# Chapter 02

# Cost Behavior, Operating Leverage, and Profitability Analysis

## Multiple Choice Questions

1. Java Joe operates a chain of coffee shops. The company pays rent of $20,000 per year for each shop. Supplies (napkins, bags and condiments) are purchased as needed. The manager of each shop is paid a salary of $3,000 per month, and all other employees are paid on an hourly basis. Relative to the number of customers for a shop, the cost of supplies is which kind of cost?

A. Fixed cost

B. Variable cost

C. Mixed cost

D. Relevant cost

2. Select the correct statement regarding fixed costs.

A. Because they do not change, fixed costs should be ignored in decision making.

B. The fixed cost per unit decreases when volume increases.

C. The fixed cost per unit increases when volume increases.

D. The fixed cost per unit does not change when volume decreases.

3. Larry's Lawn Care incurs significant gasoline costs. This cost would be classified as a variable cost if the total gasoline cost:

A. varies inversely with the number of hours the lawn equipment is operated.

B. is not affected by the number of hours the lawn equipment is operated.

C. increases in direct proportion to the number of hours the lawn equipment is operated.

D. None of these

4. Select the correct statement regarding fixed costs.

A. There is a contradiction between the term "fixed cost per unit" and the behavior pattern implied by the term.

B. Fixed cost per unit is not fixed.

C. Total fixed cost remains constant when volume changes.

D. All of these are correct statements.

5. Rock Creek Bottling Company pays its production manager a salary of $6,000 per month. Salespersons are paid strictly on commission, at $1.50 for each case of product sold.

   For Rock Creek Bottling Company, the production manager's salary is an example of:

   A. a variable cost.

   B. a mixed cost.

   C. a fixed cost.

   D. None of these

6. Rock Creek Bottling Company pays its production manager a salary of $6,000 per month. Salespersons are paid strictly on commission, at $1.50 for each case of product sold.

   For Rock Creek Bottling Company, the salespersons' commissions are an example of:

   A. a fixed cost.

   B. a variable cost.

   C. a mixed cost.

   D. None of these

7. Based on the following cost data, what conclusions can you make about Product A and Product B?

| | Total Cost | |
|---|---|---|
| Production: | Product A | Product B |
| 10 units | $100 | ? |
| 100 units | $1,000 | ? |
| 1,000 units | $10,000 | ? |
| | Unit Cost | |
| Production: | Product A | Product B |
| 10 units | ? | $10,000 |
| 100 units | ? | $1,000 |
| 1,000 units | ? | $100 |

A. Product A is a fixed cost and Product B is a variable cost.

B. Product A is a variable cost and Product B is a fixed cost.

C. Product A and Product B are both variable costs.

D. Product A and Product B are both mixed costs.

8. Based on the following cost data, items labeled (a) and (b) in the table below are which of the following amounts, respectively?

| Number of units: | 1,500 | 3,000 |
|---|---|---|
| Total cost: | | |
| Variable | $7,500 | $15,000 |
| Fixed | $6,000 | $6,000 |
| | | |
| Cost per unit: | | |
| Variable | $5 | (a) |
| Fixed | $4 | (b) |

A. (a) = $3.00; (b) = $3.00

B. (a) = $5.00; (b) = $4.00

C. (a) = $2.50; (b) = $2.00

D. (a) = $5.00; (b) = $2.00

9. Two different costs incurred by Ruiz Company exhibit the following behavior pattern per unit:

| | Units Sold | | | |
|---|---|---|---|---|
| | 50 | 100 | 150 | 200 |
| Cost # 1 | $300 per unit | $150 per unit | $100 per unit | $75 per unit |
| Cost # 2 | $2 per unit | $2 per unit | $2 per unit | $2 per unit |

Cost #1 and Cost #2 exhibit which of the following cost behavior patterns, respectively?

A. Fixed/Variable

B. Variable/Variable

C. Fixed/Fixed

D. Variable/Fixed

10. Wu Company incurred $40,000 of fixed cost and $50,000 of variable cost when 4,000 units of product were made and sold.

If the company's volume doubles, the total cost per unit will:

A. stay the same.

B. decrease.

C. double as well.

D. increase but will not double.

11. Wu Company incurred $40,000 of fixed cost and $50,000 of variable cost when 4,000 units of product were made and sold.

    If the company's volume increases to 5,000 units, the total cost per unit will be:

    A. $18.00.

    B. $20.00.

    C. $20.50.

    D. $22.50.

12. Wu Company incurred $40,000 of fixed cost and $50,000 of variable cost when 4,000 units of product were made and sold.

    If the company's volume increases to 5,000 units, the company's total costs will be:

    A. $100,000

    B. $90,000

    C. $102,500

    D. $80,000

13. Wu Company incurred $40,000 of fixed cost and $50,000 of variable cost when 4,000 units of product were made and sold.

    If the company's volume doubles, the company's **total cost** will:

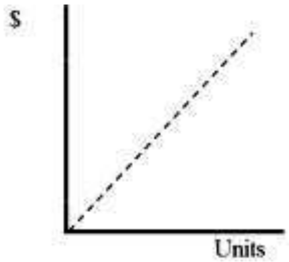
    A. stay the same.

    B. double as well.

    C. increase but will not double.

    D. decrease.

14. In the graph below, which depicts the relationship between units produced and total cost, the dotted line depicts which type of total **cost**?



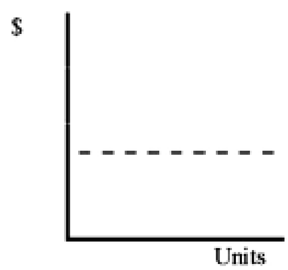

A. Variable cost

B. Fixed cost

C. Mixed cost

D. None of these

15. In the graph below, which depicts the relationship between units produced and unit cost, the dotted line depicts which type of **cost per unit**?



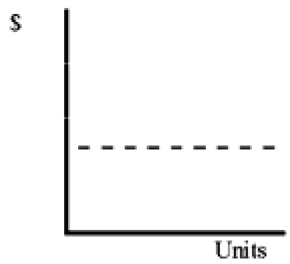

A. Variable cost

B. Fixed cost

C. Mixed cost

D. None of these

16. In the graph below, which depicts the relationship between units produced and total cost, the dotted line depicts which type of **total cost**?




A. Variable cost

B. Fixed cost

C. Mixed cost

D. None of these

17. Pickard Company pays its sales staff a base salary of $4,500 a month plus a $3.00 commission for each product sold. If a salesperson sells 800 units of product in January, the employee would be paid:

A. $6,900

B. $4,500

C. $2,300

D. $2,700

18. Quick Change and Fast Change are competing oil change businesses. Both companies have 5,000 customers. The price of an oil change at both companies is $20. Quick Change pays its employees on a salary basis, and its salary expense is $40,000. Fast Change pays its employees $8 per customer served. Suppose Quick Change is able to lure 1,000 customers from Fast Change by lowering its price to $18 per vehicle. Thus, Quick Change will have 6,000 customers and Fast Change will have only 4,000 customers.

    Select the **correct** statement from the following.

    A. Quick Change's profit will increase while Fast Change's profit will fall.

    B. Fast Change's profit will fall but it will still earn a higher profit than Quick Change.

    C. Profits will decline for both Quick Change and Fast Change.

    D. Quick Change's profit will remain the same while Fast Change's profit will decrease.

19. Hard Nails and Bright Nails are competing nail salons. Both companies have the same number of customers. Both charge the same price for a manicure. The only difference is that Hard Nails pays its manicurists on a salary basis (i.e., a fixed cost structure) while Bright Nails pays its manicurists on the basis of the number of customers they serve (i.e., a variable cost structure). Both companies currently make the same amount of net income. If sales of both salons increase by an equal amount, Hard Nails:

    A. will earn a higher profit than Bright Nails.

    B. will earn a lower profit than Bright Nails.

    C. will earn the same amount of profit as Bright Nails.

    D. The answer cannot be determined from the information provided.

20. Fixed cost per unit:

A. decreases as production volume decreases.

B. is not affected by changes in the production volume.

C. decreases as production volume increases.

D. increases as production volume increases.

21. Cool Runnings operates a chain of frozen yogurt shops. The company pays $5,000 of rent expense per month for each shop. The managers of each shop are paid a salary of $3,000 per month and all other employees are paid on an hourly basis. Relative to the number of shops, the cost of rent is which kind of cost?

A. Variable cost

B. Fixed cost

C. Mixed cost

D. Opportunity cost

22. Companies A and B are in the same industry and are identical except for cost structure. At a volume of 50,000 units, the companies have equal net incomes. At 60,000 units, Company A's net income would be substantially higher than B's. Based on this information,

A. Company A's cost structure has more variable costs than B's.

B. Company A's cost structure has higher fixed costs than B's.

C. Company B's cost structure has higher fixed costs than A's.

D. At a volume of 50,000 units, Company A's magnitude of operating leverage was lower than B's.

23. Operating leverage exists when:

A. a company utilizes debt to finance its assets.

B. management buys enough of the company's shares of stock to take control of the corporation.

C. the organization makes purchases on credit instead of paying cash.

D. small percentage changes in revenue produce large percentage changes in profit.

24. For the last two years BRC Company had net income as follows:

| | | 2012 | 2013 |
|---|---|---|---|
| Net Income | | $160,000 | $200,000 |

What was the percentage change in income from 2012 to 2013?

A. 20% increase

B. 20% decrease

C. 25% increase

D. 25% decrease

25. The activity director for City Recreation is planning an activity. She is considering alternative ways to set up the activity's cost structure. Select the **incorrect** statement from the following.

A. If the director expects a low turnout, she should use a fixed cost structure.

B. If the director expects a large turnout, she should attempt to convert variable costs into fixed costs.

C. If the director shifts the cost structure from fixed to variable, the level of risk decreases.

D. If the director shifts the cost structure from fixed to variable, the potential for profits will be reduced.

26. Select the **incorrect** statement regarding the relationship between cost behavior and profits.

A. A pure variable cost structure offers higher potential rewards.

B. A pure fixed cost structure offers more security if volume expectations are not achieved.

C. In a pure variable cost structure, when revenue increases by $1, so do profits.

D. In a pure fixed cost structure, the unit selling price and unit contribution margin are equal.

27. Select the correct statement from the following.

A. A fixed cost structure offers less risk (i.e., less earnings volatility) and higher opportunity for profitability than does a variable cost structure.

B. A variable cost structure offers less risk and higher opportunity for profitability than does a fixed cost structure.

C. A fixed cost structure offers greater risk but higher opportunity for profitability than does a variable cost structure.

D. A variable cost structure offers greater risk but higher opportunity for profitability than does a fixed cost structure.

28. The manager of Kenton Company stated that 45% of its total costs were fixed. The manager was describing the company's:

A. operating leverage.

B. contribution margin.

C. cost structure.

D. cost averaging.

29. Select the **incorrect** statement regarding cost structures.

A. Highly leveraged companies will experience greater profits than companies less leveraged when sales increase.

B. The more variable cost, the higher the fluctuation in income as sales fluctuate.

C. When sales change, the amount of the corresponding change in income is affected by the company's cost structure.

D. Faced with significant uncertainty about future revenues, a low leverage cost structure is preferable to a high leverage cost structure.

30. Executive management at Ballard Books is very optimistic about the chain's ability to achieve significant increases in sales in each of the next five years. The company will most benefit if management creates a:

A. low leverage cost structure.

B. medium leverage cost structure.

C. high leverage cost structure.

D. no leverage cost structure.

31. Based on the income statements shown below, which division has the cost structure with the highest operating leverage?

| | Soft Drinks | Bottled Water | Fruit Juices |
|---|---|---|---|
| Revenue | $50,000 | $50,000 | $50,000 |
| Variable costs | (10,000) | ( 5000) | (30,000) |
| Contribution margin | 40,000 | 45,000 | 20,000 |
| Fixed costs | (30,000) | (40,000) | (10,000) |
| Net income | $10,000 | $5,000 | $10,000 |

A. Bottled Water.

B. Fruit Juices.

C. Soft Drinks.

D. The three divisions have identical operating leverage.

32. The following income statements are provided for two companies operating in the same industry

| | Felix Company | | Jinx Company | |
|---|---|---|---|---|
| Revenue | $ | 200,000 | $ | 200,000 |
| Variable costs | | (25,000) | | (70,000) |
| Contribution margin | | 175,000 | | 130,000 |
| Fixed costs | | (70,000) | | (25,000) |
| Net income | $ | 105,000 | $ | 105,000 |

Assuming sales increase by $1,000, select the correct statement from the following:

A. Felix's net income will be more than Jinx's.

B. Both companies will experience an increase in profit.

C. Felix's net income will increase by $250.

D. Jinx's net income will increase by 6%.

33. The excess of a product's selling price over its variable costs is referred to as:

A. gross profit

B. gross margin

C. contribution margin

D. manufacturing margin

34. Select the **incorrect** statement regarding the contribution margin income statement.

A. The contribution margin approach for the income statement is unacceptable for external reporting.

B. Contribution margin represents the amount available to cover product costs and thereafter to provide profit.

C. The contribution margin approach requires that all costs be classified as fixed or variable.

D. Assuming no change in fixed costs, a $1 increase in contribution margin will result in a $1 increase in profit.

35. Which of the following items would **not** be found on a contribution format income statement?

A. Fixed cost

B. Variable cost

C. Gross margin

D. Net income

36. The following income statement is provided for Ramirez Company in 2013:

| | | |
|---|---|---|
| Sales revenue (2,500 units x $40 per unit) | $ | 100,000 |
| Cost of goods sold (variable; 2,500 units x $16 per unit) | | (40,000) |
| Cost of goods sold (fixed) | | (8,000) |
| Gross margin | | 52,000 |
| Administrative salaries | | (12,000) |
| Depreciation | | (8,000) |
| Supplies (2,500 units x $4 per unit) | | (10,000) |
| Net income | $ | 22,000 |

What amount was the company's contribution margin?

A. $50,000

B. $22,000

C. $52,000

D. $60,000

37. In order to prepare a contribution format income statement:

A. costs must be separated into manufacturing and selling, general, and administrative costs.

B. costs must be separated into cost of goods sold and operating expenses.

C. costs must be separated into variable and fixed costs.

D. costs must be separated into mixed, variable and fixed costs.

38. Select from the following the **incorrect** statement regarding contribution margin.

A. Sales - fixed costs = contribution margin

B. Net income + total fixed costs = contribution margin

C. At the breakeven point (where the company has neither profit nor loss), total fixed costs = total contribution margin

D. Total sales revenue times the contribution margin percentage = total contribution margin

39. The following information is provided for Southall Company:

| | | |
|---|---|---|
| Sales revenue | $ | 125,000 |
| Variable manufacturing costs | | 42,500 |
| Fixed manufacturing costs | | 37,500 |
| Variable selling and administrative costs | | 15,000 |
| Fixed selling and administrative costs | | 12,500 |

What is this company's contribution margin?

A. $30,000

B. $17,500

C. $45,000

D. $67,500

40. Which of the following equations can be used to compute a firm's magnitude of operating leverage?

A. Net income/sales

B. Fixed costs/contribution margin

C. Contribution margin/net income

D. Net income/contribution margin

41. The following income statement is provided for Vargas, Inc.

| | | |
|---|---|---|
| Sales revenue (2,500 units x $60 per unit) | $ | 150,000 |
| Cost of goods sold (variable; 2,500 units x $20 per unit) | | (50,000) |
| Cost of goods sold (fixed) | | (8,000) |
| Gross margin | | 92,000 |
| Administrative salaries | | (42,000) |
| Depreciation | | (10,000) |
| Supplies (2,500 units x $4 per unit) | | (10,000) |
| Net income | $ | 30,000 |

What is this company's magnitude of operating leverage?

A. 3.07

B. 0.33

C. 3.00

D. 1.67

42. The following income statement is provided for Grant, Inc.

| | | |
|---|---|---|
| Sales revenue (1,500 @ $30 per unit) | $ | 45,000 |
| Variable costs (1,500 @ $14 per unit) | | 21,000 |
| Fixed costs | | 16,000 |
| Net income | $ | 8,000 |

What is this company's magnitude of operating leverage?

A. 0.33

B. 1.31

C. 2.00

D. 3.00

43. The magnitude of operating leverage for Forbes Corporation is 1.8 when sales are $200,000 and net income is $24,000. If sales increase by 5%, what is net income expected to be?

A. $25,200

B. $26,160

C. $24,667

D. $43,200

44. The magnitude of operating leverage for Blue Ridge Corporation is 3.5 when sales are $200,000 and net income is $36,000. If sales decrease by 6%, net income is expected to decrease by what amount?

A. $2,160

B. $7,560

C. $3,420

D. $1,260

45. The magnitude of operating leverage for Perkins Corporation is 4.5 when sales are $100,000. If sales increase to $110,000, profits would be expected to increase by what percent?

A. 4.5%

B. 14.5%

C. 45%

D. 10%

46. Based on the income statements of the three following retail businesses, which company has the highest operating leverage?

| | Alpha Company | Beta Company | Gamma Company |
|---|---|---|---|
| Revenue | $200,000 | $200,000 | $200,000 |
| Variable costs | (95,000) | (155,000) | (125,000) |
| Contribution margin | $105,000 | $45,000 | $75,000 |
| Fixed costs | (80,000) | (20,000) | (50,000) |
| Net income | $25,000 | $25,000 | $25,000 |

A. Alpha Company

B. Beta Company

C. Gamma Company

D. They all have same operating leverage

47. Wham Company sells electronic squirrel repellants for $60. Variable costs are 60% of sales and total fixed costs are $40,000. What is the firm's magnitude of operating leverage if 2,000 units are sold?

A. 0.17

B. 6.0

C. 2.25

D. None of these

48. Whether a cost behaves as a fixed cost or as a variable cost depends upon the:

A. presence of fixed costs.

B. cost structure of the company.

C. industry.

D. activity base used.

49. Craft, Inc. normally produces between 120,000 and 150,000 units each year. Producing more than 150,000 units alters the company's cost structure. For example, fixed costs increase because more space must be rented, and additional supervisors must be hired. The production range between 120,000 and 150,000 is called the:

A. differential range.

B. median range.

C. relevant range.

D. leverage range.

50. Mug Shots operates a chain of coffee shops. The company pays rent of $15,000 per year for each shop. Supplies (napkins, bags and condiments) are purchased as needed. The managers of each shop are paid a salary of $2,500 per month and all other employees are paid on an hourly basis. The cost of rent relative to the number of customers in a particular shop and relative to the number of customers in the entire chain of shops is which kind of cost, respectively?

A. Variable cost/fixed cost

B. Fixed cost/fixed cost

C. Fixed cost/variable cost

D. Variable cost/variable cost

51. Select the **incorrect** statement regarding the relevant range of volume.

A. Total fixed costs are expected to remain constant.

B. Total variable costs are expected to vary in direct proportion with changes in volume.

C. Variable cost per unit is expected to remain constant.

D. Total cost per unit is expected to remain constant.

52. What are the expected average quarterly costs of running a consulting practice if fixed costs are expected to be $4,000 a month and variable costs are expected to be $100 per client for each quarter? Expected number of clients for the year are:

| Jan-March | April-June | July-Sep | Oct-Dec |
|---|---|---|---|
| 110 | 140 | 150 | 100 |

A. $12,500

B. $24,500

C. $16,500

D. $19,500

53. Yankee Tours provide seven-day guided tours along the New England coast. The company pays its guides a total of $100,000 per year. The average cost of supplies, lodging and food per customer is $500. The company expects a total of 500 customers during the period January - June, and a total of 1,500 customers from July through December. Yankee wants to earn $100 income per customer. For promotional reasons the company desires to charge the same price throughout the year. Based on this information, what is the correct price per customer? (round to nearest dollar)

A. $450

B. $500

C. $650

D. $700

54. Select the **incorrect** statement regarding the use of average unit costs.

A. Average costs should be calculated for a sufficiently long time period to capture seasonal fluctuations in costs.

B. Average costs are often more relevant for decision making than are actual costs.

C. Average cost information can help managers evaluate performance of the company or departments in the company.

D. Cost averaging should be used only for fixed costs, and not for variable costs.

55. The following information is given regarding driving lessons provided by Arrive Alive Company over several spans of time:

| | Length of Time | | |
|---|---|---|---|
| | TODAY | ONE YEAR | FIVE YEARS |
| Total cost of lessons | $600 | $110,000 | $508,000 |
| Number of lessons | 50 | 10,000 | 55,000 |

Select the **incorrect** statement from the following.

A. The average cost per lesson over the five-year period was $9.24.

B. Based on the most current information, the cost per lesson was $12.00.

C. The average cost based on the total five-year period is probably the most appropriate cost for pricing purposes.

D. The selection of the most appropriate time span for calculating the average cost often requires considerable judgment.

56. A cost that contains both fixed and variable elements is referred to as a:

A. mixed cost.

B. hybrid cost.

C. relevant cost.

D. nonvariable cost.

57. Which of the following costs typically include both fixed and variable components?

A. Direct materials

B. Direct labor

C. Factory overhead

D. None of these

58. Southern Food Service operates six restaurants in the Atlanta area. The company pays rent of $20,000 per year for each shop. The managers of each shop are paid a salary of $4,200 per month and all other employees are paid on an hourly basis. Relative to the number of hours worked, total compensation cost for a particular shop is which kind of cost?

A. Mixed cost

B. Fixed cost

C. Variable cost

D. None of these

59. Production in 2013 for California Manufacturing, a producer of high security bank vaults, was at its highest point in the month of June when 80 units were produced at a total cost of $800,000. The lowest point in production was in January when only 20 units were produced at a cost of $440,000. The company is preparing a budget for 2013 and needs to project expected fixed cost for the budget year. Using the high/low method, the projected amount of fixed cost per month is

A. $120,000

B. $320,000

C. $480,000

D. $360,000

60. The following income statements are provided for Li Company's last two years of operation:

| | 2012 | 2013 |
|---|---|---|
| Number of units produced and sold | 3,500 | 3,000 |
| Sales revenue | $ 101,500 | $ 87,000 |
| Cost of goods sold | 68,000 | 60,000 |
| Gross margin | 33,500 | 27,000 |
| General, selling, and administrative expenses | 13,000 | 12,000 |
| Net income | $ 20,500 | $ 15,000 |

Assuming that cost behavior did not change over the two year period, what is the amount of the company's variable cost of goods sold per unit?

A. $12.00 per unit

B. $16.00 per unit

C. $22.00 per unit

D. None of these

61. The following income statements are provided for Li Company's last two years of operation:

| | 2012 | 2013 |
|---|---|---|
| Number of units produced and sold | 3,500 | 3,000 |
| Sales revenue | $ 101,500 | $ 87,000 |
| Cost of goods sold | 68,000 | 60,000 |
| Gross margin | 33,500 | 27,000 |
| General, selling, and administrative expenses | 13,000 | 12,000 |
| Net income | $ 20,500 | $ 15,000 |

Assuming that cost behavior did not change over the two year period, what is the annual amount of the company's fixed manufacturing overhead?

A. $12,000

B. $24,000

C. $26,000

D. None of these

62. The following income statements are provided for Li Company's last two years of operation:

| | | 2012 | | 2013 |
|---|---|---|---|---|
| Number of units produced and sold | | 3,500 | | 3,000 |
| Sales revenue | $ | 101,500 | $ | 87,000 |
| Cost of goods sold | | 68,000 | | 60,000 |
| Gross margin | | 33,500 | | 27,000 |
| General, selling, and administrative expenses | | 13,000 | | 12,000 |
| Net income | $ | 20,500 | $ | 15,000 |

Assuming that cost behavior did not change over the two year period, what is the company's annual fixed general, selling, and administrative cost?

A. $6,500

B. $6,000

C. $3,000

D. $2,500

63. The following income statements are provided for Li Company's last two years of operation:

| | | 2012 | | 2013 |
|---|---|---|---|---|
| Number of units produced and sold | | 3,500 | | 3,000 |
| Sales revenue | $ | 101,500 | $ | 87,000 |
| Cost of goods sold | | 68,000 | | 60,000 |
| Gross margin | | 33,500 | | 27,000 |
| General, selling, and administrative expenses | | 13,000 | | 12,000 |
| Net income | $ | 20,500 | $ | 15,000 |

Assuming that cost behavior did not change over the two year period, what is Li Company's contribution margin in 2013?

A. $33,000

B. $32,000

C. $39,000

D. $69,000

64. The results below represent what form of cost behavior?

| | | 2012 | | 2013 |
|---|---|---|---|---|
| Units | | 4,500 | | 4,800 |
| Total Cost | $ | 11,250 | $ | 12,000 |

A. Fixed Cost

B. Variable Cost

C. Mixed Cost

D. Opportunity Cost

65. Based on the following operating data, the operating leverage is:

| | | |
|---|---|---|
| Sales | $ | 500,000 |
| Variable costs | | 280,000 |
| Contribution margin | | 220,000 |
| Fixed costs | | 180,000 |
| Income from operations | $ | 40,000 |

A. 0.18

B. 5.50

C. 1.22

D. 12.5

66. The following information is for Gable, Inc. and Harlowe, Inc. for the recent year.

| | Gable, Inc. | Harlowe, Inc. |
|---|---|---|
| Sales | $ 800,000 | $ 800,000 |
| Variable costs | 400,000 | 200,000 |
| Contribution margin | 400,000 | 600,000 |
| Fixed costs | 200,000 | 400,000 |
| Income from operations | $ 200,000 | $ 200,000 |

Based on the above data, which company has a higher operating leverage?

A. Gable, Inc.

B. Harlowe, Inc.

C. Operating leverage is the same for both companies

D. Cannot be determined

67. The following information is for Gable, Inc. and Harlowe, Inc. for the recent year.

| | | Gable, Inc. | | Harlowe, Inc. |
|---|---|---|---|---|
| Sales | $ | 800,000 | $ | 800,000 |
| Variable costs | | 400,000 | | 200,000 |
| Contribution margin | | 400,000 | | 600,000 |
| Fixed costs | | 200,000 | | 400,000 |
| Income from operations | $ | 200,000 | $ | 200,000 |

What total amount of net income will Harlowe, Inc. earn if it experiences a 10 percent increase in revenue?

A. $180, 000

B. $80,000

C. $260,000

D. $20,000

68.

| | | | | | | |
|---|---|---|---|---|---|---|
| Units sold | | 20 | | 40 | | 60 |
| Total salary cost | $ | 6,000 | $ | 7,800 | $ | 9,200 |
| Total cost of goods sold | | 14,000 | | 28,000 | | 42,000 |
| Depreciation cost per unit | $ | 120 | $ | 60 | $ | 40 |

Based on the above information, select the correct statement.

A. Cost of goods sold is a mixed cost.

B. Salary cost is a mixed cost.

C. Depreciation cost is a variable cost.

D. If the company sells 20 units for $540 each, it will incur a loss of $200.

69. Select the **incorrect** statement regarding fixed and variable costs.

A. Fixed cost per unit remains constant as the number of units increases.

B. Total variable cost is represented by a straight line sloping upward from the origin when total variable cost is graphed versus number of units.

C. The concept of relevant range applies to both fixed costs and variable costs.

D. The terms "fixed" and "variable" refer to the behavior of total cost.

70. The following information is for Companies M and N for the most recent year:

| | Company M | Company N |
|---|---|---|
| Sales | $500,000 | $500,000 |
| Variable costs | $300,000 | $200,000 |
| Fixed costs | $ 50,000 | $150,000 |

Based on this information, select the **incorrect** statement

A. M's magnitude of operating leverage was lower than N's.

B. N would suffer more than M from an equal drop in sales revenue.

C. M's cost structure carries greater risk and greater potential for profit.

D. If N's sales increased by 20%, its net income would increase by 40%.

71. Carson Corporation's sales increase from $500,000 to $600,000 in the current year. What is the percentage change in sales?

A. 20%

B. 25%

C. 22%

D. 16.7%

72. Frazier Company sells women's ski jackets. The average sales price is $275 and the variable cost per jacket is $175. Fixed Costs are $1,350,000. If Frazier sells 15,000 jackets, the contribution margin will be:

A. $2,775,000

B. $1,500,000

C. $2,250,000

D. $150,000

73. Mark Company, Inc. sells electronics. The company generated sales of $45,000. Contribution margin is $20,000 and net income is $4,000. Based on this information, the magnitude of operating leverage is:

A. 2.25 times

B. 11.25 times

C. 5 times

D. 6.25 times

74. Which characteristic is true of the scatter graph method, high-low method, and regression analysis?

A. All methods will produce the same estimate of variable and fixed costs.

B. All methods use historic data to estimate variable and fixed costs.

C. All methods use only two data points in analyzing a mixed cost.

D. None of these is true.

75. Taste of the Town, Inc. operates a gourmet sandwich shop. The company orders bread, cold cuts, and produce several times a week. If the cost of these items remains constant per customer served, the cost is said to be:

A. Variable

B. Fixed

C. Opportunity

D. Mixed

76. The following income statement was produced when volume of sales was at 400 units.

| | | |
|---|---|---|
| Sales Revenue | $ | 2,000 |
| Variable Cost | | 1,200 |
| Contribution Margin | $ | 800 |
| Fixed Cost | | 300 |
| Net Income | $ | 500 |

If volume reaches 500 units, net income will be:

A. $625

B. $1,800

C. $700

D. None of these

77. All of the following would be considered a fixed cost for a bottled water company **except**:

A. Rent on warehouse facility

B. Depreciation on its manufacturing equipment

C. Hourly wages for machine operators

D. Property taxes on its factory building

**True / False Questions**

78. The variable cost per unit increases in direct proportion to the activity base.

True False

79. If managers of a company do not understand the behavior of its costs, they are likely to make poor decisions about the company's operations.

True False

80. For a mixed cost, total cost increases in direct proportion to volume.

True False

81. The total variable cost increases in direct proportion to volume.

True False

82. If a company had a mixed cost structure, every dollar of revenue after covering the fixed costs would be pure profit.

True False

83. As activity increases, the fixed cost per unit increases while the variable cost per unit remains constant.

True False

84. Risk refers to the possibility that sacrifices may exceed benefits.

True False

85. Operating leverage enables a company to convert small changes in fixed costs into dramatic changes in profitability.

True False

86. If a company shifts its cost structure by decreasing fixed costs and increasing variable costs, it will lower both the level of risk and its potential for profits.

True False

87. If revenues are expected to decline, management should attempt to convert its variable costs into fixed costs.

True False

88. Companies with low operating leverage will experience lower profits when sales increase than will companies with higher operating leverage.

True False

89. A company with a completely fixed cost structure will have operating leverage of 1.

True False

90. Contribution margin represents the amount available to cover fixed expenses and then provide company profits.

True False

91. No contribution margin is provided by selling one unit of a product at a price of $35 if variable production costs are $20, variable general and administrative costs are $5, and fixed costs are $10 per unit.

True False

92. The contribution margin format income statement is **not** widely used for external financial reporting, but is allowed by GAAP.

True False

93. The contribution margin format income statement classifies costs according to their behavior patterns.

True False

94. Contribution margin can only be determined if costs are separated into product and period costs.

True False

95. If a company has both fixed and variable costs, their operating leverage will always be greater than 1.

True False

96. The higher the magnitude of a company's operating leverage, the more benefit the company will receive from a given percentage increase in revenue.

True False

97. The higher the magnitude of a company's operating leverage, the smaller the decrease in profit for a given percentage decrease in revenue.

True False

98. A low magnitude of operating leverage is best for most companies.

True False

99. The BRC Company is considering the introduction of a new line of high end electronics. Because there is considerable uncertainty with regard to the demand for the products, the company would probably be served better by a variable cost structure.

True False

100. Descriptions of cost behavior as fixed or variable pertain to a particular range of activity.

True False

101. Variable costs will become fixed outside the relevant range.

True False

102. Within the relevant range, the fixed cost per unit can be expected to decrease with increases in volume.

True False

103. The activity base selected determines whether a cost behaves as a variable cost or fixed cost.

True False

104. A cost that is considered variable for one activity base may be considered fixed for a different activity base.

True False

105. One reason for computing the average cost for a product rather than the actual cost is that average cost is easier to compute.

True False

106. One way that computing an average cost per unit facilitates management decision making is that managers are provided more timely and more relevant cost information.

True False

107. Potential problems associated with cost averaging can be reduced by averaging the cost over a shorter span of time.

True False

108. A cost that is part selling cost and part manufacturing cost is referred to as a mixed cost.

True False

109. When selecting the high and low observations under the high-low method of analyzing mixed costs, the selection should be based on the dependent variable (cost).

True False

110. When using least-squares regression to determine variable and fixed costs, the r-square refers to the degree to which the change in the dependent variable can be explained by a change in the independent variable.

True False

111. An advantage of using the scattergraph method over the high-low method is that all points of data are used in determining the cost line.

True False

112. Multiple regression analysis should be performed when a single independent variable influences multiple dependent variables.

True False

113. In regression analysis, an r-square value of one indicates that there is a perfect fit between the independent and dependent variables.

True False

114. A disadvantage of the high-low method is that the high point and low point may not be representative of the total data set available.

True False

## Essay Questions

115. Blackstock Company manufactures digital cameras. Indicate whether the cost is a product cost or period cost AND whether its cost behavior is fixed, variable, or mixed by placing X's in the appropriate boxes. As an example, commissions paid to sales staff would be classified as a period cost and variable.

| | | | Cost Behavior | | |
|---|---|---|---|---|---|
| Cost | Product Cost | Period Cost | Fixed | Variable | Mixed |
| Insurance on executive offices | | | | | |
| Lens caps for digital cameras | | | | | |
| Depreciation on manufacturing equipment | | | | | |
| Shipping cost to deliver products to customers | | | | | |
| Salary of company president | | | | | |
| Wages of assembly workers | | | | | |
| Product advertising | | | | | |
| Utilities: electricity to run machines and for heat and lights in factory | | | | | |

116. How does total fixed cost behave when volume increases?

117. How does fixed cost per unit behave when volume decreases?

118. How does total variable cost respond when volume increases?

119. How does variable cost per unit behave when volume decreases?

120. If a company had a pure fixed cost structure, what would be the relationship between a given dollar increase in sales and net income?

121. What are mixed or semivariable costs? Give an example of a mixed cost.

122. What is operating leverage, and how does a company achieve operating leverage?

123. What is meant by the phrase, "cost structure?"

124. How is operating leverage related to cost structure?

125. Describe the format of an income statement prepared using the contribution margin approach.

126. For Marvin Company in 2013, the magnitude of operating leverage was 3.5. Demonstrate what this magnitude of operating leverage would mean for the company's profitability by creating an example.

127. If a company had a pure variable cost structure, what would be the relationship between contribution margin and net income, and what would be the magnitude of operating leverage?

128. What is meant by the phrase, "relevant range?" How does the concept of relevant range affect fixed costs?

129. Assume that wages expense is a variable cost and that the relevant range is 10,000 to 15,000 labor hours. Within that range, the cost is $15 per hour. What can you assume about wages expense outside this range?

130. What is an activity base, and how does the activity base relate to a variable cost?

131. Why would a company often calculate and use average costs of its products and services rather than actual costs?

132. Why would a company need to estimate the fixed and variable components of a mixed cost?

133. What is the high-low method used for?

134. Describe the steps in the high-low method.

135. What is a primary disadvantage of the high-low method of analyzing a mixed cost?

136. Compare least squares regression and the scattergraph method of analyzing mixed costs.

137. What advantages does the regression method of cost estimation offer, compared to the high-low and scattergraph methods of estimating mixed costs?

138.Select the term from the list provided that best matches each of the following descriptions. The first is done for you.

| Answer | Description | List of terms |
|---|---|---|
| 5 | A. A cost that remains constant in total when volume changes | 1. Mixed cost |
| | B. The way a cost changes relative to changes in a measure of activity | 2. Operating leverage |
| | C. A company's cost mix or relative proportion of variable and fixed costs to total costs | 3. Scattergraph method |
| | D. The difference between a company's sales revenue and its variable costs | 4. Contribution margin |
| | E. Costs composed of both fixed and variable components | 5. Fixed cost |
| | F. A cost that changes in total in direct proportion to changes in volume | 6. Cost behavior |
| | G. A factor that causes (or drives) changes in costs | 7. Activity base |
| | H. A condition in which a percentage change in revenue will produce a proportionately larger percentage change in net income | 8. Variable cost |
| | I. A method of estimating the fixed and variable components of a mixed cost using two data observations | 9. Cost structure |
| | J. A method of estimating the fixed and variable components of a mixed cost where data are plotted on a graph and a line is visually fit to the data | 10. High-low method |

139. Costs that might be incurred by service, merchandising, and manufacturing companies are described below:

**Required:**

Classify each cost as variable (V) or fixed (F) with respect to volume or level of activity.

Sales commissions paid to sales associates in a department store

Shipping cost for Amazon

Electricity cost to heat and light a law firm

Rent on a storeroom used by Turf Pros to store lawn equipment

Salary of a supervisor in a Best Buy distribution center

Wages paid to production workers in a General Motors plant

Insurance on a Hershey factory

Fuel costs for Southwest Airlines

Depreciation of office equipment by Microsoft Corporation

Dishwashing in an Olive Garden restaurant

Salary of the CEO of Microsoft

Lubricants used to maintain machinery in a textile factory

Cost of metal cans used in a dog food factory

Cost of pizza boxes for Domino's Pizza

Material handling costs for Frito Lay

140. Complete the following table to indicate your understanding of fixed and variable cost behavior by inserting one of the following responses in each box: "Remain constant," "Increase," or "Decrease."

| | When Activity Increases | When Activity Decreases |
|---|---|---|
| Unit fixed costs | | |
| Total fixed costs | | |
| Unit variable costs | | |
| Total variable costs | | |

141. Sandford Company manufactures one product. Its variable manufacturing cost is $16 per unit; total fixed manufacturing cost is $600,000.

**Required:**

1.) Calculate Sandford's total manufacturing costs if it produces 10,000 units.

2.) What would be the total cost per unit (including both fixed and variable costs) assuming that Sandford produces 10,000 units?

3.) Calculate Sandford's total manufacturing costs if it produces 20,000 units.

4.) What would be the total cost per unit assuming that Sandford produces 20,000 units?

5.) Compare your answers from parts 2 and 4. If the cost per unit is different at 10,000 units than at 20,000 units, explain why.

142. Phoenix Corporation manufactures smartphones, generally selling from 200,000 to 300,000 units per year. The following cost data apply to the activity levels shown:

| Number of Units | | 200,000 | 250,000 | 300,000 |
|---|---|---|---|---|
| Total costs | | | | |
| Fixed | $ | 15,000,000 | | |
| Variable | | 24,000,000 | | |
| Total costs | $ | 39,000,000 | | |
| | | | | |
| Cost per Unit | | | | |
| Fixed | $ | 75 | | |
| Variable | | 120 | | |
| Total cost per unit | $ | 195 | | |

**Required:**

1.) Complete the preceding table by filling the missing amounts for 250,000 and 300,000 units.

2.) Assume that Phoenix actually makes 280,000 units. What would be the total costs and the cost per unit at this level of activity?

3.) If Phoenix sells each unit for $220, what is Phoenix's magnitude of operating leverage at sales of 280,000 units?

143. Grant Company and Lee Company compete in the same market. The following budgeted income statements illustrate their cost structures.

| | Grant Company | | Lee Company | |
|---|---|---|---|---|
| Number of customers | | 200 | | 200 |
| Sales revenue (200 x $150) | $ | 30,000 | $ | 30,000 |
| Less variable costs | | 6,000 | | 18,000 |
| Contribution margin | $ | 24,000 | $ | 12,000 |
| Less fixed costs | | 19,000 | | 7,000 |
| Net income | $ | 5,000 | $ | 5,000 |

**Required:**

(a) If Grant Company lowers its price to $135, it will lure 80 customers away from Lee Company. Prepare Grant's income statement based on 280 customers.

(b) If Lee Company lowers its price to $135 (assuming that Grant Company is still charging $150 per customer), Lee would lure 80 customers away from Grant. Prepare Lee's income statement based on 280 customers.

(c) Which of the companies would benefit more from lowering its sales price to attract more customers, and why?

144. Income statements for three companies are provided below:

| | Company A | | Company B | | Company C | |
|---|---|---|---|---|---|---|
| Sales (20 units) | $ | 1,000 | $ | 1,000 | $ | 1,000 |
| Less variable costs | | 600 | | 300 | | - |
| Less fixed costs | | 200 | | 500 | | 800 |
| Net income | $ | 200 | $ | 200 | $ | 200 |

**Required:**

(a) Prepare new income statements for the firms assuming each sells one additional unit (i.e. each firm sells 21 units)

(b) Briefly describe the effect of cost structure on profitability.

145. Former NFL coach Joe Gibbs is highly sought after as a guest speaker. His fee can run as high as $150,000 for a single two-hour appearance. Recently, he was asked to speak at a seminar offered by the National Sports in Education Foundation (NSEF). Due to the charitable nature of the organization, Mr. Gibbs offered to speak for $100,000. NSEF planned to invite 350 guests who would each make a $500 contribution to the organization. The Foundation's executive director was concerned about committing so much of the organization's cash to this one event. So instead of the $100,000 fee she countered with an offer to pay Mr. Gibbs 50% of the revenue received from the seminar and no other payments.

**Required:**

(a) Classify the two offers in terms of cost behavior (fixed vs. variable).

Scenario A, NSEF pays Gibbs a $100,000 fee:
Scenario B, NSEF pays Gibbs 50% of revenue:

(b) Compute the budgeted income (assuming there are no other expenses) under each of the following scenarios:

1) NSEF agrees to pay the $100,000 fee, and 350 guests actually attend the seminar; and
2) NSEF pays Mr. Gibbs 50% of revenue, and 350 guests attend the seminar.

(c) For each scenario ($100,000 fee vs. 50% of revenue), compute the percentage increase in profit that would result if the Foundation is able to increase attendance by 20 percent over the original plan (to a total of 420).

(d) For each scenario, compute NSEF's cost per contributor if 350 attend and if 420 contributors attend.

(e) Summarize the impact on risk and profits of shifting the cost structure from fixed to variable costs.

146. Assume that Microsoft and Sony both plan to introduce a new hand-held video game. Microsoft plans to use a heavily automated production process to produce its product while Sony plans to use a labor-intensive production process. The following revenue and cost relationships are provided:

| | Microsoft Game | | Sony Game | |
|---|---|---|---|---|
| Selling price per unit | | 150 | | 150 |
| Variable costs per unit | | | | |
| Direct materials | $ | 27.00 | $ | 27.00 |
| Direct labor | | 7.50 | | 30.00 |
| Overhead | | 7.50 | | 30.00 |
| Selling and administrative | | 3.00 | | 3.00 |
| Annual fixed costs | | | | |
| Overhead | $ | 600,000 | $ | 240,000 |
| Selling and administrative | | 135,000 | | 135,000 |

**Required:**

(a) Compute the contribution margin per unit for each company.

(b) Prepare a contribution income statement for each company assuming each company sells 8,000 units.

(c) Compute each firm's net income if the number of units sold increases by 10%.

(d) Which firm will have more stable profits when sales change? Why?

147.Cannon Company operates a clothing store that reported the following operating results for 2013:

| Income Statement | |
|---|---|
| Sales revenue | $2,000,000 |
| Cost of goods sold | (1,200,000) |
| Gross margin | $ 800,000 |
| Employee commissions and bonuses (5% of sales) | ( 100,000) |
| Depreciation expense | ( 150,000) |
| Salaries expense | ( 260,000) |
| Shipping and delivery expense (2% of sales) | ( 40,000) |
| Advertising expense | ( 80,000) |
| Net income | $ 170,000 |

Required: Prepare an income statement for Cannon Company using the contribution margin format.

148.Contribution margin income statements for two competing companies are provided below:

| | Yin Company | | Yang Company | |
|---|---|---|---|---|
| Revenue | $ | 750,000 | $ | 750,000 |
| Less variable cosrts | | 300,000 | | 525,000 |
| Contribution margin | $ | 450,000 | $ | 225,000 |
| Less fixed costs | | 405,000 | | 180,000 |
| Net income | $ | 45,000 | $ | 45,000 |

**Required:**

1) Show each company's cost structure by inserting the percentage of the company's revenue represented by each item on the contribution income statement.

2) Compute each company's magnitude of operating leverage.

3) Using the operating leverage measures computed in requirement 2, determine the increase in each company's net income (percentage and amount) if each company experiences a 10 percent increase in sales.

4) Assume that sales are expected to continue to increase for the foreseeable future, which company probably has more desirable cost structure? Why?

149. ETutor is an online tutoring service provider that is particularly popular with college students. The company is interested in estimating the fixed and variable components of its tutoring services costs. The manager believes that these costs are driven by the number of hours of tutoring services provided. The following information was gathered for the last six months of business:

| Month | Number of Hours | Tutoring costs |
|---|---|---|
| January | 25,000 | $308,000 |
| February | 41,000 | 420,000 |
| March | 29,000 | 352,000 |
| April | 31,000 | 373,000 |
| May | 34,000 | 378,000 |
| June | 18,000 | 252,000 |

**Required:**

1) Compute the average tutoring cost per hour for the six-month period.

2) Use the high-low method to estimate the total fixed cost and the variable cost per hour.

3) Name one advantage and one disadvantage of the high-low method.

4) Describe the scattergraph method that can be used to analyze mixed costs.

150. Maryland Novelties Company produces and sells souvenir products. Monthly income statements for two activity levels are provided below:

| Unit volumes | 20,000 units | | 30,000 units | |
|---|---|---|---|---|
| Revenue | $ | 150,000 | $ | 225,000 |
| Less cost of goods sold | | 60,000 | | 90,000 |
| Gross margin | $ | 90,000 | $ | 135,000 |
| Less operating expenses | | | | |
| Salaries and commissions | | 20,000 | | 25,000 |
| Advertising expenses | | 30,000 | | 30,000 |
| Administrative expenses | | 12,500 | | 12,500 |
| Total operating expenses | | 62,500 | | 67,500 |
| Net income | $ | 27,500 | $ | 67,500 |

**Required:**

1) Identify the mixed expense(s).

2) Use the high-low method to separate the mixed costs into variable and fixed components.

3) Prepare a contribution margin income statement at the 20,000-unit level.

# Chapter 02 Cost Behavior, Operating Leverage, and Profitability Analysis

## Answer Key

### Multiple Choice Questions

1. Java Joe operates a chain of coffee shops. The company pays rent of $20,000 per year for each shop. Supplies (napkins, bags and condiments) are purchased as needed. The manager of each shop is paid a salary of $3,000 per month, and all other employees are paid on an hourly basis. Relative to the number of customers for a shop, the cost of supplies is which kind of cost?

A. Fixed cost
B. Variable cost
C. Mixed cost
D. Relevant cost

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 1 Easy*
*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

2. Select the correct statement regarding fixed costs.

A. Because they do not change, fixed costs should be ignored in decision making.

B. The fixed cost per unit decreases when volume increases.

C. The fixed cost per unit increases when volume increases.

D. The fixed cost per unit does not change when volume decreases.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

3. Larry's Lawn Care incurs significant gasoline costs. This cost would be classified as a variable cost if the total gasoline cost:

A. varies inversely with the number of hours the lawn equipment is operated.

B. is not affected by the number of hours the lawn equipment is operated.

C. increases in direct proportion to the number of hours the lawn equipment is operated.

D. None of these

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

4. Select the correct statement regarding fixed costs.

A. There is a contradiction between the term "fixed cost per unit" and the behavior pattern implied by the term.

B. Fixed cost per unit is not fixed.

C. Total fixed cost remains constant when volume changes.

D. All of these are correct statements.

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 1 Easy*
*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

5. Rock Creek Bottling Company pays its production manager a salary of $6,000 per month. Salespersons are paid strictly on commission, at $1.50 for each case of product sold.

For Rock Creek Bottling Company, the production manager's salary is an example of:

A. a variable cost.

B. a mixed cost.

C. a fixed cost.

D. None of these

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 1 Easy*
*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

6. Rock Creek Bottling Company pays its production manager a salary of $6,000 per month. Salespersons are paid strictly on commission, at $1.50 for each case of product sold.

For Rock Creek Bottling Company, the salespersons' commissions are an example of:

A. a fixed cost.

B. a variable cost.

C. a mixed cost.

D. None of these

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

7. Based on the following cost data, what conclusions can you make about Product A and Product B?

| | Total Cost | |
|---|---|---|
| Production: | Product A | Product B |
| 10 units | $100 | ? |
| 100 units | $1,000 | ? |
| 1,000 units | $10,000 | ? |
| | Unit Cost | |
| Production: | Product A | Product B |
| 10 units | ? | $10,000 |
| 100 units | ? | $1,000 |
| 1,000 units | ? | $100 |

A. Product A is a fixed cost and Product B is a variable cost.

B. Product A is a variable cost and Product B is a fixed cost.

C. Product A and Product B are both variable costs.

D. Product A and Product B are both mixed costs.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

8. Based on the following cost data, items labeled (a) and (b) in the table below are which of the following amounts, respectively?

| | | |
|---|---|---|
| Number of units: | 1,500 | 3,000 |
| Total cost: | | |
| Variable | $7,500 | $15,000 |
| Fixed | $6,000 | $6,000 |
| | | |
| Cost per unit: | | |
| Variable | $5 | (a) |
| Fixed | $4 | (b) |

A. (a) = $3.00; (b) = $3.00

B. (a) = $5.00; (b) = $4.00

C. (a) = $2.50; (b) = $2.00

**D.** (a) = $5.00; (b) = $2.00

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

9. Two different costs incurred by Ruiz Company exhibit the following behavior pattern per unit:

| | Units Sold | | | |
|---|---|---|---|---|
| | 50 | 100 | 150 | 200 |
| Cost # 1 | $300 per unit | $150 per unit | $100 per unit | $75 per unit |
| Cost # 2 | $2 per unit | $2 per unit | $2 per unit | $2 per unit |

Cost #1 and Cost #2 exhibit which of the following cost behavior patterns, respectively?

A. Fixed/Variable

B. Variable/Variable

C. Fixed/Fixed

D. Variable/Fixed

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

10. Wu Company incurred $40,000 of fixed cost and $50,000 of variable cost when 4,000 units of product were made and sold.

If the company's volume doubles, the total cost per unit will:

A. stay the same.

B. decrease.

C. double as well.

D. increase but will not double.

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

11. Wu Company incurred $40,000 of fixed cost and $50,000 of variable cost when 4,000 units of product were made and sold.

If the company's volume increases to 5,000 units, the total cost per unit will be:

A. $18.00.

B. $20.00.

**C.** $20.50.

D. $22.50.

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Analyze*

*Difficulty: 3 Hard*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

12. Wu Company incurred $40,000 of fixed cost and $50,000 of variable cost when 4,000 units of product were made and sold.

If the company's volume increases to 5,000 units, the company's total costs will be:

A. $100,000

B. $90,000

**C.** $102,500

D. $80,000

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

13. Wu Company incurred $40,000 of fixed cost and $50,000 of variable cost when 4,000 units of product were made and sold.

If the company's volume doubles, the company's **total cost** will:

A. stay the same.

B. double as well.

C. increase but will not double.

D. decrease.

*AACSB: Analytic*

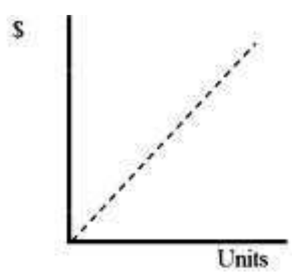
*AICPA FN: Measurement*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

14. In the graph below, which depicts the relationship between units produced and total cost, the dotted line depicts which type of total **cost**?




A. Variable cost

B. Fixed cost

C. Mixed cost

D. None of these

*AACSB: Analytic*

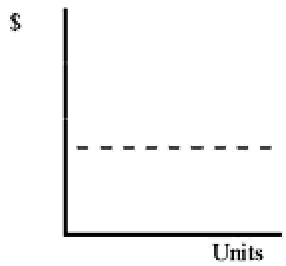
*AICPA BB: Industry*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

15. In the graph below, which depicts the relationship between units produced and unit cost, the dotted line depicts which type of **cost per unit**?




A. Variable cost

B. Fixed cost

C. Mixed cost

D. None of these

*AACSB: Analytic*

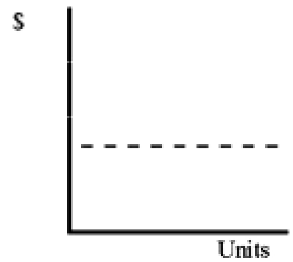
*AICPA BB: Industry*

*Blooms: Understand*

*Difficulty: 3 Hard*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

16. In the graph below, which depicts the relationship between units produced and total cost, the dotted line depicts which type of **total cost**?




A. Variable cost

B. Fixed cost

C. Mixed cost

D. None of these

*AACSB: Analytic*

*AICPA BB: Industry*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

17. Pickard Company pays its sales staff a base salary of $4,500 a month plus a $3.00 commission for each product sold. If a salesperson sells 800 units of product in January, the employee would be paid:

**A.** $6,900

B. $4,500

C. $2,300

D. $2,700

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Apply*

*Difficulty: 1 Easy*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

18. Quick Change and Fast Change are competing oil change businesses. Both companies have 5,000 customers. The price of an oil change at both companies is $20. Quick Change pays its employees on a salary basis, and its salary expense is $40,000. Fast Change pays its employees $8 per customer served. Suppose Quick Change is able to lure 1,000 customers from Fast Change by lowering its price to $18 per vehicle. Thus, Quick Change will have 6,000 customers and Fast Change will have only 4,000 customers.

    Select the **correct** statement from the following.

    A. Quick Change's profit will increase while Fast Change's profit will fall.
    B. Fast Change's profit will fall but it will still earn a higher profit than Quick Change.
    C. Profits will decline for both Quick Change and Fast Change.
    D. Quick Change's profit will remain the same while Fast Change's profit will decrease.

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Analyze*

*Difficulty: 3 Hard*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

19. Hard Nails and Bright Nails are competing nail salons. Both companies have the same number of customers. Both charge the same price for a manicure. The only difference is that Hard Nails pays its manicurists on a salary basis (i.e., a fixed cost structure) while Bright Nails pays its manicurists on the basis of the number of customers they serve (i.e., a variable cost structure). Both companies currently make the same amount of net income. If sales of both salons increase by an equal amount, Hard Nails:

A. will earn a higher profit than Bright Nails.

B. will earn a lower profit than Bright Nails.

C. will earn the same amount of profit as Bright Nails.

D. The answer cannot be determined from the information provided.

*AACSB: Analytic*
*AICPA FN: Measurement*
*Blooms: Analyze*
*Difficulty: 3 Hard*
*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

20. Fixed cost per unit:

A. decreases as production volume decreases.

B. is not affected by changes in the production volume.

C. decreases as production volume increases.

D. increases as production volume increases.

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 1 Easy*
*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

21. Cool Runnings operates a chain of frozen yogurt shops. The company pays $5,000 of rent expense per month for each shop. The managers of each shop are paid a salary of $3,000 per month and all other employees are paid on an hourly basis. Relative to the number of shops, the cost of rent is which kind of cost?

A. Variable cost
B. Fixed cost
C. Mixed cost
D. Opportunity cost

*AACSB: Analytic*
*AICPA FN: Measurement*
*Blooms: Analyze*
*Difficulty: 2 Medium*
*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

22. Companies A and B are in the same industry and are identical except for cost structure. At a volume of 50,000 units, the companies have equal net incomes. At 60,000 units, Company A's net income would be substantially higher than B's. Based on this information,

A. Company A's cost structure has more variable costs than B's.
B. Company A's cost structure has higher fixed costs than B's.
C. Company B's cost structure has higher fixed costs than A's.
D. At a volume of 50,000 units, Company A's magnitude of operating leverage was lower than B's.

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Analyze*
*Difficulty: 3 Hard*
*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

23. Operating leverage exists when:

A. a company utilizes debt to finance its assets.

B. management buys enough of the company's shares of stock to take control of the corporation.

C. the organization makes purchases on credit instead of paying cash.

D. small percentage changes in revenue produce large percentage changes in profit.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

24. For the last two years BRC Company had net income as follows:

| | | 2012 | 2013 |
|---|---|---|---|
| Net Income | | $160,000 | $200,000 |

What was the percentage change in income from 2012 to 2013?

A. 20% increase

B. 20% decrease

C. 25% increase

D. 25% decrease

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

25. The activity director for City Recreation is planning an activity. She is considering alternative ways to set up the activity's cost structure. Select the **incorrect** statement from the following.

A. If the director expects a low turnout, she should use a fixed cost structure.

B. If the director expects a large turnout, she should attempt to convert variable costs into fixed costs.

C. If the director shifts the cost structure from fixed to variable, the level of risk decreases.

D. If the director shifts the cost structure from fixed to variable, the potential for profits will be reduced.

*AACSB: Analytic*
*AICPA FN: Decision Making*
*AICPA FN: Risk Analysis*
*Blooms: Analyze*
*Difficulty: 3 Hard*
*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

26. Select the **incorrect** statement regarding the relationship between cost behavior and profits.

A. A pure variable cost structure offers higher potential rewards.

B. A pure fixed cost structure offers more security if volume expectations are not achieved.

C. In a pure variable cost structure, when revenue increases by $1, so do profits.

D. In a pure fixed cost structure, the unit selling price and unit contribution margin are equal.

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Analyze*
*Difficulty: 3 Hard*
*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

27. Select the correct statement from the following.

A. A fixed cost structure offers less risk (i.e., less earnings volatility) and higher opportunity for profitability than does a variable cost structure.

B. A variable cost structure offers less risk and higher opportunity for profitability than does a fixed cost structure.

C. A fixed cost structure offers greater risk but higher opportunity for profitability than does a variable cost structure.

D. A variable cost structure offers greater risk but higher opportunity for profitability than does a fixed cost structure.

*AACSB: Analytic*
*AICPA FN: Risk Analysis*
*Blooms: Analyze*
*Difficulty: 3 Hard*
*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

28. The manager of Kenton Company stated that 45% of its total costs were fixed. The manager was describing the company's:

A. operating leverage.

B. contribution margin.

C. cost structure.

D. cost averaging.

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

29. Select the **incorrect** statement regarding cost structures.

A. Highly leveraged companies will experience greater profits than companies less leveraged when sales increase.

B. The more variable cost, the higher the fluctuation in income as sales fluctuate.

C. When sales change, the amount of the corresponding change in income is affected by the company's cost structure.

D. Faced with significant uncertainty about future revenues, a low leverage cost structure is preferable to a high leverage cost structure.

*AACSB: Analytic*
*AICPA FN: Risk Analysis*
*Blooms: Understand*
*Difficulty: 3 Hard*
*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

30. Executive management at Ballard Books is very optimistic about the chain's ability to achieve significant increases in sales in each of the next five years. The company will most benefit if management creates a:

A. low leverage cost structure.

B. medium leverage cost structure.

C. high leverage cost structure.

D. no leverage cost structure.

*AACSB: Analytic*
*AICPA FN: Decision Making*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

31. Based on the income statements shown below, which division has the cost structure with the highest operating leverage?

| | Soft Drinks | Bottled Water | Fruit Juices |
|---|---|---|---|
| Revenue | $50,000 | $50,000 | $50,000 |
| Variable costs | (10,000) | ( 5000) | (30,000) |
| Contribution margin | 40,000 | 45,000 | 20,000 |
| Fixed costs | (30,000) | (40,000) | (10,000) |
| Net income | $10,000 | $5,000 | $10,000 |

A. Bottled Water.

B. Fruit Juices.

C. Soft Drinks.

D. The three divisions have identical operating leverage.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Analyze*

*Difficulty: 1 Easy*

*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

32. The following income statements are provided for two companies operating in the same industry

| | Felix Company | | Jinx Company | |
|---|---|---|---|---|
| Revenue | $ | 200,000 | $ | 200,000 |
| Variable costs | | (25,000) | | (70,000) |
| Contribution margin | | 175,000 | | 130,000 |
| Fixed costs | | (70,000) | | (25,000) |
| Net income | $ | 105,000 | $ | 105,000 |

Assuming sales increase by $1,000, select the correct statement from the following:

A. Felix's net income will be more than Jinx's.

B. Both companies will experience an increase in profit.

C. Felix's net income will increase by $250.

D. Jinx's net income will increase by 6%.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

33. The excess of a product's selling price over its variable costs is referred to as:

A. gross profit

B. gross margin

C. contribution margin

D. manufacturing margin

*AACSB: Reflective Thinking*

*AICPA BB: Critical Thinking*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

34. Select the **incorrect** statement regarding the contribution margin income statement.

A. The contribution margin approach for the income statement is unacceptable for external reporting.

B. Contribution margin represents the amount available to cover product costs and thereafter to provide profit.

C. The contribution margin approach requires that all costs be classified as fixed or variable.

D. Assuming no change in fixed costs, a $1 increase in contribution margin will result in a $1 increase in profit.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

35. Which of the following items would **not** be found on a contribution format income statement?

A. Fixed cost

B. Variable cost

C. Gross margin

D. Net income

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

36. The following income statement is provided for Ramirez Company in 2013:

| | | |
|---|---|---|
| Sales revenue (2,500 units x $40 per unit) | $ | 100,000 |
| Cost of goods sold (variable: 2,500 units x $16 per unit) | | (40,000) |
| Cost of goods sold (fixed) | | (8,000) |
| Gross margin | | 52,000 |
| Administrative salaries | | (12,000) |
| Depreciation | | (8,000) |
| Supplies (2,500 units x $4 per unit) | | (10,000) |
| Net income | $ | 22,000 |

What amount was the company's contribution margin?

**A.** $50,000

B. $22,000

C. $52,000

D. $60,000

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Analyze*

*Difficulty: 3 Hard*

*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

37. In order to prepare a contribution format income statement:

A. costs must be separated into manufacturing and selling, general, and administrative costs.

B. costs must be separated into cost of goods sold and operating expenses.

C. costs must be separated into variable and fixed costs.

D. costs must be separated into mixed, variable and fixed costs.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

38. Select from the following the **incorrect** statement regarding contribution margin.

A. Sales - fixed costs = contribution margin

B. Net income + total fixed costs = contribution margin

C. At the breakeven point (where the company has neither profit nor loss), total fixed costs = total contribution margin

D. Total sales revenue times the contribution margin percentage = total contribution margin

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Analyze*

*Difficulty: 3 Hard*

*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

39. The following information is provided for Southall Company:

| | |
|---|---|
| Sales revenue | $ 125,000 |
| Variable manufacturing costs | 42,500 |
| Fixed manufacturing costs | 37,500 |
| Variable selling and administrative costs | 15,000 |
| Fixed selling and administrative costs | 12,500 |

What is this company's contribution margin?

A. $30,000

B. $17,500

C. $45,000

**D.** $67,500

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Apply*

*Difficulty: 2 Medium*

*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

40. Which of the following equations can be used to compute a firm's magnitude of operating leverage?

A. Net income/sales

B. Fixed costs/contribution margin

C. Contribution margin/net income

D. Net income/contribution margin

*AACSB: Analytic*

*AICPA FN: Risk Analysis*

*Blooms: Remember*

*Difficulty: 2 Medium*

*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

41. The following income statement is provided for Vargas, Inc.

| | | |
|---|---|---|
| Sales revenue (2,500 units x $60 per unit) | $ | 150,000 |
| Cost of goods sold (variable; 2,500 units x $20 per unit) | | (50,000) |
| Cost of goods sold (fixed) | | (8,000) |
| Gross margin | | 92,000 |
| Administrative salaries | | (42,000) |
| Depreciation | | (10,000) |
| Supplies (2,500 units x $4 per unit) | | (10,000) |
| Net income | $ | 30,000 |

What is this company's magnitude of operating leverage?

A. 3.07

B. 0.33

**C.** 3.00

D. 1.67

*AACSB: Analytic*

*AICPA FN: Risk Analysis*

*Blooms: Analyze*

*Difficulty: 3 Hard*

*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

42. The following income statement is provided for Grant, Inc.

| | | |
|---|---|---|
| Sales revenue (1,500 @ $30 per unit) | $ | 45,000 |
| Variable costs (1,500 @ $14 per unit) | | 21,000 |
| Fixed costs | | 16,000 |
| Net income | $ | 8,000 |

What is this company's magnitude of operating leverage?

A. 0.33

B. 1.31

C. 2.00

**D.** 3.00

*AACSB: Analytic*

*AICPA FN: Risk Analysis*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

43. The magnitude of operating leverage for Forbes Corporation is 1.8 when sales are $200,000 and net income is $24,000. If sales increase by 5%, what is net income expected to be?

A. $25,200

**B.** $26,160

C. $24,667

D. $43,200

*AACSB: Analytic*

*AICPA FN: Risk Analysis*

*Blooms: Analyze*

*Difficulty: 3 Hard*

*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

44. The magnitude of operating leverage for Blue Ridge Corporation is 3.5 when sales are $200,000 and net income is $36,000. If sales decrease by 6%, net income is expected to decrease by what amount?

A. $2,160

**B.** $7,560

C. $3,420

D. $1,260

*AACSB: Analytic*

*AICPA FN: Risk Analysis*

*Blooms: Analyze*

*Difficulty: 3 Hard*

*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

45. The magnitude of operating leverage for Perkins Corporation is 4.5 when sales are $100,000. If sales increase to $110,000, profits would be expected to increase by what percent?

A. 4.5%

B. 14.5%

**C.** 45%

D. 10%

*AACSB: Analytic*

*AICPA FN: Risk Analysis*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

46. Based on the income statements of the three following retail businesses, which company has the highest operating leverage?

| | Alpha Company | Beta Company | Gamma Company |
|---|---|---|---|
| Revenue | $200,000 | $200,000 | $200,000 |
| Variable costs | (95,000) | (155,000) | (125,000) |
| Contribution margin | $105,000 | $45,000 | $75,000 |
| Fixed costs | (80,000) | (20,000) | (50,000) |
| Net income | $25,000 | $25,000 | $25,000 |

A. Alpha Company

B. Beta Company

C. Gamma Company

D. They all have same operating leverage

*AACSB: Analytic*
*AICPA FN: Risk Analysis*
*Blooms: Analyze*
*Difficulty: 2 Medium*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

47. Wham Company sells electronic squirrel repellants for $60. Variable costs are 60% of sales and total fixed costs are $40,000. What is the firm's magnitude of operating leverage if 2,000 units are sold?

A. 0.17

**B.** 6.0

C. 2.25

D. None of these

*AACSB: Analytic*
*AICPA FN: Risk Analysis*
*Blooms: Analyze*
*Difficulty: 3 Hard*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

48. Whether a cost behaves as a fixed cost or as a variable cost depends upon the:

A. presence of fixed costs.

B. cost structure of the company.

C. industry.

D. activity base used.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

49. Craft, Inc. normally produces between 120,000 and 150,000 units each year. Producing more than 150,000 units alters the company's cost structure. For example, fixed costs increase because more space must be rented, and additional supervisors must be hired. The production range between 120,000 and 150,000 is called the:

A. differential range.

B. median range.

C. relevant range.

D. leverage range.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

50. Mug Shots operates a chain of coffee shops. The company pays rent of $15,000 per year for each shop. Supplies (napkins, bags and condiments) are purchased as needed. The managers of each shop are paid a salary of $2,500 per month and all other employees are paid on an hourly basis. The cost of rent relative to the number of customers in a particular shop and relative to the number of customers in the entire chain of shops is which kind of cost, respectively?

A. Variable cost/fixed cost

B. Fixed cost/fixed cost

C. Fixed cost/variable cost

D. Variable cost/variable cost

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

51. Select the **incorrect** statement regarding the relevant range of volume.

A. Total fixed costs are expected to remain constant.

B. Total variable costs are expected to vary in direct proportion with changes in volume.

C. Variable cost per unit is expected to remain constant.

D. Total cost per unit is expected to remain constant.

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

52. What are the expected average quarterly costs of running a consulting practice if fixed costs are expected to be $4,000 a month and variable costs are expected to be $100 per client for each quarter? Expected number of clients for the year are:

| Jan-March | April-June | July-Sep | Oct-Dec |
|---|---|---|---|
| 110 | 140 | 150 | 100 |

A. $12,500

**B.** $24,500

C. $16,500

D. $19,500

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Analyze*

*Difficulty: 3 Hard*

*Learning Objective: 02-05 Select an appropriate time period for calculating the average cost per unit.*

53. Yankee Tours provide seven-day guided tours along the New England coast. The company pays its guides a total of $100,000 per year. The average cost of supplies, lodging and food per customer is $500. The company expects a total of 500 customers during the period January - June, and a total of 1,500 customers from July through December. Yankee wants to earn $100 income per customer. For promotional reasons the company desires to charge the same price throughout the year. Based on this information, what is the correct price per customer? (round to nearest dollar)

A. $450

B. $500

**C.** $650

D. $700

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Analyze*

*Difficulty: 3 Hard*

*Learning Objective: 02-05 Select an appropriate time period for calculating the average cost per unit.*

54. Select the **incorrect** statement regarding the use of average unit costs.

A. Average costs should be calculated for a sufficiently long time period to capture seasonal fluctuations in costs.

B. Average costs are often more relevant for decision making than are actual costs.

C. Average cost information can help managers evaluate performance of the company or departments in the company.

D. Cost averaging should be used only for fixed costs, and not for variable costs.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 02-05 Select an appropriate time period for calculating the average cost per unit.*

55. The following information is given regarding driving lessons provided by Arrive Alive Company over several spans of time:

| | Length of Time | | |
|---|---|---|---|
| | TODAY | ONE YEAR | FIVE YEARS |
| Total cost of lessons | $600 | $110,000 | $508,000 |
| Number of lessons | 50 | 10,000 | 55,000 |

Select the **incorrect** statement from the following.

A. The average cost per lesson over the five-year period was $9.24.

B. Based on the most current information, the cost per lesson was $12.00.

C. The average cost based on the total five-year period is probably the most appropriate cost for pricing purposes.

D. The selection of the most appropriate time span for calculating the average cost often requires considerable judgment.

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Analyze*
*Difficulty: 2 Medium*
*Learning Objective: 02-05 Select an appropriate time period for calculating the average cost per unit.*

56. A cost that contains both fixed and variable elements is referred to as a:

A. mixed cost.

B. hybrid cost.

C. relevant cost.

D. nonvariable cost.

*AACSB: Reflective Thinking*
*AICPA BB: Critical Thinking*
*Blooms: Remember*
*Difficulty: 1 Easy*

*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

57. Which of the following costs typically include both fixed and variable components?

A. Direct materials

B. Direct labor

C. Factory overhead

D. None of these

*AACSB: Reflective Thinking*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

58. Southern Food Service operates six restaurants in the Atlanta area. The company pays rent of $20,000 per year for each shop. The managers of each shop are paid a salary of $4,200 per month and all other employees are paid on an hourly basis. Relative to the number of hours worked, total compensation cost for a particular shop is which kind of cost?

A. Mixed cost

B. Fixed cost

C. Variable cost

D. None of these

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

59. Production in 2013 for California Manufacturing, a producer of high security bank vaults, was at its highest point in the month of June when 80 units were produced at a total cost of $800,000. The lowest point in production was in January when only 20 units were produced at a cost of $440,000. The company is preparing a budget for 2013 and needs to project expected fixed cost for the budget year. Using the high/low method, the projected amount of fixed cost per month is

A. $120,000

**B.** $320,000

C. $480,000

D. $360,000

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

60. The following income statements are provided for Li Company's last two years of operation:

| | | 2012 | | 2013 |
|---|---|---|---|---|
| Number of units produced and sold | | 3,500 | | 3,000 |
| Sales revenue | $ | 101,500 | $ | 87,000 |
| Cost of goods sold | | 68,000 | | 60,000 |
| Gross margin | | 33,500 | | 27,000 |
| General, selling, and administrative expenses | | 13,000 | | 12,000 |
| Net income | $ | 20,500 | $ | 15,000 |

Assuming that cost behavior did not change over the two year period, what is the amount of the company's variable cost of goods sold per unit?

A. $12.00 per unit

B. $16.00 per unit

C. $22.00 per unit

D. None of these

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

61. The following income statements are provided for Li Company's last two years of operation:

| | | 2012 | | 2013 |
|---|---|---|---|---|
| Number of units produced and sold | | 3,500 | | 3,000 |
| Sales revenue | $ | 101,500 | $ | 87,000 |
| Cost of goods sold | | 68,000 | | 60,000 |
| Gross margin | | 33,500 | | 27,000 |
| General, selling, and administrative expenses | | 13,000 | | 12,000 |
| Net income | $ | 20,500 | $ | 15,000 |

Assuming that cost behavior did not change over the two year period, what is the annual amount of the company's fixed manufacturing overhead?

**A.** $12,000

B. $24,000

C. $26,000

D. None of these

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

62. The following income statements are provided for Li Company's last two years of operation:

| | | 2012 | | 2013 |
|---|---|---|---|---|
| Number of units produced and sold | | 3,500 | | 3,000 |
| Sales revenue | $ | 101,500 | $ | 87,000 |
| Cost of goods sold | | 68,000 | | 60,000 |
| Gross margin | | 33,500 | | 27,000 |
| General, selling, and administrative expenses | | 13,000 | | 12,000 |
| Net income | $ | 20,500 | $ | 15,000 |

Assuming that cost behavior did not change over the two year period, what is the company's annual fixed general, selling, and administrative cost?

A. $6,500

**B.** $6,000

C. $3,000

D. $2,500

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

63. The following income statements are provided for Li Company's last two years of operation:

| | | 2012 | | 2013 |
|---|---|---|---|---|
| Number of units produced and sold | | 3,500 | | 3,000 |
| Sales revenue | $ | 101,500 | $ | 87,000 |
| Cost of goods sold | | 68,000 | | 60,000 |
| Gross margin | | 33,500 | | 27,000 |
| General, selling, and administrative expenses | | 13,000 | | 12,000 |
| Net income | $ | 20,500 | $ | 15,000 |

Assuming that cost behavior did not change over the two year period, what is Li Company's contribution margin in 2013?

**A.** $33,000

B. $32,000

C. $39,000

D. $69,000

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

64. The results below represent what form of cost behavior?

| | | 2012 | | 2013 |
|---|---|---|---|---|
| Units | | 4,500 | | 4,800 |
| Total Cost | $ | 11,250 | $ | 12,000 |

A. Fixed Cost

B. Variable Cost

C. Mixed Cost

D. Opportunity Cost

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

65. Based on the following operating data, the operating leverage is:

| | | |
|---|---|---|
| Sales | $ | 500,000 |
| Variable costs | | 280,000 |
| Contribution margin | | 220,000 |
| Fixed costs | | 180,000 |
| Income from operations | $ | 40,000 |

A. 0.18

**B.** 5.50

C. 1.22

D. 12.5

*AACSB: Analytic*

*AICPA FN: Risk Analysis*

*Blooms: Apply*

*Difficulty: 1 Easy*

*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

66. The following information is for Gable, Inc. and Harlowe, Inc. for the recent year.

| | Gable, Inc. | Harlowe, Inc. |
|---|---|---|
| Sales | $ 800,000 | $ 800,000 |
| Variable costs | 400,000 | 200,000 |
| Contribution margin | 400,000 | 600,000 |
| Fixed costs | 200,000 | 400,000 |
| Income from operations | $ 200,000 | $ 200,000 |

Based on the above data, which company has a higher operating leverage?

A. Gable, Inc.

B. Harlowe, Inc.

C. Operating leverage is the same for both companies

D. Cannot be determined

*AACSB: Analytic*

*AICPA FN: Risk Analysis*

*Blooms: Apply*

*Difficulty: 2 Medium*

*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

67. The following information is for Gable, Inc. and Harlowe, Inc. for the recent year.

| | Gable, Inc. | Harlowe, Inc. |
|---|---|---|
| Sales | $ 800,000 | $ 800,000 |
| Variable costs | 400,000 | 200,000 |
| Contribution margin | 400,000 | 600,000 |
| Fixed costs | 200,000 | 400,000 |
| Income from operations | $ 200,000 | $ 200,000 |

What total amount of net income will Harlowe, Inc. earn if it experiences a 10 percent increase in revenue?

A. $180, 000

B. $80,000

**C.** $260,000

D. $20,000

*AACSB: Analytic*

*AICPA FN: Risk Analysis*

*Blooms: Apply*

*Difficulty: 2 Medium*

*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

68.

| | | | | | | |
|---|---|---|---|---|---|---|
| Units sold | | 20 | | 40 | | 60 |
| Total salary cost | $ | 6,000 | $ | 7,800 | $ | 9,200 |
| Total cost of goods sold | | 14,000 | | 28,000 | | 42,000 |
| Depreciation cost per unit | $ | 120 | $ | 60 | $ | 40 |

Based on the above information, select the correct statement.

A. Cost of goods sold is a mixed cost.

B. Salary cost is a mixed cost.

C. Depreciation cost is a variable cost.

D. If the company sells 20 units for $540 each, it will incur a loss of $200.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

69. Select the **incorrect** statement regarding fixed and variable costs.

A. Fixed cost per unit remains constant as the number of units increases.

B. Total variable cost is represented by a straight line sloping upward from the origin when total variable cost is graphed versus number of units.

C. The concept of relevant range applies to both fixed costs and variable costs.

D. The terms "fixed" and "variable" refer to the behavior of total cost.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

*Learning Objective: 02-05 Select an appropriate time period for calculating the average cost per unit.*

70. The following information is for Companies M and N for the most recent year:

| | Company M | Company N |
|---|---|---|
| Sales | $500,000 | $500,000 |
| Variable costs | $300,000 | $200,000 |
| Fixed costs | $ 50,000 | $150,000 |

Based on this information, select the **incorrect** statement

A. M's magnitude of operating leverage was lower than N's.

B. N would suffer more than M from an equal drop in sales revenue.

C. M's cost structure carries greater risk and greater potential for profit.

D. If N's sales increased by 20%, its net income would increase by 40%.

*AACSB: Analytic*

*AICPA FN: Risk Analysis*

*Blooms: Analyze*

*Difficulty: 3 Hard*

*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

71. Carson Corporation's sales increase from $500,000 to $600,000 in the current year. What is the percentage change in sales?

**A.** 20%

B. 25%

C. 22%

D. 16.7%

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

72. Frazier Company sells women's ski jackets. The average sales price is $275 and the variable cost per jacket is $175. Fixed Costs are $1,350,000. If Frazier sells 15,000 jackets, the contribution margin will be:

A. $2,775,000

**B.** $1,500,000

C. $2,250,000

D. $150,000

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

73. Mark Company, Inc. sells electronics. The company generated sales of $45,000. Contribution margin is $20,000 and net income is $4,000. Based on this information, the magnitude of operating leverage is:

A. 2.25 times

B. 11.25 times

C. 5 times

D. 6.25 times

*AACSB: Analytic*

*AICPA FN: Risk Analysis*

*Blooms: Apply*

*Difficulty: 1 Easy*

*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

74. Which characteristic is true of the scatter graph method, high-low method, and regression analysis?

A. All methods will produce the same estimate of variable and fixed costs.

B. All methods use historic data to estimate variable and fixed costs.

C. All methods use only two data points in analyzing a mixed cost.

D. None of these is true.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

75. Taste of the Town, Inc. operates a gourmet sandwich shop. The company orders bread, cold cuts, and produce several times a week. If the cost of these items remains constant per customer served, the cost is said to be:

A. Variable

B. Fixed

C. Opportunity

D. Mixed

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

76. The following income statement was produced when volume of sales was at 400 units.

| | | |
|---|---|---|
| Sales Revenue | $ | 2,000 |
| Variable Cost | | 1,200 |
| Contribution Margin | $ | 800 |
| Fixed Cost | | 300 |
| Net Income | $ | 500 |

If volume reaches 500 units, net income will be:

A. $625

B. $1,800

**C.** $700

D. None of these

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

77. All of the following would be considered a fixed cost for a bottled water company **except**:

A. Rent on warehouse facility

B. Depreciation on its manufacturing equipment

C. Hourly wages for machine operators

D. Property taxes on its factory building

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

## True / False Questions

78. The variable cost per unit increases in direct proportion to the activity base.

**FALSE**

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

79. If managers of a company do not understand the behavior of its costs, they are likely to make poor decisions about the company's operations.

**TRUE**

*AACSB: Analytic*
*AICPA FN: Decision Making*
*Blooms: Understand*
*Difficulty: 1 Easy*
*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

80. For a mixed cost, total cost increases in direct proportion to volume.

**FALSE**

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Analyze*
*Difficulty: 2 Medium*
*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

81. The total variable cost increases in direct proportion to volume.

**TRUE**

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

82. If a company had a mixed cost structure, every dollar of revenue after covering the fixed costs would be pure profit.

**FALSE**

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

83. As activity increases, the fixed cost per unit increases while the variable cost per unit remains constant.

**FALSE**

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

84. Risk refers to the possibility that sacrifices may exceed benefits.

**TRUE**

*AACSB: Analytic*
*AICPA FN: Risk Analysis*
*Blooms: Remember*
*Difficulty: 1 Easy*
*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

85. Operating leverage enables a company to convert small changes in fixed costs into dramatic changes in profitability.

**FALSE**

*AACSB: Analytic*
*AICPA FN: Risk Analysis*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

86. If a company shifts its cost structure by decreasing fixed costs and increasing variable costs, it will lower both the level of risk and its potential for profits.

**TRUE**

*AACSB: Analytic*
*AICPA FN: Risk Analysis*
*Blooms: Apply*
*Difficulty: 2 Medium*
*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

87. If revenues are expected to decline, management should attempt to convert its variable costs into fixed costs.

**FALSE**

*AACSB: Analytic*
*AICPA FN: Risk Analysis*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

88. Companies with low operating leverage will experience lower profits when sales increase than will companies with higher operating leverage.

**TRUE**

*AACSB: Analytic*
*AICPA FN: Risk Analysis*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

89. A company with a completely fixed cost structure will have operating leverage of 1.

**FALSE**

*AACSB: Analytic*
*AICPA FN: Reporting*
*Blooms: Apply*
*Difficulty: 2 Medium*
*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

90. Contribution margin represents the amount available to cover fixed expenses and then provide company profits.

**TRUE**

*AACSB: Reflective Thinking*
*AICPA BB: Critical Thinking*
*Blooms: Remember*
*Difficulty: 1 Easy*
*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

91. No contribution margin is provided by selling one unit of a product at a price of $35 if variable production costs are $20, variable general and administrative costs are $5, and fixed costs are $10 per unit.

**FALSE**

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Analyze*
*Difficulty: 2 Medium*
*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

92. The contribution margin format income statement is **not** widely used for external financial reporting, but is allowed by GAAP.

**FALSE**

*AACSB: Reflective Thinking*
*AICPA BB: Industry*
*Blooms: Remember*
*Difficulty: 1 Easy*
*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

93. The contribution margin format income statement classifies costs according to their behavior patterns.

**TRUE**

*AACSB: Reflective Thinking*
*AICPA BB: Critical Thinking*
*Blooms: Remember*
*Difficulty: 1 Easy*
*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

94. Contribution margin can only be determined if costs are separated into product and period costs.

**FALSE**

*AACSB: Reflective Thinking*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

95. If a company has both fixed and variable costs, their operating leverage will always be greater than 1.

**TRUE**

*AACSB: Analytic*
*AICPA FN: Risk Analysis*
*Blooms: Understand*
*Difficulty: 3 Hard*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

96. The higher the magnitude of a company's operating leverage, the more benefit the company will receive from a given percentage increase in revenue.

**TRUE**

*AACSB: Analytic*
*AICPA FN: Risk Analysis*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

97. The higher the magnitude of a company's operating leverage, the smaller the decrease in profit for a given percentage decrease in revenue.

**FALSE**

*AACSB: Analytic*
*AICPA FN: Risk Analysis*
*Blooms: Understand*
*Difficulty: 3 Hard*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

98. A low magnitude of operating leverage is best for most companies.

**FALSE**

*AACSB: Analytic*
*AICPA FN: Risk Analysis*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

99. The BRC Company is considering the introduction of a new line of high end electronics. Because there is considerable uncertainty with regard to the demand for the products, the company would probably be served better by a variable cost structure.

**TRUE**

*AACSB: Analytic*
*AICPA FN: Decision Making*
*AICPA FN: Risk Analysis*
*Blooms: Analyze*
*Difficulty: 3 Hard*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

100. Descriptions of cost behavior as fixed or variable pertain to a particular range of activity.

**TRUE**

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

101. Variable costs will become fixed outside the relevant range.

**FALSE**

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

102. Within the relevant range, the fixed cost per unit can be expected to decrease with increases in volume.

**TRUE**

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

103. The activity base selected determines whether a cost behaves as a variable cost or fixed cost.

**TRUE**

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

104. A cost that is considered variable for one activity base may be considered fixed for a different activity base.

**TRUE**

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

105. One reason for computing the average cost for a product rather than the actual cost is that average cost is easier to compute.

**TRUE**

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 1 Easy*
*Learning Objective: 02-05 Select an appropriate time period for calculating the average cost per unit.*

106. One way that computing an average cost per unit facilitates management decision making is that managers are provided more timely and more relevant cost information.

**TRUE**

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 1 Easy*
*Learning Objective: 02-05 Select an appropriate time period for calculating the average cost per unit.*

107. Potential problems associated with cost averaging can be reduced by averaging the cost over a shorter span of time.

**FALSE**

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-05 Select an appropriate time period for calculating the average cost per unit.*

108. A cost that is part selling cost and part manufacturing cost is referred to as a mixed cost.

**FALSE**

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Remember*
*Difficulty: 2 Medium*
*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*
*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

109. When selecting the high and low observations under the high-low method of analyzing mixed costs, the selection should be based on the dependent variable (cost).

**FALSE**

*AACSB: Analytic*
*AICPA BB: Industry*
*Blooms: Apply*
*Difficulty: 2 Medium*
*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

110. When using least-squares regression to determine variable and fixed costs, the r-square refers to the degree to which the change in the dependent variable can be explained by a change in the independent variable.

**TRUE**

*AACSB: Analytic*
*AICPA BB: Industry*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

111. An advantage of using the scattergraph method over the high-low method is that all points of data are used in determining the cost line.

**TRUE**

*AACSB: Analytic*
*AICPA BB: Industry*
*Blooms: Understand*
*Difficulty: 1 Easy*
*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

112. Multiple regression analysis should be performed when a single independent variable influences multiple dependent variables.

**FALSE**

*AACSB: Analytic*
*AICPA BB: Industry*
*Blooms: Analyze*
*Difficulty: 3 Hard*
*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

113. In regression analysis, an r-square value of one indicates that there is a perfect fit between the independent and dependent variables.

**TRUE**

*AACSB: Analytic*
*AICPA BB: Industry*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

114. A disadvantage of the high-low method is that the high point and low point may not be representative of the total data set available.

**TRUE**

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

## Essay Questions

115. Blackstock Company manufactures digital cameras. Indicate whether the cost is a product cost or period cost AND whether its cost behavior is fixed, variable, or mixed by placing X's in the appropriate boxes. As an example, commissions paid to sales staff would be classified as a period cost and variable.

| | | | Cost Behavior | | |
|---|---|---|---|---|---|
| Cost | Product Cost | Period Cost | Fixed | Variable | Mixed |
| Insurance on executive offices | | | | | |
| Lens caps for digital cameras | | | | | |
| Depreciation on manufacturing equipment | | | | | |
| Shipping cost to deliver products to customers | | | | | |
| Salary of company president | | | | | |
| Wages of assembly workers | | | | | |
| Product advertising | | | | | |
| Utilities: electricity to run machines and for heat and lights in factory | | | | | |

Answers will vary

Feedback:

| | | | Cost Behavior | | |
|---|---|---|---|---|---|
| Cost | Product Cost | Period Cost | Fixed | Variable | Mixed |
| Insurance on executive offices | | X | X | | |
| Lens caps for digital cameras | X | | | X | |
| Depreciation on manufacturing equipment | X | | X | | |
| Shipping cost to deliver products to customers | | X | | | X |
| Salary of company president | | X | X | | |
| Wages of assembly workers | X | | | X | |
| Product advertising | | X | X | | |
| Utilities: electricity to run machines and for heat and lights in factory | X | | | | X |

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Apply*

*Difficulty: 1 Easy*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

116. How does total fixed cost behave when volume increases?

Answers will vary

Feedback: Total fixed cost is constant (does not change) when volume increases.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

117. How does fixed cost per unit behave when volume decreases?

Answers will vary

Feedback: Fixed cost per unit increases when volume decreases because the same amount of fixed costs is spread over (allocated to) fewer units.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

118. How does total variable cost respond when volume increases?

Answers will vary

Feedback: Total variable cost would increase in direct proportion to volume. A 5% increase in volume would mean a 5% increase in total variable costs.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

119. How does variable cost per unit behave when volume decreases?

Answers will vary

Feedback: Variable cost per unit is constant when volume decreases.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 1 Easy*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

120. If a company had a pure fixed cost structure, what would be the relationship between a given dollar increase in sales and net income?

Answers will vary

Feedback: With a fixed cost structure, a given dollar increase in sales would result in an equal increase in net income.

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Analyze*
*Difficulty: 2 Medium*
*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

121. What are mixed or semivariable costs? Give an example of a mixed cost.

Answers will vary

Feedback: A mixed or semivariable cost has a fixed component and a variable component. Examples would be utilities or compensation of sales staff. For example, if sales personnel receive a salary and a commission, their compensation has a variable part (the commission, which varies with sales) and a fixed part (the salary).

*AACSB: Analytic*
*AACSB: Communication*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

122. What is operating leverage, and how does a company achieve operating leverage?

Answers will vary

Feedback: Operating leverage exists when a company achieves a disproportionate change in profit from a small increase in sales. For example, a 5% increase in sales could result in a 25 or 50% increase in profit. A company achieves operating leverage through having fixed costs in its cost structure.

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

123. What is meant by the phrase, "cost structure?"

Answers will vary

Feedback: "Cost structure" refers to the amount of fixed cost and variable cost a company has. For example, a company's managers may be able to make a change that would increase fixed costs and decrease variable costs. Such a change would increase the company's operating leverage.

*AACSB: Reflective Thinking*
*AICPA BB: Critical Thinking*
*AICPA BB: Industry*
*Blooms: Remember*
*Difficulty: 1 Easy*
*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

124. How is operating leverage related to cost structure?

Answers will vary

Feedback: Cost structure refers to the proportion of a company's fixed and variable costs. A company that has a more fixed cost structure will have high operating leverage. That means that for a given change in sales volume, it will have a greater change in net income than a company with a more variable cost structure.

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

125. Describe the format of an income statement prepared using the contribution margin approach.

Answers will vary

Feedback: An income statement that uses the contribution margin approach begins with revenue. Variable costs are subtracted, resulting in contribution margin. The amount of fixed costs is then subtracted from contribution margin to calculate net income.

*AACSB: Analytic*
*AICPA FN: Reporting*
*Blooms: Understand*
*Difficulty: 2 Medium*
*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

126. For Marvin Company in 2013, the magnitude of operating leverage was 3.5. Demonstrate what this magnitude of operating leverage would mean for the company's profitability by creating an example.

Answers will vary

Feedback: With magnitude of operating leverage of 3.5, a given percentage increase or decrease in revenue would result in a change in profits that is 3.5 times as great. For example, a 10% decrease in sales revenue would result in a 35% decrease in profit.

*AACSB: Analytic*
*AICPA FN: Risk Analysis*
*Blooms: Apply*
*Difficulty: 2 Medium*
*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

127. If a company had a pure variable cost structure, what would be the relationship between contribution margin and net income, and what would be the magnitude of operating leverage?

Answers will vary

Feedback: Contribution margin and net income would be equal. In other words, every dollar of contribution margin would be a dollar of profit. Magnitude of operating leverage would be 1.0 (which really means the absence of operating leverage) because the company would have no fixed costs. Net income would equal contribution margin.

*AACSB: Analytic*
*AICPA FN: Risk Analysis*
*Blooms: Analyze*
*Difficulty: 3 Hard*

*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

128. What is meant by the phrase, "relevant range?" How does the concept of relevant range affect fixed costs?

Answers will vary

Feedback: The relevant range is a range of activity over which definitions of fixed and variable costs are valid. For a fixed cost, the relevant range is the range of activity over which the cost does not change.

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 1 Easy*
*Learning Objective: 02-05 Select an appropriate time period for calculating the average cost per unit.*

129. Assume that wages expense is a variable cost and that the relevant range is 10,000 to 15,000 labor hours. Within that range, the cost is $15 per hour. What can you assume about wages expense outside this range?

Answers will vary

Feedback: Outside the relevant range, the cost may be more or less than $15 per hour. A cost relationship or behavior that applies within a specified range may not apply outside that range.

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Analyze*
*Difficulty: 2 Medium*

*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

130. What is an activity base, and how does the activity base relate to a variable cost?

Answers will vary

Feedback: An activity base is a measure or definition of activity. Examples include number of stores, sales, number of employees, etc. A variable cost varies in direct proportion to the activity base. A cost that varies with one activity base may not vary with a different activity base.

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Analyze*
*Difficulty: 2 Medium*
*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

131. Why would a company often calculate and use average costs of its products and services rather than actual costs?

Answers will vary

Feedback: When a company provides many products or services that are similar, calculating the actual cost of each might be difficult and expensive and of little benefit. Average costs may be used in setting the price to charge customers and in evaluating performance and making other managerial decisions.

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Understand*
*Difficulty: 1 Easy*

*Learning Objective: 02-05 Select an appropriate time period for calculating the average cost per unit.*

132. Why would a company need to estimate the fixed and variable components of a mixed cost?

Answers will vary

Feedback: For many managerial decisions, a company would need to know the fixed and variable parts of its mixed costs. For example - if sales are expected to increase by 5%, by how much will the mixed cost increase? Managers would need to know the fixed and variable components of the mixed cost to answer this question. Analysis of a mixed cost would be needed for budgeting, evaluating performance, deciding whether to expand operations, and other important decisions.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

133. What is the high-low method used for?

Answers will vary

Feedback: The high-low method is used to estimate the fixed and variable parts of a mixed cost.

*AACSB: Reflective Thinking*

*AICPA BB: Industry*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

134. Describe the steps in the high-low method.

Answers will vary

Feedback: The steps in the high-low method are:

1. Assemble cost and volume information for a given period of time (several months, perhaps)
2. Select the high volume point and the low volume point in the data set
3. Determine the estimated variable cost per unit. Estimated variable cost = difference in total cost divided by difference in volume
4. Use the estimated variable cost per unit and either the high point or the low point to estimate the fixed cost

*AACSB: Reflective Thinking*
*AICPA BB: Industry*
*Blooms: Apply*
*Difficulty: 3 Hard*
*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

135. What is a primary disadvantage of the high-low method of analyzing a mixed cost?

Answers will vary

Feedback: The high-low method uses just two data points, the high point and the low point, out of a set of several. If either point is not representative of the rest of the data, the results from the method (the variable cost and fixed cost) will be inaccurate.

*AACSB: Analytic*
*AICPA BB: Critical Thinking*
*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

136. Compare least squares regression and the scattergraph method of analyzing mixed costs.

Answers will vary

Feedback: Both methods involve fitting a line to a set of cost and volume data points. Both identify the fixed and variable components of the mixed cost: the fixed component is the y-intercept for the line, and the variable component is the line's slope. The scattergraph method involves subjectivity: the line fitted to the data is the line that "looks best" in the judgment of the cost analyst. The least squares approach is more objective: it is a statistical method of fitting the best line to the data points. Least squares also generates some statistics that can be used to determine how well the line actually does fit the data.

*AACSB: Analytic*

*AACSB: Communication*

*AICPA BB: Critical Thinking*

*Blooms: Analyze*

*Difficulty: 3 Hard*

*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

137. What advantages does the regression method of cost estimation offer, compared to the high-low and scattergraph methods of estimating mixed costs?

Answers will vary

Feedback: The regression method is more accurate than either the high-low method or the scattergraph method. It uses all the data points in the data set and fits the best straight line to these points. It is an objective method of estimating costs. In comparison, the scattergraph approach is subjective, requiring the analyst to fit to the data the line that he/she judges to be best. Also, with least-squares regression, statistics are generated that enable assessment of the quality of the estimates.

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Analyze*

*Difficulty: 3 Hard*

*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

138. Select the term from the list provided that best matches each of the following descriptions. The first is done for you.

| Answer | Description | List of terms |
|---|---|---|
| 5 | A. A cost that remains constant in total when volume changes | 1. Mixed cost |
| | B. The way a cost changes relative to changes in a measure of activity | 2. Operating leverage |
| | C. A company's cost mix or relative proportion of variable and fixed costs to total costs | 3. Scattergraph method |
| | D. The difference between a company's sales revenue and its variable costs | 4. Contribution margin |
| | E. Costs composed of both fixed and variable components | 5. Fixed cost |
| | F. A cost that changes in total in direct proportion to changes in volume | 6. Cost behavior |
| | G. A factor that causes (or drives) changes in costs | 7. Activity base |
| | H. A condition in which a percentage change in revenue will produce a proportionately larger percentage change in net income | 8. Variable cost |
| | I. A method of estimating the fixed and variable components of a mixed cost using two data observations | 9. Cost structure |
| | J. A method of estimating the fixed and variable components of a mixed cost where data are plotted on a graph and a line is visually fit to the data | 10. High-low method |

Answers will vary

Feedback:

| Answer | Description | List of terms |
|---|---|---|
| 5 | A. A cost that remains constant in total when volume changes | 1. Mixed cost |
| 6 | B. The way a cost changes relative to changes in a measure of activity | 2. Operating leverage |
| 9 | C. A company's cost mix or relative proportion of variable and fixed costs to total costs | 3. Scattergraph method |
| 4 | D. The difference between a company's sales revenue and its variable costs | 4. Contribution margin |
| 1 | E. Costs composed of both fixed and variable components | 5. Fixed cost |
| 8 | F. A cost that changes in total in direct proportion to changes in volume | 6. Cost behavior |
| 7 | G. A factor that causes (or drives) changes in costs | 7. Activity base |
| 2 | H. A condition in which a percentage change in revenue will produce a proportionately larger percentage change in net income | 8. Variable cost |
| 10 | I. A method of estimating the fixed and variable components of a mixed cost using two data observations | 9. Cost structure |
| 3 | J. A method of estimating the fixed and variable components of a mixed cost where data are plotted on a graph and a line is visually fit to the data | 10. High-low method |

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Remember*

*Difficulty: 2 Medium*

*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

139. Costs that might be incurred by service, merchandising, and manufacturing companies are described below:

**Required:**

Classify each cost as variable (V) or fixed (F) with respect to volume or level of activity.

Sales commissions paid to sales associates in a department store

Shipping cost for Amazon

Electricity cost to heat and light a law firm

Rent on a storeroom used by Turf Pros to store lawn equipment

Salary of a supervisor in a Best Buy distribution center

Wages paid to production workers in a General Motors plant

Insurance on a Hershey factory

Fuel costs for Southwest Airlines

Depreciation of office equipment by Microsoft Corporation

Dishwashing in an Olive Garden restaurant

Salary of the CEO of Microsoft

Lubricants used to maintain machinery in a textile factory

Cost of metal cans used in a dog food factory

Cost of pizza boxes for Domino's Pizza

Material handling costs for Frito Lay

Sales commissions paid to sales associates in a department store **V**

Shipping cost for Amazon **V**

Electricity cost to heat and light a law firm **F**

Rent on a storeroom used by Turf Pros to store lawn equipment **F**

Salary of a supervisor in a Best Buy distribution center **F**

Wages paid to production workers in a General Motors plant **V**

Insurance on a Hershey factory **F**

Fuel costs for Southwest Airlines **V**

Depreciation of office equipment by Microsoft Corporation **F**

Dishwashing in an Olive Garden restaurant **V**

Salary of the CEO of Microsoft **F**

Lubricants used to maintain machinery in a textile factory **V**

Cost of metal cans used in a dog food factory **V**

Cost of pizza boxes for Domino's Pizza **V**

Material handling costs for Frito Lay **V**

*AACSB: Analytic*

*AICPA BB: Industry*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

140. Complete the following table to indicate your understanding of fixed and variable cost behavior by inserting one of the following responses in each box: "Remain constant," "Increase," or "Decrease."

| | **When Activity Increases** | **When Activity Decreases** |
|---|---|---|
| Unit fixed costs | | |
| Total fixed costs | | |
| Unit variable costs | | |
| Total variable costs | | |

Answers will vary

Feedback:

| | **When Activity Increases** | **When Activity Decreases** |
|---|---|---|
| Unit fixed costs | Decrease | Increase |
| Total fixed costs | Remain constant | Remain constant |
| Unit variable costs | Remain constant | Remain constant |
| Total variable costs | Increase | Decrease |

*AACSB: Analytic*

*AICPA BB: Critical Thinking*

*Blooms: Understand*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

141. Sandford Company manufactures one product. Its variable manufacturing cost is $16 per unit; total fixed manufacturing cost is $600,000.

**Required:**

1.) Calculate Sandford's total manufacturing costs if it produces 10,000 units.

2.) What would be the total cost per unit (including both fixed and variable costs) assuming that Sandford produces 10,000 units?

3.) Calculate Sandford's total manufacturing costs if it produces 20,000 units.

4.) What would be the total cost per unit assuming that Sandford produces 20,000 units?

5.) Compare your answers from parts 2 and 4. If the cost per unit is different at 10,000 units than at 20,000 units, explain why.

Answers will vary

Feedback: 1.) Total manufacturing costs = ($16 × 10,000) + $600,000 = $760,000

2.) Cost per unit = $760,000/10,000 units = $76 per unit

3.) Total manufacturing costs = ($16 × 20,000) + $600,000 = $920,000

4.) Cost per unit = $920,000/20,000 units = $46 per unit

5.) At 10,000 units, the cost per unit is $76; at 20,000 units, it is $46. The difference is caused by fixed costs: the fixed cost per unit decreases as the number of units increases.

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

142. Phoenix Corporation manufactures smartphones, generally selling from 200,000 to 300,000 units per year. The following cost data apply to the activity levels shown:

| Number of Units | 200,000 | 250,000 | 300,000 |
|---|---|---|---|
| Total costs | | | |
| Fixed | $ 15,000,000 | | |
| Variable | 24,000,000 | | |
| Total costs | $ 39,000,000 | | |
| | | | |
| Cost per Unit | | | |
| Fixed | $ 75 | | |
| Variable | 120 | | |
| Total cost per unit | $ 195 | | |

**Required:**

1.) Complete the preceding table by filling the missing amounts for 250,000 and 300,000 units.

2.) Assume that Phoenix actually makes 280,000 units. What would be the total costs and the cost per unit at this level of activity?

3.) If Phoenix sells each unit for $220, what is Phoenix's magnitude of operating leverage at sales of 280,000 units?

Answers will vary

Feedback: 1.)

| Number of Units | 200,000 | 250,000 | 300,000 |
|---|---|---|---|
| Total costs | | | |
| Fixed | $ 15,000,000 | $ 15,000,000 | $ 15,000,000 |
| Variable | 24,000,000 | 30,000,000 | 36,000,000 |
| Total costs | $ 39,000,000 | $ 45,000,000 | $ 51,000,000 |
| | | | |
| Cost per Unit | | | |
| Fixed | $ 75 | $ 60 | $ 50 |
| Variable | 120 | 120 | 120 |
| Total cost per unit | $ 195 | $ 180 | $ 170 |

2.) Total cost = $15,000,000 + (280,000 × $120) = $48,600,000

Cost per unit = $48,600,000/280,000 units = $173.57

3.) Sales = $220 × 280,000 = $61,600,000

Contribution margin = $61,600,000 - ($120 × 280,000) = $28,000,000

Net income = $28,000,000 - $15,000,000 = $13,000,000

Operating leverage = $28,000,000/$13,000,000 = 2.15

*AACSB: Analytic*

*AICPA FN: Measurement*

*Blooms: Apply*

*Difficulty: 2 Medium*

*Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.*

*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

143. Grant Company and Lee Company compete in the same market. The following budgeted income statements illustrate their cost structures.

| | Grant Company | | Lee Company | |
|---|---|---|---|---|
| Number of customers | | 200 | | 200 |
| Sales revenue (200 x $150) | $ | 30,000 | $ | 30,000 |
| Less variable costs | | 6,000 | | 18,000 |
| Contribution margin | $ | 24,000 | $ | 12,000 |
| Less fixed costs | | 19,000 | | 7,000 |
| Net income | $ | 5,000 | $ | 5,000 |

**Required:**

(a) If Grant Company lowers its price to $135, it will lure 80 customers away from Lee Company. Prepare Grant's income statement based on 280 customers.

(b) If Lee Company lowers its price to $135 (assuming that Grant Company is still charging $150 per customer), Lee would lure 80 customers away from Grant. Prepare Lee's income statement based on 280 customers.

(c) Which of the companies would benefit more from lowering its sales price to attract more customers, and why?

Answers will vary

Feedback: (a) Grant Company income statement

| | | |
|---|---|---|
| Number of customers | | 280 |
| Sales revenue (280 x $135) | $ | 37,800 |
| Less variable costs ($30 x 280) | | 8,400 |
| Contribution margin | | 29,400 |
| Less fixed costs | | 19,000 |
| Net income | $ | 10,400 |

(b) Lee Company income statement

| | | |
|---|---|---|
| Number of customers | | 280 |
| Sales revenue (280 x $135) | $ | 37,800 |
| Less variable costs ($90 x 280) | | 25,200 |
| Contribution margin | | 12,600 |
| Less fixed costs | | 7,000 |
| Net income | $ | 5,600 |

(c) Grant Company would benefit more from lowering its sales price to attract new customers; its income would increase by $5,400, while in the same circumstances, Lee's income would increase by just $600. The difference is caused by the companies' cost structures: Grant has a cost structure with more fixed costs, and Lee has higher variable costs. Therefore, the increase in sales (at a lower selling price) causes more of an increase in Grant's contribution margin and net income.

*AACSB: Analytic*

*AICPA FN: Decision Making*

*AICPA FN: Reporting*

*Blooms: Analyze*

*Difficulty: 3 Hard*

*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

144. Income statements for three companies are provided below:

| | Company A | | Company B | | Company C | |
|---|---|---|---|---|---|---|
| Sales (20 units) | $ | 1,000 | $ | 1,000 | $ | 1,000 |
| Less variable costs | | 600 | | 300 | | - |
| Less fixed costs | | 200 | | 500 | | 800 |
| Net income | $ | 200 | $ | 200 | $ | 200 |

**Required:**

(a) Prepare new income statements for the firms assuming each sells one additional unit (i.e. each firm sells 21 units)

(b) Briefly describe the effect of cost structure on profitability.

Answers will vary

Feedback: (a) Income statements

| | Company A | | Company B | | Company C | |
|---|---|---|---|---|---|---|
| Sales (21 units) | $ | 1,050 | $ | 1,050 | $ | 1,050 |
| Less variable costs | | 630 | | 315 | | - |
| Less fixed costs | | 200 | | 500 | | 800 |
| Net income | $ | 220 | $ | 235 | $ | 250 |

(b) Companies with high operating leverage experience higher profitability when sales increase. The more fixed costs, the higher the fluctuation in net income. Company C has the highest operating leverage, and it experienced the greatest increase in net income with the increase in sales volume.

*AACSB: Analytic*

*AICPA FN: Decision Making*

*AICPA FN: Reporting*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

145. Former NFL coach Joe Gibbs is highly sought after as a guest speaker. His fee can run as high as $150,000 for a single two-hour appearance. Recently, he was asked to speak at a seminar offered by the National Sports in Education Foundation (NSEF). Due to the charitable nature of the organization, Mr. Gibbs offered to speak for $100,000. NSEF planned to invite 350 guests who would each make a $500 contribution to the organization. The Foundation's executive director was concerned about committing so much of the organization's cash to this one event. So instead of the $100,000 fee she countered with an offer to pay Mr. Gibbs 50% of the revenue received from the seminar and no other payments.

**Required:**

(a) Classify the two offers in terms of cost behavior (fixed vs. variable).

Scenario A, NSEF pays Gibbs a $100,000 fee:
Scenario B, NSEF pays Gibbs 50% of revenue:

(b) Compute the budgeted income (assuming there are no other expenses) under each of the following scenarios:

1) NSEF agrees to pay the $100,000 fee, and 350 guests actually attend the seminar; and
2) NSEF pays Mr. Gibbs 50% of revenue, and 350 guests attend the seminar.

(c) For each scenario ($100,000 fee vs. 50% of revenue), compute the percentage increase in profit that would result if the Foundation is able to increase attendance by 20 percent over the original plan (to a total of 420).

(d) For each scenario, compute NSEF's cost per contributor if 350 attend and if 420 contributors attend.

(e) Summarize the impact on risk and profits of shifting the cost structure from fixed to variable costs.

Answers will vary

Feedback: (a) Cost behavior of the two offers:

$100,000 fee: Fixed

50% of revenue: Variable

(b) Profit computations:

| | Scenario A | | Scenario B | |
|---|---|---|---|---|
| Number of guests | | 350 | | 350 |
| Revenue (350 x $500) | $ | 175,000 | $ | 175,000 |
| Costs | | 100,000 | | 87,500 |
| Profit | $ | 75,000 | $ | 87,500 |

(c) Percentage increase in profit:

| | Scenario A | | Scenario B | |
|---|---|---|---|---|
| Number of guests | | 420 | | 420 |
| Revenue (420 x $500) | $ | 210,000 | $ | 210,000 |
| Costs | | 100,000 | | 105,000 |
| Profit | $ | 110,000 | $ | 105,000 |
| % increase in profit | | 47% | | 20% |

($110,000 - $75,000)/$75,000 = 47%

($105,000 - $87,500)/$87,500 = 20%

(d) Cost per Guest:

**350 attendees**

Scenario A, $75,000/350 = $214.29

Scenario B, $87,500/350 = $250

**420 attendees**

Scenario A, $110,000/420 = $261.90

Scenario B, $105,000/420 = $250

(e) Shifting the cost structure from fixed to variable reduces the level of risk. For example, if no one attends, Mr. Gibbs is paid nothing. However, shifting to variable costs also reduces the potential for profits. For example, a 20 percent increase in attendance results in a 47% increase in profit under the fixed fee scenario but only a 20% increase in profits under the variable cost scenario.

*AACSB: Analytic*

*AICPA FN: Decision Making*

*Blooms: Analyze*

*Difficulty: 3 Hard*

*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

146. Assume that Microsoft and Sony both plan to introduce a new hand-held video game. Microsoft plans to use a heavily automated production process to produce its product while Sony plans to use a labor-intensive production process. The following revenue and cost relationships are provided:

| | Microsoft Game | Sony Game |
|---|---|---|
| Selling price per unit | 150 | 150 |
| Variable costs per unit | | |
| Direct materials | $ 27.00 | $ 27.00 |
| Direct labor | 7.50 | 30.00 |
| Overhead | 7.50 | 30.00 |
| Selling and administrative | 3.00 | 3.00 |
| Annual fixed costs | | |
| Overhead | $ 600,000 | $ 240,000 |
| Selling and administrative | 135,000 | 135,000 |

**Required:**

(a) Compute the contribution margin per unit for each company.

(b) Prepare a contribution income statement for each company assuming each company sells 8,000 units.

(c) Compute each firm's net income if the number of units sold increases by 10%.

(d) Which firm will have more stable profits when sales change? Why?

Answers will vary

Feedback: (a) Contribution margin per unit:

| | Microsoft Game | Sony Game |
|---|---|---|
| Revenue | 150.00 | 150.00 |
| Less variable costs: | | |
| Direct materials | $ 27.00 | $ 27.00 |
| Direct labor | 7.50 | 30.00 |
| Overhead | 7.50 | 30.00 |
| Selling and administrative expenses | 3.00 | 3.00 |
| Contribution margin | $ 105.00 | $ 60.00 |

(b) Contribution income statements:

| | Microsoft Game | | Sony Game | |
|---|---|---|---|---|
| Revenue (8,000 x $150) | $ | 1,200,000 | $ | 1,200,000 |
| Less variable costs: | | | | |
| Direct materials | | 216,000 | | 216,000 |
| Direct labor | | 66,000 | | 240,000 |
| Overhead | | 66,000 | | 240,000 |
| Selling and administrative expenses | | 24,000 | | 24,000 |
| Contribution margin | $ | 828,000 | $ | 480,000 |
| Less fixed costs | | | | |
| Overhead | | 600,000 | | 240,000 |
| Selling and administrative expenses | | 135,000 | | 135,000 |
| Net income | $ | 93,000 | $ | 105,000 |

(c) Increase in NI with a 10% increase in sales volume:

| | Microsoft Game | | Sony Game | |
|---|---|---|---|---|
| Revenue (8,800 x $150) | $ | 1,320,000 | $ | 1,320,000 |
| Less variable costs: | | | | |
| Direct materials | | 237,600 | | 237,600 |
| Direct labor | | 66,000 | | 264,000 |
| Overhead | | 66,000 | | 264,000 |
| Selling and administrative expenses | | 26,400 | | 26,400 |
| Contribution margin | $ | 924,000 | $ | 528,000 |
| Less fixed costs | | | | |
| Overhead | | 600,000 | | 240,000 |
| Selling and administrative expenses | | 135,000 | | 135,000 |
| Net income | $ | 189,000 | $ | 153,000 |

(d) The lower the fixed costs, the more stable will be net income. Because Sony has approximately half the fixed costs of Microsoft, its earnings should be more stable. Note also that Sony's unit contribution margin is considerably less than Microsoft's. As sales rise, Microsoft will gain contribution margin (and thus profit) faster than Sony and, of course, when sales fall will lose contribution margin faster than Sony.

*AACSB: Analytic*

*AICPA FN: Decision Making*

*AICPA FN: Reporting*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.*

*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

147. Cannon Company operates a clothing store that reported the following operating results for 2013:

| Income Statement | |
|---|---|
| Sales revenue | $2,000,000 |
| Cost of goods sold | (1,200,000) |
| Gross margin | $ 800,000 |
| Employee commissions and bonuses (5% of sales) | ( 100,000) |
| Depreciation expense | ( 150,000) |
| Salaries expense | ( 260,000) |
| Shipping and delivery expense (2% of sales) | ( 40,000) |
| Advertising expense | ( 80,000) |
| Net income | $ 170,000 |

Required: Prepare an income statement for Cannon Company using the contribution margin format.

Answers will vary

Feedback:

| Income Statement | |
|---|---|
| Sales revenue | $2,000,000 |
| Less variable expenses: | |
| Cost of goods sold | (1,200,000) |
| Employee commissions and bonuses (5% of sales) | ( 100,000) |
| Shipping and delivery expense (2% of sales) | ( 40,000) |
| Contribution margin | $ 660,000 |
| Less fixed expenses | |
| Depreciation expense | ( 150,000) |
| Salaries expense | ( 260,000) |
| Advertising expense | ( 80,000) |
| Net income | $ 170,000 |

*AACSB: Analytic*

*AICPA FN: Reporting*

*Blooms: Apply*

*Difficulty: 2 Medium*

*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

148. Contribution margin income statements for two competing companies are provided below:

| | Yin Company | | Yang Company | |
|---|---|---|---|---|
| Revenue | $ | 750,000 | $ | 750,000 |
| Less variable cosrts | | 300,000 | | 525,000 |
| Contribution margin | $ | 450,000 | $ | 225,000 |
| Less fixed costs | | 405,000 | | 180,000 |
| Net income | $ | 45,000 | $ | 45,000 |

**Required:**

1) Show each company's cost structure by inserting the percentage of the company's revenue represented by each item on the contribution income statement.

2) Compute each company's magnitude of operating leverage.

3) Using the operating leverage measures computed in requirement 2, determine the increase in each company's net income (percentage and amount) if each company experiences a 10 percent increase in sales.

4) Assume that sales are expected to continue to increase for the foreseeable future, which company probably has more desirable cost structure? Why?

Answers will vary

Feedback: 1)

| | Yin Company | | | Yang Company | | |
|---|---|---|---|---|---|---|
| Revenue | $ | 750,000 | 100% | $ | 750,000 | 100% |
| Less variable costs | | 300,000 | 40% | $ | 525,000 | 70% |
| Contribution Margin | $ | 450,000 | 60% | $ | 225,000 | 30% |
| Less fixed costs | | 405,000 | 54% | $ | 180,000 | 24% |
| Net income | $ | 45,000 | 6% | $ | 45,000 | 6% |

2) Magnitude of operating leverage:

Yin Company = $450,000 contribution margin/$45,000 net income = <u>10</u>

Yang Company = $225,000 contribution margin/$45,000 net income = <u>5</u>

3) Expected profits when sales increase by 10%:

Yin Company: 10% × 10 magnitude of operating leverage = 100%

If sales increase by 10%, net income should increase to $90,000

Yang Company: 10% × 5 magnitude of operating leverage = 50%

If sales increase by 10%, net income should increase to $67,500

4) Cost structures: Assuming sales continue to increase, Yin Company will fare better than Yang Company because its contribution margin ratio is higher (60% vs. 30%) and its operating leverage is higher. This means that as sales increase, Yin Company's net income will increase more rapidly than Yang Company's.

*AACSB: Analytic*

*AICPA FN: Risk Analysis*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-04 Calculate the magnitude of operating leverage.*

149. ETutor is an online tutoring service provider that is particularly popular with college students. The company is interested in estimating the fixed and variable components of its tutoring services costs. The manager believes that these costs are driven by the number of hours of tutoring services provided. The following information was gathered for the last six months of business:

| Month | Number of Hours | Tutoring costs |
|---|---|---|
| January | 25,000 | $308,000 |
| February | 41,000 | 420,000 |
| March | 29,000 | 352,000 |
| April | 31,000 | 373,000 |
| May | 34,000 | 378,000 |
| June | 18,000 | 252,000 |

**Required:**

1) Compute the average tutoring cost per hour for the six-month period.

2) Use the high-low method to estimate the total fixed cost and the variable cost per hour.

3) Name one advantage and one disadvantage of the high-low method.

4) Describe the scattergraph method that can be used to analyze mixed costs.

Answers will vary

Feedback: 1) Average tutoring cost per hour:

$2,083,000/178,000 hours = <u>$11.70 per hour</u>

$2,083,000 = total tutoring costs for the 6-month period; 178,000 = total number of hours

2) High-Low method of analyzing mixed costs:

Total costs = a + bX where a = total fixed costs and b = unit variable cost, and X is the cost driver or independent variable

Variable cost per hour (b) = (February costs - June costs)/(February hours - June hours)

b = ($420,000 - 252,000)/(41,000 - 18,000) = <u>$7.30 per hour</u>

Total fixed costs:

If total costs = a + bX then a = $420,000 - ($7.30 × 41,000) = <u>$120,700</u>

(note that answers are affected by rounding)

Thus, the cost equation would be defined as total costs = $120,700 + 7.30X, where X is the number of tutoring hours.

3) An advantage of the high-low method is its simplicity of use. The primary disadvantage is its vulnerability to inaccuracy.

4) Under the scattergraph approach data are plotted on a graph and a visual fit line is visually drawn through the points so that the total distance between the data points and the line is minimized.

*AACSB: Communication*
*AICPA BB: Critical Thinking*
*AICPA FN: Measurement*
*Blooms: Apply*
*Difficulty: 1 Easy*
*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*

150. Maryland Novelties Company produces and sells souvenir products. Monthly income statements for two activity levels are provided below:

| Unit volumes | 20,000 units | | 30,000 units | |
|---|---|---|---|---|
| Revenue | $ | 150,000 | $ | 225,000 |
| Less cost of goods sold | | 60,000 | | 90,000 |
| Gross margin | $ | 90,000 | $ | 135,000 |
| Less operating expenses | | | | |
| Salaries and commissions | | 20,000 | | 25,000 |
| Advertising expenses | | 30,000 | | 30,000 |
| Administrative expenses | | 12,500 | | 12,500 |
| Total operating expenses | | 62,500 | | 67,500 |
| Net income | $ | 27,500 | $ | 67,500 |

**Required:**

1) Identify the mixed expense(s).

2) Use the high-low method to separate the mixed costs into variable and fixed components.

3) Prepare a contribution margin income statement at the 20,000-unit level.

Answers will vary

Feedback: 1) The salaries and commissions cost is mixed.

2) The variable cost per unit: ($25,000 - $20,000)/(30,000 - 20,000) = <u>$0.50 per unit</u>

The total fixed cost = $25,000 - (30,000 × $0.50) = <u>$10,000</u>

3) Contribution margin income statement:

| | | |
|---|---|---|
| Unit volume | 20,000 units | |
| Revenue | $ | 150,000 |
| Less variable costs | | |
| Cost of goods sold | | 60,000 |
| Salaries and commissions | | 10,000 |
| Total variable costs | $ | 70,000 |
| Contribution margin | $ | 80,000 |
| Less fixed costs | | |
| Salaries and commissions | | 10,000 |
| Advertising expense | | 30,000 |
| Administrative expenses | | 12,500 |
| Total fixed costs | $ | 52,500 |
| Net income | $ | 27,500 |

*AACSB: Analytic*

*AICPA FN: Reporting*

*Blooms: Apply*

*Difficulty: 2 Medium*

*Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.*

*Learning Objective: 02-06 Use the high-low method; scattergraphs; and regression analysis to estimate fixed and variable costs.*