# 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

Answer: B
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Variable Cost Behavior
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback: When the volume increases, the total cost of supplies increases; when volume decreases, the total decreases; as such, the cost of supplies is a variable 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.

Answer: B
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy
Feedback: The total amount of a fixed cost does not change when volume changes. In contrast, fixed cost per unit is *not* fixed. It changes as the volume changes. The fixed cost per unit decreases when volume increases and the fixed cost per unit increases 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 the above.

Answer: C
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Variable Cost Behavior
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback: The gasoline cost would be classified as variable if the total gasoline cost increases when the volume increases and the total gasoline cost decreases when the volume decreases.

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.

Answer: D
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy
Feedback: The total amount of a fixed cost does not change when volume changes. In contrast, fixed cost per unit is *not* fixed. It changes as the volume changes. The fixed cost per unit decreases when volume increases and the fixed cost per unit increases when volume decreases.

Use the following information to answer questions 5 and 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.

5. 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

Answer:
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback: The total amount of a fixed cost does not change when volume changes.

6. For Rock Creek Bottling Company, the cost of the salespersons' commissions is an example of:

A. a fixed cost.

**B.** a variable cost.

C. a mixed cost.

D. none of these

Answer: B
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Variable Cost Behavior
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback: Since the salespersons are paid strictly on commission, at $1.50 for each case of product sold, the total cost of the salespersons' commissions would increase as the sales volume increases. As such, this cost would be classified as a variable cost.

7. Based on the following cost data, what conclusions can you make about the costs of 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. The cost of Product A is a fixed cost and the cost of Product B is a variable cost.

**B.** The cost of Product A is a variable cost and the cost of Product B is a fixed cost.

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

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

Answer: B
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior

Topic: Variable Cost Behavior
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback: When the volume increases, the total cost of Product A increases; as such, the cost of Product A is a variable cost. The fixed cost per unit of Product B decreases when volume increases; as such, the cost of Product B is a fixed cost.

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

Answer: D
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Topic: Variable Cost Behavior
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
(a) Total cost of $15,000 ÷ 3,000 units = $5 per unit
(b) Total cost of $6,000 ÷ 3,000 units = $2 per unit

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 and variable

B. Variable and variable

C. Fixed and fixed

D. Variable and fixed

Answer: A
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Topic: Variable Cost Behavior
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback: The cost per unit of Cost #1 decreases when volume increases; as such, Cost #1 is a fixed cost. When the volume increases, the cost per unit of Cost #2 stays the same; as such, Cost #2 is a variable cost.

Use the following information to answer questions 10 through 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.

10. 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.

Answer: B

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Topic: Variable Cost Behavior
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Current cost per unit:
Total cost per unit = (Fixed cost + Variable cost) ÷ Number of units
Total cost per unit = ($40,000 + $50,000) ÷ 4,000 units = $22.50 per unit
Cost per unit when volume doubles:
Total cost per unit = [$40,000 + ($50,000 x 2)] ÷ (4,000 units x 2) = $17.50 per unit

11. 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.

Answer: C
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Topic: Variable Cost Behavior
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Variable cost per unit = Total variable cost ÷ Number of units
Variable cost per unit = $50,000 ÷ 4,000 units = $12.50 per unit
Total cost per unit = Fixed cost per unit + Variable cost per unit
Total cost per unit = ($40,000 ÷ 5,000 units) + $12.50 per unit = $20.50 per unit

12. 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

Answer: C
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Topic: Variable Cost Behavior
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Variable cost per unit = Total variable cost ÷ Number of units
Variable cost per unit = $50,000 ÷ 4,000 units = $12.50 per unit
Total cost = Fixed cost + Variable cost
Total cost = $40,000 + ($12.50 per unit x 5,000 units) = $102,500

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

A. stay the same.

B. double as well.

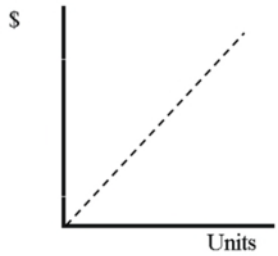
**C.** increase but will not double.

D. decrease.

Answer: C
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Topic: Variable Cost Behavior
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Current cost:

Total cost = Fixed cost + Variable cost
Total cost = $40,000 + $50,000 = $90,000
Cost per unit when volume doubles:
Total cost = $40,000 + ($50,000 x 2) = $140,000

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

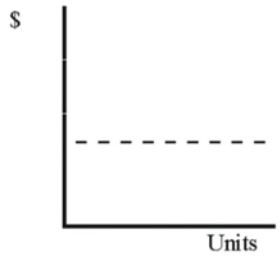
B. Fixed cost

C. Mixed cost

D. None of these

Answer: A
Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: Scattergraph Method of Estimating Fixed and Variable Costs
Blooms: Recall
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy
Feedback: Since the total cost line intersects the vertical axis at zero, there is no fixed cost component in this total cost. As such, and because the total cost line slopes upward, this line depicts a variable cost.

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

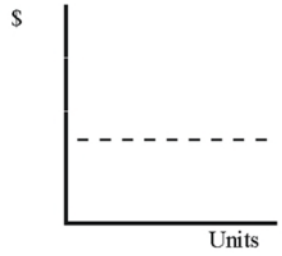
B. Fixed cost

C. Mixed cost

D. None of these

Answer: A
Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: Scattergraph Method of Estimating Fixed and Variable Costs
Blooms: Recall
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy
Feedback: Since the per unit cost line is horizontal, the cost per unit is constant. A variable cost per unit remains *constant* regardless of volume changes. As such, this depicts a variable cost.

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

Answer: B
Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: Scattergraph Method of Estimating Fixed and Variable Costs
Blooms: Recall
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy
Feedback: Since the total cost line is horizontal, the total cost is constant as the volume changes. As such, this depicts a fixed cost.

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

Answer: A
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Topic: Variable Cost Behavior
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Total cost = Fixed cost + Variable cost
Total cost = $4,500 + (800 units x $3.00 per unit) = $6,900

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.

Answer:
Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: Using Fixed Cost to Provide a Competitive Operating Advantage
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Net income = Sales revenue – Variable cost – Fixed cost
Before the price change:
Quick Change: Net income = (5,000 x $20 per unit) – $0 – $40,000 = $60,000
Fast Change: Net income = (5,000 x $20 per unit) – (5,000 x $8 per unit) – $0 = $60,000
After the price change:
Quick Change: Net income = (6,000 x $18 per unit) – $0 – $40,000 = $68,000
Fast Change: Net income = (4,000 x $20 per unit) – (4,000 x $8 per unit) – $0 = $48,000

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.

Answer:
Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: Using Fixed Cost to Provide a Competitive Operating Advantage Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback: When sales change, the amount of the corresponding change in net income is directly influenced by the company's cost structure. The more fixed cost, the greater the fluctuation in net income. Since Hard Nails has a fixed cost structure while Bright Nails has a variable cost structure, if sales of both salons increase by an equal amount, Hard Nails will earn a higher profit than Bright Nails.

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.

Answer: C
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy
Feedback: The total amount of a fixed cost does not change when volume changes. In contrast, fixed cost per unit is *not* fixed. It changes as the volume changes. The fixed cost per unit decreases when volume increases and the fixed cost per unit increases when volume decreases.

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

Answer: A
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Context-Sensitive Definitions of Fixed and Variable
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback: The behavior pattern of a particular cost may be either fixed or variable, depending on the context. In this context, the total cost of rent increases proportionately with the number of shops while cost per shop remains constant. The rent is therefore variable relative to the number of shops.

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.

Answer: B
Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: Using Fixed Cost to Provide a Competitive Operating Advantage
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback: When sales change, the amount of the corresponding change in net income is directly influenced by the company’s cost structure. The more fixed cost, the greater the fluctuation in net income. Since Company A’s net income is substantially higher than Company B’s when both companies experience an equal increase in sales, Company A has a fixed cost structure while Company B has a variable cost structure.

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.

Answer: D
Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Topic: Operating Leverage
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy
Feedback: Operating leverage is the cost structure condition that produces a proportionately larger percentage change in net income for a given percentage change in revenue. Business managers apply operating leverage to magnify small changes in revenue into dramatic changes in 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 Year 1 to Year 2?

A. 20% increase

B. 20% decrease

**C.** 25% increase

D. 25% decrease

Answer: C
Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Topic: Calculating Percentage Change
Blooms: Apply
AACSB: Knowledge Application

AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
% change = (Alternative measure – Base measure) ÷ Base measure
% change = ($200,000 – $160,000) ÷ $160,000 = 25%

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.

Answer: A
Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Topic: Risk and Reward Assessment
Topic: Effect of Cost Structure on Profit Stability
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback: A manager who expects revenues to increase should use a fixed cost structure. On the other hand, if future sales growth is uncertain or if the manager believes revenue is likely to decline, a variable cost structure makes more sense. Shifting the cost structure from fixed to variable reduces not only the level of risk but also the potential for profits.

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.

Answer: D
Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Risk and Reward Assessment
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback: Recall that contribution margin equals sales revenue minus variable costs. As such, in a pure fixed cost structure, because variable costs are zero, the unit selling price equals the unit contribution margin. Shifting the cost structure from fixed to variable reduces not only the level of risk but also the potential for profits.

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.

Answer: C
Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Topic: Risk and Reward Assessment
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy
Feedback: Shifting the cost structure from fixed to variable reduces not only the level of risk but also the potential for profits.

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.

Answer: C
Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Topic: Effect of Cost Structure on Profit Stability
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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.

Answer: B
Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Topic: Risk and Reward Assessment
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy
Feedback: Shifting the cost structure from fixed to variable reduces not only the level of risk but also the potential for profits. As a result, the more variable cost, the lower the fluctuation in income as sales fluctuate.

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 operating leverage cost structure.

B. medium operating leverage cost structure.

**C.** high operating leverage cost structure.

D. no operating leverage cost structure.

Answer: C
Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Topic: Risk and Reward Assessment
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback: The higher the proportion of fixed cost to total costs, the greater the operating leverage. A manager who expects revenues to increase should use a fixed cost structure. While the variable cost structure reduces risk, it also limits the opportunity to benefit from operating leverage.

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.

Answer: A
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application

AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Magnitude of operating leverage = Contribution margin ÷ Net income
Soft drinks: Magnitude of operating leverage = $40,000 ÷ $10,000 = 4.0
Bottled water: Magnitude of operating leverage = $45,000 ÷ $5,000 = 9.0
Fruit juices: Magnitude of operating leverage = $20,000 ÷ $10,000 = 2.0

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. Only Felix will experience an increase in profit.

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

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

Answer: A
Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: An Income Statement under the Contribution Margin Approach
Topic: Using Fixed Cost to Provide a Competitive Operating Advantage
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Magnitude of operating leverage = Contribution margin ÷ Net income
Felix: Magnitude of operating leverage = $175,000 ÷ $105,000 = 1.6667
Jinx: Magnitude of operating leverage = $130,000 ÷ $105,000 = 1.2381

Impact of an increase in sales of $1,000 or 0.5% (= $1,000 ÷ $105,000):
Increase in net income = Sales x Percentage increase x Magnitude of degree of operating leverage
Felix: Increase in net income = $105,000 x (0.5% x 1.6667) = $875
Jinx: Increase in net income = $105,000 x (0.5% x 1.2381) = $650

33. The excess of revenue over variable costs is referred to as:

A. gross profit

B. gross margin

**C.** contribution margin

D. manufacturing margin

Answer: C
Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: An Income Statement under the Contribution Margin Approach
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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.

Answer: B
Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: An Income Statement under the Contribution Margin Approach
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry

AICPA: FN Decision Making
Difficulty: 1 Easy
Feedback: The contribution margin represents the amount available to cover fixed expenses and thereafter to provide company profits.

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

Answer: C
Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: An Income Statement under the Contribution Margin Approach
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

36. The following income statement is provided for Ramirez Company for the current year:

| | |
|---|---|
| Sales revenue (2,500 units x $40 per unit) | $ 100,000 |
| Cost of goods sold (varable; 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

Answer: A
Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: An Income Statement under the Contribution Margin Approach
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Contribution margin = Revenues – Variable expenses
Contribution margin = $100,000 – ($40,000 + $10,000) = $50,000

37. In order to prepare a contribution format income statement, costs must be separated into:

A. manufacturing and selling, general, and administrative costs.

B. cost of goods sold and operating expenses.

**C.** variable and fixed costs.

D. mixed, variable and fixed costs.

Answer: C
Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: An Income Statement under the Contribution Margin Approach
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: A
Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: An Income Statement under the Contribution Margin Approach
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy
Feedback+ Contribution margin = Revenues – Variable expenses

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

Answer:
Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: An Income Statement under the Contribution Margin Approach
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Contribution margin = Revenues – Variable expenses
Contribution margin = $125,000 – ($42,500 + $15,000) = $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

Answer: C
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback: Magnitude of operating leverage = Contribution margin ÷ Net income

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 (varable; 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

Answer: C

Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Contribution margin = Revenues – Variable expenses
Contribution margin = $150,000 – ($50,000 + $10,000) = $90,000
Magnitude of operating leverage = Contribution margin ÷ Net income
Magnitude of operating leverage = $90,000 ÷ $30,000 = 3.00

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

Answer: D
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Magnitude of operating leverage = Contribution margin ÷ Net income
Magnitude of operating leverage = ($45,000 – $21,000) ÷ $8,000 = 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

Answer: B
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Expected net income = Net income + (Net income x Percentage increase in sales x Magnitude of degree of operating leverage)
Expected net income = $24,000 + ($24,000 x 0.05 x 1.8) = $26,160

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

Answer: B
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:

Increase in net income = Net income x Percentage increase in sales x Magnitude of degree of operating leverage
Increase in net income = $36,000 x 0.06 x 3.5 = $7,560

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%

Answer: C
Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Calculating Percentage Change
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Percentage increase in net income = Percentage increase in sales x Magnitude of degree of operating leverage
Percentage increase in net income = [$110,000 – $100,000) ÷ $100,000] x 4.5 = 45%

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

Answer: A
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback: Given that all three companies have the same sales revenue and the same net income, the company with the greatest contribution margin will have the highest degree of operating leverage.
Alternatively, the answer can be obtained by calculating the degree of operating leverage for each company:
Magnitude of operating leverage = Contribution margin ÷ Net income
Alpha: Magnitude of operating leverage = $105,000 ÷ $25,000 = 4.2
Beta: Magnitude of operating leverage = $45,000 ÷ $25,000 = 1.8
Gamma: Magnitude of operating leverage = $75,000 ÷ $25,000 = 3.0

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.** 6.00

C. 2.25

D. none of these

Answer: B
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Net income = Sales – Variable expenses – Fixed expenses
Net income = ($60 x 2,000 units) – ($60 x 0.60 x 2,000 units) – $40,000 = $48,000 – $40,000 = $8,000

Magnitude of operating leverage = Contribution margin ÷ Net income
Magnitude of operating leverage =$48,000 ÷ $8,000 = 6.00

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

**A.** activity based used.

B. cost structure of the company.

C. industry

D. significance of the dollar amount of the cost.

Answer: A
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Context-Sensitive Definitions of Fixed and Variable
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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.

Answer: C
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: The Relevant Range
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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 and fixed cost

**B.** Fixed cost and fixed cost

C. Fixed cost and variable cost

D. Variable cost and variable cost

Answer: B
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Context-Sensitive Definitions of Fixed and Variable
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback: The behavior pattern of a particular cost may be either fixed or variable, depending on the context. In this context, the total cost of rent remains the same relative to the number of customers in a particular shop and also remains the same relative to the number of customers in the entire chain of shops. As such, in both situations, the rent is a fixed 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.

Answer: D
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: The Relevant Range
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry

AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: B
Learning Objective: 02-05 Select an appropriate time period for calculating the average cost per unit.
Topic: Cost Averaging
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Total costs for the year = Variable costs + Fixed costs
Total costs for the year = [(110 clients + 140 clients + 150 clients + 100 clients) x $100 per client] + ($4,000 x 12) = $50,000 + $48,000 = $98,000
Average quarterly costs = $98,000 ÷ 4 = $24,500

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 through 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

Answer: C
Learning Objective: 02-05 Select an appropriate time period for calculating the average cost per unit.
Topic: Cost Averaging
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Total costs for the year = Variable costs + Fixed costs
Total costs for the year = [(500 customers + 1,500 customers) x $500 per customer] + $100,000 = 2,000 customers x $500 per customer + $100,000 = $1,100,000
Average costs per customer = $1,100,000 ÷ 2,000 customers = $550
Net income per customer = Price per customer – Average cost per customer
$100 per customer = Price per customer – $550 per customer
Price per customer = $100 per customer + $550 per customer = $650 per customer

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.

Answer: D
Learning Objective: 02-05 Select an appropriate time period for calculating the average cost per unit.
Topic: Cost Averaging
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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.

Answer: C
Learning Objective: 02-05 Select an appropriate time period for calculating the average cost per unit.
Topic: Cost Averaging
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Average costs for 5-year period = $508,000 ÷ 55,000 lessons = $9.24
Average costs for today = $600 ÷ 50 lessons = $12.00
Since the demand for driving lessons may vary from day-to-day, significant differences in the cost per driving lesson may occur when calculated on a daily basis. A cost average approach averages costs over a longer span of time, such as a year. Distortions can occur when the time period, such as a 5-year period, is too long; if older costs are mixed with newer costs, the average does not represent current conditions.

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.

Answer: A
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Mixed Costs (Semivariable Costs)
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: C
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Mixed Costs (Semivariable Costs)
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: A
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.

Topic: Mixed Costs (Semivariable Costs)
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback: The total compensation cost is comprised of the cost of the manager salaries, which is a fixed monthly cost, and the cost of the other employees, which is a variable cost based on the hours worked. A cost that contains both fixed and variable elements is referred to as a mixed cost.

59. Production during the current year 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 the current year 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

Answer: B
Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: High-Low Method of Estimating Fixed and Variable Costs
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Variable cost per unit = Change in costs ÷ Change in activity
Variable cost per unit = ($800,000 – $440,000) ÷ (80 units – 20 units) = $6,000 per unit
Total cost = Variable cost + Fixed cost
Fixed cost = Total cost – Variable cost
Fixed cost = $800,000 – (80 units x $6,000 per unit) = $320,000

Use the following information to answer question 60 through 63.

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

| | Year 1 | Year 2 |
|---|---|---|
| Number of units producted 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 |

60. 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

Answer: B
Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: High-Low Method of Estimating Fixed and Variable Costs
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Variable cost per unit = Change in costs ÷ Change in activity
Variable cost per unit = ($68,000 – $60,000) ÷ (3,500 units – 3,000 units) = $16.00 per unit

61. 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

Answer: A
Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: High-Low Method of Estimating Fixed and Variable Costs
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Variable cost per unit = Change in costs ÷ Change in activity
Variable cost per unit = ($68,000 – $60,000) ÷ (3,500 units – 3,000 units) = $16.00 per unit
Total cost = Variable cost + Fixed cost
Fixed cost = Total cost – Variable cost
Fixed cost = $68,000 – (3,500 units x $16.00 per unit) = $12,000

62. 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

Answer: B
Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: High-Low Method of Estimating Fixed and Variable Costs
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Variable cost per unit = Change in costs ÷ Change in activity
Variable cost per unit = ($13,000 – $12,000) ÷ (3,500 units – 3,000 units) = $2.00 per unit
Total cost = Variable cost + Fixed cost
Fixed cost = Total cost – Variable cost
Fixed cost = $13,000 – (3,500 units x $2.00 per unit) = $6,000

63. Assuming that cost behavior did not change over the two-year period, what is Li Company's contribution margin in Year 2?

**A.** $33,000

B. $32,000

C. $39,000

D. $69,000

Answer: A
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.
Topic: An Income Statement under the Contribution Margin Approach
Topic: High-Low Method of Estimating Fixed and Variable Costs
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Variable cost per unit = Change in costs ÷ Change in activity
Cost of goods sold:
Variable cost per unit = ($68,000 – $60,000) ÷ (3,500 units – 3,000 units) = $16.00 per unit
Selling and administrative expense:
Variable cost per unit = ($13,000 – $12,000) ÷ (3,500 units – 3,000 units) = $2.00 per unit
Contribution margin in Year 2:
Contribution margin = Sales revenue – Variable costs
Contribution margin = $87,000 – [3,000 units x ($16.00 per unit + $2.00 per unit)]= $33,000

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

| | | Year 1 | | Year 2 |
|---|---|---|---|---|
| Units | | 4,500 | | 4,800 |
| Total Cost | $ | 11,250 | $ | 12,000 |

A. Fixed Cost

**B.** Variable Cost

C. Mixed Cost

D. Opportunity Cost

Answer:
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Topic: Variable Cost Behavior
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback:
Cost per unit in Year 1: $11,250 ÷ 4,500 units = $2.50
Cost per unit in Year 2: $12,000 ÷ 4,800 units = $2.50
When the volume increases, the cost per unit of stayed the same; as such, the cost is a variable 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

Answer: B
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard

Feedback:
Magnitude of operating leverage = Contribution margin ÷ Net income
Magnitude of operating leverage = $220,000 ÷ $40,000 = 5.5

Use the following information to answer questions 66 and 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 |

66. 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

Answer: B
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Magnitude of operating leverage = Contribution margin ÷ Net income
Gable: Magnitude of operating leverage = $400,000 ÷ $200,000 = 2.0
Harlowe: Magnitude of operating leverage = $600,000 ÷ $200,000 = 3.0

67. 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

Answer: C
Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Using Fixed Cost to Provide a Competitive Operating Advantage
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Magnitude of operating leverage = Contribution margin ÷ Net income
Magnitude of operating leverage = $600,000 ÷ $200,000 = 3.0
Increase in net income = Net income + (Net income x Percentage increase in sales x Magnitude of degree of operating leverage)
Increase in net income = $200,000 + ($200,000 x 0.10 x 3.0) = $260,000

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.

Answer: B
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.
Topic: Fixed Cost Behavior
Topic: Variable Cost Behavior

Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback:
As shown below, the salary cost is a mixed cost since it differs in total and also differs on a per unit basis.
$6,000 ÷ 20 = $300.00
$7,800 ÷ 40 = $195.00
$9,200 ÷ 60 = $153.33

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.

Answer: A
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.
Topic: Fixed Cost Behavior
Topic: Variable Cost Behavior
Topic: Scattergraph Method of Estimating Fixed and Variable Costs
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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, which of the following statements is **incorrect?**

**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. N'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%.

Answer: A
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.
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Risk and Reward Assessment
Topic: Using Fixed Cost to Provide a Competitive Operating Advantage
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Magnitude of operating leverage = Contribution margin ÷ Net income
Company M: Magnitude of operating leverage = ($500,000 – $300,000) ÷ $50,000 = 4.0
Company N: Magnitude of operating leverage = ($500,000 – $200,000) ÷ $150,000 = 2.0.
Given the above, N’s magnitude of operating leverage is lower than M’s.
Since it has relatively higher fixed costs, Company N would suffer more than M from an equal drop in sales revenue.
Shifting the cost structure from fixed (Company N) to variable (Company M) reduces not only the level of risk but also the potential for profits.
If N’s sales increased by 20%, it’s net income would increase by 40% (= 20% x 2.0)

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%

Answer: A
Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Topic: Calculating Percentage Change
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
% change = (Alternative measure – Base measure) ÷ Base measure
% change = ($600,000 – $500,000) ÷ $500,000 = 20%

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

Answer: B
Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Topic: An Income Statement under the Contribution Margin Approach
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Contribution margin = Revenues – Variable expenses
Contribution margin = ($275 x 15,000 jackets) – ($175 x 15,000 jackets) = $1,500,000

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

B. 11.25

**C.** 5.00

D. 6.25

Answer: C
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Magnitude of operating leverage = Contribution margin ÷ Net income
Magnitude of operating leverage = $20,000 ÷ $4,000 = 5.0

74. Which characteristic is true of the high-low method, the scattergraph 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 the above is true.

Answer: B
Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: High-Low Method of Estimating Fixed and Variable Costs
Topic: Scattergraph Method of Estimating Fixed and Variable Costs
Topic: Regression Method of Cost Estimation
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: A
Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Variable Cost Behavior
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium

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 the above

Answer: C
Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Calculating Percentage Change
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application

AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
% change = (Alternative measure – Base measure) ÷ Base measure
% change = (500 – 400) ÷ 400 = 25%
Magnitude of operating leverage = Contribution margin ÷ Net income
Magnitude of operating leverage = $800 ÷ $500 = 1.6
Increase in net income = Net income + (Net income x Percentage increase in sales x Magnitude of degree of operating leverage)
Increase in net income = $500 + ($500 x 0.25 x 1.6) = $700

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

Answer: C

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium

78. Assume that the management of Dairy Deli wants to expand operations. To help evaluate the risks involved in opening an additional store, the company president wants to know the amount of fixed cost a new store will likely incur. Management uses the regression method to analyze the company's mixed costs. In terms of interpreting the results:

A. a low $R^2$ statistic suggests that the independent value (units sold) more strongly influences the dependent variable (total cost).

B. the $R^2$ statistic represents the percentage of change in the independent variable (units sold) that is explained by a change in the independent variable (total cost).

**C**. the $R^2$ statistic represents the percentage of change in the dependent variable (total cost) that is explained by a change in the independent variable (units sold).

D. the $R^2$ statistic is not a good measures of reliability.

Answer: C
Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: Regression Method of Cost Estimation
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy
Feedback: The R Square ($R^2$) is the most commonly used measure of reliability. The $R^2$ statistic represents the percentage of change in the dependent variable (total cost) that is explained by a change in the independent variable (units sold). The $R^2$ values vary between zero and 100 percent. Higher $R^2$ values suggest that the independent variable more strongly influences the dependent variable.

**True / False Questions**

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

Answer: **FALSE**

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Variable Cost Behavior
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

80. 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.

Answer: **TRUE**

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Blooms: Remember

AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **FALSE**

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Mixed Costs (Semivariable Costs)
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **TRUE**

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Variable Cost Behavior
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **FALSE**

Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: An Income Statement under the Contribution Margin Approach
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium

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

Answer: **FALSE**

Learning Objective: 02-01 Identify and describe fixed; variable; and mixed cost behavior.
Topic: Fixed Cost Behavior
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **TRUE**

Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Topic: Risk and Reward Assessment
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **FALSE**

Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Topic: Operating Leverage
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

87. 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.

Answer: **TRUE**

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

Topic: Effect of Cost Structure on Profit Stability
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **FALSE**

Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: Using Fixed Cost to Provide a Competitive Operating Advantage
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **TRUE**

Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Topic: Operating Leverage
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **FALSE**

Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Topic: Operating Leverage
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making

Difficulty: 2 Medium
Feedback: The sales revenue of a company with a completely fixed cost structure will equal its contribution margin. Since the magnitude of operating leverage equals the contribution margin divided by net income, the magnitude of the degree of operating leverage of a company with a completely fixed cost structure cannot be determined without additional information.

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

Answer: **TRUE**

Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: An Income Statement under the Contribution Margin Approach
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

92. 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.

Answer: **FALSE**

Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: An Income Statement under the Contribution Margin Approach
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard
Feedback:
Contribution margin = Revenues – Variable expenses
Contribution margin = $35 – ($20 + $5) = $10

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

Answer: **FALSE**

Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: An Income Statement under the Contribution Margin Approach

Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **TRUE**

Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: An Income Statement under the Contribution Margin Approach
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **FALSE**

Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: An Income Statement under the Contribution Margin Approach
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy
Feedback: Contribution margin can only be determined if costs are separated into fixed and variable costs.

96. If a profitable company has both fixed and variable costs, its operating leverage will always be greater than 1.

Answer: **TRUE**

Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback: Recall that magnitude of operating leverage equals contribution margin divided by net income.

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

Answer: **TRUE**

Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **FALSE**

Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **FALSE**

Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium
Feedback: Operating leverage itself is neither good nor bad; it represents a strategy that can work to a company’s advantage or disadvantage, depending on how it is used.

100. 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.

Answer: **TRUE**

Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Effect of Cost Structure on Profit Stability
Blooms: Remember
Blooms: Understand
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy
Difficulty: 2 Medium
Feedback: A manager who expects revenues to increase should use a fixed cost structure. On the other hand, if future sales growth is uncertain or if the manager believes revenue is likely to decline, a variable cost structure makes more sense.

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

Answer: **TRUE**

Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Context-Sensitive Definitions of Fixed and Variable
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **FALSE**

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: The Relevant Range
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **TRUE**

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: The Relevant Range
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **TRUE**

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Context-Sensitive Definitions of Fixed and Variable
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **TRUE**

Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Context-Sensitive Definitions of Fixed and Variable
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **TRUE**

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

Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

107. 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.

Answer: **TRUE**

Learning Objective: 02-05 Select an appropriate time period for calculating the average cost per unit.
Topic: Cost Averaging
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **FALSE**

Learning Objective: 02-05 Select an appropriate time period for calculating the average cost per unit.
Topic: Cost Averaging
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **FALSE**

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.Topic: Mixed Costs (Semivariable Costs)
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

110. 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).

Answer: **FALSE**

Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: High-Low Method of Estimating Fixed and Variable Costs
Topic: Scattergraph Method of Estimating Fixed and Variable Costs
Topic: Regression Method of Cost Estimation
Topic: Multiple Regression Analysis
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

111. 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.

Answer: **TRUE**

Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: Regression Method of Cost Estimation
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

112. 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.

Answer: **TRUE**

Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: Scattergraph Method of Estimating Fixed and Variable Costs
Blooms: Remember
AACSB: Knowledge Application

AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **FALSE**

Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: Multiple Regression Analysis
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer: **TRUE**

Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: Regression Method of Cost Estimation
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

115. 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.

Answer: **TRUE**

Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: High-Low Method of Estimating Fixed and Variable Costs
Blooms: Remember
Blooms: Understand
Blooms: Apply

AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

**Essay Questions**

116. 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 | 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 | | | |

Answer:

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

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Topic: Variable Cost Behavior
Topic: Mixed Costs (Semivariable Costs)
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer:

Answers will vary

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

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Blooms: Remember
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer:

Answers will vary

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

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Blooms: Remember
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer:

Answers will vary

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

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Variable Cost Behavior
Blooms: Remember
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer:

Answers will vary

Variable cost per unit is constant when volume decreases.

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Variable Cost Behavior
Blooms: Remember
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer:

Answers will vary

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

Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Topic: Effect of Cost Structure on Profit Stability
Blooms: Understand
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium

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

Answer:

Answers will vary

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).

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Mixed Costs (Semivariable Costs)
Blooms: Understand
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium

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

Answer:

Answers will vary

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.

Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Topic: Operating Leverage
Blooms: Remember
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer:

Answers will vary

"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.

Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Topic: Effect of Cost Structure on Profit Stability

Blooms: Remember
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

125. How is operating leverage related to cost structure?

Answer:

Answers will vary

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.

Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Topic: Effect of Cost Structure on Profit Stability
Blooms: Remember
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer:

Answers will vary

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.

Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: An Income Statement under the Contribution Margin Approach
Blooms: Remember
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry

AICPA: FN Decision Making
Difficulty: 1 Easy

127. For Marvin Company, the magnitude of operating leverage was 3.5 during the current year. Demonstrate what this magnitude of operating leverage would mean for the company's profitability by creating an example.

Answer:

Answers will vary

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.

Learning Objective: 02-02 Demonstrate the effects of operating leverage on profitability.
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Operating Leverage
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Understand
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium

128. 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?

Answer:

Answers will vary

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.

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

Topic: Effect of Cost Structure on Profit Stability
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Understand
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium

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

Answer:

Answers will vary

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.

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: The Relevant Range
Blooms: Remember
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

130. 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?

Answer:

Answers will vary

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.

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Variable Cost Behavior
Topic: The Relevant Range

Blooms: Remember
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer:

Answers will vary

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.

Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Variable Cost Behavior
Topic: Context-Sensitive Definitions of Fixed and Variable
Blooms: Remember
Blooms: Understand
Blooms: Apply
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer:

Answers will vary

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.

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

Blooms: Remember
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer:

Answers will vary

Mixed costs (semivariable costs) include both fixed and variable components; mixed costs should be broken down into these components for decision-making. For example, if sales are expected to increase by 5%, managers will want to be able to estimate the increase in total costs.Analysis of mixed costs is required for budgeting, evaluating performance, deciding whether to expand operations, and other important decisions.

Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: Use of Estimates in Real-World Problems
Blooms: Remember
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer:

Answers will vary

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

Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: High-Low Method of Estimating Fixed and Variable Costs
Blooms: Remember
AACSB: Communication

AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer:

Answers will vary

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

Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: High-Low Method of Estimating Fixed and Variable Costs
Blooms: Remember
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer:

Answers will vary

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.

Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: High-Low Method of Estimating Fixed and Variable Costs

Blooms: Remember
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer:

Answers will vary

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. The least squares method also generates some statistics that can be used to determine how well the line actually does fit the data.

Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: Regression Method of Cost Estimation
Topic: Multiple Regression Analysis
Blooms: Remember
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

Answer:

Answers will vary

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.

Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: High-Low Method of Estimating Fixed and Variable Costs
Topic: Regression Method of Cost Estimation
Topic: Multiple Regression Analysis
Blooms: Remember
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

139. Assume that management uses the regression method to separate a mixed cost into its fixed and variable components. Briefly describe the significance of the R Square ($R^2$) when interpreting the reliability of cost estimates that result.

Answer:

Answers will vary

The R Square ($R^2$) is the most commonly used measure of reliability. The $R^2$ statistic represents the percentage of change in the dependent variable (total cost) that is explained by a change in the independent variable that was chosen. The $R^2$ values vary between zero and 100 percent. Higher $R^2$ values suggest that the independent variable more strongly influences the dependent variable.

Answer: C
Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: Regression Method of Cost Estimation
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

**Matching Questions**

140. 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 |

Answer:

| 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 |

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.
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.
Topic: Fixed Cost Behavior
Topic: Variable Cost Behavior
Topic: Mixed Costs (Semivariable Costs)
Topic: Context-Sensitive Definitions of Fixed and Variable
Topic: Operating Leverage
Topic: Effect of Cost Structure on Profit Stability
Topic: An Income Statement under the Contribution Margin Approach
Topic: High-Low Method of Estimating Fixed and Variable Costs
Topic: Scattergraph Method of Estimating Fixed and Variable Costs
Blooms: Remember
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 1 Easy

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

| | |
|---|---|
| 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** |

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

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Topic: Variable Cost Behavior
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium

**Problems**

142. 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 | | |

Answer:

| | 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 |

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Topic: Variable Cost Behavior
Blooms: Understand
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 2 Medium

143. 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.

Answer:

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.

Learning Objective: 02-01 Identify and describe fixed, variable, and mixed cost behavior.
Topic: Fixed Cost Behavior
Topic: Variable Cost Behavior
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making

Difficulty: 3 Hard

144. 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? (Round the cost per unit to two decimal points)
3.) If Phoenix sells each unit for $220, what is Phoenix's magnitude of operating leverage at sales of 280,000 units? (Round to two decimal points.)

Answer:

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

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.
Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Fixed Cost Behavior
Topic: Variable Cost Behavior
Topic: An Income Statement under the Contribution Margin Approach
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard

145. 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?

Answer:

(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.

Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: An Income Statement under the Contribution Margin Approach
Topic: Using Fixed Cost to Provide a Competitive Operating Advantage
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard

146. 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.

Answer:

Answers will vary

(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.

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.
Topic: Risk and Reward Assessment
Topic: Effect of Cost Structure on Profit Stability
Topic: An Income Statement under the Contribution Margin Approach
Topic: Using Fixed Cost to Provide a Competitive Operating Advantage
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard

147. 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). (Round the percentages to the nearest whole numbers.)
(d) For each scenario, compute NSEF's cost per contributor if 350 attend and if 420 contributors attend. (Round the cost per contributor to two decimal points.)

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

Answer:

(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 = $250.00
**420 attendees**
Scenario A, $110,000 ÷ 420 = $261.90
Scenario B, $105,000 ÷ 420 = $250.00
(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.

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.
Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: Fixed Cost Behavior
Topic: Variable Cost Behavior
Topic: Calculating Percentage Change
Topic: Risk and Reward Assessment
Topic: Effect of Cost Structure on Profit Stability
Topic: An Income Statement under the Contribution Margin Approach
Blooms: Apply

AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard

148. 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?

Answer:

Answers will vary

(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.

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.
Topic: Risk and Reward Assessment
Topic: Effect of Cost Structure on Profit Stability
Topic: An Income Statement under the Contribution Margin Approach
Topic: Using Fixed Cost to Provide a Competitive Operating Advantage
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard

149. Cannon Company operates a clothing store that reported the following operating results for the current year:

| 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.

Answer:

| 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 |

Learning Objective: 02-03 Prepare an income statement using the contribution margin approach.
Topic: An Income Statement under the Contribution Margin Approach
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard

150. 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?

Answer:

Answers will vary

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 = 10
Yang Company = $225,000 contribution margin ÷ $45,000 net income = 5
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.

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.
Learning Objective: 02-04 Calculate the magnitude of operating leverage.
Topic: Risk and Reward Assessment
Topic: Effect of Cost Structure on Profit Stability
Topic: An Income Statement under the Contribution Margin Approach
Topic: Using Fixed Cost to Provide a Competitive Operating Advantage
Topic: Measuring Operating Leverage Using Contribution Margin
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry

AICPA: FN Decision Making
Difficulty: 3 Hard

151. 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. (Round the average tutoring cost per hour to two decimal points.)
2) Use the high-low method to estimate the total fixed cost and the variable cost per hour. (Round the variable cost per hour to two decimal points.)
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.

Answer:

Answers will vary

1) Average tutoring cost per hour:
$2,083,000 ÷ 178,000 hours = $11.70 per hour
$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) = $7.30 per hour
Total fixed costs:
If total costs = a + bX then a = $420,000 – ($7.30 × 41,000) = $120,700
(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.

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

Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: Cost Averaging
Topic: High-Low Method of Estimating Fixed and Variable Costs
Topic: Scattergraph Method of Estimating Fixed and Variable Costs
Blooms: Remember
Blooms: Understand
Blooms: Apply
AACSB: Communication
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard

152. 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.

Answer:

1) The salaries and commissions cost is mixed.
2) The variable cost per unit: ($25,000 – $20,000) ÷ (30,000 – 20,000) = $0.50 per unit
The total fixed cost = $25,000 – (30,000 × $0.50) = $10,000
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 |

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.
Learning Objective: 02-06 Use the high-low method, scattergraphs, and regression analysis to estimate fixed and variable costs.
Topic: Mixed Costs (Semivariable Costs)
Topic: An Income Statement under the Contribution Margin Approach
Topic: High-Low Method of Estimating Fixed and Variable Costs
Blooms: Apply
AACSB: Knowledge Application
AICPA: BB Industry
AICPA: FN Decision Making
Difficulty: 3 Hard