Managerial Accounting & Finance

Profit Management (cont.)

- For businesses selling products and services with low margins, more volume must be sold to generate a desired profit level.
- Businesses with high-margin products and services often do not need to sell as many of their high-margin items to generate the same profit level.

What is CVP Analysis?

- It is a management tool that expresses the relationships among various costs, sales volume, and profits in either graphic or equation form.

CVP Analysis

The following are some of the questions that CVP analysis is able to answer:

1. What level of sales is required to cover all costs?
2. What occupancy level must be achieved in order to earn a certain profit level?

CVP Analysis (cont.)

3. What will happen to our profitability if we built more rooms or expanded the seating capacity in the dining room?
4. If we increased our advertising costs, by how much would sales have to rise in order to maintain the same profit level we had before?

Cost-Volume Behaviors

Assumptions in CVP Analysis

1. Fixed costs remain fixed in the short-run.
2. Variable costs fluctuate proportionally and linearly with total revenues.
3. Revenues and total costs vary directly and linearly with number of rooms sold.
4. Mixed costs can be separated fully into fixed and variable parts.

CVP Graph

CVP Graph (cont.)

- Fixed cost line is parallel to X-axis.
- Variable cost line is parallel to total cost line and begins from origin. It suggests that where there are no sales there is no variable cost, and variable cost increases proportionately with volume increases. Total cost only increases as variable cost increases and as volume rises.

CVP Graph (cont.)

- At the intersection of Total Revenue and Total Cost there is no profit or loss, this is the **BREAKEVEN POINT**.
- Beyond the breakeven point revenues increase at a faster rate than costs, due in part to economies of scale.

Other Cost Behaviors

1. Where volume increases occur and existing employees have to work overtime in order to meet guest needs, the rise in labor cost that occurs, for example, will exhibit a **curvilinear** relationship instead of a linear one.

Other Cost Behaviors (cont.)

2. Where sharp increases or decreases in general business activity occurs, such as in a recession or expansion, and whole shifts of employees must be added or eliminated, that gives rise to a **"stair-step"** behavior with operating costs. This represents lump-sum additions to labor cost.

Breakeven Point

Point where no profit or loss results from operations. Setting total revenues equal to the total of fixed and variable costs results in the breakeven revenue point, and solving for the quantity involved yields the required breakeven units.

Breakeven Point (cont.)

Suppose: S = Total Revenues
X = Units of sales volume
P = selling price per unit
v = variable cost per unit
VC = Total variable cost
FC = Total fixed cost

Breakeven Point (cont.)

Then: $S = VC + FC$

OR

$PX = vX + FC$

Determining Breakeven Units

$$PX - vX = FC$$

$$X(P - v) = FC$$

Therefore $$X = \frac{FC}{P - v}$$

OR

$$\frac{\text{Fixed Costs}}{\text{Unit selling price} - \text{Unit variable cost}}$$

Breakeven Example

Owner of Sullivan Foods is concerned about changing costs and the inability to increase prices. During 1999 the average check per meal served was $10.25, the average variable cost per meal was $5.25, and the average monthly fixed costs totaled $20,000. During 2000 she expected the average variable cost to increase by $0.25 per meal and the average monthly fixed cost to increase by $2,000. There was no price increase.

Breakeven Example (cont.)

Questions:

1. What was the breakeven point in meals sold in 1999?
2. What was the breakeven point in revenues in 1999?
3. What was the expected breakeven point in meals sold for 2000?

Contribution Margin

This is the amount by which revenue exceeds variable costs. Variable costs change in direct proportion to revenue, therefore, each additional dollar of revenue generated creates additional variable cost.

Contribution Margin (cont.)

Prior to reaching the breakeven point the excess of revenues over variable cost, the contribution margin (CM), goes to cover all of fixed costs. **Once revenues exceed the breakeven point, every dollar in additional revenue contributes toward operating profit.**

Contribution Margin (cont.)

Contribution margin is expressed as:

1) a percentage of revenue or contribution margin ratio (CMR):

$$\frac{\text{CM/unit}}{\text{Unit Price}}$$

2) a contribution margin per unit: (P-v)

Desired Level of Operating Profit

To determine how many rooms or units to sell to achieve a desired level of operating profit:

Required units X = $\frac{\text{FC + Desired Profit}}{\text{CM/unit}}$

Desired Level of Operating Profit (cont.)

To determine how much revenues is needed to achieve a desired operating profit level:

Required revenues = $\frac{\text{FC + Desired Profit}}{\text{CMR}}$

Margin of Safety

This represents the dollar amount by which actual revenues or volume exceeds the breakeven revenues or volume. It also represents the dollar amount by which revenues can decline before an operating loss is incurred. During a recession it is important for managers to know the extent to which the business can sustain a decline in sales.

Margin of Safety (cont.)

Margin of Safety =
Total Revenues – Breakeven Revenues

Margin of safety rate =

$$\frac{\text{Total Revenues} - \text{Breakeven Revenues}}{\text{Total Revenues}}$$

Margin of Safety (cont.)

Estimating operating profit using margin of safety:
Operating profit = Margin of safety x contribution margin ratio

Why? The margin of safety represents revenues in excess of the breakeven point. So if fixed costs have already been met, then the entire contribution margin of these excess sales represents operating profit.

Weighted Average Contribution Margin (CMR_W)

Many hospitality businesses sell a variety of products and services. Restaurants sell different menu items, each with a different contribution margin. Full-service hotels sell different room packages with different contribution margins. Hotels also have different revenue centers with different contributions margins.