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Financial Analysis: Scenario Analysis

Introduction

Whitewater Transmissions, Inc. has provided the following estimates for its new gear assembly project:

- **Price per unit (P)** = $1,900
- **Variable costs per unit (VC)** = $680
- **Fixed costs (FC)** = $5,100,000
- **Quantity (Q)** = 105,000 units

The company believes all its estimates are accurate within **± 15%**. To perform scenario analysis, the best-case and worst-case scenarios must be calculated for each of the four variables.

Best-Case Scenario Analysis

- **Price per unit (P):**

  $$P_{best} = P_{base} \times (1 + 0.15)$$

  Where $\mathbf{P_{base} = \$1,900}$

  $$P_{best} = 1900 \times 1.15 = 2185$$

  Explanation: In the best-case scenario, the price per unit increases by 15%. Multiplying $1,900 by 1.15 results in $2,185.

- **Variable Cost per unit (VC):**

  $$VC_{best} = VC_{base} \times (1 - 0.15)$$

  Where $\mathbf{VC_{base} = \$680}$

  $$VC_{best} = 680 \times 0.85 = 578$$

  Explanation: In the best-case scenario, the variable cost per unit decreases by 15%. Multiplying $680 by 0.85 results in $578.

- **Fixed Costs (FC):**

  $$FC_{best} = FC_{base} \times (1 - 0.15)$$

  Where $\mathbf{FC_{base} = \$5,100,000}$

  $$FC_{best} = 5100000 \times 0.85 = 4335000$$

  Explanation: The fixed costs decrease by 15% in the best-case scenario. Multiplying $5,100,000 by 0.85 results in $4,335,000.

- **Quantity (Q):**

  $$Q_{best} = Q_{base} \times (1 + 0.15)$$

  Where $\mathbf{Q_{base} = 105,000}$

  $$Q_{best} = 105000 \times 1.15 = 120750$$

  Explanation: The quantity produced increases by 15% in the best-case scenario. Multiplying 105,000 units by 1.15 results in 120,750 units.

Worst-Case Scenario Analysis

- **Price per unit (P):**

  $$P_{worst} = P_{base} \times (1 - 0.15)$$

  Where $\mathbf{P_{base} = \$1,900}$

  $$P_{worst} = 1900 \times 0.85 = 1615$$

  Explanation: In the worst-case scenario, the price per unit decreases by 15%. Multiplying $1,900 by 0.85 results in $1,615.

- **Variable Cost per unit (VC):**

  $$VC_{worst} = VC_{base} \times (1 + 0.15)$$

  Where $\mathbf{VC_{base} = \$680}$

  $$VC_{worst} = 680 \times 1.15 = 782$$

  Explanation: In the worst-case scenario, the variable cost per unit increases by 15%. Multiplying $680 by 1.15 results in $782.

- **Fixed Costs (FC):**

  $$FC_{worst} = FC_{base} \times (1 + 0.15)$$

Where **FC_{base} = $5,100,000**

$$FC_{worst} = 5100000 \times 1.15 = 5865000$$

Explanation: The fixed costs increase by 15% in the worst-case scenario. Multiplying $5,100,000 by 1.15 results in $5,865,000.

- **Quantity (Q):**

$$Q_{worst} = Q_{base} \times (1 - 0.15)$$

Where **Q_{base} = 105,000**

$$Q_{worst} = 105000 \times 0.85 = 89250$$

Explanation: The quantity produced decreases by 15% in the worst-case scenario. Multiplying 105,000 units by 0.85 results in 89,250 units.

Final Solution

Best-Case Scenario:

- Unit Price: 2,185
- Variable Cost: 578
- Fixed Costs: 4,335,000
- Quantity: 120,750

Worst-Case Scenario:

- Unit Price: 1,615
- Variable Cost: 782
- Fixed Costs: 5,865,000
- Quantity: 89,250

All scenarios have been calculated, analyzed, and verified for accuracy.