CHAPTER 5
Organizational Costing and Profit Analysis

Managers of healthcare businesses have many responsibilities, including planning, budgeting, and overseeing routine operations. All of these activities require information—a great deal of information—which is created by the business's managerial accounting system. This chapter begins the coverage of managerial accounting by examining organizational costing and profit (CVP) analysis.

Managerial vs. Financial Accounting

- ***Financial accounting***:
  - Uses organizational (aggregate) data
  - Designed for use by external parties
  - Primarily historical
  - Must adhere to external standards (GAAP)
- ***Managerial accounting***:
  - Uses organizational ***and subunit*** data.
  - Designed for use by ***managers***.
  - Primarily ***forward looking***.
  - Does ***not*** adhere to external standards.

Cost Measurement

- **Cost measurement** is a critical part of managerial accounting.
  - In fact, there is an entire field of accounting called **cost accounting**.
  - Unfortunately, there is no single definition of the term ***cost***. Different costs are used for different purposes.
- Costs are classified in several ways. In this chapter, we focus on the relationship of costs to volume to the volume of services provided.

Fixed Versus Variable Costs

- The relationship between costs and the volume of services provided is called **underlying cost structure**.
- If the underlying cost structure is known, managers can forecast costs at different levels of patient volume.
- In this context, costs may be:
  - **Fixed**, which are independent of volume
  - **Variable**, which depend on volume
  - **Semi-fixed**, which partially depend on volume (found in the chapter supplement)

Two Ground Rules

- In the *long run*, all costs are variable, and hence these cost classifications hold only in the *short run*, say, for one year.
- Also, no costs are fixed throughout an infinite range of volumes. Thus, the concept of cost classifications according to volume must be applied within some *relevant range* of patient volume.

Cost Structure Example: Walk-In Clinic

Variable Costs per Visit	
Clinical supplies	$20
Other supplies	5
Variable cost rate	$25

Fixed Costs per Year	
Facilities	$ 30,000
Salaries	190,000
Overhead	80,000
	$300,000

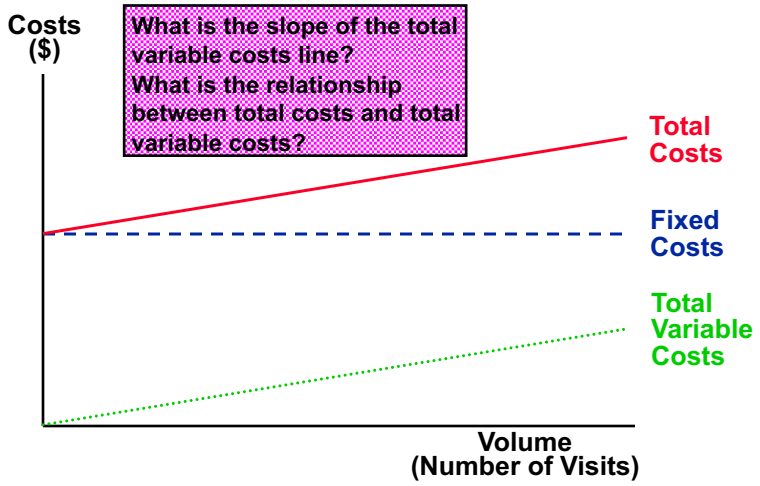
Total Volume	Fixed Costs	Variable Costs	Total Costs	Average Cost
1	$300,000	$ 25	$300,025	$300,025
100	300,000	2,500	302,500	3,025
200	300,000	5,000	305,000	1,525
1,000	300,000	25,000	325,000	325
5,000	300,000	125,000	425,000	85
10,000	300,000	250,000	550,000	55
25,000	300,000	625,000	925,000	37

Note: The relevant range is this example is unrealistic.

Cost Structure Example (Cont.)

- Consider a volume of 5,000:
  - Fixed costs = $300,000.
  - Variable cost rate = $25.
  - Total variable costs = $125,000.
  - Total costs = $425,000.
  - Average cost per visit = $85.
- Now consider a volume of 10,000:
  - Fixed costs = $300,000.
  - Variable cost rate = $25.
  - Total variable costs = $250,000.
  - Total costs = $550,000.
  - Average cost per visit = $55.

Graphical Cost Structure



Profit (CVP) Analysis

- **Profit analysis**, also called **cost-volume-profit** (**CVP**) **analysis**, is a technique used to assess the effects of alternative volume assumptions on costs and profits.

? Why is such information valuable to health services managers?

Profit Analysis Example

Atlanta Clinic has forecasted the following cost data on the basis of 75,000 expected visits:

Fixed costs	$4,967,462
Total variable costs	2,113,500
Total costs	$7,080,962

Profit Analysis Example (Cont.)

What is the variable cost rate?

$$\text{Variable cost rate} = \frac{\text{Total variable costs}}{\text{Volume}}$$

$$= \frac{\$2{,}113{,}500}{75{,}000}$$

= $28.18 per visit.

Profit Analysis Example (Cont.)

What is Atlanta's cost structure?

Total costs = Fixed costs + Total variable costs
= $4,967,462 + ($28.18 × Volume).

For example, at 70,000 visits:

Total costs = $4,967,462 + ($28.18 × 70,000)
= $4,967,462 + $1,972,600
= $6,940,062.

Profit Analysis Example (Cont.)

Cost/Volume Summary:

Volume = 70,000

TC = $4,967,462 + $1,972,600 = $6,940,062.

Average cost per visit = $6,940,062 ÷ 70,000 = $99.14.

Volume = 75,000 (Base Case)

TC = $4,967,462 + $2,113,500 = $7,080,962.

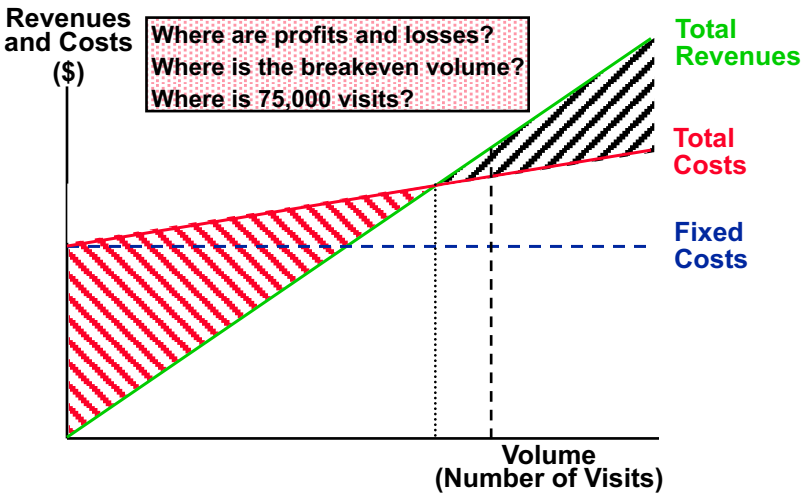
Average cost per visit = $7,080,962 ÷ 75,000 = $94.41.

Volume = 80,000

TC = $4,967,462 + $2,254,400 = $7,221,862.

Average cost per visit = $7,221,862 ÷ 80,000 = $90.27.

Graphical Profit Analysis



Forecasted (Projected) Profit and Loss (P&L) Statement

- A P&L statement uses cost structure information along with the revenue forecast and projected volume to forecast profitability.
- Although it looks like an income statement (discussed later in the course), it does not have to follow financial accounting guidelines (GAAP). Thus, different formats can be used for different purposes.

Base Case P&L Statement

Total revenues ($100 × 75,000)	$7,500,000
Total VC ($28.18 × 75,000)	2,113,500
Total CM ($71.82 × 75,000)	$5,386,500
Fixed costs	4,967,462
Profit	$ 419,038

VC = Variable costs.
CM = Contribution margin.

Note: The base case is the single best estimate of future profitability.

Base Case P&L Statement (Cont.)

- Note that *base case* total costs equal fixed costs plus total variable costs or $4,967,462 + $2,113,500 = $7,080,962.
- Thus, Atlanta's *average per visit cost* is $7,080,962 ÷ 75,000 = $94.41.

Contribution Margin

- The contribution margin is defined as the difference between *per visit (unit) revenue* and the *variable cost rate*.
- It is the amount of each visit's revenue that is available to:
  - First cover fixed costs.
  - Flow to profit when fixed costs are covered.
- In this illustration, the contribution margin is $100 − $28.18 = $71.82.

? What is the total contribution margin?

Breakeven Analysis

- **Breakeven analysis** is performed in many different finance contexts.
- Here, it is used to determine the **breakeven volume**, defined as that volume needed for an organization (or service or program) to be financially self-sufficient.
- There are two types of breakeven:
  - Accounting breakeven (zero profit)
  - Economic breakeven (with profit)

Breakeven Analysis (Cont.)

What is the *accounting breakeven* for Atlanta Clinic?

Total revenues	- Total VC	- FC	= Profit
($100 × V)	- ($28.18 × V)	- $4,967,462	= $0
		$71.82 × V	= $4,967,462
	V = $4,967,462 ÷ $71.82		= 69,165 visits.

Breakeven Analysis (Cont.)

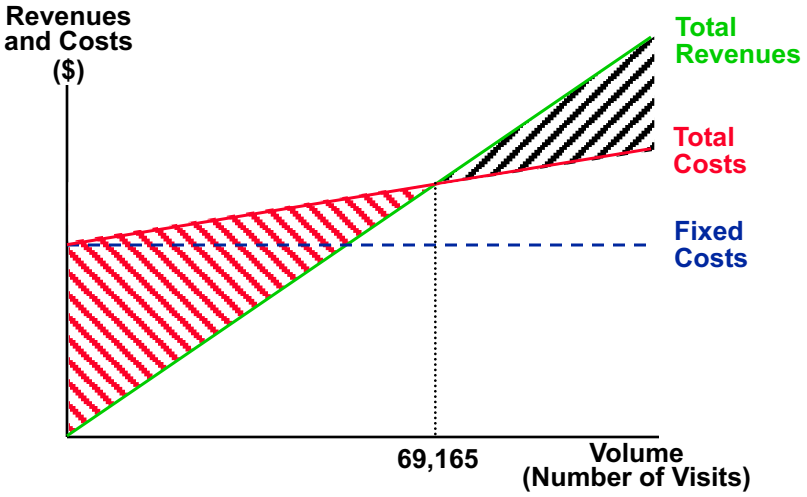
Note that the breakeven equation can be recast in a *contribution margin format*.

$$\text{CM} \times V = \text{Fixed costs}$$

$$\$71.82 \times V = \$4{,}967{,}462$$

$$V = \$4{,}967{,}462 \div \$71.82 = 69{,}165 \text{ visits.}$$

Graphical Breakeven Analysis



Breakeven Analysis (Cont.)

What is the *economic breakeven* if the desired profit level is $100,000?

$$CM \times V = \text{Fixed costs} + \text{Profit}$$
$$\$71.82 \times V = \$5{,}067{,}462$$
$$V = \$5{,}067{,}462 \div \$71.82 = 70{,}558 \text{ visits.}$$

Note that the accounting breakeven is 69,165 visits.
The additional number of visits needed is 1,393.
1,393 × CM = 1,393 × $71.82 = $100,000.

Profit Analysis Under Discounted FFS

- Suppose Atlanta Clinic is confronted with a situation in which a payer contributing 5,000 visits wants a 40 percent discount.
- Atlanta's managers might want to drop the contract because a $60 per visit payment is less than the $94.41 average per visit cost.
- But further analysis is required.

P&L Statement with 70,000 Visits

Total revenues ($100 × 70,000)	$7,000,000
Total VC ($28.18 × 70,000)	1,973,600
Total CM ($71.82 × 70,000)	$5,027,400
Fixed costs	4,967,462
Profit	$ 39,938

P&L Statement with Discount Visits

Undiscounted revenue ($100 × 70,000)	$7,000,000
Discounted revenue ($60 × 5,000)	300,000
Total revenues ($97.33 × 75,000)	$7,300,000
Total VC ($28.18 × 75,000)	2,113,500
Total CM ($69.15 × 75,000)	$5,186,500
Fixed costs	4,967,462
Profit	$ 219,038

Marginal (Incremental) Analysis

- Suppose Atlanta Clinic is approached by a new insurer.
  - This payer is expected to contribute 5,000 additional visits.
  - However, it wants a 40 percent discount, resulting in a revenue of $60 per visit.
- At a volume of 80,000, the clinic's average cost per visit is $7,221,862 ÷ 80,000 = $90.27, so again Atlanta's managers might be tempted to say "no."

Base Case P&L Statement

Total revenues ($100 × 75,000)	$7,500,000
Total VC ($28.18 × 75,000)	2,113,500
Total CM ($71.82 × 75,000)	$5,386,500
Fixed costs	4,967,462
Profit	$ 419,038

VC = Variable costs.
CM = Contribution margin.

P&L Statement with Added Volume

Undiscounted revenue ($100 × 75,000)	$7,500,000
Discounted revenue ($60 × 5,000)	300,000
Total revenues ($97.50 × 80,000)	$7,800,000
Total VC ($28.18 × 80,000)	2,254,400
Total CM ($69.32 × 80,000)	$5,545,600
Fixed costs	4,967,462
Profit	$ 578,138

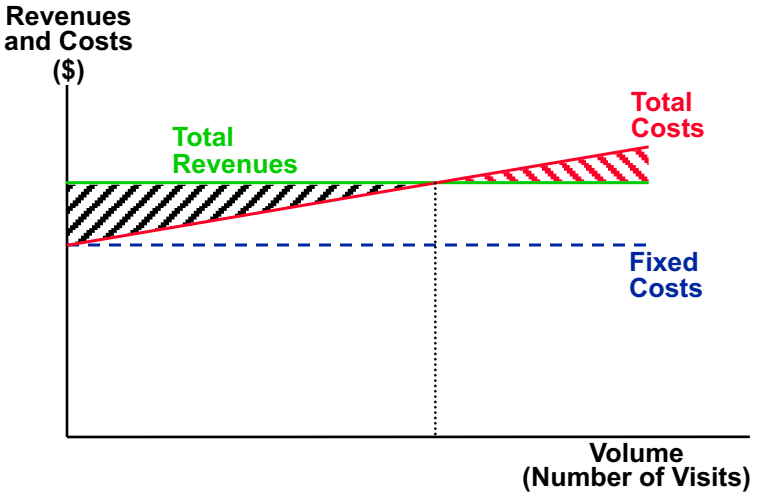
Marginal (Incremental) Analysis (Cont.)

- The marginal cost of each visit is the *variable cost rate* of $28.18 per visit.
- The marginal revenue on the new contract is $60 per visit, so the contribution margin is $60 − $28.18 = $31.82.
- Thus, 5,000 incremental visits would add 5,000 × $31.82 = $159,100 to the bottom line: $419,038 + $159,100 = $578,138.

Profit Analysis Under Capitation

- **Capitation** changes the way in which profit analysis is conducted.
- Perhaps the best way to see the effects of capitation is by ***graphical analysis***.
- We will examine two approaches to graphical analysis:
  - In terms of utilization (number of visits).
  - In terms of membership (covered lives).

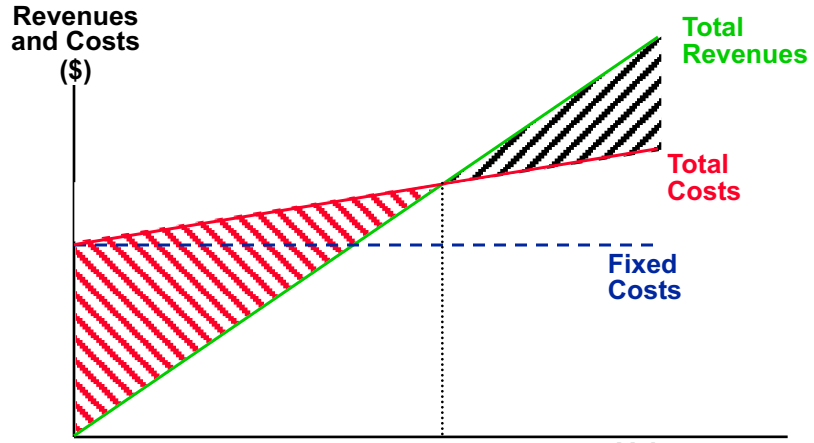
Analysis Based on Visits



Analysis Based on Visits (Cont.)

- On this graph, the profit and loss areas are *reversed* from the fee-for-service graph.
- This "perverse" result occurs because the contribution margin on a per visit basis is negative.
  - $0 − $28.18 = −$28.18.
  - Each additional visit increases costs with no increase in revenues.

Graphical Analysis Based on Members



Note: Average utilization is assumed regardless of volume.

Analysis Based on Members (Cont.)

- Now, the profit and loss areas are the *same* as on the fee-for-service graph.
- On a per member basis, the contribution margin is positive.
  - Each additional member contributes positively to profits.
  - If per member annual revenue is $400 and the variable cost rate (based on 4 visits per year) is 4 × $28.18 = $112.72 per year, the contribution margin is $400 − $112.72 = $287.28.

Discussion Items

What do the graphs tell managers about the importance of *utilization management*:

(1) Under FFS reimbursement?

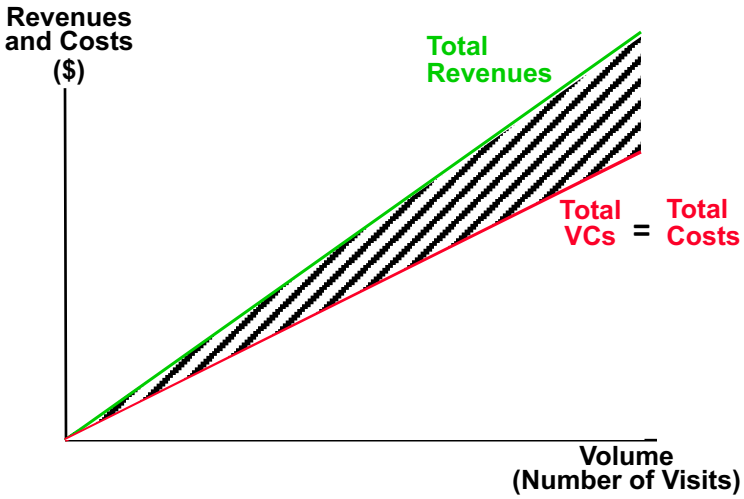
(2) Under capitation?

What do the graphs tell about the importance of the *number of members* under capitation?

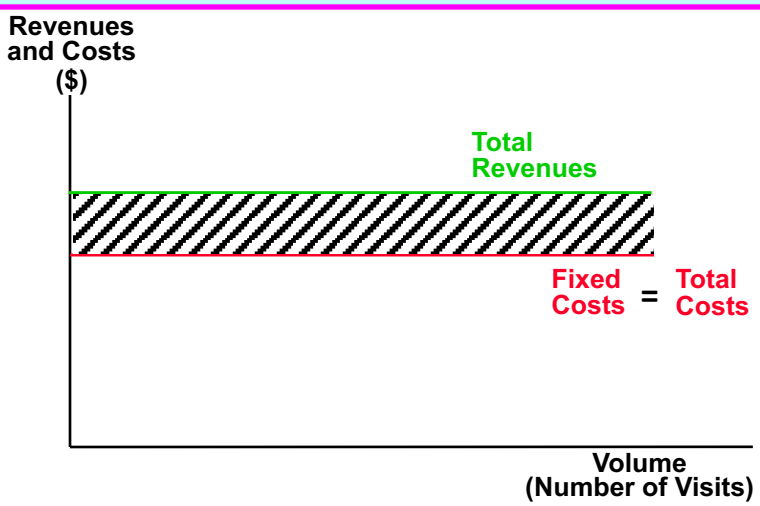
The Impact of Cost Structure on Risk

- If reimbursement is tied exclusively to volume (FFS), then the provider's financial risk is minimized if *all costs are variable*.
- If reimbursement is exclusively capitated, then the provider's financial risk is minimized if *all costs are fixed*.

Graphical Analysis Under FFS



Graphical Analysis Under Capitation



That's all for Chapter 5!