# Dr. Mohamed Fawzy El-Bardan


Associate Professor of Business Administration
Faculty of commerce - University of Sadat City
Aassociate Trainer from IBCT

Mohammed.fawzy@com.usc.edu.eg

# Lecture
# Code of ethics


# Financial Forecasting

# Learning Objectives

Financial forecasting is essential to the strategic growth of the firm.

The three financial statements for forecasting are the pro forma income statement, the cash budget, and the pro forma balance sheet.

The percent-of-sales method may also be used for forecasting on a less precise basis.

The various methods of forecasting enable the firm to determine the amount of new funds required in advance.

The process of forecasting forces the firm to consider seasonal and other effects on cash flow.

# Chapter Opening

## Financial Forecasting

- Ability to plan ahead and make necessary adjustments before events occur
- Firm's outcome through external events involves
  - Risk-taking desires
  - Ability to hedge against risk with careful planning
- No growth or a decline in volume are not necessarily the primary cause of a shortage of funds
- Comprehensive financing plan must be developed for significant growth

# Constructing Pro Forma Statements

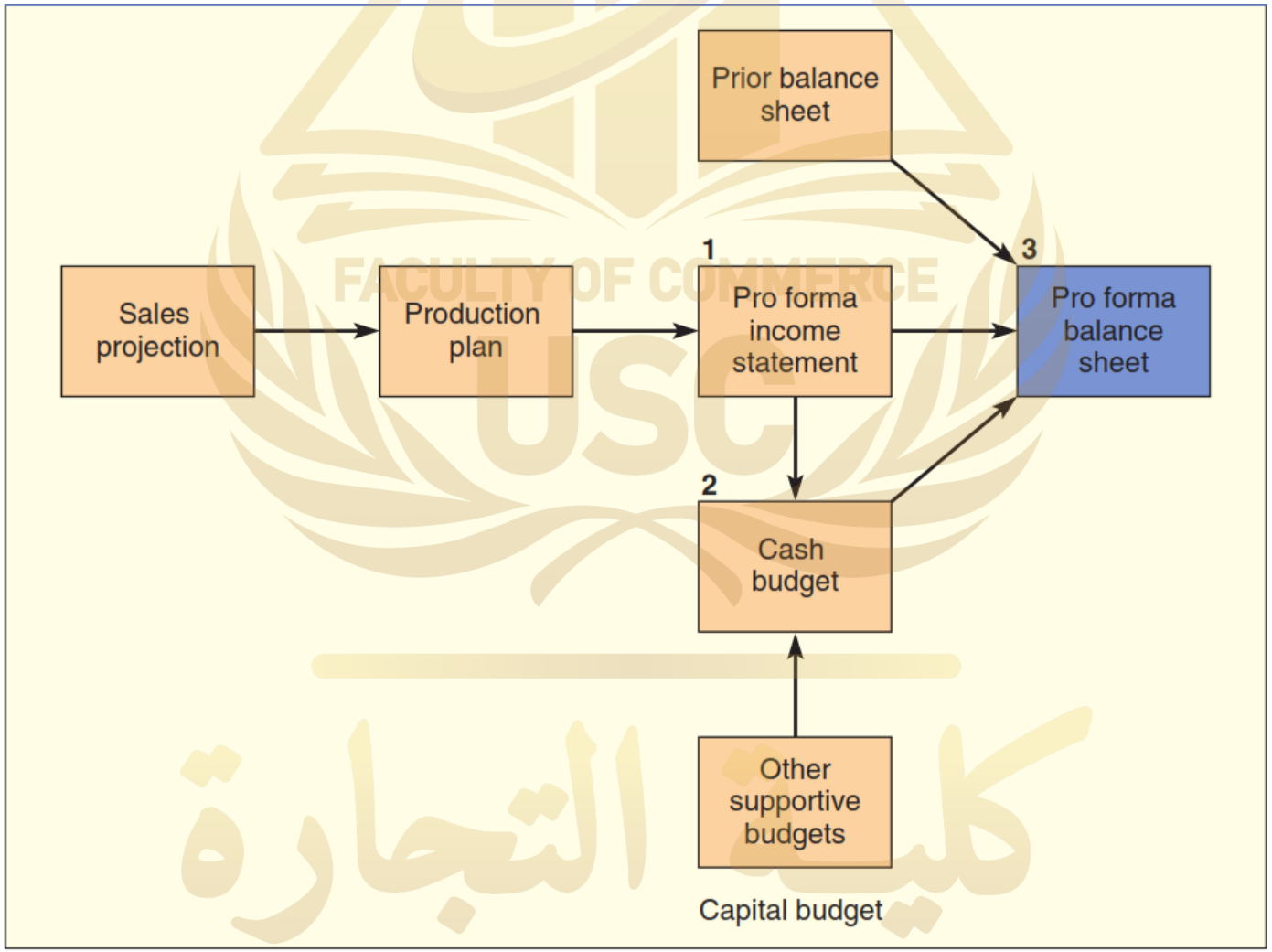
Pro forma financial statements enable a firm to estimate future receivables, inventory, and payables, as well as anticipated profits and borrowing requirements

Statements are often required by bankers, other lenders as guide for the future

Systems approach to develop pro forma statements

- Construct income statement based on sales projections and the production plan
- Translate this into a cash budget
- Assimilate all materials into pro forma balance sheet

# Figure 4-1 Development of Pro Forma Statements

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# Pro Forma Income Statement

Provides projection on anticipated profits over subsequent period

Important steps

- Establish sales projection
- Determine production schedule, associated use of new material, direct labor, and overhead to arrive at gross profit
- Compute other expenses
- Determine profit by completing actual pro forma statement

# Table 4-1 Projected Wheel and Caster Sales

Assume Goldman Corporation has two primary products: wheels and casters

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 2 | | **Wheels** | **Casters** | | | |
| 3 | Quantity | 1,000 | 2,000 | | | |
| 4 | Sales price | $30 | $35 | | | |
| 5 | Sales revenue | $30,000 | $70,000 | | | |
| 6 | Total | | | $100,000 | | |

# Determine Production Schedule and Gross Profit

Number of units produced depends on

- Beginning inventory
- Sales projections
- Desired ending inventory

To determine production requirements

| **Units** |
| --- |
| + Projected sales |
| + Desired ending inventory |
| – Beginning inventory |
| = Production requirements |

# Table 4-2 Stock of Beginning Inventory

Goldman Corporation has in stock the items shown

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 9 | | **Wheels** | **Casters** | | | |
| 10 | Quantity | 85 | 180 | | | |
| 11 | Cost | $16 | $20 | | | |
| 12 | Total value | $1,360 | $3,600 | | | |
| 13 | Total | | | $4,960 | | |

# Table 4-3 Production Requirements for Six Months

| | A | B | C | D |
|---|---|---|---|---|
| 16 | | **Wheels** | **Casters** | |
| 17 | Projected unit sales (Table 4-1) | +1,000 | +2,000 | |
| 18 | Desired ending inventory (assumed to represent 10% of unit sales for the time period) | +100 | +200 | |
| 19 | Beginning inventory (Table 4-2) | −85 | −180 | |
| 20 | Units to be produced | 1,015 | 2,020 | |

# Table 4-4 Unit Costs

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 23 | | **Wheels** | **Casters** | | | |
| 24 | Materials | $10 | $12 | | | |
| 25 | Labor | 5 | 6 | | | |
| 26 | Overhead | 3 | 4 | | | |
| 27 | Total | $18 | $22 | | | |

# Table 4-5 Total Production Costs

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 30 | | **Wheels** | **Casters** | | |
| 31 | Units to be produced (Table 4-3) | 1,015 | 2,020 | | |
| 32 | Cost per unit (Table 4-4) | $18 | $22 | | |
| 33 | Total cost | $18,270 | $44,440 | $62,710 | |

# Cost of Goods Sold

Costs associated with units sold during time period

- Assumptions for illustration
  - FIFO accounting used
  - First allocates cost of current sales to beginning inventory, then to goods manufactured during period

# Table 4-6 Allocation of Manufacturing Cost and Determination of Gross Profits

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 36 | | Wheels | | Casters | | Combined |
| 37 | Quantity sold (Table 4-1) | | 1,000 | | 2,000 | 3,000 |
| 38 | Sales price | | $30 | | $35 | |
| 39 | Sales revenue | | $ 30,000 | | $ 70,000 | $ 100,000 |
| 40 | Cost of goods sold: | | | | | |
| 41 | Old inventory (Table 4-2) | | | | | |
| 42 | Quantity (units) | 85 | | 180 | | |
| 43 | Cost per unit | $16 | | $20 | | |
| 44 | Total | | $ 1,360 | | $ 3,600 | |
| 45 | New inventory (the remainder) | | | | | |
| 46 | Quantity (units) | 915 | | 1,820 | | |
| 47 | Cost per unit (Table 4-4) | $18 | | $22 | | |
| 48 | Total | | 16,470 | | 40,040 | |
| 49 | Total cost of goods sold | | $ 17,830 | | $ 43,640 | $ 61,470 |
| 50 | Gross profit | | $ 12,170 | | $ 26,360 | $ 38,530 |

# Table 4-7 Value of Ending Inventory

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 53 | + Beginning inventory (Table 4-2) | $ 4,960 | | | |
| 54 | + Total production costs (Table 4-5) | 62,710 | | | |
| 55 | Total inventory available for sales | $ 67,670 | | | |
| 56 | − Cost of goods sold (Table 4-6) | 61,470 | | | |
| 57 | Ending inventory | $ 6,200 | | | |

# Other Expense Items

Must be subtracted from gross profits to arrive at a net profit figure

- Earnings before taxes
  - General and administrative expenses, interest expenses subtracted from gross profit
- Aftertax income
  - Subtract taxes to determine aftertax income
- Contribution to retained earnings
  - Deduct dividends to ascertain the contribution to retained earnings

# Table 4-8 Income Statement

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 61 | **Pro Forma Income Statement June 30, 2019** | | | | |
| 62 | Sales revenue (Table 4-1) | | $100,000 | | |
| 63 | Cost of goods sold (Table 4-6) | | 61,470 | | |
| 64 | Gross profit | | $ 38,530 | | |
| 65 | General and administrative expense | | 12,000 | | |
| 66 | Operating profit (EBIT) | | $ 26,530 | | |
| 67 | Interest expense | | 1,500 | | |
| 68 | Earnings before taxes (EBT) | | $ 25,030 | | |
| 69 | Taxes (20%)* | | 5,006 | | |
| 70 | Earnings after taxes (EAT) | | $ 20,024 | | |
| 71 | Common stock dividends | | 1,500 | | |
| 72 | Increase in retained earnings | | **$ 18,524** | | |

*A 20 percent tax rate is used for simplicity.

# Cash Budget

Pro forma income statement must be translated into cash flows

- Divide longer-term pro forma income statement into smaller units
- More precise time frames are set to anticipate seasonal and monthly patterns of cash inflows and outflows
  - May represent highs or low sales volume
  - May require dividends, taxes, or capital expenditures

# Table 4-9 Monthly Sales Pattern

| | C | D | E | F | G | H |
|---|---|---|---|---|---|---|
| 2 | **January** | **February** | **March** | **April** | **May** | **June** |
| 3 | $15,000 | $10,000 | $15,000 | $25,000 | $15,000 | $20,000 |

# Cash Receipts

In the case of Goldman Corporation

- Break down the pro forma income statement for first half of the year
  - Divided into monthly cash budgets
- Analysis of past sales and collection records show
  - 20 percent of sales collected in month of sales
  - 80 percent collected in following month

# Table 4-10 Monthly Cash Receipts

| | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| 6 | | **December** | **January** | **February** | **March** | **April** | **May** | **June** | | |
| 7 | Sales | $12,000 | $15,000 | $10,000 | $15,000 | $25,000 | $15,000 | $20,000 | | |
| 8 | Collections: | | | | | | | | | |
| 9 | (20% of current sales) | | $ 3,000 | $ 2,000 | $ 3,000 | $ 5,000 | $ 3,000 | $ 4,000 | $16,000 | Ending A/R |
| 10 | Collections: | | | | | | | | | |
| 11 | (80% of previous month's sales) | | 9,600 | 12,000 | 8,000 | 12,000 | 20,000 | 12,000 | | |
| 12 | Total cash receipts | | $12,600 | $14,000 | $11,000 | $17,000 | $23,000 | $16,000 | | |

Ending accounts receivable:

| | |
|---|---|
| $20,000 | June sales |
| −4,000 | Collected |
| $16,000 | |

# Table 4-11 Component Costs of Manufactured Goods

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 15 | | Wheels | | | Casters | | | |
| 16 | | Units Produced | Cost per Unit | Total Cost | Units Produced | Cost per Unit | Total Cost | Combined Cost |
| 17 | Materials | 1,015 | $10 | $10,150 | 2,020 | $12 | $24,240 | $34,390 |
| 18 | Labor | 1,015 | 5 | 5,075 | 2,020 | 6 | 12,120 | 17,195 |
| 19 | Overhead | 1,015 | 3 | 3,045 | 2,020 | 4 | 8,080 | 11,125 |
| 20 | | | | | | | | $62,710 |

# Cash Payments 1

Primary considerations are monthly costs associated with:

- Inventory manufactured during period
  - Material
  - Labor
  - Overhead
- Disbursements for general and administrative expenses
- Interest payments, taxes, and dividends
- Cash payments for new plant and equipment

# Cash Payments 2

Assumptions for next two tables

- Costs incurred on equal monthly basis over six-month period
- Even production level to ensure maximum efficiency
- Payment for material made once per month after purchases have been made

# Table 4-12 Average Monthly Manufacturing Costs

| | A | B | C | D |
|---|---|---|---|---|
| 23 | | **Total Costs** | **Time Frame** | **Average Monthly Cost** |
| 24 | Materials | $34,390 | 6 months | $5,732 |
| 25 | Labor | 17,195 | 6 months | 2,866 |
| 26 | Overhead | 11,125 | 6 months | 1,854 |

# Table 4-13 Summary of All Monthly Cash Payments

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 29 | | December | January | February | March | April | May | June | |
| 30 | From Table 4-12: | | | | | | | | |
| 31 | Monthly material purchase | $ 4,500 | $ 5,732 | $ 5,732 | $ 5,732 | $ 5,732 | $ 5,732 | $ 5,732 | Ending A/P |
| 32 | Payment for material (prior month's purchase) | | $ 4,500 | $ 5,732 | $ 5,732 | $ 5,732 | $ 5,732 | $ 5,732 | |
| 33 | Monthly labor cost | | 2,866 | 2,866 | 2,866 | 2,866 | 2,866 | 2,866 | |
| 34 | Monthly overhead | | 1,854 | 1,854 | 1,854 | 1,854 | 1,854 | 1,854 | |
| 35 | From Table 4-8: | | | | | | | | |
| 36 | General and administrative expense ($12,000 over 6 months) | | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | |
| 37 | Interest expense | | | | | | | 1,500 | |
| 38 | Taxes (two equal payments) | | | | 2,503 | | | 2,503 | |
| 39 | Cash dividend | | | | | | | 1,500 | |
| 40 | Also: | | | | | | | | |
| 41 | New equipment purchases | | | 8,000 | | | | 10,000 | |
| 42 | Total payments | | $ 11,220 | $ 20,452 | $ 14,955 | $ 12,452 | $ 12,452 | $ 27,955 | |

# Table 4-14 Monthly Cash Flow

Difference between monthly receipts and payments is net cash flow for month

- Allows firm to anticipate need for outside funding at end of each month

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 45 | | **January** | **February** | **March** | **April** | **May** | **June** |
| 46 | Total receipts (Table 4-10) | $ 12,600 | $ 14,000 | $ 11,000 | $ 17,000 | $ 23,000 | $ 16,000 |
| 47 | Total payments (Table 4-13) | (11,220) | (20,452) | (14,955) | (12,452) | (12,452) | (27,955) |
| 48 | Net cash flow | $ 1,380 | ($6,452) | ($3,955) | $ 4,548 | $ 10,548 | ($11,955) |

# Table 4-15 Cash Budget with Borrowing and Repayment Provisions

## Assumptions for Table 4-15

- Firm wishes to maintain minimum cash balance of $5,000
- If balance goes below minimum, firm will borrow
- If balance goes above minimum, firm will use excess to repay outstanding loan

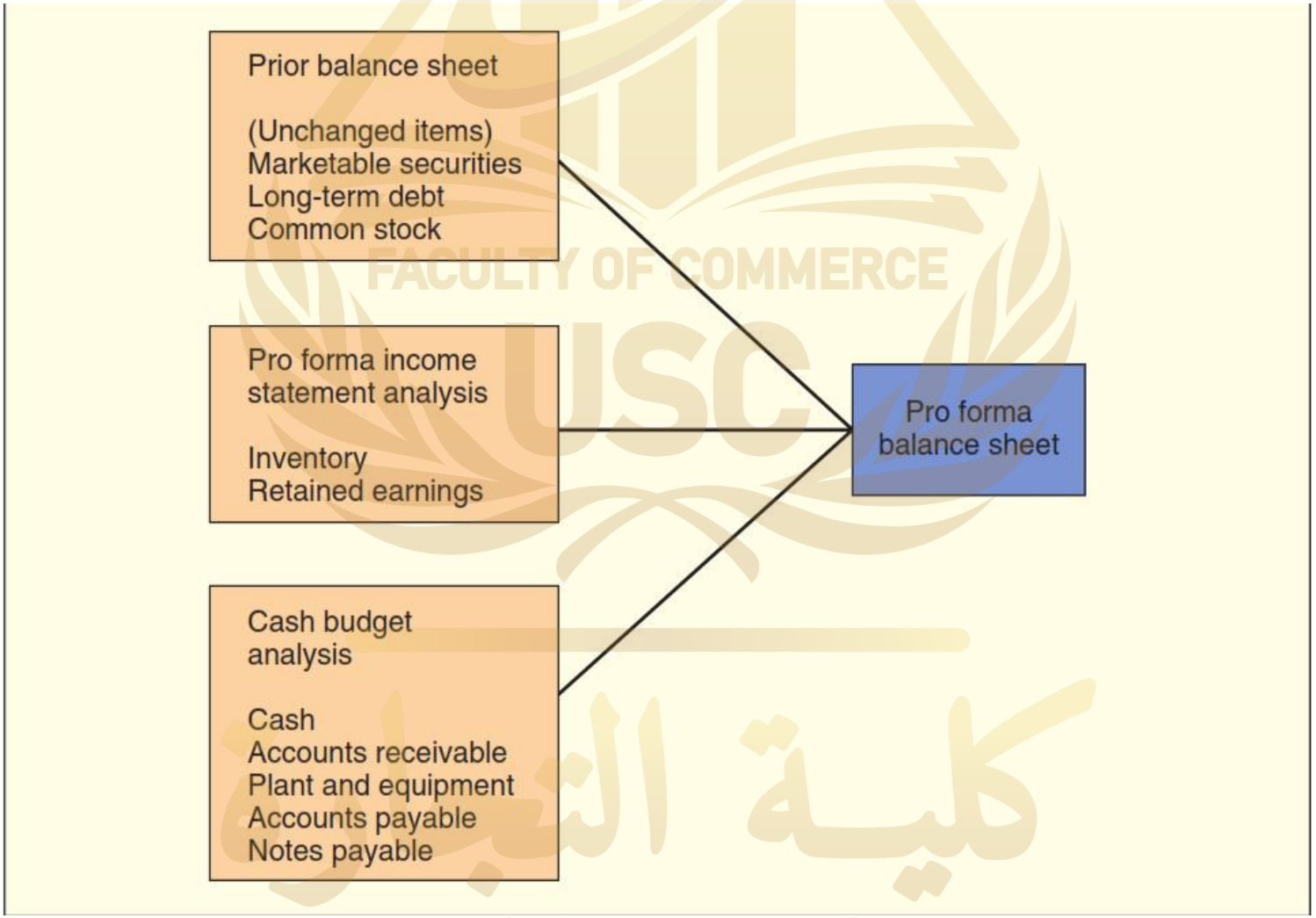
| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 51 | | **January** | **February** | **March** | **April** | **May** | **June** |
| 52 | Net cash flow | $ 1,380 | ($6,452) | ($3,955) | $4,548 | $10,548 | ($11,955) |
| 53 | Beginning cash balance | 5,000* | 6,380 | 5,000 | 5,000 | 5,000 | 11,069 |
| 54 | Cumulative cash balance | $ 6,380 | $ (72) | $1,045 | $9,548 | $15,548 | $ (886) |
| 55 | Monthly loan (or repayment) | — | 5,072 | 3,955 | (4,548) | (4,479) | 5,886 |
| 56 | Cumulative loan balance | — | 5,072 | 9,027 | 4,479 | — | 5,886 |
| 57 | Ending cash balance | $ 6,380 | $5,000 | $5,000 | $5,000 | $ 11,069 | $ 5,000 |

# Pro Forma Balance Sheet

Represents cumulative changes over time

- Important to examine prior period's balance sheet
- Some accounts remain unchanged, while others take on new values
  - Information derived from pro forma income statement and cash budget

# Figure 4-2 Development of a Pro Forma Balance Sheet

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# Table 4-16 Balance Sheet December 31, 2018

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 3 | **Balance Sheet December 31, 2018** | | | | |
| 4 | **Assets** | | | | |
| 5 | Current assets: | | | | |
| 6 | Cash | | $ 5,000 | | |
| 7 | Marketable securities | | 3,200 | | |
| 8 | Accounts receivable | | 9,600 | | |
| 9 | Inventory | | 4,960 | | |
| 10 | Total current assets | | $22,760 | | |
| 11 | Plant and equipment | | 27,740 | | |
| 12 | Total assets | | $50,500 | | |
| 13 | **Liabilities and Stockholders' Equity** | | | | |
| 14 | Accounts payable | | $ 4,500 | | |
| 15 | Notes payable | | 0 | | |
| 16 | Long-term debt | | 15,000 | | |
| 17 | Common stock | | 10,500 | | |
| 18 | Retained earnings | | 20,500 | | |
| 19 | Total liabilities and stockholders' equity | | $50,500 | | |

# Table 4-17 Pro Forma Balance Sheet June 30, 2019

| | E | F | G | H | I |
|---|---|---|---|---|---|
| 3 | **Pro Forma Balance Sheet June 30, 2019** | | | | |
| 4 | **Assets** | | | | |
| 5 | Current assets: | | | | |
| 6 | 1. Cash | | $ 5,000 | Table 4-15 | |
| 7 | 2. Marketable securities | | 3,200 | Table 4-16 | |
| 8 | 3. Accounts receivable | | 16,000 | Table 4-10 | |
| 9 | 4. Inventory | | 6,200 | Table 4-7 | |
| 10 | Total current assets | | $30,400 | | |
| 11 | 5. Plant and equipment | | 45,740 | Table 4-16 plus 4-13 | |
| 12 | Total assets | | $76,140 | | |
| 13 | **Liabilities and Stockholders' Equity** | | | | |
| 14 | 6. Accounts payable | | $ 5,732 | Table 4-13 | |
| 15 | 7. Notes payable | | 5,886 | Table 4-15 | |
| 16 | 8. Long-term debt | | 15,000 | Table 4-16 | |
| 17 | 9. Common stock | | 10,500 | Table 4-16 | |
| 18 | 10. Retained earnings | | 39,024 | Table 4-16 plus Table 4-8 | |
| 19 | Total liabilities and stockholders' equity | | $76,142 | | |

# Explanation of Pro Forma Balance Sheet[1]

Cash ($5,000) minimum cash balance in Table 4-15

Marketable securities ($3,200) remains unchanged from prior period's value in Table 4-16

Accounts receivable ($16,000) based on June sales of $20,000 in Table 4-10

- 20 percent will be collected that month
- 80 percent will become accounts receivable at the end of month

Inventory ($6,200) shown in Table 4-7

Plant and equipment: $27,740 (initial value) + $18,000 (purchases) = $45,740

# Explanation of Pro Forma Balance Sheet 2

Accounts payable ($5,732) based on June purchases in Table 4-13

Notes payable ($5,886) amount to be borrowed to maintain $5,000 in cash in Table 4-15

Long-term debt ($15,000) unchanged from prior period's value in Table 4-16

Common stock ($10,500) unchanged from prior period's value in Table 4-16

Retained earnings ($39,024) equals the initial value plus pro forma income ($20,500 + $18,524)

# Analysis of Pro Forma Statement

Growth ($25,642) was financed by accounts payable, notes payable, and profit

- Reflected by increase in retained earnings

Total assets (June 30, 2019)……$76,142

Total assets (Dec. 31, 2018)……$50,500

Increase……$25,642

# Percent-of-Sales Method[1]

Based on assumption that

- Accounts on balance sheet will maintain given percentage relationship to sales
- Percentages are not computed for
  - Notes payable
  - Common stock
  - Retained earnings
- Not assumed to maintain a direct relationship with sales volume

# Table 4-18 Balance Sheet and Percentage-of-Sales Table for Howard Corporation

| | A | B | C | D |
|---|---|---|---|---|
| 3 | **HOWARD CORPORATION**<br>**Balance Sheet and Percent-of-Sales Table** | | | |
| 4 | **Assets** | | **Liabilities and Stockholders' Equity** | |
| 5 | Cash | $ 5,000 | Accounts payable | $ 40,000 |
| 6 | Accounts receivables | 40,000 | Accrued expenses | 10,000 |
| 7 | Inventory | 25,000 | Notes payable | 15,000 |
| 8 | Total current assets | $ 70,000 | Common stock | 10,000 |
| 9 | Plant and equipment | 50,000 | Retained earnings | 45,000 |
| 10 | Total assets | $120,000 | Total liabilities and stockholders' equity | $120,000 |
| 11 | **$200,000 Sales**<br>**Percent of Sales** | | | |
| 12 | Cash | 2.5% | Accounts payable | 20.0% |
| 13 | Accounts receivable | 20.0 | Accrued expenses | 5.0 |
| 14 | Inventory | 12.5 | | 25.0% |
| 15 | Total current assets | 35.0% | | |
| 16 | Plant and equipment | 25.0 | | |
| 17 | | 60.0% | | |

# Percent-of-Sales Method 2

Establish funds required to finance growth

Decide to finance based on

- Notes payable
- Sale of common stock
- Use of long-term debt

# Percent-of-Sales Method 3

Company operating at full capacity—needs to buy new plant and equipment to produce more goods to sell:

- Required new funds:
  - (RNF) = $A/S\ (\Delta S) - L/S\ (\Delta S) - PS_2\ (1 - D)$
- $A/S$ = Relationship of variable assets to sales [60%]
- $\Delta S$ = Change in sales [$100,000]
- $L/S$ = Percentage of variable liabilities to sales [25%]
- $P$ = Profit margin [6%]
- $S_2$ = New sales level [$300,000]
- $D$ = Dividend payout ratio [0.50]

RNF = 60% (100,000) – 25% ($100,000) – 6% ($300,000) (1 – 0.50)

= $60,000 – $25,000 – $18,000 (0.50)

= $35,000 – $9,000

= $26,000 required sources of new funds (at full capacity)

# Percent-of-Sales Method 4

Company not operating at full capacity

- Needs to add more current assets to increase sales
- Does not need to buy new equipment

RNF = 35% ($100,000) – 25% ($100,000) – 6% ($300,000)
(1 – 0.50)

= $35,000 – $25,000 – $18,000 (0.50)

= $35,000 – $25,000 – $9,000

= $1,000 required sources of new funds
(at less than full capacity)