

Managerial Accounting - Book Notes

Chapter 01 – Managerial Accounting basics

Managers' activities and responsibilities can be classified into three broad functions:

1. **Planning**
2. **Directing**
3. **Controlling**

Organizational charts: show the interrelationships of activities and the delegation of authority and responsibility within the company

Ethics: The **IMA's Statement of Ethical Professional Practice** provides the following codes of conduct regarding competence, confidentiality, integrity, and credibility

Managerial accounting practices

- The **value chain** refers to all activities associated with providing a product or service
 - 1) Research and development, and product design
 - 2) The acquisition of raw materials,
 - 3) Production
 - 4) Sales and marketing
 - 5) Delivery
 - 6) Customer relations, and subsequent service
- Technology:
 - Many companies now employ **enterprise resource planning (ERP)** software systems to manage their value chains; ERP systems provide a comprehensive, centralized, and integrated source of information.
 - **Computer-integrated manufacturing (CIM):** using CIM, many companies can now manufacture products that are untouched by human hands
- **Just-in-time (JIT) inventory methods**
- **Total quality management (TQM)** systems to reduce defects (Bottlenecks: constraints that limit the company's potential profitability) in finished products
- **Activity-based costing (ABC):** overhead is allocated based on each product's use of economic resources as it undergoes various activities
- **Theory of constraints** is a specific approach used to identify and manage constraints in order to achieve the company's goals
- **Lean manufacturing:** sets out to eliminate waste and to concentrate more accurately on the needs of the customer
- **Balanced scorecard:** performance-measurement approach that uses both financial and non-financial measures to evaluate all aspects of a company's operations in an integrated way

Chapter 02 - Managerial cost concepts and cost behaviour analysis

Manufacturing costs consists of activities and processes that convert raw materials into finished goods

Direct material

- **Raw materials** are the basic materials and parts used in the manufacturing process
- **Direct materials** are raw materials that can be physically and directly associated with the finished product (flour for bread, steel for automobiles)
- **Indirect materials** (1) do not physically become part of the finished product (lubricants and polishing compounds) or (2) cannot be easily traced because their physical association with the finished product is too small in terms of cost (sandpaper and glue)
Indirect materials are accounted for in the manufacturing overhead
- **Direct labour** is the work of factory employees that can be physically and directly associated with converting raw materials into finished goods
- **Indirect labour** (1) is the work of factory employees that has no physical association with the finished product, or (2) is work for which it is impractical to trace costs to the goods produced. (Wages of maintenance people, timekeepers, and supervisors)

Manufacturing overhead is the costs that are indirectly associated with the manufacture of the finished product

→ It contains: indirect materials, indirect labour, depreciation on factory buildings and machines, and insurance, taxes, and maintenance on factory facilities

Prime costs vs. conversion costs

- **Prime costs** are the sum of all direct materials costs and direct labour costs
- **Conversion costs** are the sum of all direct labour costs and manufacturing overhead costs, which together are the costs of converting raw materials into a final product

Product costs vs. period costs

- **Product costs** are costs that are a necessary and integral part of producing the finished product (recorded when incurred as inventory and when sold as cost of good sold)
- **Period costs** are costs that are matched with the revenue of a specific time period (deducted from revenues) e.g. administrative and selling expenses

Cost behaviour analysis

- **Variable costs**: vary in total directly and proportionally with changes in the activity level (remains the same per unit at every level of activity)
- **Fixed costs**: remain the same in total within the relevant range regardless of changes in the activity level
- **Mixed costs** (or semi variable costs) have both a variable element and a fixed element
- The **high-low method** uses the total costs incurred at the high and low levels of activity
$$\text{Change in total costs} / \text{change in activity levels} = \text{variable cost per unit}$$

Manufacturing Costs in financial statements

Income Statement

Beginning finished goods inventory
+ Cost of goods manufactured
- Ending goods inventory
= Cost of goods sold

Beginning work in process inventory
+ Total manufacturing cost
= Total cost of work in process
- Ending work in process inventory
= Cost of goods manufactured

Balance sheet

Have three inventories:

- Raw material inventory
- Work in process inventory
- Finished goods inventory

Chapter 03 – Job-order cost accounting

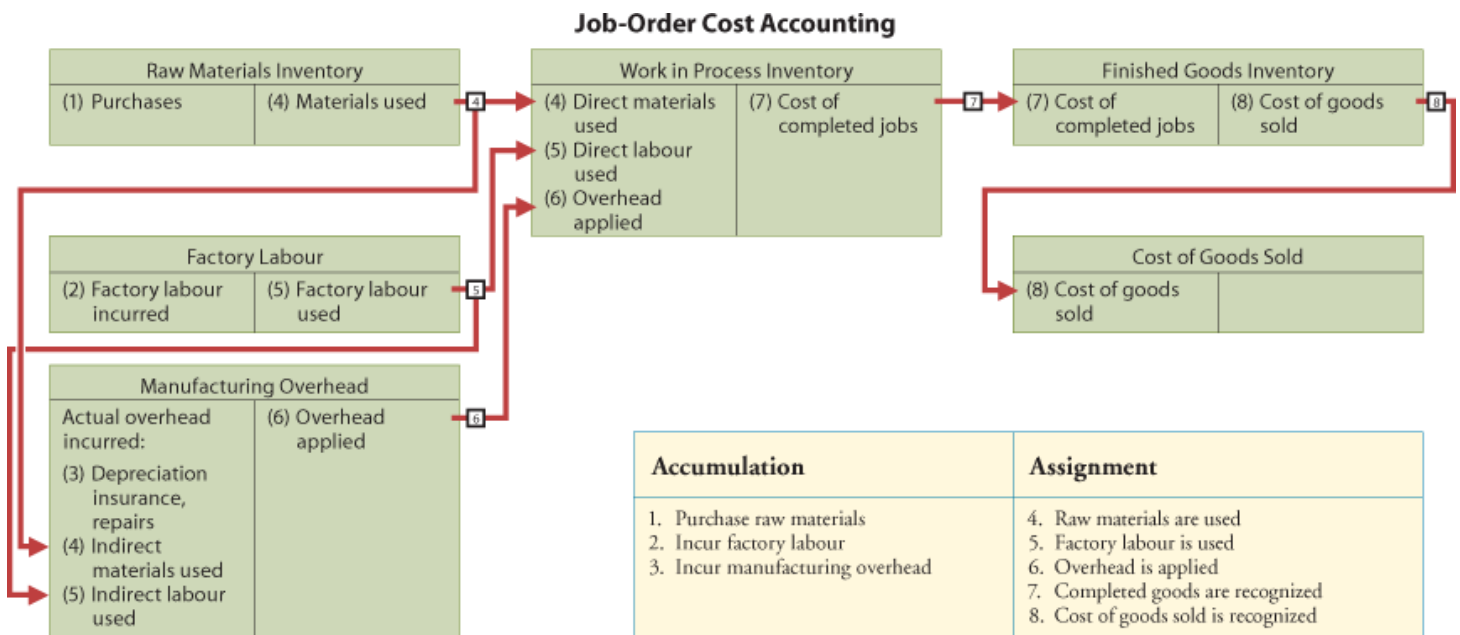
Cost accounting involves the measuring, recording, and reporting of product costs (total cost and unit cost). A **cost accounting system** consists of accounts for the various manufacturing costs (it uses the perpetual inventory system)

The two basic types of cost accounting systems are:

1. Job-order cost system: the company assigns costs to each job or to each batch of goods. Each job (or batch) has its own unique characteristics.
2. Process cost system: the company manufactures a large volume of similar products and accumulates product-related costs for a period of time (week, month). The costs are assigned to departments or processes for a set (predetermined) period of time

Job-Order Cost Flow

Manufacturing costs → work in process inv. → finished goods inv. → cost of goods sold



The cost flows in the diagram can be categorized as one of four types:

- **Accumulation:** The company first accumulates costs by (1) purchasing raw materials, (2) incurring labour costs, and (3) incurring manufacturing overhead costs.
- **Assignment to Jobs:** Once the company has incurred manufacturing costs, it must assign them to specific jobs:
 1. As it uses raw materials on specific jobs (4), it assigns them to work in process, or treats them as manufacturing overhead if the raw materials cannot be associated with a specific job.
 2. It either assigns factory labour (5) to work in process, or treats it as manufacturing overhead if the factory labour cannot be associated with a specific job.
 3. It assigns manufacturing overhead (6) to work in process using a

predetermined overhead rate

- Predetermined overhead rate= estimated annual overhead costs / expected annual operating activity
- “Actual activity based used x predetermined overhead rate” is assigned to work in process

- **Completed Jobs:** As jobs are completed (7), the company transfers the cost of the completed job out of work in process inventory into finished goods inventory.
- **When Goods Are Sold:** As specific items are sold (8), the company transfers their cost out of finished goods inventory into cost of goods sold.

Under-Applied or Over-Applied Manufacturing Overhead

- **Under-applied overhead:** means that the overhead assigned to Work in Process is less than the overhead incurred (manufacturing overhead has a debit balance)
- **Over-applied overhead:** means that the overhead assigned to Work in Process is greater than the overhead incurred (manufacturing overhead has a debit balance)

Dec. 31	Manufacturing Overhead	2,500	
	Cost of Goods Sold		2,500
	To close over-applied Manufacturing Overhead (i.e., to transfer over-applied overhead to cost of goods sold).		

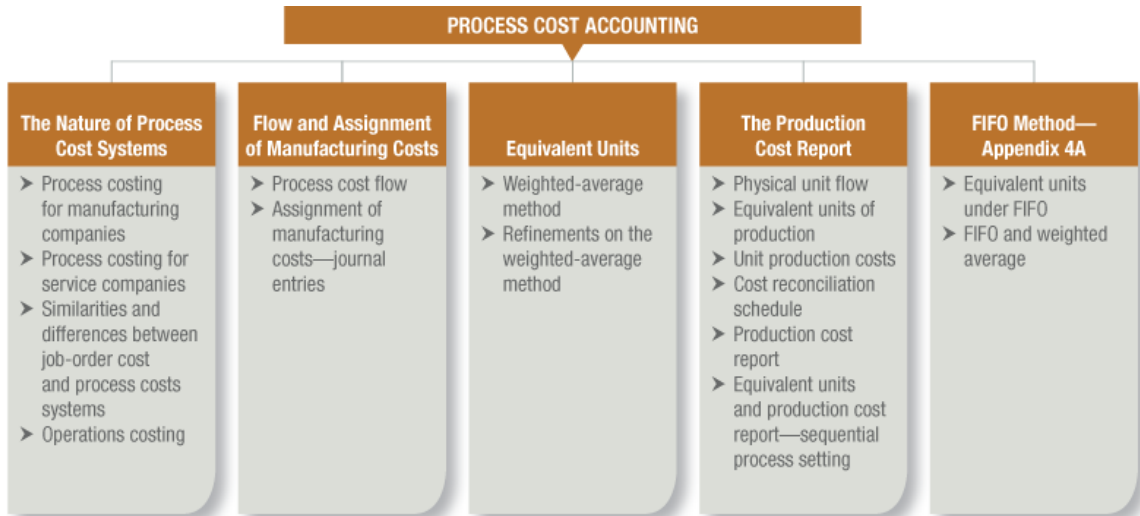
The end-of-period under-applied or over-applied overhead costs are treated in one of two methods

- 1) Make an **adjustment to Cost of Goods Sold**
- 2) **Proration method:**
 - Determine the ratio of each account's balance to the total of the three account balances together
 - Apply this ratio to the under- or over-applied overhead amount

Dec. 31	Work in Process Inventory ($\$10,000 \div \$100,000$) \times \$10,000	1,000	
	Finished Goods Inventory ($\$20,000 \div \$100,000$) \times \$10,000	2,000	
	Cost of Goods Sold ($\$70,000 \div \$100,000$) \times \$10,000	7,000	
	Manufacturing Overhead		10,000
	To close under-applied Manufacturing Overhead.		

Chapter 04 – Process Cost Systems

- ⇒ Companies use process cost systems to apply costs to similar products that are mass-produced in a continuous way
- ⇒ In a job-order cost system, costs are assigned to each job. In a process cost system, costs are tracked through a series of departments, rather than by individual jobs



Similarities and differences between job-order and cost process

Similarities

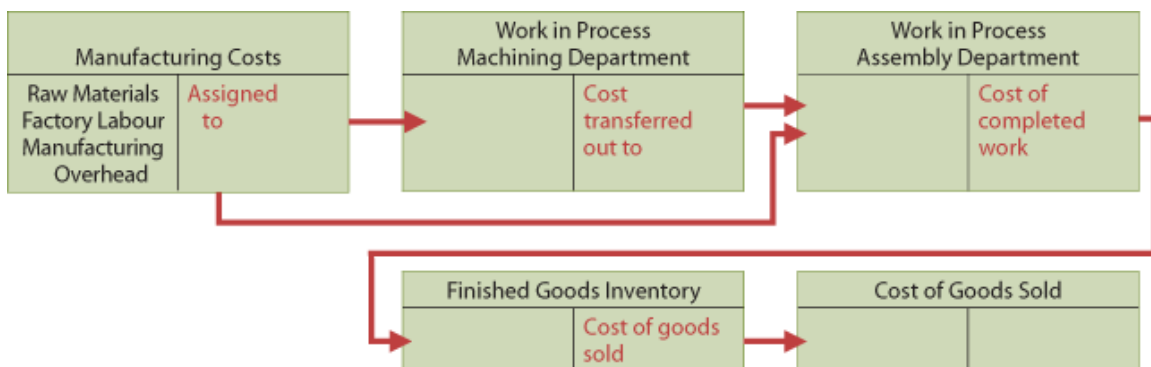
1. The manufacturing cost elements (direct materials, direct labour, and manufacturing overhead)
2. The accumulation of the costs of materials, labour, and overhead
3. The flow of costs

Differences

1. The number of work in process accounts used
2. Documents used to track costs (job cost sheet vs. production cost report for each department).
3. The point at which costs are totalled (when the job is completed vs. at the end of the period)
4. Unit cost calculations (total cost per job divided by the units produced vs. total manufacturing cost for the period divided by the units produced during the period)

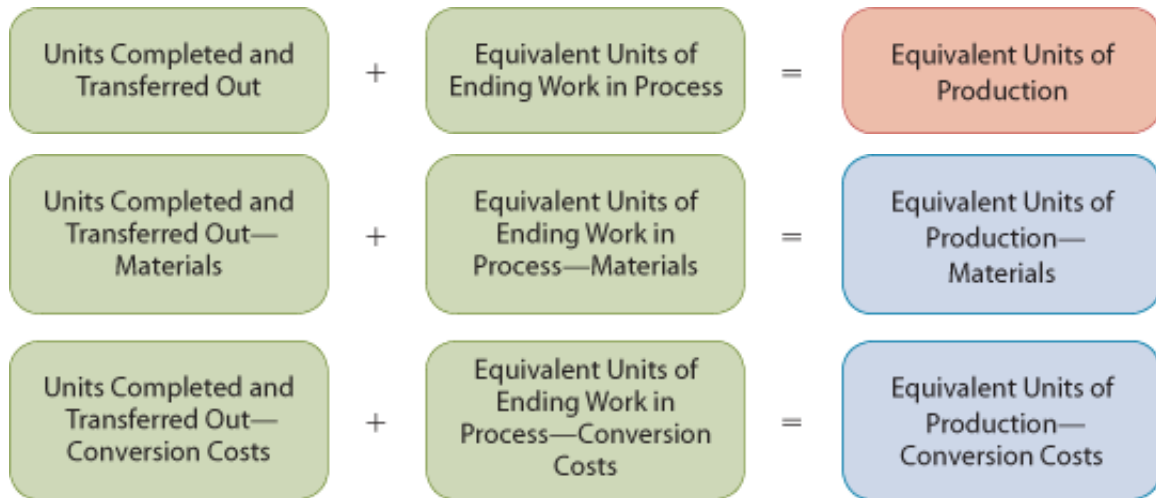
⇒ **Operations costing or hybrid cost systems:** combination of a process cost and a job-order cost system

The process cost flow



Equivalent Units of production measure the work done during the period, expressed in fully completed units (\neq physical units of production)

Weighted-average method: considers the degree of completion (weighting) of the units completed and transferred out and the ending work in process



- ⇒ **Conversion costs:** sum of labour costs and overhead costs
- ⇒ In calculating equivalent units, the beginning work in process is not part of the equivalent units of production formula

The production cost report: document for management that shows the production quantity and cost data for a production department

To be ready to complete a production cost report, the company must perform four steps:

Step 1 - Calculate the physical unit flow

- ⇒ Physical units: actual units to be accounted for during a period, regardless of any work performed
- ⇒ Total units to be accounted for: units started (or transferred) into production during the period and the units in process at the beginning of the period
- ⇒ Total units accounted for: units transferred out during the period and any units in process at the end of the period

Step 2 - Calculate the equivalent units of production

Step 3 - Calculate the unit production costs

- ⇒ Unit production costs: costs expressed in terms of equivalent units of production



<div style="border: 1px solid black; border-radius: 15px; background-color: #f4a460; padding: 5px; width: fit-content; margin: 0 auto;">Total Conversion Cost</div>	÷	<div style="border: 1px solid black; border-radius: 15px; background-color: #f4a460; padding: 5px; width: fit-content; margin: 0 auto;">Equivalent Units of Conversion Costs</div>	=	<div style="border: 1px solid black; border-radius: 15px; background-color: #a4a4c4; padding: 5px; width: fit-content; margin: 0 auto;">Unit Conversion Cost</div>
\$205,000	÷	820,000	=	\$0.25
<div style="border: 1px solid black; border-radius: 15px; background-color: #a4c484; padding: 5px; width: fit-content; margin: 0 auto;">Unit Materials Cost</div>	+	<div style="border: 1px solid black; border-radius: 15px; background-color: #a4a4c4; padding: 5px; width: fit-content; margin: 0 auto;">Unit Conversion Cost</div>	=	<div style="border: 1px solid black; border-radius: 15px; background-color: #a4c4e4; padding: 5px; width: fit-content; margin: 0 auto;">Total Manufacturing Cost per Unit</div>
\$0.50	+	\$0.25	=	\$0.75

Step 4 - Prepare a cost reconciliation schedule.

Example of a CRS ([see next page](#))

Sequential process setting: goods are transferred from one department to another in a sequence

Equivalent units under FIFO

- ⇒ Under the FIFO method, the calculation of equivalent units is done on a first-in, first-out basis
- ⇒ Using the FIFO method, equivalent units are the sum of the following work:
 - 1) Work done to finish the units from the beginning work in process inventory.
 - 2) Work done to complete the units started into production during the period (referred to as the units started and completed).
 - 3) Work done to start, but only partially complete, the units in ending work in process inventory.

MIXING DEPARTMENT
Production Cost Report
Month Ended June 30, 2012

	Physical Units	Equivalent Units		
		Materials	Conversion Costs	
Quantities	Step 1	Step 2		
Units to be accounted for				
Work in process, June 1	100,000			
Started into production	<u>800,000</u>			
Total units	<u>900,000</u>			
Units accounted for				
Transferred out	700,000	700,000	700,000	
Work in process, June 30	<u>200,000</u>	<u>200,000</u>	<u>120,000</u>	(200,000 × 60%)
Total units	<u>900,000</u>	<u>900,000</u>	<u>820,000</u>	
Costs		Materials Costs	Conversion	Total
Unit costs Step 3				
Costs in June	(a)	\$450,000	\$205,000	\$655,000
Equivalent units	(b)	<u>900,000</u>	<u>820,000</u>	
Unit costs [(a) ÷ (b)]		\$ 0.50	\$ 0.25	\$ 0.75
Costs to be accounted for				
Work in process, June 1				\$ 85,000
Started into production				<u>570,000</u>
Total costs				<u>\$655,000</u>
Cost Reconciliation Schedule Step 4				
Costs accounted for				
Transferred out (700,000 × \$0.75)				\$525,000
Work in process, June 30				
Materials (200,000 × \$0.50)			\$100,000	
Conversion costs (120,000 × \$0.25)			<u>30,000</u>	<u>130,000</u>
Total costs				<u>\$655,000</u>

Chapter 05 – Activity-based costing

Activity-based costing (ABC) allocates overhead to multiple activity cost pools, and it then assigns the activity cost pools to products and services by using cost drivers

- ⇒ Activity is any event, action, transaction, or work sequence that incurs a cost when producing a product or providing a service
- ⇒ Activity cost pool is a distinct type of activity (e.g., ordering materials or setting up machines)
- ⇒ Cost driver is any factor or activity that has a direct cause-effect relationship with the resources consumed

ABC principle: products consume activities, and activities consume resources

ABC process:

- 1) Allocate overhead costs to activity cost pools
- 2) Use cost drivers to assign the overhead allocated to the activity cost pools to specific products

Steps in an activity-based costing system

- 1) Identify and classify the major **activities** involved in the manufacture of specific products, and allocate manufacturing overhead costs to cost pools
- 2) Identify the **cost driver** that has a strong correlation to the costs accumulated in the cost pool
- 3) Calculate the **overhead rate for each cost driver**

$$\begin{array}{c} \text{Estimated Overhead} \\ \text{per Activity} \end{array} \div \begin{array}{c} \text{Expected Use of Cost} \\ \text{Drivers per Activity} \end{array} = \begin{array}{c} \text{Activity-Based} \\ \text{Overhead Rate} \end{array}$$

- 4) Assign **manufacturing overhead costs** for each cost pool to products, using the overhead rates (cost per driver).

Benefit and limitation of ABC

Benefits: more accurate product costing

1. ABC leads to more cost pools for assigning overhead costs to products
2. ABC leads to better control over overhead costs
3. ABC leads to better management decisions

Limitations

1. ABC can be expensive to use
2. Some arbitrary allocations continue to be used

When to use ABC

- 1) Product lines differ greatly in volume and manufacturing complexity.
- 2) Product lines are numerous and diverse, and require differing degrees of support services.
- 3) Overhead costs are a significant portion of total costs.
- 4) The manufacturing process or the number of products has changed significantly; for example, from labour-intensive to capital-intensive due to automation.

- 5) Production or marketing managers are ignoring data provided by the existing system and are instead using “bootleg” costing data or other alternative data when pricing or making other product decisions.
- 6) The scale of the business is large enough to support the high upfront cost of the system software and ongoing support costs.

Value-added and non-value-added

- ⇒ **Activity-based management (ABM):** An extension of ABC from a product costing system to a management function that focuses on reducing costs and improving processes and decision-making.
- ⇒ **Value-added activities** increase the worth of a product or service to customers
- ⇒ **Non-value-added activities** are production- or service-related activities that simply add cost to, or increase the time spent on, a product or service without increasing its market value

Classification of activity levels

- 7) **Unit-level activities**—activities performed for each unit of production.
- 1) **Batch-level activities**—activities performed for each batch of products rather than each unit.
- 2) **Product-level activities**—activities performed in support of an entire product line, but not always performed every time a new unit or batch of products is produced.
- 3) **Facility-level activities**—activities required to support or sustain an entire production process.

Chapter 6 – Cost-volume-profit

I. Cost-Volume-Profit Analysis and Income Statement

Cost-volume-profit (CVP) analysis is the study of the effects that changes in costs and volume have on a company's profits

→ The following assumptions underlie each CVP analysis:

- 1) The behaviour of both costs and revenues is linear throughout the relevant range of the activity index.
- 2) All costs can be classified with reasonable accuracy as either variable or fixed.
- 3) Changes in activity are the only factors that affect costs.
- 4) Inventory levels remain constant—all units that are produced are sold.
- 5) When more than one type of product is sold, the sales mix will remain constant.

The **cost-volume-profit (CVP) income statement** classifies costs as variable or fixed and calculates a contribution margin

II. Contribution margin (CM) is the amount of revenue that remains after variable costs have been deducted

$$\begin{array}{r}
 \text{Sales} \\
 - \text{ Variable costs} \\
 = \text{ Contribution margin} \\
 - \text{ Fixed costs} \\
 = \text{ Operating income}
 \end{array}$$

$$\begin{array}{r}
 \text{Unit Selling Price} \\
 - \text{ Unit Variable Costs} \\
 = \text{ Contribution Margin per Unit} \\
 \$500 \quad - \quad \$300 \quad = \quad \$200
 \end{array}$$

$$\begin{array}{r}
 \text{Contribution Margin per Unit} \\
 \div \text{ Unit Selling Price} \\
 = \text{ Contribution Margin Ratio} \\
 \$200 \quad \div \quad \$500 \quad = \quad 40\%
 \end{array}$$

III. Applying Basic Cost-Volume-Profit Concepts

Break even analysis

→ **The break-even point:** level of activity at which total revenues equal total costs (both fixed and variable)

→ The break-even point can be

- 1) *calculated with a mathematical equation,*

Sales = variable costs + fixed costs + operating income

Operating income is zero at the break-even point, break-even occurs when total sales equal variable costs plus fixed costs:

$$\begin{array}{r}
 \text{Sales} \\
 \$500Q \\
 = \\
 \text{Variable Costs} \\
 \$300Q \\
 + \\
 \text{Fixed Costs} \\
 \$200,000 \\
 + \\
 \text{Operating income} \\
 \$0
 \end{array}$$

To find the sales dollars required to break even, we multiply the units sold at the break-even point by the selling price per unit

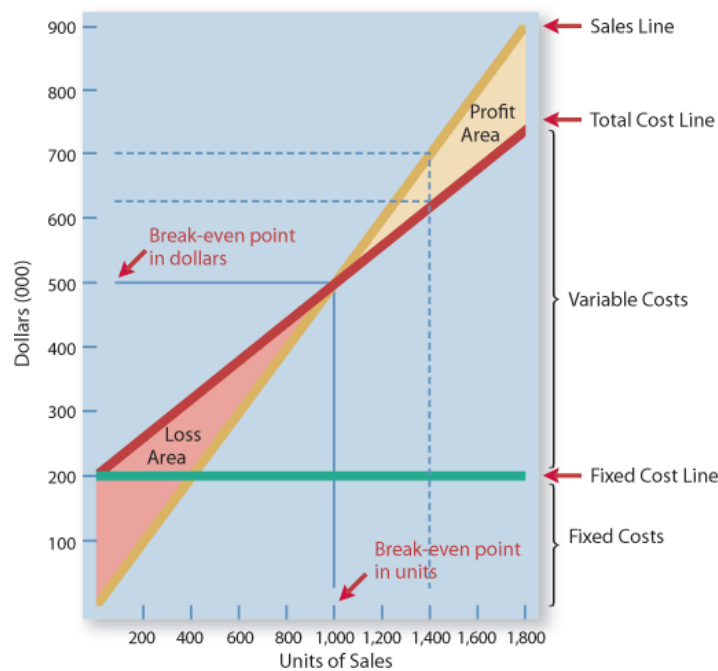
2) *Calculated by using contribution margin*

the contribution margin equals total revenues less variable costs, so at the break-even point, the **contribution margin must equal total fixed costs**

Fixed Costs	÷	Contribution Margin per Unit	=	Break-Even Point in Units
\$200,000	÷	\$200	=	1,000 units
Fixed Costs	÷	Contribution Margin Ratio	=	Break-Even Point in Dollars
\$200,000	÷	40%	=	\$500,000

3) *Derived from a cost-volume-profit (CVP) graph*

The **cost-volume-profit (CVP) graph**: graph showing the relationship between costs, volume, and profits



IV. Target operating income before and after tax

Target operating income: income objective for individual product lines

→ Technique for determining the sales necessary to achieve the target operating:

1) *The mathematical equation*

Variable Costs	+	Fixed Costs	+	Target Operating income	=	Required Sales
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2) *The contribution margin technique*

$$\begin{array}{l} \text{Fixed Costs + Target Operating income before Taxes} \div \text{Contribution Margin per Unit} = \text{Required Sales in Units} \\ \text{Fixed Costs + Target Operating Income before Taxes} \div \text{Contribution Margin Ratio} = \text{Required Sales in Dollars} \end{array}$$

3) *The graphic representation*

$$\text{Operating income after taxes} = \text{operating income before taxes} \times (1 - \text{tax rate})$$

V. Margin of safety

Margin of safety is the difference between actual or expected sales and sales at the break-even point (expressed in dollars, units or as a ratio)

$$\begin{array}{l} \text{Actual (Expected) Sales} - \text{Break-Even Sales} = \text{Margin of Safety in Dollars} \\ \$750,000 - \$500,000 = \$250,000 \\ \text{Margin of Safety in Dollars} \div \text{Actual (Expected) Sales} = \text{Margin of Safety Ratio} \\ \$250,000 \div \$750,000 = 33\% \end{array}$$

VI. CVP and changes in the business environment

CVP can help measure the affect of changes in fixed costs, variable costs, and selling price on the number of required sale to break even

VII. **Sales mix**: when a company sells multiple products

Companies must measure the **weighted-average unit contribution margin** of all the products

$$\begin{array}{l} \text{DVD Players} \quad \quad \quad \text{TVs} \\ \text{Unit Contribution Margin} \times \text{Sales Mix Percentage} + \text{Unit Contribution Margin} \times \text{Sales Mix Percentage} = \text{Weighted-Average Unit Contribution Margin} \\ (\$200 \times 0.75) + (\$500 \times 0.25) = \$275 \\ \text{Fixed Costs} \div \text{Weighted-Average Unit Contribution Margin} = \text{Break-Even Point in Units} \\ \$275,000 \div \$275 = 1,000 \text{ units} \end{array}$$

→ At any level of units sold, operating income will be greater if higher contribution margin units are sold, rather than lower contribution margin units

Chapter 07 - Incremental Analysis

I. Management's decision-making process

- 1) Identify the problem and assign responsibility
- 2) Determine and evaluate possible courses of action
- 3) Make a decision
- 4) Review the results of the decision

Accounting contributes in steps 2 and 4

II. Incremental analysis approach

Incremental analysis: process used to identify the financial expenses that change under alternative courses of action

three important cost concepts:

- 1) **Relevant cost:** factors to be considered are (1) those costs and revenues that are different for each alternative and (2) that will occur in the future
- 2) **Opportunity cost:** opportunity to benefit from one action when choosing to take another action
- 3) **Sunk cost:** costs that have already been incurred and will not be changed or avoided by any future decision

III. Types of Incremental analysis

1) Accept an order at a special price

- It is assumed that sales of the product in other markets would not be affected by the special order
- Sometime a special order is rejected because the company is operating at full capacity

2) Make or buy component parts or finished products

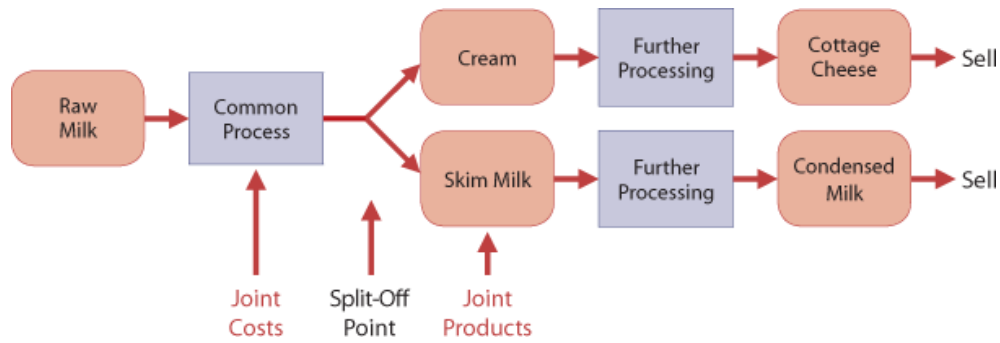
- Buy = outsourcing
- Sometime there is an opportunity cost that changes the deal

3) Sell products or process them further.

single product case

	A	B	C	D
		Sell	Process Further	Incremental Revenue and Costs
1				
2	Sales per unit	\$50.00	\$60.00	\$10.00
3	Cost per unit			
4	Direct materials	15.00	17.00	(2.00)
5	Direct labour	10.00	14.00	(4.00)
6	Variable manufacturing overhead	6.00	8.40	(2.40)
7	Fixed manufacturing overhead	4.00	4.00	0.00
8	Total	35.00	43.40	(8.40)
9	Net income per unit	\$15.00	\$16.60	\$ 1.60
10				

multiple product case



- **Joint products:** several end products are produced from a single raw material and a common production process
- **Joint costs:** incurred before the point at which the two products are separately identifiable (the split-off point) - joint product costs are sunk costs, thus they are irrelevant in sell-or-process-further decisions

	A	B	C	D
1				Incremental
		Sell	Process Further	Revenue and Costs
2	Sales per day	\$11,000	\$26,000	\$15,000
3	Cost per day			
4	Processing skim milk into condensed milk	0	8,000	(8,000)
5		\$11,000	\$18,000	\$ 7,000
6				

4) Retain or replace equipment.

	A	B	C	D	E	F
1		Retain Equipment		Replace Equipment		Incremental Costs Saving
2	Variable manufacturing costs	\$640,000	a	\$500,000	b	\$140,000
3	New machine cost			120,000		(120,000)
4	Total	\$640,000		\$620,000		\$ 20,000
5						
6	a(4 years × \$160,000)					
7	b(4 years × \$125,000)					
8						

- The book value of the old machine does not affect the decision, it is a sunk cost. Any trade-in allowance or cash disposal value of the existing asset, however, is relevant to the decision, because the company will not realize this value if it continues to use the asset

5) Eliminate or retain an unprofitable business segment.

	Pro	Master	Champ	Total
Sales	\$800,000	\$300,000	\$100,000	\$1,200,000
Variable expenses	520,000	210,000	90,000	820,000
Contribution margin	280,000	90,000	10,000	380,000
Fixed expenses	80,000	50,000	30,000	160,000
Net income	<u>\$200,000</u>	<u>\$ 40,000</u>	<u>\$(20,000)</u>	<u>\$ 220,000</u>

	<u>Pro</u>	<u>Master</u>	<u>Total</u>
Sales	\$800,000	\$300,000	\$1,100,000
Variable expenses	<u>520,000</u>	<u>210,000</u>	<u>730,000</u>
Contribution margin	280,000	90,000	370,000
Fixed expenses	<u>100,000</u>	<u>60,000</u>	<u>160,000</u>
Net income	<u>\$180,000</u>	<u>\$ 30,000</u>	<u>\$ 210,000</u>

	<u>Pro</u>	<u>Master</u>	<u>Champ</u>	<u>Total</u>
Sales	\$800,000	\$300,000	\$100,000	\$1,200,000
Variable expenses	<u>520,000</u>	<u>210,000</u>	<u>90,000</u>	<u>820,000</u>
Contribution margin	280,000	90,000	10,000	380,000
Fixed expenses	<u>80,000</u>	<u>50,000</u>	<u>30,000</u>	<u>160,000</u>
Net income	<u>\$200,000</u>	<u>\$ 40,000</u>	<u>\$ (20,000)</u>	<u>\$ 220,000</u>

6) Allocate limited resources.

Bilodeau Company manufactures deluxe and standard pen-and-pencil sets. The limiting resource is machine capacity, which is 3,600 hours per month

	<u>Deluxe Sets</u>	<u>Standard Sets</u>
Contribution margin per unit (a)	\$ 8	\$ 6
Machine hours required (b)	<u>÷ 0.4</u>	<u>÷ 0.2</u>
Contribution margin per unit of limited resource [(a) ÷ (b)]	<u>\$20</u>	<u>\$30</u>

	<u>Produce Deluxe Sets</u>	<u>Produce Standard Sets</u>
Machine hours (a)	600	600
Contribution margin per unit of limited resource (b)	<u>× \$20</u>	<u>× \$30</u>
Contribution margin [(a) × (b)]	<u>\$12,000</u>	<u>\$18,000</u>

- **Theory of constraints:** specific approach that a company uses to identify and manage constraints in order to achieve its goals.

Chapter 8 - Alternative Inventory Costing Methods

I. Inventory Costing Methods

Full costing or absorption costing: all manufacturing costs are charged to, or absorbed by, the product (usually used for external reporting).

PREMIUM PRODUCTS CORPORATION Income Statement Month Ended January 31, 2012 Absorption Costing		
Sales (20,000 units × \$20)		\$400,000
Cost of goods sold		
Inventory, January 1	\$ 0	
Cost of goods manufactured (30,000 units × \$13)	<u>390,000</u>	
Cost of goods available for sale	390,000	
Inventory, January 31 (10,000 units × \$13)	<u>130,000</u>	
Cost of goods sold (20,000 units × \$13)		<u>260,000</u>
Gross profit		140,000
Variable selling and administrative expenses		40,000
Fixed selling and administrative expenses		<u>15,000</u>
Net income		<u>\$ 85,000</u>

Variable costing: only direct materials, direct labour, and variable manufacturing overhead costs are considered product costs. Fixed manufacturing overhead costs are recognized as period costs (expenses) when incurred.

PREMIUM PRODUCTS CORPORATION Income Statement Month Ended January 31, 2012 Variable Costing		
Sales (20,000 units × \$20)		\$400,000
Variable costs		
Inventory, January 1	\$ 0	
Variable manufacturing costs (30,000 units × \$9)	<u>270,000</u>	
Cost of goods available for sale	270,000	
Inventory, January 31 (10,000 units × \$9)	<u>90,000</u>	
Variable cost of goods sold	180,000	
Variable selling and administrative expenses (20,000 units × \$2)	<u>40,000</u>	<u>220,000</u>
Contribution margin		180,000
Fixed manufacturing overhead		120,000
Fixed selling and administrative expenses		<u>15,000</u>
Net income		<u>\$ 45,000</u>

When there are more units produced than sold, income under absorption costing is higher (this is because some fixed manufacturing costs are not expensed in the current period, but are deferred to future periods as part of the inventory).

III. Decision-Making Concerns

For external reporting purposes, companies must report their financial information using **generally accepted accounting principles (GAAP)**, which requires companies to use absorption costing for the costing of inventory

IV. Normal costing

Absorption costing using normal costing approach: we assume that budgeted production volume is X units and can find a predetermined fixed manufacturing overhead per unit

- ⇒ Under absorption costing, the **unsold part of the fixed overhead costs is deferred** to a future period as part of the cost of ending inventory
- ⇒ A **production-volume variance** occurs whenever actual production deviates from budgeted production level (It occurs only under absorption costing and not under variable costing)
- ⇒ We can reconcile the absorption costing net income to the variable costing net income by concentrating on the fixed manufacturing overhead in ending inventory:

Absorption costing net income	\$75,000
Less: Ending inventory fixed manufacturing overhead	<u>\$30,000</u>
Variable costing net income	\$45,000

V. Throughput costing (or super-variable costing)

Throughput costing: treats all costs as period expenses except for direct materials.

- ⇒ This means that inventory is valued using only direct material costs and all other manufacturing costs are treated as expenses in the accounting period in which they occur

PREMIUM PRODUCTS CORPORATION		
Income Statement		
Month Ended January 31, 2012		
Throughput Costing		
Sales (20,000 × \$20)		\$400,000
Variable cost of goods sold		
Inventory, January 1	\$ 0	
Direct material costs (30,000 units × \$5)	<u>150,000</u>	
Cost of goods available for sale	150,000	
Inventory, January 31 (10,000 units × \$5)	<u>50,000</u>	
Variable cost of goods sold		<u>100,000</u>
Throughput contribution margin		300,000
Other operating costs		
Direct labour costs (30,000 × \$3)	\$ 90,000	
Variable overhead costs (30,000 × \$1)	30,000	
Variable selling and administrative costs (20,000 × \$2)	40,000	
Fixed manufacturing overhead	120,000	
Fixed selling and administrative expenses	<u>15,000</u>	
Total other operating costs		<u>\$295,000</u>
Net income		<u>\$ 5,000</u>

Note: Under throughput costing, direct labour and variable manufacturing overhead are charged as an expense in the current period. Therefore, they are not deferred to future periods through the ending inventory

when there are more units produced than sold, income under variable costing is higher than under throughput costing.

Chapter 9 - Pricing

- Factors that can influence pricing decisions:
 - 1) Pricing objectives
 - 2) Environment
 - 3) Demand
 - 4) Cost considerations
- **Competitive market**: when the price is set by the laws supply and demand

I. Target Costing

- In a competitive market, companies must focus on controlling their costs (rather than changing their prices).
- This requires a **target cost**:

$$\text{Market Price} - \text{Desired Profit} = \text{Target Cost}$$

II. Full Cost-Plus Pricing

- In a less competitive or non-competitive environment, the company may have to set its own price
- **Full cost-plus pricing**: Approach to pricing in which a product's selling price is determined by adding a markup to the target selling price
- **Cost-Plus formula**:

$$\text{Cost} + \text{Markup Percentage} \times \text{Cost} = \text{Target Selling Price}$$

- **Percentage markup**:

$$\frac{\text{Desired ROI per Unit}}{\text{Total Unit Cost}} = \text{Markup Percentage}$$

$\$20 \div \$112 = 17.86\%$

$$\text{Total Unit Cost} + (\text{Total Unit Cost} \times \text{Markup Percentage}) = \text{Target Selling Price per Unit}$$

$\$112 + (\$112 \times 17.86\%) = \$132$

- Limitations of Full Cost-Plus Pricing
 - Does not consider the demand side
 - Sales volume plays a large role in determining per-unit costs: the lower the budgeted volume, the higher the per-unit price

III. Absorption Cost-Plus Pricing

- Under **Absorption cost-plus pricing**, both the variable and fixed selling and administrative costs are excluded from the cost base
- Steps in absorption cost-plus pricing

- 1) Calculate the manufacturing cost per unit
- 2) Calculate the markup percentage

$$\begin{array}{ccccccc}
 \text{Desired ROI per Unit} & + & \text{Selling and Administrative Expenses per Unit} & = & \text{Markup Percentage} & \times & \text{Manufacturing Cost per Unit} \\
 \$20 & + & \$32 & = & \text{MP} & \times & \$80
 \end{array}$$

- 3) Set the target selling price

$$\begin{array}{ccccccc}
 \text{Manufacturing Cost per Unit} & + & (\text{Markup Percentage} \times \text{Manufacturing Cost per Unit}) & = & \text{Target Selling Price} \\
 \$80 & + & (65\% \times \$80) & = & \$132
 \end{array}$$

IV. Variable Cost-Plus Pricing

→ Under **variable cost-plus pricing**, the cost base consists of all of the variable costs associated with a product (including S&A). Because fixed costs are not included in the base, the markup must cover fixed costs (manufacturing, as well as selling and administrative) and the target ROI.

→ Steps in the variable-cost approach:

- 1) Calculate the variable cost per unit
- 2) Calculate the markup percentage

$$\begin{array}{ccccccc}
 \text{Desired ROI per Unit} & + & \text{Fixed Manufacturing Overhead + Selling and Administrative Expenses per Unit} & = & \text{Markup Percentage} & \times & \text{Variable Cost per Unit} \\
 \$20 & + & (\$28 + \$24) & = & \text{MP} & \times & \$60
 \end{array}$$

- 3) Set the target selling price

V. Time-and-material pricing

→ Under this approach, the company sets two pricing rates: one for the labour used on a job and another for the material

→ Steps in time-and-material pricing:

- 1) Calculate the layout charges (rate per hour of labour)

This rate includes

- the direct labour cost of the employee, including the hourly rate or salary and fringe benefits
- selling, administrative, and similar overhead costs
- an allowance for a desired profit or ROI per hour of employee time

- 2) Calculate the Material Loading Charge (percentage of the total estimated costs of parts and materials for the year)

Purchasing, receiving, handling, and storing materials, plus any desired profit margin on the materials themselves

- Estimate total annual costs for purchasing, receiving, handling, and storing materials
- Divide amount by the total estimated cost of parts and materials
- Add a desired profit margin on the materials themselves.

- 3) Calculate Charges for a Particular Job

Sum of (1) the labour charge, (2) the charge for the materials, and (3) the material loading charge

VI. Internal sales

- **Transfer price:** used internally
- General transfer price formula:

$$\begin{array}{l} \text{Transfer Price} \\ \text{Transfer Price} \end{array} = \begin{array}{l} \text{Variable Cost per Unit} \\ \text{Additional costs per unit for} \\ \text{transfer of goods} \end{array} + \begin{array}{l} \text{Opportunity Cost} \\ \text{Maximum contribution} \\ \text{margin per unit that company} \\ \text{loses because of transfer} \end{array}$$

- **Minimum price** that the selling division is willing to accept is the price charged to outside buyers
- **Maximum price** that the buying division is willing to pay is how much the division would have to pay to buy it outside the company

First Situation: No Excess Capacity

- **Minimum transfer price:**

$$\begin{array}{l} \text{Variable} \\ \text{Cost} \\ \$95 \end{array} + \begin{array}{l} \text{Opportunity} \\ \text{Cost} \\ \$35 \end{array} = \begin{array}{l} \text{Minimum} \\ \text{Transfer Price} \\ \$130 \end{array}$$

- **Opportunity cost:** contribution margin per unit that the division would lose if transferring instead of selling

Second Situation: Excess Capacity

- **Minimum transfer price:**

$$\begin{array}{l} \text{Variable} \\ \text{Cost} \\ \$95 \end{array} + \begin{array}{l} \text{Opportunity} \\ \text{Cost} \\ \$0 \end{array} = \begin{array}{l} \text{Minimum} \\ \text{Transfer Price} \\ \$95 \end{array}$$

- Excess capacity = \$0 opportunity cost

VII. Transfer pricing approaches

- **Negotiated Transfer Pricing Approach:** selling division establishes a minimum transfer price, and the purchasing division establishes a maximum transfer price.
- **Cost-based transfer price:** based on the costs of the division producing the goods
- **Market-Based Transfer Prices:** the selling division receives the market price and the buying division pays the market price

VIII. Transferring between divisions in different countries

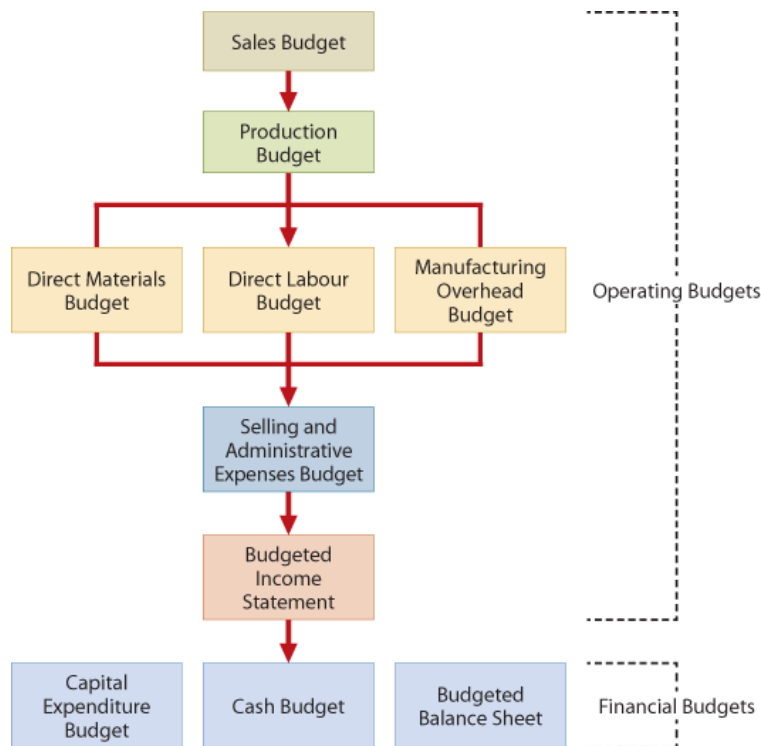
In order to increase income and pay less income tax, many companies prefer to report more income in countries with low tax rates. They do this by adjusting the transfer prices they use on internal transfers between divisions located in different countries.

Chapter 10 - Budgetary planning

I. Budgeting basics

- **Sales forecast:** the projection of potential sales for the industry and the company's expected share of these sales
- **Budget committee:** group responsible for coordinating the preparation of the budget
- **Participative budgeting:** a budgetary approach that starts with input from lower-level managers and works upward so that managers at all levels participate
 Drawback: **budgetary slack:** the amount by which a manager intentionally underestimates budgeted revenues or overestimates budgeted expenses in order to make it easier to achieve budgetary goals
- **Long-range planning:** a formalized process of selecting strategies to achieve long-term goals and developing policies and plans to implement the (usually 5 years)

Master budget: a set of interrelated budgets that becomes a plan of action for a specific time period



II. Preparing the operating budget

Sales budget: management's best estimate of sales revenue for the budget period

	A	B	C	D	E	F
1	HAYES COMPANY					
2	Sales Budget					
3	For the Year Ending December 31, 2012					
4		Quarter				
5		1	2	3	4	Year
6	Expected unit sales	3,000	3,500	4,000	4,500	15,000
7	Unit selling price	× \$60	× \$60	× \$60	× \$60	× \$60
8	Total sales	\$180,000	\$210,000	\$240,000	\$270,000	\$900,000

Production budget: shows the units that must be produced to meet expected sales

	A	B	C	D	E	F	G	H	I	J
1	HAYES COMPANY									
2	Production Budget									
3	For the Year Ending December 31, 2012									
4		Quarter								
5		1	2	3	4	Year				
6	Expected unit sales (Illustration 10-3)	3,000	3,500	4,000	4,500					
7	Add: Desired ending finished goods units ^a	700	800	900	1,000	^b				
8	Total required units	3,700	4,300	4,900	5,500					
9	Less: Beginning finished goods units	600	700	800	900	^c				
10	Required production units	3,100	3,600	4,100	4,600	15,400				
11										
12	^a 20% of next quarter's sales									
13	^b Expected 2012 first-quarter sales, 5,000 units × 20%									
14	^c 20% of estimated first-quarter 2011 sales units									

Direct material budget: quantity and cost of direct materials that need to be purchased

	A	B	C	D	E	F	G	H	I	J	K
1	HAYES COMPANY										
2	Direct Materials Budget										
3	For the Year Ending December 31, 2012										
4		Quarter									
5		1	2	3	4	Year					
6	Units to be produced (Illustration 10-5)	3,100	3,600	4,100	4,600						
7	Direct materials per unit	× 2	× 2	× 2	× 2						
8	Total kilograms needed for production	6,200	7,200	8,200	9,200						
9	Add: Desired ending direct materials (kilograms) ^a	720	820	920	1,020	^b					
10	Total materials required	6,920	8,020	9,120	10,220						
11	Less: Beginning direct materials (kilograms)	620	720	820	920	^c					
12	Direct materials purchases	6,300	7,300	8,300	9,300						
13	Cost per kilogram	× \$4	× \$4	× \$4	× \$4						
14	Total cost of direct materials purchases	\$25,200	\$29,200	\$33,200	\$37,200	\$124,800					
15											
16	^a 10% of next quarter's production requirements										
17	^b Estimated 2013 first-quarter kilograms needed for production, 10,200 × 10%										
18	^c 10% of estimated first-quarter kilograms needed for production										

Direct labour budget: quantity (hours) and cost of direct labour that will be needed to meet production requirements

	A	B	C	D	E	F	G	H	I	J
1	HAYES COMPANY									
2	Direct Labour Budget									
3	For the Year Ending December 31, 2012									
4		Quarter								
5		1	2	3	4	Year				
6	Units to be produced (Illustration 10-5)	3,100	3,600	4,100	4,600					
7	Direct labour time (hours) per unit	× 2	× 2	× 2	× 2					
8	Total required direct labour hours	6,200	7,200	8,200	9,200					
9	Direct labour cost per hour	× \$10	× \$10	× \$10	× \$10					
10	Total direct labour cost	\$62,000	\$72,000	\$82,000	\$92,000	\$308,000				
11										

Manufacturing overhead budget: distinguishes between variable and fixed overhead costs

	A	B	C	D	E	F
1	HAYES COMPANY					
2	Manufacturing Overhead Budget					
3	For the Year Ending December 31, 2012					
4	Quarter					
5		1	2	3	4	Year
6	Variable costs					
7	Indirect materials (\$1.00/hour)	\$ 6,200	\$ 7,200	\$ 8,200	\$ 9,200	\$ 30,800
8	Indirect labour (\$1.40/hour)	8,680	10,080	11,480	12,880	43,120
9	Utilities (\$0.40/hour)	2,480	2,880	3,280	3,680	12,320
10	Maintenance (\$0.20/hour)	1,240	1,440	1,640	1,840	6,160
11	Total variable costs	18,600	21,600	24,600	27,600	92,400
12	Fixed costs					
13	Supervisory salaries	20,000	20,000	20,000	20,000	80,000
14	Depreciation	3,800	3,800	3,800	3,800	15,200
15	Property taxes and insurance	9,000	9,000	9,000	9,000	36,000
16	Maintenance	5,700	5,700	5,700	5,700	22,800
17	Total fixed costs	38,500	38,500	38,500	38,500	154,000
18	Total manufacturing overhead	\$57,100	\$60,100	\$63,100	\$66,100	\$246,400
19	Direct labour hours (Illustration 9-9)	6,200	7,200	8,200	9,200	30,800
20	Manufacturing overhead rate per direct labour hour (\$246,400 ÷ 30,800)					\$8
21						

Selling and administrative expenses budget: expenses are also classified as either variable or fixed

	A	B	C	D	E	F
1	HAYES COMPANY					
2	Selling and Administrative Expense Budget					
3	For the Year Ending December 31, 2012					
4	Quarter					
5		1	2	3	4	Year
6	Budgeted sales in units (Illustration 9-3)	3,000	3,500	4,000	4,500	15,000
7	Variable expenses					
8	Sales commissions (\$3 per unit)	\$ 9,000	\$10,500	\$12,000	\$ 13,500	\$ 45,000
9	Freight-out (\$1 per unit)	3,000	3,500	4,000	4,500	15,000
10	Total variable expenses	12,000	14,000	16,000	18,000	60,000
11	Fixed expenses					
12	Advertising	5,000	5,000	5,000	5,000	20,000
13	Sales salaries	15,000	15,000	15,000	15,000	60,000
14	Office salaries	7,500	7,500	7,500	7,500	30,000
15	Depreciation	1,000	1,000	1,000	1,000	4,000
16	Property taxes and insurance	1,500	1,500	1,500	1,500	6,000
17	Total fixed expenses	30,000	30,000	30,000	30,000	120,000
18	Total selling and administrative expenses	\$42,000	\$44,000	\$46,000	\$48,000	\$180,000
19						

Budgeted income statement: important end product of the operating budgets, indicates the expected profitability of operations for the budget period

Cost of One Kitchen-mate				
Cost element	Illustration	Quantity	Unit Cost	Total
Direct materials	10-7	2 kg	\$ 4.00	\$ 8.00
Direct labour	10-9	2 hours	\$10.00	20.00
Manufacturing overhead	10-10	2 hours	\$ 8.00	16.00
Total unit cost				\$44.00

HAYES COMPANY Budgeted Income Statement Year Ending December 31, 2012	
Sales (Illustration 10-3)	\$900,000
Cost of goods sold (15,000 × \$44)	<u>660,000</u>
Gross profit	240,000
Selling and administrative expenses (Illustration 10-11)	<u>180,000</u>
Income from operations	60,000
Interest expense	<u>100</u>
Income before income taxes	59,900
Income tax expense	<u>12,000</u>
Net income	<u>\$ 47,900</u>

II. Preparing the financial budgets

Cash budget: shows expected cash flows

→ Is composed of three sections:

- 1) **Cash receipts:** expected receipts from the company's main source(s) of revenue
- 2) **Cash disbursements:** expected cash payments (direct materials, direct labour, manufacturing overhead, and selling and administrative expenses)
- 3) **Financing:** expected borrowings and the repayment of the borrowed funds plus interest

	A	B	C	D	E	F	G	H	I	J
1	HAYES COMPANY									
2	Cash Budget									
3	For the Year Ending December 31, 2012									
4			Quarter							
5		Assumption	1	2	3	4				
6	Beginning cash balance	1	\$ 38,000	\$ 25,500	\$ 15,000	\$ 19,400				
7	Add: Receipts									
8	Collections from customers	2	168,000	198,000	228,000	258,000				
9	Sale of securities	3	2,000	0	0	0				
10	Total receipts		170,000	198,000	228,000	258,000				
11	Total available cash		208,000	223,500	243,000	277,400				
12	Less: Disbursements									
13	Direct materials	4	23,200	27,200	31,200	35,200				
14	Direct labour	5	62,000	72,000	82,000	92,000				
15	Manufacturing overhead	6	53,300	^a 56,300	59,300	62,300				
16	Selling and administrative expenses	6	41,000	^b 43,000	45,000	47,000				
17	Purchase of truck	7	0	10,000	0	0				
18	Income tax expense	8	3,000	3,000	3,000	3,000				
19	Total disbursements		182,500	211,500	220,500	239,500				
20	Excess (deficiency) of available cash over cash disbursements		25,500	12,000	22,500	37,900				
21	Financing									
22	Borrowings		0	3,000	0	0				
23	Repayments-plus \$100 interest	9	0	0	3,100	0				
24	Ending cash balance		\$ 25,500	\$ 15,000	\$ 19,400	\$ 37,900				
25										
26	^a \$57,100-\$3,800 depreciation									
27	^b \$42,000-\$1,000 depreciation									

Budgeted balance sheet: projection of the company's financial position at the end of the budget period

HAYES COMPANY Budgeted Balance Sheet December 31, 2012		
<u>Assets</u>		
Cash		\$ 37,900
Accounts receivable		108,000
Finished goods inventory		44,000
Raw materials inventory		4,080
Buildings and equipment	\$192,000	
Less: Accumulated depreciation	<u>48,000</u>	<u>144,000</u>
Total assets		<u>\$337,980</u>
<u>Liabilities and Shareholders' Equity</u>		
Accounts payable		\$ 18,600
Common shares		225,000
Retained earnings		<u>94,380</u>
Total liabilities and shareholders' equity		<u>\$337,980</u>

IV. Budgeting in non-manufacturing companies

Merchandisers

- There are two major differences between the master budgets of a merchandiser and a manufacturer.
- 1) A merchandiser uses a merchandise purchases budget instead of a production budget.
 - 2) A merchandiser does not use the manufacturing budgets (direct materials, direct labour, and manufacturing overhead).

LIMA COMPANY Merchandise Purchases Budget Month Ending July 31, 2012	
Budgeted cost of goods sold ($\$300,000 \times 70\%$)	\$210,000
Plus: Desired ending merchandise inventory ($\$224,000 \times 30\%$)	<u>67,200</u>
Total	277,200
Less: Beginning merchandise inventory ($\$210,000 \times 30\%$)	<u>63,000</u>
Budgeted merchandise purchases for July	<u>\$214,200</u>

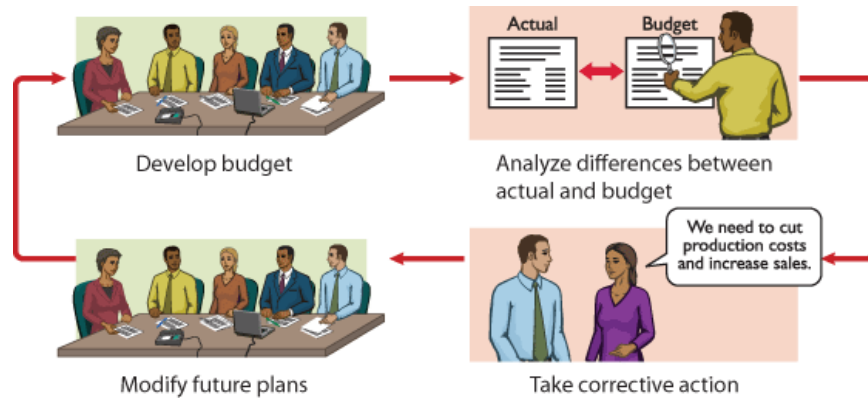
Service enterprises: the critical factor in budgeting is coordinating professional staff needs with expected services

Not-for-profit organizations: budget based on cash flows (expenditures and receipts), rather than on a revenue and expense basis

Chapter 11 - budgetary control and responsibility accounting

I. The concept of budgetary control

⇒ The different activities of budgetary control



II. Static budgets

- ⇒ **Static budget:** projection of budget data at one level of activity
- ⇒ **Favourable** and **unfavourable** variance

III. Flexible budgets

- ⇒ **Flexible budget:** projection of budget data for various levels of activity (= series of static budgets at different levels of activity)
- ⇒ Developing the flexible budget
 - 1) Identify the **activity index** and the **relevant range of activity** = in direct labour hours, e.g. 8,00 to 12,000 direct labour hours per month
 - 2) Identify the **variable costs**, and determine the **budgeted variable cost per unit of activity** for each cost (= total budgeted cost / direct labour hours)
 - 3) Identify the **fixed costs**, and determine the **budgeted amount** for each cost.
 - 4) **Prepare the budget** for selected increments of activity within the relevant range (e.g. Increments of 1,000 direct labour hours)

	A	B	C	D	E	F
1	FOX MANUFACTURING COMPANY					
2	Monthly Manufacturing Overhead Flexible Budget					
3	Finishing Department					
4	For Months During the Year 2012					
5	Activity level					
6	Direct labour hours	8,000	9,000	10,000	11,000	12,000
7	Variable costs					
8	Indirect materials (\$1.50)	\$12,000	\$13,500	\$15,000	\$16,500	\$18,000
9	Indirect labour (\$2.00)	16,000	18,000	20,000	22,000	24,000
10	Utilities (\$0.50)	4,000	4,500	5,000	5,500	6,000
11	Total variable costs	32,000	36,000	40,000	44,000	48,000
12	Fixed costs					
13	Depreciation	15,000	15,000	15,000	15,000	15,000
14	Supervision	10,000	10,000	10,000	10,000	10,000
15	Property taxes	5,000	5,000	5,000	5,000	5,000
16	Total fixed costs	30,000	30,000	30,000	30,000	30,000
17	Total costs	\$62,000	\$66,000	\$70,000	\$74,000	\$78,000
18						

⇒ **Flexible budget reports**

	A	B	C	D	E
1	FOX MANUFACTURING COMPANY				
2	Manufacturing Overhead Flexible Budget Report				
3	Finishing Department				
4	For the Month Ended January 31, 2012				
5				Difference	
6		Budget at	Actual costs at	Favourable - F	
7	Direct labour hours (DLH)	9,000 DLH	9,000 DLH	Unfavourable - U	
8					
9	Variable costs				
10	Indirect materials (\$1.50)	\$13,500	\$14,000	\$ 500	U
11	Indirect labour (\$2.00)	18,000	17,000	1,000	F
12	Utilities (\$0.50)	4,500	4,600	100	U
13	Total variable costs	36,000	35,600	400	F
14	Fixed costs				
15	Depreciation	15,000	15,000	0	
16	Supervision	10,000	10,000	0	
17	Property taxes	5,000	5,000	0	
18	Total fixed costs	30,000	30,000	0	
19	Total costs	\$66,000	\$65,600	\$ 400	F
20					
21					

⇒ **Management by exception:** that top management's review of a budget report is focused either entirely or mostly on differences between actual results and planned objectives.

Criteria for identifying an exceptional difference are:

- 1) **Materiality:** quantitative guidelines. For example, management may set the percentage difference at 5% for important items and 10% for other items
- 2) **Controllability:** the guidelines usually applies to items that the manager can control (e.g. Not to tax expenses)

IV. The concept of responsibility accounting

Responsibility accounting: a part of management accounting that involves accumulating and reporting revenues and costs that relate to the manager who has the authority to make the day-to-day decisions about the cost items

⇒ It is used when the following conditions exist:

- 1) Costs and revenues can be directly associated with the specific level of management responsibility.
- 2) The costs and revenues are controllable at the level of responsibility that they are associated with.

- 3) Budget data can be developed for evaluating the manager's effectiveness in controlling the costs and revenues.
Segment: identifies an area of responsibility in a decentralized company

Controllable and non-controllable costs and revenues

A cost is considered to be controllable at a particular level of managerial responsibility if the manager has the power to incur it in a specific period of time (thus, all costs are controllable by top management)

Responsibility reporting system

	A		C	D	E
1	REPORT A				
2					
3	To President			Month: January	
4	Controllable Costs:	Budget	Actual	Fav/Unfav	
5	President	\$ 150,000	\$ 151,500	\$ 1,500	U
6	Vice-Presidents:				
7	Sales	185,000	187,000	2,000	U
8	Production	1,179,000	1,186,300	7,300	U
9	Finance	100,000	101,000	1,000	U
10	Total	\$1,614,000	\$1,625,800	\$11,800	U
11					

Report A
 President sees summary data of vice-presidents.

	A		C	D	E
1	REPORT B				
2					
3	To Vice-President Production			Month: January	
4	Controllable Costs:	Budget	Actual	Fav/Unfav	
5	V P Production	\$ 125,000	\$ 126,000	\$1,000	U
6	Assembly Plants:				
7	Toronto	420,000	418,000	2,000	F
8	Montreal	304,000	309,300	5,300	U
9	Halifax	330,000	333,000	3,000	U
10	Total	\$1,179,000	\$1,186,300	\$7,300	U
11					

Report B
 Vice-president sees summary of controllable costs in his/her functional area.

	A		C	D	E
1	REPORT C				
2					
3	To Plant Manager-Montreal			Month: January	
4	Controllable Costs:	Budget	Actual	Fav/Unfav	
5	Montreal Plant	\$110,000	\$113,000	\$3,000	U
6	Departments:				
7	Fabricating	84,000	85,300	1,300	U
8	Enamelling	62,000	64,000	2,000	U
9	Assembly	48,000	47,000	1,000	F
10	Total	\$304,000	\$309,300	\$5,300	U
11					

Report C
 Plant manager sees summary of controllable costs for each department in the plant.

	A		C	D	E
1	REPORT D				
2					
3	To Fabricating Department Manager			Month: January	
4	Controllable Costs:	Budget	Actual	Fav/Unfav	
5	Direct Materials	\$20,000	\$20,500	\$ 500	U
6	Direct Labour	40,000	41,000	1,000	U
7	Overhead	24,000	23,800	200	F
8	Total	\$84,000	\$85,300	\$1,300	U
9					

Report D
 Department manager sees controllable costs of his/her department.

Principle of performance evaluation

Management function that compares actual results with budget goals

Types of responsibility centres

- 1) **cost centres**: incurs costs (and expenses) but does not directly generate revenues (production or service departments) judged on control cost.
- 2) **profit centres**: incurs costs (and expenses) and also generates revenues (individual departments of a retail store) judged on profitability.
- 3) **investment centres**: incurs costs (and expenses) and generates revenues and has control over the investment funds that are available for use (product lines and subsidiary companies) judged on profitability, but mainly roi.

V. Responsibility accounting for profit centres

A profit centre is evaluated based on **controllable costs** (all variable costs and expenses incurred by the centre, and most direct fixed costs) and **controllable revenues** (operating revenue)

- ⇒ **Direct fixed costs**: specifically for one centre and are incurred for the benefit of that centre alone
- ⇒ **Indirect fixed costs** (or **common costs**): for a company's overall operating activities and are incurred for the benefit of more than one profit centre

Responsibility report

- ⇒ **Controllable margin**: best measure of the manager's performance in controlling revenues and costs
= contribution margin - controllable fixed costs

	A	B	C	D	E
1	MANTLE MANUFACTURING COMPANY				
2	Marine Division				
3	Responsibility Report				
4	For the Year Ended December 31, 2012				
5				Difference	
6		Budget	Actual	Favourable - F Unfavourable - U	
7	Sales	\$1,200,000	\$1,150,000	\$50,000	U
8	Variable costs				
9	Cost of goods sold	500,000	490,000	10,000	F
10	Selling and administrative	160,000	156,000	4,000	F
11	Total	660,000	646,000	14,000	F
12	Contribution margin	540,000	504,000	36,000	U
13	Controllable fixed costs				
14	Cost of goods sold	100,000	100,000	0	
15	Selling and administrative	80,000	80,000	0	
16	Total	180,000	180,000	0	
17	Controllable margin	\$ 360,000	\$ 324,000	\$36,000	U
18					

VI. Responsibility accounting for investment centres

- ⇒ **Return on investment (RIO)** shows how effectively the manager uses the assets at his or her disposal

$$\begin{array}{ccc}
 \text{Controllable Margin} & \div & \text{Average Operating Assets} & = & \text{Return on Investment (ROI)} \\
 \$1,000,000 & \div & \$5,000,000 & = & 20\%
 \end{array}$$

DuPont formula

$$\begin{array}{ccc}
 \text{Operating Income} \div \text{Sales} & \times & \text{Sales} \div \text{Operating Assets} \\
 \text{Profit Margin} & \times & \text{Investment Turnover} \\
 \hline
 & = & \text{Return on Investment (ROI)}
 \end{array}$$

Note: in an investment centre, all fixed costs are controllable by its manager

Responsibility report

	A	B	C	D	E
1	MANTLE MANUFACTURING COMPANY				
2	Marine Division				
3	Responsibility Report				
4	For the Year Ended December 31, 2012				
5				Difference	
6		Budget	Actual	Favourable - F Unfavourable - U	
7	Sales	\$1,200,000	\$1,150,000	\$ 50,000	U
8	Variable costs				
9	Cost of goods sold	500,000	490,000	10,000	F
10	Selling and administrative	160,000	156,000	4,000	F
11	Total	660,000	646,000	14,000	F
12	Contribution margin	540,000	504,000	36,000	U
13	Controllable fixed costs				
14	Cost of goods sold	100,000	100,000	0	
15	Selling and administrative	80,000	80,000	0	
16	Other fixed costs	60,000	60,000	0	
17	Total	240,000	240,000	0	
18	Controllable margin	\$ 300,000	\$ 264,000	\$ 36,000	U
19	Return on investment	15.0%	13.2%	1.8%	U
20		(a)	(b)	(c)	
21					
22		(a) \$ 300,000	(b) \$ 264,000	(c) \$ 36,000	
23		\$2,000,000	\$2,000,000	\$2,000,000	

Judgemental factors in ROI

- 1) Valuation of operating assets
- 2) Margin (income) measure

The manager of an investment centre can improve the roi in two ways:

- 1) **increase the controllable margin** (by increasing sales or decreasing variable and fixed costs)
- 2) **reduce the average operating assets**

VIII. Residual income

When evaluating investment performance, ROI has a significant disadvantage: it ignores an important variable; the **minimum rate of return** on a company's operating assets

Minimum rate of return: rate at which the marine division can cover its costs and earn a profit
If ROI > minimum rate of return, the company should go ahead with production.

Residual Income: The income that remains after subtracting from the controllable margin the minimum rate of return on a company's operating assets

$$\begin{array}{rcccl}
 \text{Controllable Margin} & - & \text{Minimum Rate of Return} \times \text{Average Operating Assets} & = & \text{Residual Income} \\
 \$260,000 & - & 10\% \times \$2,000,000 & = & \$60,000
 \end{array}$$

Economic Value Added (EVA): after-tax controllable margin minus the weighted average cost of the total capital used

$$\begin{array}{rcccl}
 \text{Investment Centre's Operating Profit After Tax} & - & \text{Weighted-Average Cost of Capital} \times \text{Total Capital Used} & = & \text{Economic Value Added (EVA)}
 \end{array}$$

Chapter 12 - Standard costs and balance scorecard

Standard costs: Predetermined unit costs that are used as measures of performance

- **Ideal standards:** standards based on the optimum level of performance under perfect operating conditions
- **Normal standards:** standards based on an efficient level of performance that are attainable under expected operating conditions

Total standard cost per unit equals to:

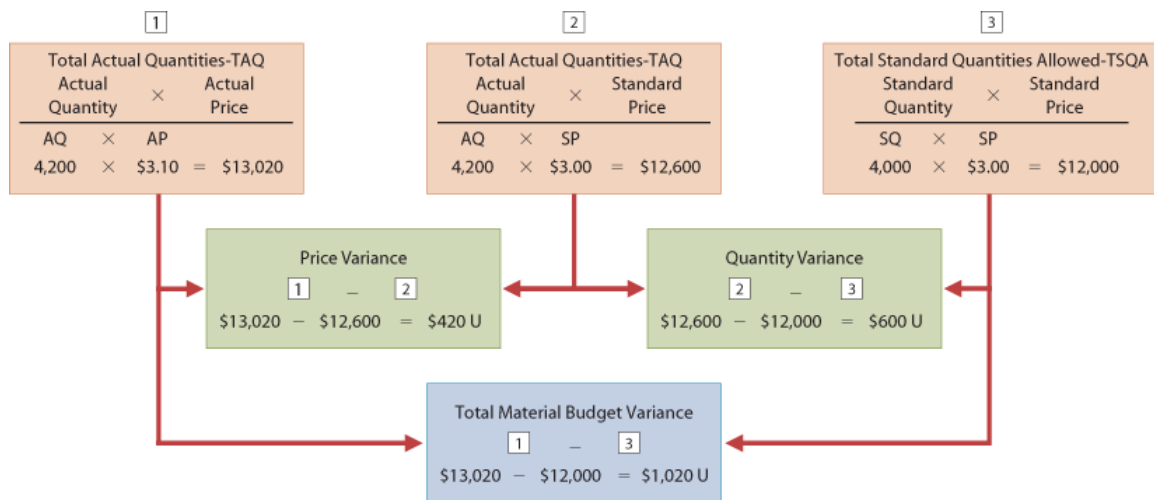
- **Direct material cost per unit** = direct material SP x direct material SQ
- **Direct labour cost per unit** = direct labour SP x direct labour SQ
- **Standard manufacturing overhead rate per unit** = predetermined overhead rate (budgeted overhead costs / expected standard activity index) x activity index SQ

Direct material variance

Total direct materials budget variance (TDMBV) = (AQ x AP) - (SQ x SP)

- Materials **price variance** = (AQ x AP) - (AQ x SP)
- Materials **quantity variance** = (AQ x SP) - (SQ x SP)

Q quantity A actual
P price S standard

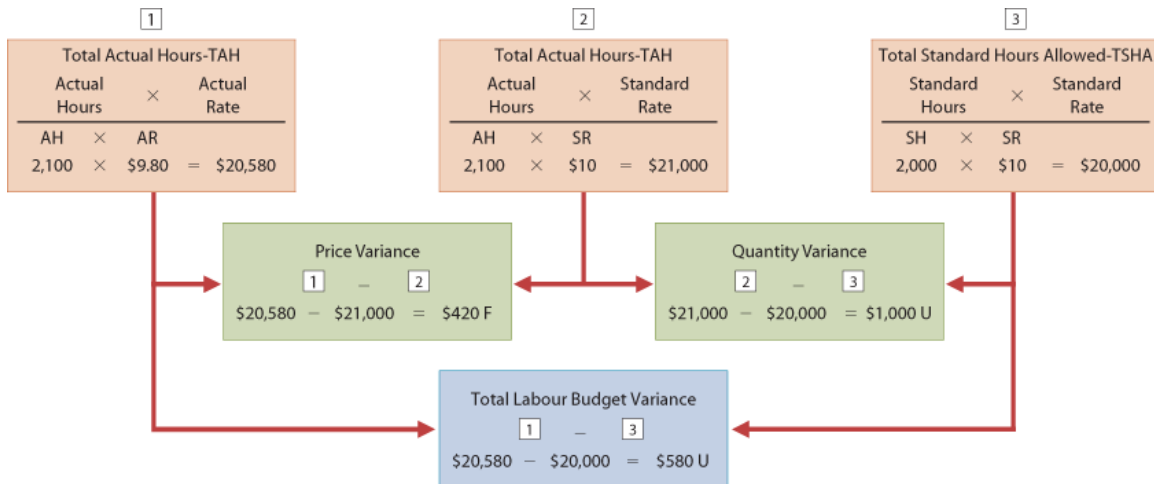


Direct labour variance

Total direct labour budget variance (TDLBV) = (AH x AR) - (SH x SR)

- Labour **price variance** = (AH x AR) - (AH x SR)
- Labour **quantity variance** = (AH x SR) - (SH x SR)

H hour
R rate



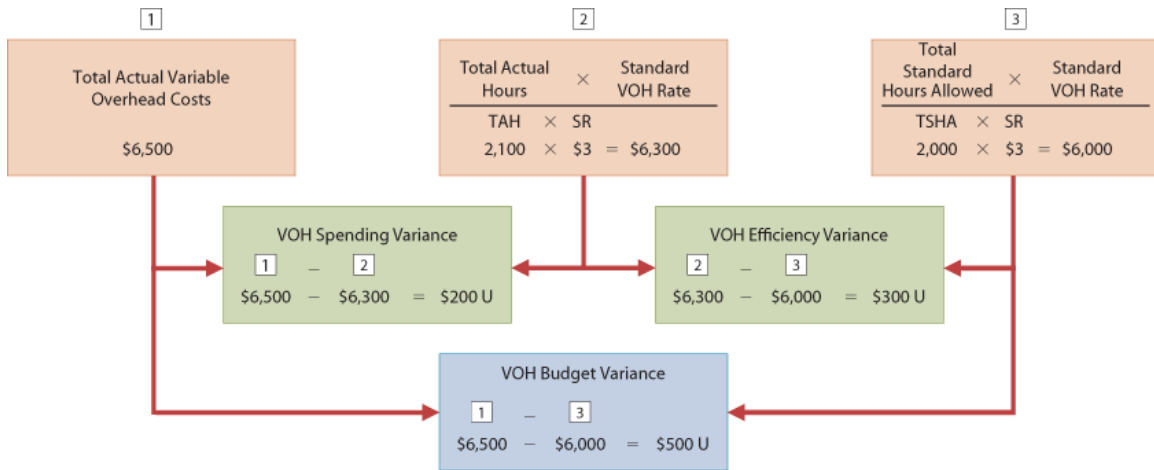
Manufacturing overhead variance

Total overhead variance = actual overhead - (SH x SR)

Total variable overhead budget variance (TVOHBV) = actual variable overhead - (SH x SR)

→ Variable overhead **spending (price) variance** = actual variable overhead - (AH x SR)

→ Variable overhead **efficiency variance** = (AH x SR) - (SH x SR)

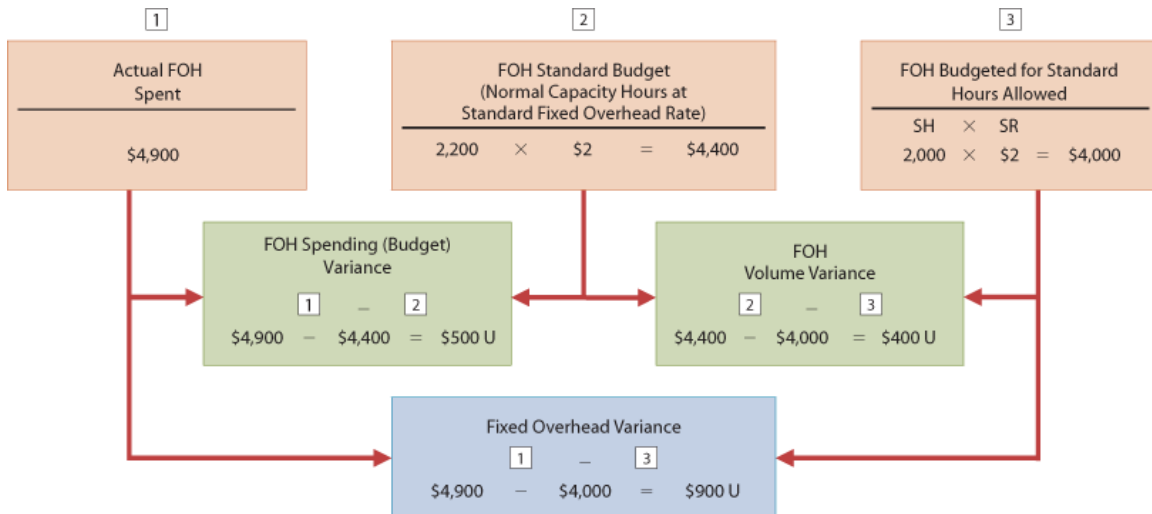


Total fixed overhead variance = actual fixed overhead - (SH x SR)

→ Fixed overhead **spending variance** = actual fixed overhead - (NCH x SR)

→ Fixed overhead **volume variance** = (NCH x SR) - (SH x SR) = fixed overhead rate x (normal capacity hours - standard hours)

NCP normal capacity hours



In calculating the overhead variances, it is important to remember the following:

- 1) The standard hours allowed are used in each of the variances.
- 2) The total budget overhead variance generally relates to total variable overhead budget variance and the fixed overhead spending (budget) variance only.
- 3) The volume variance relates only to fixed overhead costs and it is also called production volume variance.
- 4) Overapplied or underapplied overhead is the difference between the total actual overhead costs and the budget overhead at the standard base allowed.

Reporting variance

XONIC, INC.					
Variance Report—Purchasing Department					
Week Ended June 8, 2012					
Type of Materials	Quantity Purchased	Actual Price	Price Standard	Price Variance	Explanation
× 100	4,200 litres	\$3.10	\$3.00	\$420 U	Rush order
× 142	1,200 units	2.75	2.80	60 F	Quantity discount
A 85	600 doz.	5.20	5.10	60 U	Regular supplier on strike
Total price variance				\$420 U	

Statement presentation of variances

Variance in income statement for management

XONIC, INC. Income Statement Month Ended June 30, 2012		
Sales		\$60,000
Cost of goods sold (at standard)		<u>42,000</u>
Gross profit (at standard)		18,000
Variances unfavourable		
Materials price	\$ 420	
Materials quantity	600	
Labour price	(420)	
Labour quantity	1,000	
Variable overhead budget (spending and efficiency)	500	
Fixed overhead spending (budget) variance	500	
Overhead volume	<u>400</u>	
Total variance unfavourable		<u>3,000</u>
Gross profit (actual)		15,000
Selling and administrative expenses		<u>3,000</u>
Net income		<u>\$12,000</u>

The balanced scorecard: an approach that uses financial and non-financial measures in an integrated system that links performance measurement and a company's strategic goals

→ The balanced scorecard evaluates company performance from 4 perspective:



→ Within each perspective, the balanced scorecard identifies objectives

Standard cost accounting system: a double-entry system of accounting in which standard costs are used in making entries and variances are recognized in the accounts