new office causes deposits in the bank's other offices to decline.
  - c. The NPV method automatically deals correctly with externalities, even if the externalities are not specifically identified, but the IRR method does not. This is another reason to favour the NPV.
  - d. Both the NPV and IRR methods deal correctly with externalities, even if the externalities are not specifically identified. However, the payback method does not.

ANS: B                      PTS: 1                      DIF: EASY | MEDIUM  
REF: 336                      OBJ: (11.5) Externalities                      BLM: Understand

7. Which of the following statements is correct?
- a. If a project can create employment in a slump area, the firm should include such an externality in the NPV calculations.
  - b. If cannibalization exists, then the cash flows associated with the project must be increased to offset these effects. Otherwise, the calculated NPV will be biased downward.
  - c. If cannibalization is determined to exist, then this means that the calculated NPV considering cannibalization will be higher than the NPV that does not recognize these effects.
  - d. Cannibalization is a type of externality that is not against the law, and any harm it causes is done to the firm itself.

ANS: D                      PTS: 1                      DIF: EASY | MEDIUM  
REF: 336                      OBJ: (11.5) Externalities                      BLM: Understand

8. Which of the following statements best describes CCA?
- a. Using CCA method rather than straight-line depreciation would normally have no effect on a project's total projected cash flows but it would affect the timing of the cash flows and thus the NPV.



- b. Corporations must use the same depreciation method (e.g., straight-line or CCA) for stockholder reporting and tax purposes.
- c. Since CCA deduction is not a cash expense, it has no affect on cash flows and thus no affect on capital budgeting decisions.
- d. Under CCA rules, higher CCA deductions occur in the early years, and this reduces the early cash flows and thus lowers a project's projected NPV.

ANS: A                      PTS: 1                      DIF: EASY | MEDIUM  
 REF: 331–334              OBJ: (11.4) CCA      BLM: Understand

9. Which of the following statements regarding CCA is true?
- a. Since CCA deduction is a cash expense, the faster an asset is depreciated, the lower the projected NPV from investing in the asset.
  - b. When corporations use CCA depreciation method, the stockholder report financially looks better.
  - c. CCA is a pool concept calculating values for the entire asset class, not individual assets.
  - d. Using CCA declining-balance depreciation rather than straight line normally has the effect of slowing down cash flows and thus reducing a project's forecasted NPV.

ANS: C                      PTS: 1                      DIF: EASY | MEDIUM  
 REF: 331–334              OBJ: (11.4) CCA      BLM: Understand

10. Which of the following statements regarding CCA is true?
- a. Since CCA deduction is not a cash expense, it plays no role in capital budgeting.
  - b. The CCA method uses a specific mandated CCA rate for each asset class.
  - c. The CCA deduction is equal to the year-end UCC for the pool divided by the mandated CCA rate.
  - d. The CCA method allows that the net capital cost of an asset is added to the pool in the year the asset is put in use.

ANS: B                      PTS: 1                      DIF: EASY | MEDIUM  
 REF: 331–334              OBJ: (11.4) CCA      BLM: Understand

11. A company is considering a new project. The CFO plans to calculate the project's NPV by estimating the relevant cash flows for each year of the project's life (the initial investment cost, the annual operating cash flows, and the terminal cash flow), then discounting those cash flows at the company's WACC. Which factor should the CFO include in the cash flows when estimating the relevant cash flows?
- a. all interest expenses on debt used to help finance the project
  - b. the investment in working capital required to operate the project, even if that investment will be recovered at the end of the project's life
  - c. sunk costs that have been incurred relating to the project, but only if those costs were incurred prior to the current year
  - d. effects of the project on other divisions of the firm, but only if those effects lower the direct cash flows of the project

ANS: B                      PTS: 1                      DIF: MEDIUM      REF: 324  
 OBJ: (11.1) Relevant cash flows      BLM: Evaluate

12. Which factor should be included in the cash flows used to estimate a project's NPV?
- a. all overhead costs incurred
  - b. interest on funds borrowed to help finance the project
  - c. the end-of-project recovery of any working capital required to operate the project
  - d. cannibalization effects, but only if those effects increase the project's projected cash flows

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 324  
OBJ: (11.1) Relevant cash flows                      BLM: Understand

13. When evaluating a new project, which statement should firms NOT include in the projected cash flows?
- previous expenditures associated with a market test to determine the feasibility of the project provided those costs have been expensed for tax purposes
  - the value of a building owned by the firm that will be used for this project
  - a decline in the sales of an existing product provided that decline is directly attributable to this project
  - the salvage value of assets used for the project at the end of the project's life

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 324  
OBJ: (11.1) Relevant cash flows                      BLM: Understand

14. Rowell Company spent \$3 million two years ago to build a plant for a new product. It then decided not to go forward with the project, so the building is available for sale or for a new product. Rowell owns the building free and clear—there is no mortgage on it. Which of the following statements is correct?
- Since the building has been paid for, it can be used by another project with no additional cost. Therefore, it should not be reflected in the cash flows for any new project.
  - If the building could be sold, then the after-tax proceeds that would be generated by any such sale should be charged as a cost to any new project that would use it.
  - This is an example of an externality, because the very existence of the building affects the cash flows for any new project that Rowell might consider.
  - Since the building was built in the past, its cost is a sunk cost and thus need not be considered when new projects are being evaluated, even if it would be used by those new projects.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 324  
OBJ: (11.1) Relevant cash flows                      BLM: Understand

15. Which item should be considered when a company estimates the cash flows used to analyze a proposed project?
- The new project is expected to reduce sales of one of the company's existing products by 5%.
  - Since the firm's director of capital budgeting spent some of her time last year to evaluate the new project, a portion of her salary for that year should be charged to the project's initial cost.
  - The company has spent and expensed \$1 million on R&D associated with the new project.
  - The firm would borrow all the money used to finance the new project, and the interest on this debt would be \$1.5 million per year.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 324  
OBJ: (11.1) Relevant cash flows                      BLM: Understand

16. Laurier Inc., a household products firm, is considering production of a new detergent. In evaluating whether to go ahead with the project, which item should NOT be explicitly considered when cash flows are estimated?
- The company will produce the detergent in a vacant building that was used to produce another product until last year. The building could be sold, leased to another company, or used in the future to produce other Laurier products.
  - The project will utilize some equipment the company currently owns but is not now using. A used-equipment dealer has offered to buy the equipment.
  - The company has spent and expensed for tax purposes \$3 million on research related to the new detergent. These funds cannot be recovered, but the research is expected to benefit

other projects that might be proposed in the future.

- d. The new detergent will cut into sales of the firm's other detergents.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 324

OBJ: (11.1) Relevant cash flows                      BLM: Analyze

17. A company is considering a proposed new plant that would increase productive capacity. Which of the following statements is correct?
- In calculating the project's operating cash flows, the firm should NOT deduct financing costs such as interest expense, because financing costs are accounted for by discounting at the WACC. If interest were deducted when estimating cash flows, it would in effect be "double-counted."
  - Since depreciation is a noncash expense, the firm does not need to deal with depreciation when calculating the operating cash flows.
  - When estimating the project's operating cash flows, it is important to include any opportunity costs and sunk costs, but the firm should ignore cash flow effects of externalities since they are accounted for in the discounting process.
  - Capital budgeting decisions should be based on *before-tax* cash flows.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 324–325

OBJ: (11.1) New project cash flows                      BLM: Understand

18. Which of the following does NOT have incremental cash flow effects and thus should NOT be considered in capital budgeting decisions?
- A new product will generate new sales, but some of those new sales will be from customers who switch from one of the firm's current products.
  - A firm must obtain new equipment for the project, and \$1 million of costs for shipping and installing the new machinery will be required.
  - A firm has spent \$2 million on R&D associated with a new product. These costs have been expensed for tax purposes, and they cannot be recovered if the new project is rejected.
  - A firm can produce a new product, and the existence of that product will stimulate sales of some of the firm's other products.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 324–325

OBJ: (11.1) Incremental cash flows                      BLM: Understand

19. Which factor is NOT relevant when determining incremental cash flows for a new product?
- the land that would be used for the new project and could be sold to another firm
  - revenues from an existing product that would be lost as a result of customers switching to the new product
  - shipping and installation costs associated with preparing a machine that would be used to produce the new product
  - the cost of a marketing study that was completed last year related to the new product (This research led to the tentative decision to go ahead with the new product, and the cost of the research was expensed for tax purposes last year.)

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 324–325

OBJ: (11.1) Incremental cash flows                      BLM: Understand

20. What is the correct rule for capital budgeting analysis?
- The interest paid on funds borrowed to finance a project must be included in the project's estimated cash flows.
  - Only incremental cash flows are relevant when making accept/reject decisions.
  - Sunk costs are not included in the annual cash flows, but they must be deducted from the PV of the project's other costs when reaching the accept/reject decision.

- d. If a product is competitive with some of the firm's other products, this fact should be incorporated into the estimate of the relevant cash flows. However, if the new product is complementary to some of the firm's other products, this will have no effect on the cash flows used in the analysis.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 324–325  
 OBJ: (11.1) Cash flow estimation                      BLM: Understand

21. Which of the following statements is correct?
- In a capital budgeting analysis where part of the funds used to finance the project are raised as debt, failure to include interest expense as a cost when determining the project's cash flows will lead to an upward bias in the NPV.
  - The existence of any type of "externality" will reduce the calculated NPV versus the NPV that would exist without the externality.
  - If one of the assets to be used by a potential project is already owned by the firm, and if that asset could be leased to another firm if the new project were not undertaken, then the net rent that could be obtained should be charged as a cost to the project under consideration.
  - If one of the assets to be used by a potential project is already owned by the firm but is not being used, then any costs associated with that asset is a sunk cost and should be ignored.

ANS: C

Regarding (a), note that since interest should not be considered, exclusion will not lead to any type of bias, positive or negative. Regarding (b), positive externality such as synergy increases calculated NPV.

PTS: 1                      DIF: MEDIUM                      REF: 324–325                      OBJ: (11.1) Cash flow estimation  
 BLM: Understand

22. Taussig Technologies is considering two potential projects, X and Y. In assessing the projects' risks, the company estimated the beta of each project versus both the company's other assets and the stock market, and it also conducted thorough scenario and simulation analyses. This research produced the following numbers:

	<u>Project X</u>	<u>Project Y</u>
Expected NPV	\$350,000	\$350,000
Standard deviation ( $\sigma_{NPV}$ )	\$100,000	\$150,000
Project beta (versus market)	1.4	0.8
Correlation of the project cash flows with cash flows from currently existing projects.	Cash flows are <i>not</i> correlated with the cash flows from existing projects.	Cash flows are <i>highly</i> correlated with the cash flows from existing projects.

Which of the following statements is correct?

- Project X has more stand-alone risk than Project Y.
- Project X has more corporate (or within-firm) risk than Project Y.
- Project X has more market risk than Project Y.
- Project X has the same level of corporate risk as Project Y.

ANS: C

(c) is true, while the other statements are false. Stand-alone risk is measured by standard deviation. Therefore, since Y's standard deviation is higher than X's, Y has higher stand-alone risk than X. (b) is false because corporate risk is affected by the correlation of project cash flows with other company cash flows, and since Y's cash flows are more highly correlated with the cash flows of existing projects than X's, Y has more corporate risk than X. Market risk is measured by beta. Therefore, since X's beta is greater than Y's, (c) is true.

PTS: 1                    DIF: MEDIUM        REF: 337–341        OBJ: (11.6) Risk analysis  
BLM: Analyze

23. Currently, Powell Products has a beta of 1.0, and its sales and profits are positively correlated with the overall economy. The company estimates that a proposed new project would have a higher standard deviation and coefficient of variation than one of the company's average projects. Also, the new project's sales would be countercyclical in the sense that they would be high when the overall economy is down and low when the overall economy is strong. On the basis of this information, which of the following statements is correct?
- The proposed new project would have more stand-alone risk than the firm's typical project.
  - The proposed new project would increase the firm's corporate risk.
  - The proposed new project would not affect the firm's risk at all.
  - The proposed new project would have less stand-alone risk than the firm's typical project.

ANS: A

(a) is true because the project has a relatively high standard deviation and thus more stand-alone risk than average. The project's revenues would be countercyclical to the rest of the firm's and to other firm's revenues, hence its within-firm and market risks would be relatively low.

PTS: 1                    DIF: MEDIUM        REF: 337–341        OBJ: (11.6) Risk analysis  
BLM: Evaluate

24. Which of the following statements is correct?
- Sensitivity analysis is a good way to measure market risk because it explicitly takes into account diversification effects.
  - One advantage of sensitivity analysis relative to scenario analysis is that it explicitly takes into account the probability of specific effects occurring, whereas scenario analysis cannot account for probabilities.
  - Simulation analysis is a computerized version of scenario analysis where input variables are selected randomly on the basis of their probability distributions.

ANS: C                    PTS: 1                    DIF: MEDIUM        REF: 337–341  
OBJ: (11.6) Sensitivity, scenario, and simulation analyses        BLM: Understand

25. Which statement best describes sensitivity analysis?
- Straightforward sensitivity analysis, as it is generally employed, is incomplete in that it fails to consider the range of likely values for the key input variables and the probabilities of different input values.
  - Sensitivity analysis is a statistically based behavioural approach to project analysis that applies predetermined probability distributions is the scenario approach.
  - Sensitivity analysis is a method for evaluating a project that uses a number of possible values for a given variable, such as cash inflows, to assess its impact on the firm's return is simulation analysis.
  - Sensitivity analysis is a type of risk analysis that considers both the sensitivity of NPV to changes in key variables and the likely range of variable values.

ANS: A                    PTS: 1                    DIF: MEDIUM        REF: 337–341

OBJ: (11.6) Sensitivity, scenario, and simulation analyses      BLM: Understand

26. A firm is considering a new project whose risk is greater than the risk of the firm's average project, based on all methods for assessing risk. In evaluating this project, what would it be reasonable for management to do?
- increase the estimated IRR of the project to reflect its greater risk
  - reject the project, since its acceptance would increase the firm's risk
  - ignore the risk differential if the project would amount to only a small fraction of the firm's total assets
  - increase the cost of capital used to evaluate the project to reflect the project's higher-than-average risk

ANS: D      PTS: 1      DIF: MEDIUM      REF: 344  
 OBJ: (11.9) Effect of a project on a firm's risk      BLM: Understand

27. Langston Labs has an overall (composite) WACC of 10%, which reflects the cost of capital for its average asset. Its assets vary widely in risk, and Langston evaluates low-risk projects with a WACC of 8%, average projects at 10%, and high-risk projects at 12%. The company is considering the following projects:

Project	Risk	Expected Return
A	High	15%
B	Average	12
C	High	11
D	Low	9
E	Low	6

Which set of projects would maximize shareholder wealth?

- A, B, and C.
- A, B, and D.
- A, B, C, and D.
- A, B, C, D, and E.

ANS: B

(b) is true; the others are false. The following table shows the required return for each project on the basis of its risk level.

Project	Risk	Expected Return	Req'd Return for this Risk	Decision
A	High	15%	12%	Accept
B	Average	12	10	Accept
C	High	11	12	Reject
D	Low	9	8	Accept
E	Low	6	8	Reject

PTS: 1      DIF: MEDIUM      REF: 344  
 OBJ: (11.9) Risk and project selection      BLM: Analyze

28. What will result from an increase in the risk-adjusted discount rate for a risky project?
- no change in the NPV
  - an increase in the IRR
  - an increase in the NPV
  - a decrease in the NPV

ANS: D

Sales revenues	\$15,000
– Cash operating costs	6,000
– CCA	<u>4,000</u>
Operating income (EBIT)	\$5,000
– Taxes            Rate = 35%	<u>1,750</u>
After-tax EBIT	\$3,250
+ CCA	<u>4,000</u>
Net operating cash flow	\$7,250

PTS: 1                    DIF: MEDIUM        REF: 344                    OBJ: (11.9) Risk adjustment  
BLM: Analyze

29. Which of the following statements is correct?
- Only incremental cash flows are relevant in project analysis, and the proper incremental cash flows are the reported accounting profits, which form the best basis for investor and managerial decisions.
  - It is unrealistic to believe that increases in net operating working capital required at the start of an expansion project can be recovered at the project's completion. Working capital like inventory is almost always used up in operations. Thus, cash flows associated with working capital are included only at the start of a project's life.
  - If a terminal loss or CCA recapture could occur at the conclusion of the business, no subsequent cash flows would be received.
  - Changes in net operating working capital refer to changes in current assets and current liabilities, not to changes in *long-term* assets and liabilities, hence they are not considered in a capital budgeting analysis.

ANS: C                    PTS: 1                    DIF: MEDIUM        REF: 324–331 | 335–337  
OBJ: (Comp. 11.1–11.5) Cash flows and accounting measures    BLM: Understand

30. You work for Athens Inc., and you must estimate the Year 1 operating cash flow for a project with the following data. What is the Year 1 operating cash flow?

Sales revenues	\$15,000
Capital cost allowance	\$4,000
Cash operating costs	\$6,000
Tax rate	35.0%

- \$7,250
- \$7,431
- \$7,617
- \$7,807

ANS: A                    PTS: 1                    DIF: EASY                    REF: 324–334  
OBJ: (Comp. 11.1–11.4) Annual operating CFs, CCA given    BLM: Remember

31. Your company, Omega Corporation, is considering a new project that you must analyze. Based on the following data, what is the project's Year 1 operating cash flow?

Sales revenues	\$25,000
Capital cost allowance	\$8,000
Cash operating costs	\$12,000

Tax rate 35.0%

- a. \$10,585
- b. \$10,913
- c. \$11,250
- d. \$11,588

ANS: C

Sales revenues	\$25,000
– Cash operating costs)	12,000
– CCA	<u>8,000</u>
Operating income (EBIT)	\$5,000
– Taxes           Rate = 35%	<u>1,750</u>
After-tax EBIT	\$3,250
+ CCA	<u>8,000</u>
Net operating cash flow	\$11,250

PTS: 1           DIF: EASY           REF: 324–334

OBJ: (Comp: 11.1–11.4) Annual op. CFs, CCA deduction given

BLM: Remember

32. Zeta Software is considering a new project whose data are shown below. The required equipment has a 3-year project life, after which it will be worthless, and it has a constant deduction rate over 3 years. Revenues and cash operating costs are expected to be constant over the project's 3-year life. What is the project's operating cash flow for Year 1?

Equipment cost	\$75,000
Capital cost allowance	\$25,000
Sales revenues, each year	\$60,000
Cash operating costs	\$25,000
Tax rate	35.0%

- a. \$29,196
- b. \$29,945
- c. \$30,712
- d. \$31,500

ANS: D

Sales revenues	\$60,000
– Cash operating costs	25,000
– CCA	<u>25,000</u>
Operating income (EBIT)	\$10,000
– Taxes           Rate = 35%	<u>3,500</u>
After-tax EBIT	\$6,500
+ CCA	<u>25,000</u>
Net operating cash flow, Year 1	\$31,500

PTS: 1           DIF: EASY           REF: 324–334

OBJ: (Comp: 11.1–11.4) Annual operating CFs: cons. CCA           BLM: Analyze

33. As a member of Midwest Corporation's financial staff, you must estimate the Year 1 operating cash flow for a proposed project with the following data. What is the Year 1 net operating cash flow?



Sales revenues, each year	\$35,000
Capital cost allowance	\$10,000
Cash operating costs	\$17,000
Interest expense	\$4,000
Tax rate	35.0%

- a. \$12,380
- b. \$13,032
- c. \$14,440
- d. \$15,200

ANS: D

Sales revenues	\$35,000
– Cash operating costs	17,000
– CCA	<u>10,000</u>
Operating income (EBIT)	\$8,000
– Taxes	Rate = 35% <u>2,800</u>
After-tax EBIT	\$5,200
+ CCA	<u>10,000</u>
Net operating cash flow	\$15,200

PTS: 1                      DIF: EASY | MEDIUM                      REF: 324–334  
 OBJ: (Comp: 11.1–11.4) Ann. op. CFs, CCA and int. given                      BLM: Analyze

34. You work for the Sing Oil Company, which is considering a new project whose data are shown below. What is the project’s net operating cash flow for Year 1?

Sales revenues, each year	\$55,000
Capital cost allowance	\$8,000
Cash operating costs	\$25,000
Interest expense	\$8,000
Tax rate	35.0%

- a. \$21,185
- b. \$22,300
- c. \$24,586
- d. \$25,815

ANS: B

Sales revenues	\$55,000
– Cash operating costs	25,000
– CCA	<u>8,000</u>
Operating income (EBIT)	\$22,000
– Taxes	Rate = 35% <u>7,700</u>
After-tax EBIT	\$14,300
+ CCA	<u>8,000</u>
Net operating cash flow	\$22,300

PTS: 1                      DIF: EASY | MEDIUM                      REF: 324–334  
 OBJ: (Comp: 11.1–11.4) Ann. op. CFs, depr’n and int. given                      BLM: Analyze

35. Fool Proof Software is considering a new project whose data are shown below. The equipment has an economic life of 3 years, and is in the CCA class 10 (30%). Revenues and cash operating costs are expected to be constant over the project's 3-year life. What is the net operating cash flow for Year 1?

Equipment cost	\$65,000
Annual sales revenues	\$60,000
Annual cash operating costs	\$25,000
Tax rate	35.0%

- a. \$26,162.50  
 b. \$28,770.00  
 c. \$30,359.25  
 d. \$25,275.50

ANS: A

Equipment cost \$65,000  
 CCA  $(0.5)(\$65,000)(0.3) = \$9,750$  half-year rule applies in year 1

Sales revenues	\$60,000.00
– Cash operating costs	25,000.00
– CCA	<u>9,750.00</u>
Operating income (EBIT)	\$25,250.00
– Taxes	Rate = 35% <u>8,837.50</u>
After-tax EBIT	\$16,412.50
+ CCA	<u>9,750.00</u>
Net operating cash flow, Year 1	\$26,162.50

PTS: 1 DIF: EASY | MEDIUM REF: 324–334  
 OBJ: (Comp: 11.1–11.4) Ann. Op. CFs: CCA method BLM: Analyze

36. Your company, Q4 Inc., is considering a new project whose data are shown below. The required equipment has an economic year of 5 years, and has a CCA rate of 30% in class 10. Revenues and cash operating costs are expected to be constant over the project's 5-year operating life. What is the project's net *operating* cash flow during Year 2?

Equipment cost	\$70,000
Sales revenues (each year)	\$50,000
Cash operating costs (each year)	\$25,000
Tax rate	35.0%

- a. \$16,213.00  
 b. \$20,067.50  
 c. \$22,497.50  
 d. \$18,863.50

ANS: C

Equipment cost \$70,000  
 CCA, Year 2  $(\$59,500)(0.3) = \$17,850$   $UCC_2 = \$70,000 - (0.5)(\$70,000)(0.3) =$   
 \$59,500

Sales revenues	\$50,000.00
– Cash operating costs	25,000.00
– CCA	<u>17,850.00</u>
Operating income (EBIT)	\$7,150.00
– Taxes      Rate = 35%	<u>–2,502.50</u>
After-tax EBIT	\$4,647.50
+ CCA	<u>17,850.00</u>
Net operating cash flow, Year 2	\$22,497.50

PTS: 1                    DIF: MEDIUM      REF: 324–334  
 OBJ: (Comp: 11.1–11.4) Ann. op. CFs: CCA method, Yr 2 CF    BLM: Analyze

37. California Hideaways is considering a new project whose data are shown below. The equipment has a 4-year project life. This equipment falls into class 43 with a CCA rate of 30% and would have zero salvage value. No new working capital would be required. Revenues and cash operating costs are expected to be constant over the project’s 4-year life. What is the project’s NPV? (Hint: Cash flows are constant in Years 1 to 4.)

WACC	10.0%
Net investment cost	\$65,000
Sales revenues, each year	\$60,000
Cash operating costs	\$25,000
Tax rate	35.0%

- a. \$28,499  
 b. \$23,402  
 c. \$19,417  
 d. \$16,284

ANS: B

WACC 10%	Years	1	2	3	4
Sales revenues		\$60,000	\$60,000	\$60,000	\$60,000
– Cash operating costs		25,000	25,000	25,000	25,000
Operating income (EBDIT)		\$35,000	\$35,000	\$35,000	\$35,000
– Taxes      Rate = 35%		<u>12,250</u>	<u>12,250</u>	<u>12,250</u>	<u>12,250</u>
After-tax operating income		\$22,750	\$22,750	\$22,750	\$22,750
PV@10%		<u>20,682</u>	<u>18,802</u>	<u>17,092</u>	<u>15,539</u>

The PV of the project’s operating cash flows = \$72,115

$$PV_{TS(CCA)} = \left[ \frac{(\$65,000)(0.3)(0.35)}{0.1+0.3} \right] \left[ \frac{1 + (0.5)(0.1)}{1+0.1} \right] = 17,062.5 \times 0.95455 = \$16,287$$

$$NPV = \$23,402 = \$72,115 + \$16,287 - \$65,000$$

PTS: 1                    DIF: MEDIUM      REF: 324–334  
 OBJ: (Comp: 11.1–11.4) NPV, CCA, constant CFs                    BLM: Analyze

38. Bing Services is now in the final year of a project. The equipment originally cost \$20,000. The existing UCC is \$5,000. Bing can sell the used equipment today for \$6,000, and its tax rate is 40%. What is the equipment’s net after-tax salvage value for use in a capital budgeting analysis? Note that the recapture is fully taxable.  
 a. \$5,320

- b. \$5,600
- c. \$5,880
- d. \$6,174

ANS: B

Existing UCC	\$5,000	
Adjusted cost of disposal	<u>6,000 = min[\$20,000, \$6,000]</u>	
Ending UCC	-\$1,000	recapture arises
Taxes on recapture @40%	<u>400</u>	
Net AT salvage value = sale proceeds – tax liability = \$5,600 = \$6,000 – \$400		

PTS: 1                    DIF: MEDIUM            REF: 324–334

OBJ: (Comp: 11.1–11.4) Salvage value calculations                    BLM: Analyze

39. Moore & Moore (MM) is considering the purchase of a new machine for \$50,000, installed. MM will use the CCA method to depreciate the machine. This machine is included in CCA class 8 (20%). MM expects to sell the machine at the end of its 4-year operating life for \$10,000. If MM’s marginal tax rate is 40%, what will be the present value of the CCA tax shield when it disposes of the machine at the end of Year 4? Assume that the relevant discount rate is 10%.
- a. \$10,905
  - b. \$9,059
  - c. \$9,400
  - d. \$8,930

ANS: A

$$PVTS = \left[ \frac{(50,000)(0.2)(0.4)}{0.1+0.2} \right] \left[ \frac{1+(0.5)(0.1)}{1+0.1} \right] - \left[ \frac{(10,000)(0.2)(0.4)}{0.1+0.2} \right] \left[ \frac{1}{(1+0.1)^4} \right]$$

$$= (13,333)(0.95455) - (2,666.67)(0.683) = 12,727 - 1,822 = \$10,905$$

PTS: 1                    DIF: MEDIUM            REF: 331–334            OBJ: (11.4) PVTS of CCA

BLM: Analyze

40. TexMex Products is considering a new salsa whose data are shown below. The equipment has a constant capital cost allowance over its 3-year life with a zero salvage value. No new working capital would be required. Revenues and cash operating costs are expected to be constant over the project’s 3-year life. However, this project would compete with other TexMex products and would reduce the company’s pre-tax annual cash flows. What is the project’s NPV? (Hint: Cash flows are constant in Years 1 to 3. Actual CCA varies. The proposed CCA is for computational convenience.)

WACC	10.0%
Pre-tax cash flow reduction in other products (cannibalization)	\$5,000
Investment cost	\$65,000
Annual capital cost of allowance	\$21,665
Annual sales revenues	\$75,000
Annual cash operating costs	\$25,000
Tax rate	35.0%

- a. \$25,269
- b. \$26,599
- c. \$27,929

d. \$29,325

ANS: B

		t = 0	t = 1	t = 2	t = 3
Investment (Basis)	WACC = 10%	-\$65,000			
Sales revenues			\$75,000	\$75,000	\$75,000
– Cannibalization cost			5,000	5,000	5,000
– Cash operating costs			25,000	25,000	25,000
– CCA (simplified)			<u>21,665</u>	<u>21,665</u>	<u>21,665</u>
Operating income (EBIT)			\$23,335	\$23,335	\$23,335
– Taxes	Rate = 35%		<u>8,167</u>	<u>8,167</u>	<u>8,167</u>
After-tax EBIT			\$15,168	\$15,168	\$15,168
+ Depreciation			<u>21,665</u>	<u>21,665</u>	<u>21,665</u>
Operating cash flow		<u>-\$65,000</u>	<u>\$36,833</u>	<u>\$36,833</u>	<u>\$36,833</u>
PV@10%		-\$65,000	\$33,485	\$30,440	\$27,673
NPV = \$26,599					

PTS: 1

DIF: MEDIUM | HARD

REF: 324–334

OBJ: (Comp: 11.1–11.4) NPV, CCA and CFs, cannibalization

BLM: Analyze

41. Easy Payment Loan Company is thinking of opening a new office, and the key data are shown below. Easy Payment owns the building, free and clear, and it would sell it for \$100,000 after taxes if the company decides not to open the new office. The equipment that would be used would be depreciated by the straight-line method over the project's 3-year life, and would have a zero salvage value. An extra \$5,000 of new working capital would be required to get this project running. Revenues and cash operating costs would be constant over the project's 3-year life. What is the project's NPV? (Hint: Cash flows are constant in Years 1–3 and the increased working capital will be recovered when this project ends. A simplified CCA is for mathematical convenience.)

WACC	10.0%
Net equipment capital cost	\$65,000
Annual CCA deduction for equipment	\$21,665
Sales revenues, each year	\$150,000
Cash operating costs, each year	\$25,000
Tax rate	35.0%

a. \$47,940

b. \$50,464

c. \$54,672

d. \$55,915

ANS: C

		t = 0	t = 1	t = 2	t = 3
Investment	WACC = 10%	-\$65,000			
Opportunity cost		-100,000			
Working capital		-5,000			
Revenues			\$150,000	\$150,000	\$150,000
– Cash operating costs			25,000	25,000	25,000
– CCA (simplified)			<u>21,665</u>	<u>21,665</u>	<u>21,665</u>
Operating income (EBIT)				\$103,335	\$103,335
	\$103,335				
– Taxes	Rate = 35%		<u>36,167</u>	<u>36,167</u>	<u>36,167</u>

After-tax EBIT		\$67,168	\$67,168	\$67,168
+ Depreciation		<u>21,665</u>	<u>21,665</u>	<u>21,665</u>
+ Recovery of working capital				5,000
Operating cash flow	-\$170,000	<u>\$88,833</u>	<u>\$88,833</u>	<u>\$93,833</u>
PV@10%	-\$170,000	\$80,757	\$73,416	\$70,498
NPV = \$54,672				

PTS: 1                      DIF: MEDIUM | HARD                      REF: 324–334  
 OBJ: (Comp: 11.1–11.4) NPV, cons CFs, opp. Cost, NWC                      BLM: Analyze

42. Rocky Top Car Wash is considering a new project whose data are shown below. The equipment that would be used has a 3-year tax life, would be depreciated by the straight-line method over the project's 3-year life, and would have zero salvage value. No new working capital would be required. Revenues and other operating costs are expected to be constant over the project's 3-year life. This is just one project for the firm, so any losses can be used to offset gains on other firm projects. If the number of cars washed declined by 50% from the expected level, by how much would the project's NPV change? (Hint: Cash flows are constant in Years 1 to 3.)

WACC	10.0%
Net capital investment cost	\$60,000
Number of cars washed	2,800
Average price per car	\$25.00
Fixed cash operating cost	\$10,000
Variable op. cost/unit (i.e., per car washed)	\$5.357
Annual capital cost allowance	\$20,000
Tax rate	35.0%

- a. \$38,113  
 b. \$40,119  
 c. \$42,230  
 d. \$44,453

ANS: D

Base Case Calculations		t = 0	t = 1	t = 2	t = 3
Investment cost	WACC = 10%	-\$60,000			
Cars washed			2,800	2,800	2,800
Price per car			\$25	\$25	\$25
Variable cost/unit			\$5.357	\$5.357	\$5.357
Sales revenues			\$70,000	\$70,000	\$70,000
– Fixed cash op. cost			10,000	10,000	10,000
– Variable op costs			15,000	15,000	15,000
– simplified capital cost allowance			<u>20,000</u>	<u>20,000</u>	<u>20,000</u>
Operating income (EBIT)				\$25,000	\$25,000
	\$25,000				
– Taxes	Rate = 35%		<u>8,750</u>	<u>8,750</u>	<u>8,750</u>
After-tax EBIT			\$16,250	\$16,250	\$16,250
+ simplified capital cost allowance			<u>20,000</u>	<u>20,000</u>	<u>20,000</u>
Operating cash flow		<u>-\$60,000</u>	<u>\$36,250</u>	<u>\$36,250</u>	<u>\$36,250</u>

Base Case NPV = \$30,149

Bad Case Calculations		t = 0	t = 1	t = 2	t = 3
Investment cost	WACC = 10%	-\$60,000			
Cars washed	Declines by 50%		1,400	1,400	1,400

Price per car		\$25	\$25	\$25
Variable cost/unit		\$5.357	\$5.357	\$5.357
Sales revenues		\$35,000	\$35,000	\$35,000
– Fixed cash op. cost		10,000	10,000	10,000
– Variable op costs		7,500	7,500	7,500
– simplified capital cost allowance		<u>20,000</u>	<u>20,000</u>	<u>20,000</u>
Operating income (EBIT)			<u>–\$2,500</u>	<u>–\$2,500</u>
	–\$2,500			
– Taxes	Rate = 35%	<u>–875</u>	<u>–875</u>	<u>–875</u>
After-tax EBIT		<u>–\$1,625</u>	<u>–\$1,625</u>	<u>–\$1,625</u>
+ simplified capital cost allowance		<u>20,000</u>	<u>20,000</u>	<u>20,000</u>
Operating cash flow		<u><u>–\$60,000</u></u>	<u><u>\$18,375</u></u>	<u><u>\$18,375</u></u>

Bad Case NPV = –\$14,304  
Decline in NPV = \$44,453

PTS: 1                    DIF: HARD                    REF: 337–341

OBJ: (11.6) Sensitivity analysis: NPV, constant CFs

BLM: Analyze

43. Merritt Company is considering a new project that has a cost of \$1,000,000, and the CFO set up the following simple decision tree to show its three most likely scenarios. Merritt could arrange with its work force and suppliers to cease operations at the end of Year 1 should it choose to do so, but to obtain this abandonment option, Merritt would have to make a payment to those parties. How much is the option to abandon worth (in thousands) to Merritt?

WACC	11.5%	Dollars in Thousands				NPV this	Prob ×
=		t = 0	t = 1	t = 2	t = 3	State	NPV
Prob =	25%		\$800.0	\$800.0	\$800.0	\$938.1	\$234.5
Prob =	50%	–\$1,000	\$520.0	\$520.0	\$520.0	\$259.8	\$129.9
Prob =	25%		–\$200.0	–\$200.0	–\$200.0	–\$1,484.5	–\$371.1
						Exp. NPV=	–\$6.7

- a. \$68.8
- b. \$72.5
- c. \$76.3
- d. \$80.1

ANS: C

NPV without Abandonment Option

WACC = 11.5%

	Dollars in Thousands				NPV this	Prob ×
	t = 0	t = 1	t = 2	t = 3	State	NPV
Prob = 25%		\$800.0	\$800.0	\$800.0	\$938.1	\$234.5
Prob = 50%	–\$1,000	\$520.0	\$520.0	\$520.0	\$259.8	\$129.9
Prob = 25%		–\$200.0	–\$200.0	–\$200.0	–\$1,484.5	–\$371.1
					Exp. NPV=	–\$6.7

NPV with Abandonment Option

WACC = 11.5%	Dollars in Thousands				NPV this State	Prob × NPV
	t = 0	t = 1	t = 2	t = 3		
Prob = 25%		\$800.0	\$800.0	\$800.0	\$938.1	\$234.5
Prob = 50%	-\$1,000	\$520.0	\$520.0	\$520.0	\$259.8	\$129.9
Prob = 25%		-\$200.0	\$0.0	\$0.0	-\$1,179.4	-\$294.8
					Exp. NPV =	\$69.6
					Value of the abandonment option	\$76.3

PTS: 1                    DIF: HARD                    REF: 344–346  
 OBJ: (11.10) Decision trees & real options—nonalgorithmic                    BLM: Analyze

44. Party Place is considering a new investment whose data are shown below. The equipment that would be used would have a constant annual capital cost allowance over the project’s 3-year life and a zero salvage value. This project would require some additional working capital that would be recovered at the end of the project’s life. Revenues and cash operating costs are expected to be constant over the project’s 3-year life. What is the project’s NPV? (Hint: Cash flows are constant in Years 1 to 3. CCA is modified to smooth out the calculations.)

WACC	10.0%
Net investment in fixed assets (basis)	\$65,000
Required new working capital	\$10,000
Annual capital cost allowance	\$21,665
Sales revenues, each year	\$70,000
Cash operating costs, each year	\$25,000
Tax rate	35.0%

- a. \$24,112  
 b. \$25,318  
 c. \$26,584  
 d. \$27,913

ANS: A

	t = 0	t = 1	t = 2	t = 3
Investment in fixed assets	WACC = 10%	-\$65,000		
Investment in net working capital	-\$10,000			
Sales revenues		\$70,000	\$70,000	\$70,000
– Cash Operating costs		25,000	25,000	25,000
– Modified CCA		<u>21,665</u>	<u>21,665</u>	<u>21,665</u>
Operating income (EBIT)			\$23,335	\$23,335
	\$23,335			
– Taxes	Rate = 35%	<u>8,167</u>	<u>8,167</u>	<u>8,167</u>
After-tax EBIT		\$15,168	\$15,168	\$15,168
+ modified CCA		<u>21,665</u>	<u>21,665</u>	<u>21,665</u>
Operating cash flow	-\$75,000	\$36,833	\$36,833	\$36,833
Recovery of working capital				<u>10,000</u>
Total cash flows	<u>-\$75,000</u>	<u>\$36,833</u>	<u>\$36,833</u>	<u>\$46,833</u>
PV@10%	-\$75,000	\$33,485	\$30,440	\$35,186
NPV = \$24,112				

PTS: 1                    DIF: HARD                    REF: 324–334  
 OBJ: (Comp: 11.1–11.4) NPV, constant CCA, constant CFs, WC  
 BLM: Analyze



45. Majestic Theaters is considering investing in some new projection equipment whose data are shown below. The required equipment has a 7-year project life falling into a CCA class of 30%, but it would have a positive pre-tax salvage value at the end of Year 7. Also, some new working capital would be required, but it would be recovered at the end of the project's life. Revenues and cash operating costs are expected to be constant over the project's 7-year life. What is the project's NPV?

WACC	12.0%
Net capital investment in fixed assets	\$950,000
Required new working capital	\$30,000
Sales revenues, each year	\$580,000
Cash operating costs, each year	\$330,000
Expected pretax salvage value	\$50,000
Tax rate	35.0%

- a. \$13,965  
 b. \$15,226  
 c. \$16,910  
 d. \$17,882

ANS: C

WACC = 10%	t = 0	t = 1	t = 6	t = 7
Investment in fixed assets		-\$950,000		
Investment in net working capital	-30,000			
Sales revenues		\$580,000	\$580,000	\$580,000
- Cash operating costs		330,000	330,000	330,000
Project Operating income (EBDIT)		\$250,000	\$250,000	\$250,000
- Taxes		87,500	87,500	87,500
Project cash flow after-tax			\$162,500	\$162,500
		\$162,500		
+ salvage value				50,000
+ return of NWC				30,000
				\$242,500

Use financial calculator to find the present value of the project's net cash flows = \$741,610 with N=7, I/Y=12, PMT=162,500, FV=0.

The present value of CCA tax shield is \$219,122.

$$\left[ \frac{(950,000)(0.3)(0.35)}{0.12 + 0.3} \right] \left[ \frac{1 + (0.5)(0.12)}{1 + 0.12} \right] - \left[ \frac{(50,000)(0.3)(0.35)}{0.12 + 0.3} \right] \left[ \frac{1}{(1 + 0.12)^7} \right] = \$219,112$$

The present value of the ending cash flows is \$36,188.

$$\left[ \frac{50,000 + 30,000}{(1 + 0.12)^7} = \frac{80,000}{(1.12)^7} \right] = \$36,188$$

$$\text{NPV}@12\% = 741,610 + 219,112 + 36,188 - 980,000 = \$16,910$$

PTS: 1 DIF: HARD REF: 324-334

OBJ: (Comp: 11.1-11.4) NPV, constant CFs, WC, SV

BLM: Analyze

## CHAPTER 12—CAPITAL STRUCTURE DECISIONS

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### TRUE/FALSE

1. Different borrowers have different risks of bankruptcy, and bankruptcy is costly to lenders. Therefore, lenders charge higher rates to borrowers judged to be more at risk of going bankrupt.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 360  
OBJ: (12.1) Bankruptcy costs

2. A firm's business risk is largely determined by the financial characteristics of its industry, especially by the amount of debt the average firm in the industry uses.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 361–362  
OBJ: (12.2) Business risk

3. Financial risk refers to the extra risk shareholders bear as a result of using debt as compared with the risk they would bear if no debt were used.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 364–366  
OBJ: (12.2) Financial risk

4. A firm's financial risk has identifiable market risk and diversifiable risk components.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 364–366  
OBJ: (12.2) Financial risk

5. A firm's capital structure does not affect its calculated free cash flows, because FCF reflects only operating cash flows.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 364–366  
OBJ: (12.2) Financial risk

6. Whenever a firm borrows money, it is using financial leverage.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 362–364  
OBJ: (12.2) Financial leverage

7. The graphical probability distribution of ROE for a firm that uses financial leverage would tend to be more peaked than the distribution if the firm used no leverage, other things held constant.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 362–364  
OBJ: (12.2) Use of financial leverage

8. Provided a firm does not use an extreme amount of debt, financial leverage typically affects both EPS and EBIT, while operating leverage affects only EBIT.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 362–364  
OBJ: (12.2) Operating and financial leverage

9. The benefit of an interest tax shield is captured by the equity holders, not the debtholders.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 370–371  
OBJ: (12.3) Interest tax shield

10. In a world with no taxes, MM shows that a firm's capital structure does not affect the firm's value. However, when taxes are considered, MM show a positive relationship between debt and value, i.e., its value rises as its debt is increased.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 370–371  
OBJ: (12.3) Taxes and capital structure

11. According to MM, in a world without taxes, the optimal capital structure for a firm is approximately 100% debt financing.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 370–371  
OBJ: (12.3) Taxes and capital structure

12. MM shows that in a world with taxes, a firm's optimal capital structure would be almost 100% debt.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 372–375  
OBJ: (12.3) MM models

13. MM shows that in a world without taxes, a firm's value is not affected by its capital structure.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 372–375  
OBJ: (12.3) MM models

14. The Miller model begins with the MM model with taxes and then adds personal taxes.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 375  
OBJ: (12.4) Miller model

15. The Miller model begins with the MM model without corporate taxes and then adds personal taxes.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 375  
OBJ: (12.4) Miller model

16. Other things held constant, an increase in financial leverage will increase a firm's market (or systematic) risk as measured by its beta coefficient.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 380  
OBJ: (12.6) Financial leverage

17. The trade-off theory states that the capital structure decision involves a tradeoff between the costs and benefits of debt financing.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 377–381  
OBJ: (12.6) Trade-off theory

18. Financial distress, agency costs, and direct and indirect bankruptcy costs affect a firm's target capital structure.

ANS: T                    PTS: 1                    DIF: MEDIUM                    REF: 359–361  
OBJ: (12.1) Capital structure issues

19. The bankruptcy risk produces an ambiguous effect on agency costs.

ANS: T                    PTS: 1                    DIF: MEDIUM        REF: 359–361  
OBJ: (12.1) Agency costs

20. If a firm utilizes debt financing, an X% decline in earnings before interest and taxes (EBIT) will result in a decline in earnings per share that is larger than X.

ANS: T                    PTS: 1                    DIF: MEDIUM        REF: 362–365  
OBJ: (12.2) Use of debt in financing

21. Firm A has a higher degree of business risk than Firm B. Firm A can offset this by using less financial leverage. Therefore, the variability of both firms' expected EBITs could actually be identical.

ANS: F                    PTS: 1                    DIF: MEDIUM        REF: 362–365  
OBJ: (12.2) Financial leverage

22. Although they operate in different industries, two firms have the same expected earnings per share and the same standard deviation of expected EPS. Thus, the two firms must have the same business risk.

ANS: F                    PTS: 1                    DIF: MEDIUM        REF: 364–365  
OBJ: (12.2) Business risk

23. It is possible that two firms could have identical financial and operating leverage yet have different degrees of risk as measured by the variability of EPS.

ANS: T  
If one firm's sales and earnings were more volatile than those of the other, it could have greater EPS variability in spite of identical financial and operating leverage.

PTS: 1                    DIF: MEDIUM        REF: 362–365  
OBJ: (12.2) Operating and financial leverage

24. If Miller and Modigliani had incorporated the costs of bankruptcy into their model, it is unlikely that they would have concluded that 100% debt financing is optimal.

ANS: T                    PTS: 1                    DIF: MEDIUM        REF: 370–374  
OBJ: (12.3) Bankruptcy costs

25. The MM model with corporate taxes is the same as the Miller model, but with zero personal taxes.

ANS: T                    PTS: 1                    DIF: MEDIUM        REF: 372–375  
OBJ: (12.3) MM models

26. The MM model is the same as the Miller model, but with zero corporate taxes.

ANS: F                    PTS: 1                    DIF: MEDIUM        REF: 372–375  
OBJ: (12.3) MM models

27. A firm's financial policy drives its equity beta.

ANS: T                    PTS: 1                    DIF: MEDIUM        REF: 370–375  
OBJ: (12.3) Equity beta

28. The MM model employs the concept of arbitrage to develop its theory.
- ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 367–370  
OBJ: (12.3) MM model
29. The presence of personal taxes completely eliminates the benefits of debt financing.
- ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 375  
OBJ: (12.4) MM extension with personal taxes
30. As a firm approaches bankruptcy, the indirect costs of bankruptcy (e.g., financial distress) will tend to increase.
- ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 377–378  
OBJ: (12.5) Bankruptcy costs
31. Firms having positive prospects try to raise new equity capital by selling new stocks.
- ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 378–379  
OBJ: (12.5) Signalling theory
32. During a recession, companies with a significant portion of their capital structure in the form of debt (i.e., high leverage) often struggle to meet their legally binding interest obligations.
- ANS: T                      PTS: 1                      DIF: EASY                      REF: 358  
OBJ: (Introduction) Financial leverage
33. During a recession, companies with a significant portion of their capital structure in the form of common share equity (i.e., low leverage) often struggle to provide a continuous stream of dividend income to their shareholders.
- ANS: F                      PTS: 1                      DIF: EASY                      REF: 358  
OBJ: (Introduction) Financial leverage

## MULTIPLE CHOICE

1. On which of the following items will an increase in the debt ratio generally have no effect?
- business risk
  - total risk
  - financial risk
  - market risk
- ANS: A                      PTS: 1                      DIF: EASY                      REF: 361–362  
OBJ: (12.2) Business risk                      BLM: Remember
2. Business risk is affected by a firm's operations. Which of the following is NOT associated with (or does not contribute to) business risk?
- demand variability
  - input price variability
  - the extent to which operating costs are fixed
  - the extent to which interest rates on the firm's debt fluctuate
- ANS: D                      PTS: 1                      DIF: EASY                      REF: 361–362  
OBJ: (12.2) Business risk                      BLM: Remember

3. Which event is likely to encourage a company to raise its target debt ratio, other things held constant?
- an increase in the corporate tax rate
  - an increase in the personal tax rate
  - an increase in the company's operating leverage
  - the company's stock price hitting a new high

ANS: A                      PTS: 1                      DIF: EASY                      REF: 364–366  
OBJ: (12.2) Target debt ratio                      BLM: Understand

4. Which of the following would *increase* the likelihood that a company would increase its debt ratio, other things held constant?
- an increase in costs incurred when filing for bankruptcy
  - an increase in the corporate tax rate
  - an increase in the personal tax rate
  - the company's stock price hitting a new low

ANS: B                      PTS: 1                      DIF: EASY                      REF: 364–366  
OBJ: (12.2) Leverage and capital structure                      BLM: Understand

5. Which of the following statements best describes WACC?
- Since debt financing raises the firm's financial risk, increasing a company's debt ratio will always increase its WACC.
  - Since debt financing is cheaper than equity financing, raising a company's debt ratio will always reduce its WACC.
  - Increasing a company's debt ratio will typically reduce the marginal cost of both debt and equity financing. However, this action still may raise the company's WACC.
  - Increasing a company's debt ratio will typically increase the marginal cost of both debt and equity financing. However, this action still may lower the company's WACC.

ANS: D                      PTS: 1                      DIF: EASY                      REF: 364–366  
OBJ: (12.2) Capital structure and WACC                      BLM: Understand

6. Which of the following statements best describes capital structure?
- The capital structure that maximizes expected EPS also maximizes the price per share of common shares.
  - The capital structure that minimizes the interest rate on debt also maximizes the expected EPS.
  - The capital structure that minimizes the required return on equity also maximizes the share price.
  - The capital structure that minimizes the WACC also maximizes the price per share of common shares.

ANS: D                      PTS: 1                      DIF: EASY                      REF: 370–374  
OBJ: (12.3) Optimal capital structure                      BLM: Understand

7. Based on the information below, what is Ezzel Enterprises' optimal capital structure?
- Debt = 40%; Equity = 60%; EPS = \$2.95; Common share price = \$26.50
  - Debt = 50%; Equity = 50%; EPS = \$3.05; Common share price = \$28.90
  - Debt = 60%; Equity = 40%; EPS = \$3.18; Common share price = \$31.20
  - Debt = 80%; Equity = 20%; EPS = \$3.42; Common share price = \$30.40

ANS: C                      PTS: 1                      DIF: EASY                      REF: 370–374  
OBJ: (12.3) Optimal capital structure                      BLM: Understand

8. Which statement best describes the optimal capital structure?
- The optimal capital structure is the mix of debt, equity, and preferred stock that maximizes the company's earnings per share (EPS).
  - The optimal capital structure is the mix of debt, equity, and preferred stock that maximizes the company's stock price.
  - The optimal capital structure is the mix of debt, equity, and preferred stock that minimizes the company's cost of equity.
  - The optimal capital structure is the mix of debt, equity, and preferred stock that minimizes the company's cost of debt.

ANS: B                      PTS: 1                      DIF: EASY                      REF: 370–374  
OBJ: (12.3) Optimal capital structure                      BLM: Remember

9. Volga Publishing is considering a proposed increase in its debt ratio, which would also increase the company's interest expense. The plan would involve issuing new bonds and using the proceeds to buy back shares of its common stock. The company's CFO thinks the plan will not change total assets or operating income but that it will increase earnings per share (EPS). Assuming the CFO's estimates are correct, which of the following statements is correct?
- Since the proposed plan increases Volga's financial risk, the company's share price still might fall even if EPS increases.
  - If the plan reduces the WACC, the share price is also likely to decline.
  - Since the plan is expected to increase EPS, this implies that net income is also expected to increase.
  - If the plan does increase the EPS, the share price will automatically increase at the same rate.

ANS: A                      PTS: 1                      DIF: EASY                      REF: 370–374  
OBJ: (12.3) Financial leverage and EPS                      BLM: Understand

10. Which statement best describes optimal capital structure?
- As a rule, the optimal capital structure is found by determining the debt–equity mix that maximizes expected EPS.
  - The optimal capital structure simultaneously maximizes EPS and minimizes the WACC.
  - The optimal capital structure simultaneously minimizes the cost of debt, the cost of equity, and the WACC.
  - The optimal capital structure simultaneously maximizes common share price and minimizes the WACC.

ANS: D                      PTS: 1                      DIF: EASY | MEDIUM  
REF: 370–374                      OBJ: (12.3) Optimal capital structure                      BLM: Remember

11. What should the firm's target capital structure be set to do?
- Maximize the earnings per share (EPS).
  - Minimize the cost of debt ( $r_d$ ).
  - Minimize the cost of equity ( $r_s$ ).
  - Minimize the weighted average cost of capital (WACC).

ANS: D                      PTS: 1                      DIF: EASY | MEDIUM  
REF: 370–374                      OBJ: (12.3) Target capital structure                      BLM: Remember

12. Which of the following statements regarding risk, or the avoidance of risk, is correct?
- A firm's business risk is determined solely by the financial characteristics of its industry.
  - Risk due to industry characteristics is beyond the control of the firm's management.
  - One of the benefits to a firm of being at or near its target capital structure is that this eliminates any risk of bankruptcy.

d. A firm's financial risk can be minimized by diversification.

ANS: B                      PTS: 1                      DIF: EASY | MEDIUM

REF: 361–362 | 370–374

OBJ: (Comp: 12.2, 12.3) Business & fin. risk & cap. struc.                      BLM: Understand

13. Suppose a firm increases the operating leverage used to produce a given quantity of output. What will this normally lead to?
- a decrease in the standard deviation of its expected EBIT
  - a decrease in its business risk
  - a decrease in the variability of its expected EPS
  - a reduction in its fixed assets turnover ratio

ANS: D

More operating leverage generally means a greater use of automation, which means more fixed assets. If fixed assets increase, but sales do not, then the fixed asset turnover (S/FA) will decline.

PTS: 1                      DIF: MEDIUM                      REF: 362–364                      OBJ: (12.2) Operating leverage

BLM: Understand

14. If debt financing is used, which of the following is correct?
- The percentage change in sales will be greater than the percentage change in EBIT, which in turn will be greater than the percentage change in net income.
  - The percentage change in net operating income will be equal to a given percentage change in net income.
  - The percentage change in net income relative to the percentage change in net operating income will depend on the interest rate charged on debt.
  - The percentage change in net income will be greater than the percentage change in net operating income.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 364–366

OBJ: (12.2) Use of financial leverage                      BLM: Understand

15. Which statement regarding debt is correct, other things held constant?
- Firms whose assets are relatively liquid tend to have relatively low bankruptcy costs; hence, they tend to use relatively little debt.
  - An increase in the personal tax rate is likely to increase the debt ratio of the average corporation.
  - An increase in the company's degree of operating leverage is likely to encourage a company to use more debt in its capital structure.
  - An increase in the corporate tax rate is likely to encourage a company to use more debt in its capital structure.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 364–366

OBJ: (12.2) Leverage and capital structure                      BLM: Understand

16. Other things held constant, which event is most likely to encourage a firm to increase the amount of debt in its capital structure?
- Its sales become less stable over time.
  - The costs that would be incurred in the event of bankruptcy increase.
  - Management believes that the firm's stock has become overvalued.
  - The corporate tax rate increases.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 364–366

OBJ: (12.2) Leverage and capital structure                      BLM: Understand



17. Reynolds Resorts is currently 100% equity financed. The CFO is considering a recapitalization plan under which the firm would issue long-term debt with a yield of 9% and use the proceeds to repurchase common stock. The recapitalization would not change the company's total assets, nor would it affect the firm's basic earning power, which is currently 15%. The CFO believes that this recapitalization would reduce the WACC and increase stock price. What would also be likely to occur if the company goes ahead with the recapitalization plan?
- The company's net income would increase.
  - The company's earnings per share would decline.
  - The company's cost of equity would increase.
  - The company's ROE would decline.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 364–366  
OBJ: (12.2) Leverage and capital structure                      BLM: Understand

18. In a perfect world of no taxes, which statement regarding MM propositions is true?
- According to proposition I, a firm is able to find its optimal capital structure.
  - Proposition II implies that an increase in leverage raises the risk of equity and thereby the required return on equity.
  - According to proposition II, changes in the capital mix of a firm will not affect the debt and equity values of the firm.
  - Proposition I states that the total firm value critically depends on capital structure.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 372–375  
OBJ: (12.3) MM model                      BLM: Understand

19. In a perfect world of no taxes, what happens if the weighted average cost of capital (WACC) is unaffected by the capital structure?
- MM proposition I holds.
  - MM proposition II holds.
  - SML is positively sloped.
  - SML is negatively sloped.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 372–375  
OBJ: (12.3) MM model                      BLM: Understand

20. With corporate taxes but no personal taxes, and without financial distress, what happens?
- An unlevered firm cannot benefit from increased leverage.
  - Equity costs decrease with more debt financing.
  - The optimal amount of leverage for a firm is 100% debt.
  - Debt costs increase with financial leverage.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 372–375  
OBJ: (12.3) MM model                      BLM: Understand

21. What is the major contribution of the Miller model?
- It demonstrates that personal taxes decrease the value of using corporate debt.
  - It demonstrates that financial distress and agency costs reduce the value of using corporate debt.
  - It demonstrates that equity costs increase with financial leverage.
  - It demonstrates that debt costs increase with financial leverage.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 375–376  
OBJ: (12.4) Miller model                      BLM: Remember

22. Which statement concerning capital structure theory is NOT true?
- The major contribution of Miller's theory is that it demonstrates that personal taxes decrease the value of using corporate debt.
  - Under MM with zero taxes, financial leverage has no effect on a firm's value.
  - Under MM with corporate taxes, the value of a levered firm exceeds the value of the unlevered firm by the product of the tax rate times the market value dollar amount of debt.
  - Under MM with corporate taxes,  $r_s$  increases with leverage, and this increase exactly offsets the tax benefits of debt financing.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 375–376  
OBJ: (12.4) MM and MillerBLM: Understand

23. Which statement concerning the MM extension with growth is incorrect?
- The value of a growing tax shield is greater than the value of a constant tax shield.
  - For a given D/E, the levered cost of equity is greater than the levered cost of equity under MM's original (with tax) assumptions.
  - For a given D/E, the WACC is less than the WACC under MM's original (with tax) assumptions.
  - The total value of the firm increases with the amount of debt.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 377–381  
OBJ: (12.6) MM extension with growth                      BLM: Understand

24. What is likely to happen in the MM model with a high risk of bankruptcy?
- almost 100% debt financing
  - valuable projects are foregone to preserve cash
  - wasteful expenditures are often found
  - management buys back shares from the open market

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 377–381  
OBJ: (12.6) MM model with bankruptcy                      BLM: Understand

25. Which of the following statements is correct?
- A firm can use retained earnings without paying a flotation cost. Therefore, while the cost of retained earnings is not zero, its cost is generally lower than the after-tax cost of debt.
  - The capital structure that minimizes a firm's weighted average cost of capital is also the capital structure that maximizes its stock price.
  - The capital structure that minimizes the firm's weighted average cost of capital is also the capital structure that maximizes its earnings per share.
  - If a firm finds that the cost of debt is less than the cost of equity, increasing its debt ratio must reduce its WACC.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 361–366 | 372–375  
OBJ: (Comp: 12.2, 12.3) Capital structure and WACC                      BLM: Understand

26. Which of the following statements is correct?
- The capital structure that maximizes the common share price is also the capital structure that minimizes the WACC.
  - The capital structure that maximizes the common share price is also the capital structure that maximizes earnings per share.
  - Increasing a company's debt ratio will typically reduce the marginal costs of both debt and equity financing; however, this still may raise the company's WACC.
  - Increasing personal tax rate but decreasing corporate tax rate would encourage companies to increase their debt ratios.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 361–366 | 381–383  
OBJ: (Comp: 12.2, 12.7) Capital structure, WACC, and EPS                      BLM: Understand

27. Which of the following statements is correct?
- In general, a firm with low operating leverage also has a small proportion of its total costs in the form of fixed costs.
  - There is no reason to think that changes in the personal tax rate would affect firms' capital structure decisions.
  - A firm with high business risk is more likely to increase its use of financial leverage than a firm with low business risk, assuming all else is equal.
  - If a firm's after-tax cost of equity exceeds its after-tax cost of debt, it can always reduce its WACC by increasing its use of debt.

ANS: A                      PTS: 1                      DIF: MEDIUM | HARD  
REF: 383–385                      OBJ: (12.8) Miscellaneous capital structure concepts  
BLM: Understand

28. The CFO of Google believes that its greatest strategic goal is to maintain flexibility. To achieve this goal, which of the following financial structures is in place at Google?
- Google has issued significantly more long-term debt than equity (common shares) because debt has a significantly lower after-tax cost.
  - Google has issued significantly more equity (common shares) to avoid the restrictions that debt would impose through restrictive covenants.
  - Google holds large amounts of cash and short-term investments in spite of the opportunity loss resulting from low investment earnings.
  - Google maintains a dividend payout ratio in line with other firms in the industry to ensure that its common shares are attractive to investors.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 382  
OBJ: (12.7) Capital structure                      BLM: Understand

29. Which of the following statements is correct?
- If corporate tax rates were decreased while other things were held constant, and if the Modigliani–Miller tax-adjusted trade-off theory of capital structure were correct, this would tend to cause corporations to decrease their use of debt.
  - A change in the personal tax rate should not affect firms' capital structure decisions.
  - "Business risk" is differentiated from "financial risk" by the fact that financial risk reflects only the use of debt, while business risk reflects both the use of debt and such factors as sales variability, cost variability, and operating leverage.
  - The optimal capital structure is the one that simultaneously (1) maximizes the price of the firm's stock, (2) minimizes its WACC, and (3) maximizes its EPS.

ANS: A                      PTS: 1                      DIF: MEDIUM | HARD  
REF: 383–385                      OBJ: (12.8) Miscellaneous capital structure concepts  
BLM: Evaluate

30. Which of the following statements is correct?
- Generally, debt-to-total-assets ratios do not vary much among different industries, although they do vary among firms within a given industry.
  - Electric utilities generally have very high common equity ratios because their revenues are more volatile than those of firms in most other industries.
  - Prescription drug companies generally have high debt-to-equity ratios because their earnings are very stable, and therefore they can cover the high interest costs associated with high debt levels.
  - Wide variations in capital structures exist both between industries and among individual

firms within given industries. These differences are caused by differing business risks and also managerial attitudes.

ANS: D                      PTS: 1                      DIF: HARD                      REF: 381–383  
 OBJ: (12.7) Variations in capital structures                      BLM: Evaluate

31. Elephant Books sells paperback books for \$7 each. The variable cost per book is \$5. At current annual sales of 200,000 books, the publisher is just breaking even. It is estimated that if the authors' royalties are reduced, the variable cost per book will drop by \$1. Assume authors' royalties are reduced and sales remain constant; how much more money can the publisher put into advertising (a fixed cost) and still break even?
- \$600,000
  - \$466,667
  - \$333,333
  - \$200,000

ANS: D  
 $\$7(200,000) - \$5(200,000) - F = 0; F = \$400,000$   
 $\$7(200,000) - \$4(200,000) - F = 0; F = \$600,000$   
 $\$600,000 - \$400,000 = \$200,000.$

PTS: 1                      DIF: EASY                      REF: 361–366  
 OBJ: (12.2) Break-even point—nonalgorithmic                      BLM: Understand

32. DeLong Inc. has fixed operating costs of \$470,000, variable costs of \$2.80 per unit produced, and its products sell for \$4.00 per unit. What is the company's break-even point, i.e., at what unit sales volume would income equal costs?
- 391,667
  - 411,250
  - 431,813
  - 453,403

ANS: A  

Fixed operating costs	\$470,000
Variable costs per unit	\$2.80
Sales price per unit	\$4.00
Break-even volume (units) = $FC/(P - VC) =$	391,667

PTS: 1                      DIF: EASY | MEDIUM                      REF: 361–366  
 OBJ: (12.2) Break-even analysis                      BLM: Analyze

33. Senbet Ventures is considering starting a new company to produce stereos. The sales price would be set at 1.5 times the variable cost per unit; the VC/unit is estimated to be \$2.50; and fixed costs are estimated at \$120,000. What sales volume would be required in order to break even, i.e., to have an EBIT of zero for the stereo business?
- 86,640
  - 91,200
  - 96,000
  - 100,800

ANS: C  

VC/unit	\$2.50
Price multiple over VC	1.50
Price	\$3.75
Fixed costs	\$120,000

$$\text{Break-even volume (units)} = \text{FC}/(\text{P} - \text{VC}) = 96,000$$

PTS: 1                      DIF: EASY | MEDIUM                      REF: 361–366  
 OBJ: (12.2) Break-even analysis                      BLM: Analyze

34. Vu Enterprises expects to have the following data during the coming year. What is Vu's expected ROE?

Assets	\$200,000	Interest rate	8%
D/A	65%	Tax rate	40%
EBIT	\$25,000		

- a. 12.51%  
 b. 13.14%  
 c. 13.80%  
 d. 14.49%

ANS: A

Assets	\$200,000
D/A	65%
EBIT	\$25,000
Interest rate	8%
Tax rate	40%

EBIT	\$25,000
Interest	<u>10,400</u>
EBT	\$14,600
Tax	<u>5,840</u>
NI	<u>\$ 8,760</u>

$$\text{ROE} = \text{NI available to common}/\text{Common equity}$$

$$\text{ROE} = 12.51\%$$

PTS: 1                      DIF: MEDIUM                      REF: 364–366                      OBJ: (12.2) Debt's effect on ROE  
 BLM: Analyze

35. The Congress Company has identified two methods for producing playing cards. One method involves using a machine having a fixed cost of \$10,000 and variable costs of \$1.00 per deck of cards. The other method would use a less expensive machine (fixed cost = \$5,000), but with greater variable costs (\$1.50 per deck of cards). If the selling price per deck of cards is the same under each method, at what level of output will the two methods produce the same net operating income (EBIT)?
- a. 5,000 decks  
 b. 10,000 decks  
 c. 15,000 decks  
 d. 20,000 decks

ANS: B

$$\text{Total cost Method 1} = \$1.00Q + \$10,000$$

$$\text{Total cost Method 2} = \$1.50Q + \$5,000$$

Set equal and solve for Q:

$$Q + \$10,000 = \$1.50Q + \$5,000; \$5,000 = \$0.5Q; 10,000 = Q.$$

PTS: 1                      DIF: MEDIUM                      REF: 362–364

OBJ: (12.2) Net operating income—nonalgorithmic

BLM: Analyze

36. Ang Enterprises has a levered beta of 1.10, its capital structure consists of 40% debt and 60% equity, and its tax rate is 40%. What would Ang's beta be if it used no debt, i.e., what is its unlevered beta?
- 0.67
  - 0.71
  - 0.75
  - 0.79

ANS: D

$b_L$	1.10
D/A	0.40
Tax rate	40%
$D/E = (D/A)/(1 - D/A)$	0.67
$b_U = b_L/(1 + (D/E) \times (1 - T))$	0.79

PTS: 1                      DIF: MEDIUM              REF: 370–375

OBJ: (12.3) Calculating the unlevered beta              BLM: Analyze

37. ABC Co. has an asset beta of 1.05 and a debt beta of 0.8. Target debt-to-equity (D/E) ratio is 0.6. With no taxes, what is the equity beta?
- 1.20
  - 1.05
  - 0.90
  - 0.65

ANS: A

D/E = 0.6 implies D = 0.6E. D/TA = 0.6/1.6 = 0.375. It follows  $E/D + E = 0.625$   
 $1.05 = (0.375)(0.8) + (0.625)(\beta_e)$ .  $\beta_e = 1.2$

PTS: 1                      DIF: MEDIUM              REF: 370–375

OBJ: (12.3) Calculating the equity beta              BLM: Analyze

38. What is the amount of annual interest tax shield for a firm with \$3 million in debt that pays 12% interest if the corporate tax rate is 35%?
- \$126,000
  - \$234,000
  - \$360,000
  - \$1,050,000

ANS: A

Annual interest payment =  $(0.12)(\$3m) = \$0.36m$   
Annual interest tax shield =  $(0.35)(\$0.36m) = \$0.126m$

PTS: 1                      DIF: MEDIUM              REF: 372–375              OBJ: (12.3) MM model

BLM: Analyze

39. If the value of a levered firm is \$5 million, what is the value of the same firm with all-equity financing?
- \$7 million
  - \$6 million
  - \$5 million
  - \$4 million

ANS: D

No calculation is required. With the corporate taxes,  $V_L = V_U + T_c \times D$  shows that the value of a levered firm will always be greater than the value of the same firm with all-equity financing.

PTS: 1                      DIF: MEDIUM      REF: 372–375      OBJ: (12.3) MM model  
BLM: Analyze

40. Suppose a firm has a debt-to-equity ratio (D/E) of 0.5, return on assets of 18%, and return on debt of 12%. What will its return on equity be?
- 15.00%
  - 16.67%
  - 20.00%
  - 21.17%

ANS: C

$$r_{\text{equity}} = 0.18 + \left(\frac{1}{3}\right)(0.18 - 0.12) = 0.2$$

PTS: 1                      DIF: MEDIUM      REF: 372–375      OBJ: (12.3) Equity return  
BLM: Analyze

41. Suppose the corporate tax rate is 34%, personal tax rate on interest income is 10%, and personal tax rate on equity income is 50%. How much value will leverage add to the unlevered firm per dollar of debt?
- −\$0.188
  - \$0.340
  - \$0.500
  - \$0.633

ANS: D

$$1 - \frac{(1 - T_c)(1 - T_s)}{1 - T_d} = 1 - \frac{(1 - 0.34)(1 - 0.5)}{(1 - 0.1)} = 0.633$$

PTS: 1                      DIF: MEDIUM      REF: 375–376  
OBJ: (12.4) MM extension with personal taxes                      BLM: Analyze

42. Suppose that the personal tax rate on income from bonds is 34%, and the personal tax rate on income from stocks is 20%. What is the critical corporate tax rate below which leverage will add no value to the unlevered firm per dollar of debt?
- 32.4%
  - 25.8%
  - 17.5%
  - 15.0%

ANS: C

$$1 - \frac{(1 - T_c)(1 - T_s)}{1 - T_d} \Rightarrow 1 = \frac{(1 - T_c)(1 - 0.2)}{(1 - 0.34)} \Rightarrow (1 - T_c) = 0.825 \therefore T_c = 0.175$$

PTS: 1                      DIF: MEDIUM      REF: 375  
OBJ: (12.4) MM extension with personal taxes                      BLM: Analyze

43. What is the value of the firm according to MM with corporate taxes?
- \$475,875

- b. \$528,750
- c. \$587,500
- d. \$646,250

ANS: C

EBIT: \$100,000  $r_d$ : 12%  $T_c$ : 30%

Debt: \$500,000  $r_{sU}$ : 16%

$$V_U = \text{EBIT}(1 - T)/r_{sU} = \$100,000(0.7)/0.16 = \$437,500$$

$$V_L = V_U + TD = \$437,500 + 0.3(\$500,000) = \$587,500$$

PTS: 1                      DIF: EASY                      REF: 373-375

OBJ: (12.3) MM with corporate tax                      BLM: Analyze

44. What is the firm's cost of equity?

- a. 23.3%
- b. 25.9%
- c. 28.8%
- d. 32.0%

ANS: D

First, note that the leveraged value of the firm is \$587,500 as found in Problem 74. Note also that the firm has \$500,000 of debt. Therefore, the value of its equity must be \$87,500. Using these data, we find the leveraged cost of equity as follows:

$$r_{sL} = r_{sU} + (r_{sU} - r_d)(1 - T)(D/S) = 16\% + (16\% - 12\%)(0.7)(\$500,000/\$87,500) = 32.0\%$$

PTS: 1                      DIF: EASY                      REF: 373-375

OBJ: (12.3) MM with corporate tax                      BLM: Analyze

45. Assume that the firm's gain from leverage according to the Miller model is \$126,667. If the effective personal tax rate on stock income is  $T_s = 20\%$ , what is the implied personal tax rate on debt income?

- a. 18.2%
- b. 20.2%
- c. 22.5%
- d. 25.0%

ANS: D

$T_c$ : 30%

Gain from leverage: \$126,667

$T_s$ : 20%

Debt: \$500,000

$$[1 - (1 - T_c)(1 - T_s)/(1 - T_d)]D = \$126,667$$

$$[1 - (0.7)(0.8)/X]\$500,000 = \$126,667$$

$$1 - 0.56/X = 0.25333$$

$$0.56/X = 0.74667$$

$$X = 0.75000$$

$$1 - T_d = 0.75000$$

$$T_d = 25.00\%$$

$$(1 - T_c) = 0.70$$

$$(1 - T_s) = 0.80$$

$$(1 - T_c) \times (1 - T_s) = 0.56$$

$$\text{Gain/Debt} = 0.25333$$

$$\text{Gain/Debt} - 1 = -0.74667$$

$$X = -0.56/-0.74666 = 0.75000$$

$$X = 1 - T_d$$

$$T_d = 0.25000$$

PTS: 1                      DIF: HARD                      REF: 373-375

OBJ: (12.4) Miller model with personal taxes

BLM: Analyze



46. A group of venture investors is considering putting money into Lemma Books, which wants to produce a new reader for electronic books. The variable cost per unit is estimated at \$250, the sales price would be set at twice the VC/unit, fixed costs are estimated at \$750,000, and the investors will put up the funds if the project is likely to have an operating income of \$500,000 or more. What sales volume would be required in order to meet this profit goal?
- 4,513
  - 4,750
  - 5,000
  - 5,250

ANS: C

VC/unit	\$250
Price multiple over VC	2
Price	\$500
Fixed costs	\$750,000
Profit target	\$500,000
Volume (units) to meet profit goal = $(FC + Profit)/(P - VC) =$	5,000
Check: Op profit = $(P - VC) \times Units - FC =$	\$500,000

PTS: 1                      DIF: MEDIUM | HARD                      REF: 361–366  
 OBJ: (12.2) EBIT and setting the price                      BLM: Analyze

47. Firms HD and LD are identical except for their level of debt and the interest rates they pay on debt—HD has more debt and pays a higher interest rate on that debt. Based on the data given below, what is the difference between the two firms' ROEs?

<u>Applicable to Both Firms</u>		<u>Firm HD's Data</u>		<u>Firm LD's Data</u>	
Assets	\$200	Debt ratio	50%	Debt ratio	30%
EBIT	\$40	Interest rate	12%	Interest rate	10%
Tax rate	35%				

- 2.18%
- 2.29%
- 2.41%
- 2.54%

ANS: C

<u>Applicable to Both Firms</u>		<u>Firm HD's Data</u>		<u>Firm LD's Data</u>	
Assets	\$200	Debt ratio	50%	Debt ratio	30%
EBIT	\$40	Interest rate	12%	Interest rate	10%
Tax rate	35%				
Debt =		\$100.0		\$60.0	
Interest = I =		\$12.0		\$6.0	
Taxable income = EBIT - I =		\$28.0		\$34.0	
NI = (Taxable Income)(1 - T) =		\$18.2		\$22.1	
Equity = A - Debt =		\$100.0		\$140.0	
ROE = NI/Equity =		18.20%		15.79%	
Difference in ROEs =		2.41%			

PTS: 1                      DIF: MEDIUM | HARD                      REF: 361–366  
 OBJ: (12.2) Differences in ROE                      BLM: Analyze

48. Lauterbach Corporation uses no debt, has a beta of 1.10, and its tax rate is 40%. However, the CFO is considering moving to a capital structure with 30% debt and 70% equity. The risk-free rate is 5.0% and the market risk premium is 6.0%. By how much would the firm's cost of equity change as a result of altering its capital structure?
- 1.53%
  - 1.70%
  - 1.87%
  - 2.05%

ANS: B

$b_U =$	1.10
Target Debt % =	30%
Target D/E =	0.43
T =	40%
$b_L = b_U \times (1 + (D/E) \times (1 - T))$	1.38
$r_{RF} =$	5.00%
$RP_M =$	6.00%
$r_{sU} = r_{RF} + b_U(RP_M) =$	11.60%
$r_{sL} = r_{RF} + b_L(RP_M) =$	13.30%
Change in equity cost =	1.70%

PTS: 1                      DIF: HARD                      REF: 370–374

OBJ: (12.3) Calculating levered beta and cost of equity                      BLM: Analyze

49. Vafeas Inc.'s capital structure consists of 80% debt and 20% common equity, it has a beta of 1.60, and its tax rate is 35%. However, the CFO thinks the company has too much debt, and he is considering moving to a capital structure with 40% debt and 60% equity. The risk-free rate is 5.0% and the market risk premium is 6.0%. By how much would the firm's cost of equity change as a result of altering its capital structure?
- 5.20%
  - 5.78%
  - 6.36%
  - 6.99%

ANS: B

$b_L =$	1.60
Current Debt%	80%
Target Debt%	40%
Current D/E = $D\% / (1 - D\%)$	4.00
Target D/E = $D\% / (1 - D\%)$	0.67
Tax rate =	35%
$b_U = b_L / (1 + (D/E)(1 - T))$	0.4444
new $b_L = b_U \times (1 + (D/E) \times (1 - T))$	0.6370
$r_{RF} =$	5.00%
$RP_M$	6.00%
$r_{s\ 80\% D} = r_{RF} + b_{80\% D}(RP_M) =$	14.60%
$r_{s\ 40\% D} = r_{RF} + b_{40\% D}(RP_M) =$	8.82%
Change in equity cost	-5.78%

PTS: 1                      DIF: HARD                      REF: 370–374

OBJ: (12.3) Calculating levered beta and cost of equity                      BLM: Analyze



OBJ: (13.11) Stock dividends and splits

9. A reverse split reduces the number of shares outstanding.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 414

OBJ: (13.11) Reverse split

10. Underlying the dividend irrelevance theory proposed by Miller and Modigliani is their argument that the value of the firm is determined only by its basic earning power and its business risk.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 397

OBJ: (13.1) Dividend irrelevance

11. One implication of the bird-in-the-hand theory of dividends is that a given reduction in dividend yield must be offset by a more than proportionate increase in growth in order to keep a firm's required return constant, other things held constant.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 398

OBJ: (13.1) Dividend-growth tradeoff

12. If the information content, or signalling, hypothesis is correct, then changes in dividend policy can have an important effect on the firm's value and capital costs.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 401–402

OBJ: (13.3) Signalling hypothesis

13. If management wants to maximize its stock price, and if it believes that the dividend irrelevance theory is correct, then it must adhere to the residual distribution policy.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 402–403

OBJ: (13.5) Residual distribution policy

14. If the shape of the curve depicting a firm's WACC versus its debt ratio is more like a sharp "V," as opposed to a shallow "U," it will be easier for the firm to maintain a steady dividend in the face of varying investment opportunities or earnings from year to year.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 412–403

OBJ: (13.10) WACC and dividend policy

15. Avoiding dividend cuts and maintaining target D/E ratio are the two underlying objectives in the residual dividend policy.

ANS: T

Residual theory of dividends proposes that the dividends paid out should be the residual cash flow that remains only after the firm has taken care of all its investment requirements.

PTS: 1                      DIF: MEDIUM                      REF: 403                      OBJ: (13.5) Residual model

16. Share repurchases result in a decrease in EPS.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 407

OBJ: (13.7) Share repurchases

17. Even if a stock split has no information content, and even if the dividend per share adjusted for the split is not increased, there can still be a real benefit (i.e., a higher value for shareholders) from such a split, but any such benefit is probably small.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 414  
OBJ: (13.11) Stock splits

### MULTIPLE CHOICE

1. Which of the following theories is supported by the argument that shareholders can transform a company dividend policy into a different policy by means of investors buying and selling on their own account?
- “bird-in-the-hand” theory
  - dividend irrelevance theory
  - residual distribution model
  - tax preference theory

ANS: B                      PTS: 1                      DIF: EASY                      REF: 396–398  
OBJ: (13.1) Dividend irrelevance                      BLM: Higher Order

2. In the real world, which statement regarding dividends is true?
- They are usually more stable than earnings.
  - They fluctuate more widely than earnings.
  - They tend to be a lower percentage of earnings for mature firms.
  - They are usually changed every year to reflect earnings changes, and these changes are randomly higher or lower, depending on whether earnings increased or decreased.

ANS: A                      PTS: 1                      DIF: EASY                      REF: 402  
OBJ: (13.4) Dividend payout                      BLM: Higher Order

3. A company planning to pay a cash dividend in excess of the regular dividend does not want investors to believe that such an extra dividend will be repeated. What will the firm likely call this extra dividend?
- a stock dividend
  - a cash-liquidating dividend
  - a special dividend
  - a residual dividend

ANS: C  
Special dividends are dividends paid in addition to the regular dividend. With good reasons, firms do not want to incorporate this amount into their regular dividend.

PTS: 1                      DIF: EASY                      REF: 405                      OBJ: (13.6) Dividend payout  
BLM: Higher Order

4. What is the chronology of a dividend payment?
- declaration date, holder-of-record date, ex-dividend date, payment date
  - declaration date, ex-dividend date, holder-of-record date, payment date
  - declaration date, holder-of-record date, payment date, ex-dividend date
  - holder-of-record date, declaration date, ex-dividend date, payment date

ANS: B                      PTS: 1                      DIF: EASY                      REF: 406  
OBJ: (13.6) Dividend payment procedures                      BLM: Remember

5. You own 100 shares of Troll Brothers stock, which currently sells for \$120 a share. The company is contemplating a 2-for-1 stock split. What will your position be after such a split takes place?
- You will have 200 shares of stock, and the stock will trade at or near \$120 a share.
  - You will have 200 shares of stock, and the stock will trade at or near \$60 a share.
  - You will have 50 shares of stock, and the stock will trade at or near \$120 a share.
  - You will have 50 shares of stock, and the stock will trade at or near \$60 a share.

ANS: B                      PTS: 1                      DIF: EASY                      REF: 413–414  
OBJ: (13.11) Stock splits                      BLM: Higher Order

6. Myron Gordon and John Lintner believe that the required return on equity increases as the dividend payout ratio is decreased. On which assumption is their argument based?
- that investors require that the dividend yield and capital gains yield equal a constant
  - that capital gains are taxed at a higher rate than dividends
  - that investors view dividends as being less risky than potential future capital gains
  - that investors value a dollar of expected capital gains more highly than a dollar of expected dividends because of the lower tax rate on capital gains

ANS: C                      PTS: 1                      DIF: EASY                      REF: 398  
OBJ: (13.1) Dividends versus capital gains                      BLM: Remember

7. Which circumstance should NOT influence a firm's dividend policy decision?
- the firm's ability to accelerate or delay investment projects
  - a strong preference by most shareholders for current cash income versus capital gains
  - Constraints imposed by the firm's bond indenture
  - the fact that much of the firm's equipment has been leased, rather than bought and owned

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 400 | 411 | 413  
OBJ: (Comp. 13.1, 13.2, 13.9, 13.10) Optimal dividend policy                      BLM: Higher Order

8. Which statement about dividend policies is correct?
- Modigliani and Miller argue that investors prefer dividends to capital gains because dividends are more certain than capital gains. They call this the bird-in-the hand effect.
  - One advantage of dividend reinvestment plans is that they allow shareholders to avoid paying taxes on the dividends that they choose to reinvest.
  - The key advantage of a residual dividend policy is that it enables a company to follow a stable dividend policy.
  - The clientele effect suggests that companies should follow a stable dividend policy.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 398 | 402 | 404 | 415  
OBJ: (Comp. 13.1, 13.4, 13.5, 13.12) Dividend theories                      BLM: Remember

9. Which statement about dividend policies is correct?
- Stock splits, stock dividends, and reverse splits are all designed to make the firm's shares more appealing to the average investor.
  - Dividend reinvestment plans are designed to aid in the distribution of stock dividends.
  - The key advantage of a residual dividend policy is that it enables a company to follow a stable dividend policy.
  - The main goal of the share repurchases is solely to avoid taxes for investors.

ANS: A

By manipulating the number of shares, a firm can change the price per share. This may be useful if there is an optimal trading range for the share price. At minimum, this allows the shares to be traded in round lots at a reasonable value.

PTS: 1                    DIF: MEDIUM      REF: 404 | 407 | 414 | 415  
OBJ: (Comp. 13.5, 13.7, 13.11, 13.12) Dividend theories                    BLM: Remember

10. Which circumstance would be most likely to lead to a decrease in a firm's dividend payout ratio?
- Its earnings become more stable.
  - Its access to the capital markets increases.
  - Its R&D efforts pay off, and it now has more high-return investment opportunities.
  - Its accounts receivable decrease due to a change in its credit policy.

ANS: C                    PTS: 1                    DIF: MEDIUM      REF: 402–403 | 411–413  
OBJ: (Comp. 13.5, 13.9, 13.10) Dividend payout                    BLM: Higher Order

11. Trenton Publishing follows a strict residual dividend policy. All else being equal, which circumstance would be most likely to lead to an increase in the firm's dividend per share?
- The firm's net income increases.
  - The company increases the percentage of equity in its target capital structure.
  - The number of profitable potential projects increases.
  - Earnings are unchanged, but the firm issues new shares of common stock.

ANS: A                    PTS: 1                    DIF: MEDIUM      REF: 402–404  
OBJ: (13.5) Residual dividend policy                    BLM: Higher Order

12. Suppose a firm adheres strictly to the residual dividend policy and its optimal capital budget requires the use of all earnings for a given year (along with new debt according to the optimal debt/total assets ratio). What should the firm pay?
- no dividends except out of past retained earnings
  - no dividends to common stockholders
  - dividends only out of funds raised by the sale of new common stock
  - dividends only out of funds raised by selling off fixed assets

ANS: B                    PTS: 1                    DIF: MEDIUM      REF: 403–404  
OBJ: (13.5) Residual dividend policy                    BLM: Higher Order

13. If a firm adheres strictly to the residual dividend policy, what would the issuance of new common stock suggest?
- The dividend payout ratio has remained constant.
  - The dividend payout ratio is increasing.
  - No dividends were paid during the year.
  - The dividend payout ratio is decreasing.

ANS: C                    PTS: 1                    DIF: MEDIUM      REF: 403–404  
OBJ: (13.5) Residual dividend policy                    BLM: Higher Order

14. What are automatic dividend reinvestment plans designed to do?
- aid shareholders in creating their preferred dividend policy
  - raise new equity capital for the firm through market repurchases
  - eliminate excess illiquid shares from the open market
  - help investors avoid paying taxes on dividends

ANS: A  
DRIP allows existing shareholders the use of dividends to buy new shares. These shares are then issued by the company without any brokerage fees or purchased from market at low transaction costs.

PTS: 1                    DIF: MEDIUM      REF: 415–406  
OBJ: (13.12) Dividend reinvestment plans                    BLM: Remember

15. Which of the following statements is correct?
- a. One disadvantage of dividend reinvestment plans is that they increase transaction costs for investors who want to increase their ownership in the company.
  - b. One advantage of dividend reinvestment plans is that they enable investors to postpone paying taxes on the dividends credited to their account.
  - c. Stock repurchases can be used by a firm that wants to increase its debt ratio.
  - d. One advantage of an open market dividend reinvestment plan is that it provides new equity capital and increases the shares outstanding.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 410 | 415–416  
OBJ: (Comp. 13.8, 13.12) Stock repurchases and DRIPs                      BLM: Higher Order

16. Which of the following statements is correct?
- a. One nice feature of dividend reinvestment plans (DRIPs) is that they reduce the taxes investors would have to pay if they received cash dividends.
  - b. Empirical research indicates that, in general, companies send a negative signal to the marketplace when they announce an increase in the dividend, and as a result, share prices fall when dividend increases are announced. The reason for this is that investors interpret the increase as a signal that the firm has relatively few good investment opportunities.
  - c. If a company wants to raise new equity capital steadily over time, a new stock dividend reinvestment plan would make sense. However, if the firm does not want or need new equity, then an open market purchase dividend reinvestment plan would probably make more sense.
  - d. Dividend reinvestment plans have not caught on in most industries, and today about 99% of all companies with DRIPs are utilities.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 401–402 | 415–416  
OBJ: (Comp. 13.3, 13.12) Dividends, DRIPs, and repurchases                      BLM: Higher Order

17. Which of the following statements is correct?
- a. Current Canadian tax law encourages companies to pay dividends rather than retain earnings.
  - b. If a company uses the residual dividend model to determine its dividend payments, dividend payouts will tend to increase whenever the company's profitable investment opportunities increase.
  - c. The stronger management thinks the clientele effect is, the more likely the firm is to adopt a strict version of the residual dividend model.
  - d. Large stock repurchases financed by debt tend to increase earnings per share, but they also increase the firm's financial risk.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 398 | 402–403 | 410  
OBJ: (Comp. 13.1, 13.5, 13.8) Dividend policy and stock repurchases  
BLM: Higher Order

18. Which of the following statements is correct?
- a. If a company has a 2-for-1 stock split, its stock price should roughly double.
  - b. Capital gains earned in a share repurchase are taxed less favourably than dividends; this explains why companies typically pay dividends and avoid share repurchases.
  - c. Very often, a company's stock price will rise when it announces that it plans to commence a share repurchase program. Such an announcement could lead to a stock price decline, but this does not normally happen.
  - d. The clientele effect is the best explanation for why companies tend to vary their dividend payments from quarter to quarter.



ANS: C                    PTS: 1                    DIF: MEDIUM            REF: 402 | 410–411 | 413–414  
OBJ: (Comp. 13.4, 13.8, 13.11) Miscellaneous dividend concepts  
BLM: Remember

19. Which of the following statements is correct?
- Firms with a lot of good investment opportunities and a relatively small amount of cash tend to have above-average payout ratios.
  - One advantage of the residual dividend policy is that it leads to a stable dividend payout, which investors like.
  - An increase in the stock price when a company decreases its dividend is consistent with signalling theory as postulated by MM.
  - Stock repurchases make the most sense at times when a company believes its stock is undervalued.

ANS: D                    PTS: 1                    DIF: MEDIUM            REF: 412–413  
OBJ: (13.10) Dividend theory                    BLM: Higher Order

20. Which of the following statements is correct?
- One advantage of dividend reinvestment plans is that they enable investors to avoid paying taxes on the dividends they receive.
  - If a company has an established clientele of investors who prefer a high dividend payout, and if management wants to keep stockholders happy, it should NOT follow the strict residual dividend policy.
  - If a firm follows a strict residual dividend policy, then, holding all else constant, its dividend payout ratio will tend to rise whenever the firm's investment opportunities improve.
  - Despite its drawbacks, following the residual dividend policy will tend to stabilize actual cash dividends, and this will make it easier for firms to attract a clientele that prefers high dividends, such as retirees.

ANS: B                    PTS: 1                    DIF: MEDIUM            REF: 404 | 412–413 | 415  
OBJ: (Comp. 13.5, 13.10, 13.12) Dividend policy                    BLM: Higher Order

21. Firm M is a mature firm in a mature industry. Its annual net income and net cash flows are both consistently high and stable. However, M's growth prospects are quite limited, so its capital budget is small relative to its net income. Firm N is a relatively new firm in a new and growing industry. Its markets and products have not stabilized, so its annual operating income fluctuates considerably. However, N has substantial growth opportunities, and its capital budget is expected to be large relative to its net income for the foreseeable future. Which of the following statements is correct?
- Firm M probably has a lower debt ratio than Firm N.
  - Firm M probably has a higher dividend payout ratio than Firm N.
  - If the corporate tax rate increases, the debt ratio of both firms is likely to decline.
  - Firm N is likely to have a clientele of shareholders who want to receive consistent, stable dividend income.

ANS: B                    PTS: 1                    DIF: MEDIUM            REF: 413  
OBJ: (13.10) Miscellaneous dividend concepts                    BLM: Higher Order

22. Which of the following statements best describes stock splits?
- When firms are deciding on the size of stock splits—say, whether to declare a 2-for-1 split or a 3-for-1 split—it is best to declare the smaller one, in this case, the 2-for-1 split, because then the after-split price will be higher than if the 3-for-1 split had been used.
  - Stock splits create more administrative problems for investors than stock dividends, especially determining the tax basis of their shares when they decide to sell them, so

today, stock dividends are used far more often than stock splits.

- c. When a company declares a stock split, the price of the stock typically declines—by about 50% after a 2-for-1 split—and this necessarily reduces the total market value of the equity.
- d. If a firm's stock price is quite high relative to most stocks—say, \$500 per share—then it can declare a stock split of say 10-for-1 so as to bring the price down to something close to \$50. Moreover, if the price is relatively low—say, \$2 per share—then it can declare a “reverse split” of, say, 1-for-25 so as to bring the price up to somewhere around \$50 per share.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 413–415  
OBJ: (13.11) Stock dividends and stock splits                      BLM: Remember

23. Which of the following statements is correct?
- a. If a firm repurchases some of its stock in the open market, then shareholders who sell their stock for more than they paid for it will be subject to capital gains taxes.
  - b. An open-market dividend reinvestment plan will be most attractive to companies that need new equity and would otherwise have to issue additional shares of common stock through investment bankers.
  - c. Stock repurchases tend to reduce financial leverage.
  - d. If a company declares a 2-for-1 stock split, its stock price should roughly double.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 407 | 410 | 413–414 | 416  
OBJ: (Comp: 13.7–13.12) Miscellaneous dividend concepts                      BLM: Higher Order

24. Which action will best enable a company to raise additional equity capital?
- a. Declare a stock split.
  - b. Begin an open-market purchase dividend reinvestment plan.
  - c. Initiate a stock repurchase program.
  - d. Begin a new-stock dividend reinvestment plan.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 407 | 413 | 415–416  
OBJ: (Comp: 13.7–13.12) Miscellaneous dividend concepts                      BLM: Higher Order

25. Which of the following statements is **NOT true**?
- a. Stock repurchases can be used by a firm as part of a plan to change its capital structure.
  - b. After a 3-for-1 stock split, a company's price per share should fall, but the number of shares outstanding will rise.
  - c. Investors can interpret a stock repurchase program as a signal that the firm's managers believe the stock is undervalued.
  - d. Stockholders pay no income tax on dividends if the dividends are used to purchase stock through a dividend reinvestment plan.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 410 | 414–415  
OBJ: (Comp: 13.8, 13.11, 13.12) Stock repurchases, stock splits, and DRIPs  
BLM: Remember

26. Which of the following statements is correct?
- a. If a firm follows the residual dividend policy, then a sudden increase in the number of profitable projects is likely to reduce the firm's dividend payout.
  - b. The clientele effect can explain why so many firms change their dividend policies so often.
  - c. One advantage of adopting the residual dividend policy is that this policy makes it easier for corporations to develop a specific and well-identified dividend clientele.
  - d. New-stock dividend reinvestment plans are similar to stock dividends because they both increase the number of shares outstanding but don't change the firm's total amount of

book equity.

ANS: A                      PTS: 1                      DIF: MEDIUM | HARD  
REF: 412–413 | 414 | 416                      OBJ: (Comp: 13.10, 13.11, 13.12) Dividend policy  
BLM: Higher Order

27. Brammer Corp.'s projected capital budget is \$1,000,000, its target capital structure is 60% debt and 40% equity, and its forecasted net income is \$550,000. If the company follows a residual dividend policy, what total dividends, if any, will it pay out?
- a. \$128,606
  - b. \$135,375
  - c. \$142,500
  - d. \$150,000

ANS: D

Capital budget	\$1,000,000
% Equity	40%
Net income (NI)	\$550,000
Dividends paid = NI – [% Equity(Capital budget)]	\$150,000

PTS: 1                      DIF: EASY                      REF: 403  
OBJ: (13.5) Residual model—divs paid, divs always positive      BLM: Higher Order

28. Blease Inc. has a capital budget of \$625,000, and it wants to maintain a target capital structure of 60% debt and 40% equity. The company forecasts a net income of \$475,000. If it follows the residual dividend policy, what is its forecasted dividend payout ratio?
- a. 40.61%
  - b. 42.75%
  - c. 45.00%
  - d. 47.37%

ANS: D

Capital budget	\$625,000
Equity ratio	40%
Net income (NI)	\$475,000
Dividends paid = NI – (Equity ratio)(Capital budget)	\$225,000
Dividend payout ratio = Dividends paid/NI	47.37%

PTS: 1                      DIF: EASY                      REF: 403  
OBJ: (13.5) Residual dividend model—dividend payout ratio      BLM: Higher Order

29. P&D Co. has a capital budget of \$1,000,000. The company wants to maintain a target capital structure of 30% debt and 70% equity. The company forecasts that its net income this year will be \$800,000. If the company follows a residual dividend policy, what will be its total dividend payment?
- a. \$100,000
  - b. \$200,000
  - c. \$300,000
  - d. \$400,000

ANS: A  
The amount of new investment that must be financed with equity is  
 $\$1,000,000 \times 70\% = \$700,000$ .

Since the firm has \$800,000 of net income only \$100,000 will be left for dividends.

PTS: 1                    DIF: EASY                    REF: 403  
OBJ: (13.5) Residual dividend policy—nonalgorithmic

BLM: Higher Order

30. Pate & Co. has a capital budget of \$3,000,000. The company wants to maintain a target capital structure that is 15% debt and 85% equity. The company forecasts that its net income this year will be \$3,500,000. If the company follows a residual dividend policy, what will be its total dividend payment?
- a. \$205,000
  - b. \$500,000
  - c. \$950,000
  - d. \$2,550,000

ANS: C

The amount of new investment that must be financed with equity is  
 $\$3,000,000 \times 85\% = \$2,550,000$ .

Since the firm has \$3,500,000 of net income,  $\$950,000 = \$3,500,000 - \$2,550,000$  will be left for dividends.

PTS: 1                    DIF: EASY                    REF: 403  
OBJ: (13.5) Residual dividend policy—nonalgorithmic

BLM: Higher Order

31. D&P Co. has a capital budget of \$2,000,000. The company wants to maintain a target capital structure that is 35% debt and 65% equity. The company forecasts that its net income this year will be \$1,800,000. If the company follows a residual dividend policy, what will be its total dividend payment?
- a. \$200,000
  - b. \$300,000
  - c. \$400,000
  - d. \$500,000

ANS: D

The amount of new investment that must be financed with equity is  
 $\$2,000,000 \times 65\% = \$1,300,000$ .

Since the firm has \$1,800,000 of net income only  $\$500,000 = \$1,800,000 - \$1,300,000$  will be left for dividends.

PTS: 1                    DIF: EASY                    REF: 403  
OBJ: (13.5) Residual dividend policy—nonalgorithmic

BLM: Higher Order

32. Becker Financial recently completed a 7-for-2 stock split. Prior to the split, its stock sold for \$90 per share. If the total market value was unchanged by the split, what was the price of the stock following the split?
- a. \$23.21
  - b. \$24.43
  - c. \$25.71
  - d. \$27.00

ANS: C

Number of new shares	7
Number of old shares	2
Old (pre-split) price	\$90
New price = Old price $\times$ (Old shrs/New shrs)	\$25.71

PTS: 1                    DIF: EASY                    REF: 414

OBJ: (13.11) Stock splits—fractional splits

BLM: Higher Order

33. Toombs Media Corp. recently completed a 3-for-1 stock split. Prior to the split, its stock sold for \$150 per share. The firm's total market value was unchanged by the split. Other things held constant, what is the best estimate of the stock's post-split price?
- a. \$50.00
  - b. \$52.50
  - c. \$55.13
  - d. \$57.88

ANS: A

Number of new shares	3
Number of old shares	1
Pre-split stock price	\$150
Post-split stock price: $P_0/\text{New per old} =$	\$50.00

PTS: 1                    DIF: EASY                    REF: 414

OBJ: (13.11) Stock splits—simple splits    BLM: Higher Order

34. Ting Technology has a capital budget of \$850,000, it wants to maintain a target capital structure of 35% debt and 65% equity, and it also wants to pay a dividend of \$400,000. If the company follows a residual dividend policy, how much net income must it earn to meet its capital budgeting requirements and pay the dividend, all while keeping its capital structure in balance?
- a. \$904,875
  - b. \$952,500
  - c. \$1,000,125
  - d. \$1,050,131

ANS: B

Capital budget	\$850,000
Equity ratio	65%
Dividends to be paid	\$400,000
Required net income = Dividends + (Capital budget × % Equity)	\$952,500

PTS: 1                    DIF: EASY | MEDIUM

REF: 403

OBJ: (13.5) Residual dividend model—find net income

BLM: Higher Order

35. Fauver Worldwide forecasts a capital budget of \$650,000, and it wants to maintain a target capital structure of 40% debt and 60% equity. It also wants to pay a dividend of \$225,000. If the company follows the residual dividend policy, how much net income must it earn to meet its capital requirements, pay the dividend, and keep the capital structure in balance?
- a. \$584,250
  - b. \$615,000
  - c. \$645,750
  - d. \$711,939

ANS: B

Capital budget	\$650,000
% Equity	60%
Dividends to be paid	\$225,000
Required net income = Dividends + (Capital budget × % Equity)	\$615,000

PTS: 1                    DIF: EASY | MEDIUM

REF: 403

OBJ: (13.5) Residual dividend model—find net income

BLM: Higher Order

36. Brooks Corp.'s projected capital budget is \$2,000,000, its target capital structure is 60% debt and 40% equity, and its forecasted net income is \$600,000. If the company follows a residual dividend policy, what total dividends, if any, will it pay out?
- a. \$228,000
  - b. \$216,600
  - c. \$205,770
  - d. \$0

ANS: D

Capital budget	\$2,000,000
% Equity	40%
Net income (NI)	\$600,000
Dividends paid = NI – [% Equity(Capital Budget)]	\$0

PTS: 1                      DIF: MEDIUM      REF: 403

OBJ: (13.5) Residual model—divs paid, divs are zero

BLM: Higher Order

37. D. Paul Inc. forecasts a capital budget of \$725,000. The CFO wants to maintain a target capital structure of 45% debt and 55% equity, and it also wants to pay dividends of \$500,000. If the company follows the residual dividend policy, how much income must it earn, and what will its dividend payout ratio be?

	<u>Net Income</u>	<u>Payout</u>
W.	\$898,750	55.63%
X.	\$943,688	58.41%
Y.	\$990,872	61.34%
Z.	\$1,040,415	64.40%

- a. Choice W
- b. Choice X
- c. Choice Y
- d. Choice Z

ANS: A

Capital budget	\$725,000
Equity ratio	55%
Dividends paid	\$500,000
NI=Divs + (Eq % × Cap Bud)	\$898,750
Payout = Dividends/NI	55.63%

PTS: 1                      DIF: MEDIUM      REF: 403

OBJ: (13.5) Residual model—find NI, then divs and payout

BLM: Higher Order

38. Banerjee Inc. wants to maintain a target capital structure with 30% debt and 70% equity. Its forecasted net income is \$550,000, and its board of directors has decreed that no new stock can be issued during the coming year. If the firm follows the residual dividend policy, what is the maximum capital budget that is consistent with maintaining the target capital structure?
- a. \$673,652
  - b. \$709,107
  - c. \$746,429
  - d. \$785,714

ANS: D	
% Debt	30%
% Equity	70%
Net income	\$550,000
Max capital budget = NI/% Equity	\$785,714
Check: Is calculated max cap bud × % Equity = NI?	\$550,000 = net income

PTS: 1                    DIF: MEDIUM            REF: 403  
 OBJ: (13.5) Residual dividend policy            BLM: Higher Order

39. Dentaltech Inc. projects the following data for the coming year. If the firm follows the residual dividend policy and also maintains its target capital structure, what will its payout ratio be?

EBIT	\$2,000,000	Capital budget	\$850,000
Interest rate	10%	% Debt	40%
Debt outstanding	\$5,000,000	% Equity	60%
Shares outstanding	\$5,000,000	Tax rate	40%

- a. 37.2%  
 b. 39.1%  
 c. 41.2%  
 d. 43.3%

ANS: D			
EBIT	\$2,000,000	Capital budget	\$850,000
Interest rate	10%	% Debt	40%
Debt outstanding	\$5,000,000	% Equity	60%
Shares outstanding	\$5,000,000	Tax rate	40%

EBIT	\$2,000,000
?2- Interest expense = interest rate × debt	<u>500,000</u>
Taxable income	\$1,500,000
?2- Taxes = Tax rate × income	<u>600,000</u>
Net income (NI)	\$900,000
?2- Equity needed for capital budget = % Equity(capital budget) =	<u>510,000</u>
Dividends = NI ?2- Equity needed	\$390,000
Payout ratio = Dividends/NI	43.33%

PTS: 1                    DIF: MEDIUM            REF: 403  
 OBJ: (13.5) Residual dividend policy            BLM: Higher Order

40. Mortal Inc. expects to have a capital budget of \$500,000 next year. The company wants to maintain a target capital structure with 30% debt and 70% equity, and its forecasted net income is \$400,000. If the company follows the residual dividend policy, how much in dividends, if any, will it pay?

- a. \$42,869  
 b. \$45,125  
 c. \$47,500  
 d. \$50,000

ANS: D	
% Debt	30%
% Debt	70%
Capital budget	\$500,000
Net income	\$400,000

$$\begin{aligned} \text{Equity requirement} &= \text{Cap Bud} \times \% \text{ Equity} = && \$350,000 \\ \text{Dividends} &= \text{NI} - 2 \cdot \text{Equity requirement} = && \$50,000 \end{aligned}$$

PTS: 1                      DIF: MEDIUM      REF: 403

OBJ: (13.5) Residual dividend policy; dividend may be zero      BLM: Higher Order

41. Ross Financial has suffered losses in recent years, and its stock currently sells for only \$0.50 per share. Management wants to use a reverse split to get the price up to a more “reasonable” level, which it thinks is \$25 per share. How many of the old shares must be given up for one new share to achieve the \$25 price, assuming this transaction has no effect on total market value?
- 24.50
  - 25.00
  - 50.00
  - 52.50

ANS: C

Current price	\$0.50
Target price	\$25.00
Old shares surrendered per 1 new share = Target price/Old price	50.00

PTS: 1                      DIF: MEDIUM      REF: 414

OBJ: (13.11) Stock splits—reverse split      BLM: Higher Order

42. Keys Financial has done extremely well in recent years, and its stock now sells for \$175 per share. Management wants to get the price down to a more typical level, which it thinks is \$25 per share. What stock split would be required to get to this price, assuming the transaction has no effect on the total market value? Put another way, how many new shares should be given per one old share?
- 5.00
  - 6.00
  - 7.00
  - 8.00

ANS: C

Current price	\$175.00
Target price	\$25.00
No. of new shares per 1 old share = Current price/Target price	7.00

PTS: 1                      DIF: MEDIUM      REF: 414

OBJ: (13.11) Stock splits—optimal stock split      BLM: Higher Order

43. Whited Products recently completed a 4-for-1 stock split. Prior to the split, its stock sold for \$120 per share. If the firm’s total market value increased by 5% as a result of increased liquidity caused by the split, what was the stock price following the split?
- \$24.00
  - \$30.00
  - \$31.50
  - \$33.50

ANS: C

New shares per 1 old share	4
Pre-split stock price	\$120
% value increase	5%
Post-split stock price = $(P_0/\text{New per old})(\% \text{ Value increase})$	\$31.50

PTS: 1                      DIF: MEDIUM      REF: 414



OBJ: (13.11) Stock splits—positive market reaction

BLM: Higher Order

44. Sheehan Corp. is forecasting an EPS of \$3.00 for the coming year on its 500,000 outstanding shares of stock. Its capital budget is forecasted at \$800,000, and it is committed to maintaining a \$2.00 dividend per share. It finances with debt and common equity, but it wants to avoid issuing any new common stock during the coming year. Given these constraints, what percentage of the capital budget must be financed with debt?
- 32.15%
  - 33.84%
  - 35.63%
  - 37.50%

ANS: D

EPS	\$3.00
Shares outstanding	500,000
DPS	\$2.00
Capital budget	\$800,000
Net income = EPS × Shares outstanding =	\$1,500,000
Dividends paid = DPS × Shares outstanding =	\$1,000,000
Retained earnings available	\$500,000
Capital budget - 2- Retained earnings = Debt needed	\$300,000
Debt needed/Capital budget = % Debt financing	37.5%

PTS: 1

DIF: MEDIUM | HARD

REF: 403

OBJ: (13.5) Residual dividend model—req'd debt ratio

BLM: Higher Order

45. Grullon Co. is considering a 7-for-3 stock split. The current stock price is \$75.00 per share, and the firm believes that its total market value would increase by 5% as a result of the improved liquidity that it thinks would follow the split. What is the stock's expected price following the split?
- \$32.06
  - \$33.75
  - \$35.44
  - \$37.21

ANS: B

Number of new shares	7
Number of old shares	3
Old (pre-split) price	\$75.00
% Increase in value	5%
New price before value increase = Old price/(Old shares/New shares)	\$32.14
New price after value increase = Prior × (1 + % Value increase)	\$33.75

PTS: 1

DIF: MEDIUM | HARD

REF: 414

OBJ: (13.11) Stock splits—positive market reaction

BLM: Higher Order

46. Pavlin Corp.'s projected capital budget is \$2,000,000, its target capital structure is 40% debt and 60% equity, and its forecasted net income is \$1,000,000. If the company follows a residual dividend policy, how much will it pay in dividends or, alternatively, how much new stock must it issue?

	<u>Dividends</u>	<u>Stock Issued</u>
W.	\$514,425	\$162,901
X.	\$541,500	\$171,475
Y.	\$570,000	\$180,500
Z.	\$0	\$200,000

- a. Choice W
- b. Choice X
- c. Choice Y
- d. Choice Z

ANS: D

Capital budget	\$2,000,000
% Equity	60%
Net income (NI)	\$1,000,000

Dividends paid = NI - [% Equity(Cap. Bud)], stock issued if dividends zero or neg      \$0              \$200,000

PTS: 1                      DIF: MEDIUM | HARD                      REF: 403  
 OBJ: (13.5) Residual model—divs paid or stock issued                      BLM: Higher Order

47. DeAngelo Corp.'s projected net income is \$150.0 million, its target capital structure is 25% debt and 75% equity, and its target payout ratio is 65%. DeAngelo has more positive NPV projects than it can finance without issuing new stock, but its board of directors has decreed that it cannot issue any new shares in the foreseeable future. The CFO now wants to determine how the maximum capital budget would be affected by changes in capital structure policy and/or the target dividend payout policy. Versus the current policy, how much larger could the capital budget be if (1) the target debt ratio were raised to 75%, other things held constant, (2) the target payout ratio were lowered to 20%, other things held constant, and (3) the debt ratio and payout were both changed by the indicated amounts.

	Increase in Capital Budget		
	Increase Debt to 75%	Lower Payout to 20%	Do Both
W.	\$120.0	\$77.2	\$351.5
X.	\$126.4	\$81.2	\$370.0
Y.	\$133.0	\$85.5	\$389.5
Z.	\$140.0	\$90.0	\$410.0

- a. Choice W
- b. Choice X
- c. Choice Y
- d. Choice Z

ANS: D

New Maximums:

	Current <u>maximum</u>	If increase <u>debt</u>	If lower <u>payout</u>	If do <u>both</u>
NI	\$150.0	\$150.0	\$150.0	\$150.0
% Debt	25.0%	75.0%	25.0%	75.0%
% Equity	75.0%	25.0%	75.0%	25.0%
% Payout	65.0%	65.0%	20.0%	20.0%
Dividends	\$97.5	\$97.5	\$30.0	\$30.0
Retained earnings	\$52.5	\$52.5	\$120.0	\$120.0
Max. capital budget = RE/% Equity	\$70.0	\$210.0	\$160.0	\$480.0
Increase over current: Changed amt - Current max.	NA	\$140.0	\$90.0	\$410.0

PTS: 1                      DIF: HARD                      REF: 403  
 OBJ: (13.5) Residual model—divs paid or stock issued                      BLM: Higher Order

48. The following data apply to Grullon-Ikenberry Inc.:

Net income (NI) expected for the coming year	\$625,000
Currently outstanding shares	100,000
Current stock price	\$40.00

The company is in a mature industry. Therefore, it plans to distribute all of its income at year end, and its earnings are not expected to grow. The CFO is now deciding whether to distribute income to stockholders as dividends or to use the funds to repurchase common stock. She believes the P/E ratio will not be affected by a repurchase. Moreover, she believes that the stock can be repurchased at the end of the year at the then-current price, which is expected to be the now-current price plus the dividend that would otherwise be received at year end. Disregarding any possible tax effects, how much would a stockholder who owns 100 shares gain if the firm used its net income to repurchase stock rather than for dividends?

- a. \$564.06
- b. \$593.75
- c. \$625.00
- d. \$656.25

ANS: C

NI	\$625,000
No. of shares outstanding	100,000
Expected EPS	\$6.25
Current stock price	\$40.00
P/E ratio	6.40
Expected DPS if pay dividend = EPS	\$6.25
Expected stock price end of year = Current price + expected DPS	\$46.25
Shares repurchased if use repurchase plan = NI/Expected Price	13,514
New shares outstanding after repurchase	86,486
New EPS if use repurchase plan = NI/New shares	\$7.227
New price = P/E × New EPS	\$46.25
Gain, 100 share owner, dividends = 100 × DPS	\$625.00
Gain, 100 share owner, repurchase = 100 × (new price – current price)	\$625.00

PTS: 1                      DIF: HARD                      REF: 407–409

OBJ: (13.7) Repurchases versus dividends

BLM: Higher Order

## CHAPTER 14—INITIAL PUBLIC OFFERINGS, INVESTMENT BANKING, AND FINANCIAL RESTRUCTURING

### TRUE/FALSE

1. Personal assets and “love money” are the two major sources of equity capital for a start-up company.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 424  
OBJ: (14.1) Start-up company

2. The TSX Exchange operates as a junior stock market, whereas TSX Venture Exchange trades senior equities.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 426–427  
OBJ: (14.3) Financial markets

3. The secondary market is a second-hand market in which securities are sold by the first and subsequent buyers.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 425  
OBJ: (14.2) Secondary market

4. Going public means a company is required to disclose information to the public for investigation.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 429  
OBJ: (14.4) Going public

5. Best efforts deals are commonly used by well-known, established issuers.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 431  
OBJ: (14.5) Best effort

6. An equity carve-out is not only a spin-off but also a special type of IPO.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 436  
OBJ: (14.6) Equity carve-outs

7. If its managers make a tender offer buying up all shares not held by the management team, this is called a private placement.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 438  
OBJ: (14.7) Private placements

8. A bought deal occurs when an underwriter buys an issue from a firm and sells the securities to investors without preparing a prospectus.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 438  
OBJ: (14.7) Bought deals

9. For providing funds to start-up firms, venture capital investors would like to be equity holders getting stocks rather than just being lenders.

ANS: T                    PTS: 1                    DIF: MEDIUM            REF: 425  
OBJ: (14.1) Venture capitalists

10. The big payoff for the entrepreneur and venture capitalist is when the firm is closely held by its founders.

ANS: F  
False. The payoff arises when the firm goes public, rather than going private.

PTS: 1                    DIF: MEDIUM            REF: 425                    OBJ: (14.1) Venture capitalists

11. Alpha and Pure Trading System are the two electronic communications networks used by dealers in the trading floor of the TSX exchange.

ANS: F                    PTS: 1                    DIF: MEDIUM            REF: 427  
OBJ: (14.3) Trading procedures

12. Exchange-traded funds (ETFs) can be bought and sold in dealer markets anytime during the day.

ANS: T                    PTS: 1                    DIF: MEDIUM            REF: 428  
OBJ: (14.3) Trading procedures

13. The ICE Futures Canada, originated from the Winnipeg Stock Exchange, is Canada's exchange trading derivatives products.

ANS: F                    PTS: 1                    DIF: MEDIUM            REF: 427  
OBJ: (14.3) Derivatives markets

14. The trading of existing equity issues among investors occurs in the primary market.

ANS: F                    PTS: 1                    DIF: MEDIUM            REF: 425  
OBJ: (14.2) Secondary stock market

15. Securities traded in the stock exchanges are primary market transactions as the sales proceeds go to the issuing companies.

ANS: F                    PTS: 1                    DIF: MEDIUM            REF: 425  
OBJ: (14.2) Secondary stock market

16. The phrase "leaving money on the table" refers to the situation where an investment bank makes a very low bid for the right to underwrite a firm's new stock offering. The banker is in effect "buying the job" with the low bid and thus not getting all the money his firm would normally earn on the job.

ANS: F  
False. Leaving money on the table occurs when a security issue is underpriced.

PTS: 1                    DIF: MEDIUM            REF: 434                    OBJ: (14.5) IPOs

17. Since providing updated information about company activities and status is costly, it has absolutely no advantage for firms.

ANS: F                    PTS: 1                    DIF: MEDIUM            REF: 429  
OBJ: (14.4) Continuous disclosure

18. Going public establishes a market value for the firm's shares, and it also ensures that a liquid market will continue to exist for the firm's shares. This is especially true for small firms that are not widely followed by security analysts.

ANS: F

False. Going public does establish the firm's market value, but it does not ensure that a liquid market will continue to exist, and this is especially true for small firms that are not widely followed.

PTS: 1                      DIF: MEDIUM      REF: 429                      OBJ: (14.4) Going public

19. The cost of filing reports with various regulatory bodies, the danger of losing control, and the possibility of an inactive market and an attendant low stock price are potential disadvantages of going public.

ANS: T                      PTS: 1                      DIF: MEDIUM      REF: 429–430

OBJ: (14.4) Disadvantages of going public

20. Syndicated offerings gain publicity because institutional investors are involved with marketing functions.

ANS: F                      PTS: 1                      DIF: MEDIUM      REF: 431

OBJ: (14.5) Syndicated offering

21. In order to secure investor interest, underwriters like to provide more information during the roadshow presentations than what has been given in the prospectus.

ANS: F                      PTS: 1                      DIF: MEDIUM      REF: 432

OBJ: (14.5) Roadshow

22. Investment banks sometimes act as an agent for the issuer on a best efforts basis, whereby they are paid with a fixed commission.

ANS: T                      PTS: 1                      DIF: MEDIUM      REF: 431

OBJ: (14.5) Best effort

23. The Investment Industry Regulatory Organization of Canada, combining Investment Dealers Association and Market Regulation Services Inc., is a federal government supervisory agency for the securities industry.

ANS: F

False. IIROC is a self-regulatory organization overseeing market surveillance in real time to ensure a fair and transparent trading system. Canada's securities industry is not governed nationally.

PTS: 1                      DIF: MEDIUM      REF: 435                      OBJ: (14.5) IIROC

24. The principal activities of investment banks are (1) to help firms issue new stock and bonds and (2) to give firms advice with regard to mergers and other financial matters. However, financial corporations often own and operate subsidiaries that operate as commercial banks and others that are investment banks. This was not true some years ago, when the two types of banks were required by law to be completely independent of one another.

ANS: T                      PTS: 1                      DIF: MEDIUM      REF: 437–439

OBJ: (14.7) Investment banks

25. The term “equity carve-out” refers to the situation where a firm’s managers give themselves the right to purchase new stock at a price far below the going market price. Since this dilutes the value of the public stockholders, it “carves out” some of their value.

ANS: F

False. An equity carve-out occurs when there is only a partial public offering. In other words, the public is sold equity in a wholly owned subsidiary, but the parent retains full control of the subsidiary by retaining the majority of the subsidiary’s common share.

PTS: 1                      DIF: MEDIUM              REF: 436                      OBJ: (14.6) Equity carve-outs

26. Once approved with a shelf prospectus, firms have the right to sell new stocks anytime up to a 25-month period by extending investors with a prospectus supplement.

ANS: T                      PTS: 1                      DIF: MEDIUM              REF: 438

OBJ: (14.7) Shelf prospectus system

27. One big advantage of going private through a leveraged buyout is the tax shields from the borrowing.

ANS: T                      PTS: 1                      DIF: MEDIUM              REF: 439

OBJ: (14.8) LBO

28. With no recourse, firms prefer to use project financing for risky but small capital investments.

ANS: F                      PTS: 1                      DIF: MEDIUM              REF: 441

OBJ: (14.9) Project financing

29. Suppose a company issued 30-year bonds 4 years ago, when the yield curve was inverted. Since then, long-term rates (10 years or longer) have remained constant, but the yield curve has resumed its normal upward slope. Under such conditions, a bond refunding would almost certainly be profitable.

ANS: F

Since long-term rates have not fallen, the yield on new bonds would be the same as the coupon rate on the old bonds, hence there would be no interest savings to offset the call premium and the new flotation costs.

PTS: 1                      DIF: MEDIUM              REF: 446

OBJ: (Appendix 14A) Bond refunding

30. The appropriate discount rate to use when analyzing a refunding decision is the after-tax cost of new debt, in part because there is relatively little risk of not realizing the interest savings.

ANS: T                      PTS: 1                      DIF: MEDIUM              REF: 446

OBJ: (Appendix 14A) Refunding discount rate

31. If the firm uses the after-tax cost of new debt as the discount rate when analyzing a refunding decision, and if the NPV of refunding is positive, then the value of the firm will be maximized if it immediately calls the outstanding debt and replaces it with an issue that has a lower coupon rate.

ANS: F

If there is a fairly high probability that interest rates are going to decline further, then it might be better to delay the refunding.

PTS: 1                      DIF: MEDIUM              REF: 446

OBJ: (Appendix 14A) Refunding decision

32. When a firm refunds a debt issue, the firm's stockholders gain and its bondholders lose. This points out the risk of a call provision to bondholders and explains why a noncallable bond will typically command a higher price than an otherwise similar callable bond.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 450

OBJ: (Appendix 14A) Refunding and callable bonds

## MULTIPLE CHOICE

1. Which term refers to the money offered to fund a start-up company?
- private placement
  - bought deal
  - project financing
  - venture capital fund

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 424

OBJ: (14.1) Venture capital fund                      BLM: Remember

2. Which of the following stock indices measures Canadian stock market performance?
- Dow Jones Industrial Average (DJIA)
  - S&P 500 Index
  - S&P/TSX 60 Index
  - NYSE Composite Index

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 428

OBJ: (14.3) Stock market index                      BLM: Remember

3. Which of the following entities does **NOT** belong to the TMX Group?
- Toronto Stock Exchange
  - ICE Futures Canada
  - Montreal Exchange
  - TSX Venture Exchange

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 427

OBJ: (14.3) Canadian Stock Exchanges                      BLM: Higher Order

4. Which of the following statements best describes listing on a stock exchange?
- Listing is a decision of more significance to a firm than going public.
  - Listing provides a company with some "free" advertising, and it may enhance the firm's prestige and help it do more business.
  - Listing reduces the reporting requirements for firms, because listed firms file reports with the exchange rather than with the security commission.
  - The OTC is the second largest market for listed stock, and it is exceeded only by the TSX.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 429

OBJ: (14.4) Listing                      BLM: Higher Order

5. What is an example of a seasoned equity offering?
- Shares are sold by founding members from their holdings in the primary market.
  - Unsubscribed new shares from the previous IPO are sold in the secondary market.
  - New shares are sold to the general public by companies in the primary market.
  - Used shares are sold to existing shareholders in the secondary market.



ANS: C

After the IPO, a successful firm will continue to grow, and from time to time it will need to raise more money by issuing stock or bonds. An issue of additional stock by a company whose stock already is publicly traded is called a seasoned offering.

PTS: 1                    DIF: MEDIUM      REF: 425                    OBJ: (14.2) Seasoned issue  
BLM: Higher Order

6. Which statement describes a general disadvantage of going public?
- It facilitates stockholder diversification.
  - It increases the liquidity of the firm's stock.
  - It establishes a market value for the firm.
  - It makes it easier for owner-managers to engage in profitable self-dealings.

ANS: D                    PTS: 1                    DIF: MEDIUM      REF: 429  
OBJ: (14.4) Going public                    BLM: Higher Order

7. What can underwriters likely do for new IPO issues with uncertain market demand from investors?
- Undertake the issue on a best efforts basis.
  - Reduce the spread.
  - Cut short the roadshows.
  - Apply a shelf prospectus for the issue.

ANS: A                    PTS: 1                    DIF: MEDIUM      REF: 430–434  
OBJ: (14.5) IPO                    BLM: Higher Order

8. What is the average spread of new security issues in Canada?
- 5.0%
  - 5.5%
  - 6.0%
  - 7.0%

ANS: B                    PTS: 1                    DIF: MEDIUM      REF: 434  
OBJ: (14.5) Spread                    BLM: Remember

9. Which statement regarding the Canadian securities industry is true?
- The industry is very concentrated.
  - The industry is unregulated.
  - The industry is not governed nationally.
  - The industry is supervised by the Canadian Security Association.

ANS: C

To overcome the fact of lacking one national regulator or a harmonized territorial system, the 13 provincial/territorial regulators jointly form the Canadian Securities Association (CSA) with a series of "National Instruments" for policy enforcements

PTS: 1                    DIF: MEDIUM      REF: 435–436                    OBJ: (14.5) Regulatory agency  
BLM: Remember

10. Which of the following is NOT included in flotation costs of an IPO?
- underwriting fees paid to underwriters
  - direct issuing costs
  - oversubscription option
  - overpricing

ANS: D                    PTS: 1                    DIF: MEDIUM    REF: 434  
OBJ: (14.5) Flotation cost                    BLM: Higher Order

11. Why does underpricing always occur for an IPO?
- to guarantee sales by underwriters
  - to discourage oversubscription from investors
  - to reward customers by issuers
  - to protect investors from deceptive firms

ANS: A                    PTS: 1                    DIF: MEDIUM    REF: 432-434  
OBJ: (14.5) Underpricing                    BLM: Higher Order

12. Who benefits the least from a syndicated offering?
- issuers
  - underwriters
  - individual investors
  - selling groups

ANS: C

The standard IPO contract is a firm commitment arrangement in which the investment dealer buys the shares for a fixed price and resells them to the public at a slightly higher price, thus earning their profits on this spread. With concerns of risk, large issues will have a lead investment dealer who manages the whole process and a banking syndicate is formed temporarily to sell part of the issue. Both groups underwrite the issue and guarantee the issuing firm the proceeds.

PTS: 1                    DIF: MEDIUM    REF: 431                    OBJ: (14.5) Syndicated offering  
BLM: Higher Order

13. Which statement about equity carve-outs is true?
- They are overpriced issues.
  - They are sold by private placements.
  - No prospectus is required.
  - They are a special type of IPO.

ANS: D                    PTS: 1                    DIF: MEDIUM    REF: 436-437  
OBJ: (14.6) Equity carve-outs                    BLM: Higher Order

14. Which type of firm is qualified to issue new stock under the short-form prospectus distribution?
- well-established large corporations
  - new start-up small companies
  - government subsidiaries

ANS: A                    PTS: 1                    DIF: MEDIUM    REF: 438  
OBJ: (14.7) Short form prospectus distribution                    BLM: Higher Order

15. What is likely to happen when a shelf prospectus system is adopted for corporations issuing securities?
- The time for raising capital will increase.
  - The competition among underwriters will increase.
  - The profit of the issuers will decrease.
  - The underwriting expenses will increase.

ANS: B                    PTS: 1                    DIF: MEDIUM    REF: 438  
OBJ: (14.7) Shelf prospectus                    BLM: Higher Order

16. Which statement concerning bought deals is true?

- a. They reduce risk to underwriters.
- b. They are also known as follow-on offerings.
- c. They involve large orders (with 10,000 shares or more).

ANS: C

In Canada, competition for lucrative underwriting deals and the market-out clause have created an environment for bought deals, which are often used by large, well-known companies for their seasoned equity issues.

PTS: 1                      DIF: MEDIUM      REF: 438–439      OBJ: (14.7) Bought deals  
BLM: Higher Order

17. Which of the following statements best describes private placements?
- a. In a private placement, securities are sold to private (individual) investors rather than to institutions.
  - b. Private placements occur most frequently with stocks, but bonds can also be sold in a private placement.
  - c. Private placements are convenient for issuers, but the convenience is offset by higher flotation costs.
  - d. Private placements can generally bring in funds faster than is the case with public offerings.

ANS: D                      PTS: 1                      DIF: MEDIUM      REF: 438  
OBJ: (14.7) Private placements                      BLM: Higher Order

18. What is one of the advantages of going private?
- a. reduced managerial flexibility
  - b. lower shareholder participation
  - c. higher cost in security registration
  - d. increased managerial efficiency

ANS: D                      PTS: 1                      DIF: MEDIUM      REF: 440  
OBJ: (14.8) Going private                      BLM: Remember

19. Which statement about leveraged buyouts is true?
- a. LBOs will not benefit public shareholders.
  - b. Incumbent management may be penalized by LBOs.
  - c. LBOs do not affect the asset values of the company.

ANS: C                      PTS: 1                      DIF: MEDIUM      REF: 439  
OBJ: (14.8) Leverage buyouts                      BLM: Higher Order

20. Which of the following projects is more likely to be funded with project financing by investors?
- a. smaller-scale but complex projects
  - b. large-scale and stable projects
  - c. smaller-scale and independent projects
  - d. large-scale and risky projects

ANS: B                      PTS: 1                      DIF: MEDIUM      REF: 441  
OBJ: (14.9) Project financing                      BLM: Higher Order

21. Which statement regarding debt refunding is true?
- a. If new debt is used to refund old debt, the correct discount rate to use in the refunding analysis is the before-tax cost of new debt.
  - b. The key benefits associated with refunding debt are the reduction in the firm's debt ratio

- and the creation of more reserve borrowing capacity.
- c. The mechanics of finding the NPV of a refunding decision are fairly straightforward. However, the decision of when to refund is not always clear because it requires a forecast of future interest rates.
  - d. If a firm with a positive NPV refunding project delays refunding and interest rates rise, the firm can still obtain the entire NPV by locking in a low coupon rate when the rates are low, even though it actually refunds the debt after rates have risen.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 446  
OBJ: (Appendix 14A) Refunding decision                      BLM: Higher Order

22. Which factor would increase the likelihood that a company would call its outstanding bonds at this time?
- a. The yield to maturity on the company's outstanding bonds increases due to a weakening of the firm's financial situation.
  - b. A provision in the bond indenture lowers the call price on specific dates, and yesterday was one of those dates.
  - c. The flotation costs associated with issuing new bonds rise.
  - d. The firm's CFO believes that interest rates are likely to decline in the future.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 446–450  
OBJ: (Appendix 14A) Refunding decision                      BLM: Higher Order

23. Which statement concerning common stock and the investment banking process is **NOT true**?
- a. The preemptive right gives each existing common stockholder the right to purchase his or her proportionate share of a new stock issue.
  - b. If a firm sells 1,000,000 new shares of Class B stock, the transaction occurs in the primary market.
  - c. Listing a large firm's stock is often considered to be beneficial to stockholders because the resulting increases in liquidity and reputation probably outweigh the additional costs to the firm.
  - d. If stockholders are dissatisfied with management's performance, an outside group may ask the stockholders to vote for it in an effort to take control of the business. This action is called a tender offer.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 435–9  
OBJ: (Comp: 14.5, 14.7) Investment banking process                      BLM: Higher Order

24. Which of the following statements is NOT true?
- a. When a corporation's shares are owned by a few individuals who own most of the stock or are part of the firm's management, we say that the firm is "closely, or privately, held."
  - b. "Going public" establishes a firm's true intrinsic value and ensures that a liquid market will always exist for the firm's shares.
  - c. When stock in a closely held corporation is offered to the public for the first time, the transaction is called "going public," and the market for such stock is called the new issue market.
  - d. It is possible for a firm to go public and yet not raise any additional new capital.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 429–431  
OBJ: (Comp: 14.5, 14.4) Investment banking process                      BLM: Higher Order

25. An entrepreneur first started his business with \$100,000. Later, a venture capitalist (VC) agrees to invest \$300,000 to sustain the growth. In return, this VC will take up a 50% equity position in the firm. How much is this business worth now?
- a. \$400,000

- b. \$600,000
- c. \$700,000
- d. \$800,000

ANS: B

$\$300,000/0.5 = \$600,000$ . In return for providing funds, venture capitalists receive an equity position in the firm in proportion with the market values.

PTS: 1                    DIF: MEDIUM      REF: 424–425                    OBJ: (14.1) Venture capital funds  
BLM: Higher Order

26. With a firm commitment underwriting, an investment bank agrees to sell 2 million shares to the public at \$10 per share with a spread of \$1. How much does the issuing company receive if only 1.5 million shares are sold?
- a. \$20.0 million
  - b. \$18.0 million
  - c. \$15.0 million
  - d. \$13.5 million

ANS: B

$(\$10 - \$1) \times 2,000,000 = \$18,000,000$ . Under a firm commitment underwriting, the investment dealer buys the new securities from the issuer and guarantees the sale of a certain number.

PTS: 1                    DIF: MEDIUM      REF: 431 | 434                    OBJ: (14.5) IPO: firm commitment underwriting                    BLM: Higher Order

27. An underwriter follows a best efforts basis to sell 2 million shares at \$10 a piece. Such a public offering price has included a \$1 spread. How much will the issuer receive if only 1.5 million shares are sold in this issue?
- a. \$20.0 million
  - b. \$18.0 million
  - c. \$15.0 million
  - d. \$13.5 million

ANS: D

$(\$10 - \$1) \times 1,500,000 = \$13,500,000$ . Best efforts underwriting refers to shares that are sold by investment dealers through an agency agreement to do their best, with no guarantee of success. Investment dealers are paid an amount for each share they sell.

PTS: 1                    DIF: MEDIUM      REF: 431 | 434                    OBJ: (14.5) IPO: best efforts underwriting                    BLM: Higher Order

28. Consider the following information about an IPO underwriting transaction. The net proceeds to the issuing firm are \$141.75 million. The public offering price is \$50 per share. The spread is \$2.75 per share. Two million shares are sold. How many shares are issued in this IPO?
- a. 3,500,000
  - b. 3,000,000
  - c. 2,500,000
  - d. 2,000,000

ANS: B

Public offer price = \$50/share. Net proceeds to issuer = \$47.25/share. Solve  $\$141,750,000 = (X)(\$47.25)$  for  $X = 3,000,000$ . This IPO is carried out by firm commitment underwriting, although only 2 million shares are actually sold.

PTS: 1                    DIF: MEDIUM      REF: 431 | 434      OBJ: (14.5) IPO: shares issued  
BLM: Higher Order

29. In an IPO issue, the issuing company has incurred \$10 million for the floatation costs and legal fees. The issue involves 50 million shares. As a firm commitment written deal, the underwriter agrees to buy the shares at \$18 each and resells to the public at \$20 per share. What will be the percentage of direct costs required in this deal?
- 11.50%
  - 10.00%
  - 9.10%
  - 8.40%

ANS: C

Underwriting spread =  $(\$20 - \$18) (50m) = \$100m$  when a firm issues new securities to the public.  
Legal fees and other explicit flotation costs = \$10m (given). Total expenses incurred for this new issue = \$110m. Underpricing is an implicit/indirect flotation cost. Direct costs =  $10/(110) = 0.0909$  in terms of percentage.

PTS: 1                    DIF: MEDIUM      REF: 434  
OBJ: (14.5) IPO: direct/indirect costs      BLM: Higher Order

30. Tuttle Buildings Inc. has decided to go public by selling \$5,000,000 of new common stock. Its investment bankers agreed to take a smaller fee now (6% of gross proceeds, versus their normal 10%) in exchange for a 1-year option to purchase an additional 200,000 shares at \$5.00 per share. The investment bankers expect to exercise the option and purchase the 200,000 shares in exactly 1 year, when the stock price is forecasted to be \$6.50 per share. However, there is a chance that the stock price will actually be \$12.00 per share 1 year from now. If the \$12 price occurs, what would the present value of the entire underwriting compensation be? Assume that the investment banker's required return on such arrangements is 15%, and ignore taxes.
- \$1,300,973
  - \$1,369,446
  - \$1,441,522
  - \$1,517,391

ANS: D

Gross funds:	\$5,000,000	Current price:	\$5.00
Small fee:	6%	Expected price:	\$6.50
Normal fee:	10%	Possible price:	\$12.00
Option shares:	200,000	Required return:	15%

Fee received now =  $6\% \times \$5,000,000 = \$300,000$

Additional fee: Option profit if the stock price is \$12 in 1 year =  $(\$12 - \$5) \times 200,000 = \$1,400,000$

PV of total compensation if \$12 price =  $\$300,000 + \$1,400,000/(1.15)^1 = \$1,517,391$

PTS: 1                    DIF: MEDIUM      REF: 434  
OBJ: (14.5) Investment bankers compensation      BLM: Higher Order

31. Europa Corporation is financing an ongoing construction project. The firm will need \$5,000,000 of new capital during each of the next 3 years. The firm has a choice of issuing new debt or equity each year as the funds are needed, or issuing only debt now and equity later. Its target capital structure is 40% debt and 60% equity, and it wants to be at that structure in 3 years, when the project has been completed. Debt flotation costs for a single debt issue would be 1.6% of the gross debt proceeds. Yearly flotation costs for three separate issues of debt would be 3.0% of the gross amount. Ignoring time value effects, how much would the firm save by raising all of the debt now, in a single issue, rather than in three separate issues?
- \$79,425
  - \$83,606
  - \$88,006
  - \$92,406

ANS: C

Flotation %, 3 issues: 3.0%      Flotation %, 1 issue: 1.6%

Total funds needed =  $3 \times \$5,000,000 = \$15,000,000$

Total debt needed =  $40\% \times \$15,000,000 = \$6,000,000$

Debt/year if use 3 separate issues =  $\text{Total debt}/3 = \$2,000,000$

Grossed-up debt if use a single issue =  $\text{Net debt needed}/(1 - F) = \$6,000,000/(1 - 0.016) = \$6,097,561$

Flotation cost for single issue:  $\text{Gross debt} - \text{Proceeds to company} = \$97,561$

Gross debt with 3 issues:  $\text{Net debt needed}/(1 - F) = \$6,000,000/(1 - 0.03) = \$6,185,567$

Flotation cost for yearly issues:  $\text{Gross debt} - \text{Proceeds to company} = \$185,567$

Difference =  $\text{Additional cost of 3 issues: } \$185,567 - \$97,561 = \$88,006$

PTS: 1

DIF: MEDIUM

REF: 438

OBJ: (14.7) Flotation costs

BLM: Higher Order

32. Thompson Enterprises has \$5,000,000 of bonds outstanding. Each bond has a maturity value of \$1,000, an annual coupon of 12.0%, and 15 years left to maturity. The bonds can be called at any time with a premium of \$50 per bond. If the bonds are called, the company must pay flotation costs of \$10 per new refunding bond. Ignore tax considerations and assume that the firm's tax rate is zero.

The company's decision of whether to call the bonds depends critically on the current interest rate on newly issued bonds. What is the breakeven interest rate, the rate below which it would be profitable to call in the bonds?

- 9.57%
- 10.07%
- 10.60%
- 11.16%

ANS: D

Call premium: \$50

Old rate: 12.0%

Flotation cost per bond: \$10

Years to maturity: 15

Amount of issue: \$5,000,000

Number of bonds: 5,000

Par value of bonds: \$1,000

Cost of refunding:

Call premium per bond  $\times$  number of bonds = \$250,000

Flotation cost =  $\$10 \times$  Number of bonds issued = \$ 50,000

Total investment outlay: \$300,000

Interest on old bond per year =  $\text{Old rate} \times \text{Amount} = \$600,000$

If the company does not call the bonds, it will have to pay \$600,000 per year for 15 years, plus \$5,000,000 at Year 15. If it goes ahead and calls the bonds, it will have to pay \$300,000 + \$5,000,000 = \$5,300,000 today. We can find the discount rate that equates these cash flows. Here is the time line:

0	1	2	3	•••	15
-300,000	\$600,000	\$600,000	\$600,000		\$ 600,000
-5,000,000					\$5,000,000
-5,300,000	600000	600000	600000		\$5,600,000

If you enter these cash flows in the cash flow register of a calculator and then press the IRR key, you will get the breakeven rate, which is 11.1583%, rounded to 11.16%. You can do the same thing with Excel. Note that the annual savings at this lower rate would be  $(0.12 - 0.111583) \times \$5,000,000 = \$42,084.78$ . The PV of that amount, discounted back for 15 years at 11.16%, is \$300,000.

PTS: 1                    DIF: HARD                    REF: 447-449  
 OBJ: (Appendix 14A) Refunding; breakeven interest rate                    BLM: Higher Order

33. Rainier Bros. has 12.0% semiannual coupon bonds outstanding that mature in 10 years. Each bond is now eligible to be called at a call price of \$1,060. If the bonds are called, the company must replace them with new 10-year bonds. The flotation cost of issuing new bonds is estimated to be \$45 per bond. How low would the yield to maturity on the new bonds have to be in order for it to be profitable to call the bonds today, i.e., what is the nominal annual “breakeven rate”?
- 9.29%
  - 9.78%
  - 10.29%
  - 10.81%

ANS: C

Call price of bonds:	\$1,060	Old rate:	12.0%
Flotation cost per bond:	\$45	Years to maturity:	10
Par value of bonds:	\$1,000	Semiannual periods:	20

Cost of refunding:

Call price per bond:	\$1,060
Flotation cost per bond:	<u>\$ 45</u>
Total investment outlay per bond:	<u>\$1,105</u>
Interest on old bond per year = Old rate × Amount =	\$120
Interest per period:	\$60

If the company does not call the bonds, it will have to pay \$60 for 20 periods, plus \$1,000 at Period 20. If it goes ahead and calls the bonds now, it will have to pay \$1,060 + \$45 = \$1,105 today. We can find the discount rate that equates these cash flows. Here is the time line:

0	1	2	3	•••	20
-\$1,105	\$60	\$60	\$60		\$ 60
					\$1,000
-\$1,105	\$60	\$60	\$60		\$1,060

If you enter these cash flows in the cash flow register of a calculator and then press the IRR key, you will get the breakeven rate, which is 5.1469%, rounded to 5.15%. You can do the same thing with Excel. Note that the semiannual savings at this lower rate would be  $(0.12/2 - 0.051469) \times \$1,000 = \$8.53$ . The PV of that amount, discounted back for 20 periods at 5.15%, is \$105.00, which is the cost of the refunding. The semiannual discount, when doubled, is the breakeven nominal rate.



Required nominal annual rate to break even: 10.29%

PTS: 1                    DIF: HARD                    REF: 447-449  
OBJ: (Appendix 14A) Breakeven rate for bond refunding                    BLM: Higher Order

**Scenario: ABC Waste**

ABC Waste (ABCW) is considering refunding a \$50,000,000, annual payment, 14% coupon, 30-year bond issue that was issued 5 years ago. It has been amortizing \$3 million of flotation costs on these bonds over their 30-year life. The company could sell a new issue of 25-year bonds at an annual interest rate of 11.67% in today's market. A call premium of 8.4% would be required to retire the old bonds, and flotation costs on the new issue would amount to \$3 million. ABCW's marginal tax rate is 40%. The new bonds would be issued when the old bonds are called.

34. Refer to Scenario: ABC Waste. What is the required after-tax refunding investment outlay, i.e., the cash outlay at the time of the refunding?
- a. \$5,315,725
  - b. \$5,595,500
  - c. \$5,890,000
  - d. \$6,200,000

ANS: D

Amount:	\$50,000,000	Call premium %:	14%
Old rate:	14.00%	Tax rate:	40%
Original life:	30	New rate:	11.67%
Years ago issued:	5	New life:	25
Orig. flotation cost:	\$3,000,000	New flotation cost:	\$3,000,000

Years remaining on old bond: 25

Old issue flotation costs:

$$\text{Remaining unexpensed} = (25/30)(\$3) = \$2,500,000$$

$$\text{Tax saving on unexpensed float cost} = \$2.5(T) = \$2.5(0.4) = -1,000,000$$

$$\text{After tax cost of call premium: } 0.084(\$50) = 4,200,000$$

$$\text{Flotation costs on new issue: } \underline{3,000,000}$$

$$\text{Net after-tax cost to call the bonds: } 6,200,000$$

PTS: 1                    DIF: EASY                    REF: 447-448  
OBJ: (Appendix 14A) Refunding investment outlay                    BLM: Higher Order

35. Refer to Scenario: ABC Waste. What will the after-tax annual interest savings for ABCW be if the refunding takes place?
- a. \$664,050
  - b. \$699,000
  - c. \$768,900
  - d. \$845,790

ANS: B

$$\text{Old interest: } \$50,000,000(0.14)(0.6) = \$4,200,000$$

$$\text{New interest: } \$50,000,000(0.1167)(0.6) = \underline{(3,501,000)}$$

$$\text{Net annual interest savings} = \$699,000$$

PTS: 1                    DIF: EASY                    REF: 448-449  
OBJ: (Appendix 14A) Refunding investment savings                    BLM: Higher Order

36. Refer to Scenario: ABC Waste. The amortization of flotation costs reduces taxes and thus provides an annual cash flow. What will be the net increase or decrease in the annual flotation cost tax savings if refunding takes place?
- \$6,480
  - \$7,200
  - \$8,000
  - \$8,800

ANS: C

Flotation costs benefit, new: $(\$3.00/25)(0.4) =$	\$48,000
Flotation costs lost, old: $(\$3.00/30)(0.4) =$	<u>(40,000)</u>
Net annual amortization tax effects =	\$ 8,000

PTS: 1                      DIF: MEDIUM              REF: 447-448

OBJ: (Appendix 14A) Refunding flotation costs                      BLM: Higher Order

37. Refer to Scenario: ABC Waste. What is the NPV if ABCW refunds its bonds today?
- \$1,746,987
  - \$1,838,933
  - \$1,935,719
  - \$2,037,599

ANS: D

Appropriate discount rate = New bond cost  $\times (1 - T) = 7.002\%$

Financial calculator solution:

Inputs:  $N = 25$ ;  $I/YR = 7.0$ ;  $PMT = 699,000 + 8,000 = 707,000$ ;  $FV = 0$ .

Output: $PV = -\$8,237,599 = PV \text{ of savings} =$	\$8,237,599
Cost to refund =	<u>6,200,000</u>
NPV of the refunding =	\$2,037,599

PTS: 1                      DIF: MEDIUM              REF: 449

OBJ: (Appendix 14A) Refunding flotation costs                      BLM: Higher Order

## CHAPTER 15—LEASE FINANCING

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### TRUE/FALSE

1. Many leases written today combine the features of operating and financial leases. Such leases are often called “combination leases.”

ANS: T                      PTS: 1                      DIF: EASY                      REF: 454  
OBJ: (15.1) Types of leases

2. A sale and leaseback arrangement is a type of financial, or capital, lease.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 454  
OBJ: (15.1) Types of leases

3. Operating leases help to shift the risk of obsolescence from the user to the lessor.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 467  
OBJ: (15.7) Other reasons for leasing

4. Under a sale and leaseback arrangement, the seller of the leased property is the lessee and the buyer is the lessor.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 454  
OBJ: (15.1) Sale and leaseback

5. The full amount of a lease payment is tax deductible provided the contract qualifies as a true lease under CRA guidelines.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 455  
OBJ: (15.2) Lease payments

6. Leasing is often referred to as off-balance sheet financing because lease payments are shown as operating expenses on a firm’s income statement and, under certain conditions, leased assets and associated liabilities do not appear on the firm’s balance sheet.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 456  
OBJ: (15.3) Off-balance sheet leasing

7. Leasing is typically a financing decision and not a capital budgeting decision. Thus, the availability of lease financing cannot affect the size of the capital budget.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 459  
OBJ: (15.4) Lease financing

8. A leveraged lease is more risky from the lessee’s standpoint than an unleveraged lease.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 464  
OBJ: (15.5) Leveraged lease

9. A synthetic lease is a combination of derivative securities and asset purchases that mimic the cash flows of an operating lease.

ANS: F                    PTS: 1                    DIF: MEDIUM        REF: 455  
OBJ: (15.1) Synthetic leases

10. In a synthetic lease, a special purpose entity (SPE) is set up by a corporation that wants to acquire the use of an asset. The SPE borrows up to 97% of its capital, uses its funds to buy the asset, and then leases it to the sponsoring corporation on a short-term basis. This keeps both the asset and the debt off the sponsoring company's books.

ANS: T                    PTS: 1                    DIF: MEDIUM        REF: 455  
OBJ: (15.1) Synthetic leases

11. By entering into a lease, the lessee incurs an opportunity cost equal to the foregone CCA tax shield provided by the CCA of the asset.

ANS: T                    PTS: 1                    DIF: MEDIUM        REF: 455  
OBJ: (15.2) Tax effects

12. A fully taxable recapture exists if the lease provides the lessee with an option to purchase the asset at a bargain price.

ANS: T                    PTS: 1                    DIF: MEDIUM        REF: 456  
OBJ: (15.2) Tax effects

13. A lease has big impacts on the balance sheet, not the income statement.

ANS: F                    PTS: 1                    DIF: MEDIUM        REF: 456-458  
OBJ: (15.3) Financial statement effects

14. Under International Accounting Standards IAS 17, a capital lease exists if the lease term is equal to 50% or less of the estimated economic life of the property.

ANS: F                    PTS: 1                    DIF: MEDIUM        REF: 457-458  
OBJ: (15.3) Intent of IAS 17

15. Because of down payments, it is cheaper for lessees to lease an asset than to borrow money and purchase the asset.

ANS: F                    PTS: 1                    DIF: MEDIUM        REF: 458-461  
OBJ: (15.4) Advantages to leasing

16. The after-tax cost of debt is used as the discount rate for leasing analysis, and to be consistent with the capital budgeting purposes.

ANS: F                    PTS: 1                    DIF: MEDIUM        REF: 459  
OBJ: (15.4) Advantages to leasing

17. CCA recapture or terminal losses will not be an issue for lessors even when the lease expires.

ANS: T  
With a capital lease, the lease payments provide the lessor with a return on the funds invested in the asset plus a return on the invested funds. With an operating lease, the lessor depends on the residual value to realize a full return of, and on, the investment.

PTS: 1                    DIF: MEDIUM      REF: 463                    OBJ: (15.5) Concerns of lessors

18. If a leased asset has a negative residual value, for example, as a result of a statutory requirement to dispose of an asset in an environmentally sound manner, the lessee of the asset could reasonably expect to pay a lower lease rate because the asset does not have a positive residual value.

ANS: F                    PTS: 1                    DIF: MEDIUM      REF: 465  
OBJ: (15.6) Residual value and lease rates

19. Assume that a piece of leased equipment has a relatively high, rather than low, expected residual value. From the lessee's viewpoint, it might be better to own the asset rather than lease it because with a high residual value the lessee will likely face a higher lease rate.

ANS: F                    PTS: 1                    DIF: MEDIUM      REF: 465  
OBJ: (15.6) Residual value and lease rates

### MULTIPLE CHOICE

1. Which type of organization are Xerox and IBM good examples of?
- firms specializing in lease financing
  - firms using only leases for asset financing
  - manufacturers of items that are financed exclusively by firms specializing in lease financing
  - manufacturers providing lease financing as part of their regular sales effort

ANS: D                    PTS: 1                    DIF: EASY              REF: 453–454  
OBJ: (15.1) Leasing                    BLM: Higher Order

2. From the lessee viewpoint, the riskiness of the cash flows, with the possible exception of the residual value, is about the same as what?
- the lessee's equity cash flows
  - the lessee's capital budgeting project cash flows
  - the lessee's debt cash flows
  - the lessee's pension fund cash flows

ANS: C                    PTS: 1                    DIF: EASY              REF: 461  
OBJ: (15.4) Lease cash flows              BLM: Higher Order

3. Which type of terms are often included in operating leases?
- terms including maintenance of the equipment by the lessor
  - terms including full amortization over the life of the lease
  - terms including very high penalties if the lease is cancelled
  - terms including restrictions on how much the leased property can be used

ANS: A                    PTS: 1                    DIF: MEDIUM      REF: 453–454  
OBJ: (15.1) Operating lease              BLM: Remember

4. Which statement best describes leases?
- Firms that use "off-balance sheet" financing, such as leasing, would show lower debt ratios if the effects of their leases were reflected in their financial statements.
  - Capitalizing a lease means that the firm issues equity capital in proportion to its current capital structure, in an amount sufficient to support the lease payment obligation.
  - The fixed charges associated with a lease can be as high as, but never greater than, the fixed payments associated with a loan.

- d. A key difference between a capital lease and an operating lease is that with a capital lease, the lease payments provide the lessor with a return of the funds invested in the asset plus a return on the invested funds, whereas with an operating lease the lessor depends on the residual value to realize a full return of and on the investment.

ANS: D                      PTS: 1                      DIF: MEDIUM      REF: 453–454  
OBJ: (15.1) Leasing                      BLM: Higher Order

5. Which of the following is NOT a typical design of a synthetic lease?
- A lender receives part of the lease payments from the lessee.
  - A lender is involved for a large part of the financing of the asset.
  - There is usually a long-term commitment.
  - It is a tax-oriented lease.

ANS: A                      PTS: 1                      DIF: MEDIUM      REF: 455  
OBJ: (15.1) Synthetic lease                      BLM: Remember

6. Which of the following statements is true?
- Being the legal owners, lessors can claim full CCA for all assets.
  - Even with ownership, lessors may claim full CCA on exempt assets only.
  - As agreed, lessees are allowed to claim the CCA and the lease payment.
  - The specified leasing property rules discriminate against lessees for non-exempt assets.

ANS: B                      PTS: 1                      DIF: MEDIUM      REF: 456  
OBJ: (15.2) Tax effects                      BLM: Remember

7. International Accounting Standards IAS 17 requires that for an unqualified audit report, financial (or capital) leases must be included in the balance sheet. How should they be reported?
- residual value as a fixed asset
  - residual value as a liability
  - present value of future lease payments as an asset and also showing this same amount as an offsetting liability
  - undiscounted sum of future lease payments as an asset and as an offsetting liability

ANS: C                      PTS: 1                      DIF: MEDIUM      REF: 457  
OBJ: (15.3) Capitalizing leases                      BLM: Remember

8. If a lease is capitalized, how is it reported under International Accounting Standards IAS 17?
- It shows up as a liability on the lessor's financial statements.
  - It is a debt on the right-hand side of the lessee's balance sheet, and an asset on the left.
  - The lease's present value shows as a liability on the lessee's balance sheet, but not as an asset.
  - The lease becomes a capital asset for the lessor, allowing the firm to capitalize on its value to borrow more.

ANS: B                      PTS: 1                      DIF: MEDIUM      REF: 457  
OBJ: (15.3) Capitalizing leases                      BLM: Remember

9. What will heavy use of off-balance sheet lease financing tend to do?
- make a company appear more risky than it actually is because its stated debt ratio will be increased
  - make a company appear less risky than it actually is because its stated debt ratio will appear lower
  - affect a company's cash flows but not its degree of risk
  - affect the lessee's cash flows but only due to tax effects

ANS: B                    PTS: 1                    DIF: MEDIUM    REF: 456–457  
OBJ: (15.3) Off–balance sheet leasing    BLM: Higher Order

10. In the lease versus buy decision, why is leasing often preferable?
- because it has no effect on the firm’s ability to borrow to make other investments
  - because, generally, no down payment is required, and there are no indirect interest costs
  - because lease obligations do not affect the firm’s risk as seen by investors
  - because the lessee may have greater flexibility in abandoning the project in which the leased property is used than if the lessee bought and owned the asset

ANS: D                    PTS: 1                    DIF: MEDIUM    REF: 467  
OBJ: (15.7) Lease reason                    BLM: Higher Order

11. Given which assumption should a lease versus purchase analysis compare the cost of leasing to the cost of owning?
- assuming that the asset purchased is financed with short-term debt
  - assuming that the asset purchased is financed with long-term debt
  - assuming that the asset purchased is financed with debt whose maturity matches the term of the lease
  - assuming that the asset purchased is financed with retained earnings

ANS: C                    PTS: 1                    DIF: MEDIUM    REF: 459  
OBJ: (15.4) Lease analysis discount rate    BLM: Higher Order

12. Under which circumstances will a lessor likely charge higher lease rates?
- if the lessor’s tax rate increases
  - if the cost of borrowing increases
  - if the residual value of the asset increases
  - if the purchase price of the asset decreases

ANS: B                    PTS: 1                    DIF: MEDIUM    REF: 463–464  
OBJ: (15.5) Lease payment                    BLM: Higher Order

13. When will a lower lease payment possibly arise?
- when there is a lower tax rate for the lessee
  - when there is a lower tax rate for the lessor
  - when there is a lower purchase cost for the asset
  - when there is a lower CCA tax shield

ANS: C                    PTS: 1                    DIF: MEDIUM    REF: 463–464  
OBJ: (15.5) Lease payment                    BLM: Higher Order

14. Under which circumstances should an asset be leased?
- when the NPV is positive and the NAL is also positive
  - when the NPV is positive but the NAL is negative
  - when the NPV is negative and the NAL is negative too
  - when the NPV is negative and the NAL is positive, but smaller than the NPV

ANS: A                    PTS: 1                    DIF: MEDIUM    REF: 458–459 | 461–462  
OBJ: (15.4) NPV and NAL                    BLM: Higher Order

15. In theory, we may regard the lease alternative as a commitment to finance the asset with what level of debt?
- 0%
  - 25%

- c. 50%
- d. 100%

ANS: D                      PTS: 1                      DIF: MEDIUM      REF: 465  
 OBJ: (15.6) Other reasons for leasing      BLM: Higher Order

16. Sutton Corporation, which has a zero tax rate due to tax loss carryforwards, is considering a 5-year, \$6,000,000 bank loan to finance service equipment. The loan has an interest rate of 10% and would be amortized over 5 years, with five end-of-year payments. Sutton can also lease the equipment for five end-of-year payments of \$1,790,000 each. How much larger or smaller is the bank loan payment than the lease payment? Note: Subtract the loan payment from the lease payment.
- a. \$177,169
  - b. \$196,854
  - c. \$207,215
  - d. \$217,576

ANS: C  
 Years: 5  
 Loan amount: \$6,000,000  
 Interest rate: 10.0%  
 Lease Pmt: \$1,790,000

	0	1	2	3	4	5
Loan:	-\$6,000,000	PMT	PMT	PMT	PMT	PMT

Find the loan payment: Financial calculator solution:  
 Inputs: N = 5; I/YR = 10; PV = -6,000,000; FV = 0.  
 Output = PMT = \$1,582,785

Difference in payments = \$1,790,000 - \$1,582,785 = \$207,215.

PTS: 1                      DIF: EASY                      REF: 459  
 OBJ: (15.4) Difference in payments      BLM: Higher Order

17. Consider the following information: original investment = \$2,500, PV of CCA tax shield = \$850, PV of after-tax lease payments = \$1,700. What is the NAL?
- a. \$2,550
  - b. \$1,650
  - c. -\$800
  - d. -\$50

ANS: D  
 NAL = \$2,500 - \$850 - \$1,700 = -\$50

PTS: 1                      DIF: EASY                      REF: 461-462  
 OBJ: (15.4) Net advantage to leasing (NAL)      BLM: Higher Order



18. Kohers Inc. is considering a leasing arrangement to finance some manufacturing tools that it needs for the next three years. The tools will be obsolete and worthless after 3 years. The firm will depreciate the cost of the tools on a straight-line basis over their 3-year life. It can borrow \$4,800,000, the purchase price, at 10% and buy the tools, or it can make 3 equal end-of-year lease payments of \$2,100,000 each and lease them. The loan obtained from the bank is a 3-year simple interest loan, with interest paid at the end of the year. The firm's tax rate is 40%. Annual maintenance costs associated with ownership are estimated at \$240,000, but this cost would be borne by the lessor if it leases. What is the net advantage to leasing (NAL), in thousands? (Suggestion: Delete 3 zeros from dollars and work in thousands.)
- \$96
  - \$106
  - \$112
  - \$117

ANS: B

Years: 3      Tax rate:      40%  
 Loan amount = equipment cost: \$4,800      Maintenance costs:      \$240  
 Interest rate:      10.0%      Salvage value:      \$0  
 Lease Pmt:      \$2,100

After tax cost of debt = Rate  $\times$  (1 - T) = 6.0%

Depreciation per year = Cost/3 = \$1,600

Tax saving from deprn = Deprn  $\times$  T = \$640

	0	1	2	3	
Cost of owning:					
Interest	-480	-480	-480		
Interest tax saving				192	192
Maintenance		-240	-240	-240	
Maintenance tax saving				96	96
Deprn tax saving			640	640	640
Repayment of loan					-4,800
Net cash loan costs			<u>208</u>	<u>208</u>	<u>-4,592</u>
PV cost of owning (6%):					-3,474
Cost of leasing:					
Lease payment		-2,100	-2,100	-2,100	
Tax savings from lease				840	840
Net cash lease costs			<u>-1,260</u>	<u>-1,260</u>	<u>-1,260</u>
PV cost of leasing (6%):					-3,368

NAL = PV Cost of Owning - PV Cost of Leasing =      \$106

PTS: 1      DIF: MEDIUM      REF: 459-460

OBJ: (15.4) Net advantage to leasing (NAL)

BLM: Higher Order

19. Dakota Trucking Company (DTC) is evaluating a potential lease for a truck with a 4-year life that costs \$40,000 and falls into the MACRS 3-year class. If the firm borrows money to buy the truck, the loan rate would be 10%, and the loan would be amortized over the truck's 4-year life, so the interest expense for taxes would decline over time. The loan payments would be made at the end of each year. The truck will be used for 4 years, at the end of which time it will be sold at an estimated residual value of \$10,000. If DTC buys the truck, it would purchase a maintenance contract that costs \$1,000 per year, payable at the end of each year. The lease terms, which include maintenance, call for a \$10,000 lease payment (4 payments total) at the beginning of each year. DTC's tax rate is 40%. Should the firm lease or buy? (Note: Depreciation rates for Years 1 to 4 are 0.33, 0.45, 0.15, and 0.07.)
- \$849
  - \$896
  - \$945
  - \$997

ANS: D

Life of equipment:	4	Tax rate:	40%
Loan amount = equipment cost:	\$40,000	Maintenance costs:	\$1,000
Interest rate:	10.0%	Salvage value:	\$10,000
Lease Pmt:	\$10,000		

Loan amortization for cash payment and interest expense:

Payment:  $N = 4$ ,  $I/YR = 10$ ,  $PV = 40000$ ,  $FV = 0$ .  $PMT = -\$12,618.83$

<u>Year</u>	<u>Beg. Bal.</u>	<u>PMT</u>	<u>Interest</u>	<u>Principal</u>	<u>Ending Bal.</u>
1	40,000	12,619	4,000	8,619	31,381
2	31,381	12,619	3,138	9,481	21,900
3	21,900	12,619	2,190	10,429	11,472
4	11,472	12,619	1,147	11,472	0

Loan Analysis:	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Depr. factor	0.33	0.45	0.15	0.07	
Depreciation	13,200	18,000	6,000	2,800	

Loan Pmt	-12,619	-12,619	-12,619	-12,619				
Int tax saving (Int. from table $\times$ T)				1,600	1,255	876	459	
Maintenance	-1,000	-1,000	-1,000	-1,000				
Maint. tax saving (Maint. $\times$ T)				400	400	400	400	
Depr'n tax saving (Deprn $\times$ T)				5,280	7,200	2,400	1,120	
Net operating CF		-6,339	-4,764	-9,943	-11,640			
Salvage value				10,000				
Tax on residual							-4,000	
Net residual val							6,000	
Total Net CF		<u>-6,339</u>	<u>-4,764</u>	<u>-9,943</u>	<u>-5,640</u>			

PV cost of buying at  $I(1 - T) = 6.00\%$     -23,035

Lease Analysis:	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Lease payment	-10,000	-10,000	-10,000	-10,000	
Tax saving on pmt		4,000	4,000	4,000	4,000
Net cost of lease		<u>-6,000</u>	<u>-6,000</u>	<u>-6,000</u>	<u>-6,000</u>
PV cost of leasing at $I(1 - T)$		-22,038			

NAL = \$997

PTS: 1                    DIF: HARD                    REF: 459-460                    OBJ: (15.4) Lessee's analysis  
 BLM: Higher Order

20. Buster's Beverages is negotiating a lease on a new piece of equipment that would cost \$100,000 if purchased. The equipment falls into the MACRS 3-year class, and it would be used for 3 years and then sold, because the firm plans to move to a new facility at that time. The estimated value of the equipment after 3 years is \$30,000. A maintenance contract on the equipment would cost \$3,000 per year, payable at the beginning of each year. Alternatively, the firm could lease the equipment for 3 years for a lease payment of \$29,000 per year, payable at the beginning of each year. The lease would include maintenance. The firm is in the 20% tax bracket, and it could obtain a 3-year simple interest loan, interest payable at the end of the year, to purchase the equipment at a before-tax cost of 10%. If there is a positive Net Advantage to Leasing the firm will lease the equipment. Otherwise, it will buy it. What is the NAL? (Note: Depreciation rates for Years 1 to 3 are 0.33, 0.45, and 0.15)
- \$5,736
  - \$6,023
  - \$6,324
  - \$6,640

ANS: A

Life of equipment:	3	Tax rate:	20%
Loan amount = equipment cost:	\$100,000	Maintenance costs:	\$3,000
Interest rate, simple:	10.0%	Salvage value:	\$30,000
Lease Pmt:	\$29,000		

Loan Analysis:	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>Totals</u>
Depr. factor	0.33	0.45	0.15	0.93	
Depreciation	33,000	45,000	15,000	93,000	

Loan repayment				-100,000		
Interest	-10,000	-10,000		-10,000		
Int tax saving (Interest × T)				2,000	2,000	2,000
Maintenance	-3,000	-3,000	-3,000			
Maint. tax saving (Maint. × T)			600	600	600	
Depr'n tax saving (Deprn × T)				6,600	9,000	3,000
Net operating CF	-2,400	-3,800	-1,400	-105,000		
Salvage value before taxes				30,000		
Book value (Cost – Total dep'rn)						<u>7,000</u>
Taxable salvage value				23,000		
Tax on salvage value					<u>-4,600</u>	
Salvage value after taxes						<u>25,400</u>
Total Net CF	<u>-2,400</u>	<u>-3,800</u>	<u>-1,400</u>	<u>-79,600</u>		
PV cost at $I(1 - T) = 8.00\%$						-70,308

Lease Analysis:	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>
Lease payment	-29,000	-29,000	-29,000	
Tax saving on pmt		5,800	5,800	5,800
Net cost of lease	<u>-23,200</u>	<u>-23,200</u>	<u>-23,200</u>	<u>0</u>
PV cost of leasing at $I(1 - T)$				-64,572

NAL = \$5,736

PTS: 1                    DIF: HARD                    REF: 459-460                    OBJ: (15.4) Lessee's analysis  
 BLM: Higher Order

**Scenario: ABC Leasing**

ABC Leasing has an after-tax cost of borrowing of 10%. The company is in a 35% tax bracket. A new machine will be purchased for \$100,000. The straight-line method is used to calculate depreciation. With heavy use, the salvage value is zero. The firm now wants to rent out this machine for 5 years at a required return of 15%. The first lease payment starts once the contract has been signed. Furthermore, lease payments received by the lessor are fully taxable.

21. Refer to Scenario: ABC Leasing. What is the net cost of this machine for the lessor as a legal owner receiving all tax benefits?
- a. \$19,057
  - b. \$29,318
  - c. \$73,465
  - d. \$100,000

ANS: C

After-tax cost of debt = 10% (given). Annual depreciation =  $(\$100,000 - 0)/5 = \$20,000$ . Tax shields from depreciation =  $(\$20,000)(0.35) = \$7,000/\text{year}$ .  $PVTS@10\% = -\$26,535.60$  using financial calculator with inputs:  $N = 5$ ,  $I/Y = 10$ ,  $PMT = 7,000$ ,  $FV = 0$ . Net cost =  $\$100,000 - \$26,535.60 = \$73,464.50$ , which is the amount the lessor has to recover through the lease payments.

PTS: 1                      DIF: HARD                      REF: 463-464  
OBJ: (15.5) Lessor's analysis: asset cost      BLM: Higher Order

22. Refer to Scenario: ABC Leasing. What is the required annual lease payment that the lessor must charge?
- a. \$17,391
  - b. \$21,915
  - c. \$26,535
  - d. \$29,318

ANS: D

With the advanced lease payment, solve  $\$73,464.5 = L * PVIFA(15\%, 5) \times (1.15)$  for  $L = 73,464.4/3.855 = \$19,056.76$ , which is the after-tax amount. At a 35% corporate tax rate, required annual lease payment =  $\$19,056.76/(1 - 0.35) = \$29,318.09$ , which is the amount charged to the lessee.

PTS: 1                      DIF: HARD                      REF: 463-464  
OBJ: (15.5) Lessor's analysis: lease payment                      BLM: Higher Order



OBJ: (16.5) Securitization

10. Securitization can always improve the liquidity with respect to the securitized assets.

ANS: T                   PTS: 1                   DIF: EASY                   REF: 484

OBJ: (16.5) Securitization

11. Liquid assets such as bankers' acceptance (BA) can never be used for securitization.

ANS: F                   PTS: 1                   DIF: EASY                   REF: 484

OBJ: (16.5) Securitization

12. Asset securitizations allow investors to expand the scope of their investment choices.

ANS: T                   PTS: 1                   DIF: EASY                   REF: 486

OBJ: (16.5) Securitization

13. Credit default swaps help protection sellers transfer all interest rate risk to the protection buyers.

ANS: F                   PTS: 1                   DIF: EASY                   REF: 486

OBJ: (16.6) Credit derivatives

14. A security made up of corporate loans and credit default swaps is called a collateralized debt obligation (CDO).

ANS: T                   PTS: 1                   DIF: EASY                   REF: 487

OBJ: (16.6) Credit derivatives

15. The "misused" asset securitizations, credit derivatives, and CDOs took the blame for creating the credit crisis of 2007.

ANS: T                   PTS: 1                   DIF: EASY                   REF: 488–489

OBJ: (16.7) Credit crisis

16. One warrant entitles the holder to purchase only one common share.

ANS: F                   PTS: 1                   DIF: MEDIUM                   REF: 475

OBJ: (16.1) Warrants

17. The value of the warrant increases as the market price of the underlying shares rises.

ANS: T                   PTS: 1                   DIF: MEDIUM                   REF: 476

OBJ: (16.1) Warrants

18. The design of stepped-up exercise prices is to control the timing of equity capital raised for the firm.

ANS: T                   PTS: 1                   DIF: MEDIUM                   REF: 476

OBJ: (16.1) Warrants

19. Convertible bonds typically have a call provision.

ANS: T                   PTS: 1                   DIF: MEDIUM                   REF: 478

OBJ: (16.2) Convertibles

20. Convertible bonds usually have higher credit ratings than the basic non-convertible bonds.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 478  
OBJ: (16.2) Convertibles

21. The conversion price of a convertible security is fixed and independent of stock market conditions.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 478  
OBJ: (16.2) Convertibles

22. Since warrants and convertibles give holders the right to exchange for their underlying stock, they should represent the same sources of financing.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 483  
OBJ: (16.3) Warrants and convertibles

23. Warrants, convertible securities, and call and put options are similar in the sense that they have a value contingent upon the future value of the firm's shares.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 483  
OBJ: (16.3) Warrants and convertibles

24. In many loan securitizations, most borrowers of the sold loans are unaware that the lender has sold the loans.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 484  
OBJ: (16.5) Securitization

25. Special purpose vehicles (SPVs) in asset securitization usually contain credit enhancements for their securities.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 485  
OBJ: (16.5) Securitization

26. Different tranches in a mortgage-backed security have different default risk exposure.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 485  
OBJ: (16.5) Securitization

27. Asset-backed commercial papers do not appeal to investors because little is known about the assets backing the securities.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 484  
OBJ: (16.5) Securitization

28. The ultimate credit risk of asset-backed securities lies with the special purpose vehicle that is the central payor.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 485  
OBJ: (16.5) Securitization

29. If the expected recovery value decreases, then the size of payment upon the occurrence of a credit event will increase. This will increase the protection payment.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 486  
OBJ: (16.6) Credit derivatives

30. If a zero correlation of default exists between the different securities and the loan, the equity tranche may have no hope of being paid.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 487–488  
OBJ: (16.6) Credit derivatives

## MULTIPLE CHOICE

1. When warrants are exercised, what happens as a result of this?
- The security associated with the warrant drops in value depending on the exercise price of the warrant.
  - Funds are transferred from the retained earnings account to common shares account for the market value of the shares.
  - The number of common shares outstanding changes.
  - There is no new capital for the firm because the warrants are exchanged for the common shares.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 475–476  
OBJ: (16.1) Warrants                      BLM: Higher Order

2. Which factor will NOT affect the price paid on warrants?
- the coupon rates of the security to which the warrant is issued
  - the expiration time of the warrant
  - the difference between the current share price and the exercise price on warrants
  - the amount of cash dividends paid on the common shares of the firm

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 476  
OBJ: (16.1) Warrants                      BLM: Higher Order

3. Which of the following statements best describes convertibles?
- One advantage of convertibles over warrants is that the issuer receives additional cash when convertibles are converted.
  - Investors are willing to accept a lower interest rate on a convertible than on otherwise similar straight debt because convertibles are less risky than straight debt.
  - At the time it is issued, a convertible's conversion (or exercise) price is generally set equal to or below the underlying stock's price.
  - For equilibrium to exist, the expected return on a convertible bond must normally be between the expected return on the firm's otherwise similar straight debt and the expected return on its common stock.

ANS: D

(d) is correct. From an investor's standpoint, convertibles are normally more risky than straight debt but less risky than common stock, hence the expected return on the convertible lies between that of the share and that of the straight bond.

PTS: 1                      DIF: MEDIUM                      REF: 477–482                      OBJ: (16.2) Convertibles  
BLM: Higher Order

4. Which of the following statements best describes warrants?
- Warrants are long-term put options that have value because holders can sell the firm's



- common stock at the exercise price regardless of how low the market price drops.
- b. Warrants are long-term call options that have value because holders can buy the firm's common stock at the exercise price regardless of how high the stock's price has risen.
  - c. A firm's investors would generally prefer to see it issue bonds with warrants than straight bonds because the warrants dilute the value of new shareholders, and that value is transferred to existing shareholders.
  - d. A drawback to using warrants is that if the firm is very successful, investors will be less likely to exercise the warrants, and this will deprive the firm of receiving any new capital.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 483  
OBJ: (16.3) Warrants and convertibles                      BLM: Higher Order

5. Which of the following statements best describes warrants?
- a. One important difference between warrants and convertibles is that convertibles bring in additional funds when they are converted, but exercising warrants does not bring in any additional funds.
  - b. The coupon rate on convertible debt is normally set below the coupon rate that would be set on otherwise similar straight debt even though investing in convertibles is more risky than investing in straight debt.
  - c. The value of a warrant to buy a safe, stable stock should exceed the value of a warrant to buy a risky, volatile stock, other things held constant.
  - d. Warrants can sometimes be detached and traded separately from the debt with which they were issued, but this is unusual.

ANS: B  
(b) is correct; convertibles do normally have a relatively low coupon because the opportunity for capital gains provides part of their expected total return. The other responses are all incorrect. (d) is incorrect because, like other options, the value of the warrant is increased by price volatility in the underlying asset.

PTS: 1                      DIF: MEDIUM                      REF: 483  
OBJ: (16.3) Warrants and convertibles                      BLM: Higher Order

6. How does home mortgage securitization benefit mortgage originators?
- a. They can improve the asset liquidity.
  - b. They have additional funds for other investment.
  - c. They are free from default and prepayment risks.
  - d. They can improve asset liquidity, have additional funds for other investments, and are free from default and prepayment risks.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 485  
OBJ: (16.5) Securitization                      BLM: Higher Order

7. Who or what is (are) the legal asset owner(s) behind home mortgage securitization?
- a. special purpose vehicles (SPV)
  - b. individual investors
  - c. banks that originate the mortgages
  - d. Canada Mortgage and Housing Corporation (CMHC)

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 485  
OBJ: (16.5) Securitization                      BLM: Remember

8. Which of the following assets cannot be used for securitization?
- a. credit card receivables
  - b. student loans

- c. accrued fees
- d. home mortgages

ANS: C                      PTS: 1                      DIF: MEDIUM      REF: 485  
OBJ: (16.5) Securitization                      BLM: Higher Order

9. Why is asset securitization advantageous to investors?
- a. It removes all risk of holding the assets.
  - b. It results in higher returns.
  - c. It increases investment choices.
  - d. It eliminates the need for financing.

ANS: C                      PTS: 1                      DIF: MEDIUM      REF: 486  
OBJ: (16.5) Securitization                      BLM: Remember

10. Which statement regarding a collateralized debt obligation (CDO) is true?
- a. A security has no default risk exposure.
  - b. A security is tax free.
  - c. A security involves a credit default swap.
  - d. A security represents a claim on the cash flows of a loan.

ANS: D                      PTS: 1                      DIF: MEDIUM      REF: 487  
OBJ: (16.6) Credit derivatives                      BLM: Higher Order

11. Which circumstance will decrease the protection payment for credit default swaps?
- a. expected recovery values decrease
  - b. expected risk of default decreases
  - c. an unexpected increase of borrowing from the underlying company
  - d. an unexpected drop in share prices of the underlying company

ANS: B                      PTS: 1                      DIF: MEDIUM      REF: 486–487  
OBJ: (16.6) Credit derivative                      BLM: Higher Order

12. What is the theoretical value of a warrant when the current price of the stock is \$50 and the exercise price is \$45? The exchange ratio is four shares for each warrant.
- a. \$20
  - b. \$15
  - c. \$10
  - d. \$5

ANS: A  
Value of a warrant = (current share price – exercise price)(exchange ratio for each warrant)  
= (\$50 – \$45)(4) = \$20

PTS: 1                      DIF: EASY                      REF: 475                      OBJ: (16.1) Warrants  
BLM: Higher Order

13. Orient Airlines' common stock currently sells for \$33, and its 8% convertible debentures (issued at par, or \$1,000) sell for \$850. Each debenture can be converted into 25 shares of common stock at any time before 2017. What is the conversion value of the bond?
- a. \$707.33
  - b. \$744.56
  - c. \$783.75
  - d. \$825.00

ANS: D

Stock price:	\$33.00	Coupon rate:	8.00%
Bond price:	\$850.00	Par value:	\$1,000.00
Conversion ratio:	25.00		

$$\text{Conversion value} = \text{Conversion ratio} \times \text{Stock price} = \$825$$

PTS: 1                    DIF: EASY                    REF: 479

OBJ: (16.2) Convertible features: straight-debt value

BLM: Higher Order

14. Chocolate Factory's convertible debentures were issued at their \$1,000 par value in 2007. At any time prior to maturity on February 1, 2027, a debenture holder can exchange a bond for 25 shares of common stock. What is the conversion price,  $P_c$ ?
- \$40.00
  - \$42.00
  - \$44.10
  - \$46.31

ANS: A

Par value:    \$1,000.00

Conversion ratio:    25.00

$$\text{Conversion price} = \text{Par value} / \text{Conversion ratio} = \$40.00$$

PTS: 1                    DIF: EASY                    REF: 477

OBJ: (16.2) Conversion price

BLM: Higher Order

15. ABC Bank enters a credit default swap of \$10 million for 5 years with XYZ Insurance. How much does ABC have to pay with a premium rate of 2.5% per year?
- \$100,000
  - \$150,000
  - \$250,000
  - \$500,000

ANS: C

$$\text{Swap premium} = \text{notional value} \times \text{premium rate} = \$10 \text{ million} \times 2.5\% = \$250,000$$

PTS: 1                    DIF: EASY                    REF: 486

OBJ: (16.6) Credit derivatives

BLM: Higher Order

16. Warren Corporation's stock sells for \$42 per share. The company wants to sell some 20-year, annual interest \$1,000 par value bonds. Each bond would have 75 warrants attached to it, each exercisable into one share of stock at an exercise price of \$47. The firm's straight bonds yield 10%. Each warrant is expected to have a market value of \$2.00 given that the stock sells for \$42. What coupon interest rate must the company set on the bonds in order to sell the bonds-with-warrants at par?
- 7.83%
  - 8.24%
  - 8.65%
  - 9.08%

ANS: B

Stock price:    \$42.00                    Bond par value:    \$1,000

Exercise price:    \$47.00                    Bond maturity:    20

No. of warrants:    75                    Straight-debt yield:    10.0%

Value of warrants:    \$2.00

$$\text{Total value} = \text{Straight-debt value} + \text{Warrant value} = \$1,000 = \text{Bond value} + \$150$$

$$V_B = \$1,000 - \$150 = \$850$$

Now set  $N = 20$ ,  $I/YR = 10$ ,  $PV = -850$ ,  $FV = 1000$  and solve for  $PMT$ : \$82.38  
 To get this payment on a \$1,000 bond, the coupon rate must be: 8.24%

PTS: 1                    DIF: MEDIUM      REF: 476                    OBJ: (16.1) Bonds with warrants  
 BLM: Higher Order

17. Curry Corporation is setting the terms on a new issue of bonds with warrants. The bonds will have a 30-year maturity and annual interest payments. Each bond will come with 20 warrants that give the holder the right to purchase one share of stock per warrant. The investment bankers estimate that each warrant will have a value of \$10.00. A similar straight-debt issue would require a 10% coupon. What coupon rate should be set on the bonds-with-warrants so that the package would sell for \$1,000?
- 6.75%
  - 7.11%
  - 7.48%
  - 7.88%

ANS: D

Bond par value:	\$1,000	No. of warrants:	20
Bond maturity:	30	Value of warrants:	\$10.00
Straight-debt yield:	10.0%		

$$\text{Total value} = \text{Straight-debt value}(V_B) + \text{Warrant value} = \$1,000$$

$$V_B = \$1,000 - \$200.00 = \$800.00$$

Set  $N = 30$ ,  $I/YR = 10$ ,  $PV = -800$ , and  $FV = 1,000$ . Then solve for  $PMT$ : \$78.78  
 To get this payment on a \$1,000 bond, the coupon rate must be 7.88%

PTS: 1                    DIF: MEDIUM      REF: 476                    OBJ: (16.1) Bonds with warrants  
 BLM: Higher Order

18. Upstate Water Company just sold a bond with 50 warrants attached. The bonds have a 20-year maturity and an annual coupon of 12%, and they were issued at their \$1,000 par value. The current yield on similar straight bonds is 15%. What is the implied value of each warrant?
- \$3.76
  - \$3.94
  - \$4.14
  - \$4.35

ANS: A

Bond par value:	\$1,000	No. of warrants:	50
Bond maturity:	20	Convertible coupon:	12.0%
Straight-debt yield:	15.0%		

Find the straight-debt value:  $N = 20$ ,  $I/YR = 15$ ,  $PMT = -120$ , and  $FV = -1000$ .  $PV = \$812.22$

$$\text{Total value} = \text{Straight-debt value} + \text{Warrant value.}$$

$$\$1,000 = \text{Straight-debt value} + 50(\text{Warrant value})$$

$$\text{Warrant value} = (\$1,000 - \text{Straight-debt value})/50 = \$3.76$$

PTS: 1                    DIF: MEDIUM      REF: 476                    OBJ: (16.1) Bonds with warrants  
 BLM: Higher Order

19. You have paid \$5 to buy a warrant with an exercise price of \$40. The stock is currently trading at \$50. How much profit or loss would you make by exercising the warrant if one warrant entitles the owner to buy one share of stock?
- a. \$5.00
  - b. \$10.00
  - c. \$40.00
  - d. \$50.00

ANS: A

$$\begin{aligned}\text{Profit} &= \text{Current stock price} - \text{exercise price} - \text{price paid for one warrant} \\ &= \$50 - \$40 - \$5 = \$5\end{aligned}$$

PTS: 1                    DIF: MEDIUM            REF: 475                    OBJ: (16.1) Profit of warrants  
BLM: Higher Order

20. A convertible bond has a call price of \$1,100. Its underlying stock is selling at \$70 per share, and the conversion price is \$50. If owners of the convertible bond convert and sell the stock, what is the profit or loss on each bond if the convertible is called by the company?
- a. -\$100
  - b. -\$200
  - c. -\$300
  - d. +\$300

ANS: C

$$\text{Conversion ratio} = \$1,000 / \$50 = 20$$

$$\text{Conversion value} = \$70(20) = \$1,400$$

$$\text{Loss if called} = \text{Call price} - \text{Conversion value} = \$1,100 - \$1,400 = -\$300$$

PTS: 1                    DIF: MEDIUM            REF: 482                    OBJ: (16.2) Callable convertibles  
BLM: Higher Order

21. The ABC Bank enters into a credit default swap with XYZ Financial. The notional amount of the swap is \$50 million. The 5-year swap is based upon a 5-year loan to LMN Corp. The size of the protection payment is 3% per year. As LMN bankrupts during the time this swap is still valid, XYZ has paid ABC \$22.5 million for settlements. What is the recovery ratio on the underlying loan?
- a. 60%
  - b. 55%
  - c. 45%
  - d. 40%

ANS: B

$$\text{Recovery ratio} = (\$50 - \$22.5) / \$50 = 55\%$$

PTS: 1                    DIF: MEDIUM            REF: 486                    OBJ: (16.6) Credit derivatives  
BLM: Higher Order

22. The ABC Bank enters into a credit default swap with XYZ Financial. The swap runs for 5 years and is based upon a term loan to LMN Corp. The size of the protection payment is 5% per year. Unfortunately, LMN goes bankrupt a year after this swap agreement becomes effective. Even with a 75% recovery value on the underlying loan, XYZ has paid ABC \$20 million for settlements. How much has ABC lent to LMN?
- a. \$100 million
  - b. \$80 million

- c. \$50 million
- d. \$20 million

ANS: B

Loan amount = Loan amount  $\times$  75% + \$20 million

Loan amount = \$20 million / (1 - 75%) = \$80 million

PTS: 1                      DIF: MEDIUM              REF: 486                      OBJ: (16.6) Credit derivatives  
BLM: Higher Order

23. Valdes Enterprises is considering issuing a 10-year convertible bond that would be priced at its \$1,000 par value. The bonds would have an 8.00% annual coupon, and each bond could be converted into 20 shares of common stock. The required rate of return on an otherwise similar nonconvertible bond is 10.00%. The stock currently sells for \$40.00 a share, has an expected dividend in the coming year of \$2.00, and has an expected constant growth rate of 5.00%. What is the estimated floor price of the convertible at the end of Year 3?
- a. \$794.01
  - b. \$835.81
  - c. \$879.80
  - d. \$926.10

ANS: D

Bond par value:	\$1,000	Conversion ratio( Shares):	20
Bond maturity:	10	Convertible coupon:	8.0%
Evaluation year:	3	Stock price:	\$40.00
Straight-debt yield:	10.0%	Growth rate:	5.0%
Dividend per share:	\$2.00		

Find the straight-debt value at  $N = 10 - 3 = 7$ :  $N = 7$ ,  $I/YR = 10$ ,  $PMT = -80$ , and  $FV = -1,000$ .  $PV = V_B = \$902.63$

Conversion value at  $t = 3$ :  $CV = (\text{Shares}) \times (\text{Stock price}) \times (1 + g)^3 = \$926.10$

The floor value is the higher of the bond value or the conversion value, so it is \$926.10.

PTS: 1                      DIF: HARD                      REF: 478–481                      OBJ: (16.2) Convertibles  
BLM: Higher Order

**Scenario Saunders**

The following data apply to Saunders Corporation's convertible bonds:

Maturity:	10	Stock price:	\$30.00
Par value:	\$1,000.00	Conversion price:	\$35.00
Annual coupon:	5.00%	Straight-debt yield:	8.00%

24. Refer to Scenario Saunders. What is the bond's conversion ratio?
- a. 27.14
  - b. 28.57
  - c. 30.00
  - d. 31.50

ANS: B

Years to maturity:	10	Stock price:	\$30.00
Par value:	\$1,000.00	Conversion price:	\$35.00
Annual coupon:	5.00%	Straight-debt yield:	8.00%

$$\text{Conversion ratio} = \text{Par/Conversion price} = \$1,000/\$35 = 28.57$$

PTS: 1                    DIF: EASY                    REF: 478  
OBJ: (16.2) Convertible features: conversion ratio BLM: Remember

25. Refer to Scenario Saunders. What is the bond's conversion value?
- \$734.89
  - \$773.57
  - \$814.29
  - \$857.14

ANS: D  
Conversion value = Conversion ratio  $\times$  Market price of stock = \$857.14

PTS: 1                    DIF: EASY                    REF: 479  
OBJ: (16.2) Convertible features: conversion value                    BLM: Remember

26. Refer to Scenario Saunders. What is the bond's straight-debt value?
- \$684.78
  - \$720.82
  - \$758.76
  - \$798.70

ANS: D  
Inputs to find the straight-debt value:  $N = 10$ ;  $I/YR = 8$ ;  $PMT = 50$ ;  $FV = 1,000$ . \$798.70

PTS: 1                    DIF: EASY                    REF: 478  
OBJ: (16.2) Convertible features: straight-debt value                    BLM: Remember

27. Refer to Scenario Saunders. Based on your answers to the three preceding questions, what is the minimum price (or "floor" price) at which the Saunders bonds should sell?
- \$734.89
  - \$773.57
  - \$814.29
  - \$857.14

ANS: D  
The floor price is the higher of the bond's conversion value or straight debt value. Those values as calculated above are as follows:

Conversion value:        \$857.14  
Straight-debt value:     \$798.70

Max of the two = minimum price = floor = \$857.14

PTS: 1                    DIF: EASY                    REF: 479–480  
OBJ: (16.2) Convertible features: floor price                    BLM: Higher Order

### Scenario 1

A firm has \$10 million of outstanding convertible bonds. The coupon on these convertibles is \$100 per bond, and each bond is convertible into common stock at a conversion price of \$25.

The income statement of the firm before conversion is as follows and EBIT remains at \$6 million after conversion. Assume the firm originally paid \$2 million in interest on other outstanding debt before the convertible was issued.

	Millions of Dollars before Conversion
EBIT	6.0
Interest @10%	-3.0
Earnings before taxes (EBT)	3.0
Taxes @40%	-1.2
Earnings after taxes (EAT)	1.8
Shares outstanding (millions)	1.0
Earnings per share (EPS)	\$1.80

28. Refer to Scenario 1. How much is the firm's total earnings after conversion?
- \$1.71 million
  - \$2.04 million
  - \$2.40 million
  - \$3.17 million

ANS: C

$$\text{EAT} = (\text{EBIT} - \text{Interest})(1 - \text{Tax rate}) = (6 - 2)(1 - 40\%) = \$2.40 \text{ million}$$

After conversion, only \$2 million in interest on other outstanding debt remains. The \$1 million in interest on convertible bonds is "backed out."

PTS: 1                      DIF: EASY                      REF: 484                      OBJ: (16.4) Reporting earnings  
BLM: Higher Order

29. Refer to Scenario 1. What is the fully diluted EPS?
- \$1.57
  - \$1.59
  - \$1.62
  - \$1.71

ANS: D

$$\text{Conversion ratio} = \$1,000 / \$25 = 40$$

Number of shares increased by the conversion of \$10 million of convertible bonds =

$$\$10 \text{ million} / \$1,000 \times 40 = 400,000 \text{ shares}$$

$$\text{Fully diluted EPS} = \$2.4 / (1 + 0.4) = \$1.71$$

PTS: 1                      DIF: MEDIUM                      REF: 484                      OBJ: (16.4) Reporting earnings  
BLM: Higher Order



## CHAPTER 17—WORKING CAPITAL MANAGEMENT AND SHORT-TERM FINANCING

### TRUE/FALSE

1. Gross working capital simply refers to current assets used in operations.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 497  
OBJ: (17 Intro) Gross working capital

2. Net working capital is defined as current assets minus current liabilities.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 497  
OBJ: (17 Intro) Net working capital

3. An increase in the holding of marketable securities must be accompanied by a corresponding increase in the net operating working capital.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 497  
OBJ: (17 Intro) Net operating working capital

4. The cash conversion cycle (CCC) combines three factors—the inventory conversion period, the receivables collection period, and the payables deferral period—and its purpose is to show how long a firm must finance its operating working capital. Other things held constant, the shorter the CCC, the more effective the firm's working capital management.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 497–500  
OBJ: (17.1) Cash conversion cycle

5. If a firm takes actions that reduce its DSO, then, other things held constant, this will lengthen its CCC.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 500  
OBJ: (17.1) Cash conversion cycle

6. Other things held constant, if a firm stretches its accounts payable, this will lengthen its CCC.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 500  
OBJ: (17.1) Cash conversion cycle

7. Minimizing cash holdings, inventories, or receivables, and maximizing payables or accruals are the aims of relaxed working capital policies.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 501  
OBJ: (17.2) Net operating WC policy

8. The firm's total capital requirement grows over time with amounts including the base level of fixed assets and current assets. There exists seasonal variation around the trend showing the required temporary working capital.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 502  
OBJ: (17.3) Temporary working capital

9. Determining a firm's optimal investment in net operating working capital and how that investment is financed are elements of working capital policy.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 502  
OBJ: (17.3) Working capital policy

10. Permanent net operating working capital reflects the fact that net operating working capital does not shrink to zero even when a business is at its seasonal or cyclical low. Thus, permanent net operating working capital represents a minimum level of net operating working capital that must be financed.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 502  
OBJ: (17.3) Permanent working capital

11. A conservative financing approach to working capital will result in most of the permanent net operating working capital being financed by long-term securities.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 503–504  
OBJ: (17.3) Conservative financing approach

12. A firm's peak borrowing needs will probably be overstated if it bases its monthly cash budget on the assumption of uniform daily cash receipts and disbursements, but actual receipts are concentrated at the beginning of each month.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 504–507  
OBJ: (17.4) Cash budget

13. Shorter-term cash budgets, in general, are used for actual cash control, while longer-term cash budgets are used for planning purposes.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 504  
OBJ: (17.4) Cash budget

14. Although short-term interest rates have historically averaged less than long-term rates, the heavy use of short-term debt is considered to be an aggressive working capital financing strategy because of the inherent risks of using short-term financing.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 508  
OBJ: (17.5) Working capital policy

15. One of the advantages of short-term debt financing is that firms can obtain short-term credit more quickly than long-term credit.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 507  
OBJ: (17.5) Short-term financing

16. Short-term financing is riskier than long-term financing since, during periods of tight credit, the firm may not be able to rollover (renew) its debt. This is especially true if the funds are used to finance long-term rather than short-term assets.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 508  
OBJ: (17.5) Short-term financing

17. Funds from short-term loans can generally be obtained faster than from long-term loans for two reasons: (1) when lenders consider long-term loans they must make a more thorough evaluation of the borrower's financial health, and (2) long-term loan agreements are more complex.
- ANS: T                      PTS: 1                      DIF: EASY                      REF: 507  
OBJ: (17.5) Short-term financing
18. You receive some goods on April 1 with the following terms: 3/20, net 30, June 1 dating. This means that you will receive a 3% discount if the bill is paid on or before June 20 and also that the full amount must be paid 30 days after receipt of the goods.
- ANS: F                      PTS: 1                      DIF: EASY                      REF: 508  
OBJ: (17.6) Cash discounts
19. Offering trade credit discounts is costly and, as a result, firms that offer trade discounts are usually those that are performing poorly and need cash quickly.
- ANS: F                      PTS: 1                      DIF: EASY                      REF: 508–510  
OBJ: (17.6) Trade discounts
20. Trade credit can be separated into two components: free trade credit, which is credit received after the discount period ends, and costly trade credit, which is the cost of discounts not taken.
- ANS: F                      PTS: 1                      DIF: EASY                      REF: 510  
OBJ: (17.6) Trade credit
21. As a rule, managers should try to always use the free component of trade credit but should use the costly component only if the cost of this credit is lower than the costs of credit from other sources.
- ANS: T                      PTS: 1                      DIF: EASY                      REF: 510  
OBJ: (17.6) Trade credit
22. One of the effects of not taking trade credit discounts when offered is that the firm's use of accounts payable rises.
- ANS: T                      PTS: 1                      DIF: EASY                      REF: 510  
OBJ: (17.6) Cost of trade credit
23. The trade credit that a firm receives during the discount period is referred to as free trade credit.
- ANS: T                      PTS: 1                      DIF: EASY                      REF: 510  
OBJ: (17.6) Free trade credit
24. Stretching accounts payable is a widely accepted and costless financing technique.
- ANS: F                      PTS: 1                      DIF: EASY                      REF: 510  
OBJ: (17.6) Stretching accounts payable
25. Accruals are "free" capital in the sense that no explicit interest must be paid on accruals.
- ANS: T                      PTS: 1                      DIF: EASY                      REF: 508  
OBJ: (17.6) Accruals

26. Accruals are spontaneous, but, unfortunately, due to law and economic forces, firms have little control over the level of these accounts.
- ANS: T                      PTS: 1                      DIF: EASY                      REF: 508  
OBJ: (17.6) Accruals
27. An informal line of credit and a revolving credit agreement are similar except that a line of credit creates a legal obligation for the bank.
- ANS: F                      PTS: 1                      DIF: EASY                      REF: 513  
OBJ: (17.7) Bank loans
28. While the maturity of most bank loans is short term, they are frequently repaid on demand rather than on a specific maturity date.
- ANS: T                      PTS: 1                      DIF: EASY                      REF: 512  
OBJ: (17.7) Bank loans
29. A line of credit can be either a formal or an informal agreement between a borrower and a bank regarding the maximum amount of credit the bank will extend to the borrower subject to certain conditions, including the borrower's maintaining its financial strength.
- ANS: T                      PTS: 1                      DIF: EASY                      REF: 513  
OBJ: (17.7) Line of credit
30. Under a revolving credit agreement, the risk to the firm of being unable to obtain funds when needed is lower than with an informal line of credit.
- ANS: T                      PTS: 1                      DIF: EASY                      REF: 513  
OBJ: (17.7) Revolving credit and risk
31. The effect of compensating balances is to decrease the effective interest rate of a loan.
- ANS: F                      PTS: 1                      DIF: EASY                      REF: 516  
OBJ: (17.8) Compensating balances
32. Interest rates charged on loans vary depending on the risk of borrower, and the size of the loan, but not the economic conditions.
- ANS: F                      PTS: 1                      DIF: EASY                      REF: 511  
OBJ: (17.7) Interest costs
33. Pledging of receivables involves the sale of accounts receivable.
- ANS: F                      PTS: 1                      DIF: EASY                      REF: 517  
OBJ: (17.9) Accounts receivable financing
34. Under a public warehouse agreement, the inventory used as collateral for the loan is stored on the premises of a third party.
- ANS: T                      PTS: 1                      DIF: EASY                      REF: 519–520  
OBJ: (17.9) Inventory financing

35. Due to the complexity of factoring procedures, factoring is rarely used as a source of short-term financing in Canada today.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 517–518  
OBJ: (17.9) Factoring

36. Generally, the longer the normal inventory holding period of customers, the longer the credit period. One effect of lengthening the credit period to match the customer's merchandise holding period is to increase the payables deferral period, which shortens the customer's cash conversion cycle.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 499  
OBJ: (17.1) Lengthening the credit period

37. The inventory conversion period of the operating cycle terminates when the inventory is paid for with cash.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 497–498  
OBJ: (17.1) Inventory conversion period

38. When the accounts receivable turnover and payables deferral period are decreased, a firm's cash conversion cycle will be lengthened.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 498–499  
OBJ: (17.1) Cash conversion cycle

39. Uncertainty about the exact lives of assets prevents precise maturity matching in an ex post (i.e., after the fact) sense even though it is possible to match maturities on an expected basis.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 502  
OBJ: (17.3) Maturity matching

40. The maturity matching, or "self-liquidating," approach involves the financing of permanent net operating working capital with combinations of long-term capital and short-term capital that vary depending on the level of interest rates. When short-term rates are relatively high, short-term assets will be financed with long-term debt to reduce costs and risk.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 502  
OBJ: (17.3) Maturity matching

41. A firm that follows an aggressive working capital financing approach is more exposed to unexpected changes in the term structure of interest rates than is a firm that follows a conservative financing policy.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 502–504  
OBJ: (17.3) Aggressive financing approach

42. The relative profitability of a firm that employs an aggressive working capital financing policy will improve when the yield curve changes from upward sloping to downward sloping.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 502  
OBJ: (17.3) Aggressive financing approach

43. The cash budget and the capital budget are handled separately and, although they are both important, they are developed independently of one another.

ANS: F                    PTS: 1                    DIF: MEDIUM        REF: 504  
OBJ: (17.4) Cash and capital budgets

44. Since depreciation is a noncash charge, it neither appears on, nor has any effect on, the cash budget.

ANS: F                    PTS: 1                    DIF: MEDIUM        REF: 507  
OBJ: (17.4) Cash budget and depreciation

45. The risk to the firm of borrowing using short-term credit is usually greater than if it used long-term debt. Added risk stems from greater variability of interest costs on short-term debt. Even if its long-term prospects are good, the firm's lender may not renew a short-term loan if the firm is even temporarily unable to repay it.

ANS: T                    PTS: 1                    DIF: MEDIUM        REF: 508  
OBJ: (17.5) Risk and short-term financing

46. Long-term loan agreements always contain provisions, or covenants, that constrain the firm's future actions. Short-term credit agreements are just as restrictive in order to protect the interests of the lender.

ANS: F                    PTS: 1                    DIF: MEDIUM        REF: 507–508  
OBJ: (17.5) Short-term financing

47. A firm constructing a new manufacturing plant and financing it with short-term loans that are scheduled to be converted to first mortgage bonds when the plant is completed would want to separate the construction loan from its other current liabilities associated with working capital management.

ANS: T                    PTS: 1                    DIF: MEDIUM        REF: 507–508  
OBJ: (17.5) Short-term financing

48. Because money has time value, cash sales are always more profitable than credit sales.

ANS: F                    PTS: 1                    DIF: MEDIUM        REF: 508–509  
OBJ: (17.6) Cash versus credit sales

49. If a firm is offered credit terms of 2/10, net 30, on its purchases, it is in the firm's financial interest to pay as early as possible during the discount period.

ANS: F                    PTS: 1                    DIF: MEDIUM        REF: 508–510  
OBJ: (17.6) Trade credit

50. If a firm fails to take trade credit discounts, then it may cost the firm some money, but generally such a policy has a negligible effect on the firm's income statement and no effect on its balance sheet.

ANS: F                    PTS: 1                    DIF: MEDIUM        REF: 508–510  
OBJ: (17.6) Trade credit

51. A firm is said to be using costly trade credit when its accounts payable are extended beyond the discount period and an explicit cost is shown on the forgone discounts.

ANS: F                    PTS: 1                    DIF: MEDIUM        REF: 510  
OBJ: (17.6) Costly trade credit

52. If a firm's suppliers stop offering discounts, then its use of trade credit is more likely to increase than to decrease.

ANS: T                   PTS: 1                   DIF: MEDIUM       REF: 509  
OBJ: (17.6) Trade credit

53. When deciding whether or not to take a trade discount, the cost of borrowing from a bank should be compared to the cost of trade credit to determine if the cash discount should be taken.

ANS: T                   PTS: 1                   DIF: MEDIUM       REF: 509–510  
OBJ: (17.6) Trade credit

54. The calculated cost of trade credit can be reduced by paying late.

ANS: T                   PTS: 1                   DIF: MEDIUM       REF: 510  
OBJ: (17.6) Cost of trade credit

55. The calculated cost of trade credit for a firm that buys on terms of 2/10, net 30, is lower (other things held constant) if the firm pays in 40 days than in 30 days.

ANS: T                   PTS: 1                   DIF: MEDIUM       REF: 510  
OBJ: (17.6) Cost of trade credit

56. The fact that no explicit interest is paid on accruals, and that the firm can vary the level of these accounts, makes accruals an attractive and flexible source of funding to meet increased working capital needs.

ANS: F                   PTS: 1                   DIF: MEDIUM       REF: 508  
OBJ: (17.6) Accruals

57. If a firm is involuntarily stretching its accounts payable, then this is probably a sign that it is undercapitalized, that is, that it needs more working capital to support its operations.

ANS: T                   PTS: 1                   DIF: MEDIUM       REF: 510  
OBJ: (17.6) Stretching accounts payable

58. If one of your firm's customers is stretching its accounts payable, this may be a nuisance, but it does not represent a real financial cost to your firm as long as the customer periodically pays off its entire balance.

ANS: F                   PTS: 1                   DIF: MEDIUM       REF: 510  
OBJ: (17.6) Stretching accounts payable

59. The prime rate charged can vary greatly (for example, as much as 2 to 4 percentage points) across banks due to banks' ability to differentiate themselves and because particular banks develop particular clienteles, such as making loans to specialty retailers.

ANS: F                   PTS: 1                   DIF: MEDIUM       REF: 511  
OBJ: (17.7) Prime rate

60. A revolving credit agreement is a formal line of credit often used by large firms. The firm generally must pay a fee on the unused balance of the committed funds to compensate the bank for the commitment to extend those funds.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 513

OBJ: (17.7) Revolving credit agreement

61. Firms must have high credit quality in order to issue commercial paper; therefore, all commercial papers are equally risky.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 513

OBJ: (17.7) Commercial paper

62. The cost of an installment loan is always slightly less than twice the stated annual rate.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 516–517

OBJ: (17.8) Installment loans

63. Discount loans are usually provided for terms of only 1 year or less. Their interest is paid together with the principal at the end of the loan.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 515

OBJ: (17.8) Discount loans

64. The factoring of receivables involves the specific use of receivables as collateral for the loan.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 517

OBJ: (17.9) Factoring

65. The blanket inventory lien gives the lender a lien against all inventories of the borrower. However, the borrower is free to sell them.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 519

OBJ: (17.9) Inventory financing

## MULTIPLE CHOICE

1. Helena Furnishings wants to reduce its cash conversion cycle sharply. Which action should it take?
- The company should increase its average inventory without increasing its sales.
  - The company should reduce its DSO.
  - The company should start paying its bills sooner, which reduces its average accounts payable without reducing its sales.
  - The company should increase its DSO.

ANS: B

(a) is false. If inventory increases and sales do not, more cash is being tied up in inventory so the cash conversion cycle is increased, not reduced. (b) is true. If the company reduces its DSO, it is collecting its accounts receivables more efficiently, so it reduces the cash conversion cycle. (c) is false. If the company pays its bills sooner, it uses its cash to pay off accounts payable, and this increases its cash conversion cycle.

PTS: 1                      DIF: MEDIUM                      REF: 500                      OBJ: (17.1) Cash conversion cycle

BLM: Higher Order

2. Other things held constant, which strategy would tend to reduce the cash conversion cycle?
- maintaining the same level of receivables as sales decline
  - placing larger orders for raw materials to take advantage of price breaks



- c. taking all discounts that are offered
- d. not taking all discounts that are offered to get more trade credit

ANS: D                      PTS: 1                      DIF: MEDIUM      REF: 500  
 OBJ: (17.1) Cash conversion cycle                      BLM: Higher Order

3. Which action would NOT be likely to shorten the length of the cash conversion cycle?
- a. adopting a new inventory system that reduces the inventory conversion period
  - b. reducing the average DSO on its accounts receivable
  - c. reducing the amount of time the company takes to pay its suppliers
  - d. increasing sales while maintaining the same level of receivables

ANS: C  
 (a), (b), and (d) would shorten the length of the cash conversion cycle; therefore, (c) is the appropriate choice. Reducing the amount of time to pay suppliers increases the length of the cash conversion cycle.

PTS: 1                      DIF: MEDIUM      REF: 500                      OBJ: (17.1) Cash conversion cycle  
 BLM: Higher Order

4. Why do firms generally choose to finance temporary net operating working capital with short-term debt?
- a. Matching the maturities of assets and liabilities reduces risk.
  - b. Short-term interest rates have traditionally been more stable than long-term interest rates.
  - c. A firm that borrows heavily on a long-term basis is more apt to be unable to repay the debt than a firm that borrows short term.
  - d. The yield curve has traditionally been downward sloping.

ANS: A                      PTS: 1                      DIF: MEDIUM      REF: 502  
 OBJ: (17.3) Working capital financing policy                      BLM: Higher Order

5. Ski Lifts Inc. is in a highly seasonal business, and the following summary balance sheet data show its assets and liabilities at peak and off-peak seasons (in thousands of dollars):

	<u>Peak</u>	<u>Off-peak</u>
Cash	\$ 50	\$ 30
Marketable securities	0	20
Accounts receivable	40	20
Inventories	100	50
Net fixed assets	<u>500</u>	<u>500</u>
Total assets	<u>\$690</u>	<u>\$620</u>
Spontaneous liabilities	\$ 30	\$ 10
Short-term bank debt	50	0
Long-term debt	300	300
Common equity	<u>310</u>	<u>310</u>
Total claims	<u>\$690</u>	<u>\$620</u>

What can we conclude from this data?

- a. Ski Lifts's working capital financing policy calls for exactly matching asset and liability maturities.
- b. Ski Lifts's working capital financing policy is relatively aggressive; that is, the company finances some of its permanent assets with short-term discretionary debt.
- c. Ski Lifts follows a relatively conservative approach to working capital financing; that is,

some of its short-term needs are met by permanent capital.

- d. Without income statement data, we cannot determine the aggressiveness or conservatism of the company's working capital financing policy.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 503–504  
OBJ: (17.3) Working capital financing policy                      BLM: Higher Order

6. Which statement best describes working capital financing policy?
- Net working capital may be defined as current assets minus current liabilities, and an increase in the current ratio automatically indicates that net working capital has increased.
  - Although short-term interest rates have historically averaged less than long-term rates, the heavy use of short-term debt is considered to be an aggressive strategy because of the inherent risks of using short-term financing.
  - If a company follows a policy of “matching maturities,” this means that it matches its use of common shares with its use of long-term debt as opposed to short-term debt.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 502–504  
OBJ: (17.3) Working capital financing policy                      BLM: Higher Order

7. Which of the following statements is most correct?
- Accruals are an expensive way to finance working capital.
  - A conservative financing policy is one in which the firm finances all of its fixed assets with long-term capital and part of its permanent net operating working capital with short-term, nonspontaneous credit.
  - If a company receives trade credit under terms 2/10, net 30, this implies the company has 10 days of free trade credit.
  - A firm following an aggressive financing policy would finance all its permanent NOWC with long-term capital.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 502–504 | 508–510  
OBJ: (17.3 and 17.6) Working capital financing policy and Accruals and trade credit  
BLM: Higher Order

8. Which factor is typically NOT considered when constructing a cash budget?
- payments lag
  - payment for plant construction
  - cumulative cash
  - writing off bad debts

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 504–507  
OBJ: (17.4) Cash budget                      BLM: Higher Order

9. Which statement best describes cash budgets?
- Depreciation expense is not explicitly included, but depreciation effects are reflected in the estimated tax payments.
  - Cash budgets do not include financial expenses such as interest and dividend payments.
  - Cash budgets do not include cash inflows from long-term sources such as bond issues.
  - Changes that affect the DSO do not affect the cash budget.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 504–507  
OBJ: (17.4) Cash budget                      BLM: Higher Order

10. Which item should a company report directly in its monthly cash budget?
- its monthly depreciation expense
  - cash proceeds from selling one of its divisions

- c. accrued interest on zero coupon bonds that it issued
- d. new shares issued in a stock split

ANS: B                      PTS: 1                      DIF: MEDIUM      REF: 504–507  
OBJ: (17.4) Cash budget                      BLM: Higher Order

11. Which statement best describes cash budgets?
- a. Shorter-term cash budgets, in general, are used primarily for planning purposes, while longer-term budgets are used for actual cash control.
  - b. The cash budget and the capital budget are planned separately and although they are both important to the firm, they are independent of each other.
  - c. Since depreciation is a noncash charge, it does not appear on nor have an effect on the cash budget.
  - d. The typical actual cash budget will reflect interest on loans and income from investment of surplus cash. These numbers are expected values and actual results might vary from budgeted results.

ANS: D                      PTS: 1                      DIF: MEDIUM      REF: 504–507  
OBJ: (17.4) Cash budget                      BLM: Higher Order

12. Which of the following statements is NOT true?
- a. Commercial paper can be issued by virtually any firm so long as it is willing to pay the going interest rate.
  - b. Accruals are free in the sense that no explicit interest is paid on these funds.
  - c. A conservative approach to working capital will result in all permanent assets being financed with long-term capital.
  - d. The risk to the firm of borrowing with short-term credit is usually greater than with long-term debt. Added risk can stem from the greater variability of interest costs on short-term debt.

ANS: A                      PTS: 1                      DIF: MEDIUM      REF: 503–504 | 508 | 513  
OBJ: (17.3, 17.5, 17.6, and 17.7) Working capital financing      BLM: Higher Order

13. Which statement best describes short-term financing?
- a. Under normal conditions, a firm's expected ROE would probably be higher if it financed with short-term rather than with long-term debt, but the use of short-term debt would probably increase the firm's risk.
  - b. Conservative firms generally use no short-term debt and thus have zero current liabilities.
  - c. A short-term loan can usually be obtained more quickly than a long-term loan, but the cost of short-term debt is normally higher than that of long-term debt.
  - d. If a firm that can borrow from its bank buys materials on terms of 2/10, net 30, and if it must pay by Day 30 or else be cut off, then we would expect to see zero accounts payable on its balance sheet.

ANS: A

(a) is true. Under normal conditions the yield curve is upward sloping, thus, short-term interest rates are lower than long-term interest rates. Consequently, a firm financing with short-term debt will pay less interest than a firm financing with long-term debt—increasing its ROE. However, a firm increases its risk by financing with short-term debt because such debt must be “rolled over” frequently, and the firm is exposed to the volatility of short-term interest rates.

PTS: 1                      DIF: MEDIUM      REF: 503–504 | 507–508 | 510  
OBJ: (17.5) Short-term financing                      BLM: Higher Order

14. Which of the following borrowers benefits the most from a revolving line of credit?

- a. a local grocery retailer located in downtown Toronto
- b. an owner of a gift shop with the majority of its annual sales during Christmas season
- c. an ice cream seller whose business is located in a Niagara Falls resort
- d. a manufacturer of hand tools whose sales are generally evenly distributed throughout the year

ANS: B                      PTS: 1                      DIF: MEDIUM      REF: 513  
OBJ: (17.7) Short-term bank loan                      BLM: Higher Order

15. Which statement best describes compensating balances?
- a. Compensating balance requirements apply only to businesses, not to individuals.
  - b. Compensating balances are essentially costless to most firms, because those firms would normally have such funds on hand to meet transactions needs anyway.
  - c. If the required compensating balance is larger than the transactions balance the firm would ordinarily hold, then the effective cost of any loan requiring such a balance is increased.
  - d. Banks are prohibited from earning interest on the compensating balances they hold.

ANS: C                      PTS: 1                      DIF: MEDIUM      REF: 516  
OBJ: (17.8) Compensating balances                      BLM: Higher Order

16. Which statement concerning commercial paper is NOT true?
- a. Commercial paper generally carries an interest rate below the prime rate.
  - b. Commercial paper is sold to money market mutual funds, as well as to other financial institutions and nonfinancial corporations.
  - c. Commercial paper can be issued by virtually any firm so long as it is willing to pay the going interest rate.
  - d. Commercial paper is a type of unsecured promissory note issued by relatively large, strong firms.

ANS: C                      PTS: 1                      DIF: MEDIUM      REF: 513  
OBJ: (17.7) Commercial paper                      BLM: Higher Order

17. Which of the following statements is NOT true?
- a. Bankers' acceptances are more popular than commercial paper used in Canada as a short-term financing source.
  - b. Banks are the ultimate guarantors for payments of bankers' acceptances.
  - c. Bankers' acceptances can be traded in the secondary markets prior to their maturities.
  - d. Bankers' acceptances are commonly used to finance goods sold with short payment terms.

ANS: D  
(a), (b), and (c) are all true. (d) is false because BAs are used to finance goods sold with long payment terms such as exports and imports.

PTS: 1                      DIF: MEDIUM      REF: 514                      OBJ: (17.7) Bankers' acceptance  
BLM: Higher Order

18. A large, well-established, highly rated firm needs to borrow money for the next 3 months. How would it likely get the best interest rate?
- a. by issuing commercial paper
  - b. by obtaining a loan secured by its inventory
  - c. by factoring its receivables
  - d. by obtaining a discounted loan

ANS: A

Commercial paper is backed by the quality of the corporation's assets and its operating cash flows. Although commercial paper is unsecured, issuers generally back up their issue by arranging a special line of credit with a bank. This guarantee may reduce default risk. Interest costs fall accordingly.

PTS: 1                    DIF: MEDIUM      REF: 513                    OBJ: (17.7) Short-term bank loans  
BLM: Higher Order

19. A firm has a serious cash shortage due to the growing investment in accounts receivable. If this firm is incapable of dealing with such a high level of receivables, how would it likely benefit most?
- by securing any short-term credit with a blanket inventory lien
  - by factoring its receivables
  - by applying for a line of credit
  - by pledging its receivables on a short-term loan

ANS: B

Some companies solve their financing problem by borrowing on the strength of their current assets; others solve it by selling their current assets. Factoring involves selling the receivables at a discount to a financial institution and letting it collect the money.

PTS: 1                    DIF: MEDIUM      REF: 517                    OBJ: (17.9) Accounts receivable financing  
BLM: Higher Order

20. Which of the following methods can NOT be employed by lenders to control inventory that has been used as security for a loan?
- blanket liens
  - trust receipts
  - warehousing
  - compensating balance

ANS: D

Banks lend on the security of inventory, but they are choosy about the inventory to accept. They want to make sure that they can identify and sell the inventory if default arises. They also need to monitor companies to ensure that they do not sell their assets and run off with the money. Blanket liens, trust receipts, and warehousing are the methods used to take control of inventory.

PTS: 1                    DIF: MEDIUM      REF: 519–520                    OBJ: (17.9) Inventory financing  
BLM: Remember

21. Which of the following is NOT a characteristic of factoring accounts receivable?
- A firm sells its accounts receivable to a finance company.
  - Receivables are sold without recourse.
  - The firm incurs any losses from nonpayment.
  - Maturity factoring and advance factoring are the two basic ways of financing.

ANS: C                    PTS: 1                    DIF: MEDIUM      REF: 517–519                    OBJ: (17.9) Accounts receivable financing  
BLM: Higher Order

22. Which of the following statements is most correct?
- Depreciation is included in the estimate of cash flows (Cash flow = Net income + Depreciation); hence, depreciation is set forth on a separate line in the cash budget.
  - If cash inflows from collections occur in equal daily amounts but most payments are made regularly on the 10th of each month, then it is not necessary to use a daily cash budget. A cash budget focused on the end of the month will suffice.
  - Sound working capital policy is designed to maximize the time between cash expenditures on materials and the collection of cash on sales.

- d. The cash flows shown on the cash budget are the actual cash inflows and outflows and thus different from the firm's free cash flows, because FCF reflects after-tax operating income and the investments required to maintain future operations.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 504–507  
OBJ: (Comp: 17.1, 17.4) Other working capital concepts                      BLM: Remember

23. Which statement best describes short-term versus long-term financing?
- Flexibility is an advantage of short-term credit, but this is somewhat offset by the high flotation costs associated with the need to repeatedly renew short-term credit.
  - A short-term loan can usually be obtained more quickly than a long-term loan, but the penalty for early repayment of a short-term loan is normally significantly higher than that for a long-term loan.
  - The flexibility, cost, and riskiness of short-term versus long-term credit are dependent on the type of credit that is actually used.
  - Short-term debt is often less costly than long-term debt, and the major reason for this is that short-term debt exposes the borrowing firm to much less risk than long-term debt.

ANS: C                      PTS: 1                      DIF: MEDIUM                      REF: 502–504 | 507–508  
OBJ: (Comp: 17.3, 17.5) Short-term versus long-term financing  
BLM: Higher Order

24. Carroll & King Corporation has \$5 million of inventory and \$2 million of accounts receivable. Its average daily sales are \$120,000. The company's payables deferral period (accounts payable divided by daily purchases) is 30 days. What is C&K's cash conversion cycle?
- 24
  - 26
  - 27
  - 28

ANS: D

Inventory:	\$5,000,000
Receivables:	\$2,000,000
Average daily sales:	\$120,000
Payables deferral period:	30

$$\text{CCC} = \text{Inv Conv Period} + \text{Rec Coll Period} - \text{Pay. Deferral Period}$$

$$\begin{aligned}\text{Inv Conv Period} &= \text{Inv}/\text{Average daily sales} = 42 \\ \text{Rec Coll Period} &= \text{Rec}/\text{Average daily sales} = 17 \\ \text{Pay. Def. Period} &= 30\end{aligned}$$

$$\text{CCC} = \text{Inv Conv Period} + \text{Rec Coll Period} - \text{Pay. Deferral Period} = 28 \text{ days}$$

PTS: 1                      DIF: EASY                      REF: 498–499                      OBJ: (17.1) Cash conversion cycle  
BLM: Higher Order

25. Westley Company's average age of accounts receivable is 50 days, the average age of accounts payable is 45 days, and the average age of inventory is 72 days. Assuming a 365-day year, what is the length of its cash conversion cycle?
- 66
  - 69
  - 73
  - 77

ANS: D

CCC = Inv Conv Period + Rec Coll Period – Pay. Deferral Period

Age of receivables = Rec Conv Period = 50

Age of inventory = Inv Conv Period = 72

Age of payables = Pay. Def. Period = 45

CCC = Inv Conv Period + Rec Coll Period – Pay. Deferral Period = 77 days

PTS: 1

DIF: EASY

REF: 499

OBJ: (17.1) Cash conversion cycle

BLM: Remember

26. Miletkov Company's total assets fluctuate between \$320,000 and \$410,000, while its fixed assets remain constant at \$260,000. If the firm follows a maturity matching, or moderate, working capital financing policy, what is the likely level of its long-term debt and equity financing?
- \$274,360
  - \$288,800
  - \$304,000
  - \$320,000

ANS: D

Minimum level of total assets: \$320,000 = LT Debt + Equity

A maturity matching policy implies that fixed assets and permanent current assets are financed with long-term sources. Since the minimum balance of its total assets is \$320,000, this is its most likely level of long-term financing.

PTS: 1

DIF: EASY

REF: 502

OBJ: (17.3) Maturity matching

BLM: Higher Order

27. Schoof Inc. expects to have sales of \$30,000 in January, \$35,000 in February, and \$40,000 in March. If 20% of sales are for cash, 40% are credit sales paid in the month following the sale, and another 40% are credit sales paid 2 months following the sale, what are the cash receipts for the firm in March?
- \$29,151
  - \$30,685
  - \$32,300
  - \$34,000

ANS: D

Payments:

Cash 20%

Pay 2nd month 40%

Pay 3rd month 40%

	<u>Sales for</u>	<u>January</u>	<u>Collections</u>	<u>March</u>
	<u>mos.</u>		<u>February</u>	
January	\$30,000	\$6,000	\$12,000	\$12,000
February	\$35,000		\$ 7,000	\$14,000
March	\$40,000			<u>\$ 8,000</u>
Total collections for month:		<u>\$6,000</u>	<u>\$19,000</u>	<u>\$34,000</u>

PTS: 1

DIF: EASY

REF: 505

OBJ: (17.4) Sales collections

BLM: Higher Order





Purchases/day = \$1,370  
 Free credit = Disc days × Purchases/day = \$20,548

PTS: 1                    DIF: EASY                    REF: 509                    OBJ: (17.6) Free trade credit  
 BLM: Higher Order

32. On average, Bragg Inc. has sales of \$2,000,000 per month. It keeps inventory equal to 50% of its monthly sales on hand at all times. Based on using a 365-day year, what is the inventory conversion period?
- 11.7
  - 13.0
  - 14.4
  - 15.2

ANS: D  
 Monthly Sales:                    \$2,000,000  
 Inventory/sales:                    50.0%  
 Annual sales =                    \$24,000,000  
 Avg. Inventory =                    \$1,000,000

$$\text{Inv. Conv. Period} = \text{Avg. Inv}/(\text{Annual sales}/365) = 15.2$$

PTS: 1                    DIF: MEDIUM                    REF: 498  
 OBJ: (17.1) Inventory conversion period    BLM: Higher Order

33. Cyree Inc. has annual sales of \$80,000,000, its average inventory is \$20,000,000, and its average accounts receivable is \$16,000,000. The firm buys all raw materials on terms of net 35 days, and it pays on time. The firm is searching for ways to shorten the cash conversion cycle. If sales can be maintained at existing levels while lowering inventory by \$4,000,000 and accounts receivable by \$2,000,000, by how many days would the cash conversion cycle be changed? Use a 365-day year.
- 27.4
  - 28.7
  - 30.2
  - 31.7

ANS: A  
 Sales:                    \$80,000,000                    Reduction in inventory:                    \$4,000,000  
 Avg. inventory:                    \$20,000,000                    Reduction in receivables:                    \$2,000,000  
 Avg. receivables:                    \$16,000,000                    Days in year:                    365  
 Payables deferrable:                    35

	<u>Original</u>	<u>New</u>
ICP = 365/(Sales/Inventory) =	91.3	73.0
DSO = Receivables/(Sales/365) =	73.0	63.9
Payables deferral:	-35.0	-35.0
	129.3	101.9

$$\text{Change} = -27.4$$

PTS: 1                    DIF: MEDIUM                    REF: 498-499                    OBJ: (17.1) Cash conversion cycle  
 BLM: Higher Order

34. You were recently hired as CFO to improve the performance of Dennis Systems, which is highly profitable but has been experiencing cash shortages due to its high rate of growth. As one part of your analysis, you want to determine the firm's cash conversion cycle. Using the following information and a 365-day year, what is your estimate of the firm's present cash conversion cycle?

Average inventory:	\$120,000
Annual sales:	\$600,000
Average accounts receivable:	\$160,000
Average accounts payable:	\$25,000
Total annual purchases:	\$365,000
Buy on net 30 days, no discounts:	30
Sell on net 50 days, no discounts:	50

- a. 118.4  
 b. 124.6  
 c. 131.2  
 d. 145.3

ANS: D

Sales:	\$600,000	Avg. payables	\$25,000
Avg. inventory:	\$120,000	Annual purchases:	\$365,000
Avg. receivables:	\$160,000	Days in year:	365

<u>New</u>	
ICP = 365/(Sales/Inventory) =	73.0
DSO = Receivables/(Sales/365) =	97.3
Payables deferral = Payables/(Purchases/365)	<u>-25.0</u>
=	<u>145.3</u>

PTS: 1            DIF: MEDIUM      REF: 498-499      OBJ: (17.1) Cash conversion cycle  
 BLM: Higher Order

35. Ferson Inc. has annual sales of \$36,500,000, or \$100,000 a day on a 365-day basis. On average, the company has \$12,000,000 in inventory and \$8,000,000 in accounts receivable. The firm is looking for ways to shorten its cash conversion cycle, which is calculated on a 365-day basis. Its CFO has proposed new policies that would result in a 20% reduction in both average inventories and accounts receivables. She also anticipates that these policies would reduce sales by 10%, while accounts payable would remain unchanged. What effect would these policies have on the company's cash conversion cycle? Round to the nearest whole day.
- a. -40 days  
 b. -22 days  
 c. +22 days  
 d. +40 days

ANS: B

Cash conversion cycle = Inv. conversion period + Rec. collection period - Pay. deferral period.

To analyze the change in the cash conversion cycle, we can ignore the payables deferral period since it remains unchanged.

$$\begin{aligned} \text{Old CCC (ignore payables)} &= \$12,000,000/\$100,000 + \$8,000,000/\$100,000 \\ &= 120 + 80 = 200 \text{ days.} \end{aligned}$$



Fixed assets:	\$100,000	EBIT:	\$35,000	Tax rate	40%
CA/Sales, restricted:	15%	CA/Sales, rel:	25%		

	<u>Restricted</u>	<u>Relaxed</u>
CA	\$ 60,000	\$100,000
FA	100,000	100,000
Total assets	<u>\$160,000</u>	<u>\$200,000</u>
Debt	\$ 80,000	\$100,000
Equity	<u>80,000</u>	<u>100,000</u>
Total liab & capital	<u>\$160,000</u>	<u>\$200,000</u>
EBIT:	\$ 35,000	\$ 35,000
Interest:	<u>8,000</u>	<u>10,000</u>
EBT	\$ 27,000	\$ 25,000
Taxes	<u>10,800</u>	<u>10,000</u>
NI	<u>\$ 16,200</u>	<u>\$ 15,000</u>
ROE	20.3%	15.0%
Difference = 5.3%		

PTS: 1 DIF: MEDIUM REF: 502–504

OBJ: (17.3) ROE and working capital policy

BLM: Higher Order

38. Nagel Corporation's budgeted monthly sales are \$5,000, and they are constant from month to month. Its customers pay as follows: 40% pay in the first month and take the 2% discount, while the remaining 60% pay in the month following the sale and do not receive a discount. The firm has no bad debts. Purchases for next month's sales are constant at 50% of projected sales for the next month. "Other payments," which include payments for wages, rent, and taxes, are 25% of sales for the month. Construct a cash budget for a typical month. What is the average cash gain or loss during the month?
- \$1,092
  - \$1,150
  - \$1,210
  - \$1,271

ANS: C

Monthly sales:	\$5,000
Monthly purchase %:	50%
Other payments:	25%

	<u>Sale month</u>	<u>Next month</u>
Payment pattern:	40%	60%
Discount:	2%	

Cash budget:	
Sales	\$5,000
Collections, same month's sales: (% of sales)(sales)(1 – Discount):	1,960
Collections (last month's sales)	<u>3,000</u>
Total collections	\$4,960
Purchases payments	2,500
Other payments	<u>1,250</u>
Total payments	<u>\$3,750</u>

Net cash gain (loss)

\$1,210

PTS: 1                    DIF: MEDIUM        REF: 505–507        OBJ: (17.4) Cash budget  
BLM: Higher Order

39. Suppose the credit terms offered to your firm by your suppliers are 2/10, net 30 days. Out of convenience, your firm is not taking discounts, but is paying after 25 days, instead of waiting until Day 30. You point out that the nominal cost of not taking the discount and paying on Day 30 is approximately 37%. But since your firm is not taking discounts and is paying on Day 25, what is the effective annual cost (NOT the nominal cost) of your firm's current practice, using a 365-day year?
- a. 60.3%
  - b. 63.5%
  - c. 66.7%
  - d. 70.0%

ANS: B

Discount	2%	Days to actually pay:	25
Discount days	10	Days in year:	365
Net days	30		

Nominal cost =  $(\text{Disc}/(1 - \text{Disc}) \times (365/(\text{Days to pay} - \text{Disc days})) = 49.7\%$   
Compounding periods =  $365/(\text{Days to pay} - \text{Disc days}) = 24$

Effective cost =  $(1 + \text{Nom cost}/\text{Period})^{\text{Periods}} - 1 = 63.5\%$

PTS: 1                    DIF: MEDIUM        REF: 509–510  
OBJ: (17.6) EAR cost of trade credit        BLM: Higher Order

40. Viale Enterprises purchases \$4,562,500 in goods per year from its sole supplier on terms of 2/15, net 50. If the firm chooses to pay on time but does not take the discount, what is the effective annual cost of its trade credit? (Assume a 365-day year.)
- a. 17.81%
  - b. 19.66%
  - c. 23.45%
  - d. 27.43%

ANS: C

Calculate the nominal percentage:

Nominal cost =  $\frac{2}{100 - 2} \times \frac{365 \text{ days}}{50 - 15} = 0.0204 \times 10.4286 = 0.2128 = 21.28\%$

The effective cost of trade credit can be found as follows:

EAR =  $(1 + 2/98)^{10.4286} - 1 = 1.2345 - 1 = 0.2345 = 23.45\%$

PTS: 1                    DIF: MEDIUM        REF: 509–510  
OBJ: (17.6) EAR cost of trade credit        BLM: Higher Order

41. A firm is offered trade credit terms of 2/8, net 45 days. The firm does not take the discount, and it pays after 58 days. What is the effective annual cost of not taking this discount? (Assume a 365-day year.)
- a. 13.35%
  - b. 14.70%
  - c. 15.89%
  - d. 18.70%

ANS: C

Calculate the interest rate per period:

$$\text{Periodic rate} = 2/98 = 2.04\%$$

Calculate the number of compounding periods:

$$\text{Number of compounding periods} = 365/50 = 7.30$$

Use periodic rate and compounding periods to determine the annual nominal rate:

$$2.04\% \times 7.3 = 14.90\%$$

Calculate EAR:

$$\text{EAR} = (1 + 2/98)^{365/50} - 1 = (1.0204)^{7.3} - 1 = 1.1589 - 1 = 0.1589 = 15.89\%$$

PTS: 1                      DIF: MEDIUM                      REF: 509–510

OBJ: (17.6) EAR cost of trade credit                      BLM: Higher Order

42. Shanklin Inc. purchases merchandise on terms of 2/15, net 40, and its total gross purchases (i.e., purchases before taking off the discount) are \$800,000 per year. What is the maximum amount of costly trade credit Shanklin could get, assuming it abides by the supplier's credit terms? (Assume a 365-day year.)
- \$53,699
  - \$56,384
  - \$59,203
  - \$62,163

ANS: A

Discount	2%	Gross purchases:	\$800,000
Discount days	15	Days in year:	365
Net days	40		

Net purchases = Gross(1 – Disc %) =	\$784,000
Net per day = Net/365 =	\$2,148
Total trade credit = Net days × Net per day =	\$85,918
Free credit = Net per day × Discount days =	\$32,219
Costly credit = Total credit – Free credit =	\$53,699

PTS: 1                      DIF: MEDIUM                      REF: 509                      OBJ: (17.6) Costly trade credit

BLM: Higher Order

43. Hefner Inc.'s business is booming, and it needs to raise more capital. The company purchases supplies on terms of 1/10, net 20, and it currently takes the discount. One way of getting the needed funds would be to forgo the discount, and the firm's owner believes she could delay payment to 40 days without adverse effects. What would be the effective annual rate of funds raised by this action? (Assume a 365-day year.)
- 10.00%
  - 11.75%
  - 12.29%
  - 13.01%

ANS: D

$$\text{Nominal annual cost: } (1/99)(365/(40 - 10)) = 12.29\%$$

$$\text{EAR is calculated as follows: } \text{EAR} = (1 + 1/99)^{12.1667} - 1 = 13.01\%$$

PTS: 1                    DIF: MEDIUM      REF: 509–510  
OBJ: (17.6) Stretching accounts payable    BLM: Higher Order

44. Gorman Inc. arranged a \$10,000,000 revolving credit agreement with a group of banks. The firm paid an annual commitment fee of 0.5% of the unused balance of the loan commitment. On the used portion of the revolver, it paid 1.5% above prime for the funds actually borrowed on a simple interest basis. The prime rate was 9% during the year. If the firm borrowed \$6,000,000 immediately after the agreement was signed and repaid the loan at the end of 1 year, what was its total dollar cost for the year?
- a. \$617,500
  - b. \$650,000
  - c. \$682,500
  - d. \$716,625

ANS: B

Total commitment:	\$10,000,000	Fee on unused:	0.5%
Prime:	9.0%	Premium over prime:	1.5%
Amount borrowed:	\$6,000,000		

Interest rate on borrowed funds = Prime + RP = 10.5%

Cost of used portion = Amount borrowed × Rate = \$630,000

Cost of unused portion: Unused × Fee = \$20,000

Total cost of loan agreement = \$650,000

PTS: 1                    DIF: MEDIUM      REF: 513  
OBJ: (17.7) Revolving credit agreement    BLM: Higher Order

45. A firm needs \$45,000 to purchase inventory. The bank requires a 5% compensating balance. With a stated interest rate of 15%, what is the effective interest rate?
- a. 14.25%
  - b. 15.00%
  - c. 15.79%
  - d. 16.67%

ANS: C

Funds required to borrow to net \$45,000 =  $(\$45,000)/(1 - 0.05) = \$47,368$ . Effective interest rate =  $(0.15)(\$47,368)/\$45,000 = 15.79\%$

PTS: 1                    DIF: MEDIUM      REF: 516  
OBJ: (17.8) Compensating balances        BLM: Higher Order

46. Your firm needs \$630 for one quarter to finance a deficit. Interest charges are 2% per quarter. Your bank requires a 10% compensating balance. How much must your firm borrow in order to obtain the needed funds?
- a. \$693.00
  - b. \$700.00
  - c. \$705.60
  - d. \$715.91

ANS: B

Funds required =  $\$630/(1 - 0.1) = \$700$

PTS: 1                    DIF: MEDIUM      REF: 516                    OBJ: (17.8) Line of credit

BLM: Higher Order

47. XYZ Inc. is planning a \$200,000 90-day commercial paper issue. The issue is sold for \$193,500. There is a flotation cost of \$1,500. The corporate tax rate is 35%. (Assume a 365-day year.) Which of the following statements is correct?
- The before-tax cost is 16.77%.
  - The before-tax cost is 15.71%.
  - The after-tax cost is 10.21%.
  - The after-tax cost is 10.06%.

ANS: A

$$[\$1,500 + (\$200,000 - \$193,500)]/\$193,500 \times (365/90) = 0.1677$$

PTS: 1                      DIF: MEDIUM              REF: 513                      OBJ: (17.8) Commercial papers  
BLM: Remember

48. LMN Co. plans to enter into a secured term loan by assigning its receivables of \$600,000 with an average maturity date of 30 days. The finance company will loan 75% of the receivables value at 11% interest plus a service fee of 0.05% of the total receivables pledged. What is the total cost of this financing arrangement?
- \$3,039
  - \$3,872
  - \$4,049
  - \$4,368

ANS: D

Loan amount =  $(0.75)(\$600,000) = \$450,000$ . Interest cost on borrowed funds =  $(\$450,000)(11\%)(30/365) = \$4,068.49$ . Service fee =  $(\$600,000)(0.0005) = \$300$ . Total cost of loan agreement =  $\$4,368.49$ .

PTS: 1                      DIF: MEDIUM              REF: 517–518              OBJ: (17.9) Receivables pledging  
BLM: Higher Order

49. Tareque Inc. wants to increase its free cash flow by \$180 million during the coming year, which should result in a higher EVA and share price. The CFO has made these projections for the upcoming year:

- EBIT is projected to be \$850 million.
- Gross capital expenditures are expected to total \$360 million versus depreciation of \$120 million, so its net capital expenditures should total \$240 million.
- The tax rate is 40%.
- There will be no changes in cash or marketable securities, nor will there be any changes in notes payable or accruals.

Which of the following actions would enable the company to achieve its goal of generating \$180 million in free cash flow?

- accounts receivable increase by \$470 million, inventory increases by \$230 million, and accounts payable increase by \$790 million
- accounts receivable increase by \$470 million, inventory increases by \$230 million, and accounts payable increase by \$610 million
- accounts receivable decrease by \$500 million, inventory increases by \$480 million, and accounts payable decline by \$80 million
- accounts receivable decrease by \$400 million, inventory increases by \$480 million, and accounts payable increase by \$80 million



ANS: B

$$FCF = EBIT(1 - T) + DEP - CapExp - \Delta NOWC$$

$$\$180,000,000 = \$850,000,000(0.6) + \$120,000,000 - \$360,000,000 - \Delta NOWC$$

$$\$180,000,000 = \$510,000,000 + \$120,000,000 - \$360,000,000 - \Delta NOWC$$

$$\$180,000,000 = \$270,000,000 - \Delta NOWC$$

$$-\$90,000,000 = -\Delta NOWC$$

$$\Delta NOWC = \$90,000,000.$$

Net operating working capital needs to increase by \$90 million, so we need to find the response that shows working capital increasing by that amount. (b) is true because  $\Delta NOWC = \$470,000,000 + \$230,000,000 - \$610,000,000 = \$90,000,000$ . Note also that (a) is false because  $\Delta NOWC = \$470,000,000 + \$230,000,000 - \$790,000,000 = -\$90,000,000$ . (c) is false because  $\Delta NOWC = -\$500,000,000 + \$480,000,000 - (-\$80,000,000) = \$60,000,000$ . (d) is false because  $\Delta NOWC = -\$400,000,000 + \$480,000,000 - \$80,000,000 = \$0$ .

PTS: 1 DIF: MEDIUM REF: 497

OBJ: (Comp: 17.1–17.6) Working capital, free cash flow—nonalgorithmic

BLM: Higher Order

50. Margetis Inc. carries an average inventory of \$1,000,000. Its annual sales are \$10 million, and its receivables conversion period is twice as long as its inventory conversion period. The firm buys on terms of net 30 days, and it pays on time. Its new CFO wants to decrease the cash conversion cycle by 10 days, based on a 365-day year. He believes he can reduce the average inventory to \$863,000 with no effect on sales. By how much must the firm also reduce its accounts receivable to meet its goal of a 10-day reduction in the cash conversion cycle?
- \$0
  - \$101,900
  - \$136,986
  - \$333,520

ANS: C

$$ICP = 365 \text{ days}/(\$10 \text{ million}/\$1 \text{ million}) = 36.5 \text{ days}$$

$$DSO = 2.0 \times ICP = 73 \text{ days}$$

Solve for accounts receivable:

$$\begin{aligned} DSO = 73 &= \text{Accounts receivable}/\text{Sales per day} \\ &= (A/R)/(\$10/365) = \$2 \text{ million} \end{aligned}$$

Calculate new ICP, change in CCC, and new DSO required to meet goal:

$$\text{New ICP} = 365/(\$10/\$0.863) = 365/11.5875 = 31.5 \text{ days}$$

$$\text{Net change in ICP} = -5 \text{ days}$$

$$\text{Total reduction in CCC required} = 10 \text{ days}$$

$$\text{Reduction in DSO needed} = 10 - 5 = 5 \text{ days}$$

$$\text{New DSO required} = 73 - 5 = 68 \text{ days}$$

Solve for new receivables level:

$$DSO = 68 = [(A/R)/(\$10,000,000/365)]$$

$$A/R = 68 \times \$27,397.26 = \$1,863,014$$

$$\text{Old A/R} = \$2,000,000. \text{ New A/R} = \$1,863,014$$

$$\text{Reduction required in A/R} = \$2,000,000 - \$1,863,014 = \$136,986$$

51. Gonzales Company currently uses maximum trade credit by not taking discounts on its purchases. The standard industry credit terms offered by all its suppliers are 2/10, net 30 days, and the firm pays in 30 days. The new CFO is considering borrowing from its bank, using short-term notes payable, and then taking discounts. The firm wants to determine the effect of this policy change on its net income. Its net purchases are \$11,760 per day, using a 365-day year. The interest rate on the notes payable is 10%, and the tax rate is 40%. If the firm implements the plan, what is the expected change in net income after taxes?
- \$31,440
  - \$23,520
  - \$23,520
  - \$38,448

ANS: D

Calculate A/P with and without taking discounts:

$$A/P_{\text{No discount}} = \$11,760 \times 30 \text{ days} = \$352,800$$

$$A/P_{\text{Discount}} = \$11,760 \times 10 \text{ days} = \$117,600$$

Calculate financing amount in notes payable and interest cost. The firm will need to borrow the difference in notes payable.

$$\$352,800 - \$117,600 = \$235,200$$

$$\text{The additional interest cost is } \$235,200 \times 0.10 = \$23,520$$

Calculate total purchases and discounts lost:

$$\text{Total purchases} = 365 \text{ days} \times 12,000 \text{ gross purchases} = \$4,380,000$$

$$\text{Discounts lost} = \$4,380,000 \times 0.02 = \$87,600$$

Find the expected increase in net income:

$$\text{Pre-tax savings} = \$87,600 - \$23,520 = \$64,080$$

$$\text{After-tax savings} = \$64,080(1 - 0.4) = \$38,448$$

Alternative Approach: Construct comparative financial statements

I. Partial balance sheet:

	Take Discounts (Borrow N/P)	Don't Take Discounts (Use Max. A/P)	Difference
Accounts payable	\$117,600	\$352,800	–\$235,200
Notes payable (10%)	235,200	–	+235,200
Total current liab.	<u>\$352,800</u>	<u>\$352,800</u>	<u>\$0</u>

II. Partial income statement:

EBIT*	\$140,000	\$140,000	\$0
Less: Interest	23,520	0	+23,520
Discounts lost	<u>0</u>	<u>87,600</u>	<u>–87,600</u>
EBT	\$116,480	\$ 52,400	+\$64,080
Less: Taxes (at 40%)	<u>46,592</u>	<u>20,960</u>	<u>+ 25,632</u>
Net income	<u>\$ 69,888</u>	<u>\$ 31,440</u>	<u>+\$38,448</u>

\*Any EBIT can be used, since the difference in EBIT from the two policies is zero.

PTS: 1                    DIF: HARD                    REF: 508–510  
 OBJ: (17.6) Financial statements and trade credit                    BLM: Higher Order

52. Aggarwal Inc. buys on terms of 2/10, net 30, and it always pays on the 30th day. The CFO calculates that the average amount of costly trade credit carried is \$375,000. What is the firm's average accounts payable balance? (Assume a 365-day year.)
- \$223,333
  - \$374,951
  - \$457,443
  - \$562,500

ANS: D

Total trade credit = Free credit + costly credit.

Free trade credit = Purchases per day  $\times$  10

Costly trade credit = Purchases per day  $\times$  20 = \$375,000

Purchases per day =  $375,000/20 = \$18,750$

Total trade credit = Accounts payable =  $\$18,750 \times 30 = \$562,500$

Note that purchases and payables are all net of discounts.

PTS: 1                    DIF: HARD                    REF: 508–510  
 OBJ: (17.6) Accounts payable balance                    BLM: Higher Order

53. If the firm adopts a restricted policy, how much lower would its interest expense be than under the relaxed policy?
- \$3,233
  - \$6,175
  - \$7,200
  - \$9,818

ANS: D

Step 1: Calculate net fixed assets, which will be the same under either policy.

$$\text{FA turnover} = \frac{\$}{\text{NFA}}$$

$$4.0 = \frac{\$3,600,000}{\text{NFA}}$$

$$\text{NFA} = \$900,000$$

Step 2: Determine total assets under each policy, given the total assets turnover ratio for each one.

$$\text{Restricted: Total assets turnover} = \frac{\$}{\text{TA}}$$

$$2.5 = \frac{\$3,600,000}{\text{TA}}$$

$$\text{TA} = \$1,440,000$$

$$\text{Relaxed: } 2.2 = \frac{\$3,600,000}{\text{TA}}$$

$$\text{TA} = \$1,636,364$$

Step 3: Develop balance sheets for each policy to determine the debt level.

	<u>Restricted</u>	<u>Relaxed</u>
Current assets	\$ 540,000	\$ 36,364
Fixed assets	<u>900,000</u>	<u>900,000</u>
Total assets	<u>\$1,440,000</u>	<u>\$1,636,364</u>
Debt	\$ 720,000	\$ 818,182
Equity	<u>720,000</u>	<u>818,182</u>
Total liabilities & equity	<u>\$1,440,000</u>	<u>\$1,636,364</u>

Step 4: Determine interest under each policy:

Restricted:  $\$720,000 \times 0.10 = \$72,000$

Relaxed:  $\$818,182 \times 0.10 = \$81,818$

Step 5: Calculate the difference in interest expense (the savings) between the two policies:

$\$81,818 - \$72,000 = \$9,818$

PTS: 1                      DIF: MEDIUM      REF: 502–504

OBJ: (17.3) Working capital investment policy—nonalgorithmic

BLM: Higher Order

54. What's the difference in the projected ROEs under the restricted and relaxed policies?

- a. 2.24%
- b. 1.50%
- c. 1.00%
- d. 0.50%

ANS: B

Step 1: Using data from the previous problem, we can now set up an income statement for each policy.

	<u>Restricted</u>	<u>Relaxed</u>
EBIT	\$150,000	\$150,000
Interest (10%)	<u>72,000</u>	<u>81,818</u>
EBT	\$ 78,000	\$ 68,182
Taxes (40%)	<u>31,200</u>	<u>27,273</u>
Net income	<u>\$ 46,800</u>	<u>\$ 40,909</u>

Step 2: Calculate ROE using common equity as calculated in the prior problem for each policy.

$$\text{Restricted: ROE} = \frac{\$46,800}{\$720,000} = 6.5\% \qquad \text{Relaxed: ROE} = \frac{\$40,909}{\$818,182} = 5.0\%$$

Step 3: Calculate the difference in ROEs.

$$\Delta\text{ROE} = 6.5\% - 5.0\% = 1.5\%$$

PTS: 1                      DIF: MEDIUM      REF: 502–504

OBJ: (17.3) Working capital investment: ROE—nonalgorithmic

BLM: Higher Order

55. Assume now that the company believes that if it adopts a restricted policy, its sales will fall by 15% and EBIT will fall by 10%, but its total assets turnover, debt ratio, interest rate, and tax rate will all remain the same. In this situation, what's the difference between the projected ROEs under the restricted and relaxed policies?
- 2.24%
  - 1.50%
  - 1.00%
  - 0.50%

ANS: A

From the prior two problems, we know that the ROE for the relaxed policy is 5%. Now we need to calculate the new ROE under the restricted policy.

Step 1: Calculate the new sales and EBIT levels.

$$\text{New sales} = \$3,600,000 \times 0.85 = \$3,060,000$$

$$\text{New EBIT} = \$150,000 \times 0.90 = \$135,000$$

Step 2: Calculate the new level of assets under the restricted policy.

$$S/TA = 2.5$$

$$\$3,060,000/2.5 = \$1,224,000$$

Step 3: Develop the firm's balance sheet under the restricted policy.

Total assets	<u>\$1,224,000</u>
Debt	\$ 612,000
Equity	<u>612,000</u>
Total liabilities & equity	<u>\$1,224,000</u>

Step 4: Develop the firm's income statement under the restricted policy.

EBIT	\$135,000
Interest (10%)	<u>61,200</u>
EBT	\$ 73,800
Taxes (40%)	<u>29,520</u>
Net income	<u>\$ 44,280</u>

Step 5: Calculate the firm's ROE under the restricted policy.

$$\text{ROE} = \text{NI}/\text{E} = \$44,280/\$612,000$$

$$\text{ROE} = 7.24\%$$

Step 6: Calculate the difference in ROEs between the two policies.

$$\Delta\text{ROE} = 7.24\% - 5\% = 2.24\%$$

PTS: 1                      DIF: MEDIUM                      REF: 502-504

OBJ: (17.3) Working capital investment: ROE—nonalgorithmic

BLM: Higher Order

## CHAPTER 18—CURRENT ASSET MANAGEMENT

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### TRUE/FALSE

1. Net operating working capital, defined as current assets minus current liabilities, is also equal to the current ratio.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 533  
OBJ: (18 Intro) Net operating working capital

2. Working capital management deals with the management of current assets and current liabilities such as accounts receivable and accruals, etc.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 532  
OBJ: (18 Intro) Working capital management

3. An increase in a current asset must be accompanied by a corresponding increase in a current liability.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 533  
OBJ: (18 Intro) Working capital

4. Cash is often referred to as a nonearning asset. Thus, one goal of cash management is to minimize the amount of cash necessary to conduct business.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 533  
OBJ: (18.1) Goal of cash management

5. For a typical nonfinancial company, a small portion of its assets is held in the form of cash, defined as demand deposits and currency.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 533  
OBJ: (18.1) Cash holding

6. Firms hold cash balances in order to complete transactions that are necessary in business operations and as compensation to banks for providing loans and services.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 533–534  
OBJ: (18.1) Motives for holding cash

7. Float refers to the difference between the firm's available or collected balance at its bank and the firm's book, or ledger, balance.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 535  
OBJ: (18.2) Float

8. Lockbox arrangements are one way for a firm to speed up collection of payments from customers.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 535  
OBJ: (18.2) Lockbox

9. In addition to being a substitute for cash balances, marketable securities are used as a temporary investment.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 537  
OBJ: (18.3) Marketable securities

10. Providing much higher yields than operating assets, marketable securities are often held in sizable amounts.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 536  
OBJ: (18.3) Marketable securities

11. Since receivables and payables both result from sales transactions, a firm with a high receivables-to-sales ratio must also have a high payables-to-sales ratio.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 540  
OBJ: (18.4) Receivables balance

12. The average accounts receivables balance is determined jointly by the volume of credit sales and the days sales outstanding.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 539  
OBJ: (18.4) Receivables balance

13. If a firm has a large percentage of accounts over 30 days old, this is solid proof that its receivables manager is not doing a good job.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 541  
OBJ: (18.4) Receivables aging

14. The aging schedule is a commonly used method for monitoring receivables.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 541  
OBJ: (18.4) Monitoring receivables

15. The four major elements in a firm's credit policy are (1) credit standards, (2) discounts offered, (3) credit period, and (4) collection policy.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 538  
OBJ: (18.4) Credit policy

16. You receive some goods on April 1 with the following terms: 3/20, net 30, June 1 dating. This means that you will receive a 3% discount if the bill is paid on or before June 20 and also that the full amount must be paid 30 days after receipt of the goods.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 538  
OBJ: (18.4) Cash discounts

17. The credit period is the amount of time it takes to do a credit search on a potential customer.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 538  
OBJ: (18.4) Credit period

18. Credit standards refer to the financial importance of a potential customer to the firm in order to qualify for credit.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 538  
OBJ: (18.4) Credit standards

19. The collection process is a fairly inexpensive component of doing business, although sometimes difficult to implement.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 539  
OBJ: (18.4) Collection policy

20. When deciding whether to offer a discount for cash payment, a firm must balance the profits from additional sales with the lost revenues from the discount.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 539  
OBJ: (18.4) Cash discounts

21. Cash discounts are mostly used to get new customers in the door since existing customers almost always use the delayed payment terms.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 539  
OBJ: (18.4) Cash discounts

22. The primary reason to monitor aggregate accounts receivable is to see if customers, on average, are paying more slowly.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 540  
OBJ: (18.4) Payment pattern approach

23. DSO analysis of accounts receivable is the most robust way to see if customers are, on average, paying more slowly, because it is unaffected by seasonal changes in sales.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 541  
OBJ: (18.4) Payment pattern approach

24. If sales are seasonal, the DSO will fluctuate from month to month, even if the amount of time customers take to pay remains unchanged.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 541  
OBJ: (18.4) Payment pattern approach

25. Two methods for improving the collection process are the use of a lockbox system and moving funds by electronic transfer.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 535  
OBJ: (18.2) Speeding up collection

26. The average collection period is calculated by dividing total sales by accounts receivable. It is an effective measure for internal use in monitoring a firm's collections.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 540  
OBJ: (18.4) Average collection period

27. Suppose a firm changes its credit policy from 2/10, net 30, to 3/10, net 30. The change is meant to meet competition, so no increase in sales is expected. The average accounts receivable balance will probably decline as a result of this change.



ANS: T                   PTS: 1                   DIF: EASY                   REF: 542  
OBJ: (18.5) Change in credit policy

28. The overriding goal of inventory management is to ensure that the firm never suffers a stock-out, i.e., never runs out of an inventory item.

ANS: F                   PTS: 1                   DIF: EASY                   REF: 544  
OBJ: (18.6) Goal of inventory management

29. The principal goal of most inventory management systems is to balance the costs of ordering, shipping, and receiving goods against the cost of carrying those goods, while simultaneously meeting the firm's policy with respect to avoiding running short of stock and thus disrupting production schedules or losing sales.

ANS: T                   PTS: 1                   DIF: EASY                   REF: 544  
OBJ: (18.6) Goal of inventory management

30. Inventory management is largely self-contained in the sense that very little coordination among the sales, purchasing, and production personnel is required for successful inventory management.

ANS: F                   PTS: 1                   DIF: EASY                   REF: 545–546  
OBJ: (18.6) Inventory management interaction

31. A JIT system is designed to stretch accounts payable as long as possible.

ANS: F                   PTS: 1                   DIF: EASY                   REF: 545  
OBJ: (18.6) Inventory system

32. Outsourcing is a practice of selling a significant percentage of intermediate components to outside suppliers from the in-house productions.

ANS: F                   PTS: 1                   DIF: EASY                   REF: 545  
OBJ: (18.6) Inventory system

33. If a company increases its safety stock, then its average inventory will go up.

ANS: T                   PTS: 1                   DIF: EASY                   REF: 550–511  
OBJ: (18.7) EOQ model

34. Constant demand, constant carrying costs, and constant ordering costs are the three key assumptions of the EOQ model.

ANS: T                   PTS: 1                   DIF: EASY                   REF: 549  
OBJ: (18.7) EOQ model

35. The EOQ model minimizes total inventory costs.

ANS: T                   PTS: 1                   DIF: EASY                   REF: 548  
OBJ: (18.7) EOQ model

36. The target cash balance should be set so that it need not be adjusted for either seasonal patterns or unanticipated fluctuations, although it should be adjusted to reflect long-term changes in the firm's operations.

ANS: F                    PTS: 1                    DIF: MEDIUM            REF: 533–534  
OBJ: (18.1) Seasonal patterns and cash

37. Cash balances vary widely both among industries and among firms, depending upon specific conditions and on the owners' and financial managers' aversion to risk.

ANS: T                    PTS: 1                    DIF: MEDIUM            REF: 533  
OBJ: (18.1) Cash management

38. Although firms do not segregate funds for various motives of holding cash, they do consider them in setting their overall cash positions.

ANS: T                    PTS: 1                    DIF: MEDIUM            REF: 533–534  
OBJ: (18.1) Cash management

39. Synchronization of cash flows is an important cash management technique, as it can reduce the required cash balance and increase a firm's profitability.

ANS: T                    PTS: 1                    DIF: MEDIUM            REF: 534–535  
OBJ: (18.2) Synchronization of cash flows

40. Collections float tends to offset disbursement float. If a firm's average collections float exceeds its average disbursement float, then it is said to be operating with positive net float.

ANS: F                    PTS: 1                    DIF: MEDIUM            REF: 535  
OBJ: (18.2) Float

41. A lockbox plan is one method of speeding up the cheque-clearing process for customer payments, and as such, it decreases the firm's net positive float position.

ANS: F                    PTS: 1                    DIF: MEDIUM            REF: 535  
OBJ: (18.2) Float

42. A firm on average collects cheques totalling \$250,000 per day. It takes the firm approximately 4 days to convert the cheques into usable cash. Assume (1) a lockbox system could be employed that would reduce the cash conversion procedure to 2 1/2 days and (2) the firm could invest any additional cash generated at 6% after taxes. The lockbox system would be a good buy if it costs only \$25,000 annually.

ANS: F  
Interest earned =  $\$250,000(1.5)(0.06) = \$22,500$ .  
Thus, the cost (\$25,000) exceeds the benefit (\$22,500).

PTS: 1                    DIF: MEDIUM            REF: 535                    OBJ: (18.2) Lockbox

43. Marketable securities aim for long-term investments, but firms may temporarily hold them to convert into cash quickly.

ANS: F                    PTS: 1                    DIF: MEDIUM            REF: 536–537  
OBJ: (18.3) Marketable securities

44. Marketable securities are liquid assets. Holding too low an amount of these liquid assets may adversely affect a firm's creditworthiness and lower its credit rating, resulting in higher future costs for securing both short- and long-term funds.

ANS: T                      PTS: 1                      DIF: MEDIUM              REF: 537  
OBJ: (18.3) Marketable securities

45. A firm's investment in accounts receivable is largely influenced by production process and the requirements imposed by competition.

ANS: F                      PTS: 1                      DIF: MEDIUM              REF: 539  
OBJ: (18.4) Receivable management

46. A firm that makes 90% of its sales on credit and 10% for cash is currently growing at a stable, steady rate of 10% annually. This firm's accounts receivable can be kept at their current level, since the 10% cash sales can be used to support the 10% growth rate.

ANS: F                      PTS: 1                      DIF: MEDIUM              REF: 539  
OBJ: (18.4) Receivables and growth

47. For a non-growth firm, it is possible to increase the percentage of sales that are made on credit sales and still keep accounts receivable at their current level, provided the firm can shorten the length of its collection period sufficiently.

ANS: T                      PTS: 1                      DIF: MEDIUM              REF: 539  
OBJ: (18.4) Receivables and growth

48. A firm's collection policy, i.e., the procedures it follows to collect accounts receivable, plays an important role in keeping its average collection period short, although too strict a collection policy can reduce profits due to lost sales.

ANS: T                      PTS: 1                      DIF: MEDIUM              REF: 539  
OBJ: (18.4) Collection policy

49. Changes in a firm's collection policy can affect sales, working capital, and even additional funds needed.

ANS: T                      PTS: 1                      DIF: MEDIUM              REF: 539  
OBJ: (18.4) Collection policy

50. Because money has time value, cash sales are always more profitable than credit sales.

ANS: F                      PTS: 1                      DIF: MEDIUM              REF: 537  
OBJ: (18.4) Cash versus credit sales

51. If a firm's sales and those of its customers are closely correlated with economic conditions, it is possible for the firm's total investment in accounts receivable to decline while its DSO increases.

ANS: T                      PTS: 1                      DIF: MEDIUM              REF: 541  
OBJ: (18.4) Days sales outstanding

52. If a firm's terms are 2/10, net 30 days, and its DSO is 28 days, we can be certain that the credit department is functioning efficiently and that the percentage of past due accounts is minimal.

ANS: F                    PTS: 1                    DIF: MEDIUM            REF: 541  
OBJ: (18.4) DSO and past due accounts

53. If your firm's DSO and/or aging schedule deteriorates from the first quarter of the year to the second quarter, this is proof positive that your firm's credit policy has weakened.

ANS: F                    PTS: 1                    DIF: MEDIUM            REF: 541  
OBJ: (18.4) Aging schedule and credit policy

54. Since a tighter collection policy is very likely to reduce sales, such a change in policy should not be considered.

ANS: F                    PTS: 1                    DIF: MEDIUM            REF: 542  
OBJ: (18.5) Change of credit policy

55. Decisions on granting credit, or changing credit or collection policies, involve an analysis of the magnitude and timing of the cash flow and the risks and returns expected. This evaluation is done with a net present value framework.

ANS: T                    PTS: 1                    DIF: MEDIUM            REF: 542–544  
OBJ: (18.5) Change of credit policy

56. When sales rise, inventory as a percentage of sales may also increase, even with a computerized inventory control.

ANS: F                    PTS: 1                    DIF: MEDIUM            REF: 544–545  
OBJ: (18.6) Inventory management

57. The just-in-time inventory control requires firms to maintain little to no inventory; however, it requires total quality management in all areas of operations.

ANS: T                    PTS: 1                    DIF: MEDIUM            REF: 545  
OBJ: (18.6) JIT system

58. Depreciation and obsolescence are inventory carrying costs.

ANS: T                    PTS: 1                    DIF: MEDIUM            REF: 546  
OBJ: (18.7) Carrying cost

59. The addition of a safety stock to the EOQ model does not change the total inventory costs.

ANS: F  
Total inventory costs are increased because average inventory is also increased by the amount of the safety stock.

PTS: 1                    DIF: MEDIUM            REF: 551                    OBJ: (18.7) EOQ model

60. The addition of a safety stock to the EOQ model increases the EOQ proportionately.

ANS: F  
EOQ remains the same.

PTS: 1                    DIF: MEDIUM            REF: 551                    OBJ: (18.7) EOQ model

## MULTIPLE CHOICE

1. Other things held constant, which circumstance will cause an increase in net operating working capital?
  - a. Cash is used to buy marketable securities.
  - b. A cash dividend is declared and paid.
  - c. Merchandise is sold at a profit, but the sale is on credit.
  - d. Missing inventory is written off against retained earnings.

ANS: C                    PTS: 1                    DIF: MEDIUM                    REF: 533  
OBJ: (18 Intro) Net operating working capital                    BLM: Higher Order

2. Which statement best describes compensating balances?
  - a. Compensating balance requirements apply only to businesses, not to individuals.
  - b. Compensating balances are essentially costless to most firms, because those firms would normally have such funds on hand to meet transactions needs anyway.
  - c. If the required compensating balance is larger than the transactions balance the firm would ordinarily hold, then the effective cost of any loan requiring such a balance is increased.
  - d. Banks are prohibited from earning interest on the compensating balances they hold.

ANS: C                    PTS: 1                    DIF: MEDIUM                    REF: 534  
OBJ: (18.1) Compensating balances                    BLM: Higher Order

3. Which statement best describes cash management?
  - a. A cash management system that minimizes collections float and maximizes disbursement float is better than one with higher collections float and lower disbursement float.
  - b. A cash management system that maximizes collections float and minimizes disbursement float is better than one with lower collections float and higher disbursement float.
  - c. The use of a lockbox is designed to minimize cash theft losses in retail stores. If the cost of the lockbox is less than theft losses saved, then the lockbox should be installed.
  - d. Other things held constant, a firm will need an identical line of credit regardless of whether it must pay its bills by the 5th of each month or pay its bills due uniformly during the month.

ANS: A  
Net float = Disbursements float – Collections float; therefore, the larger the disbursements float and the lower the collections float, the better the cash management system.

PTS: 1                    DIF: MEDIUM                    REF: 535                    OBJ: (18.2) Cash management  
BLM: Higher Order

4. Which statement best describes cash management?
  - a. A good cash management system minimizes disbursement float and maximizes collections float.
  - b. If a firm begins to use a well-designed lockbox system, this will reduce its customers' net float.
  - c. If Firm A can get its suppliers to permit it to pay by wire transfers rather than sending cheques through the mail, this would increase Firm A's net float and thus reduce its investment in cash.
  - d. A highly efficient cash management system can enable a firm to always have a positive net float, a negative chequebook balance, and still not have its cheques bounce.

ANS: D

A very efficient cash management system can allow a firm to operate with positive net float where the firm has a negative chequebook balance at most times but still does not bounce its cheques.

PTS: 1                      DIF: MEDIUM      REF: 535–536      OBJ: (18.2) Cash management  
BLM: Higher Order

5. What is the purpose of a lockbox plan?
- It is used for safekeeping cash and marketable securities.
  - It is used to identify inventory safety stocks.
  - It is used to slow down the collection of cheques a firm writes.
  - It is used to speed up the collection of cheques received.

ANS: D                      PTS: 1                      DIF: MEDIUM      REF: 535  
OBJ: (18.2) Lockbox                      BLM: Remember

6. Which statement best describes cash balances?
- Most firms' cash balances consist of transactions and compensating and precautionary balances. The total desired cash balance can be determined by calculating the amount needed for each purpose and then summing them.
  - The easier a firm's access to borrowed funds, the higher its precautionary balances will be in order to protect against sudden increases in interest rates.
  - For some firms, holding highly liquid marketable securities is a substitute for holding cash, because the marketable securities accomplish the same objective as cash.
  - All companies hold the same percentage of funds for transaction balances.

ANS: C                      PTS: 1                      DIF: MEDIUM      REF: 533–534 | 536–537  
OBJ: (18.1 and 18.3) Reasons for holding cash and Marketable securities  
BLM: Higher Order

7. A lockbox plan is most beneficial to which firms?
- those with widely disbursed manufacturing facilities
  - those that have a large marketable securities portfolio and cash to protect
  - those that hold inventories at many different sites
  - those that have customers who operate in many different parts of the country

ANS: D                      PTS: 1                      DIF: MEDIUM      REF: 535  
OBJ: (18.2) Cash management                      BLM: Higher Order

8. Which statement best describes float?
- A lack of synchronization of cash inflows and outflows will result in larger cash balances than would be necessary with better synchronization, but the cash balances can be reduced by increasing disbursement float and decreasing collections float.
  - The size of a firm's net float is primarily a function of its natural cash flow synchronization and how it clears its cheques.
  - Lockbox systems are used both for security purposes and to decrease the firm's net float.
  - If a firm speeds up its collections and slows down its disbursements, this will reduce its net float.

ANS: A                      PTS: 1                      DIF: MEDIUM      REF: 535  
OBJ: (18.2) Float      BLM: Higher Order

9. Which of the following is NOT likely to be a proper investment for temporarily idle cash?
- Treasury bills
  - commercial paper
  - recently issued long-term AAA corporate bonds

d. government bonds due within 1 year

ANS: C                      PTS: 1                      DIF: MEDIUM      REF: 537  
OBJ: (18.3) Short-term investment                      BLM: Higher Order

10. Which situation is NOT likely to lead a firm to hold marketable securities?
- The firm has replaced an obsolete machine with a new model; a large write-off must be taken on the old machine.
  - The firm must meet a known financial commitment, such as financing an ongoing construction project.
  - The firm must finance seasonal operations.
  - The firm has just sold long-term securities and has not yet invested the proceeds in earning assets.

ANS: A                      PTS: 1                      DIF: MEDIUM      REF: 537  
OBJ: (18.3) Marketable securities                      BLM: Higher Order

11. If the yield curve is upward sloping, then which type of marketable securities, assumed to be held for emergencies, should be held in a firm's portfolio?
- They should consist mainly of long-term securities because those pay higher rates.
  - They should consist mainly of short-term securities because those pay higher rates.
  - They should consist mainly of government securities to minimize interest rate risk.
  - They should consist mainly of short-term securities to minimize interest rate risk.

ANS: D                      PTS: 1                      DIF: MEDIUM      REF: 537  
OBJ: (18.3) Marketable securities                      BLM: Higher Order

12. Which items does a firm's credit policy consist of?
- credit period, cash discounts, credit standards, receivables monitoring
  - credit period, cash discounts, credit standards, collection policy
  - credit period, cash discounts, receivables monitoring, collection policy
  - cash discounts, credit standards, receivables monitoring, collection policy

ANS: B                      PTS: 1                      DIF: MEDIUM      REF: 538  
OBJ: (18.4) Credit policy                      BLM: Remember

13. Which of the following statements is NOT correct?
- Collection policy is how a firm goes about collecting past-due accounts.
  - A more aggressive collection policy will reduce bad debt expenses, but may also decrease sales.
  - Collection policy usually has little impact on sales since collecting past-due accounts occurs only after the customer has already purchased.
  - Typically, a firm will turn over an account to a collection agency only after it has tried several times on its own to collect the account.

ANS: C                      PTS: 1                      DIF: MEDIUM      REF: 538–539  
OBJ: (18.4) Collection policy                      BLM: Higher Order

14. Suppose a firm has seasonal sales and customers that all pay promptly at the end of 30 days. Which of the following statements is NOT correct?
- DSO will vary from month to month.
  - The quarterly uncollected balances schedule will be the same in each quarter.
  - The level of accounts receivable will be constant from month to month.
  - The ratio of accounts receivable to sales will vary from month to month.

ANS: C                      PTS: 1                      DIF: MEDIUM      REF: 539

OBJ: (18.4) Payments pattern approach BLM: Higher Order

15. Seligstine Inc.'s DSO was 31 days in March, and 45 days in April. Which of the following is the most likely?
- Sales increased from March to April.
  - Sales decreased from March to April.
  - May's quarterly uncollected balances schedule showed a higher percent of April's sales as uncollected than March's sales.
  - Some receivables were at least 45 days old.

ANS: D PTS: 1 DIF: MEDIUM REF: 541

OBJ: (18.4) Payments pattern approach BLM: Higher Order

16. Which of the following statements is correct?
- If credit sales as a percentage of a firm's total sales increases, and the volume of credit sales also increases, then the firm's accounts receivable will automatically increase.
  - It is possible for a firm to overstate profits by offering very lenient credit terms that encourage additional sales to financially weak firms. A major disadvantage of such a policy is that it is likely to increase uncollectible accounts.
  - Firms use seasonal dating primarily to decrease their DSO.
  - Seasonal dating with terms 2/15, net 30 days, with April 1 dating, means that if the original sale took place on February 1, the customer can take the discount up until March 15, but must pay the net invoice amount by April 1.

ANS: B PTS: 1 DIF: MEDIUM REF: 538–541

OBJ: (18.4) Credit policy and seasonal dating BLM: Higher Order

17. The DSO and the aging schedule are two common methods for monitoring receivables. When are they misleading?
- when customers' payments patterns are changing
  - when sales fluctuate seasonally
  - when some customers take the discount and others do not
  - when sales are relatively constant, both seasonally and cyclically

ANS: B PTS: 1 DIF: MEDIUM REF: 540–541

OBJ: (18.4) Monitoring receivables BLM: Higher Order

18. Which of the following is NOT commonly regarded as being a credit policy variable?
- credit period
  - collection policy
  - cash discounts
  - payments deferral period

ANS: D PTS: 1 DIF: MEDIUM REF: 538

OBJ: (18.4) Credit policy BLM: Remember

19. If easing a firm's credit policy lengthens the collection period and results in a worsening of the aging schedule, then why might a firm take this action?
- to slow down an unsustainable growth in sales
  - to meet competitive pressures
  - to increase the payments deferral period
  - to shorten the cash collection cycle

ANS: B PTS: 1 DIF: MEDIUM REF: 537

OBJ: (18.4) Credit policy BLM: Higher Order



20. Which statement best describes receivables management?
- A firm that makes 90% of its sales on credit and 10% for cash is growing at a constant rate of 10% annually. This firm will be able to keep its accounts receivable at the current level, since the 10% cash sales can be used to support the 10% growth rate.
  - In managing a firm's accounts receivable, it is possible to increase credit sales per day yet still keep accounts receivable fairly steady, provided the firm can shorten the length of its collection period (its DSO).
  - If a firm has a high percentage of accounts over 30 days old, this is a sure sign that the credit manager is not doing his or her job well.
  - Since receivables and payables both result from sales transactions, a firm with a high receivables-to-sales ratio must also have a high payables-to-sales ratio.

ANS: B                      PTS: 1                      DIF: MEDIUM      REF: 539–541  
OBJ: (18.4) Receivables management      BLM: Higher Order

21. Which statement best describes DSO and aging?
- If a firm's volume of credit sales declines, then its DSO must also decline.
  - If a firm changes its credit terms from 1/20, net 40, to 2/10, net 60, the impact on sales can't be determined because the increase in the discount is offset by the longer net terms, which tends to reduce sales.
  - The DSO of a firm with seasonal sales can vary. While the sales per day calculation is usually based on the total annual sales, the accounts receivable balance will be high or low depending on the season.
  - An aging schedule is used to determine what portion of customers pay cash and what portion buy on credit.

ANS: C                      PTS: 1                      DIF: MEDIUM      REF: 540–541  
OBJ: (18.4) DSO and aging schedule      BLM: Higher Order

22. Which statement best describes DSO?
- Other things held constant, the higher a firm's DSO, the better its credit department.
  - If a firm that sells on terms of net 30 changes its policy to 2/10, net 30, and if no change in sales volume occurs, then the firm's DSO will probably increase.
  - If a firm sells on terms of 2/10, net 30, and its DSO is 30 days, then its aging schedule would probably show some past due accounts.
  - DSO indicates the maximum number of days it takes a firm's customers to pay their bills.

ANS: C                      PTS: 1                      DIF: MEDIUM      REF: 540–541  
OBJ: (18.4) Days sales outstanding (DSO)      BLM: Higher Order

23. Which circumstance is NOT consistent with efficient inventory management?
- a high inventory turnover ratio
  - a low incidence of production schedule disruptions
  - a high total assets turnover
  - a high payable turnover ratio

ANS: D                      PTS: 1                      DIF: MEDIUM      REF: 544  
OBJ: (18.6) Inventory management      BLM: Higher Order

24. Which one of the following has nothing to do with inventory management?
- EOQ
  - JIT
  - FIFO
  - DSO

ANS: D                    PTS: 1                    DIF: MEDIUM            REF: 545–546  
OBJ: (18.7) Inventory management            BLM: Remember

25. Which of the following has to do with inventory management?
- economic ordering quantity
  - in the nick of time
  - few in, lots out
  - red-line

ANS: A                    PTS: 1                    DIF: MEDIUM            REF: 546  
OBJ: (18.7) Inventory management            BLM: Remember

26. Which circumstance would cause average inventory holdings to decrease, other things held constant?
- Fixed order costs double.
  - The purchase price of inventory items decreases by 50%.
  - The carrying price of an item decreases as a percentage of purchase price.
  - The sales forecast is revised downward by 10%.

ANS: D                    PTS: 1                    DIF: MEDIUM            REF: 548–549  
OBJ: (18.7) Average inventory                BLM: Higher Order

27. An increase in which variable will cause the economic ordering quantity to rise?
- product demand (sales)
  - current level of inventory
  - purchase price
  - carrying cost

ANS: A                    PTS: 1                    DIF: MEDIUM            REF: 548–549  
OBJ: (18.7) EOQ            BLM: Higher Order

28. Which of the following is true of the EOQ model? Note that the optimal order quantity,  $Q$ , will be called EOQ.
- If the fixed per order cost increases by 20%, then EOQ will increase by 20%.
  - If the annual sales, in units, increases by 20%, then EOQ will increase by 20%.
  - If the average inventory increases by 20%, then the total carrying costs will increase by 20%.
  - If the average inventory increases by 20% the total order costs will increase by 20%.

ANS: C                    PTS: 1                    DIF: MEDIUM            REF: 548–549  
OBJ: (18.7) EOQ model                        BLM: Higher Order

29. Suppose you have \$10,000 in your chequing account. You write a cheque for \$2,000 and deposit \$3,000. What is your disbursement float?
- \$2,000
  - \$3,000
  - \$7,000
  - \$8,000

ANS: A

The sum of cheques written by a firm that have not yet cleared the banking system is often called disbursement float. While the cheque is clearing, the company obtains the benefit of an extra of \$2,000 in the bank.

PTS: 1                    DIF: EASY                    REF: 535                    OBJ: (18.2) Disbursement float  
BLM: Remember

30. Suppose you have \$10,000 in your chequing account. You write a cheque for \$2,000 and deposit \$3,000. What is your collection float?
- a. -\$2,000
  - b. -\$3,000
  - c. -\$7,000
  - d. -\$8,000

ANS: B

\$3,000 is deposited. The minus sign associated with the collection float represents a cost to the firm resulting from the time delay to clear payment receipts through the banking system.

PTS: 1                    DIF: EASY                    REF: 535                    OBJ: (18.2) Collection float  
BLM: Remember

31. Suppose you have \$10,000 in your chequing account. You write a cheque for \$2,000 and deposit \$3,000. What is your net float?
- a. \$5,000
  - b. \$1,000
  - c. -\$1,000
  - d. -\$5,000

ANS: C

Net float = \$2,000 - \$3,000 = -\$1,000

PTS: 1                    DIF: EASY                    REF: 535                    OBJ: (18.2) Net float  
BLM: Remember

32. Bello Inc. had sales of \$2,500,000 per year (all credit), and its DSO was 35 days. What was its average amount of accounts receivable outstanding, based on a 365-day year?
- a. \$239,726
  - b. \$251,712
  - c. \$264,298
  - d. \$277,513

ANS: A

Sales: \$2,500,000                    DSO: 35

Receivables = Sales/365 × DSO = \$239,726

PTS: 1                    DIF: EASY                    REF: 539                    OBJ: (18.4) Accounts receivable balance                    BLM: Remember

33. Wintoki Company writes cheques averaging \$15,000 a day, and it takes 5 days for these cheques to clear. The firm also receives cheques in the amount of \$17,000 per day, and it takes 3 days for these cheques to be deposited and cleared. What is the firm's net float, in dollars?
- a. \$20,577
  - b. \$21,660
  - c. \$22,800
  - d. \$24,000

ANS: D

Cheques/day, written: \$15,000

Cheques/day, received: \$17,000

Days to clear cheques written: 5

Days to clear cheques recvd: 3

Positive disbursement float =  $\$15,000(5) = \$75,000$   
 Negative collections float =  $\$17,000(3) = \underline{\$51,000}$   
 Net float =  $\$75,000 - \$51,000 = \underline{\$24,000}$

PTS: 1                    DIF: MEDIUM      REF: 535                    OBJ: (18.2) Float  
 BLM: Remember

34. Martell-Webb Inc. sells to customers all over Canada, and payment cheques come in to its headquarters in Toronto. The firm's average accounts receivable balance is \$2.5 million, and they are financed by a bank loan at an 11% annual interest rate. The firm is considering a regional lockbox system to speed up collections, and it believes the lockboxes will reduce receivables by 20%. If the annual cost of the system is \$15,000, what would the estimated pre-tax net annual savings be if the firm implements the lockbox system?
- \$500,000
  - \$60,000
  - \$55,000
  - \$40,000

ANS: D

Calculate the net reduction in A/R:

Current A/R = \$2,500,000

New A/R with 20% reduction:  $\$2,500,000 - 0.20(\$2,500,000) = \$2,000,000$

Net reduction in A/R = \$500,000

Calculate the interest savings and net savings:

Interest savings =  $\$500,000(0.11) = \$55,000$ .

Net savings                    = Interest savings – Annual lockbox cost  
                                       =  $\$55,000 - \$15,000 = \$40,000$

PTS: 1                    DIF: MEDIUM      REF: 535                    OBJ: (18.2) Lockbox  
 BLM: Higher Order

35. Fogel's Pumps offers its customers credit terms of 2/10, net 30, while Larry's Pumps offers terms of 2/10, net 45 days. The aging schedules for the two companies' receivables are shown below:

Age of Account(Days)	Fogel's		Larry's	
	Value of Account	Percentage of Total Value	Value of Account	Percentage of Total Value
0–10	\$58,800	60%	\$ 73,500	50%
11–30	19,600	20	29,400	20
31–45	14,700	15	29,400	20
46–60	2,940	3	10,290	7
Over 60	<u>1,960</u>	<u>2</u>	<u>4,410</u>	<u>3</u>
Total receivables	<u>\$98,000</u>	<u>100%</u>	<u>\$147,000</u>	<u>100%</u>

Which company has the higher percentage of overdue accounts, and what is its percentage of overdue accounts?

- Larry's: 50% overdue
- Larry's: 40% overdue
- Fogel's: 30% overdue
- Fogel's: 20% overdue

ANS: D

Fogel's credit policy is 2/10, net 30 days, so customers' receivables are overdue after 30 days. The percentage of accounts overdue (after 30 days) is  $15\% + 3\% + 2\% = 20\%$ . Larry's credit policy is 2/10, net 45 days, so customers' receivables are overdue after 45 days. The percentage of accounts overdue (after 45 days) is  $7\% + 3\% = 10\%$ . Thus, Fogel has the greatest percentage of overdue accounts at 20%. (Note that you could also use the dollar amounts to develop the total percentage of overdue accounts, and you would arrive at the same answer.)

Alternative solution using dollar amounts of receivables:

$$\text{Fogel: } \frac{(\$14,700 + \$2,940 + \$1,960)}{\$98,000} = 20\%$$

$$\text{Larry: } \frac{(\$10,290 + \$4,410)}{\$147,000} = 10\%$$

PTS: 1                      DIF: MEDIUM              REF: 541

OBJ: (18.4) Aging schedule—nonalgorithmic

BLM: Higher Order

36. Suppose the Campus Bookstore purchases 50,000 boxes of writing tablets every year. Ordering costs are \$100 per order and carrying costs are \$0.40 per box. Moreover, management has determined that the EOQ is 5,000 boxes. The vendor now offers a quantity discount of \$0.20 per box if the company buys tablets in order sizes of 10,000 boxes. Determine the before-tax benefit or loss of accepting the quantity discount. (Assume the carrying cost remains at \$0.40 per box whether or not the discount is taken.)
- \$1,000 loss
  - \$1,000 benefit
  - \$ 500 loss
  - \$ 500 benefit

ANS: D

Total cost of ordering and carrying EOQ (5,000)

$$\frac{50,000(\$100)}{5,000} + \frac{5,000(\$0.40)}{2} = \$2,000.$$

Total cost of ordering and carrying 10,000

$$\frac{50,000(\$100)}{10,000} + \frac{10,000(\$0.40)}{2} = \$2,500.$$

Cost of increase = \$500

Savings from discount =  $\$0.20(50,000) = \$1,000$

Net benefit =  $\$1,000 - \$500 = \$500$

PTS: 1                      DIF: MEDIUM              REF: 547

OBJ: (18.7) Quantity discounts

BLM: Higher Order

37. Crystal Clear Company purchases 50,000 litres of distilled water each year. Ordering costs are \$100 per order, and the carrying cost, as a percentage of inventory value, is 80%. The purchase price to CCC is \$0.50 per litre. Management currently orders the EOQ each time an order is placed. No safety stock is carried. The supplier is now offering a quantity discount of \$0.03 per litre if CCC orders 10,000 litres at a time. Should CCC take the discount?
- No, the cost exceeds the benefit by \$500.
  - No, the cost exceeds the benefit by \$1,000.
  - Yes, the benefit exceeds the cost by \$500.
  - Yes, the benefit exceeds the cost by \$1,120.

ANS: D

$$EOQ = \sqrt{\frac{2(\$100)(50,000)}{0.8(0.50)}} = \sqrt{25,000,000} = 5,000$$

$$TC = (50,000/5,000)(\$100) + (10,000/2)(\$0.50)(0.80) \\ = \$1,000 + \$1,000 = \$2,000$$

If the firm orders 10,000 litres at a time,

$$TC = (50,000/10,000)(\$100) + (10,000/2)(\$0.47)(0.80) \\ = \$500 + \$1,880 = \$2,380$$

Therefore, costs increase by  $\$2,380 - \$2,000 = \$380$ .

The benefit is  $(\$0.03)(50,000) = \$1,500$ .

Thus, the benefit exceeds the cost by \$1,120.

PTS: 1                      DIF: MEDIUM                      REF: 547                      OBJ: (18.7) Quantity discounts  
BLM: Higher Order

38. Fullerton Wine Company is a retailer that sells vintage wines. The company has established a policy of reordering inventory every 30 days. A recently employed MBA has considered Fullerton's inventory problem from the EOQ model viewpoint. If the following constitute the relevant data, how does the current policy compare with the optimal policy?

Ordering cost = \$10 per order  
Carrying cost = 20% of purchase price  
Purchase price = \$10 per unit  
Total sales for year = 1,000 units  
Safety stock = 0

- Total costs will be the same, since the current policy is optimal.
- Total costs under the current policy will be less than total costs under the EOQ by \$10.
- Total costs under the current policy exceed those under the EOQ by \$3.
- Total costs under the current policy exceed those under the EOQ by \$10.

ANS: C

$$EOQ = \sqrt{\frac{2(\$10)(1,000)}{(0.2)(\$10)}} = 100 \text{ units.}$$

$$\text{Total cost}_{EOQ} = \frac{100(\$2)}{2} + \frac{1,000(\$10)}{100} = \$200$$

Units per order under current policy:

$$\frac{360 \text{ days}}{30 \text{ days}} = 12 \text{ orders; } \frac{1,000 \text{ units}}{12 \text{ orders}} = 83 \text{ units per order}$$

$$\text{Total cost}_{\text{Current policy}} = \frac{83(\$2)}{2} + \frac{1,000(\$10)}{83} = \$203$$

Thus,  $\text{Total cost}_{\text{Current policy}} - \text{Total cost}_{EOQ} = \$203 - \$200 = \$3$

Total costs of current policy exceed total costs of EOQ by \$3.00.

PTS: 1                      DIF: MEDIUM                      REF: 548-550                      OBJ: (18.7) Total inventory costs  
BLM: Higher Order

39. What would be the incremental bad debt losses if the change were made?  
a. \$315,000

- b. \$260,500
- c. -\$260,500 (bad debt losses would decline)
- d. -\$315,000 (bad debt losses would decline)

ANS: D

Bad debt losses old:  $(.05)(\$15,000,000) = \$750,000$

Bad debt losses new:  $(.03)(\$14,500,000) = \$435,000$

Change in bad debt losses =  $\$435,000 - \$750,000 = -\$315,000$

PTS: 1                    DIF: MEDIUM            REF: 542-544            OBJ: (18.5) Bad debt losses  
BLM: Higher Order

40. What would be the incremental cost of carrying receivables if this change were made?
- a. \$157,900
  - b. \$108,750
  - c. -\$116,250 (carrying costs would decline)
  - d. -\$225,000 (carrying costs would decline)

ANS: C

$DSO_0 = 60$  days;  $DSO_N = 30$  days. No discounts.

Calculate cost of carrying receivables at current and new sales levels:

Cost of carrying

receivable =  $DSO(\text{Sales}/\text{Day})(\text{Variable cost ratio})(\text{Cost of funds})$

Sales at \$15,000,000:  $60(\$15,000,000/360)(0.6)(0.15) = \$225,000$

Sales at \$14,500,000:  $30(\$14,500,000/360)(0.6)(0.15) = \$108,750$

Change =  $\$108,750 - \$225,000 = -\$116,250$

PTS: 1                    DIF: MEDIUM            REF: 543  
OBJ: (18.5) Cost of carrying receivables    BLM: Higher Order

41. What are the incremental pre-tax profits from this proposal?
- a. \$181,250
  - b. \$206,500
  - c. \$231,250
  - d. \$256,250

ANS: C

Analysis of policy change:

	Current Projections	Effect of Credit Policy Change	New Projections
Net sales	\$15,000,000	-\$500,000	\$14,500,000
Production costs	<u>9,000,000</u>	<u>+ 300,000</u>	<u>8,700,000</u>
Profit before credit costs	\$ 6,000,000	-\$200,000	\$ 5,800,000
Cost of carrying receivables	225,000	+ 116,250	108,750
Bad debt losses	<u>750,000</u>	<u>+ 315,000</u>	<u>435,000</u>
Pre-tax profits	<u>\$ 5,025,000</u>	<u>+\$231,250</u>	<u>\$ 5,256,250</u>

Change in incremental pre-tax profits = \$231,250

PTS: 1                    DIF: MEDIUM            REF: 542–544            OBJ: (18.5) Incremental profits  
BLM: Higher Order

**Scenario BC Prints**

BC Prints expects to have sales this year of \$15 million under its current credit policy. The present terms are net 30; the DSO is 60 days, and the bad debt loss percentage is 5%. Also, BC Prints' cost of capital is 15%, and its variable costs total 60% of sales. Since BC Prints wants to improve its profitability, a proposal has been made to offer a 2% discount for payment within 10 days; that is, change the credit terms to 2/10, net 30. The consultants predict that sales would increase by \$500,000 and that 50% of all customers would take the discount. The new DSO would be 30 days, and the bad debt loss percentage on all sales would fall to 4%.

42. Refer to Scenario BC Prints. What would be the cost to BC of the discounts taken?
- a. -\$108,750
  - b. \$116,750
  - c. \$155,000
  - d. \$225,000

ANS: C

No discounts with old policy; 2% discount with new policy (2/10, net 30).

$$\text{Discount} = \$15,500,000(0.5)(0.02) = \$155,000$$

PTS: 1                    DIF: EASY                    REF: 543                    OBJ: (18.5) Cash discounts  
BLM: Higher Order

43. Refer to Scenario BC Prints. What would be the incremental bad debt losses if the change were made?
- a. \$250,000
  - b. \$130,000
  - c. -\$130,000 (bad debt losses would decline)
  - d. -\$250,000 (bad debt losses would decline)

ANS: C

Bad debt losses old:  $(0.05)(\$15,000,000) = \$750,000$

Bad debt losses new:  $(0.04)(\$15,500,000) = \$620,000$

Changes in bad debt losses =  $\$620,000 - \$750,000 = -\$130,000$

PTS: 1                    DIF: EASY                    REF: 543                    OBJ: (18.5) Bad debt losses  
BLM: Higher Order

44. Refer to Scenario BC Prints. What would be the incremental cost of carrying receivables if the change were made?
- a. -\$108,750 (carrying costs would decline)
  - b. -\$225,000 (carrying costs would decline)
  - c. \$116,250
  - d. \$157,900

ANS: A

$DSO_0 = 60$  days;  $DSO_N = 30$  days

Cost of carrying

receivable =  $DSO(\text{Sales}/\text{Day})(\text{Variable cost ratio})(\text{Cost of funds})$

Sales at \$15,000,000:  $60(\$15,000,000/360)(0.6)(0.15) = \$225,000$

Sales at \$15,500,000:  $30(\$15,500,000/360)(0.6)(0.15) = \$116,250$

Change =  $\$116,250 - \$225,000 = -\$108,750$



PTS: 1                    DIF: MEDIUM      REF: 543  
 OBJ: (18.5) Cost of carrying receivables    BLM: Higher Order

45. Refer to Scenario BC Prints. What are the incremental pre-tax profits from this proposal?
- \$250,500
  - \$283,750
  - \$303,250
  - \$493,750

ANS: B  
 Analysis of policy change:

	<u>Current Projections</u>	<u>Effect of Credit Policy Change</u>	<u>New Projections</u>
Sales	\$15,000,000	+\$500,000	\$15,500,000
Discounts	<u>0</u>	<u>-155,000</u>	<u>155,000</u>
Net sales	\$15,000,000	+\$345,000	\$15,345,000
Production costs	<u>9,000,000</u>	<u>-300,000</u>	<u>9,300,000</u>
Profit before credit costs	\$ 6,000,000	+\$ 45,000	\$ 6,045,000
Cost of carrying receivables	225,000	+ 108,750	116,250
Bad debt losses	<u>750,000</u>	<u>+ 130,000</u>	<u>620,000</u>
Pre-tax profits	<u>\$ 5,025,000</u>	<u>+\$283,750</u>	<u>\$ 5,308,750</u>

Change in incremental pre-tax profits = +\$283,750

PTS: 1                    DIF: MEDIUM      REF: 542–544      OBJ: (18.5) Incremental profits  
 BLM: Higher Order

**Scenario Aberwald**

Aberwald Corporation expects to order 126,000 memory chips for inventory during the coming year, and it will use this inventory at a constant rate. Fixed ordering costs are \$200 per order, the purchase price per chip is \$25, and the firm's inventory carrying costs is equal to 20% of the purchase price. (Assume a 360-day year.)

46. Refer to Scenario Aberwald. What is the economic ordering quantity for chips?
- 3,175
  - 6,243
  - 12,088
  - 13,675

ANS: A

$$EOQ = \sqrt{\frac{2(\$200)(126,000)}{\$25(0.20)}} = 3,174.90 \approx 3,175$$

PTS: 1                    DIF: EASY              REF: 548              OBJ: (18.7) EOQ  
 BLM: Remember

47. Refer to Scenario Aberwald. If Aberwald holds a safety stock equal to a 30-day supply of chips, what is its average inventory level?
- 3,175
  - 12,088
  - 13,675

d. 15,750

ANS: B

$$\begin{aligned}\text{Average inventory level} &= (3,175/2) + \left(\frac{126,000}{360}\right) (30) \\ &= 1,587.50 + 10,500 = 12,087.50 \approx 12,088\end{aligned}$$

PTS: 1            DIF: EASY            REF: 550–551            OBJ: (18.7) Average inventory  
BLM: Remember

48. Refer to Scenario Aberwald. Assume that Aberwald holds a safety stock equal to a 30-day supply of chips. What is the maximum amount of inventory that Aberwald will have on hand at any time, i.e., what will be the inventory level right after a delivery is made?

- a. 3,175
- b. 6,243
- c. 9,216
- d. 13,675

ANS: D

$$\text{Maximum inventory level} = \text{EOQ} + \text{Safety stock} = 3,175 + 10,500 = 13,675$$

PTS: 1            DIF: EASY            REF: 550–551            OBJ: (18.7) Maximum inventory  
BLM: Higher Order

49. Refer to Scenario Aberwald. How many orders should Aberwald place during the year?

- a. 12
- b. 25
- c. 30
- d. 40

ANS: D

$$\text{Number of orders} = \frac{126,000}{3,175} = 39.69 \approx 40$$

PTS: 1            DIF: EASY            REF: 546            OBJ: (18.7) Orders per year  
BLM: Remember

50. Refer to Scenario Aberwald. If the lead time for placing an order is 5 days, and Aberwald holds a safety stock equal to a 30-day supply of chips, then at what inventory level should an order be placed?

- a. 15,570
- b. 13,675
- c. 12,250
- d. 3,175

ANS: C

$$\text{Reorder point} = \left(\frac{126,000}{360}\right) (5) + \left(\frac{126,000}{360}\right) (30) = 1,750 + 10,500 = 12,250$$

PTS: 1            DIF: MEDIUM            REF: 550–551            OBJ: (18.7) Ordering inventory  
BLM: Remember

51. Refer to Scenario Aberwald. If Aberwald holds a safety stock equal to a 30-day supply of chips, what is Aberwald's minimum cost of ordering and carrying inventory?

- a. \$15,950

- b. \$28,500
- c. \$34,220
- d. \$68,440

ANS: D

Average inventory is rounded to  $12,088 = \text{EOQ}/2 + (126,000/360)(30)$

Number of orders is rounded to  $40 = 126,000/3,175$

Total cost =  $40(\$200) + (\$12,088)(\$25)(0.20) = \$68,440$

PTS: 1                    DIF: MEDIUM            REF: 548–551            OBJ: (18.7) Total inventory costs  
BLM: Higher Order

### Scenario Fashion Clothiers

Assume that Fashion Clothiers Inc. uses 1,440,000 metres of material each year. Further, assume that Fashion can order the material at a cost of \$2 per metre, plus fixed ordering costs of \$100 per order. The firm's carrying cost is 20% of the inventory value, at cost.

52. Refer to Scenario Fashion Clothiers. What is the firm's EOQ?
- a. 13,563
  - b. 26,833
  - c. 30,040
  - d. 43,987

ANS: B

$$\text{EOQ} = \sqrt{\frac{2 (\$100) (1,440,000)}{\$2 (0.20)}} = 26,832.22 \approx 26,833$$

PTS: 1                    DIF: EASY                    REF: 548                    OBJ: (18.7) EOQ  
BLM: Remember

53. Refer to Scenario Fashion Clothiers. What is Fashion Clothiers' minimum costs of ordering and holding inventory?
- a. \$ 6,254
  - b. \$10,733
  - c. \$11,560
  - d. \$13,563

ANS: B

EOQ is rounded to 26,833, from previous question.

$$\begin{aligned} \text{Total cost} &= \left( \frac{26,833}{2} \right) (0.20) (\$2) + \left( \frac{1,440,000}{26,833} \right) (\$100) \\ &= \$5,366.60 + \$5,366.53 = \$10,733.13 \approx \$10,733 \end{aligned}$$

PTS: 1                    DIF: EASY                    REF: 547                    OBJ: (18.7) Total inventory costs  
BLM: Remember

54. Refer to Scenario Fashion Clothiers. Now, suppose the manufacturer offers a discount of 0.5% for orders of a least 40,000 metres. Should Fashion Clothiers increase its ordering quantity to take the discount?
- a. Yes; it will save \$827 if it takes the discount.
  - b. No; it will lose \$827 if it takes the discount.
  - c. Yes; it will save \$13,573 if it takes the discount.
  - d. No; it will lose \$13,573 if it takes the discount.

ANS: C

Total inventory cost with discount

$$\begin{aligned} &= \left( \frac{40,000}{2} \right) (0.20) (\$2 \times 0.995) + \left( \frac{1,440,000}{40,000} \right) (\$100) \\ &= \$7,960 + \$3,600 = \$11,560. \end{aligned}$$

$$\text{Incremental costs} = \$11,560 - \$10,733 = \$827$$

$$\text{Savings from discount} = (\$2)(0.005)(1,440,000) = \$14,400$$

$$\text{Net savings} = \$14,400 - \$827 = \$13,573$$

PTS: 1                      DIF: MEDIUM                      REF: 547

OBJ: (18.7) Quantity discounts

BLM: Higher Order





OBJ: (19.1) Option terms

BLM: Remember

2. Which of the following does NOT affect the value of an option, other things held constant?
- the strike price
  - the variability of the stock price
  - the option's time to maturity
  - the stock beta

ANS: D

PTS: 1

DIF: EASY

REF: 571

OBJ: (19.1) Option value

BLM: Remember

3. Call options on XYZ Corporation's common stock trade in the market. Which statement regarding XYZ Corporation's options is true, other things held constant?
- The price of these call options is likely to rise if XYZ's stock price rises.
  - The higher the strike price on XYZ's options, the higher the option's price will be.
  - Assuming the same strike price, an XYZ call option that expires in 1 month will sell at a higher price than one that expires in 3 months.
  - If XYZ's stock price stabilizes (becomes less volatile), then the price of its options will increase.

ANS: A

PTS: 1

DIF: EASY

REF: 564–566

OBJ: (19.1) Option concepts

BLM: Higher Order

4. GCC Corporation is planning to issue options to its key employees, and it is now discussing the terms to be set on those options. Which circumstance would decrease the value of the options, other things held constant?
- GCC's stock price becomes more risky (higher variance).
  - The exercise price of the option is increased.
  - The life of the option is increased, i.e., the time until it expires is lengthened.
  - The government takes actions that increase the risk-free rate.

ANS: B

PTS: 1

DIF: EASY

REF: 564–566

OBJ: (19.1) Option concepts

BLM: Higher Order

5. Which of the following statements is correct?
- Put options give investors the right to buy a stock at a certain strike price before a specified date.
  - Call options give investors the right to sell a stock at a certain strike price before a specified date.
  - LEAPS are very short-term options that were created relatively recently and now trade in the market.
  - An option holder is not entitled to receive dividends unless he or she exercises their option before the stock goes ex dividend.

ANS: D

PTS: 1

DIF: EASY

REF: 562–563

OBJ: (19.1) Miscellaneous option concepts

BLM: Higher Order

6. Which term refers to the type of options sold by an investor who writes standard call options against stock held in his or her portfolio?
- in-the-money
  - naked
  - covered
  - out-of-the-money

ANS: C

PTS: 1

DIF: MEDIUM

REF: 562

OBJ: (19.1) Options

BLM: Remember

7. Deeble Construction Co.'s stock is trading at \$30 a share. Call options on the company's stock are also available, some with a strike price of \$25 and some with a strike price of \$35. Both options expire in 3 months. Which statement regarding the value of these options is true?
- The options with the \$25 strike price will sell for less than the options with the \$35 strike price.
  - The options with the \$25 strike price have an exercise value greater than \$5.
  - The options with the \$35 strike price have an exercise value greater than \$0.
  - If Deeble's stock price rose by \$5, the exercise value of the options with the \$25 strike price would also increase by \$5.

ANS: D

PTS: 1

DIF: MEDIUM

REF: 562–566

OBJ: (19.1) Option value

BLM: Higher Order

8. Warner Motors' stock is trading at \$20 a share. Call options that expire in three months with a strike price of \$20 sell for \$1.50. What will happen if the stock price increases 10%, to \$22 a share?
- The price of the call option will increase by \$2.
  - The price of the call option will increase by less than \$2, and the percentage increase in price will be less than 10%.
  - The price of the call option will increase by less than \$2, but the percentage increase in price will be more than 10%.
  - The price of the call option will increase by more than \$2, but the percentage increase in price will be less than 10%.

ANS: C

PTS: 1

DIF: MEDIUM

REF: 565

OBJ: (19.1) Option value

BLM: Higher Order

9. Which of the following statements is correct?
- If the underlying stock does not pay a dividend, it does not make good economic sense to exercise a call option prior to its expiration date, even if this would yield an immediate profit.
  - Call options generally sell at a price greater than their exercise value, and the greater the exercise value, the higher the premium on the option is likely to be.
  - Call options generally sell at a price below their exercise value, and the greater the exercise value, the lower the premium on the option is likely to be.
  - Call options generally sell at a price below their exercise value, and the lower the exercise value, the lower the premium on the option is likely to be.

ANS: A

PTS: 1

DIF: MEDIUM

REF: 563–566 | 571 | 574

OBJ: (Comp: 19.1, 19.2, 19.3) Miscellaneous option concepts

BLM: Higher Order

10. Which of the following statements is correct?
- Call options generally sell at a price less than their exercise value.
  - If a stock becomes riskier (more volatile), call options on the stock are likely to decline in value.
  - Call options generally sell at prices above their exercise value, but for an in-the-money option, the greater the exercise value in relation to the strike price, the lower the premium on the option is likely to be.
  - Because of the put-call parity relationship, under equilibrium conditions, a put option on a stock must sell at exactly the same price as a call option on the stock.

ANS: C

(c) is correct. See Figure 19-1 and the related discussion.



PTS: 1                    DIF: MEDIUM            REF: 564 | 571 | 574

OBJ: (Comp: 19.1, 19.2, 19.3) Miscellaneous option concepts    BLM: Higher Order

11. Which of the following statements best describes options?
- An option's value is determined by its exercise value, which is the market price of the stock less its striking price. Thus, an option can't sell for more than its exercise value.
  - As the stock's price rises, the time value portion of an option on a stock increases because the difference between the price of the stock and the fixed strike price increases.
  - The market value of an option depends in part on the option's time to maturity and also on the variability of the underlying stock's price.
  - The potential loss on an option decreases as the option sells at higher and higher prices because the profit margin gets bigger.

ANS: C

PTS: 1

DIF: HARD

REF: 564–566

OBJ: (19.1) Options

BLM: Higher Order

12. Suppose you believe that Johnson Company's stock price is going to increase from its current level of \$22.50 sometime during the next 5 months. For \$310.25 you can buy a 5-month call option giving you the right to buy 100 shares at a price of \$25 per share. If you buy this option for \$310.25 and Johnson's stock price actually rises to \$45, what would your pre-tax net profit be?
- \$310.25
  - \$1,689.75
  - \$1,774.24
  - \$1,862.95

ANS: B

The call option will be exercised only if the final price is above the strike price. If the final price is below the strike price, there will simply be a loss equal to the cost of the option.

Strike price: \$25.00      No. of options: 100

Final price: \$45.00      Option cost: \$310.25

Profit per share = Final price – Strike price = \$45 – \$25 or zero: \$20.00

Total profit = Profit/option × No. of options – Cost of options = \$1,689.75

PTS: 1

DIF: EASY

REF: 565

OBJ: (19.1) Call options

BLM: Higher Order

13. Suppose you believe that Delva Corporation's stock price is going to decline from its current level of \$82.50 sometime during the next 5 months. For \$510.25 you could buy a 5-month put option giving you the right to sell 100 shares at a price of \$85 per share. If you bought this option for \$510.25 and Delva's stock price actually dropped to \$60, what would your pre-tax net profit be?
- \$510.25
  - \$1,989.75
  - \$2,089.24
  - \$2,193.70

ANS: B

The put option will be exercised only if the final price is below the strike price. If the final price exceeds the strike price, there will simply be a loss equal to the cost of the option.

Strike price: \$85.00      No. of options: 100

Final price: \$60.00      Option cost: \$510.25

Profit per share = Strike price – Final price = \$85 – \$60 or zero: \$25.00

Total profit = Profit/option × No. of options – Cost of options = \$1,989.75

PTS: 1                    DIF: EASY                    REF: 562                    OBJ: (19.1) Put options  
BLM: Higher Order

14. The current price of a stock is \$22, and at the end of 1 year its price will be either \$27 or \$17. The annual risk-free rate is 6.0%, based on daily compounding. A 1-year call option on the stock, with an exercise price of \$22, is available. Based on the binominal model, what is the option's value?
- \$2.43
  - \$2.70
  - \$2.99
  - \$3.29

ANS: C

Current price	\$22.00	Price at end of year:	
Exercise price	\$22.00	High	\$27.00
$r_{RF}$	6.00%	Low	\$17.00

Step 1.                    Payoff range, stock: \$27.00 – \$17.00 =                    \$10.00

Step 2.                    Payoff range, option:

If stock is high:	Price – Exercise = 27 – 22 =	\$ 5.00
If stock is low:	(Price – Exercise) or \$0 =	<u>0.00</u>
Option range:	\$5 – \$0 =	<u>\$ 5.00</u>

Step 3.                    Equalize the ranges to find the number of shares of stock:  
Option range/Stock range = \$5/\$10 = shares of stock =                    0.5

Step 4.	The payoff from 0.5 shares of stock will be either:	\$13.50	or	\$ 8.50
	The payoff from the option will be either:	<u>5.00</u>	or	<u>0.00</u>
	The portfolio's payoff will be either:	<u>\$ 8.50</u>	or	<u>\$ 8.50</u>

So the portfolio's payoff is riskless, \$8.50 regardless of which choice materializes.

Step 5. The present value of \$8.50 at the daily compounded risk-free rate is:  
 $PV = \$8.50 / (1 + (0.06/365))^{365} = \$8.005$ .

Step 6. The option price is the cost of the stock purchased for the portfolio minus the PV of the payoff:  
 $V = 0.5(\$22) - \$8.01 = \$2.99$

PTS: 1                    DIF: MEDIUM                    REF: 567–569  
OBJ: (19.2) Option price based on binomial model                    BLM: Higher Order

15. The current price of a stock is \$50, the annual risk-free rate is 6%, and a 1-year call option with a strike price of \$55 sells for \$7.20. What is the value of a put option, assuming the same strike price and expiration date as for the call option?
- \$7.71
  - \$8.12
  - \$8.55
  - \$9.00

ANS: D

Stock price:	\$50.00
Strike price:	\$55.00
Call option price:	\$7.20
Risk-free rate:	6.0%

$$\begin{aligned}
\text{Value of put} &= \text{Value of call} - \text{Stock price} + (\text{Exercise price} \times e^{-rt}) \\
&= \$7.20 - \$50.00 + \$55 \times e^{-rt} \\
&= \$7.20 - \$50.00 + \$51.80 \\
&= \$9.00
\end{aligned}$$

PTS: 1                      DIF: MEDIUM                      REF: 574                      OBJ: (19.3) Put-call parity  
BLM: Higher Order

16. An analyst wants to use the Black-Scholes model to value call options on the stock of Ledbetter Inc. based on the following data:

- The price of the stock is \$40.
- The strike price of the option is \$40.
- The option matures in 3 months ( $t = 0.25$ ).
- The standard deviation of the stock's returns is 0.40, and the variance is 0.16.
- The risk-free rate is 6%.

Given this information, the analyst then calculated the following necessary components of the Black-Scholes model:

- $d_1 = 0.175$
- $d_2 = -0.025$
- $N(d_1) = 0.56946$
- $N(d_2) = 0.49003$

$N(d_1)$  and  $N(d_2)$  represent areas under a standard normal distribution function. What is the value of the call option?

- \$2.81
- \$3.12
- \$3.47
- \$3.82

ANS: C

Stock price:	\$40.00	$N(d_1) = 0.56946$
Strike price:	\$40.00	$N(d_2) = 0.49003$
Option maturity:	0.25	
Variance of stock returns:	0.16	
Risk-free rate:	6.0%	

The Black-Scholes model calculates the value of the call option as

$$\begin{aligned}
V &= P[N(d_1)] - Xe^{-rt}[N(d_2)] \\
&= \$40(0.56946) - \$40e^{-rt}(0.49003) \\
&= \$22.78 - \$19.31 \\
&= \$3.47
\end{aligned}$$

PTS: 1                      DIF: HARD                      REF: 571                      OBJ: (19.3) Black-Scholes model  
BLM: Higher Order

## CHAPTER 20—DECISION TREES, REAL OPTIONS, AND OTHER CAPITAL BUDGETING TOPICS

### TRUE/FALSE

1. Real options exist when managers have the opportunity, after a project has been implemented, to make operating changes in response to changed conditions that modify the project's cash flows.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 581  
OBJ: (20.1) Real options

2. Real options are options to buy real assets, such as stocks, rather than interest-bearing assets, such as bonds.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 582  
OBJ: (20.1) Real options

3. The option to abandon a project is a real option, but a call option on a stock is not a real option.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 581–582  
OBJ: (20.1) Real options

4. Real options are most valuable when the underlying source of risk is very low.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 582  
OBJ: (20.2) Real options

5. Real options affect the size, but not the risk, of a project's expected cash flows.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 582–583  
OBJ: (20.2) Real options

### MULTIPLE CHOICE

1. Commodore Corporation is deciding whether to invest in a project today or to postpone the decision until next year. The project has a positive expected NPV, but its cash flows could be less than expected, in which case the NPV could be negative. No competitors are likely to invest in a similar project if Commodore decides to wait. Which of the following issues should Commodore consider most seriously when making this investment decision?
- The more uncertainty about the future cash flows, the more logical it is for Commodore to go ahead with this project today.
  - Since the project has a positive expected NPV today, this means that its expected NPV will be even higher if it chooses to wait a year.
  - Since the project has a positive expected NPV today, this means that it should be accepted in order to lock in that NPV.
  - Waiting would probably reduce the project's risk.

ANS: D

By having the ability to wait and see, you reduce the risk of the project. The greater the uncertainty, the more value there is in waiting for additional information before going on with a project. The correct choice is (d), (a) is false. Statements (b) and (c) are not necessarily true due to their expected positive NPVs, which still have uncertainty.

PTS: 1                    DIF: EASY                    REF: 582–583  
OBJ: (20.2) Investment timing option                    BLM: Higher Order

2. Which one of the following is an example of a flexibility option?
- A company has an option to invest in a project today or to wait a year.
  - A company has an option to close down an operation if it turns out to be unprofitable.
  - A company agrees to pay more to build a plant in order to be able to change the plant's inputs and/or outputs at a later date if conditions change.
  - A company invests in a project today to gain knowledge that may enable it to expand into different markets at a later date.

ANS: C

Statements (a), (b), (c), and (d) are all examples of different types of real options. A flexibility option permits the firm to alter operations depending on how conditions change during the life of the project. Typically, either inputs or outputs, or both, can be changed. (a) is an example of an investment timing option, while (b) is an example of an abandonment option. (c) is an example of a flexibility option, and (d) is an example of a growth option. Therefore, (c) is the correct choice.

PTS: 1                    DIF: EASY                    REF: 582 | 591  
OBJ: (Comp: 20.1–20.4) Real options                    BLM: Higher Order

3. Which of the following is NOT a real option?
- the option to expand production if the product is successful
  - the option to buy shares of stock if its price goes up
  - the option to expand into a new geographic region
  - the option to switch the type of fuel used in an industrial furnace

ANS: B                    PTS: 1                    DIF: MEDIUM                    REF: 582  
OBJ: (20.1) Real options                    BLM: Higher Order

4. Which circumstance will NOT increase the value of a real option?
- lengthening the time in which a real option must be exercised
  - an increase in the volatility of the underlying source of risk
  - an increase in the risk-free rate
  - an increase in the cost of obtaining the real option

ANS: D                    PTS: 1                    DIF: MEDIUM                    REF: 583  
OBJ: (20.2) Real options                    BLM: Higher Order

5. Which of the following best describes real options?
- Real options change the size, but not the risk, of projects' expected cash flows.
  - Real options change the risk, but not the size, of projects' expected cash flows.
  - Real options are likely to reduce the cost of capital that should be used to discount a project's expected cash flows.
  - Very few projects actually have real options.

ANS: C                    PTS: 1                    DIF: MEDIUM                    REF: 583  
OBJ: (20.2) Real options                    BLM: Higher Order

6. Lighthouse Corporation uses the NPV method for selecting projects, and it does a reasonably good job of estimating projects' sales and costs. However, it never considers real options that might be associated with projects. Which of the following statements is most likely to describe its situation?
- Its estimated capital budget is probably too small, because projects' NPVs are often larger when real options are taken into account.

- b. Its estimated capital budget is probably too large due to its failure to consider abandonment and growth options.
- c. Failing to consider abandonment and flexibility options probably makes the optimal capital budget too large, but failing to consider growth and timing options probably makes the optimal capital budget too small, so it is unclear what impact not considering real options has on the overall capital budget.
- d. Failing to consider abandonment and flexibility options probably makes the optimal capital budget too small, but failing to consider growth and timing options probably makes the optimal capital budget too large, so it is unclear what impact not considering real options has on the overall capital budget.

ANS: A

By failing to consider real options, the firm's capital budget would probably be too small. The firm might well reject projects that would be seen to have positive expected NPVs if real options had been considered. Therefore, the correct choice is (a).

PTS: 1                      DIF: MEDIUM      REF: 597                      OBJ: (20.4) Real options  
BLM: Higher Order

7. Texas Wildcatters Inc. (TWI) is in the business of finding and developing oil properties and then selling the successful ones to major oil refining companies. TWI is now considering a new potential field, and its geologists have developed the following data, in thousands of dollars.

t = 0. A \$400 feasibility study would be conducted at  $t = 0$ . The results of this study would determine if the company should commence drilling operations or make no further investment and abandon the project.

t = 1. If the feasibility study indicates good potential, the firm would spend \$1,000 at  $t = 1$  to drill exploratory wells. The best estimate is that there is an 80% probability that the exploratory wells would indicate good potential and thus that further work would be done, and a 20% probability that the outlook would look bad and the project would be abandoned.

t = 2. If the exploratory wells test positive, TWI would go ahead and spend \$10,000 to obtain an accurate estimate of the amount of oil in the field at  $t = 2$ . The best estimate now is that there is a 60% probability that the results would be very good and a 40% probability that results would be poor and the field would be abandoned.

t = 3. If the full drilling program is carried out, there is a 50% probability of finding a lot of oil and receiving a \$25,000 cash inflow at  $t = 3$ , and a 50% probability of finding less oil and then receiving only a \$10,000 inflow.

Since the project is considered to be quite risky, a 20% cost of capital is used. What is the project's expected NPV, in thousands of dollars?

- a. \$336.15
- b. \$373.50
- c. \$415.00
- d. \$461.11

ANS: D

Cost of capital: 20%

Invest this period:	Invest this period:	Invest this period:	CF this period:	Possible NPVs*	Joint Prob.**	Product	
0	1	2	3				
				\$25,000	6,289.81	24%	\$1,509.56
				\$10,000	-2,390.74	24%	-\$573.78
				\$0	-1,233.33	32%	-\$394.67
				\$0	-400.00	20%	-\$80.00
				Expected NPV = <b>\$461.11</b>			

\*Here are the cash flows of the four potential outcomes. Find the potential outcomes' NPVs as the PVs of these cash flows, discounted at the 20% cost of capital:

	0	1	2	3	NPV
NPV-1 =	-\$400	-\$1,000	-\$10,000	\$25,000	\$6,289.81
NPV-2 =	-\$400	-\$1,000	-\$10,000	\$10,000	-\$2,390.74
NPV-3 =	-\$400	-\$1,000	\$0	\$0	-\$1,233.33
NPV-4 =	-\$400	\$0	\$0	\$0	-\$400.00

\*\*Joint probabilities: Probs 1 and 2 =  $0.8 \times 0.6 \times 0.5 = 0.24$ ; Prob 3 =  $0.8 \times 0.4 = 0.32$ ; Prob 4 = 0.2.

PTS: 1 DIF: MEDIUM REF: 592-595

OBJ: (20.3) Decision tree: expected NPV

BLM: Higher Order

8. In the previous problem you were asked to find the expected NPV of a project TWI is considering. Use the same data to calculate the project's coefficient of variation. (Hint: Use the expected NPV as found in Question 7.)
- 5.87
  - 6.52
  - 7.25
  - 8.77

ANS: C

The CV = SD/Expected NPV. Students can use the expected NPV as found in Question 7.

Prob.	NPV	NPV <sub>i</sub> - E(NPV)	Squared deviation	Squared dev. times probability
0.24	\$6,289.81	\$5,829	\$33,973,787	\$8,153,709
0.24	-\$2,390.74	-\$2,852	\$8,133,059	\$1,951,934
0.32	-\$1,233.33	-\$1,694	\$2,871,142	\$918,765
<u>0.20</u>	<u>-\$400.00</u>	<u>-\$861</u>	<u>\$741,512</u>	<u>\$148,302</u>
<u>1.00</u>	<u>\$461.11</u>			
			Variance	<u>\$11,172,711</u>
			Standard deviation	\$3,342.56
			CV	7.25

PTS: 1 DIF: MEDIUM REF: 592-595

OBJ: (20.3) Decision tree: SD and CV

BLM: Higher Order

9. Nebraska Pharmaceuticals Company (NPC) is considering a project that has an up-front cost at  $t = 0$  of \$1,500. (All dollars in this problem are in thousands.) The project's subsequent cash flows are critically dependent on whether a competitor's product is approved by Health Canada. If Health Canada rejects the competitive product, NPC's product will have high sales and cash flows, but if the competitive product is approved, that will negatively impact NPC. There is a 75% chance that the competitive product will be rejected, in which case NPC's expected cash flows will be \$500 at the end of each of the next seven years ( $t = 1$  to 7). There is a 25% chance that the competitor's product will be approved, in which case the expected cash flows will be only \$25 at the end of each of the next seven years ( $t = 1$  to 7). NPC will know for sure 1 year from today whether the competitor's product has been approved.

NPC is considering whether to make the investment today or to wait a year to find out Health Canada's decision. If it waits a year, the project's up-front cost at  $t = 1$  will remain at \$1,500, the subsequent cash flows will remain at \$500 per year if the competitor's product is rejected and \$25 per year if the alternative product is approved. However, if NPC decides to wait, the subsequent cash flows will be received only for six years ( $t = 2 \dots 7$ ).

Assuming that all cash flows are discounted at 10%, if NPC chooses to wait a year before proceeding, how much will this increase or decrease the project's expected NPV in today's dollars (i.e., at  $t = 0$ ), relative to the NPV if it proceeds today?

- \$77.23
- \$85.81
- \$95.34
- \$105.94

ANS: D

Cost of capital: 10%

Invest immediately.

	0	1	2	3	4	5	6	7	NPV *	Product: NPV × Prob
75% Good		\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$934.21	\$700.66
		↙								
25% Bad		\$25	\$25	\$25	\$25	\$25	\$25	\$25	-\$1,378.29	-\$344.57
		↘								
									Expected NPV if Go Now:	\$356.08

Delay, then invest in period 1 if the outlook is good:

	0	1	2	3	4	5	6	7	NPV *	Product: NPV × Prob
75% Good			\$500	\$500	\$500	\$500	\$500	\$500	\$616.03	\$462.02
		↙								
25% Bad			\$0	\$0	\$0	\$0	\$0	\$0	\$0.00	\$0.00
		↘								
									Expected NPV if Wait:	\$462.02

Increase in expected NPV from waiting: NPV Wait – NPV Go Now = **\$105.94**

\*The NPV under the delay option occurs one year later, so it must be discounted back to  $t = 0$  at the cost of capital to make the NPVs comparable. The figure shown in the delay tree is after discounting.

PTS: 1

DIF: MEDIUM REF: 584–546

OBJ: (20.2) Investment timing option, decision trees

BLM: Higher Order

10. In the previous problem you found the benefit from delaying an investment decision. Now use the same data to calculate the effect of waiting on the project's risk. By how much will delaying reduce the project's coefficient of variation? (Hint: Use the expected NPV as found in Question 9.)
- 2.23



- b. 2.46
- c. 2.70
- d. 2.97

ANS: A

The CV = SD/Expected NPV. Students can use the Expected NPV as found in Question 9.

Invest immediately:

Prob.	NPV	NPV <sub>i</sub> – E(NPV)	Squared deviation	Squared dev. times probability
0.75	\$934.21	\$578	\$334,228	\$250,671
0.25	–\$1,378.29	–\$1,734	\$3,008,054	\$752,013
<u>1.00</u>	<u>\$356.08</u>			<u>\$1,002,685</u>
			Variance	\$1,001.34
			Standard deviation	2.81
			CV	

Delay, then invest in period 1 if the outlook is good:

Prob.	NPV	NPV <sub>i</sub> – E(NPV)	Squared deviation	Squared dev. times probability
0.75	\$616.03	\$154	\$23,718	\$17,789
0.25	\$0.00	–\$462	\$213,463	\$53,366
<u>1.00</u>	<u>=\$462.02</u>			<u>\$71,154</u>
			Variance	\$266.75
			Standard deviation	0.58
			CV	

Reduction in the CV due to waiting 2.23

Note that the problem implicitly assumes that the project is riskless if it is delayed. This is, of course, unrealistic. Note also that a lower cost of capital should be used to find the NPV of the “Go Now” decision than the “Wait” decision. The appropriate cost of capital is often lowered by the existence of real options.

PTS: 1 DIF: MEDIUM REF: 584–586

OBJ: (20.3) Timing option, effect of delay on CV

BLM: Higher Order

### Scenario Diplomat

Diplomat.com is considering a project that has an up-front cost of \$3 million and is expected to produce a cash flow of \$500,000 at the end of each of the next 5 years. The project’s cost of capital is 10%.

11. Refer to Scenario Diplomat. Based on the above data, what is the project’s net present value?
- a. –\$1,312,456
  - b. –\$1,104,607
  - c. –\$875,203
  - d. \$105,999

ANS: B

Find the project’s NPV using a financial calculator and entering the following data inputs: CF<sub>0</sub> = –3,000,000; CF<sub>1–5</sub> = 500,000; I/YR = 10; and then solve for NPV = –\$1,104,607.

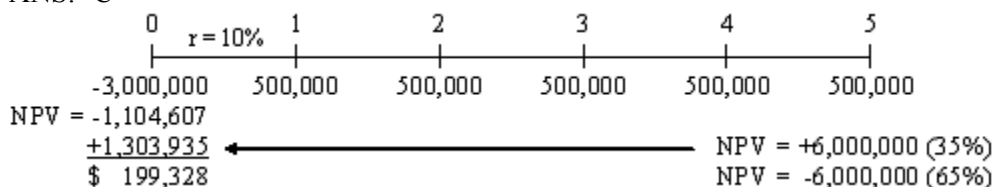
PTS: 1 DIF: EASY REF: 591

OBJ: (20.3) Project NPV—nonalgorithmic

BLM: Higher Order

12. Refer to Scenario Diplomat. If Diplomat.com goes ahead with this project today, it will obtain knowledge that will give rise to additional opportunities 5 years from now (at  $t = 5$ ). The company can decide at  $t = 5$  whether or not it wants to pursue these additional opportunities. Based on the best information available today, there is a 35% probability that the outlook will be favourable, in which case the future investment opportunity will have a net present value of \$6 million at  $t = 5$ . There is a 65% probability that the outlook will be unfavourable, in which case the future investment opportunity will have a net present value of  $-\$6$  million at  $t = 5$ . Diplomat.com does not have to decide today whether it wants to pursue the additional opportunity. Instead, it can wait to see what the outlook is. However, the company cannot pursue the future opportunity unless it makes the \$3 million investment today. What is the estimated net present value of the project, after consideration of the potential future opportunity?
- $-\$1,104,607$
  - $-\$875,203$
  - $\$199,328$
  - $\$561,947$

ANS: C



Step 1: Find the NPV at  $t = 0$  of the first project:

Enter the following data inputs in the financial calculator:

$CF_0 = -3,000,000$ ;  $CF_{1-5} = 500,000$ ;  $I/YR = 10$ ; and then solve for  $NPV = -\$1,104,607$ .

Step 2: Find the NPV at  $t = 0$  of the new projects:

If at  $t = 5$  the firm's technology is not successful, the firm will choose not to do the additional projects (since their NPV is  $-\$6,000,000$ ). Therefore, the NPV at  $t = 5$  is calculated as  $0.35(\$6,000,000) + 0.65(\$0) = \$2,100,000$ .

However, this is the NPV at  $t = 5$ , so we need to discount this NPV to find the NPV of the additional projects today. Enter the following data inputs in the financial calculator:

$N = 5$ ;  $I/YR = 10$ ;  $PMT = 0$ ;  $FV = 2,100,000$ ; and then solve for  $PV = \$1,303,935$ .

Step 3: Find the NPV of the entire project considering its future opportunities:

$-\$1,104,607 + \$1,303,935 = \$199,328$

PTS: 1 DIF: MEDIUM REF: 592-595

OBJ: (20.3) Growth option—nonalgorithmic

BLM: Higher Order

### Scenario Oklahoma

Oklahoma Instruments (OI) is considering a project called F-200 that has an up-front cost of \$250,000. The project's subsequent cash flows are critically dependent on whether another of its products, F-100, becomes an industry standard. There is a 50% chance that the F-100 will become the industry standard, in which case the F-200's expected cash flows will be \$110,000 at the end of each of the next 5 years. There is a 50% chance that the F-100 will not become the industry standard, in which case the F-200's expected cash flows will be \$25,000 at the end of each of the next 5 years. Assume that the cost of capital is 12%.

13. Refer to Scenario Oklahoma. Based on the above information, what is the F-200's expected net present value?
- \$6,678
  - \$3,251
  - \$15,303
  - \$20,004

ANS: A

Step 1: Find the project's expected cash flows in Years 1 through 5:  $(0.5)(\$110,000) + (0.5)(\$25,000) = \$67,500$ .

Step 2: Find the project's NPV by entering the following data inputs in the financial calculator:

$CF_0 = -250,000$ ;  $CF_{1-5} = 67,500$ ;  $I/YR = 12$ ; and then solve for  $NPV = -\$6,678$ .

PTS: 1

DIF: EASY

REF: 591

OBJ: (20.3) Project NPV—nonalgorithmic

BLM:

Higher Order

14. Refer to Scenario Oklahoma. Now assume that 1 year from now OI will know if the F-100 has become the industry standard. Also assume that after receiving the cash flows at  $t = 1$ , OI has the option to abandon the project, in which case it will receive an additional \$100,000 at  $t = 1$  but no cash flows after  $t = 1$ . Assuming that the cost of capital remains at 12%, what is the estimated value of the abandonment option?
- \$2,075
  - \$4,067
  - \$8,945
  - \$10,745

ANS: D

No abandonment:

<u>Yr. 0</u>		1	2	3	4	5	Prob	NPV	Prob × NPV
-250,000	0.5	110,000	110,000	110,000	110,000	110,000	0.5	\$146,525	\$73,263
	0.5	25,000	25,000	25,000	25,000	25,000	0.5	159,881	-79,941
									$E(NPV) = \underline{\$ -6,678}$

Abandonment:

<u>Yr. 0</u>		1	2	3	4	5	Prob	NPV	Prob × NPV
-250,000	0.5	110,000	110,000	110,000	110,000	110,000	0.5	\$146,525	\$73,263
	0.5	125,000					0.5	-138,393	-69,196
									$E(NPV) = \underline{\$ 4,067}$

Value of Abandonment =  $\$4,067 - (-\$6,678) = \underline{\$10,745}$

PTS: 1

DIF: MEDIUM

REF: 592-595

OBJ: (20.3) Abandonment option—nonalgorithmic

BLM: Higher Order

## CHAPTER 21—DERIVATIVES AND RISK MANAGEMENT

### TRUE/FALSE

1. One objective of risk management can be to reduce the volatility of a firm's cash flows.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 605  
OBJ: (21.1) Risk management

2. Interest rate swaps allow a firm to exchange fixed for floating-rate payments, but a swap cannot reduce actual net interest expenses.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 611–612  
OBJ: (21.4) Swaps

3. Speculative risks are symmetrical in the sense that they offer the chance of a gain as well as a loss, while pure risks are those that can lead only to losses.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 614  
OBJ: (21.5) Speculative versus pure risk

4. An option is a definite agreement leading to a firm completion of the transaction.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 618  
OBJ: (21.6) Risk management

5. The two basic types of hedges involving the futures market are long hedges and short hedges, where the words “long” and “short” refer to the maturity of the hedging instrument. For example, a long hedge might use Treasury bonds, while a short hedge might use 3-month T-bills.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 619  
OBJ: (21.6) Futures market hedging

### MULTIPLE CHOICE

1. Which of the following are NOT ways risk management can be used to increase the value of a firm?
- Risk management can help a firm maintain its optimal capital budget.
  - Risk management can reduce the expected costs of financial distress.
  - Risk management can help firms minimize taxes.
  - Risk management can allow managers to defer receipt of their bonuses and thus postpone tax payments.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 606  
OBJ: (21.1) Risk management                      BLM: Remember

2. Which of the following statements is NOT a reason for companies to actively manage risks?
- Firms generally have lower transactions costs due to a larger volume of hedging activities.
  - Nowadays most investors hold well-diversified portfolios.
  - Managers know more about the firm's risk exposure than outside investors due to asymmetric information.
  - Firms are more likely to have specialized skills and knowledge required for effective risk management.

ANS: B                      PTS: 1                      DIF: EASY                      REF: 604 | 606  
OBJ: (21.1) Reasons to manage risk                      BLM: Remember

3. A swap is a method used to reduce financial risk. Which statement about swaps is NOT correct?
- A swap involves the exchange of cash payment obligations.
  - The earliest swaps were currency swaps, in which companies traded debt denominated in different currencies, say, dollars and pounds.
  - Swaps are very often arranged by a financial intermediary, which may or may not take the position of one of the counterparties.
  - A problem with swaps is the short maturities, which has prevented the development of a secondary market.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 611–613  
OBJ: (21.4) Swaps                      BLM: Higher Order

4. Which statement best describes forward and/or futures contracts?
- One advantage of forward contracts is that they are default free.
  - Futures contracts generally trade on an organized exchange and are marked to market daily.
  - Goods are never delivered under forward contracts, but are almost always delivered under futures contracts.
  - While futures contracts can be constructed to accommodate both parties, forward contracts are standardized.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 610  
OBJ: (21.4) Forwards vs. futures                      BLM: Higher Order

5. A commercial bank recognizes that its net income suffers whenever interest rates increase. Which strategy would protect the bank against rising interest rates?
- buying inverse floaters
  - entering into an interest rate swap where the bank receives a fixed payment stream, and in return agrees to make payments that float with market interest rates
  - entering into a short hedge where the bank agrees to sell interest rate futures
  - selling some of the bank's floating-rate loans and using the proceeds to make fixed-rate loans

ANS: C

Given its interest rate exposure, the bank needs a strategy that is profitable whenever interest rates rise. If designed correctly, the profits from this strategy can partially or, in some cases, completely offset the losses the bank realizes from its basic operations whenever rates rise. Of the four strategies, only the short hedge is profitable when rates rise; all the other strategies would make sense if the bank were looking for extra profits when rates dropped.

PTS: 1                      DIF: MEDIUM                      REF: 617–618                      OBJ: (21.6) Hedging  
BLM: Higher Order

6. Company A can issue floating-rate debt at LIBOR + 1%, and it can issue fixed rate debt at 9%. Company B can issue floating-rate debt at LIBOR + 1.5%, and it can issue fixed-rate debt at 9.4%. Suppose A issues floating-rate debt and B issues fixed-rate debt, after which they engage in the following swap: A will make a fixed 7.95% payment to B, and B will make a floating-rate payment equal to LIBOR to A. What are the resulting net payments of A and B?
- A pays a fixed rate of 9%; B pays LIBOR + 1.5%.
  - A pays a fixed rate of 8.95%; B pays LIBOR + 1.45%.
  - A pays LIBOR plus 1%; B pays a fixed rate of 9.4%.

d. A pays a fixed rate of 7.95%; B pays LIBOR.

ANS: B

A pays LIBOR + 1% to its lenders, receives LIBOR from B, and pays B 7.95%, for a net fixed payment of 8.95%. B pays 9.4% to its lenders, pays LIBOR to A, and receives 7.95% from A, for a net payment of LIBOR + 1.45%.

PTS: 1                    DIF: MEDIUM        REF: 612  
OBJ: (21.4) Swaps—nonalgorithmic        BLM: Higher Order

7. Suppose the quoted price for a June 2008 10-year CGB futures contract has changed from 118.72 to 118.77. What is the corresponding change in value in this futures contract?
- \$70
  - \$60
  - \$50
  - \$30

ANS: C

The futures contract on the 10-year Government of Canada bond is designed to change by \$10 for each 0.01 change in the price of the futures contract. An increase in the price from 118.72 to 118.77 is an increase of 0.05 representing a rise in value of \$50.

PTS: 1                    DIF: MEDIUM        REF: 618                    OBJ: (21.6) CGB futures contracts  
BLM: Higher Order

8. Suppose the June 2008, 10-year, \$100,000 Government of Canada bond futures contract has a quoted price of 118.72. The notional amount involved is \$27,234,486,720. What is the open interest, that is, the number of contracts outstanding?
- 118,720
  - 186,125
  - 229,401
  - 272,345

ANS: C

With a quoted price of  $\$118,720 = (118.72\%)(\$100,000)$  and total value amounts to  $\$27,234,486,720$ , open interest (i.e., outstanding contracts) =  $229,401 = \$27,234,486,720 / \$118,720$ .

PTS: 1                    DIF: MEDIUM        REF: 617                    OBJ: (21.6) CGB futures contracts  
BLM: Higher Order

9. Suppose the standard size of a copper futures contract is 25,000 pounds each. At initiation of a futures contract, the futures price is \$22.50 per pound. At expiration of the futures contract, the copper price is \$19.50 per pound. Which of the following is true?
- The short profits by \$3 per pound.
  - The long profits by \$3 per pound.
  - Demand for copper has risen relative to its supply.
  - The two parties split the profit.

ANS: A

Short (seller) makes money when prices fall. Profit =  $\$22.50 - \$19.50 = \$3$ . However, long (buyer) makes money only if prices rise, which is not our case.

PTS: 1                    DIF: MEDIUM        REF: 621                    OBJ: (21.6) Commodity futures  
BLM: Higher Order

## CHAPTER 22—INTERNATIONAL FINANCIAL MANAGEMENT

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### TRUE/FALSE

1. Multinational financial management requires that financial analysts consider the effects of changing currency values.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 631  
OBJ: (22.2) Multinational financial management

2. Legal and economic differences among countries, although important, do **NOT** pose significant problems for most multinational corporations when they coordinate and control worldwide operations of subsidiaries.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 631  
OBJ: (22.2) Multinational financial management

3. Exchange rate quotations consist solely of direct quotations.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 632  
OBJ: (22.3) Exchange rates

4. Calculating a currency cross rate involves determining the exchange rate for two currencies by using a third currency as a base.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 632–633  
OBJ: (22.3) Cross rates

5. When our Canadian dollar appreciates against another country's currency, we may purchase more of the foreign currency with a dollar.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 635  
OBJ: (22.4) Currency appreciation

6. If Canada is running a deficit trade balance with China, then in a free market we would expect the value of the Chinese yuan to depreciate against the Canadian dollar.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 635  
OBJ: (22.4) Trade deficit and depreciation

7. Canada and most other major industrialized nations currently operate under a system of floating exchange rates.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 636  
OBJ: (22.5) Floating exchange rates

8. Exchange rate risk refers to the risk that cash flows from a foreign project, when converted to the parent company's currency, will be worth less than was originally projected because of exchange rate fluctuations.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 637  
OBJ: (22.5) Exchange rate risk



9. A Eurocanadian is Canadian dollar deposited in a bank outside Canada.

ANS: T                   PTS: 1                   DIF: EASY                   REF: 645  
OBJ: (22.10) Eurocurrencies

10. The Eurocurrency market is essentially a long-term market; most loans and deposits in this market have maturities longer than 1 year.

ANS: F                   PTS: 1                   DIF: EASY                   REF: 646  
OBJ: (22.10) Eurocurrency market

11. LIBOR is an acronym for London Interbank Offer Rate, which is an average of interest rates offered by London banks to smaller North American corporations.

ANS: F                   PTS: 1                   DIF: EASY                   REF: 646  
OBJ: (22.10) LIBOR

12. Because political risk is seldom negotiable, it cannot be explicitly addressed in international corporate financial analysis.

ANS: F                   PTS: 1                   DIF: EASY                   REF: 648  
OBJ: (22.11) Political risk

13. Credit policy for international firms is generally more risky due in part to the additional consideration of exchange rates and also due to uncertainty regarding the creditworthiness of many foreign customers.

ANS: T                   PTS: 1                   DIF: EASY                   REF: 653  
OBJ: (22.13) International credit management

14. Due to advanced communications technology and the standardization of general procedures, working capital management for multinational firms is no more complex than it is for large domestic firms.

ANS: F                   PTS: 1                   DIF: EASY                   REF: 653  
OBJ: (22.13) International working capital management

15. Exchange rates influence a multinational firm's inventory policy because changing currency values can affect the value of inventory.

ANS: T                   PTS: 1                   DIF: EASY                   REF: 654  
OBJ: (22.13) Multinational inventory management

16. The threat of expropriation creates an incentive for the multinational firm to minimize inventory holdings in certain countries and to bring in goods only as needed.

ANS: T                   PTS: 1                   DIF: EASY                   REF: 654–655  
OBJ: (22.13) Expropriation and inventory

17. Individuals and corporations can buy or sell forward currencies to hedge their exchange rate exposure. Essentially, the process involves simultaneously selling the currency expected to appreciate in value and buying the currency expected to depreciate.

ANS: F                   PTS: 1                   DIF: MEDIUM                   REF: 639

OBJ: (22.5) Forward market hedging transactions

18. If an investor can obtain more of a foreign currency for a dollar in the forward market than in the spot market, then the foreign currency is said to be selling at a discount to the spot rate.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 639–640

OBJ: (22.6) Discount on forward rate

19. If a dollar will buy fewer units of a foreign currency in the forward market than in the spot market, then the foreign currency is said to be selling at a premium to the spot rate.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 640

OBJ: (22.6) Premium on forward rate

20. On average, foreign currency will depreciate against the Canadian dollar at a percentage rate approximately equal to the amount by which its inflation rate exceeds that of Canada.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 644

OBJ: (22.9) Currency value and inflation

21. The interest rate paid on Eurocurrency deposits depends on the particular bank's lending rate and on rates available on its domestic money market instruments.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 645

OBJ: (22.10) Eurocurrency interest rates

22. The cash flows relevant for a foreign investment should, from the parent company's perspective, include the financial cash flows that the subsidiary can legally send back to the parent company plus the cash flows that must remain in the foreign country.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 649

OBJ: (22.11) Relevant investment cash flows

23. The cost of capital may be different for a foreign project than for an equivalent domestic project because foreign projects may be more or less risky.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 648

OBJ: (22.11) Foreign project's cost of capital

24. When considering the risk of a foreign investment, a higher risk might arise from exchange rate risk and political risk while lower risk might result from international diversification.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 648

OBJ: (22.11) Risk and international investment

## MULTIPLE CHOICE

1. Which of the following is NOT likely to be a reason that companies move into international operations?
- to take advantage of lower production costs in regions where labour costs are relatively low
  - to develop new markets for the firm's products
  - because important raw materials are located abroad

d. to diversify the risk of global terrorist attacks

ANS: D                    PTS: 1                    DIF: EASY                    REF: 629–630  
OBJ: (22.1) Motivation for “going global”                    BLM: Remember

2. What is NOT one of the requirements of international financial management?
- that the effects of changing currency values be included in financial analyses
  - that legal and economic differences be considered in financial decisions
  - that markets be considered to be efficient
  - that unique cultural heritages be respected in the conduct of business

ANS: C                    PTS: 1                    DIF: EASY                    REF: 631  
OBJ: (22.2) International financial management                    BLM: Remember

3. If the inflation rate in Canada is greater than the inflation rate in Britain, other things held constant, what will happen to the British pound?
- It will appreciate against the Canadian dollar.
  - It will depreciate against the Canadian dollar.
  - It will remain unchanged against the Canadian dollar.
  - It will appreciate against other major currencies.

ANS: A                    PTS: 1                    DIF: EASY                    REF: 644  
OBJ: (22.9) Currency depreciation                    BLM: Higher Order

4. In Japan, 90-day securities have a 4% annualized return and 180-day securities have a 5% annualized return. In Canada, 90-day securities have a 4% annualized return and 180-day securities have an annualized return of 4.5%. All securities are of equal risk, and Japanese securities are denominated in terms of the Japanese yen. Assuming that interest rate parity holds in all markets, which statement about the exchange rate is true?
- The yen-dollar spot exchange rate equals the yen-dollar exchange rate in the 90-day forward market.
  - The yen-dollar spot exchange rate equals the yen-dollar exchange rate in the 180-day forward market.
  - The yen-dollar exchange rate in the 90-day forward market equals the yen-dollar exchange rate in the 180-day forward market.

ANS: A                    PTS: 1                    DIF: MEDIUM                    REF: 640–641  
OBJ: (22.7) Interest rate parity                    BLM: Higher Order

5. Which of the following statements is NOT correct?
- Any bond sold outside the country of the borrower is called an international bond.
  - Foreign bonds and Eurobonds are two important types of international bonds.
  - Foreign bonds are bonds sold by a foreign borrower but denominated in the currency of the country in which the issue is sold.
  - The term “Eurobond” applies only to foreign bonds denominated in U.S. currency.

ANS: D                    PTS: 1                    DIF: MEDIUM                    REF: 646  
OBJ: (22.10) International bond markets                    BLM: Remember

6. If one Swiss franc can purchase \$0.966 Canadian dollars, how many Swiss francs can one Canadian dollar buy?
- 0.50
  - 0.71
  - 1.00
  - 1.04

ANS: D

Dollars should sell for 1/0.966, or 1.035 Swiss francs per dollar.

PTS: 1                    DIF: EASY                    REF: 632                    OBJ: (22.3) Exchange rates  
BLM: Higher Order

7. If one U.S. dollar buys 1.0613 Canadian dollars, how many U.S. dollars can you purchase for one Canadian dollar?
- 0.37
  - 0.61
  - 0.94
  - 1.00

ANS: C

You can get 1/1.0613, or 0.9422, U.S. dollars for one Canadian dollar.

PTS: 1                    DIF: EASY                    REF: 632                    OBJ: (22.3) Exchange rates  
BLM: Higher Order

8. Suppose 104 yen could be purchased in the foreign exchange market for one Canadian dollar today. If the yen depreciates by 8.0% tomorrow, how many yen could one Canadian dollar buy tomorrow?
- 123.5 yen
  - 112.3 yen
  - 104.0 yen
  - 95.7 yen

ANS: B

If the yen depreciates by 8%, one would get more yen per dollar. One Canadian dollar will equal  $104 \times 1.08 = 112.32$  yen.

PTS: 1                    DIF: EASY                    REF: 636                    OBJ: (22.5) Currency appreciation  
BLM: Higher Order

9. Suppose a foreign investor who holds tax-exempt Eurobonds paying 9% is considering investing in an equivalent-risk domestic bond in a country with a 28% withholding tax on interest paid to foreigners. If 9% after-tax is the investor's required return, what before-tax rate would the domestic bond need to pay to provide the required after-tax return?
- 9.00%
  - 10.20%
  - 11.28%
  - 12.50%

ANS: D

Gross up the interest rate on the domestic bond:

$$r_{d(\text{pretax})} = 0.09 / (1 - 0.28) = 12.5\%$$

Solution check:

$$\text{After-tax return: } 12.5\% - 0.28(12.5\%) = 12.5\% - 3.5\% = 9.0\%$$

PTS: 1                    DIF: EASY                    REF: 646  
OBJ: (22.10) Eurobonds versus domestic bonds                    BLM: Remember

10. Suppose DeGraw Corporation, a Canadian exporter, sold a solar heating station to a Japanese customer at a price of 106.0875 million yen, when the exchange rate was 103.5 yen per dollar. In order to close the sale, DeGraw agreed to make the bill payable in yen, thus agreeing to take some exchange rate risk for the transaction. The terms were net 6 months. If the yen fell against the dollar such that one dollar would buy 110.2 yen when the invoice was paid, what dollar amount would DeGraw actually receive after it exchanged yen for Canadian dollars?
- \$1,060,875
  - \$1,025,000
  - \$962,681
  - \$929,404

ANS: C

At spot rate 103.5 yen/\$  $\longrightarrow$  1,025,000 C\$  
 Spot rate = 110.2 yen/\$  
 \$962,681.49 C\$

Calculate the amount received in Canadian dollars after the 106,087,500 yen are exchanged for dollars at the spot rate of 110.2 yen, when the invoice is paid.

$$106,087,500 / 110.2 = \$962,681.49 \approx \$962,681.$$

PTS: 1                      DIF: EASY                      REF: 653  
 OBJ: (22.13) Credit and exchange rate risk                      BLM: Higher Order

11. Suppose the exchange rate between Canadian dollars and Swiss francs is SF 1.10 = \$1.00, and the exchange rate between the Canadian dollar and the euro is \$1.00 = 0.68 euros. What is the cross-rate of Swiss francs to euros?
- 0.43
  - 0.86
  - 1.41
  - 1.62

ANS: D

$$\text{SF/euro} = (1.10/1) \times (1/0.68) = 1.10/0.68 = 1.6176 \text{ SF/euro.}$$

PTS: 1                      DIF: MEDIUM                      REF: 632–633                      OBJ: (22.3) Cross rates  
 BLM: Higher Order

12. Suppose that currently 1 British pound equals 1.98 Canadian dollars and 1 Canadian dollar equals 1.04 Swiss francs. What is the cross exchange rate between the pound and the franc?
- 1 British pound equals 3.2400 Swiss francs
  - 1 British pound equals 2.0592 Swiss francs
  - 1 British pound equals 1.9037 Swiss francs
  - 1 British pound equals 1.0000 Swiss francs

ANS: B

1 British pound can be exchanged for 1.98 Canadian dollars. 1 Canadian dollar can then be exchanged for 1.04 Swiss Francs. It follows that 1 pound is worth 2.0592 francs =  $(1.98) \times (1.04)$ .

PTS: 1                      DIF: MEDIUM                      REF: 632–633  
 OBJ: (22.3) Cross rates—nonalgorithmic                      BLM: Higher Order

13. If the spot rate of the Israeli shekel is 5.51 shekels per dollar and the 180-day forward rate is 5.97 shekels per dollar, then what is the forward rate for the Israeli shekel selling at?
- a premium of 8% to the spot rate

- b. a premium of 18% to the spot rate
- c. a discount of 18% to the spot rate
- d. a discount of 8% to the spot rate

ANS: D

$(5.97 - 5.51)/5.51 = 0.083 \approx 8\%$ . Because one can obtain more Israel shekels for a dollar in the forward market, the forward currency is selling at an 8% discount to the spot rate.

PTS: 1                    DIF: MEDIUM      REF: 639–640

OBJ: (22.6) Forward exchange rates—nonalgorithmic

BLM: Higher Order

14. In 1997, a certain Japanese imported automobile sold for 1,476,000 yen, or \$8,200. If the car still sold for the same amount of yen today but the current exchange rate is 110 yen per dollar, what would the car be selling for today in Canadian dollars?
- a. \$8,200
  - b. \$10,250
  - c. \$12,628
  - d. \$13,418

ANS: D

Exchange rate in 1997 =  $1,476,000/\$8,200 = 180$  yen per dollar.

Today's exchange rate = 110 yen per dollar;  $110/180 = 0.611$ .

Today's price =  $\$8,200/0.611 = \$13,420$ . The difference is due to rounding problem.

Alternatively,  $1,476,000/110 = \$13,418$ .

PTS: 1                    DIF: MEDIUM      REF: 632

OBJ: (22.3) Exchange rates and asset value

BLM: Higher Order

15. Suppose one British pound can purchase 1.82 US dollars today in the foreign exchange market, and currency forecasters predict that the U.S. dollar will depreciate by 12.0% against the pound over the next 30 days. How many dollars will a pound buy in 30 days?
- a. 1.12
  - b. 1.63
  - c. 1.82
  - d. 2.04

ANS: D

The British pound will appreciate against the dollar by 12%.

$\text{£}1 = 1.82 \text{ US\$} \times 1.12 = 2.04 \text{ US\$}$ .

PTS: 1                    DIF: MEDIUM      REF: 636

BLM: Higher Order

OBJ: (22.5) Currency depreciation

16. Stover Corporation, a Canadian importer, makes a purchase of crystal glassware from a firm in Switzerland for 39,960 Swiss francs, or \$38,610, at the spot rate of 1.035 francs per dollar. The terms of the purchase are net 90 days, and the Canadian firm wants to cover this trade payable with a forward market hedge to eliminate its exchange rate risk. Suppose the firm completes a forward hedge at the 90-day forward rate of 1.099 francs. If the spot rate in 90 days is actually 1.062 francs, how much will the Canadian firm have saved or lost in Canadian dollars by hedging its exchange rate exposure?
- a. \$2,557
  - b. \$1,267
  - c. -\$1,079
  - d. -\$1,243

ANS: B

90-day forward contract: \$36,360.33

Calculate the cost of the forward contract at the forward rate:

$39,960 \text{ SFr}/(1.099 \text{ SFr}/\$) = \$36,360.33.$

Calculate the cost of purchasing exchange currency at the spot rate in 90 days to satisfy the payable:

$39,960 \text{ SFr}/1.062 \text{ SFr}/\$ = \$37,627.12.$

Calculate the savings from the forward market hedge:

$\$37,627.12 - \$36,360.33 = \$1,266.79 \approx \$1,267.$

PTS: 1

DIF: MEDIUM

REF: 639

OBJ: (22.6) Forward market hedge

BLM: Higher Order

17. Suppose 90-day investments in Britain have a 6% annualized return and a 1.5% quarterly (90-day) return. In Canada, 90-day investments of similar risk have a 4% annualized return and a 1% quarterly (90-day) return. In the 90-day forward market, 1 British pound equals \$1.96. If interest rate parity holds, what is the spot exchange rate?
- 1 pound = \$1.9700
  - 1 pound = \$1.8582
  - 1 pound = \$1.4308
  - 1 pound = \$0.8500

ANS: A

From the interest rate parity formula it follows that

$e_0 = (f_t)(1 + r_f)/(1 + r_h) = (1.96 \text{ dollars/pound})(1.015)/(1.01) = 1.97 \text{ dollars/pound.}$

PTS: 1

DIF: MEDIUM

REF: 640–641

OBJ: (22.7) Interest rate parity

BLM: Higher Order

18. Suppose in the spot market 1 U.S. dollar equals 1.0613 Canadian dollars. 6-month Canadian securities have an annualized return of 6% (and thus a 6-month periodic return of 3%). 6-month U.S. securities have an annualized return of 6.5% and a periodic return of 3.25%. If interest rate parity holds, what is the U.S. dollar–Canadian dollar exchange rate in the 180-day forward market?
- 1 US dollar = 0.6235 Canadian dollars
  - 1 US dollar = 0.6265 Canadian dollars
  - 1 US dollar = 1.0587 Canadian dollars
  - 1 US dollar = 1.5961 Canadian dollars

ANS: C

From the interest rate parity formula it follows that

$f_t = (e_0)(1 + r_h)/(1 + r_f) = (1.0613 \text{ Canadian dollars/US dollar})(1.03)/(1.0325)$   
 $= 1.0587 \text{ Canadian dollar/U.S. dollar.}$

Another way to think of this is \$1 invested today in Canada yields \$1.03 six months from now.

Alternatively, investors could put their money in U.S. securities. In this case, the investor would exchange \$1 today for 0.941 U.S. dollars. This money could be invested in U.S. and after 6 months this investment would be worth 0.971 U.S. dollars  $[(0.941)(1.0325)]$ . At a forward exchange rate of 1 U.S. dollar equals 1.0587 Canadian dollars, 0.971 U.S. dollars would be worth \$1.03 in Canada. Since the two investments produce the same return, interest rate parity holds.

PTS: 1

DIF: MEDIUM

REF: 640–641

OBJ: (22.7) Interest rate parity

BLM: Higher Order

19. A product sells for \$750 in Canada. The exchange rate is \$1 to 9.55 pesos. If the law of one price holds, what is the price of the product in Mexico?
- 4,375.00 pesos
  - 5,545.50 pesos
  - 6,750.00 pesos
  - 7,162.50 pesos

ANS: D

\$750 equals 7,162.50 [= (750)(9.55)] Mexican pesos. If PPP holds, the product should cost the same in both markets.

PTS: 1                    DIF: MEDIUM            REF: 641–642  
OBJ: (22.8) Purchasing power parity            BLM: Higher Order

20. Suppose hockey skates sell in Canada for 105 Canadian dollars, and 1 Canadian dollar equals 0.9423 U.S. dollars. If absolute purchasing power parity (PPP) holds, what is the price of hockey skates in the United States?
- \$63.00
  - \$74.55
  - \$85.88
  - \$98.94

ANS: D

105 Canadian dollars equals 98.94 [= (105)(0.9423)] U.S. dollars. If PPP holds, the skates should cost the same in both markets.

PTS: 1                    DIF: MEDIUM            REF: 641–642  
OBJ: (22.8) Purchasing power parity            BLM: Higher Order

21. A box of candy costs 12.80 euros in Germany and \$20 in Canada. Assuming that the law of one price holds, what is the current exchange rate?
- 1 Canadian dollar equals 0.64 euros
  - 1 Canadian dollar equals 0.85 euros
  - 1 Canadian dollar equals 1.21 euros
  - 1 Canadian dollar equals 1.56 euros

ANS: A

If PPP holds, the candy should cost the same in each country, so that 12.80 euros equal 20 Canadian dollars. This relationship implies that 1 Canadian dollar equals 0.64 euros (= €12.80/\$20).

PTS: 1                    DIF: MEDIUM            REF: 641–642  
OBJ: (22.8) Purchasing power parity—nonalgorithmic            BLM: Higher Order

22. Suppose 6 months ago a British investor bought a 6-month Canadian Treasury bill at a price of \$9,708.74, with a maturity value of \$10,000. The exchange rate at that time was 1.9516 dollars per pound. Today, at maturity, the exchange rate is 2.0751 dollars per pound. What is the annualized rate of return to the British investor?
- 6.26%
  - 3.13%
  - 6.00%
  - 8.25%

ANS: A

The British investor paid  $9,708.74/1.9516 = 4,974.759$  pounds (the investment) 6 months ago.



Today, the \$10,000 mature value can be exchanged for  $10,000/2.0751 = 4,819.045$  pounds. Calculate the 6-month return to the British investor after exchanging Canadian dollars for pounds. Rate of return in pounds is  $(4,819.045 - 4,974.759)/4,974.759 = -155.714/4,974.759 = -0.0313$  for 6-month. Annualized nominal rate of return =  $-3.13(2) = -6.26\%$ .

PTS: 1                    DIF: MEDIUM      REF: 632

OBJ: (22.3) Exchange fluctuations and T-bills

BLM: Higher Order

23. Suppose 1 year ago Hein Company had inventory in Britain valued at 240,000 pounds. The exchange rate for dollars to pounds was £1 = 2 Canadian dollars. This year, the exchange rate is £1 = 1.82 Canadian dollars. The inventory in Britain is still valued at 240,000 pounds. What is the gain or loss in inventory value in Canadian dollars as a result of the change in exchange rates?
- \$240,000
  - \$43,200
  - \$0
  - \$43,200

ANS: B

Inventory, this year = £240,000 × \$1.82 =	\$436,800
Inventory, last year = £240,000 × \$2.00 =	<u>480,000</u>
Loss =	<u>(\$ 43,200)</u>

PTS: 1                    DIF: MEDIUM      REF: 654

OBJ: (22.13) Inventory value and exchange rates

BLM: Higher Order

24. Blenman Corporation, based in Canada, arranged a 2-year, \$1,000 loan to fund a project in Mexico. The loan is denominated in Mexican pesos, carries a 10.0% nominal rate, and requires equal semiannual payments. The exchange rate at the time of the loan was 10.1366 pesos per dollar, but it dropped to 9.5511 pesos per dollar before the first payment came due. The loan was not hedged in the foreign exchange market. Thus, Blenman must convert Canadian dollars into Mexican pesos to make its payments. If the exchange rate remains at 9.5511 pesos per dollar through the end of the loan period, what *effective* interest rate will Blenman end up paying on the loan?
- 11.50%
  - 12.44%
  - 13.00%
  - 15.80%

ANS: D

The loan has a value in terms of Mexican pesos:  $1,000 \times 10.1366 = 10,137$

Financial calculator solution:

Calculate the required payments in Mexican pesos:

Inputs: N = 4; I/YR = 5; PV = -10,137; FV = 0.

Output: PMT = 2,858.714 MP.

2,858.714 Mexican pesos are needed on each payment date. At the initial exchange rate of 10.137 pesos/\$, the payments are approximately \$282.008. Payment in Canadian dollars after conversion =  $2,858.714 \text{ pesos}/(10.137 \text{ MP}/\$) = \$282.008$ . However, at an exchange rate of 9.551 pesos/\$, the cost to the firm in \$ increases to  $2,858.714/9.551 = \$299.31$ .

Calculate nominal annual interest rate on loan:

Inputs: N = 4; PV = -1,000; PMT = 299.31; FV = 0.

Output: I/YR = 7.613% semiannual rate.

Annual nominal rate =  $7.613(2) = 15.226\%$ .

Calculate effective annual rate:

Inputs: P/YR = 2; NOM% = 15.226. Output: EFF% = 15.8%.

PTS: 1                      DIF: HARD                      REF: 646                      OBJ: (22.10) EAR on foreign debt  
BLM: Higher Order

25. Chen Transport, a Canadian company, is considering expanding its operations into a foreign country for 5 years. The required investment at Time = 0 is \$10 million. The firm forecasts total cash inflows of \$4 million per year for 2 years, \$6 million for the next 2 years, and then a possible terminal value of \$8 million. Due to political risk factors, Chen believes that there is a 50% chance that the gross terminal value will be only \$2 million and a 50% chance that it will be \$8 million. In addition, the government of the host country will block 20% of all cash flows. Thus, cash flows that can be repatriated are 80% of those projected. Chen's cost of capital is 15%, but it adds one percentage point to all foreign projects to account for exchange rate risk. Under these conditions, what is the project's NPV?
- a. \$1.01 million
  - b. \$2.77 million
  - c. \$3.09 million
  - d. \$5.96 million

ANS: B

Calculate the expected terminal value cash flow:

Expected terminal cash flow (CF<sub>5</sub>) = 0.5(8) + 0.5(2) = 4 + 1 = 5.

Calculate the unrestricted cash flows that can be repatriated to the parent firm:

Unrestricted cash flows = Projected cash inflows × 0.80.

Tabular solution (In millions):

<u>Year</u>	<u>Projected Cash Flow</u>	<u>Unrestricted Percent Repatriable</u>	
		<u>Unrestricted</u>	<u>Cash Flows</u>
1	\$4	0.80	\$3.2
2	4	0.80	3.2
3	6	0.80	4.8
4	6	0.80	4.8
5	5	0.80	4.0

$$\begin{aligned} \text{NPV} &= \$3.2/1.16 + \$3.2/1.16^2 + \$4.8/1.16^3 + \$4.8/1.16^4 + \$4.0/1.16^5 - \$10.0 \\ &= \$3.2(0.8621) + \$3.2(0.7432) + \$4.8(0.6407) + \$4.8(0.5523) + \$4.0(0.4761) - \$10.0 \\ &= \$2.759 + \$2.378 + \$3.075 + \$2.651 + \$1.904 - \$10.0 \\ &= \$2.768 \approx \$2.77 \text{ million.} \end{aligned}$$

Financial calculator solution (In millions):

Inputs: CF<sub>0</sub> = -10.0; CF<sub>1</sub> = 3.2; N<sub>j</sub> = 2; CF<sub>2</sub> = 4.8; N<sub>j</sub> = 2; CF<sub>3</sub> = 4.0; I/YR = 16.

Output: NPV = \$2.767 ≈ \$2.77 million.

PTS: 1                      DIF: HARD                      REF: 649-651                      OBJ: (22.11) Foreign investment cash flows                      BLM: Higher Order

26. Suppose a Canadian firm buys \$200,000 worth of television tubes from a Norwegian manufacturer for delivery in 60 days with payment to be made in 90 days (30 days after the goods are received). The rising Canadian deficit has caused the dollar to depreciate against the krone recently. The current exchange rate is 5.50 kroner per Canadian dollar. The 90-day forward rate is 5.45 kroner/dollar. The firm goes into the forward market today and buys enough Norwegian kroner at the 90-day forward rate to completely cover its trade obligation. Assume the spot rate in 90 days is 5.30 kroner per Canadian dollar. How much in Canadian dollars did the firm save by eliminating its foreign exchange currency risk with its forward market hedge?
- a. \$0
  - b. \$1,834.86
  - c. \$4,517.26
  - d. \$5,712.31

ANS: D

Obligation is for  $200,000 \times 5.50 = 1,100,000$  kroner.

$1,100,000/5.45 =$  cost of forward contract = \$201,834.86.

Spot rate in 90 days = 5.30 kroner per Canadian dollar.

$1,100,000/5.30 =$  cost of spot rate in 90 days = \$207,547.17.

Spot cost – forward cost =  $\$207,547.17 - \$201,834.86 = \$5,712.31$ .

PTS: 1                      DIF: HARD                      REF: 639 | 654

OBJ: (22.6 and 22.13) Forward market hedge

BLM: Higher Order

## CHAPTER 23—CORPORATE VALUATION, VALUE-BASED MANAGEMENT, AND CORPORATE GOVERNANCE

### TRUE/FALSE

1. The corporate valuation model cannot be used unless a company doesn't pay dividends.  
ANS: F                      PTS: 1                      DIF: EASY                      REF: 662  
OBJ: (23.1) Corporate valuation model
2. Free cash flows should be discounted at the firm's weighted average cost of capital to find the value of its operations.  
ANS: T                      PTS: 1                      DIF: EASY                      REF: 667  
OBJ: (23.2) Free cash flows and valuation
3. Value-based management focuses on sales growth, profitability, capital requirements, the weighted average cost of capital, and the dividend growth rate.  
ANS: F                      PTS: 1                      DIF: EASY                      REF: 662–663  
OBJ: (23.1) Value-based management
4. Two most important issues in corporate governance are (1) the rules that cover the board's ability to fire the CEO and (2) the rules that cover the CEO's ability to remove members of the board.  
ANS: F                      PTS: 1                      DIF: EASY                      REF: 679–680  
OBJ: (23.5) Corporate governance
5. If a company's expected return on invested capital is less than its cost of equity, then the company must also have a negative market value added (MVA).  
ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 675  
OBJ: (23.3) Return on invested capital and MVA
6. A poison pill is also known as a corporate restructuring.  
ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 682  
OBJ: (23.5) Corporate governance
7. The CEO of BMI Industries has been granted some stock options that have provisions similar to most other executive stock options. If BMI's stock underperforms the market, these options will necessarily be worthless.  
ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 682  
OBJ: (23.5) Stock options
8. Leverage has unclear impact on corporate value as debt can reduce one aspect of agency costs (wasteful spending), but it may increase another (underinvestment).  
ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 684  
OBJ: (23.5) Capital structure

## MULTIPLE CHOICE

1. Which statement regarding the corporate valuation model is NOT correct?
  - a. The corporate valuation model can be used both for companies that pay dividends and those that do not pay dividends.
  - b. The corporate valuation model discounts free cash flows by the required return on equity.
  - c. The corporate valuation model can be used to find the value of a division.
  - d. An important step in applying the corporate valuation model is forecasting the firm's pro forma financial statements.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 662–663  
OBJ: (23.1) Corporate valuation model                      BLM: Higher Order

2. Which action does NOT always increase a company's market value?
  - a. increasing the expected growth rate of sales
  - b. increasing the expected operating profitability (nopat/sales)
  - c. decreasing the capital requirements (capital/sales)
  - d. decreasing the weighted average cost of capital

ANS: A  
Only (a) is correct, because investors recognize that companies sometimes try to grow too fast, at the expense of maintaining profit margins.

PTS: 1                      DIF: MEDIUM                      REF: 675  
OBJ: (23.3) Value-based management                      BLM: Higher Order

3. Which of the following will NOT be regarded as being a barrier to hostile takeovers?
  - a. targeted share repurchases
  - b. shareholder rights provisions
  - c. restricted voting rights
  - d. cumulative voting

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 680–682  
OBJ: (23.5) Corporate governance                      BLM: Higher Order

4. Which action can be an adverse move for corporate governance?
  - a. making the CEO the chairman of the board
  - b. decreasing the board size
  - c. increasing the seats of independent directors in the board up to 80%
  - d. paying board members with stock rather than salary

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 681  
OBJ: (23.5) Corporate governance                      BLM: Remember

5. Akyol Corporation is undergoing a restructuring, and its free cash flows are expected to be unstable during the next few years. However, FCF is expected to be \$50 million in Year 5, i.e., FCF at  $t = 5$  equals \$50 million, and the FCF growth rate is expected to be constant at 6% beyond that point. If the weighted average cost of capital is 12%, what is the horizon value (in millions) at  $t = 5$ ?
  - a. \$757
  - b. \$797
  - c. \$839
  - d. \$883

ANS: D

FCF<sub>5</sub>: \$50  
g: 6%  
WACC: 12%

$$\begin{aligned} HV_5 &= FCF_6 / (WACC - g) = FCF_5(1 + g) / (WACC - g) \\ &= \$50(1 + 0.06) / (0.12 - 0.06) = \$53 / 0.06 = \$883 \end{aligned}$$

PTS: 1 DIF: EASY REF: 667

OBJ: (23.2) Corporate valuation model, horizon value

BLM: Higher Order

6. Simonyan Inc. forecasts a free cash flow of \$40 million in Year 3, i.e., at  $t = 3$ , and it expects FCF to grow at a constant rate of 5% thereafter. If the weighted average cost of capital is 10% and the cost of equity is 15%, what is the horizon value, in millions at  $t = 3$ ?
- \$840
  - \$882
  - \$926
  - \$972

ANS: A

FCF<sub>3</sub>: \$40  
g: 5%  
WACC: 10%

$$\begin{aligned} HV_3 &= FCF_4 / (WACC - g) = FCF_3(1 + g) / (WACC - g) \\ &= \$40(1 + 0.05) / (0.10 - 0.05) = \$42 / 0.05 = \$840 \end{aligned}$$

PTS: 1 DIF: EASY REF: 667

OBJ: (23.2) Corporate valuation model, horizon value

BLM: Higher Order

7. Suppose Yon Sun Corporation's free cash flow during the just-ended year ( $t = 0$ ) was \$100 million, and FCF is expected to grow at a constant rate of 5% in the future. If the weighted average cost of capital is 15%, what is the firm's value of operations, in millions?
- \$948
  - \$998
  - \$1,050
  - \$1,103

ANS: C

FCF<sub>0</sub>: \$100  
g: 5%  
WACC: 15%

$$\begin{aligned} \text{Value Ops} &= FCF_1 / (WACC - g) = FCF_0(1 + g) / (WACC - g) \\ &= \$100(1 + 0.05) / (0.15 - 0.05) = \$105 / 0.1 = \$1,050 \end{aligned}$$

PTS: 1 DIF: EASY REF: 667

OBJ: (23.2) Corporate valuation model, value of operations

BLM: Higher Order

8. Suppose Leonard, Nixon, & Shull Corporation's projected free cash flow for next year is \$100,000, and FCF is expected to grow at a constant rate of 6%. If the company's weighted average cost of capital is 11%, what is the value of its operations?
- \$1,714,750
  - \$1,805,000
  - \$1,900,000

d. \$2,000,000

ANS: D

FCF<sub>1</sub>: \$100,000

g: 6%

WACC: 11%

$$\begin{aligned}\text{Value Ops} &= \text{FCF}_1 / (\text{WACC} - g) = \text{FCF}_0(1 + g) / (\text{WACC} - g) \\ &= \$100,000 / (0.11 - 0.06) = \$100,000 / 0.05 = \$2,000,000\end{aligned}$$

PTS: 1                    DIF: EASY                    REF: 667

OBJ: (23.2) Corporate valuation model, value of operations                    BLM: Higher Order

9. Zhdanov Inc. forecasts that its free cash flow in the coming year, i.e., at  $t = 1$ , will be  $-\$10$  million, but its FCF at  $t = 2$  will be  $\$20$  million. After Year 2, FCF is expected to grow at a constant rate of 4% forever. If the weighted average cost of capital is 14%, what is the firm's value of operations, in millions?
- a. \$158
  - b. \$167
  - c. \$175
  - d. \$184

ANS: B

FCF<sub>1</sub>:  $-\$10$

FCF<sub>2</sub>:  $\$20$

g: 4%

WACC: 14%

First, find the horizon, or terminal, value:

$$\text{HV}_2 = \text{FCF}_2(1 + g) / (\text{WACC} - g) = \$20(1.04) / (0.14 - 0.04) = \$20.8 / 0.10 = \$208.00$$

Then find the PV of the free cash flows and the horizon value:

$$\begin{aligned}\text{Value of operations} &= -\$10 / (1.14)^1 + (\$20 + \$208) / (1.14)^2 \\ &= -\$8.772 + \$175.439 = \$167\end{aligned}$$

PTS: 1                    DIF: MEDIUM                    REF: 667

OBJ: (23.2) Corporate valuation model, value of operations                    BLM: Higher Order

10. Leak Inc. forecasts the free cash flows (in millions) shown below. If the weighted average cost of capital is 11% and FCF is expected to grow at a rate of 5% after Year 2, what is the Year 0 value of operations, in millions? Assume that the ROIC is expected to remain constant in Year 2 and beyond (and do not make any half-year adjustments).

Year:	1	2
Free cash flow:	$-\$50$	$\$100$

- a. \$1,456
- b. \$1,529
- c. \$1,606
- d. \$1,686

ANS: A

FCF<sub>1</sub>:  $-\$50$

FCF<sub>2</sub>:  $\$100$

g: 5%

WACC: 11%

First, find the horizon, or terminal, value:

$$HV_2 = FCF_2(1 + g)/(WACC - g) = \$100(1.05)/(0.11 - 0.05) = \$1,750.00$$

Then find the PV of the free cash flows and the horizon value:

$$\text{Value of operations} = -\$50/(1.11) + (\$100 + \$1,750)/(1.11)^2 = \$1,456$$

PTS: 1 DIF: MEDIUM REF: 667

OBJ: (23.2) Corporate valuation model, value of operations BLM: Higher Order

11. A company forecasts the free cash flows (in millions) shown below. The weighted average cost of capital is 13%, and the FCFs are expected to continue growing at a 5% rate after Year 3. Assuming that the ROIC is expected to remain constant in Year 3 and beyond, what is the Year 0 value of operations, in millions?

Year:	1	2	3
Free cash flow:	-\$15	\$10	\$40

- a. \$331
- b. \$348
- c. \$367
- d. \$386

ANS: D

Year:	1	2	3
FCF:	-\$15	\$10	\$40

g: 5%  
WACC: 13%

First, find the horizon, or terminal, value:

$$HV_4 = FCF_3(1 + g)/(WACC - g) = \$40(1.05)/(0.13 - 0.05) = \$525$$

Then find the PV of the free cash flows and the horizon value:

$$\text{Value of operations} = -\$15/(1.13) + \$10/(1.13)^2 + (\$40 + \$525)/(1.13)^3 = \$386$$

PTS: 1 DIF: MEDIUM REF: 667

OBJ: (23.2) Corporate valuation model, value of operations BLM: Higher Order

12. Based on the corporate valuation model, Bernile Inc.'s value of operations is \$750 million. Its balance sheet shows \$50 million of short-term investments that are unrelated to operations, \$100 million of accounts payable, \$100 million of notes payable, \$200 million of long-term debt, \$40 million of common stock (par plus paid-in-capital), and \$160 million of retained earnings. What is the best estimate for the firm's value of equity, in millions?

- a. \$450
- b. \$475
- c. \$500
- d. \$525

ANS: C

Value of operations:	\$750
Short-term investments:	\$50
Notes payable:	\$100
Long-term debt:	\$200



Assuming that the book value of debt is close to its market value, the total market value of the company is:

$$\begin{aligned} \text{Total market value} &= \text{Value of operations} + \text{Value of non-operating assets} \\ &= \$750 + \$50 = \$800 \end{aligned}$$

Value of Equity = Total MV - Long- and Short-term debt = \$500.

The book values of equity figures are irrelevant for this problem. Also, the accounts payable are not relevant because they were netted out when the FCF was calculated.

PTS: 1                      DIF: MEDIUM              REF: 664-670

OBJ: (23.2) Corporate valuation model, value of equity                      BLM: Higher Order

13. Based on the corporate valuation model, the value of a company's operations is \$1,200 million. The company's balance sheet shows \$80 million in accounts receivable, \$60 million in inventory, and \$100 million in short-term investments that are unrelated to operations. The balance sheet also shows \$90 million in accounts payable, \$120 million in notes payable, \$300 million in long-term debt, \$50 million in preferred stock, \$180 million in retained earnings, and \$800 million in total common equity. If the company has 30 million shares of stock outstanding, what is the best estimate of the stock's price per share?
- \$24.90
  - \$27.67
  - \$30.43
  - \$33.48

ANS: B

Value of operations:	\$1,200
Short-term investments:	\$100
Notes payable:	\$120
Long-term debt:	\$300
Preferred stock	\$50
Shares outstanding:	30

Assuming that the book value of debt is close to its market value, the total market value of the company is:

$$\begin{aligned} \text{Total market value} &= \text{Value of operations} + \text{Value of non-operating assets} \\ &= \$1,200 + \$100 = \$1,300 \end{aligned}$$

Value of Equity = Total MV - Long- and Short-term debt and preferred = \$830

Stock price = Value of Equity/Shares outstanding = \$27.67

The book values of equity figures are irrelevant for this problem. Also, the working capital account numbers are not relevant because they were netted out when the FCF was calculated.

PTS: 1                      DIF: MEDIUM              REF: 664-670

OBJ: (23.2) Corporate valuation model, P0                      BLM: Higher Order

14. Based on the corporate valuation model, the value of a company's operations is \$900 million. Its balance sheet shows \$70 million in accounts receivable, \$50 million in inventory, \$30 million in short-term investments that are unrelated to operations, \$20 million in accounts payable, \$110 million in notes payable, \$90 million in long-term debt, \$20 million in preferred stock, \$140 million in retained earnings, and \$280 million in total common equity. If the company has 25 million shares of stock outstanding, what is the best estimate of the stock's price per share?
- \$23.00
  - \$25.56
  - \$28.40
  - \$31.24

ANS: C

Value of operations:	\$900
Short-term investments:	\$30
Notes payable:	\$110
Long-term debt:	\$90
Preferred stock	\$20
Shares outstanding:	25

Assuming that the book value of debt is close to its market value, the total market value of the company is:

$$\begin{aligned} \text{Total market value} &= \text{Value of operations} + \text{Value of non-operating assets} \\ &= \$900 + \$30 = \$930 \end{aligned}$$

Value of Equity = Total MV - Long- and Short-term debt and preferred = \$710

Stock price = Value of Equity/Shares outstanding = \$28.40

The book values of equity figures are irrelevant for this problem. Also, the working capital account numbers are not relevant because they were netted out when the FCF was calculated.

PTS: 1                      DIF: MEDIUM      REF: 664–670

OBJ: (23.2) Corporate valuation model, P0

BLM: Higher Order

15. Based on the corporate valuation model, Hunsader's value of operations is \$300 million. The balance sheet shows \$20 million of short-term investments that are unrelated to operations, \$50 million of accounts payable, \$90 million of notes payable, \$30 million of long-term debt, \$40 million of preferred stock, and \$100 million of common equity. The company has 10 million shares of stock outstanding. What is the best estimate of the stock's price per share?
- \$13.72
  - \$14.44
  - \$15.20
  - \$16.00

ANS: D

Value of operations:	\$300
Short-term investments:	\$20
Notes payable:	\$90
Long-term debt:	\$30
Preferred stock	\$40
Shares outstanding:	10

Assuming that the book value of debt is close to its market value, the total market value of the company is:

$$\begin{aligned} \text{Total market value} &= \text{Value of operations} + \text{Value of non-operating assets} \\ &= \$300 + \$20 = \$320 \end{aligned}$$

Value of Equity = Total MV – Long- and Short-term debt and preferred = \$160

Stock price = Value of Equity/Shares outstanding = \$16.00

The book values of equity figures are irrelevant for this problem. Also, the working capital account numbers are not relevant because they were netted out when the FCF was calculated.

PTS: 1                      DIF: MEDIUM              REF: 664–670

OBJ: (23.2) Corporate valuation model, P0

BLM: Higher Order

16. Vasudevan Inc. forecasts the free cash flows (in millions) shown below. If the weighted average cost of capital is 13% and the free cash flows are expected to continue growing at the same rate after Year 3 as from Year 2 to Year 3, what is the Year 0 value of operations, in millions?

Year:	1	2	3
Free cash flow:	–\$20	\$42	\$45

- a. \$586
- b. \$617
- c. \$648
- d. \$680

ANS: B

Year:	1	2	3
Free cash flow:	–\$20	\$42	\$45

WACC: 13%

First, find the growth rate:  $g = \$45/\$42 - 1.0 = 7.14\%$

Second, find the horizon, or terminal, value, at Year 2

$$HV_2 = FCF_3 / (WACC - g) = \$45 / (0.13 - 0.0714) = \$768$$

Now find the PV of the FCFs and the horizon value:

$$\text{Value of operations} = -\$20 / (1.13) + (\$42 + \$768) / (1.13)^2 = \$617$$

PTS: 1                      DIF: HARD                      REF: 667

OBJ: (23.2) Corporate valuation model, value of operations

BLM: Higher Order

## CHAPTER 24—MERGERS, ACQUISITIONS, AND RESTRUCTURING

### TRUE/FALSE

1. In a merger with true synergies, the post-merger value exceeds the sum of the separate companies' pre-merger values.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 696  
OBJ: (24.1) Synergistic merger

2. Synergistic benefits can arise from a number of different sources, including operating economies of scale, financial economies, and increased managerial efficiency.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 696  
OBJ: (24.1) Sources of synergy

3. A spin-off is a type of divestiture in which the assets of a division are sold to another firm.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 716  
OBJ: (24.16) Spin-off

4. A conglomerate merger occurs when two firms with either a horizontal or a vertical business relationship combine.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 699  
OBJ: (24.2) Conglomerate merger

5. Merger activity is likely to heat up when interest rates are high because target firms can expect to receive an especially high premium over the pre-announcement stock price.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 699–700  
OBJ: (24.3) Mergers and interest rates

6. Most defensive mergers occur as a result of managers' actions to maximize shareholders' wealth.

ANS: F                      PTS: 1                      DIF: EASY                      REF: 700  
OBJ: (24.4) Defensive mergers

7. Post-merger control and the negotiated price paid by the acquirer are two of the most important issues in agreeing on the terms of a merger.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 700  
OBJ: (24.4) Merger terms

8. A company seeking to fight off a hostile takeover might employ the services of an investment banking firm to develop a defensive strategy.

ANS: T                      PTS: 1                      DIF: EASY                      REF: 712  
OBJ: (24.12) Defensive tactics

9. Since the primary rationale for any operating merger is synergy, in planning such mergers, the development of accurate pro forma cash flows is the single most important action.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 701  
OBJ: (24.5) Merger analysis

10. If the constant growth model is used to calculate the value of a target company, the terminal value is an insignificant cash flow analysis.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 702  
OBJ: (24.6) Merger valuation

11. The appropriate discount rate to be used when calculating the NPV of a target company is the cost of equity of the target company.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 702  
OBJ: (24.6) Merger valuation

12. Currently, mergers in Canada can be accounted for using either the purchase method or the pooling method.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 709  
OBJ: (24.10) Merger accounting

13. Three procedures used to defend against hostile takeovers are borrowing funds on terms that would require immediate repayment of all funds if the firm is acquired, selling off valuable assets, and granting huge “golden parachutes” that open if the firm is acquired. These strategies are known as “poison pills.”

ANS: T                    PTS: 1                    DIF: EASY                    REF: 712–713  
OBJ: (24.12) Poison pills

14. A joint venture is one in which two, or sometimes more, independent companies agree to combine resources in order to achieve a specific objective, usually limited in scope.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 715  
OBJ: (24.14) Joint ventures

15. Leveraged buyouts (LBOs) occur when a firm’s managers, generally backed by private equity groups, try to gain control of a publicly owned company by buying out the public shareholders using large amounts of borrowed money.

ANS: T                    PTS: 1                    DIF: EASY                    REF: 716  
OBJ: (24.15) Leveraged buyouts

16. In a carve-out, a majority interest in a corporate subsidiary is sold to new shareholders, so the parent gains new equity financing yet retains control.

ANS: F                    PTS: 1                    DIF: EASY                    REF: 716  
OBJ: (24.16) Divestitures

17. The purchase of assets at below their replacement cost and tax considerations are two factors that motivate mergers.

ANS: T                    PTS: 1                    DIF: MEDIUM                    REF: 697  
OBJ: (24.1) Merger motivation

18. The primary reason managers give for most mergers is to acquire more assets so as to increase sales and market share.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 698  
OBJ: (24.1) Merger motivation

19. Since managers' central goal is to maximize stock price, managerial control issues do not interfere with mergers that would benefit the target firm's shareholders.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 698  
OBJ: (24.1) Managerial control

20. Foreign firms are interested in buying Canadian companies to gain entrance to Canada. A decline in the value of the dollar relative to most foreign currencies makes this competitive strategy especially attractive.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 700  
OBJ: (24.2) International mergers

21. If a petrochemical firm that used oil as feedstock merged with an oil producer that had large oil reserves and a drilling subsidiary, this would be a vertical merger.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 698–699  
OBJ: (24.2) Vertical merger

22. A congeneric merger is one where the merging firms operate in related businesses but do not necessarily produce the same products or have a producer–supplier relationship.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 699  
OBJ: (24.2) Congeneric merger

23. Since a manager's central goal is to maximize the firm's common share price, any merger offer that provides shareholders with significant gains over the current share price will be approved by the current management team.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 698 | 700  
OBJ: (24.1 and 24.4) Managerial opposition

24. A merger will be financially justified only if a target firm's value is greater to the acquiring firm than its market value as a separate entity.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 701  
OBJ: (24.5) Merger analysis

25. Interest expense must be explicitly included in a merger incremental cash flow analysis.

ANS: T  
The target firm generally has embedded debt that is being assumed by the acquiring firm. Since these costs are not small, they must be specifically included in the analysis.

PTS: 1                      DIF: MEDIUM                      REF: 701–703  
OBJ: (24.6) Free cash flow to equity

26. In a financial merger, the relevant post-merger cash flows are simply the sum of the expected cash flows of the two companies, measured as if they were operated independently.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 704  
OBJ: (24.7) Relevant merger cash flows

27. A taxable merger offer is one where the acquiring company offers to purchase the target company with cash. However, the same deal is not taxable if the merger is paid by exchanging stocks. Such nontaxable bids should be more popular by far.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 708  
OBJ: (24.9) Tax issue

28. Using the purchase accounting method to report mergers, goodwill is not amortized, rather it is subject to an annual impairment test.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 710  
OBJ: (24.10) Merger accounting

29. The income statement of the post-merger firm will be the same regardless of the accounting method used.

ANS: F  
Goodwill generated under purchase accounting is annually reviewed for any impairment. Thus this practice may reduce the reported net income of the merged firm.

PTS: 1                      DIF: MEDIUM                      REF: 710                      OBJ: (24.10) Merger accounting

30. Under purchase accounting, the acquired assets must be written up or written down if the purchase price does not equal net asset value.

ANS: T  
Note that net asset value is total assets less debt.

PTS: 1                      DIF: MEDIUM                      REF: 710                      OBJ: (24.10) Merger accounting

31. Coca-Cola's acquisition of Columbia Pictures and its announcement that it would operate its new subsidiary separately could be described as primarily a financial merger.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 704  
OBJ: (24.7) Projecting post-merger cash flows

32. A shareholder rights plan allowing existing shareholders to buy or sell shares at very attractive prices provides the acquirer an inexpensive way for takeovers.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 713  
OBJ: (24.12) Defensive tactics

33. By examining stock prices around merger announcement dates, event studies provide inconclusive results that mergers benefit only targets, not acquirers.

ANS: T                      PTS: 1                      DIF: MEDIUM                      REF: 713-715  
OBJ: (24.13) Empirical evidence

34. The distribution of synergistic gains between the stockholders of two merged firms is almost always based strictly on their respective market values before the announcement of the merger.

ANS: F                      PTS: 1                      DIF: MEDIUM                      REF: 711–712  
OBJ: (24.11) Synergistic gain

35. If the capital structure is stable, and free cash flows are expected to be growing at a constant rate at the horizon date, then the horizon value is calculated by discounting the free cash flows plus the expected future tax shields at the weighted average cost of capital.

ANS: F                      PTS: 1                      DIF: HARD                      REF: 704  
OBJ: (24.7) Merger analysis

36. The present value of the free cash flows discounted at the unlevered cost of equity is the value of the firm's operations if it had no debt.

ANS: T                      PTS: 1                      DIF: HARD                      REF: 705  
OBJ: (24.7) Merger analysis

### MULTIPLE CHOICE

1. Which of the following is a valid, acceptable reason for a closely held firm proposing a merger activity?
- synergistic benefits arising from mergers
  - reduction in competition resulting from mergers
  - attempts to stabilize earnings by diversifying
  - minimizing taxes when disposing of excess cash

ANS: C                      PTS: 1                      DIF: EASY                      REF: 698  
OBJ: (24.1) Mergers                      BLM: Remember

2. What is NOT one of the defensive tactics firms use to fight off undesired mergers?
- Developing poison pills
  - getting white knights to bid for the firm
  - repurchasing their own stock
  - issuing new shares at low prices on the market

ANS: D                      PTS: 1                      DIF: EASY                      REF: 700 | 712–713  
OBJ: (24.4 and 24.12) Hostile mergers                      BLM: Higher Order

3. What is one of the actions that can NOT help managers defend against a hostile takeover?
- establishing a poison pill provision
  - granting lucrative golden parachutes to senior managers
  - establishing a super-majority provision in the company's bylaws to raise the percentage of the board of directors that must approve an acquisition from 50% to 75%
  - changing the voting procedures for the board election from noncumulative to cumulative one

ANS: D                      PTS: 1                      DIF: EASY                      REF: 700 | 712–713  
OBJ: (24.4 and 24.12) Defensive strategies                      BLM: Higher Order

4. Which statement best describes a merger concept?
- A conglomerate merger is one where a firm combines with another firm in the same



industry.

- b. Regulations in Canada prohibit acquiring firms from using common shares to purchase another firm.
- c. Defensive mergers are designed to make a company less vulnerable to a takeover.
- d. The corporate valuation method and the equity residual method, even properly applied, produce different results.

ANS: C                      PTS: 1                      DIF: EASY                      REF: 699 | 701 | 708 | 712–713

OBJ: (Comp: 24.2, 24.5, 24.9, 24.12) Miscellaneous merger concepts

BLM: Higher Order

5. Which of the following is NOT a valid reason for a company to seek external growth through mergers?
- a. to avoid paying dividends
  - b. to achieve greater diversification
  - c. to take advantage of the tax-loss carryforwards
  - d. to maintain availability of raw materials

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 696–698

OBJ: (24.1) Merger motivation                      BLM: Higher Order

6. Which statement best describes mergers?
- a. Tax considerations often play a part in mergers. If one firm has excess cash, purchasing another firm exposes the purchasing firm to additional taxes. Thus, firms with excess cash rarely undertake mergers.
  - b. The smaller the synergistic benefits of a particular merger, the greater the scope for striking a bargain in negotiations, and the higher the probability that the merger will be completed.
  - c. Since mergers are frequently financed by debt rather than equity, a lower cost of debt or a greater debt capacity are rarely relevant considerations when considering a merger.
  - d. Managers who purchase other firms often assert that the new combined firm will enjoy benefits from diversification, including more stable earnings. However, since shareholders are free to diversify their own holdings, and at what's probably a lower cost, diversification benefits are generally not a valid motive for a publicly held firm.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 696–698 | 706–707

OBJ: (24.1 and 24.8) Merger motivation and setting the bid price

BLM: Higher Order

7. Which statement best describes mergers?
- a. The high Canadian dollar relative to foreign currencies makes Canadian companies comparatively inexpensive to foreign buyers, spurring many mergers.
  - b. The expansion of the junk bond market makes debt more freely available for large acquisitions and LBOs, resulting in an increased level of merger activity.
  - c. Increased nationalization of business and a desire to scale down and focus on producing in one's home country may virtually halt international mergers.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 699–700

OBJ: (24.3) Level of merger activity                      BLM: Remember

8. Which statement best describes mergers?
- a. The acquiring firm's required rate of return in most horizontal mergers will not be affected, because the two firms will have similar betas.
  - b. Financial theory says that the choice of how to pay for a merger is irrelevant because although it may affect the firm's capital structure, it will not affect its overall required rate of return.

- c. The basic rationale for any consolidation is financial synergy and, thus, the estimation of pro forma cash flows is the single most important part of the analysis.
- d. The primary rationale for most operating mergers is synergy.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 696 | 701  
OBJ: (24.1 and 24.5) Merger rationale and analysis                      BLM: Higher Order

9. Which of the following factors does NOT influence the consideration of a merger and an acquisition of stocks?
- a. Shareholders are dealt with directly to bypass the target management and board of directors.
  - b. In a tender offer, usually some minority shareholders do not tender stopping complete firm absorption.
  - c. Target management may be unfriendly and resist an offer. Resistance usually makes the stock price higher.
  - d. The target company's supplier has developed a new high-quality product.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 700–701  
OBJ: (24.4) Merger situation                      BLM: Higher Order

10. Which statement best describes accounting for mergers?
- a. Goodwill is amortized for shareholder reporting.
  - b. Goodwill is subject to impairment test for tax purposes.
  - c. Goodwill is no longer created in a merger.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 710  
OBJ: (24.10) Merger accounting                      BLM: Remember

11. Two firms merge and no synergies occur. Which statement best explains this unlikely result?
- a. The reduction in risk in the combined firm benefits the bondholders at the expense of the shareholders.
  - b. The value of the debt in the combined firm will likely be greater than the value of the debt in the two separate firms.
  - c. The size of the gain to the bondholders depends on the specific reductions in bankruptcy probabilities after the merger.
  - d. The share price of the acquiring or combined company increases substantially.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 697–698  
OBJ: (24.1) Rationale for mergers                      BLM: Higher Order

12. Which statement best describes leveraged buyouts (LBOs)?
- a. LBOs occur when a firm issues equity and uses the proceeds to take a firm public.
  - b. In a typical LBO, bondholders do well but shareholders see their value decline.
  - c. Firms are forbidden by law to sell any assets during the first five years following a leverage buyout.
  - d. The objective is to take the firm public again or to sell to others in a few years after boosting the firm's value through efficient management.

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 716  
OBJ: (24.15) LBOs                      BLM: Higher Order

13. What is NOT a reason for a divestiture?
- a. a firm's need for cash
  - b. the poor performance of a business unit
  - c. a change in a firm's strategic thinking

d. a reduction in tax burden

ANS: D                      PTS: 1                      DIF: MEDIUM                      REF: 716–717  
OBJ: (24.16) Divestiture                      BLM: Remember

14. Which statement best describes mergers?
- The purchase of Red Lobster Restaurants initiated by Remax Realty is an example of conglomerate mergers.
  - A merger can be blocked either by a firm’s customers or its suppliers, not the government.
  - The existence of golden parachutes is a reason that the management of a target company tries to block a takeover.
  - In a hostile takeover, the target company’s management makes a tender offer asking its shareholders to sell their shares to the acquiring company.

ANS: A                      PTS: 1                      DIF: MEDIUM                      REF: 698–701  
OBJ: (Comp. 24.2, 24.4) Aspects of mergers                      BLM: Higher Order

15. Which statement best describes mergers?
- If a company that produces military equipment merges with a company that manages a chain of motels, this is an example of a horizontal merger.
  - A defensive merger is one where the firm’s managers decide to merge with another firm to avoid or lessen the possibility of being acquired through a hostile takeover.
  - Acquiring firms send a signal that their stock is undervalued if they choose to use stock to pay for the acquisition.

ANS: B                      PTS: 1                      DIF: MEDIUM                      REF: 699 | 708 | 712  
OBJ: (Comp. 24.2, 24.9, and 24.12) Miscellaneous merger concepts  
BLM: Higher Order

16. The value of synergy can be estimated by the equation
- $V_{AB} - V_A - V_B$
  - $V_{AB} - V_B - \text{taxes}$
  - $V_A - V_B - \text{costs}$
  - $V_A + V_B - \text{revenues}$

ANS: A                      PTS: 1                      DIF: EASY                      REF: 696  
OBJ: (24.1) Synergy                      BLM: Higher Order

17. Great Subs Inc., a regional sandwich chain, is considering purchasing a smaller chain, Eastern Pizza, which is currently financed using 20% debt at a cost of 8%. Great Subs’ analysts project that the merger will result in incremental free cash flows and interest tax savings of \$2 million in Year 1, \$4 million in Year 2, \$5 million in Year 3, and \$117 million in Year 4. (The Year 4 cash flow includes a horizon value of \$107 million.) The acquisition would be made immediately, if it is to be undertaken. Eastern’s pre-merger beta is 2.0, and its post-merger tax rate would be 34%. The risk-free rate is 8%, and the market risk premium is 4%. What is the appropriate rate for use in discounting the free cash flows and the interest tax savings?
- 12.0%
  - 13.9%
  - 14.4%
  - 16.0%

ANS: B  
 $r_{sL} = 8\% + 2.0(4\%) = 16\%$ ;  $r_{sU} = 0.20(8\%)(1 - 34\%) + 0.80(16\%) = 13.86\%$

PTS: 1                      DIF: EASY                      REF: 703                      OBJ: (24.7) Discount rate

BLM: Higher Order

18. Dunbar Hardware, a national hardware chain, is considering purchasing a smaller chain, Eastern Hardware. Dunbar's analysts project that the merger will result in incremental free flows and interest tax savings with a combined present value of \$72.52 million, and they have determined that the appropriate discount rate for valuing Eastern is 16%. Eastern has 4 million shares outstanding and no debt. Eastern's current price is \$16.25. What is the maximum price per share that Dunbar should offer?
- \$16.25
  - \$16.97
  - \$17.42
  - \$18.13

ANS: D

$$\text{Price per share} = \frac{\$72.52 \text{ million}}{4 \text{ million}} = \mathbf{\$18.13}$$

PTS: 1                      DIF: EASY                      REF: 706–707  
OBJ: (24.8) Maximum price per share                      BLM: Higher Order

19. Kelly Tubes is considering a merger with Reilly Tires. Reilly's market-determined value is \$3.75 million, and Kelly's market value as a stand-alone company is \$4.50 million. Both firms are all equity-financed. Kelly acquires Reilly for \$4.25 million because it believes the combined firm value will increase to \$9.25 million. What will the synergy from this merger be?
- \$0.50 million
  - \$1.00 million
  - \$4.75 million
  - \$5.00 million

ANS: B

Given combined firm value  $V_{K+R} = \$9.25\text{m}$ , stand-alone values of  $V_K = \$4.5\text{m}$  and  $V_R = \$3.75\text{m}$ , synergy =  $V = 9.25 - (4.5 + 3.73) = \$1$  million.

PTS: 1                      DIF: MEDIUM                      REF: 696                      OBJ: (24.1) Synergy  
BLM: Higher Order

20. Firms A and B, both all-equity financed, are merging. Prior to merge, Firm A, having 100 shares outstanding, is worth \$15,000, while Firm B has 50 shares outstanding worth \$10,000. The combined firm will be worth \$30,000. Firm A pays \$11,500 in cash for Firm B. What is the net benefit of the merger to Firm A?
- \$3,500
  - \$5,000
  - \$11,500
  - \$18,500

ANS: A

The net benefit of a merger to the acquirer is synergy minus premium paid for the target. With premium =  $\$11,500 - \$10,000 = \$1,500$ , and synergy =  $\$30,000 - \$15,000 - \$10,000 = \$5,000$ , merger benefit (NPV) =  $\$5,000 - \$1,500 = \$3,500$ .

PTS: 1                      DIF: MEDIUM                      REF: 696 | 706–707  
OBJ: (24.1 and 24.8) Merger benefit and pricing                      BLM: Higher Order

21. Kelly Tubes is considering a merger with Reilly Tires. Reilly's market-determined beta is 0.9, and the firm currently is financed with 20% debt, at an interest rate of 8%, and its tax rate is 25%. If Kelly acquires Reilly, it will increase the debt to 60%, at an interest rate of 9%, and the tax rate will increase to 35%. The risk-free rate is 6% and the market risk premium is 4%. What will Reilly's required rate of return on equity be after it is acquired?
- 7.4%
  - 8.9%
  - 9.3%
  - 9.7%

ANS: D

Calculate the current required return to Reilly's equity:

$$r_K = r_{RF} + b(RP_M) = 6\% + (0.9)4\% = 9.6\%$$

Calculate Reilly's unlevered cost of equity:

$$r_{SU} = [r_{SL} + r_d (D/S)(1 - T)] / [1 + (D/S)(1 - T)] = [9.6\% + (8\%)(0.2/0.8)(1 - 25\%)] / [1 + (0.2/0.8)(1 - 25\%)] = 9.35\%$$

Calculate Reilly's levered cost of equity at the new capital structure with the new cost of debt:

$$r_{SL} = r_{SU} + (r_{SU} - r_d)(D/S)(1 - T) = 9.35\% + (9.35\% - 9\%)(0.6/0.4)(1 - 35\%) = 9.69\%$$

PTS: 1                      DIF: MEDIUM                      REF: 703

OBJ: (24.7) Post-merger return on equity

BLM: Higher Order

22. Brau Auto, a national auto parts chain, is considering purchasing a smaller chain, South Georgia Parts (SGP). Brau's analysts project that the merger will result in the following incremental free cash flows, tax shields, and horizon values:

Year	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Free cash flow	\$1	\$3	\$3	\$7
Unlevered horizon value				75
Tax shield	1	1	2	3
Horizon value of tax shield				32

Assume that all cash flows occur at the end of the year. SGP is currently financed with 30% debt at a rate of 10%. The acquisition would be made immediately, and if it is undertaken, SGP would retain its current \$15 million of debt and issue enough new debt to continue at the 30% target level. The interest rate would remain the same. SGP's pre-merger beta is 2.0, and its post-merger tax rate would be 34%. The risk-free rate is 8% and the market risk premium is 4%. What is the value of SGP to Brau?

- \$53.40 million
- \$61.96 million
- \$64.59 million
- \$76.96 million

ANS: C

$$r_{SL} = r_{RF} + b(RP_M) = 8\% + 2.0(4\%) = 16\%$$

$$WACC = w_d r_d (1 - T) + w_s r_s = 0.30(10\%)(1 - 34\%) + 0.70(16\%) = 13.18\%$$

Since all of the cash flows are to be discounted at the same rate, we don't need to separately calculate the values of the tax shield and unlevered value of operations. We can simply add the tax shields and free cash flows together each year to input in the financial calculator:

Financial calculator solution (in millions):

Inputs:  $CF_0 = 0$ ;  $CF_1 = 2$ ;  $CF_2 = 4$ ;  $CF_3 = 5$ ;  $CF_4 = 117$ ;  $I/YR = 13.2$

Output:  $NPV = \$79.59$  million = Value of operations

Value of equity = Value of operations – Value of debt = \$79.59 – 15 = \$64.59 million

Some students will calculate separately the value of the tax shield and the unlevered value of operations and add them together. In that case, the separate calculations are:

Unlevered value of operations:

Inputs:  $CF_0 = 0$ ;  $CF_1 = 1$ ;  $CF_2 = 3$ ;  $CF_3 = 3$ ;  $CF_4 = 75 + 7 = 82$ ;  $I/YR = 13.2$

Output: NPV = \$55.23 million = Unlevered value of operations

Value of tax shields:

Inputs:  $CF_0 = 0$ ;  $CF_1 = 1$ ;  $CF_2 = 1$ ;  $CF_3 = 2$ ;  $CF_4 = 3 + 32 = 35$ ;  $I/YR = 13.2$

Output: NPV = \$24.36 million = Value of tax shields

Value of operations = Value of tax shields + Unlevered value of operations = \$55.23 + \$24.36 = \$79.59 million.

PTS: 1                      DIF: MEDIUM                      REF: 703–706  
OBJ: (24.7) Value of an acquisition                      BLM: Higher Order

23. Firm X is considering acquiring Firm Y by offering one share of its common stock for 0.8728 shares of Firm Y. Currently, the market price of Firm X is \$48. What is the cash bidding price proposed for this deal?
- \$35
  - \$42
  - \$55
  - \$63

ANS: C

One X share equals 0.8728 Y share, implying that one Y share is equivalent to  $1/0.8728 = 1.1457$  shares of X. That is, the share-for-share exchange ratio is 1.1457. Note that exchange ratio = offer price/trading price. With a market price of \$48/share for Firm X, offer price =  $(1.1457) \times (48) = \$55$ .

PTS: 1                      DIF: MEDIUM                      REF: 708–709                      OBJ: (24.9) Cash bidding price  
BLM: Higher Order

24. The DAB Corp. has unfortunately accumulated net operating losses of \$70 million and is likely to go bankrupt. The CLC Corp. has earnings of \$200 million and is in the 36% marginal tax bracket. CLC is considering buying DAB and liquidating the company and retaining a few of the assets. What is the minimum value of DAB to CLC?
- \$25.2 million
  - \$70.0 million
  - \$72.0 million
  - There is insufficient information provided.

ANS: A

Tax shields =  $(0.36)(\$70m) = \$25.2m$  are the underlying force for this merger. A firm with net operating losses is an attractive merger partner for a firm with significant tax liabilities. Barring any other effects, the combined firm will have a lower tax bill than the two firms considered separately.

PTS: 1                      DIF: MEDIUM                      REF: 697 | 706–707  
OBJ: (24.1 and 24.8) Tax consideration as rationale for mergers and Bid price  
BLM: Higher Order

25. MCorp, with a book value of \$20 million and a market value of \$30 million, has merged with NCorp, with a book value of \$6 million and a market value of \$8 million at a price of \$9 million. Under the purchase method, what will be the total assets on the book of the new merged firm?
- \$26 million
  - \$29 million
  - \$38 million
  - \$39 million

ANS: B

Total assets = \$20m + \$9m = \$29m, including \$1m of goodwill. Under the purchase method, the assets of acquired firm are recorded at their fair market value, allowing for the creation of goodwill.

However, the assets of the acquiring firm remain at their old book value. Surprisingly, they will not be revalued upward when the new firm is formed.

PTS: 1                      DIF: MEDIUM      REF: 709–710

OBJ: (24.10) Financial report for mergers

BLM: Higher Order

26. Blazer Inc. is thinking of acquiring Laker Company. Blazer expects Laker's NOPAT to be \$9 million the first year, with no net new investment in operating capital and no interest expense. For the second year, Laker is expected to have NOPAT of \$25 million and interest expense of \$5 million. Also, in the second year only, Laker will need \$10 million of net new investment in operating capital. Laker's marginal tax rate is 40%. After the second year, the free cash flows and the tax shields from Laker to Blazer will both grow at a constant rate of 4%. Blazer has determined that Laker's cost of equity is 17.5%, and Laker currently has no debt outstanding. Assuming that all cash flows occur at the end of the year, Blazer must pay \$45 million to acquire Laker. What is the NPV of the proposed acquisition? Note that you must first calculate the value to Blazer of Laker's equity.
- \$ 45.0 million
  - \$ 68.2 million
  - \$ 94.1 million
  - \$139.1 million

ANS: C

The unlevered cost of equity is 17.5%. All cash flows are discounted at this rate:

FCFE: Year 1 = \$9 million, Year 2 = \$25 – \$10 – \$5(1 – 40%) = \$12 million, HV = [ $\$25 - \$5(1 - 40\%)$ ](1 + 4%) / (17.5% – 4%) = \$169.48 million

$$V_{\text{ops}} = \$9/(1.175) + (\$12 + \$169.48)/(1.175)^2 = \$139.11 = V \text{ equity since there is no debt.}$$

The NPV is \$139.11 – \$45 = \$94.11 million

PTS: 1                      DIF: HARD                      REF: 705–706                      OBJ: (24.7) Merger NPV

BLM: Higher Order

### Scenario Dustvac

Magiclean Corporation is considering the acquisition of Dustvac Company. Dustvac has a capital structure consisting of \$5 million (market value) of 11% bonds and \$10 million (market value) of common stock. Dustvac's pre-merger beta is 1.36. Magiclean's beta is 1.02, and both it and Dustvac face a 40% tax rate. Magiclean's capital structure is 40% debt and 60% equity. The free cash flows from Dustvac are estimated to be \$3.0 million for each of the next 4 years and a horizon value of \$10.0 million in Year 4. Tax savings are estimated to be \$1 million for each of the next 4 years and a horizon value of \$5 million in Year 4. New debt would be issued to finance the acquisition and retire the old debt, and this new debt would have an interest rate of 8%. Currently, the risk-free rate is 6.0% and the market risk premium is 4.0%.

27. Refer to Scenario Dustvac. What Dustvac's pre-merger WACC?
- 9.02%
  - 9.50%
  - 9.83%
  - 10.01%

ANS: C

The pre-merger weight of debt is  $\$5/(\$5 + \$10) = 0.333$

The pre-merger required rate of return on equity is  $6\% + 1.36(4\%) = 11.44\%$ .

$WACC = w_d r_d(1 - T) + w_s r_s = 0.333(11\%)(1 - 0.40) + 0.667(11.44\%) = 9.83\%$

PTS: 1                      DIF: MEDIUM                      REF: 703                      OBJ: (24.7) WACC of target  
BLM: Higher Order

28. Refer to Scenario Dustvac. What discount rate should you use to discount Dustvac's free cash flows and interest tax savings?
- 10.01%
  - 10.06%
  - 11.34%
  - 11.44%

ANS: C

The correct discount rate is the unlevered cost of equity. The levered cost of equity is  $6\% + 1.36(4\%) = 11.44\%$ , the percent of debt is  $\$5/(\$5 + \$10) = 0.333$ . The rate on the debt is 11%.

The unlevered cost of equity is  $[r_{sL} + r_d (D/S)(1 - T)] / [1 + (D/S)(1 - T)] = [11.44\% + (11\%)(0.333/0.667)(1 - 40\%)] / [1 + (0.333/0.667)(1 - 40\%)] = 11.34\%$ .

PTS: 1                      DIF: MEDIUM                      REF: 703 | 706                      OBJ: (24.7) Discount rate for value of operations                      BLM: Higher Order

29. Refer to Scenario Dustvac. What is the value of Dustvac's equity to Magiclean? (Round your answer to the closest thousand dollars.)
- \$16.019 million
  - \$17.080 million
  - \$18.916 million
  - \$22.080 million

ANS: B

Because the cash flows are all discounted at the same rate, we don't need to separately calculate the unlevered value of operations and the value of the tax shield. We can simply enter the sum of the tax shields and free cash flows and their horizon values for each year into the financial calculator:

Financial calculator solution:

Inputs:  $CF_0 = 0$ ;  $CF_1 = 4$ ;  $N_j = 3$ ;  $CF_2 = 3 + 10 + 1 + 5 = 19$ ;  $I/YR = 11.34$



Output:  $PV_{\text{Inflows}} = \$22.08 = V_{\text{ops}}$ .

Value of equity =  $V_{\text{ops}} - \text{Debt} = \$22.08 - \$5 = \$17.08$  million

Alternately, some students will calculate separately the unlevered value of operations and the value of the tax shield:

Inputs:  $CF_0 = 0$ ;  $CF_1 = 3$ ;  $N_j = 3$ ;  $CF_2 = 3 + 10 = 13$ ;  $I/YR = 11.34$

Output:  $PV_{\text{Inflows}} = \$15.747 = \text{Value of unlevered operations}$ .

Inputs:  $CF_0 = 0$ ;  $CF_1 = 1$ ;  $N_j = 3$ ;  $CF_2 = 1 + 5 = 6$ ;  $I/YR = 11.34$

Output:  $PV_{\text{Inflows}} = \$6.334 = \text{Value of tax shield}$ .

Adding these together gives the value of operations above, and subtracting the debt gives the value of equity above.

PTS: 1                      DIF: MEDIUM                      REF: 706                      OBJ: (24.7) Value of equity  
BLM: Higher Order

### Scenario Maritime

TV Emporium, a national retailer of flat panel screens, is investigating an opportunity to purchase Maritime TV and Sound Inc. An acquisition is expected to lower overhead costs, improve distribution efficiencies, and improve ordering volumes from the major manufactures. If those improvements (synergies) are implemented, TV Emporium financial staff estimates the following incremental net cash flows to be \$5 million, \$5.6 million, and \$6.9 million for the first three years. Cash flows would grow at 3% thereafter. Maritime TV and Sound's tax rate is 30%. Its cost of equity is 10%.

30. Refer to Scenario Maritime. What is the horizontal value of Maritime's operation as of year 3?
- \$101.53 million
  - \$98.57 million
  - \$86.66 million
  - \$71.07 million

ANS: A

$$HV_{\text{operations, year 3}} = \frac{FCF_{\text{year 4}}}{WACC - g} = \frac{FCF_{\text{years}}(1+g)}{WACC - g} = \frac{\$6.9(1+0.03)}{0.1 - 0.03} = \frac{\$7.107}{0.07} = \$101.529772$$

PTS: 1                      DIF: MEDIUM                      REF: 704  
OBJ: (24.7) Horizontal value of operations                      BLM: Higher Order

31. Refer to Scenario Maritime. What is the highest price TV Emporium pays for Maritime?
- \$67.75 million
  - \$76.28 million
  - \$81.10 million
  - \$90.64 million

ANS: D

$$V_{\text{operations}} = \frac{\$5}{(1+0.1)^1} + \frac{\$5.6}{(1+0.1)^2} + \frac{(\$6.9 + \$101.53)}{(1+0.1)^3} = \$90.638772$$

PTS: 1                      DIF: MEDIUM                      REF: 705-707  
OBJ: (24.7 and 24.8) Merger value and Bid price                      BLM: Higher Order