



## COMM 305 Notes Midterm & Final

Managerial Accounting (Concordia University)

# COMM 305 SUMMER 2018 FINAL NOTES

## CHAPTER 1

### Managerial accounting basics:

#### Introduction:

- “Management accounting”
- Field of accounting that provides economic and financial information for managers and other internal users
- **Terms and concepts:** printed in blue where they first appear and are defined in the end-of-chapter glossary
- Applies to all types of businesses & business organization:
  - Service, merchandising, manufacturing
  - Proprietorships, partnerships, corporations
- How the role of managerial accounting has changes:
  - Methods used to determine amount/type of cost in a product have changes (more automated)
  - Managerial accountants are now responsible for strategic cost management, help management evaluate the efficiency of resource use

#### Comparison of financial accounting and managerial accounting

- *Similarities:*
  - Both deal with economic events of a business
- *Differences:*

<b>Feature</b>	<b>Financial Accounting</b>	<b>Managerial Accounting</b>
Primary Users of Reports	External users: shareholders, creditors, and regulators.	Internal users: officers and managers.
Types and Frequency of Reports	Financial statements. Quarterly and annually.	Internal reports. As frequently as needed.
Purpose of Reports	General-purpose.	Special-purpose for specific decisions.

Content of Reports	<p>Pertains to business as a whole. Highly aggregated (condensed). Limited to double-entry accounting and cost data. Generally accepted accounting principles.</p>	<p>Pertains to subunits of the business. Very detailed. Extends beyond double-entry accounting to any relevant data. Standard is relevance to decisions.</p>
Verification Process	Audited by CPA (chartered professional accountant).	No independent audits.

### **Management functions and organizational structures**

Managers' activities/responsibilities classified into 3 broad functions:

1. Planning: look ahead and plan objectives
  - Objectives: maximizing short-term profits/market share, maintaining commitment to environment protection, etc
  - Key objective of management: add value to business under its control, usually measured by the trading price of company's shares and potential selling price of the company
2. Directing: coordinating company's activities and human resources to produce smoothly running operation
3. Controlling: process of keeping company's activities on track

### Organizational structures

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

- Shareholders: own corporation, manage it indirectly
- Board of directors: elected by shareholders to manage corporation, creates operating policies, selects officers
- CEO: has overall responsibility
- CFO: responsible for accounting/finance issues. Supported by
  - Controller: responsibilities include (1) maintaining accounting records, (2) maintaining system of internal control, (3) preparing financial statements, tax returns, and internal reports
  - Treasurer: has custody of corporation's funds, responsible for maintaining company's cash position

- Internal audit staff: review reliability/integrity of financial; information provided by controller and treasurer
- Vice president of operations: oversees employees with line positions

Responsibility is classified as either:

1. *Line position*: directly involved in company's main revenue-generating operating activities
2. *Staff position*: involved in activities that support the efforts of the line employees

### **Business ethics**

- Creating proper incentives
- Corporate social responsibility: company efforts to employ sustainable business practices with regard to its employees and the environment
  - *Triple bottom line*: evaluation of company's social responsibility performance with regard to people, planet and profit
  - Sustainable business practices issues:
    - Deciding what items are to be measures (usually ones that are most important to stakeholders)
    - Deciding measurable attributes for each item
    - Consider materiality of the item, cost of measuring attributes, reliability of measurements
- Code of ethical standards:
  - Canada: each province has its own code of ethics and rules and guidelines of professional conduct
  - U.S Sarbanes-Oxley Act of 2002 (SOX)
    - clarified top management's responsibility for the company's financial statements
    - companies now pay more attention to the composition of the board of directors
  - U.S IMA Standards of Ethical Conduct for Practitioners of Management Accounting and Financial Management
    - The IMA's **Statement of Ethical Professional Practice** provides the following codes of conduct regarding **competence, confidentiality, integrity, and credibility**:
      - Competence: maintain professional competence, perform professional duties corresponding to relevant laws, regulations and technical standards, prepare complete/clear reports/recommendations, communicate professional limitations that would preclude responsible judgement or successful performance of an activity.
      - Confidentiality: refrain from disclosing confidential information, inform subordinates as to how to handle

confidential information, refrain from using confidential information for unethical or illegal advantage.

- Integrity: avoid conflicts of interest, refrain from activity that would prejudice their ability to carry out their duties ethically, refrain from engaging in or supporting any activity that would discredit the accounting profession.
- Credibility: communicate information fairly and objectively, disclose fully all relevant information that could reasonably be expected to influence a user's understanding of the reports, comments, and recommendations presented.

### **Managerial accounting today**

- Service industry trends: canadian and U.S economies generally shifted toward providing services instead of goods
- Managerial accounting practices
  - Focus on *value chain*: all activities associated with providing a product or service
  - Technological change:
    - *Enterprise resource planning (ERP) software systems*: SAP; provide information used to manage all major business processes, from purchasing to manufacturing to recording human resources
    - *Computer-integrated manufacturing (CIM)*: manufacture products that are untouched by human hands
  - *Just-in-time inventory (JIT)* methods: goods are manufactured or purchased just in time for use.
  - Quality:
    - *Total quality management (TQM)*: systems to reduce defects in finished products. The goal is to achieve zero defects
  - *Activity-based costing (ABC)*: method of allocating overhead based on each product's use of activities. PROS: accurate product costing, careful scrutiny of all activities in value chain
  - *Theory of constraints*: The practice of identifying constraints that impede a company's ability to provide a good or service, and dealing with the constraints to maximize profitability.
    - *Bottlenecks*: constraints that limit company's potential profitability
  - *Lean manufacturing*: eliminates waste and concentrates on needs of customer
    - 5 basic principles: identify value stream, create flow, respond to customer pull or demands, aim for perfection
  - *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.

## Accounting organizations and professional accounting careers in Canada

- *Chartered accountant (CA)*
- *Certified management accountants (CMA)*
- *Certified general accountants (CGA)*

## CHAPTER 2

### Managerial cost concepts and cost behavior analysis:

#### 1. **MANAGERIAL COST CONCEPTS**

##### a. *Manufacturing costs*

- **Manufacturing:** consists of activities and processes that convert raw materials into finished goods
- **Manufacturing costs:** classified in 3 categories:
  - Direct materials vs. Indirect materials:
    - Direct materials: materials that can be physically and directly associated with the finished product during the manufacturing process. E.g.: flour in bread, syrup in soda, steel in cars
    - Indirect materials: have 1 of 2 characteristics:
      - i. Don't physically become part of finished product (polishing compounds)
      - ii. Can't be easily traced because physical association with finished product is so small (glue)
  - Direct labour vs. Indirect labour:
    - Direct labour: work that can be physically/directly associated with converting raw materials into finished goods
    - Indirect labour: has one of two characteristics:
      - i. Work has no physical associated with finished product
      - ii. Work for which it is impractical to trace costs to the good produced (work of supervisors, maintenance people)
  - Manufacturing overhead (also known as factory overhead, indirect manufacturing costs, burden): costs that are indirectly associated with the manufacture of the finished product. Includes indirect materials or indirect labour, depreciation, insurance, taxes, maintenance

##### b. *Prime costs and conversion costs*

- Prime costs: sum of all direct materials costs and direct labour costs

- Conversion costs: sum of all direct labour costs and manufacturing overhead costs, which together = cost of converting raw materials into final product

c. *Product vs. Period costs*

- Product costs (also known as inventoriable costs): necessary to produce finished product, manufacturing costs, recorded as “inventory”, don’t become expenses till finished goods are sold & at that point it is recorded as expense as cost of goods sold. Include direct materials, direct labour, manufacturing overhead (indirect materials, indirect labour, other indirect costs). **Total manufacturing costs are the sum of the product costs**
- Period costs: matched with the revenue of a specific time period, non-manufacturing costs, include selling and administrative expenses, deducted from revenues in period they are incurred to determine net income

d. *Cost concepts (review)*

Cost Item	Product Costs			
	Direct Materials	Direct Labour	Manufacturing Overhead	Period Costs
1. Material cost (\$30) per board	X			
2. Labour costs (\$40) per board		X		
3. Depreciation on factory equipment (\$25,000 per year)			X	
4. Property taxes on factory building (\$6,000 per year)			X	
5. Advertising costs (\$30,000 per year)				X
6. Sales commissions (\$20 per board)				X
7. Maintenance salaries (factory facilities) (\$45,000 per year)			X	

8. Salary of plant manager (\$70,000)	X
9. Cost of shipping boards (\$8 per board)	X

#### Illustration 2-4 Assignment of costs to cost categories

## 2. COST BEHAVIOR ANALYSIS

- a. *Variable costs*: costs that vary in total directly and proportionately with changes in the activity level; remains constant per unit at every level of activity. Includes direct materials, direct labour, cost of goods sold, sales commissions. Manufacturers want **less variable costs** and more **fixed costs**
- b. *Fixed costs*: remain the same in total within the relevant range regardless of changes in the activity level. Includes property taxes, insurance, rent, salaries, depreciation. Fixed costs/unit vary inversely with activity → as volume increases, unit cost declines and vice versa
- c. *Relevant range (also known as normal/practical range)*: the range that company expects to operate in during a year; within relevant range there is usually a linear relationship for both variable and fixed costs which produces useful data for cost behavior analysis as long as level of activity stays in relevant range
  - Linear: changes in activity index = direct, proportional change in variable cost. Very rare in businesses
  - Curvilinear: changes in the activity index = not direct, not proportional change in the variable cost. Realistic in businesses
- d. *Mixed costs (also known as semi-variable costs)*: have both a variable element and a fixed element; change in total but not proportionally with changes in the activity level
- e. *Classifying costs*:
  - Mixed costs: classified into their fixed and variable elements; determine the variable and fixed cost components of the total cost at the end of a period of time. Uses several methods, but explain high-low method
    - High-low method: uses total costs incurred at the high and low levels of activity. The difference in costs between high and low levels represent variable costs (since only variable costs change when activity levels change). Steps: **\*page cost behavior analysis**
      - Determine variable cost/unit using formula: **change in total costs ÷ change in activity levels**

- Determine the fixed cost by subtracting total variable cost at either the high or the low activity level from the total cost at that activity level.

### 3. MANUFACTURING COSTS IN FINANCIAL STATEMENTS

a. *Income statement:* merchandiser and manufacturer income statements **differ** in the cost of goods sold section

- Merchandiser: cost of goods sold is calculated by adding beginning merchandise inventory to the cost of goods purchased and subtracting the ending merchandise inventory
  - Cost of goods purchased: The net cost of merchandise purchased (after deducting purchase returns, purchase allowances, and purchase discounts) plus the cost of freight-in
- Manufacturer: cost of goods sold is calculated by adding the beginning finished goods inventory to the cost of goods manufactured and subtracting the ending finished goods inventory
  - Cost of goods manufactured: Total cost of work in process less the cost of the ending work in process inventory.
  - Cost of goods manufactured schedule: internal report that shows each of the cost elements described in the cost of goods manufactured formula. Presents data for direct materials and for manufacturing overhead. Numbers or categories in financial statements are often highlighted in red

b. *Balance sheet:*

- Merchandising company: shows just one category of inventory
- Manufacturer company: inventories generally listed in order of their liquidity, may have 3 inventory accounts
  - Raw material inventory: shows cost of raw materials on hand
  - Work in process inventory: shows cost of partially completed units
  - Finished goods (appears first on list, most liquid): shows cost of completed goods on hand

MERCHANDISING COMPANY		MANUFACTURING COMPANY	
Balance Sheet		Balance Sheet	
December 31, 2016		December 31, 2016	
Current assets		Current assets	
Cash	\$100,000	Cash	\$180,000
Receivables (net)	210,000	Receivables (net)	210,000
Merchandise inventory	400,000	Inventories	
Prepaid expenses	22,000	Finished goods	\$80,000
Total current assets	\$732,000	Work in process	25,200
		Raw materials	22,800
		Prepaid expenses	18,000
		Total current assets	\$536,000

#### Additional definitions:

- *Cost*: an economic resource given up or foregone to accomplish a particular objective
- *Cost object*: anything for which we want to calculate a cost, such as a product, product line, service, process for which cost information is measured and accumulated
- *Cost behavior analysis*: study of how specific costs respond to changes in the level of business activity
  - *Activity index*: identifies the activity that causes changes in the behavior of costs. Used to classify behavior of costs in response to changed in activity levels into 3 categories: variable, fixed, or mixed
- *Ending work in process inventory*: Units that were partially completed at the end of the accounting period.

### CHAPTER 3

#### Job order cost accounting

1. **COST ACCOUNTING SYSTEMS**: consists of accounts for the various manufacturing costs, uses perpetual inventory system which provides immediate, up-to-date information on cost of product. 2 types:
  - a. *Job-order cost systems*: company assigns costs to each job or to each batch of goods, which has its own distinguishing characteristics
  - b. *Process cost systems*: used when company manufactures large volume of similar products. Production is continuous. Accumulates product related costs

for period of time. Costs are assigned to departments or processes for a set period of time

Job-Order Costing	Process Costing
<ul style="list-style-type: none"> <li>● Distinct products with low volumes: home building, shipbuilding, film production, aircraft manufacture, custom machining, furniture manufacture, printing, consulting</li> <li>● Cost totalled by job or batch</li> <li>● Unit cost calculated by dividing total job costs by units produced</li> </ul>	<ul style="list-style-type: none"> <li>● Homogeneous products with high volumes: chemicals, gasoline, microchips, soft drinks, processed food, electricity</li> <li>● Costs added by process or department</li> <li>● Unit cost calculated by dividing total process costs during the period by units produced during that period</li> </ul>

**2. JOB-ORDER COST FLOW:** flow of costs (direct materials, direct labour, manufacturing overhead) in job-order cost accounting parallels the physical flow of materials as they are converted into finished goods. Two major steps in the flow of costs: (1) *accumulating* the manufacturing costs incurred and (2) *assigning* the accumulated costs to the work done

a. *Accumulating manufacturing costs incurred:*

- i. Raw materials costs
- ii. Factory labour costs: consists of
  - Gross earnings of factory workers
  - Employer payroll taxes on these earnings
  - Fringe benefits incurred by the employer (sick pay, group insurance, vacation pay)
- iii. Manufacturing overhead costs: may be recognized daily or periodically
  - Summary entry: periodically recorded manufacturing overhead costs such as property taxes, depreciation, insurance; summarizes totals from multiple transactions

**3. ASSIGNING MANUFACTURING COSTS TO WORK IN PROCESS**

a. Results in the following entries:

- i. Debits are made to work in process inventory
- ii. Credits are made to raw materials inventory, factory labour, and manufacturing overhead

- b. *Job cost sheet*: form that is used to record the costs that are chargeable to a specific job and to determine the total and unit costs of the completed job
- c. Raw materials cost:
  - i. *Materials requisition slip*: A document authorizing the issue of raw materials from the storeroom to production. **Direct materials** will be charged to work in process inventory and **indirect materials** will be charged to manufacturing overhead
  - ii. Inventory costing methods:
    - FIFO (first in first out): costs of earliest goods acquired are first to be recognized as cost of goods sold
    - Average cost method: cost of goods sold and ending inventory are determined by dividing cost of goods available for sale by the units available for sale
- d. Factory labour costs: assigned to jobs on basis of time tickets prepared when work is performed
  - i. *Time tickets*: indicates employee, hours worked, account and job to be charged, and total labour cost

#### 4. MANUFACTURING OVERHEAD COSTS

- a. Predetermined overhead rate: A rate based on the relationship between the estimated annual overhead costs and the expected annual operating activity, expressed in terms of a common activity base.
  - i. Activity base: A predetermined overhead rate that is based on the relationship between the estimated annual overhead costs and the expected annual operating activity. It is expressed in terms of direct labour costs, direct labour hours, machine hours, or any other measure that will provide a fair basis for applying overhead costs to jobs.
- b. Overhead uses *actual costing system*: A cost accounting system in which costs are assigned to a cost object by using data on actual costs incurred during the accounting period. Direct and indirect costs are assigned to a cost object by using the actual costs incurred during the accounting period. Not workable for managers because that can't wait that long for information about the costs of specific jobs that were completed during the year
- c. Predetermined overhead rate uses Normal costing system: traces direct costs to a cost object by using the actual cost data incurred during the accounting period and that allocates indirect costs based on the predetermined rate(s) times the actual quantity of the cost-allocation base(s).

Costs	Actual Costing System	Normal Costing System
Direct cost		

Direct material	<ul style="list-style-type: none"> <li>actual direct raw material cost rate times the actual quantity of direct material used</li> </ul>	<ul style="list-style-type: none"> <li>actual direct raw material cost rate times the actual quantity of direct material used</li> </ul>
Direct labour	<ul style="list-style-type: none"> <li>actual direct labour cost rate times the actual hours used</li> </ul>	<ul style="list-style-type: none"> <li>actual direct labour cost rate times the actual hours used</li> </ul>
<b>Indirect cost</b>		
Factory overhead	<ul style="list-style-type: none"> <li>actual factory overhead rate(s) times the actual quantity used of the activity base(s)</li> </ul>	<ul style="list-style-type: none"> <li>predetermined factory overhead rate(s) times the actual quantity used of the activity base(s)</li> </ul>
Time and accuracy	<ul style="list-style-type: none"> <li>more accurate, but untimely information</li> </ul>	<ul style="list-style-type: none"> <li>less accurate, but more timely information</li> </ul>

## 5. ACCOUNTING FOR JOBS COMPLETED AND SOLD

- a. *Assigning costs to finished goods*: when a job is finished, an entry is made to transfer its total cost to Finished Goods Inventory. This entry increases Finished Goods Inventory and reduces Work in Process Inventory. Finished Goods Inventory is a control account. It controls individual finished goods records in a finished goods subsidiary ledger
- b. *Assigning costs to cost of goods sold*: the cost of goods sold is recognized when each sale occur. The units sold, the cost per unit, and the total cost of goods sold for each job that has been sold are recorded in the issues section of the finished goods record
- c. *Job-order costing for service companies*
- d. *Summary of job-order cost flows*: the cost flows in the diagram can be categorized as one of four types:
  - i. Accumulation: The company first accumulates costs by (1) purchasing raw materials, (2) incurring labour costs, and (3) incurring manufacturing overhead costs.
  - ii. Assignment to jobs: Once the company has incurred manufacturing costs, it must assign them to specific jobs. For example, 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. Similarly, 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. Finally it assigns manufacturing overhead (6) to work in process using a *predetermined overhead rate*. This deserves emphasis: **Do not assign overhead using actual overhead costs, but instead use a predetermined rate.**

- iii. Completed jobs: company transfers the cost of the completed job out of work in process inventory into finished goods inventory.
- iv. When goods are sold: company transfers their cost out of finished goods inventory into cost of goods sold

e. *pros/cons of job-order costing*

i. Pros:

- more precise in assignment of costs to projects than process costing
- provides more useful information for determining the profitability of particular projects and for estimating costs when preparing bids on future jobs.

ii. Cons:

- requires a significant amount of data entry
- if the data are not entered accurately, then the product costs are not accurate
- Issues regarding how to allocate overhead to the finished product

## 6. REPORTING JOB COST DATA

a. *Under-applied or over-applied manufacturing overhead*

- i. Under-applied: the overhead assigned to Work in Process is less than the overhead incurred.
  - If actual (costs incurred) **greater than** applied (costs assigned)
- ii. Over-applied: when Manufacturing Overhead has a credit balance, overhead is overapplied
  - If actual (costs incurred) **less than** applied (costs assigned)
- iii. Methods of adjustment:
  - Cost of goods sold method: more common method is to make an adjustment to Cost of Goods Sold. Here, the underapplied or over-applied overhead costs are closed into Cost of Goods Sold. Thus, under-applied overhead is debited to Cost of Goods Sold. Over-applied overhead is credited to Cost of Goods Sold.
  - Proration method: The process of assigning under- and over-applied overhead costs to the inventory accounts Work in Process and Finished Goods, and to Cost of Goods Sold; the

under- or over-applied overhead is prorated among these three accounts.

Additional definitions:

- *Cost accounting*: involves measuring, recording, and reporting of product costs

## **CHAPTER 4**

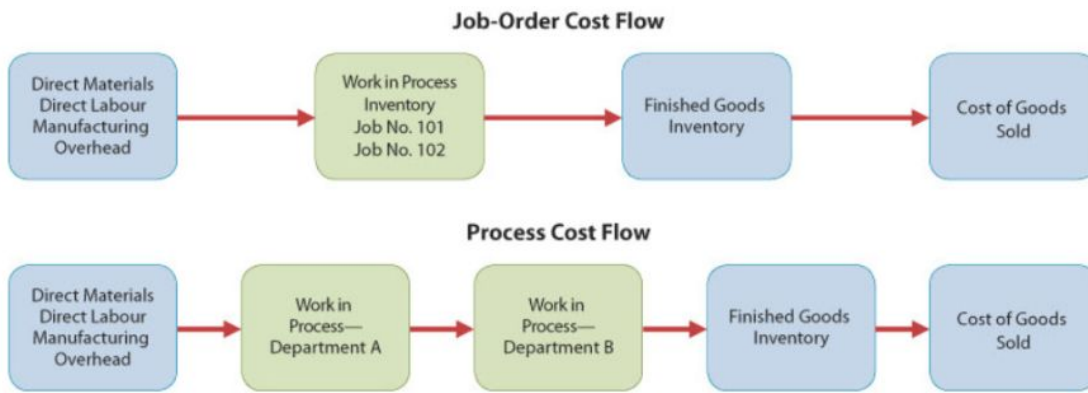
### **THE NATURE OF PROCESS COST SYSTEM**

Process cost system: companies use them to apply costs to similar products that are mass-produced in a continuous way.

- Process costing for manufacturing companies: soft drinks, oil, computer chips, chemicals
- Process costing for service companies: services that perform repetitive, routine duties such as oil changes on a car, etc

#### Similarities and differences between job-order cost and process cost systems

- *Similarities*:
  - Manufacturing cost elements: track same ones (direct materials, direct labour, manufacturing overhead)
  - Accumulating of the costs of DM, DL & MO: raw materials are debited to raw materials inventory, factory labour is debited to F.L and M.O costs are debited to M.O
  - Flow of costs: are assigned to same accounts in both costing systems (work in process, finished goods inventory, and COGS)
- *Differences*
  - Number of work in process accounts used: one for job-order cost system, several for process cost system
  - Documents used to track costs: costs are charged to individuals jobs & summarized in job cost sheet for job-order cost system. Costs are summarized in a production cost report for each department for a process cost system
  - Point at which costs are totalled: when job is completed for job-order cost system, at end of period of time for process cost system
  - Unit cost calculations:  $U.C = \text{total cost/job} \div \text{the units product}$  for JOCS. For PCS,  $U.C = \text{total manufacturing cost for period} \div \text{the units produced during the period}$



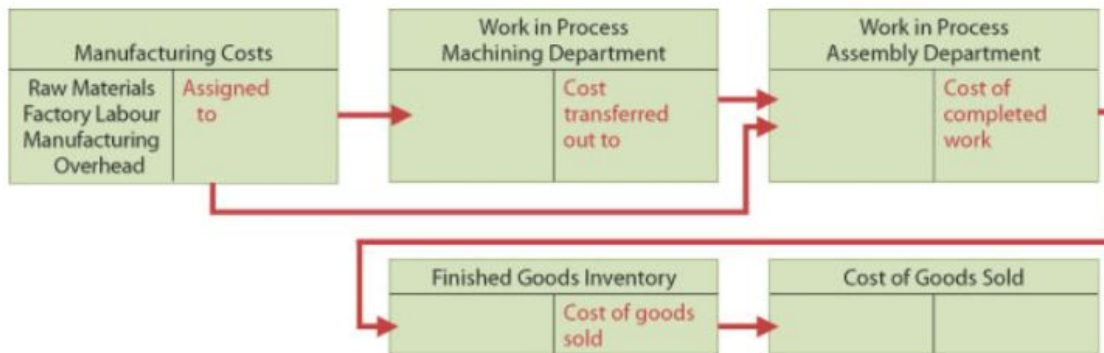
**Illustration 4-3** Job-order cost and process cost flow systems

<u>Features</u>	<u>Job-Order Cost System</u>	<u>Process Cost System</u>
<u>Work in process accounts</u>	<ul style="list-style-type: none"> <li>• <u>one for each job</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>one for each process</u></li> </ul>
<u>Documents used</u>	<ul style="list-style-type: none"> <li>• <u>job cost sheets</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>production cost reports</u></li> </ul>
<u>Determination of total manufacturing costs</u>	<ul style="list-style-type: none"> <li>• <u>each job</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>each period</u></li> </ul>
<u>Unit cost calculations</u>	<ul style="list-style-type: none"> <li>• <u>cost of each job</u> <u>÷ units</u> <u>produced for the</u> <u>job</u></li> </ul>	<ul style="list-style-type: none"> <li>• <u>total manufacturing costs</u> <u>÷ units produced during</u> <u>the period</u></li> </ul>

Operations costing: similar to PCS, companies use standardized methods to manufacture a product. Product may have some customized features that requires a JOCS

## **FLOW AND ASSIGNMENT OF MANUFACTURING COST**

### Process cost flow



**Illustration 4-5** Flow of costs in a process cost system

Assignment of manufacturing costs: journal entries

- Accumulation of costs of DM, DL & MO: same for both PCS & JOCS
  - Debit all raw materials to Raw Materials inventory when the materials are purchased
  - Debit all factory labour to Factory Labour when the labour costs are incurred
  - Debit overhead costs to Manufacturing Overhead as they are incurred

Assignment of costs are different for PCS:

- Materials costs: Materials requisition slips may be used in a process cost system, **but fewer requisitions are generally used than in a job-order cost system, because the materials are used for processes rather than for specific jobs.** Requisitions are issued less often in a process cost system because the requisitions are for larger quantities of material. Journal entry example to record materials:

Work in Process Machining	XXXX	
Work in Process Assembly	XXXX	
Raw Materials Inventory		XXXX
To record materials used.		

- Factory labour costs: Time tickets can be used to determine the cost of labour that should be assigned to production departments. labour cost that is chargeable to a process can be obtained from the payroll register or a department's payroll summaries. Journal entry example for factory labour costs:

Work in Process—Machining	XXXX	
Work in Process—Assembly	XXXX	
Factory Labour		XXXX
To assign factory labour to production.		

- Manufacturing overhead costs: basis is the activity that “drives” or causes the costs. A major driver of overhead costs in continuous manufacturing operations is **machine time used**, not direct labour. Thus, **machine hours are widely used** to allocate manufacturing overhead costs. Journal entry example for manufacturing overhead costs

Work in Process—Machining	XXXX	
Work in Process—Assembly	XXXX	
Manufacturing Overhead		XXXX
To assign overhead to production.		

- Transfer to next department: an entry is needed to record the cost of the goods transferred out of the department

Work in Process—Assembly		XXXX
Work in Process—Machining		XXXX
To record transfer of units to the assembly department.		

- Transfer to finished goods: The units completed in the assembly department are transferred to the finished goods warehouse.

Finished Goods Inventory		XXXX
Work in Process—Assembly		XXXX
To record transfer of units to finished goods.		

- Transfer to COGS: when finished goods are sold

Cost of Goods Sold	XXXX	
Finished Goods Inventory		XXXX
To record cost of units sold.		

## EQUIVALENT UNITS

Equivalent units of production: measure the work done during the period, expressed in fully completed units, used to determine cost/unit of completed product

Weighted-average method: a method used to calculate equivalent units of production, which considers the degree of completion (weighting) of the units completed and transferred out and the ending work in process.

Refinements on the weighted-average method: considers calculations for materials and conversion costs

## **THE PRODUCTION COST REPORT**

<b>FREEZING/PACKAGING DEPARTMENT</b>					
<b>Production Cost Report</b>					
<b>Month Ended June 30, 2016</b>					
Quantities	Physical Units		Transferred In	Direct Materials	Conversion Costs
	Step 1	Step 2			
Units to be accounted for					
Work in process	200,000				
Units transferred in	700,000				
<b>Total units</b>	<b>900,000</b>				
Units accounted for					
Transferred out		800,000	800,000	800,000	
Work in process, June 30		100,000	0	75,000	(100,000 × 75%)
<b>Total units</b>		<b>900,000</b>	<b>800,000</b>	<b>875,000</b>	
<b>Costs Step 3</b>					
Unit costs					Total
Costs in June	(a)	\$765,000	\$120,000	\$175,000	\$1,060,000
Equivalent units	(b)	900,000	800,000	875,000	
Unit costs [(a) ÷ (b)]		\$ 0.85	\$ 0.15	\$ 0.20	\$ 1.20
Costs to be accounted for					
Work in process, June 1					\$ 206,000
Started into production					85,000
<b>Total costs</b>					<b>\$1,060,000</b>
<b>Cost Reconciliation Schedule: Step 4</b>					
Costs accounted for					
Transferred out (800,000 × \$1.20)					\$ 960,000
Work in process, June 30					
Transferred in (100,000 × \$0.85)				\$ 85,000	
Direct materials (0 × \$0.15)				0	
Conversion costs (75,000 × \$0.20)				15,000	100,000
<b>Total costs</b>					<b>\$1,060,000</b>

Production cost report: an internal report for management that shows both the production quantity and cost data for a production department. Four steps:

- Calculate the physical unit flow.
- Calculate the equivalent units of production.
- Calculate the unit production costs.
- Prepare a cost reconciliation schedule.

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: The sum of the units (costs) started (or transferred) into production during the period plus the units (costs) in process at the beginning of the period
- Total units accounted for: The sum of the units (costs) transferred out during the period plus the units (costs) in process at the end of the period.

Equivalent units of production: two calculations of equivalent units are required: one for materials, and one for conversion costs

Unit production costs: costs expressed in terms of equivalent units of production. When equivalent units of production are different for materials and for conversion costs, three unit costs are calculated: (1) materials cost, (2) conversion cost, and (3) total manufacturing cost

Cost reconciliation schedule: a schedule that shows that the total costs accounted for equal the total costs to be accounted for.

<b>MIXING DEPARTMENT</b>		
<b>Cost Reconciliation Schedule</b>		
Costs accounted for		
Transferred out (700,000 × \$0.75)		\$525,000
Work in process, June 30		
Materials (200,000 × \$0.50)	\$100,000	
Conversion cost (120,000 × \$0.25)	30,000	130,000
Total cost		<u>\$655,000</u>

Equivalent units and production cost report: sequential process setting

- Transferred-in cost: a cost component that is used in a sequential (or multiple-department) process setting. It has a percentage of completion factor of 100% and is treated the same as any other cost component in the calculations of the equivalent units of production and the cost per equivalent unit of production.

### **FIFO METHOD FOR CALCULATING EQUIVALENT UNITS**

- First-in, first-out method: a process costing method in which the cost assigned to the beginning work in process inventory is separated from current-period production costs. The cost per equivalent unit is related to the current period only.

Using the FIFO method, equivalent units are the sum of the following work:

- Work done to finish the units from the beginning work in process inventory.
- Work done to complete the units started into production during the period (referred to as the units started and completed).
- Work done to start, but only partially complete, the units in ending work in process inventory.

#### Difference between FIFO & Weighted average

- Weighted-average method:
  - Simple to understand and apply
- FIFO
  - Better because current performance is measured
  - Provides current cost information
  - Establish more accurate pricing strategies

### **CHAPTER 5: ACTIVITY-BASED COSTING**

#### **TRADITIONAL COSTING & ACTIVITY-BASED COSTING**

##### Traditional costing systems

- Hardest part of calculating unit costs is determining proper amount of overhead cost
- Traditional costing systems used direct labour as the activity base to calculate overhead costs. High correlation between direct labour and overhead cost
- Use direct labour when:
  - Direct labour is a significant part of the total product cost
  - There is a high correlation between direct labour and changes in the amount of overhead cost
- Traditional one-stage costing system:
  - Overhead costs → direct labour hours or dollars → products

##### Need for a new approach

- No correlation between direct labour and overhead
  - Advances in technology changed the manufacturing environment dramatically
  - Direct labour used in industries **decreased** while overhead costs from depreciation, repairs and maintenance have **increased**
- To over product cost distortions, can't use direct labour as a basis for overhead rates & instead use **activity-based costing** which uses multiple bases

##### Activity-based costing

- Approach to allocating overhead costs by allocating overhead to multiple activity cost pools and assigning activity cost pools to products and services by using cost drivers.
- In ABC:
  - Activity: any event, action, transaction or work sequence that incurs a cost when producing a product or providing a service
  - Activity cost pool: distinct type of activity such as ordering materials or setting up machines
  - Cost driver: any factor/activity that has a direct cause-effect relationship with the resources consumed
- Reasoning behind ABC: **products consume activities, and activities consume resources**
- 2 stage process:
  - 1st stage (step 1):
    - Allocates overhead costs to activity cost pools (traditional method = allocates costs to departments or jobs)
    - Examples of overhead activity cost pools: ordering materials, setting machines, assembling products, inspecting products
  - 2nd stage (steps 2-4):
    - Uses cost drivers to assign the overhead allocated to the activity cost pools to specific products using cost drivers which measure the # of individual activities that are performed to produce products/services
    - Examples of cost drivers: purchase orders, number of set-ups, labour hours, number of inspections
- If there is no correlation between changes in cost driver and consumption of overhead cost = **inaccurate product costs** (product costs also known as *inventory costs*)
- ABC SUPPLEMENTS traditional cost systems it does **not replace** them

## APPLYING AN ACTIVITY-BASED COSTING SYSTEM

### Step 1: Identify and classify activities and allocate overhead to cost pools

<u>Activity Cost Pools</u>	<u>Estimated Overhead</u>
Setting up machines	\$300,000
Machining	500,000
Inspecting	<u>100,000</u>
Total	<u>\$900,000</u>

### Step 2: identify cost drivers

- High degree of **correlation** must exist between cost driver and the actual consumption of the overhead costs in the cost pool

Activity Cost Pools	Cost Drivers	Expected Use of Cost Drivers per Activity
Setting up machines	Number of set-ups	1,500 set-ups
Machining	Machine hours	50,000 machine hours
Inspecting	Number of inspections	2,000 inspections

**Illustration 5-5** Cost drivers and their expected use

Step 3: calculate overhead rates

**Activity-based overhead rate:**  $\frac{\text{estimated overhead per activity}}{\text{expected use of cost drivers per activity}}$

<u>Activity Cost Pools</u>	<u>Estimated Overhead</u>	$\div$	<u>Expected Use of Cost Drivers per Activity</u>	$=$	<u>Activity-Based Overhead Rates</u>
Setting up machines	\$300,000		1,500 set-ups		\$200 per set-up
Machining	500,000		50,000 machine hours		\$ 10 per machine hour
Inspecting	<u>100,000</u>		2,000 inspections		\$ 50 per inspection
Total	<u>\$900,000</u>				

**Illustration 5-7** Calculation of activity-based overhead rates

Step 4: assign overhead costs to products

- Necessary to know expected use of cost drivers for **each product** in order to assign overhead costs
- Multiply activity-based overhead rate per cost driver by the number of cost drivers expected to be used per product, to assign overhead costs to each product

<u>Activity Cost Pools</u>	<u>Cost Drivers</u>	<u>Expected Use of Cost Drivers per Activity</u>	<u>Expected Use of Cost Drivers per Product</u>	
			<u>The Boot</u>	<u>The Club</u>
Setting up machines	Number of set-ups	1,500 set-ups	500	1,000
Machining	Machine hours	50,000 machine hours	30,000	20,000
Inspecting	Number of inspections	2,000 inspections	500	1,500

**Illustration 5-8** Expected use of cost drivers per product

ATLAS COMPANY										
The Boot				The Club						
Activity Cost Pools	Expected Use of Cost Drivers per Product	x	Activity-Based Overhead Rates	=	Cost Assigned	Expected Use of Cost Drivers per Product	x	Activity-Based Overhead Rates	=	Cost Assigned
Setting up machines	500		\$200		\$100,000	1,000		\$200		\$200,000
Machining	30,000		\$10		300,000	20,000		\$10		200,000
Inspecting	500		\$50		25,000	1,500		\$50		75,000
Total costs assigned [(a)]					\$425,000					\$475,000
Units produced [(b)]					25,000					5,000
Overhead cost per unit [(a) ÷ (b)]					\$17					\$95

**Illustration 5-9** Assignment of activity cost pools to products

Step 5: unit cost comparison

- ABC: assigning overhead will usually **increase** cost/unit for low-volume products as compared to traditional overhead allocation
- Low-volume products usually require more special handling such as machine set-ups and inspections and is usually responsible for more overhead cost/unit than high-volume product

Manufacturing Costs	Products	
	The Boot	The Club
Direct materials	\$40	\$30
Direct labour	12	12
Overhead	<u>30*</u>	<u>30*</u>
Total unit cost	<u>\$82</u>	<u>\$72</u>

**Illustration 5-10** Calculation of unit costs—traditional costing





Manufacturing Costs	The Boot		The Club	
	Traditional	ABC	Traditional	ABC
	Costing		Costing	
Direct materials	\$40	\$40	\$30	\$ 30
Direct labour	12	12	12	12
Overhead	<u>30</u>	<u>17</u>	<u>30</u>	<u>95</u>
Total cost per unit	<u>\$82</u>	<u>\$69</u>	<u>\$72</u>	<u>\$137</u>
	Overstated \$13		Understated \$65	

**Illustration 5-11** Comparison of unit product costs

## BENEFITS AND LIMITATIONS OF ACTIVITY-BASED COSTING

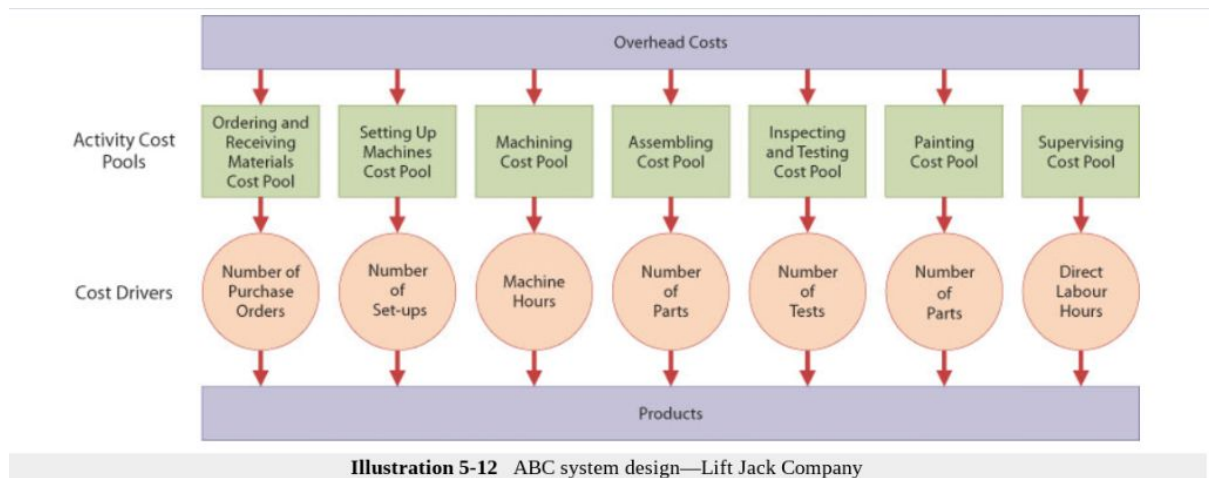
### Benefits of ABC

- **Leads to more cost pools and therefore more accurate product costing**
  - Uses multiple cost pools with more relevant cost drivers= product accuracy
  - To be effective, costs within the pool must be correlated with the driver. To achieve this activities must belong to 4 activity-level groups when designing an ABC system:
    - Unit-level activities: performed for each unit of production
    - Batch-level activities: performed every time a company produces another batch of a product
    - Product-level activities: performed every time a company produces a new type of product
    - Facility-level activities: required to support or sustain an entire production process

Four Levels	Types of Activities	Examples of Cost Drivers
<b>Unit-Level Activities</b> 	<u>Machine-related</u> Drilling, cutting, milling, trimming, pressing  <u>Labour-related</u> Assembling, painting, sanding, sewing	Machine hours  Direct labour hours or cost
<b>Batch-Level Activities</b> 	Equipment set-ups Purchase ordering Inspection  Materials handling	Number of set-ups or set-up time Number of purchase orders Number of inspections or inspection time Number of material moves
<b>Product-Level Activities</b> 	Product design Engineering changes	Number of product designs Number of changes
<b>Facility-Level Activities</b> 	Plant management salaries Plant depreciation Property taxes Utilities	Number of employees managed Square footage Square footage Square footage

- **Leads to enhanced control over overhead costs**
  - Helps managers classify activities as value-added or non value-added
    - Value-added: of a company's operations that increase the perceived value of a product/service to customers. Examples: engineering design, machining, assembly, painting, surgery at a hospital, providing legal research to law firm, etc
    - Non-value-adding activities: if eliminated, would not reduce perceived value of a company's product/service; they add cost to, or increase time spent on a product/service without increasing its perceived value. Example: inventory storage, moving materials, work in process or finished goods from one locaiton to another
  - Companies use flow charts to show value-added and non-value-added activities
- **Leads to better management decisions**

- Activity-based management: uses ABC for product costing and comprehensive management tool that focuses on reducing costs and improving processes and decision-making
- Helps managers:
  - Improve efficiency of its operations
  - Evaluate employees, departments and business units
  - Establish performance standards and benchmark



### Limitations of ABC

- Can be expensive to use: identifying multiple activities and applying numerous cost drivers
- Some arbitrary allocations remain: doesn't offer complete accuracy, some overhead costs still need to be allocated by arbitrary cost drivers such as labour or machine hours

### When to use ABC

- Product lines differ greatly in volume and manufacturing complexity
- Product lines are numerous and diverse, requiring various degrees of support services
- Overhead costs constitute a significant portion of total costs
- The manufacturing process or number of products has changed significantly (from labour-intensive to capital-intensive due to automation)
- 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

## **ACTIVITY-BASED COSTING IN SERVICE INDUSTRIES**

### ABC in services & manufacturing similarities & differences :

- Similarities:

- Same objective: identify key activities that generate costs and keep track of how many of those activities are completed for each service performed (by job, service, contract or customer)
- General approach to identifying activities, activity cost pools and cost drivers
- Labelling of activities as value-added or non-value added
- Differences:
  - For services: larger proportion of overhead costs are company-wide costs that cannot be directly traced to specific services performed by the company

Traditional costing example for services: uses only one cost driver, **direct labour cost**, to determine overhead application rate

<b>CHECK AND DOUBLECHECK, CPAs</b>		
<b>Annual Budget</b>		
Revenue		\$4,000,000
Direct labour	\$1,200,000	
Overhead (expected)	<u>600,000</u>	
Total costs		<u>1,800,000</u>
Operating income		<u>\$2,200,000</u>
<u>Estimated overhead</u> = Predetermined overhead rate		
<u>Direct labour cost</u>		
	$\frac{\$ 600,000}{\$ 1,200,000}$	= 50 %

<b>CHECK AND DOUBLECHECK, CPAs</b>		
<b>Plano Moulding Company Audit</b>		
Revenue		\$260,000
Less: Direct professional labour	\$140,000	
Applied overhead (50% × \$140,000)	<u>70,000</u>	<u>210,000</u>
Operating income		<u>\$ 50,000</u>

**Illustration 5-16** Overhead applied under traditional costing system

Activity-based costing example for services: uses multiple cost pools to calculate overhead rates (uses ABC)

CHECK AND DOUBLECHECK, CPAs Annual Overhead Budget				
Activity Cost Pools	Cost Drivers	Estimated Overhead	Expected Use of Cost Drivers per Activity	Activity-Based Overhead Rates
Administration	Number of partner-hours	\$335,000	3,350	\$100 per partner-hour
Customer development	Revenue billed	160,000	\$4,000,000	\$0.04 per \$1 of revenue
Recruiting and training	Direct professional hours	<u>105,000</u>	30,000	\$3.50 per hour
		<u>\$600,000</u>		

	A	B	C	D	E
1	CHECK AND DOUBLECHECK, CPAs				
2	Plano Moulding Company Audit				
3					
4			Actual Use of Drivers	Activity-Based Overhead Rates	Cost Assigned
5	Activity Cost Pools	Cost Drivers			
6	Administration	Number of partner-hours	335	\$100.00	\$33,500
7	Customer development	Revenue billed	\$260,000	\$0.04	10,400
8	Recruiting and training	Direct professional hours	3,800	\$3.50	13,300
9					<u>\$57,200</u>
10					

CHECK AND DOUBLECHECK, CPAs Plano Moulding Company Audit		
	Traditional Costing	ABC
Revenue	\$260,000	\$260,000
Expenses		
Direct professional labour	\$140,000	\$140,000
Applied overhead	70,000	57,200
Total expenses	<u>210,000</u>	<u>197,200</u>
Operating income	<u>\$ 50,000</u>	<u>\$ 62,800</u>
Profit margin	19.2%	24.2%

## CHAPTER 6: DECISION-MAKING COST VOLUME-PROFIT

## CVP ANALYSIS, INCOME STATEMENT AND THE CONTRIBUTION MARGIN

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

Basic components: CVP analysis considers the interrelationships among the components listed below

- Volume or level of activity
- Unit selling prices
- Variable cost per unit
- Total fixed costs
- Sales mix

CVP analysis assumptions:

1. The behavior of both costs and revenues is linear through 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; meaning % of total sales that each product represents will stay the same. Sales mix complicated CVP analysis because different products will have different cost relationships

\*when these 5 assumptions are not valid, the results of CVP ANALYSIS MAY BE inaccurate

Cost volume profit income statement: classifies costs as variable or fixed and calculates a contribution margin

- *Contribution margin:* amount of revenue that remains after variable costs have been deducted. Can be stated as total amount or per-unit basis

Example:

Unit selling price of Blu-ray DVD player	\$	500
Unit variable costs	\$	300
Total monthly fixed costs		\$200,000
Units sold		1,600

**Illustration 6-2** Assumed selling and cost data for Vargo Video

<b>VARGO VIDEO COMPANY</b>		
<b>CVP Income Statement</b>		
<b>Month Ended June 30, 2016</b>		
	Total	Per Unit
Sales (1,600 Blu-ray DVD players)	\$800,000	\$500
Variable costs	480,000	300
<b>Contribution margin</b>	<b>320,000</b>	<b>\$200</b>
Fixed costs	200,000	
<b>Operating income</b>	<b>\$120,000</b>	

**Illustration 6-3** CVP income statement, with operating income

Detailed Cvp income statement

**VARGO VIDEO COMPANY**  
**CVP Income Statement**  
**For the Month Ended June 30, 2016**

	Total	Per Unit
Sales	\$800,000	\$500
Variable expenses		
Cost of goods sold	\$400,000	
Selling expenses	60,000	
Administrative expenses	20,000	
Total variable expenses	480,000	300
<b>Contribution margin</b>	<b>320,000</b>	<b>\$200</b>
Fixed expenses		
Cost of goods sold	120,000	
Selling expenses	40,000	
Administrative expenses	40,000	
Total fixed expenses	200,000	
<b>Operating income</b>	<b>\$120,000</b>	

Differences/similarities between traditional and CVP income statement:

- Similarities: a traditional income statement and CVP income statement both report same bottom-line operating income
- Differences:
  - traditional income statement does NOT CLASSIFY costs as variable or fixed and therefore can't report a contribution margin
  - CVP shows both total and per/unit amount to help CVP analysis

Cost for CVP analysis includes:

- All costs and expenses for the production and sale of a product: manufacturing, selling and administrative costs

Contribution margin/unit: the amount of revenue remaining per unit after deducting variable costs; calculated as the unit selling price minus the unit variable cost.

- Indicates that for every unit of product sold, company will have **contribution margin/unit value** to cover its fixed costs and contribute to operating income

**Contribution margin**: unit selling price – unit variable costs

**Contribution margin/unit**: contribution margin ÷ units sold

Contribution margin ratio: the contribution margin per unit divided by the unit selling price.

Generally expressed as a percentage

- Indicates that **contribution margin ratio %** of each sales dollar can be applied to fixed costs and contribute to operating income

**Contribution margin ratio**:  $\frac{\text{contribution margin per unit}}{\text{unit selling price}}$

Or  $\frac{\text{sales} - \text{variable costs}}{\text{sales}}$

<b>VARGO VIDEO COMPANY</b>				
<b>CVP Income Statement</b>				
<b>Month Ended June 30, 2016</b>				
	No Change		With Change	
	Total	Per Unit	Total	Per Unit
Sales	\$500,000	\$500	\$600,000	\$500
Variable costs	300,000	300	360,000	300
<b>Contribution margin</b>	<b>200,000</b>	<b>\$200</b>	<b>240,000</b>	<b>\$200</b>
Fixed costs	200,000		200,000	
Operating income	<u>\$ 0</u>		<u>\$ 40,000</u>	

**Illustration 6-9** Comparative CVP income statement

**BREAK-EVEN ANALYSIS**

Break-even point: level of activity at which total revenues = total costs (both fixed and variable)

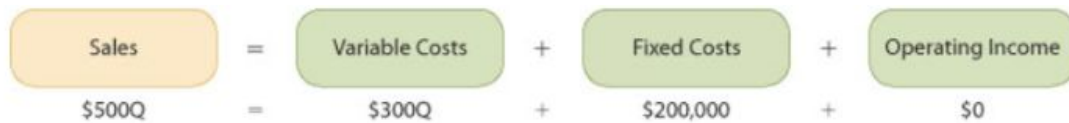
- Key relationship in CVP analysis
- Company will realized no income and suffer no loss
- Useful to know whether to introduce new product lines, change sales prices on established products, enter new market areas
- Can be:
  - Calculated with a mathematical equation
  - Calculated using contribution margin
  - Derived from a cost-volume profit (CVP) graph
- Either expressed in sales units or sales dollars
- Type of CVP Analysis because operating income is 0 at break-even point

Mathematical equation

**Common equation used for CVP analysis:**

Sales = variable costs + fixed costs + operating income

To find break-even units:



**Illustration 6-11** Calculation of break-even point in units

$$\begin{aligned}
 \$200Q &= \$200,000 \\
 Q &= \frac{\$200,000}{\$200} = \frac{\text{Fixed Costs}}{\text{Unit Contribution Margin}} \\
 Q &= 1,000 \text{ units}
 \end{aligned}$$

where :

$$\begin{aligned}
 Q &= \text{sales volume} \\
 \$500 &= \text{selling price} \\
 \$300 &= \text{variable costs per unit} \\
 \$200,000 &= \text{total fixed costs}
 \end{aligned}$$

To find break-even dollars:

Break even \$ = units sold at break-even point x selling price/unit

$$1,000 \times \$500 = \$500,000 \text{ (break-even sales in dollars)}$$

### Contribution margin technique

- Efficient because unit contribution margin is the net amount by which each sale exceeds the variable costs per unit; every sale generates this much money to pay off fixed costs

### Break-even units

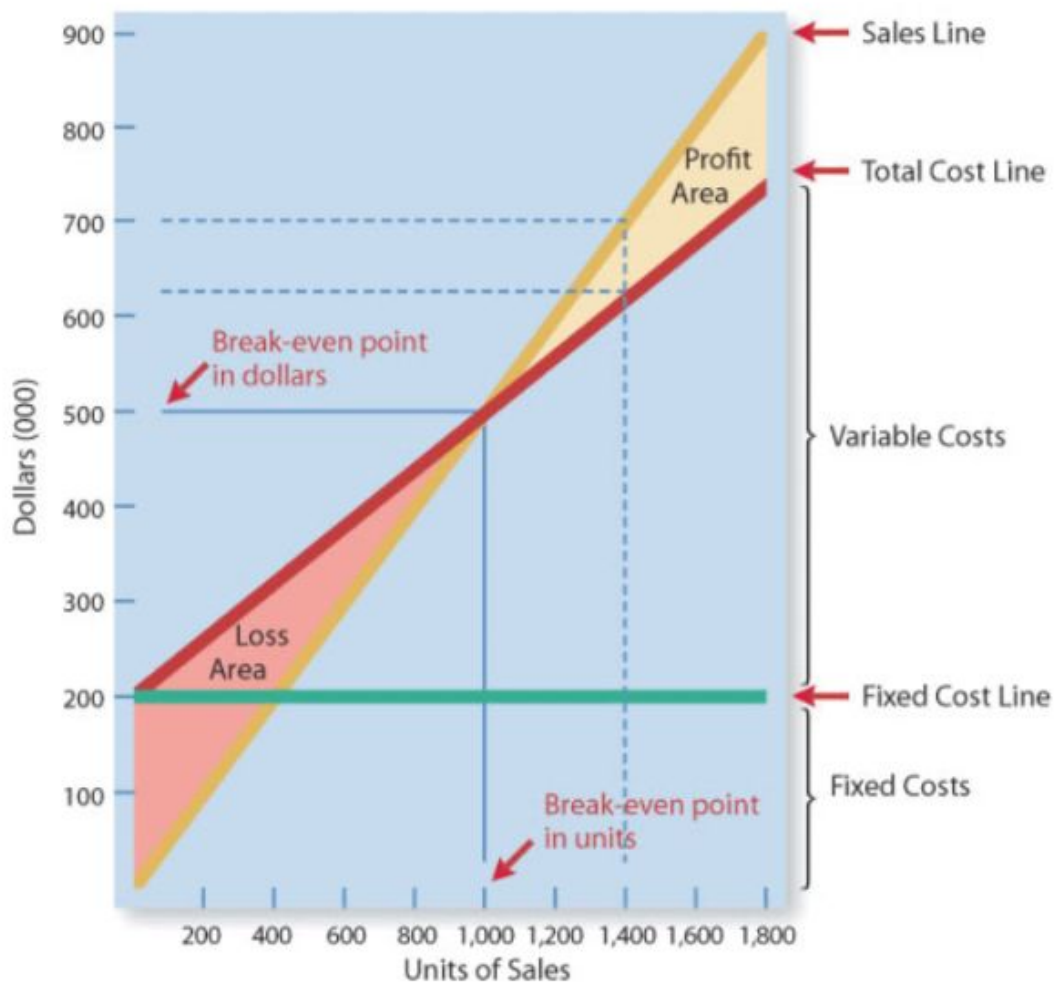
**Fixed costs ÷ contribution margin per unit = break-even point in units**

### Break-even dollars

**Fixed costs ÷ contribution margin ratio = break-even point in \$**

### Graphic presentation

- Cost-volume-profit (CVP) graph: graph showing relationship between costs, volume and profits



**Illustration 6-14** CVP graph

## TARGET OPERATING INCOME AND THE MARGIN OF SAFETY

### Target operating income before tax

- *Target operating income*: income objective for individual product lines; indicates sales company needs to achieve level of income. Sales can be determined from each of approaches used to determine break-even sales

### Mathematical technique:

**Sales to meet target operating income:** variable costs + fixed costs + target operating income

- In units:

$$\begin{aligned} \$500Q &= \$300Q + \$200,000 + \$120,000 \\ \$200Q &= \$320,000 \\ Q &= 1,600 \end{aligned}$$

where:

$$\begin{aligned} Q &= \text{sales volume} \\ \$500 &= \text{selling price} \\ \$300 &= \text{variable costs per unit} \\ \$200,000 &= \text{total fixed costs} \\ \$120,000 &= \text{target operating income} \end{aligned}$$

**Illustration 6-16** Calculation of required sales

- In dollars:  $1,600 \times \$500 = \$800,000$

### Contribution margin technique:

- In units:

$$\begin{array}{ccc} \text{Fixed Costs + Target Operating Income} & \div & \text{Contribution Margin per Unit} & = & \text{Required Sales in Units} \\ (\$200,000 + \$120,000) & \div & \$200 & = & 1,600 \text{ units} \end{array}$$

**Illustration 6-17** Formula for required sales in units using contribution margin per unit

- In dollars:

$$\begin{array}{ccc}
 \text{Fixed Costs + Target Operating Income} & \div & \text{Contribution Margin Ratio} & = & \text{Required Sales in Dollars} \\
 (\$200,000 + \$120,000) & & 40\% & & \$800,000
 \end{array}$$

**Illustration 6-18** Formula for required sales in dollars using contribution margin ratio

Graphic presentation: refer to graph 6-14

- Profit area of graph: distance between sales line and total cost line at any point = operating income
- Required sales amount can be found by analyzing difference between 2 lines until it finds desired operating income

Target operating income after tax

- In general: income taxes can be calculated by multiplying the tax rate by operating income before taxes

**Operating income after taxes:** operating income before taxes  $\times$  (1 - tax rate)

**Operating income before taxes:** operating income after taxes  $\div$  (1 - tax rate)

Mathematical technique:

- In units:

$$\$500Q = \$300Q + \$200,000 + \frac{\$120,000}{(1-0.4)}$$

$$\$200Q = \$200,000 + \$200,000 \text{ target operating income before tax}$$

$$Q = \$400,000 \div \$200$$

$$Q = 2,000$$

where :

Q = sales volume

\$500 = selling price

\$300 = variable costs per unit

\$200,000 = total fixed costs

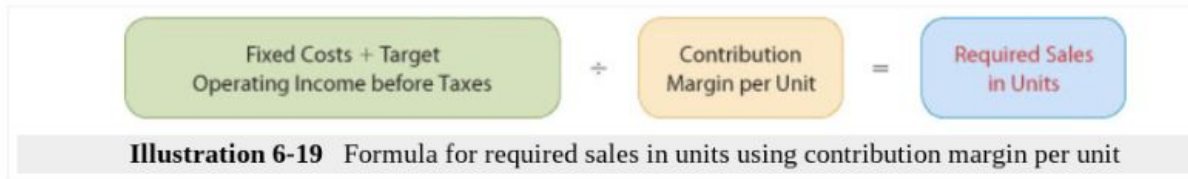
\$120,000 = target operating income

40% = tax rate

- In dollars: 2,000  $\times$  \$500 = \$1,000,000

Contribution margin technique

- In units



The calculation for Vargo Video is as follows:

$$[\$200,000 + (\$120,000 \div (1 - 0.4))] \div \$200 = 2,000 \text{ units}$$

- In dollars

Illustration 6-20 shows the formula using the contribution margin ratio.



The calculation for Vargo Video is as follows:

$$\$400,000 \div 40\% = \$1,000,000$$

### Margin of safety

- Another relationship that may be calculated in the CVP analysis
- Difference between actual/expected sales and sales at the break-even point
- Measures the “cushion” that a management has, allowing it to still break even if expected sales fail to be reached
- Expressed in \$, units or ratio
- **The higher the dollars/% , the greater the margin of safety will be**

### Margin of safety in dollars:

- Means that company’s sales would have to fall more than x amount or over x units before it would be operating at a loss



### Margin of safety as a ratio:

- Means that company’s sale would have to decline by more than x% before it would be operating at a loss

$$\begin{array}{ccc}
 \text{Margin of Safety} & \div & \text{Actual (Expected)} \\
 \text{in Dollars} & & \text{Sales} \\
 \$250,000 & \div & \$750,000 \\
 & & = \\
 & & \text{Margin of Safety} \\
 & & \text{Ratio} \\
 & & 33\%
 \end{array}$$

**Illustration 6-22** Formula for margin of safety ratio

### CVP AND CHANGES IN THE BUSINESS ENVIRONMENT

- CVP analysis helps management respond intelligently to changes such as business conditions
- 3 example of cases that can incur change:
  - Competitor offering a discount
  - Threat of foreign competition, so mgm invest in robotic equipment to low amount of direct labour
  - Suppliers increase their prices

### SALES MIX

Sales mix: relative proportion in which each product is sold when a company sells more than one product. Example: company sells 80% printers and 20% PCS, therefore sales mix is 80% to 20%

- Important because different products have different contribution margins
- Operating income will be **greater** if higher contribution margin units are sold, rather than lower contribution margin units

Break-even sales in units: can be determined using the weighted-average unit contribution margin of all products

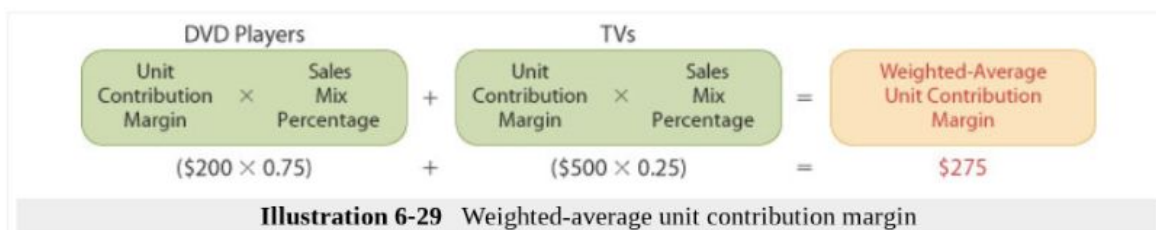
$$\begin{array}{cc}
 \text{Blu-ray DVD players} & \text{TVs} \\
 \hline
 1,500 \text{ units} \div 2,000 \text{ units} = 75 \% & 500 \text{ units} \div 2,000 \text{ units} = 25 \%
 \end{array}$$

**Illustration 6-27** Sales mix as a function of units sold

Unit Data	Blu-ray DVD Players	TVs
Selling price	\$500	\$1,000
Variable costs	300	500
Contribution margin	\$200	\$ 500
Sales mix—units	75%	25%
Fixed costs = \$275,000		

**Illustration 6-28** Per-unit data—sales mix

Weighted-average unit contribution margin



**Illustration 6-29** Weighted-average unit contribution margin

Break-even point in units



**Illustration 6-30** Break-even point in units

Product	Unit Sales	×	Unit Contribution Margin	=	Total Contribution Margin
Blu-ray DVD players	750	×	\$200	=	\$150,000
TVs	250	×	500	=	125,000
	<u>1,000</u>				<u>\$275,000</u>

**Illustration 6-31** Break-even proof—sales units

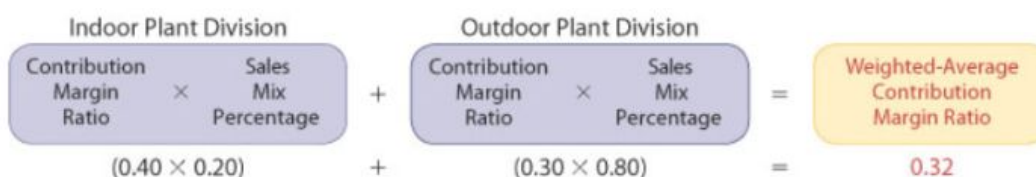
Break-even sales in dollars

- Used for companies that offer thousands of different units (e.g.: loblaws)
- Sales mix is calculated as a % of total sales dollars (rather than units sold)
- Contribution margin ratio (instead of contribution margin/unit)

Example:

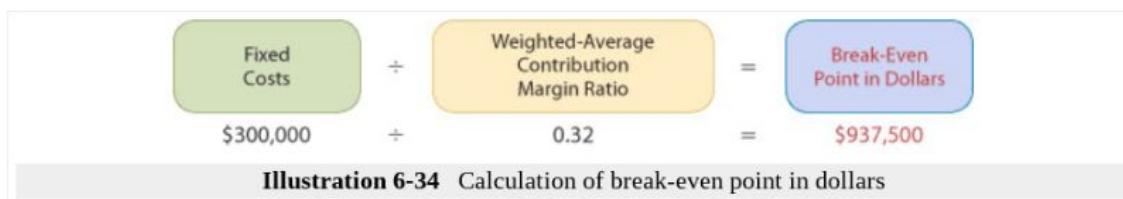
	Indoor Plant Division		Outdoor Plant Division		Total
Sales	\$ 200,000		\$ 800,000		\$ 1,000,000
Variable costs	120,000		560,000		680,000
Contribution margin	\$ 80,000		\$ 240,000		\$ 320,000
Sales-mix percentage					
(Division sales ÷ Total sales)	$\frac{\$200,000}{\$1,000,000} = 0.20$		$\frac{\$800,000}{\$1,000,000} = 0.80$		
Contribution margin ratio (Contribution margin ÷ Sales)	$\frac{\$80,000}{\$200,000} = 0.40$		$\frac{\$240,000}{\$800,000} = 0.30$		$\frac{\$320,000}{\$1,000,000} = 0.32$
Total fixed costs = \$300,000					

**Illustration 6-32** Cost-volume-profit data for Kale Garden Supply



**Illustration 6-33** Calculation of weighted-average contribution margin

Kale Garden Supply's break-even point in dollars is then calculated by dividing fixed costs by the weighted-average contribution margin ratio of 32%, as shown in [Illustration 6-34](#).



**Illustration 6-34** Calculation of break-even point in dollars

## COST STRUCTURE AND OPERATING LEVERAGE APPENDIX 6A

Cost structure: refers to the relative proportion of fixed versus variable costs that a company incurs, can have a significant impact on profitability

- Companies can influence their cost structure in many ways:
  - Acquiring sophisticated robotic equipment (reduce manual labour)
  - Outsourcing production (reduces fixed costs and increases variable costs)

### Effect on contribution margin ratio

- For every \$ of sales: N.W generates 0.80\$ of contribution margin, Vargo generates 0.40\$
- For every \$ sales decline: N.W loses 0.80\$ in operating income, Vargo loses 0.40\$
- N.W relies more heavily on fixed costs and is therefore more sensitive to changes in sales revenue

	<b>Contribution Margin</b>	÷	<b>Sales</b>	=	<b>Contribution Margin Ratio</b>
Vargo Video	\$320,000	÷	\$800,000	=	0.40
New Wave	\$640,000	÷	\$800,000	=	0.80

#### Effect on break-even point

- N.W needs to generate \$150,000 (\$650,000-\$500,000) more in sales than Vargo before it breaks even which makes it riskier because company cannot survive for very long unless it breaks even

	<b>Fixed Costs</b>	÷	<b>Contribution Margin Ratio</b>	=	<b>Break-even Point in Dollars</b>
Vargo Video	\$200,000	÷	0.40	=	\$500,000
New Wave	\$520,000	÷	0.80	=	\$650,000

**Illustration 6A-3** Calculation of break-even point for two companies

#### Effect on margin of safety ratio

- The difference in the margin of safety ratio = difference in risk between the two companies.
- Vargo could sustain a 38% decline in sales before operating at a loss
- New Wave could sustain only a 19% decline in sales before it would be “in the red.”

	<b>(Actual Sales - Break-Even Sales)</b>	÷	<b>Actual Sales</b>	=	<b>Margin of Safety Ratio</b>
Vargo Video	(\$800,000 - \$500,000)	÷	\$800,000	=	0.38
New Wave	(\$800,000 - \$650,000)	÷	\$800,000	=	0.19

**Illustration 6A-4** Calculation of margin of safety ratio for two companies

Operating leverage: the extent to which a company's operating income reacts to a given change in sales.

- Companies with higher fixed costs compared to variable costs = higher operating leverage
- When a company's sales revenue is increasing: high operating leverage is a good thing = means that profits will increase rapidly.
- When sales are declining: too much operating leverage = bad thing

Degree of operating leverage: provides a measure of a company's earnings volatility and can be used to compare companies.

- **Degree of operating leverage:**  $\frac{\text{contribution margin}}{\text{operating income}}$

	<u>Contribution Margin</u>	÷	<u>Operating Income</u>	=	<u>Degree of Operating Leverage</u>
Vargo Video	\$320,000	÷	\$120,000	=	2.67
New Wave	\$640,000	÷	\$120,000	=	5.33

- New Wave's earnings go up/down by about 2x as much as Vargo's with an equal increase/decrease in sales.
- For example, both companies incur 10% decrease in sales. Vargo's operating income will decrease by 26.7% , while New Wave's will decrease by 53.3% . New Wave's higher operating leverage exposes it to greater earnings volatility risk.

### **FORMULAS**

**Total manufacturing costs are the sum of the product costs:** direct materials + direct labour + manufacturing overhead (indirect materials, indirect labour, other indirect costs)

**Variable cost/unit:** change in total costs ÷ change in activity levels

**Merchandise cost of goods sold:** beg. merchandise inventory + cost of goods purchased - end merch. inventory

**Manufacturer cost of goods sold:** beg. finished goods inventory + cost of goods manufactured - ending finished goods inventory

**Cost of goods manufactured:** total manufacturing cost + beginning work in process inventory - Ending work in process inventory

- **Total cost of work in process:** total manufacturing cost + beginning work in process inventory
- **Beginning work in process inventory:** DM + DL + FOC

**Predetermined overhead rate:** estimated annual overhead costs ÷ expected annual operating activity

**Operating expenses:** gross profit - net income

**Conversion cost (CON):** direct labour costs + manufacturing overhead costs

**Prime cost (PC):** direct materials costs + direct labour costs

- Direct materials cost (DMC) = *prime cost* – *direct labour costs*
- Direct labour cost (DLC) = *prime cost* – *direct materials cost*

**Factory overhead cost (FOC):** *conversion cost* – *direct labour costs*

- Or FOC = COGS - direct materials and direct labour
- Variable overhead (variable production): total variable costs of production – direct costs of production
- Fixed overhead: total indirect cost of production – total variable overhead

**Total manufacturing cost (TMC):** direct materials costs + direct labour costs + factory overhead cost = DMC + DLC + FOC

**Beginning direct materials inventory (BDMI):** ending direct materials inventory + direct materials used – direct materials purchased

**Ending direct materials inventory (EDMI):** beginning direct materials inventory + direct materials purchased – direct materials used

**Ending finished inventory:** beg. Finished goods + COGM - COGS

**Cost of goods sold:** *sales* – *gross profit*

- OR **Cost of goods sold** = Beginning finished inventory + cost of goods manufactured – Ending finished inventory

**Requisitions:** indirect materials + direct materials

**Unit materials cost:** total materials cost ÷ equivalent units of materials

**Unit conversion cost:** total conversion cost ÷ equivalent units of conversion costs

**Manufacturing cost/unit:** unit materials cost + unit conversion cost

**Equivalent units of production:** units completed and transferred out + equivalent units of ending work in process

**Refined equivalent units of production:**

- For conversion costs: units completed and transferred out (conversion costs) + equivalent units of ending work in process (conversion cost)

- For materials: units completed and transferred out (materials) + equivalent units of ending work in process (materials)

**Fifo method:**

- Units TRANSFERRED OUT: BWIP + STARTED AND COMPLETED
- Units STARTED: STARTED AND COMPLETED + EWIP

**Under applied of over applied MOH:**

- **Under-applied: debit COGS, credit MOH, which INCREASES COGS ON INCOME STATEMENT**
- **Over-applied: credit COGS, debit MOH, which DECREASES COGS ON INCOME STATEMENT**

**CHAPTER 7: INCREMENTAL ANALYSIS**

**Decision-making and the incremental analysis approach**

Management's decision-making process

Management usually uses these steps in process:

1. Identify the problem & assign responsibility
2. Determine and evaluate possible courses of action
  - Where most of the accounting takes place: provides relevant revenue and cost data
3. Make a decision
4. Review the results of the decision
  - Where most of the accounting takes place: prepares internal reports that review the actual impact of decision

In making decisions: management considers both

- Financial information: about revenues and costs and their effect on profitability
- Non-financial information: the effect of the decision on employee turnover, environment, company's image

Incremental analysis approach

- Decisions involve a choice among alternative courses of action
- Process used to identify the financial expenses that change under alternative courses of action
- Some cases: both costs & revenues will vary, other cases only costs or revenues will vary
- Also known as “differential analysis” because analysis focuses on differences

	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
<u>1</u>		<u>Alternative A</u>	<u>Alternative B</u>	<u>Net Income Increase (Decrease)</u>
<u>2</u>	<u>Revenues</u>	<u>\$125,000</u>	<u>\$110,000</u>	<u>\$(15,000)</u>
<u>3</u>	<u>Costs</u>	<u>100,000</u>	<u>80,000</u>	<u>20,000</u>
<u>4</u>	<u>Net income</u>	<u>\$ 25,000</u>	<u>\$ 30,000</u>	<u>\$ 5,000</u>
<u>5</u>				

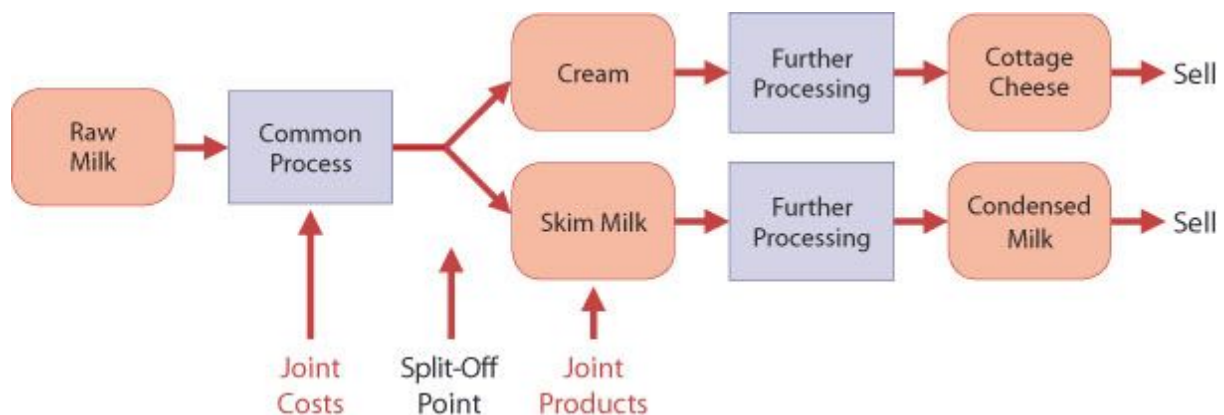
### **Illustration 7-2 Basic approach in incremental analysis**

#### **Important cost concepts on incremental analysis:**

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

#### **Types of incremental analysis**

1. Accept or reject an order at special price:
  - Company may have opportunity to obtain additional business if it is willing to make a major price concession to a specific customer
2. Make or buy (outsource)
  - The decision to buy parts or services known as outsourcing
3. Sell or process further
  - Selling products at a particular point in the production cycle or continuing to process the product in order to sell it at a later and higher price
  - Rule of thumb: process further as long as incremental revenue from the processing is MORE THAN incremental processing costs
  - Can either be a:
    - i. Single product case
    - ii. Multiple product case:
      - Include joint products: multiple end products produced from a single raw material in a common process
      - Joint costs: all costs that are incurred before the split-off point (point which 2 products are separated)



**Illustration 7-12** Joint production process—Marais Creamery

4. Retain or replace equipment
  - Deciding whether to continue using an asset or replace it
  - Book value of the old machine is a **sunk cost** which is not relevant and cannot be changed by any present or future decision
5. Eliminate an unprofitable segment
  - Decide whether to eliminate an unprofitable business segment or product
6. Allocate limited resources
  - Management must decide which products to make and sell in order to maximize net income
  - Contribution margin alone is not enough; must use CM/limited resource
  - Uses **theory of constraints**: specific approach to constraints in which company manages them to improve its overall results; must continually identify its constraints and find ways to reduce/eliminate them

## FORMULAS

**Contribution margin per unit of limited resource:** contribution margin ÷ limited resource (in hours)

**Total contribution margin:** limited resource x contribution margin per unit of limited resource

## CHAPTER 8: ALTERNATIVE INVENTORY COSTING METHODS (A DECISION MAKING PERSPECTIVE)

### INVENTORY COSTING METHODS

Comparing absorption costing and variable costing:

Absorption costing:

- What we have been practicing in earlier chapters: product costs = variable + fixed manufacturing costs
- All manufacturing costs are charged to or absorbed by the product
- Fixed MOH Is included
- Used for external reporting under GAAP

Variable costing:

- Only direct materials, direct labour and variable MOH costs are considered product costs
- Fixed MOH is seen as a **period cost (expense)** when incurred

Similarities & differences:

- Similarities: *SELLING & ADMIN expenses are **period costs** for both*
- Differences: under variable costing, the fixed MOH overhead is charged as an expense in the current period
  - Under AC, fixed MOH is deferred to a future period as a product cost
  - Under VC, fixed MOH is expensed in current period

Example:

<b>PREMIUM PRODUCTS CORPORATION</b>		
<b>Income Statement</b>		
<b>Month Ended January 31, 2016</b>		
<b>Variable Costing</b>		
Sales (20,000 units × \$20)		\$400,000
Variable costs		
Inventory, January 1	\$ 0	
Variable manufacturing costs (30,000 units × \$9)	270,000	
Cost of goods available for sale	<u>270,000</u>	
Inventory, January 31 (10,000 units × \$9)	90,000	
Variable cost of goods sold	<u>180,000</u>	
Variable selling and administrative expenses (20,000 units × \$2)	40,000	<u>220,000</u>
Contribution margin		180,000
Fixed manufacturing overhead		120,000
Fixed selling and administrative expenses		15,000
Net income		<u>\$ 45,000</u>

**Illustration 8-5** Variable-costing income statement

**PREMIUM PRODUCTS CORPORATION**

**Income Statement**

**Month Ended January 31, 2016**

**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)	390,000	
Cost of goods available for sale	<u>390,000</u>	
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><u>\$ 85,000</u></u>

**Illustration 8-4** Absorption-costing income statement

Type of cost	Absorption costing	Variable costing
Direct materials	\$ 5	\$5
Direct labour	3	3
Variable manufacturing overhead	1	1
Fixed manufacturing overhead ( $\$120,000 \div 30,000$ units produced)	4	—
<b>Manufacturing cost per unit</b>	<b>\$13</b>	<b>\$9</b>

**Illustration 8-3** Calculation of per-unit manufacturing cost

Fixed selling price: \$20 per unit

Units: produced 30,000; sold 20,000; beginning inventory zero

Variable unit costs: manufacturing \$9 (direct materials \$5, direct labour \$3, and variable overhead \$1); selling and administrative expenses \$2

Fixed costs: manufacturing overhead \$120,000; selling and administrative expenses \$15,000

**Illustration 8-2** Sealant sales and cost data for Premium Products Corporation

### Net income effect

- AC income is **higher** than VC: when there are more units produced than sold
- AC income is **lower** than VC: when there are less units produced than sold
- When units are produced and sold the same, net income will be equal for both costing approaches

## DECISION-MAKING CONCERNS

### GAAP

- For external reporting: companies have to report financial information using generally accepting accounting principles
- GAAP: requires companies to use **absorption costing** for all the costing of inventory
- Net income (under GAAP) is often used internally to:
  - Evaluate performance

- Justify cost reductions
- Evaluate new projects
- However it does not highlight differences between variable and fixed costs which can lead to bad decision making

### Performance evaluation

- Using AC when production exceeds sales reports higher income therefore management might be tempted to overproduce in a period in order to increase net income
- Although net income will increase, overproducing might not be a good thing
  - Inventory costs increase
- Under VC: company avoids this situation because net income is NOT affected by changes in production levels

### Potential advantages of variable costing

1. Consistent with cost-volume-profit material presented in chapter 6 and incremental analysis material in chapter 7
2. Net income is not affected by changes in production level which leads to easier understanding of impact of fixed and variable costs on the calculation of net income
3. Net income is greatly affected by changes in sales levels and therefore provides a realistic assessment of company's success/failure during a period
4. Fixed & variable cost components are shown on the income statement which makes it easier to identify these costs and understand their effect on the business

## **OTHER INVENTORY COSTING METHODS (APPENDIX 8A)**

### Normal costing

- Uses actual direct manufacturing costs and actual production units with a predetermined overhead rate
- Predetermined overhead rate is more practical for assigning fixed MOH costs to production
- Fixed MOH costs are based on the predetermined rate under absorption costing
- Under VC: fixed MOH costs are still a period cost and are therefore expensed

### Throughput costing

- Also known as super-variable costing
- Treats all costs as period expenses except for direct materials
- Modified version of VC that treats DL and VMOH as period expenses
- Based on lean manufacturing principles: cost can be reduced and profitability increased by improvements in the manufacturing workflow which eliminates waste and focuses more on needs of customer

- Product cost are only DM costs: inventory is valued using only direct material costs and all other manufacturing costs is treated as expenses in the accounting period in which they occur
- Before choosing throughput costing, company should meet 2 criteria:
  - Company must be engaged in a manufacturing process in which conversions costs are fixed costs and don't vary proportionately with units of production (eg.: assembly line, continuous processes that are highly automated)
  - Should be logical extension of the company's choice of variable costing over absorption costing

### Throughput contribution

- The difference between revenues and direct material costs for the units sold

### Main difference between throughput costing and variable costing:

- Under TC: DL & VMOH are charged as an expense in the current period, are not deferred to future periods through end inventory. Result:
  - VC will show higher net income than TC whenever more unit products than sold
  - VC will show lower net income when fewer units are produced than sold
  - Net income will be equal under both costing approaches when same number of units are produced and sold
    - In this case: there is no increase in end inventory
    - DL and VMOH of current period are not deferred to future periods through end inventory

### Advantages of TC

- Reduces incentive for management to build up excess inventories in order to spread fixed MOH costs over larger number of units produced
- Encourages managers to reduce operating costs such as DL and VMOH which are treated as period costs not product costs
- Unlike VC or AC: where many manufacturing costs are initially capitalized as assets (inventory) until goods are sold. Therefore, managers may perceive less need to reduce direct labour and manufacturing overhead.

## **CHAPTER 9: PRICING**

### **EXTERNAL PRICING**

#### Many factors that can affect pricing decisions:

- Pricing objectives: gain market share, achieve a target rate of return
- Demand: price sensitivity, demographics
- Environment: political reaction to prices, patent or copyright protection

- Cost considerations: fixed & variable costs, short-run or long-run

#### How is price set:

- In most cases...company does not set price:
  - Price is set by competitive market (the laws of supply and demand)
  - Companies such as **price takers** gasoline retailers Imperial oil or Petro-canada can't set the price of gasoline by themselves, it is set by market forces (the supply of oil and the demand from customers)
    - Happens when any product that appears to be identical to competing products
- In some cases...company sets its own prices:
  - When product is specially made for a customer
  - When few or no other producers can manufacture a similar item
  - When company has been successful at distinguishing its product or service from others

#### Target costing

- **Target cost:** market price – desired profit
- Companies that can't control their price and want to earn a profit focus on **controlling costs** by setting a **target cost** which gives a desired profit

#### Total cost-plus pricing

- When companies have more control over product pricing (less competitive environment)
- When a company sets a produce price it does so as a function of the cost of the product or service hence, **total cost-plus pricing**
- **Total cost-plus pricing:** a company first determines a cost base and then adds a markup to the cost base to determine the *target selling price* ( the selling price that will provide the desired profit on a product when the seller can determine the product's price)
  - Cost base = all costs required to produce and sell the product
  - Markup = desired profit
  - Selling price – cost = markup (profit)
  - **Cost-plus pricing formula:**  $\text{cost} + \text{markup \%} \times \text{cost} = \text{target selling price}$
- Determining optimal markup company must consider:
  - Competitive and market conditions
  - Political and legal issues
  - Other relevant factors
- Limitations of cost-plus pricing:
  - Advantage: simple to calculate
  - Does not consider the demand side
- Relationship between budgeted volume and per-unit price:

- The lower the budgeted volume, the higher the per-unit price because fixed costs and ROI are spread over fewer units and therefore fixed costs and ROI per unit increases
- The higher the budgeted volume, the lower the per-unit price because fixed costs and ROI are spread over more units and therefore fixed costs and ROI per unit decreases

### Absorption cost-plus pricing

- Consistent with GAAP because it defines the cost base as the manufacturing cost
- Both variable and fixed selling & administrative costs are excluded from this cost base
- Therefore, companies should provide for selling and administrative costs plus the target ROI which they do through markup

### Reasons for why companies that use cost-plus pricing either use absorption cost or total cost as the basis:

1. Their cost accounting system provides absorption cost information most easily, because absorption cost data already exist in general ledger accounts, it is cost-effective to use them for pricing
2. Basing cost-plus formula on only variable costs could encourage managers to set too low a price in order to boost sales and managers will substitute these variable costs for total costs which can lead to suicidal price-cutting
3. The absorption cost or total cost is the easiest basis to defend when prices need to be justified to all interested parties (managers, customers, governments)

### Formulas used:

$$\text{desired ROI/unit} + \text{S\&A expenses per unit} = \text{markup \%} \times \text{manufacturing cost/unit}$$

$$\text{manufacturing cost/unit} + (\text{markup \%} \times \text{manufacturing cost/unit}) = \text{target selling price}$$

### Variable cost-plus pricing

- The cost base consists of all of the variable costs associated with a product, including variable selling and administrative costs, because fixed costs are not included in the base, the markup must cover fixed costs (manufacturing, as well as S&A) and the target ROI
- More useful for short-term decisions: because it considers variable cost and fixed cost behavior patterns separately

### Formulas used:

$desired\ ROI/unit + fixed\ MOH + S\&A/unit$

$variable\ cost/unit + (Markup\ \% \times variable\ cost/unit) = target\ selling\ price$

### Advantages & disadvantages of VC:

- Pros:
  - More consistent with cost-volume-profit analysis that managers use to measure the profit implications of changes in price and volume
  - Provides type of data that mgmt needs for pricing special orders, shows incremental cost of accepting one special order
  - Avoids any arbitrary allocation of fixed costs to individual product lines
- Cons:
  - Managers may set the price too low and consequently fail to cover their fixed costs which in the long run = LOSSES
  - Therefore, must use higher markups to make sure price they set will give a fair return

### Time & Material Pricing

- Company sets two pricing rates:
  1. Labour rate: used on a job, includes direct labour times and other employee costs
  2. Material rate: used on a job, based on the cost of direct materials used and a material loading charge for related overhead costs
    - *Material loading charge:* covers purchasing, receiving, handling, storing materials, plus any desired profit margin on the materials themselves, expressed as a % of total estimated costs of parts and materials for the year. To determine, do the following
      - i. Estimated total annual costs for purchasing, receiving, handling and storing materials
      - ii. Divides this amount by total estimated cost of parts and materials
      - iii. Adds a desired profit margin on the materials themselves
- Widely used in service industries (accounting, law, engineering, consulting firms), construction companies, repair shops and printers

## INTERNAL PRICING

### Transfer pricing: an explanation

- *Transfer price:* when companies transfer goods internally, it is the price they use to record the transfer between two divisions

- High transfer price: high revenue for selling division and high costs for buying division
- Low transfer price: reverse
- Should accomplish 3 objectives:
  - Promote goal congruence: maximize company earnings as a whole
  - Maintain divisional autonomy: top mgmt should not interfere with decision-making process of division managers
  - Provide accurate performance evaluation: should be possible to evaluate division managers involved in transfer

General approach:

*special variable/cost unit + opportunity cost/ unit (contribution margin/unit) = MTP*

- Key elements:
  - Minimum price that selling division is willing to accept: needs to charge buying division so that selling division would not be better off if sold product to outside buyer
  - Maximum price buying division is willing to pay: determined by the outside market, how much it would pay an outside seller for the product
- Internal transfer should be done: when selling division's min price is less than or equal to buying division's max price (external market price)
- Two possible situations:
  - EXCESS CAPACITY: special variable cost/unit + opportunity cost/unit (**Always 0 in this case**) = minimum transfer price/unit
  - NO EXCESS CAPACITY: special variable cost/unit + opportunity cost/unit = minimum transfer price/unit

Transfer-pricing approaches

1. **Negotiated transfer prices:** determined through an agreement by division managers when no external market price is available. The selling division establishes min transfer price and purchasing division establishes a max transfer price
  - Disadvantages:
    - i. Market price information is sometimes not easily obtainable
    - ii. A lack of trust between 2 negotiating divisions may lead to a breakdown in the negotiations
    - iii. Negotiations often lead to different pricing strategies from division to division, which is difficult to work with and sometimes expensive
2. **Cost-based transfer prices:** base transfer price on the costs of the division that produces goods or services, may be based on variable costs alone or on variable costs plus fixed costs, selling division might add a markup
  - Advantages:
    - i. Simple to understand

- ii. Easy to use because information is already available in accounting system
  - iii. Method most companies use because market information is sometimes not available
  - Disadvantages:
    - i. Divisions sometimes use improper transfer prices
    - ii. Leads to a loss of profitability for the company and unfair evaluations of division performance
- 3. Market-based transfer prices:** based on the actual market prices of competing goods or services, often considered best approach because it is objective and generally provides proper economic incentives

Effect of outsourcing on transfer pricing:

- More outsourcing = less components being transferred internally between divisions = less need for transfer prices

Transfer between divisions in different countries

- Increasing of globalization = increase of transfers between divisions in different countries
- Differences in tax rates might complicate determination of right transfer price
- Companies must pay income taxes in the country where income is generated, therefore they report more income in countries with low tax rates and less income in countries with high tax rates by adjusting transfer prices they use on internal transfers
- Division in country with lower tax rate is allocated more contribution margin and division with higher tax rate is allocated less

**CHAPTER 10: BUDGETARY PLANNING**

**BUDGETING BASICS AND THE MASTER BUDGET**

**BUDGETS AND ACCOUNTING**

- The data of accounting information (revenues, costs, expenses) are helpful in setting future budget goals
- Accountants are responsible for:
  - Presenting management's budgeting goals in financial terms
  - Translate management's plans & communicate budget to employees
  - Prepare periodic budget reports which provide basis for measuring performance and comparing actual results with planned objectives
- Management is responsible for: administration of the budget and the budget itself

Budget: formal written statement in financial terms of management's plans for a specified future time period; important basis for evaluating performance, promotes efficiency and discourages waste and inefficiency

- Aid to management, not a substitute

### BENEFITS OF BUDGETING

1. Plan ahead & formalize goals on a recurring basis
2. Define objectives for evaluating performance at each level of responsibility
3. Early warning system for potential issues so management can prevent
4. Coordinate activities within business by ensuring goal congruence with each segment and company
5. Greater management awareness of overall operations and impact on operations of external factors
6. Motivates personnel to meet planned objectives

### ESSENTIALS OF EFFECTIVE BUDGETING

- Depends on sound organizational structure that clarifies authority for all phases of organizations
- Budgets based on research and analysis, should result in realistic goals
- Must be accepted by all levels of management

### LENGTH OF THE BUDGET PERIOD

- Can be prepared for any period of time
- Many factors influence length
  - Type of budget
  - Type of organization
  - Need for periodic appraisal
  - Actual business conditions
- Long enough that seasonal/cyclical fluctuations don't have big impact on it but short enough that reliable estimates are possible
- Most common = one year; continuous 12-month budgets which keeps management planning a full year ahead

### BUDGETING PROCESS

- First step: collect data from each organizational unit of company analyzing past performance
- Second step: develop budget within framework of *sales forecast* which shows potential sales for industry and company's expected share of these sales. Various factors are considered
  - General economic conditions
  - Industry trends
  - Market research studies

- Anticipated ads and promotions
- Previous market share
- Changes in prices
- Technological developments

Budgeting process in large vs. small companies:

- Small: informal process
- Large: responsibility for coordinating preparation of budget is assigned to a *budget committee*
  - includes president, treasurer, chief accountant (controller), and management personnel from each of the major areas of the company.
  - acts as a review board where managers can defend their budget goals and requests. Differences are reviewed, modified if necessary, and reconciled. The budget is then put in its final form and is approved and distributed.

### BUDGETING & HUMAN BEHAVIOR

- *Participative budgeting*: when each level of management is invited to participate in the development of the budget
  - Pros:
    - Lower-level managers acquire more knowledge on their expertise and able to provide more accurate budgetary estimated
    - Consequently, if L-L mgmt is invited, they view resulting budget as fair. If they don't view budget as fair (when higher level management develops budget) they might feel discouraged and uncommitted to budget goals
  - Cons:
    - Time-consuming and most costly
    - Encourage budgetary "gaming" through *budgetary slack*: happens when managers intentionally underestimated budgeted revenues or overestimates budgeted expenses in order to make it easier to achieve budgetary goals

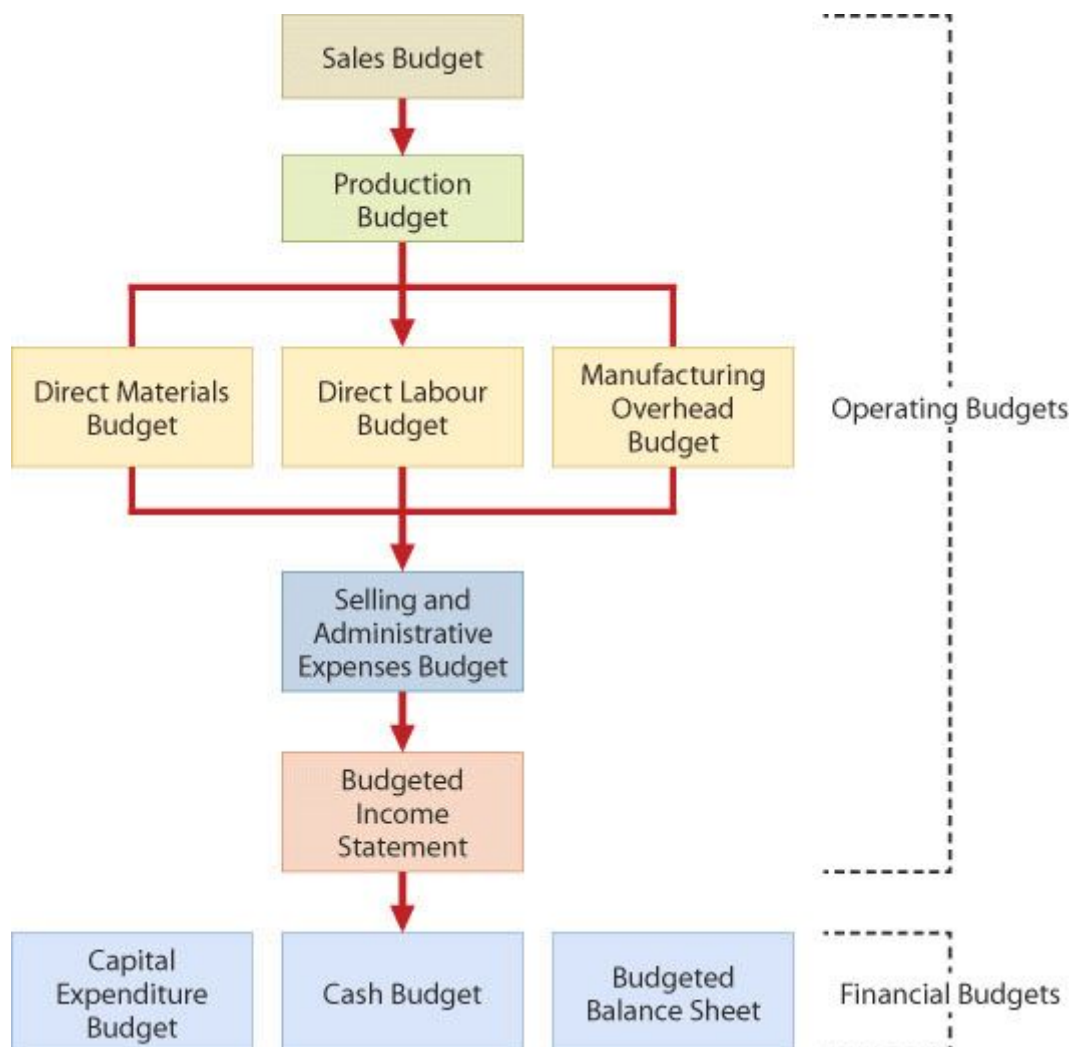
### BUDGETING AND LONG-RANGE PLANNING

- Budgeting and long-range planning = not the same
- Differences
  - Time period involved
    - Budgets: one year
    - Long-range planning: at least five years
  - Emphasis:
    - Budgets: achieving specific short-term goals
    - Long-range: long-term goals, anticipated trends
  - Amount of detail presented:

- Budgets: very detailed
- Long-range: less detailed

## THE MASTER BUDGET

- Master budget: set of interrelated budgets that create a plan of action for a specified time period. Divided in two
  - Operating budgets: individual budgets that used to prepare budgeted income statement, establish goals for company's sales and production personnel
  - Financial budgets: capital expenditure budget, cash budget and budgeted balance sheet, focus on cash resources needed to fund expected operations and planned capital expenditures



## PREPARING THE SALES, PRODUCTION, AND DIRECT MATERIALS BUDGETS

### SALES BUDGET

- First budget that is prepared

- Every other budget depends on sales budget
- Derived from sales forecast
- Represents management's best estimate of sales revenue for budget period
- Inaccurate sales budget = adverse effect on net income
- Prepared by: **expected sales volume (in units) for each product x anticipated selling price/unit**

	A	B	C	D	E	F
1	<b>HAYES COMPANY</b>					
2	Sales Budget					
3	For the Year Ending December 31, 2016					
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

**Illustration 10-3** Sales budget

### PRODUCTION BUDGET

- Shows units that must be produced to meet expected sales
- A realistic estimate of ending inventory is essential to correctly schedule production requirements
  - Excessive inventories in one quarter may lead to cutbacks in production and employee layoffs in the next quarter
  - inadequate inventories may result in either added costs for overtime work or lost sales.

$$\begin{array}{r}
 \text{Budgeted} \\
 \text{Sales Units}
 \end{array}
 +
 \begin{array}{r}
 \text{Desired Ending} \\
 \text{Finished} \\
 \text{Goods Units}
 \end{array}
 -
 \begin{array}{r}
 \text{Beginning} \\
 \text{Finished} \\
 \text{Goods Units}
 \end{array}
 =
 \begin{array}{r}
 \text{Required} \\
 \text{Production Units}
 \end{array}$$

**Illustration 10-4** Production requirements formula

	A	B	C	D	E	F
1	<b>HAYES COMPANY</b>					
2	<b>Production Budget</b>					
3	<b>For the Year Ending December 31, 2016</b>					
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 <sup>a</sup>	700	800	900	1,000 <sup>b</sup>	
8	Total required units	3,700	4,300	4,900	5,500	
9	Less: Beginning finished goods units	600 <sup>c</sup>	700	800	900	
10	<b>Required production units</b>	<b>3,100</b>	<b>3,600</b>	<b>4,100</b>	<b>4,600</b>	<b>15,400</b>
11						
12	<sup>a</sup> 20% of next quarter's sales					
13	<sup>b</sup> Expected 2017 first-quarter sales, 5,000 units × 20%					
14	<sup>c</sup> 20% of estimated first-quarter 2016 sales units					

**Illustration 10-5** Production budget

<b><u>Units of Finished Goods Inventory</u></b>	
<u>Beg. Inv.</u>	
<u>Required Prod. Units</u>	<u>Sale s</u>
<u>End. Inv.</u>	

### DIRECT MATERIALS BUDGET

- Shows both the quantity and cost of direct materials that need to be purchased
- Ending inventory = key component
  - Inadequate inventory: temporary shutdowns of production

$$\begin{array}{l}
 \text{Direct Materials} \\
 \text{Units Required for} \\
 \text{Production}
 \end{array}
 +
 \begin{array}{l}
 \text{Desired Ending} \\
 \text{Direct} \\
 \text{Materials Units}
 \end{array}
 -
 \begin{array}{l}
 \text{Beginning} \\
 \text{Direct} \\
 \text{Materials Units}
 \end{array}
 =
 \begin{array}{l}
 \text{Required Direct} \\
 \text{Materials Units} \\
 \text{to Be Purchased}
 \end{array}$$

**Illustration 10-6** Formula for direct materials quantities

**Units of Direct Materials**

<u>Beg. Inv.</u>	
<u>Direct Materials to Purchase</u>	<u>Direct Materials Required for Prod.</u>
<u>End. Inv.</u>	

	A	B	C	D	E	F
1	<b>HAYES COMPANY</b>					
2	<b>Direct Materials Budget</b>					
3	<b>For the Year Ending December 31, 2016</b>					
4		<b>Quarter</b>				
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) <sup>a</sup>	720	820	920	1,020 <sup>b</sup>	
10	Total materials required	6,920	8,020	9,120	10,220	
11	Less: Beginning direct materials (kilograms)	620 <sup>c</sup>	720	820	920	
12	Direct materials purchases	6,300	7,300	8,300	9,300	
13	Cost per kilogram	× \$4	× \$4	× \$4	× \$4	
14	<b>Total cost of direct materials purchases</b>	<b>\$25,200</b>	<b>\$29,200</b>	<b>\$33,200</b>	<b>\$37,200</b>	<b>\$124,800</b>
15						
16	<sup>a</sup> 10% of next quarter's production requirements					
17	<sup>b</sup> Estimated 2017 first-quarter kilograms needed for production, 10,200 × 10%					
18	<sup>c</sup> 10% of estimated first-quarter kilograms needed for production					

**Illustration 10-7** Direct materials budget

**Units of Direct Materials**

**(1st quarter)**

<u>620</u>	
<u>6,300</u>	<u>6,200</u>
<u>720</u>	

**PREPARING THE DIRECT LABOUR, MANUFACTURING OVERHEAD AND S&A EXPENSE BUDGETS**

**DIRECT LABOUR BUDGET**

- Contains the quantity (hours) and cost of direct labour that will be needed to meet production requirements
- Direct labour hours are determined from the production budget

$$\text{Units to Be Produced} \times \text{Direct Labour Time per Unit} \times \text{Direct Labour Cost per Hour} = \text{Total Direct Labour Cost}$$

**Illustration 10-8** Formula for direct labour cost

	A	B	C	D	E	F
1	<b>HAYES COMPANY</b>					
2	Direct Labour Budget					
3	For the Year Ending December 31, 2016					
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	<b>Total direct labour cost</b>	<b>\$62,000</b>	<b>\$72,000</b>	<b>\$82,000</b>	<b>\$92,000</b>	<b>\$308,000</b>
11						

**Illustration 10-9** Direct labour budget

### MANUFACTURING OVERHEAD BUDGET

- Shows the expected manufacturing overhead costs for the budget period
- Distinguishes between variable and fixed overhead costs
- Accuracy of budgeted fixed overhead cost estimates can be greatly improved by using activity-based costing

	A	B	C	D	E	F
1	<b>HAYES COMPANY</b>					
2	<b>Manufacturing Overhead Budget</b>					
3	<b>For the Year Ending December 31, 2016</b>					
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	<b>Total manufacturing overhead</b>	<b>\$57,100</b>	<b>\$60,100</b>	<b>\$63,100</b>	<b>\$66,100</b>	<b>\$246,400</b>
19	<b>Direct labour hours (Illustration 10-9)</b>	<b>6,200</b>	<b>7,200</b>	<b>8,200</b>	<b>9,200</b>	<b>30,800</b>
20	<b>Manufacturing overhead rate per direct labour hour (\$246,400 ÷ 30,800)</b>					<b>\$8</b>
21						

**Illustration 10-10** Manufacturing overhead budget

### S&A EXPENSES BUDGET

- Combines all operating expenses into one budget
- Project selling and administrative expenses for the budget period
- Expenses are classified as either variable or fixed

	A	B	C	D	E	F
1	<b>HAYES COMPANY</b>					
2	<b>Selling and Administrative Expenses Budget</b>					
3	<b>For the Year Ending December 31, 2016</b>					
4		Quarter				
5		1	2	3	4	Year
6	Budgeted sales in units (Illustration 10-3)	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	<b>Total selling and administrative expenses</b>	<b>\$42,000</b>	<b>\$44,000</b>	<b>\$46,000</b>	<b>\$48,000</b>	<b>\$180,000</b>
19						

**Illustration 10-11** Selling and administrative expenses budget

## BUDGETED INCOME STATEMENT

- Is the important end product of the operating budgets
- Indicates the expected profitability of operations for the budget period
- Provides the basis for evaluating company performance
- Prepared from various operating budgets

Example:

<b>Cost of One Right Ride</b>				
Cost element	Illustration	Quantity	Unit Cost	Total
Direct materials	<a href="#">10-7</a>	2 kg	\$ 4.00	\$ 8.00
Direct labour	<a href="#">10-9</a>	2 hours	\$10.00	20.00
Manufacturing overhead	<a href="#">10-10</a>	2 hours	\$ 8.00	16.00
<b>Total unit cost</b>				<b>\$44.00</b>

**Illustration 10-12** Calculation of total unit cost

<b>HAYES COMPANY</b>	
<b>Budgeted Income Statement</b>	
<b>Year Ending December 31, 2016</b>	
Sales (Illustration <a href="#">10-3</a> )	\$900,000
Cost of goods sold (15,000 × \$44)	660,000
Gross profit	240,000
Selling and administrative expenses (Illustration <a href="#">10-11</a> )	180,000
Income from operations	60,000
Interest expense	100

Income before income taxes	59,900
Income tax expense	12,000
Net income	\$ 47,900

**Illustration 10-13** Budgeted income statement

## PREPARING THE FINANCIAL BUDGETS

### CASH BUDGET

- Shows expected cash flows
- Important because cash is so vital and is considered important output in preparing financial budgets
- Usually prepared once a month (sometimes daily)
- Contains 3 sections:
  - Cash receipts:
    - includes expected receipts from company's main source(s) of revenue. Example: cash sales, collections from customers on credit sales
    - Includes anticipates receipts of interest and dividends, proceeds from planned sales of investments, plant assets, company's capital stock
  - Cash disbursements: shows expected cash payments
    - Includes: direct materials, direct labour, MOH, S&A expenses
    - Includes: projected payments for income taxes, dividends, investments and plant assets
  - Financing: shows expected borrowings and the repayment of the borrowed funds + interest. Needed when there is cash deficiency or when cash balance is below management's required balance
  - beginning/ending cash balances:
    - Ending cash balance on one period becomes beginning cash balance for next period

Example:

<b>ANY COMPANY</b>	
<b>Cash Budget</b>	

---

Beginning cash balance	\$X,XX X
<b>Add: Cash receipts</b> (itemized)	X,XXX
Total available cash	<u>X,XXX</u>

Less: Cash disbursements (itemized)	X,XXX
Excess (deficiency) of available cash over cash disbursements	X,XXX
Financing	X,XXX
Ending cash balance	\$X,XX X

**Illustration 10-14** Basic form of a cash budget

Example from textbook:

- The January 1, 2016, cash balance is expected to be \$38,000. Hayes wishes to maintain a balance of at least \$15,000.
- Sales (Illustration [10-3](#)): 60% are collected in the quarter sold and 40% are collected in the following quarter. Accounts receivable of \$60,000 at December 31, 2015, are expected to be collected in full in the first quarter of 2016.
- Short-term investments are expected to be sold for \$2,000 cash in the first quarter.
- Direct materials (Illustration [10-7](#)): 50% are paid for in the quarter purchased and 50% are paid for in the following quarter. Accounts payable of \$10,600 at December 31, 2015, are expected to be paid in full in the first quarter of 2016.
- Direct labour (Illustration [10-9](#)): 100% is paid in the quarter incurred.
- Manufacturing overhead (Illustration [10-10](#)) and selling and administrative expenses (Illustration [10-11](#)): All items except depreciation are paid in the quarter incurred.
- Management plans to purchase a truck in the second quarter for \$10,000 cash.
- Hayes makes equal quarterly payments of its estimated annual income taxes.
- Loans are repaid in the earliest quarter in which there is sufficient cash (that is, when the cash on hand exceeds the \$15,000 minimum required balance).

First step: prepare schedules for collections from customers (assumption # 2) and cash payments for direct materials (assumption #4)

	A	B	C	D	E	F
1	<b>HAYES COMPANY</b>					
2	<b>Schedule of Expected Collections from Customers</b>					
3	Collections by Quarter					
4		Sales <sup>a</sup>	1	2	3	4
5	Accounts receivable, December 31, 2015		\$ 60,000			
6	First quarter	\$180,000	108,000 <sup>b</sup>	\$ 72,000 <sup>c</sup>		
7	Second quarter	210,000		126,000	\$ 84,000	
8	Third quarter	240,000			144,000	\$ 96,000
9	Fourth quarter	270,000				162,000
10	<b>Total collections</b>		<b>\$168,000</b>	<b>\$198,000</b>	<b>\$228,000</b>	<b>\$258,000</b>
11						
12	<sup>a</sup> Per Illustration 10-3; <sup>b</sup> \$180,000 × 0.60; <sup>c</sup> \$180,000 × 0.40					
13						

**Illustration 10-15** Collections from customers

	A	B	C	D	E	F
1	<b>HAYES COMPANY</b>					
2	<b>Schedule of Expected Payments for Direct Materials</b>					
3	Payments by Quarter					
4		Purchases <sup>a</sup>	1	2	3	4
5	Accounts payable, December 31, 2015		\$10,600			
6	First quarter	\$25,200	12,600 <sup>b</sup>	\$12,600 <sup>c</sup>		
7	Second quarter	29,200		14,600	\$14,600	
8	Third quarter	33,200			16,600	\$16,600
9	Fourth quarter	37,200				18,600
10	<b>Total payments</b>		<b>\$23,200</b>	<b>\$27,200</b>	<b>\$31,200</b>	<b>\$35,200</b>
11						
12	<sup>a</sup> Per Illustration 10-7; <sup>b</sup> \$25,200 × 0.50; <sup>c</sup> \$25,200 × 0.50					
13						

**Illustration 10-16** Payments for direct materials

Second step: prepare cash budget

	A	B	C	D	E	F
1	<b>HAYES COMPANY</b>					
2	<b>Cash Budget</b>					
3	<b>For the Year Ending December 31, 2016</b>					
4			Quarter			
5		Assumption	1	2	3	4
6	Beginning cash balance	1	\$ 38,000	\$ 25,500	\$ 15,000	\$ 19,400
7	<b>Add: Receipts</b>					
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	<b>Less: Disbursements</b>					
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 <sup>a</sup>	56,300	59,300	62,300
16	Selling and administrative expenses	6	41,000 <sup>b</sup>	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	<b>Financing</b>					
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	<sup>a</sup> \$57,100 – \$3,800 depreciation					
27	<sup>b</sup> \$42,000 – \$1,000 depreciation					

**Illustration 10-17** Cash budget

## **BUDGETING IN NON-MANUFACTURING COMPANIES**

Budgeting is not limited to manufacturers: may be used by

1. Merchandisers
2. Service enterprises
3. Not-for-profit organizations

Merchandisers:

- 2 main differences between master budget for merchandiser and manufacturer
  1. Merchandiser uses **merchandise purchases budget** instead of production budget
  2. Merchandiser **does not use manufacturing budgets** (DM, DL, MOH)
- When a merchandiser is organized by department, separate budgets are prepared for each one; furthermore separate master budgets are created for each departments and then incorporated into master budgets for the company as a whole
- Merchandise purchases budget: shows estimated cost of goods to be purchased not meet expected sales

$$\text{Budgeted Cost of Goods Sold} + \text{Desired Ending Merchandise Inventory} - \text{Beginning Merchandise Inventory} = \text{Required Merchandise Purchases}$$

**Illustration 10-19** Merchandise purchases formula

<u><b>LIMA COMPANY</b></u>	
<u><b>Merchandise Purchases Budget</b></u>	
<u><b>Month Ending July 31, 2016</b></u>	
<u><b>Budgeted cost of goods sold (\$300,000 × 70%)</b></u>	<u><b>\$210,00</b></u>
	<b>0</b>
<u><b>Plus: Desired ending merchandise inventory (\$224,000 × 30%)</b></u>	<u><b>67,200</b></u>
<u><b>Total</b></u>	<u><b>277,200</b></u>
<u><b>Less: Beginning merchandise inventory (\$210,000 × 30%)</b></u>	<u><b>63,000</b></u>
<u><b>Budgeted merchandise purchases for July</b></u>	<u><b>\$214,20</b></u>
	<b>0</b>

**Illustration 10-20** Merchandise purchases budget

#### Service enterprises

- Public accounting firm, law office, medical practice
- Critical factor in budgeting: coordinating professional staff needs with expected services
- Overstaffed firm problems:
  - Labour costs will be really high
  - Profits will be lower because of additional salaries
  - Staff turnover may increase because there isn't enough challenging work
- Understaffed firm problems:
  - Lose revenue because can't meet needs for customers
  - Staff might feel workload is too heavy and quit
- Budget data for service revenue can be obtained from **expected output** or **expected input**

#### Example:

	A	B	C	D	E
1	<b>STEPHAN LAWN AND PLOWING SERVICE</b>				
2	Direct Labour Budget				
3	For the Month Ending July 31, 2016				
4		Small	Medium	Large	Total
5	Lawns to be serviced	300	200	100	
6	Direct labour time (hours) per lawn	×1	× 1.75	× 2.75	
7	Total required direct labour hours	300	350	275	
8	Direct labour cost per hour	× \$15	× \$15	× \$15	
9	<b>Total direct labour cost</b>	<b>\$4,500</b>	<b>\$5,250</b>	<b>\$4,125</b>	<b>\$13,875</b>
10					

**Illustration 10-21** Direct labour budget for service company

### Not-for-profit organizations

- Budget based on cash flows (expenditures and receipts), rather than on revenue and expense basis
- Management's task: find receipts needed to support planned expenditures
- After budget is adopted, it must be strictly followed; spending on activities not included in the budget is illegal
- Budget for municipality can have specified authorization

## **CHAPTER 11: BUDGETARY CONTROL AND RESPONSIBILITY ACCOUNTING**

### **THE CONCEPT OF BUDGETARY CONTROL AND STATIC BUDGET REPORTS**

#### BUDGETARY CONTROL

- Using budget reports to compare actual results with planned objectives
- Used because planned objectives often lose much of their potential value if progress is not monitored along the way
- Budget reports: give feedback on operations
- Budgetary control must have a reporting system that does the following:
  - Identify the name of the budget report
  - State frequency of report
  - Specify purpose of the report
  - Indicate primary recipients of report

#### Budgetary control activities for manufacturing company

- Develop budget
- Analyze differences between actual and budget
- Take corrective action
- Modify future plans

<u>Name of Report</u>	<u>Frequency</u>	<u>Purpose</u>	<u>Primary Recipient(s)</u>
<u>Sales</u>	<u>Weekly</u>	<u>Determine whether sales goals are being met</u>	<u>Top management and sales manager</u>
<u>Labour</u>	<u>Weekly</u>	<u>Control direct and indirect labour costs</u>	<u>Vice-president of production and production department managers</u>
<u>Scrap</u>	<u>Daily</u>	<u>Determine efficient use of materials</u>	<u>Production manager</u>
<u>Departmental overhead costs</u>	<u>Monthly</u>	<u>Control overhead costs</u>	<u>Department manager</u>
<u>Selling expenses</u>	<u>Monthly</u>	<u>Control selling expenses</u>	<u>Sales manager</u>
<u>Income statement</u>	<u>Monthly and quarterly</u>	<u>Determine whether income objectives are being met</u>	<u>Top management</u>

**Illustration 11-2 Budgetary control reporting system**

**STATIC BUDGETARY REPORTS**

- Projection of budget data at one level of activity
- Do not consider data for different levels of activity
- Result: companies always compare actual results with budget data at the activity level that was used in developing the master budget

**Uses and limitations of static budget**

- Uses: For fixed manufacturing costs and for fixed selling and admin expenses
  - Appropriate in evaluating how well a manager controls costs when
    - Actual level of activity closely approximates the master budget activity level or
    - The behavior of the costs in response to changes in activity is fixed
- Limitations: many not be good for evaluating a manager's performance in controlling variable costs

**FLEXIBLE BUDGETS**

## WHY FLEXIBLE BUDGETS?

*Flexible budget:* projects budget data for various levels of activity

- Series of static budgets at different level of activity
- Recognizes that budgetary process is more useful if it can be adapted to changes in operating conditions

## DEVELOPING THE FLEXIBLE BUDGET

1. Identify the activity index and the relevant range of activity
  - Activity index chosen should have a strong positive relationship with costs that are being budgeted
    - E.g.: MOH costs = use direct labour hours or machine hours as activity index. S&A expenses = use sales or net sales
2. Identify variable costs, determine budgeted variable cost per unit of activity for each cost
3. Identify fixed costs, determine the budgeted amount for each cost
4. Prepare the budget for selected increments of activity within the relevant range

*formula : total budgeted costs = FIXED COSTS + VARIABLE COSTS*

## FLEXIBLE BUDGET REPORTS

- Internal report
- Report 2 sections:
  - Production data for a selected activity index (eg: direct labour hours)
  - Cost data for variable and fixed costs
- Evaluates management's performance in 2 areas:
  - Production control
  - Cost control
- Widely used in production and service departments

## RESPONSIBILITY ACCOUNTING FOR COST AND PROFIT CENTRES

### THE RESPONSIBILITY ACCOUNTING CONCEPT

*Responsibility accounting:* involves accumulating and reporting costs and revenues, where relevant) that involve the manager who has the authority to make daily decisions about cost items

- Can be used at every level of managements with these conditions:
  - Costs and revenues can be directly associated with the specific level of management responsibility
  - Costs and revenues are controllable at the level of responsibility that they are associated with

- Budget data can be developed for evaluating the manager's effectiveness in controlling the costs and revenues
- Useful for a decentralized company:
  - Decentralization: means that control of operations is given to many managers throughout organization
  - Segment: used to identify an area of responsibility in decentralized operations. Under responsibility accounting, segment reports can be prepared periodically (monthly, quarterly, annually) to evaluate manager's performance

### CONTROLLABLE VS NON CONTROLLABLE REVENUES AND COSTS

1. Controllable costs: costs that a level of responsibility directly incurs can be controlled at that level
  - a. All costs are controllable by top management because of its broad range of authority
  - b. Fewer costs are controllable as one moves down to each lower level of management because manager's authority decreases at each level
2. Non controllable costs: costs that are incurred indirectly and allocated to a responsibility level are uncontrollable at that level

### RESPONSIBILITY REPORTING SYSTEM

- A report that is prepared for each level of responsibility in the company's organization chart
- Begins with lowest level of responsibility for controlling costs and moves upward to each higher level

#### Different types of responsibility reports:

- Report for top level responsibility (president): shows controllable costs and expenses of this position and summary data on the vice-presidents who are accountable to the president
- Report for third level responsibility: shows controllable costs of vice-president of production and summary data on the assembly plants that this officer is responsible for
- Report for plant managers: shows costs of plant that are controllable at second level of responsibility, shows summary data for each department that the plant manager controls
- Report for lowest level of responsibility (department managers)

#### Uses of responsibility reporting system:

- Makes it possible to used management by exception at each level of responsibility
- Each level of responsibility can obtain detailed report for each lower level of responsibility

- Comparative evaluations
- Easy to rank manager's effectiveness in controlling manufacturing costs

### PRINCIPLES OF PERFORMANCE EVALUATION

- **Performance evaluation:** management function that compares actual results with budget goals, uses both behavioural and reporting principles

Management by exception: top management's review of a budget report is focused either entirely or mostly on differences between actual results and planned objectives; helps top management focus on problem areas. 2 criteria for this approach to work:

1. Materiality: usually expressed as a % difference from the budget
2. Controllability of the item

### Behavioural principles

1. Managers of responsibility centres should be directly involved in setting budget goals for their areas of responsibility
2. Evaluation of performance should be based entirely on matters that can be controlled by the manager being evaluated
3. Top management should support evaluation process
4. Evaluation process must allow managers to respond to their evaluations
5. Evaluation should identify both good and poor performance

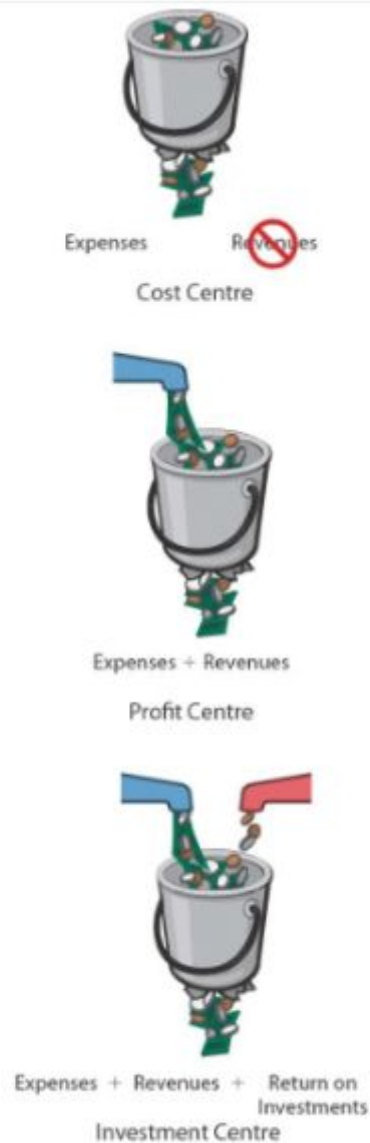
Reporting principles: performance reports should

1. Contain only data that is controllable by manager of responsibility centre
2. Provide accurate and reliable budget data to measure performance
3. Highlight significant differences between actual results and budget goals
4. Be tailor-made for the intended evaluation
5. Be prepared at reasonable intervals

### ACCOUNTING FOR VARIOUS RESPONSIBILITY CENTRES

3 types of responsibility centres:

1. Cost centre:
  - Incurs costs & expenses but does not directly generate revenues
  - Usually either production or service departments
2. Profit centre
  - Incurs costs & expenses and also generates revenues
  - E.g: individual departments of a retail store, clothing, furniture
3. Investment centre
  - Incurs costs & expenses and generates revenues and has control over investment funds that are available for use
  - Often associated with product lines and subsidiary companies



**Illustration 11-20** Types of responsibility centres

Responsibility accounting for:

1. Cost centres
  - Management performance based on their ability to meet budgeted goals for controllable costs
  - Compare actual controllable costs with flexible budget data
  - Only controllable costs are included in the report and no distinction is made between variable and fixed costs
  - Responsibility report continues the concept of management by exception
2. Profit centres
  - Detailed information is needed about controllable revenues and costs to evaluate performance of manager of profit centre
  - Revenues & variable cost/expenses can be controlled by manager

- To determine controllability of fixed costs, distinguish between direct and indirect fixed costs
    - i. *Indirect fixed costs*: for company's overall operating activities and are incurred for benefit of more than 1 profit centre; allocated to profit centres according to some type of equitable basis
      - Also known as common costs
      - Most indirect FC = uncontrollable
    - ii. *Direct fixed costs*: specifically for one centre and are incurred for the benefit of datcentre alone
      - Also known as traceable cost
      - Most direct FC = controllable by profit centre manager
  - Responsibility report for profit centre has these 3 features:
    - i. Controllable fixed costs are deducted from contribution margin
    - ii. Amount by which CM is greater than controllable FC is identified as *controllable margin*
    - iii. Non Controllable FC = not reported
3. Investment centres

## **EVALUATING PERFORMANCE IN INVESTMENT CENTRES**

### **RETURN ON INVESTMENT (ROI)**

- A measure of management's effectiveness in using assets at its disposal in an investment centre
- Main basis for evaluating performance of manager of investment centre

$$ROI = \text{controllable margin} \div \text{average operating assets}$$

### **RESPONSIBILITY REPORT**

- All fixed costs are controllable
- Shows budgeted and actual ROI on a line beneath controllable margin

### **JUDGEMENTAL FACTORS IN ROI**

1. Valuation of operating assets: operating assets may be valued at their acquisition cost, book value, appraised value or market value
2. Margin (income) measure: may be the controllable margin, income from operations or net income

### **IMPROVING ROI**

- Expanded form of ROI formula helps improve it:
  - *Profit margin*: focuses on profitability; shows how operating margin can be improved by increasing the margin on each dollar of sales. Measures

manager's ability to control operating expenses that are related to sales during specific period

- *Investment turnover*: focuses on efficiency; shows how investment turnover can be improved by generating more sales for each dollar invested
- Expanded ROI = DuPont profitability analysis
- Management can improve ROI in 2 ways:
  - Increase the controllable margin
  - Reduce the average operating assets

*ROI expanded form* :  $\frac{\text{operating income}}{\text{sales}} \times \frac{\text{sales}}{\text{operating assets}}$

Or *profit margin x investment turnover*

## **RESIDUAL INCOME: ANOTHER PERFORMANCE MEASURE**

### **RESIDUAL INCOME COMPARED WITH ROI**

#### **Con for ROI:**

- Ignores the minimum rate of return on a company's operating assets

#### **Residual income:**

- To evaluate performance using min rate of return, companies use residual income approach
- It is the income that remains after subtracting from controllable margin the min rate of return on a company's average operating assets

*residual income* : *controllable margin – min rate of return x average operating assets*

#### **Residual income (economic value added approach):**

Differs in 2 ways:

1. Uses weighted-average cost of capital instead of min rate of return on invested assets
2. Calculates investment centre profit after tax

If value of EVA is:

- Positive = company has added economic value
- Negative = company has lose capital

*investment centre operating profit after tax – weighted average cost of capital x total capital used*

### **RESIDUAL INCOME CONS**

- Goal of maximizing total amount of residual income ignores the fact that one division might use fewer assets to attain same level of residual income as another division

## **CHAPTER 12: STANDARD COSTS AND BALANCED SCORECARD**

### **STANDARDS: NEEDS AND COSTS**

- Standard costs: predetermined unit costs that are used as measures of performance
  - Pros:
    - Facilitate management planning
    - Promote greater economy by making employees cost-conscious
    - Help set selling prices
    - Contribute to management control by providing basis for evaluation of cost control
    - Simplify cost of inventories and reduce clerical costs
    - Help highlight variances in management by exception

### **DISTINGUISHING BETWEEN STANDARDS & BUDGETS**

- Similarities:
  - Both are predetermined costs
  - Both contribute to management planning and control
- Differences:
  - Standard
    - unit amount
    - Sometimes used in cost accounting systems
    - Company may report inventories at standard cost in financial statements
  - Budget
    - total amount
    - Not journalized in cost accounting systems
    - Companies don't report inventories at budgeted costs

### **SETTING STANDARD COSTS**

- Ideal vs. normal standards
  - Ideal: represent optimum levels of performance under perfect operating conditions
    - Might motivate employees to improve or lower morale because they are hard to meet
    - Very few companies used ideal standards
  - Normal: represent efficient levels of performance that are attainable under expected operating conditions
    - Most companies use them
    - Rigorous but attainable

- Allow for rest periods, machine breakdowns and other contingencies

Standards for each manufacturing cost element: is determined from standard price to be paid and standard quantity to be used

1. Direct materials

- **Direct materials price standard:** cost per unit of DM that should be incurred; based on purchasing dept. best estimate of cost of RM.
  - Should include related costs such as receiving, storing and handling material
- **Direct materials quantity standard:** quantity of DM that should be used per unit if FG. expressed as kg, barrels, litres, etc
  - Should include allowances (extra amounts) for unavoidable waste and normal spoilage
- Formula:
 
$$\text{standard DM \$/unit} = \text{standard DM price} \times \text{standard DM quantity}$$

2. Direct labour

- **Direct labour price standard:** rate per hour for direct labour, based on current wage rates and adjusted for expected changes such as cost of living adjustments
  - Includes payroll taxes and benefits
- **Direct labour quantity standard:** time required to make one unit, should include allowances for rest periods, cleanup, etc
- Formula:  $\text{standard DL \$/unit} = \text{standard DL rates} \times \text{standard DL hours}$

3. Manufacturing overhead

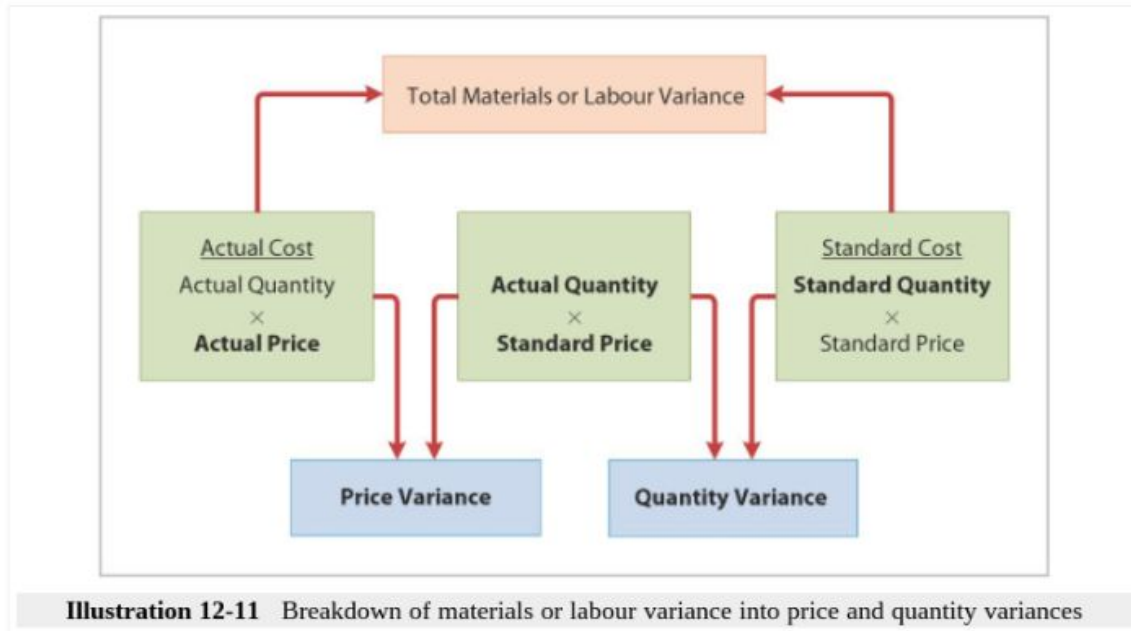
- **Standard predetermined overhead rate:** used in setting standard for MOH; calculated by dividing budgeted overhead costs by standard activity index
- **Normal capacity:** average activity output that company experiences over long run
- Formula:
 
$$\text{standard MOH rate/unit} = \text{predetermined OH rate} \times \text{activity index quantity standard}$$

Total standard cost/unit:  $\text{standard costs of DM} + \text{DL} + \text{MOH}$

ANALYZING AND REPORTING VARIANCES FROM STANDARDS

- Use of standard costs is to identify variances which are differences between actual costs and total standard costs and is expressed in total dollars and not per-unit basis
  - Variance is **favorable:** when actual costs are **higher** than standard costs; has a negative connotation, suggests that too much was paid for one or more of the manufacturing cost elements or elements were used inefficiently
  - Variance is **favourable:** when actual costs are **lower** than standard costs; has a positive connotation, suggests efficient management of manufacturing costs and use of elements

- Formula:  $total\ standard\ cost = standard\ \$/unit \times units\ produced$



### **DIRECT MATERIAL VARIANCES**

- *Total DM budget variance (TDMBV)*: difference between amount paid (actual quantity times actual price) and amount that should have been paid based on standards (standard quantity times standard price of materials)
- *Material price variance*: results from difference between actual price and standard price

$$TDMBV = total\ actual\ qty \times actual\ \$ - total\ standard\ qty \times standard\ \$$$

$$total\ material\ variance = materials\ price\ variance + materials\ quantity\ variance$$

If material purchased during month is different from material used during the month use this formula:

$$TOTAL\ actual\ quantities\ purchases \times (actual\ \$/unit - standard\ \$/unit)$$

Materials quantity variance: results from differences between amount of material actually used and the amount that should have been used

$$material\ quantity\ variance : TAQ \times SP - TSQA \times SP \text{ OR } SP \times (TAQ - TSQA)$$

- TAQ = total actual quantities
- SP = standard price
- TSQA: total standard quantities allowed

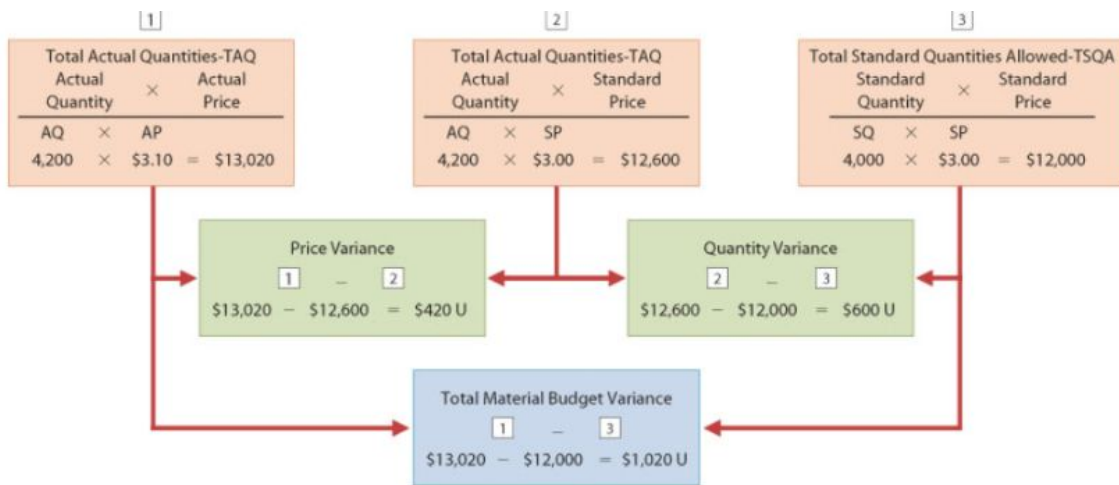


Illustration 12-17 Matrix for total direct materials budget variances

## CAUSES OF MATERIALS VARIANCES

- Internal and external factors
- **Material price variance** usually occurs in **purchasing department**: Many factors affect price paid for RM (delivery, available discounts, quality)
  - Uncontrollable factors: actions by groups company cannot control
- **Material quantity variance** usually occur in **production department**: inexperienced workers, faulty machinery, carelessness
  - If materials are obtained by purchasing department were of inferior quality, then purchasing department would be responsible

## DIRECT LABOUR AND MANUFACTURING OVERHEAD VARIANCES

### DIRECT LABOUR VARIANCES

$$TDLBV = TAH \times AR - TSHA \times SR$$

- TDLBV: total direct labour budget variance
- TAH: total actual hours
- AR: actual rate
- TSHA: total standard hours allowed
- SR: standard rate

Total labour variance: caused by differences in the labour rate or labour hours

$$\text{total labour variance} = \text{labour price variance} + \text{labour quantity variance}$$

Labour price variance: difference between rate paid to workers vs rate that was supposed to be paid

$$\text{Formula: } TAH \times AR - TAH \times SR \text{ or } AH \times (AR - SR)$$

- TAH: total actual hours
- AR: actual rate
- SR: standard rate

Labour quantity variance: difference between amount that should have been paid for hours worked (TAH x SR) and amount that should have been paid for hours that should have been worked (TSHA x SR)

Formula:  $TAH \times SR - TSHA \times SR$  or  $SR \times (AH - SH)$

- TAH: total actual hours
- TSHA: total standard hours allowed

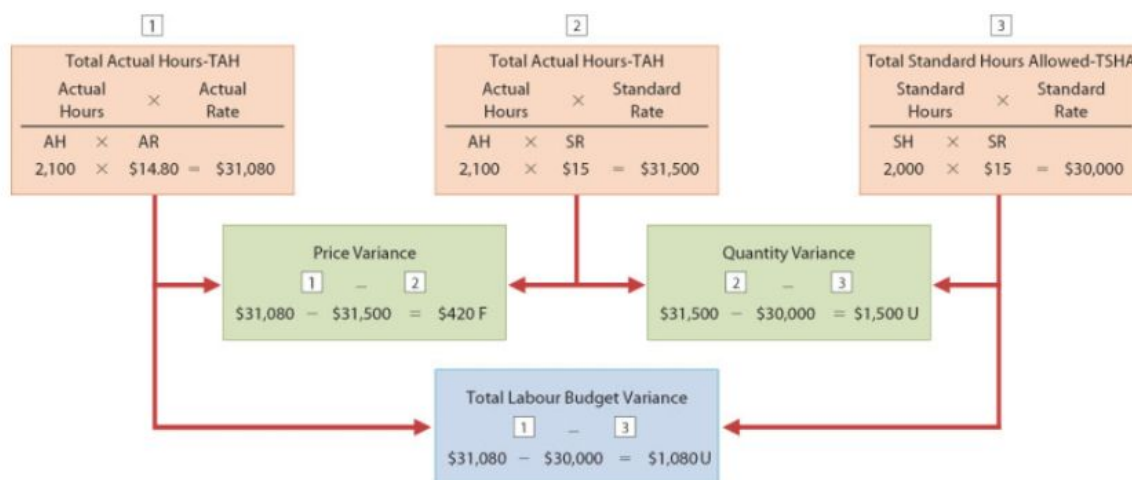


Illustration 12-23 Matrix for total direct labour budget variances

Causes of labour variances:

- **Labour price variance:**
  - Paying workers higher wages than expected
  - Misallocation of workers (using skilled workers instead of unskilled workers and vice versa)
- **Labour quantity variance:**
  - relates to efficiency of workers
  - Production department's responsibility: poor training, worker fatigue, faulty machinery
  - If excess time is due to inferior materials than production dept is not responsible

## MANUFACTURING OVERHEAD VARIANCES

Total overhead variance: difference between actual overhead costs and overhead costs applied based on standard hours allowed (hours that *should* have been worked for units produced) for the amount of goods produced

Formula:  $TOHV = Actual\ OH - TSHA \times SR$  (overhead applied)

Total variable overhead budget variance: shows whether variable OH were effectively controlled; actual variable OH costs is compared with budgeted costs for total standard hours allowed. budgeted costs are determined form flexible MOH budget

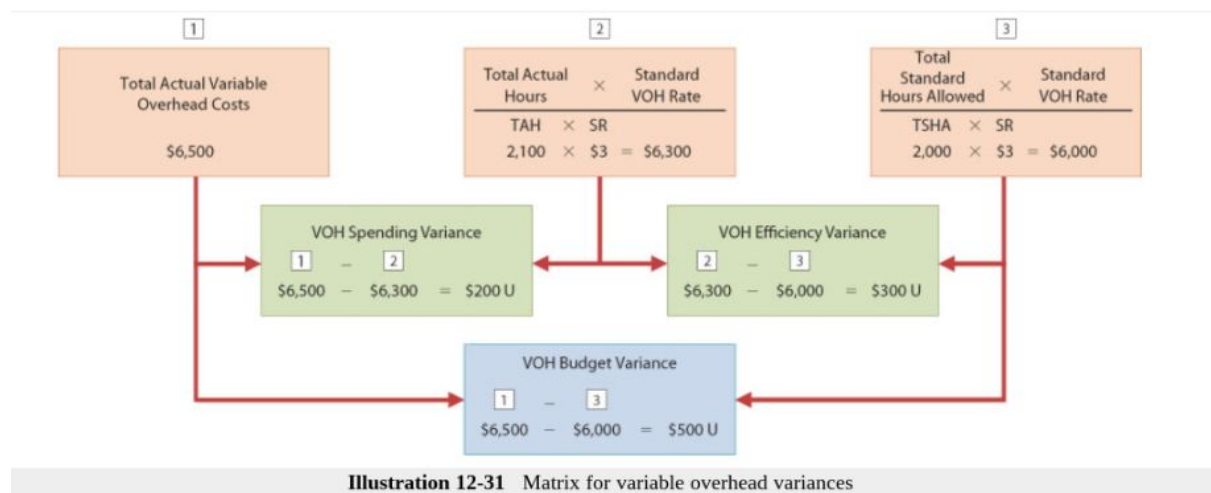
$TV\ OHBV : actual\ variable\ OH - TSHA \times SR$  (variable OH applied)

Variable overhead spending price variance

$VOHSPV = actual\ variable\ OH - TAH (at\ standard\ variable\ OH\ rate) \times SR$

Variable overhead efficiency (quantity) variance

$VOHEQV = TAH (at\ standard\ variable\ OH) \times SR - TSHA (at\ standard\ variable\ OH\ rate) \times SR$



Total fixed overhead variance: the difference between the actual fixed overhead and the total standard hours allowed multiplied by the fixed overhead rate. Can also be analyzed into a spending (budget) variance and a volume variance.

Fixed overhead spending budget variance: shows whether spending on fixed costs was under or over the budgeted fixed costs for the year.

$Total\ fixed\ OH\ variance = actual\ fixed\ OH - TSHA (fixed\ OH\ applied) \times SR$

*Fixed OH spending (budget) variance*

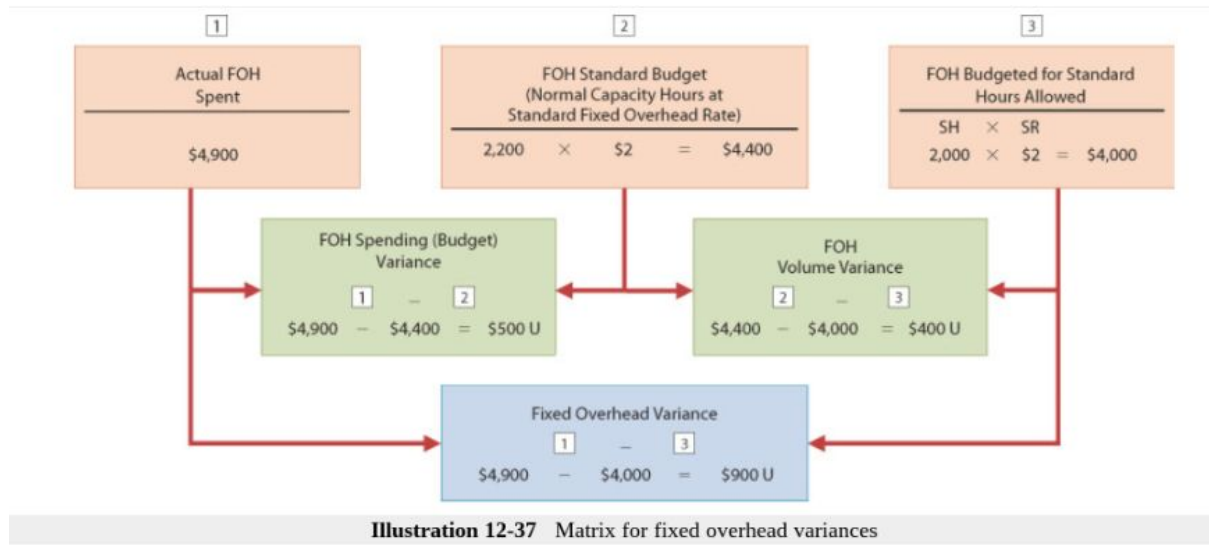
$actual\ FOH - FOH\ master\ budget\ (static)\ normal\ capacity\ hrs\ at\ standard\ FOH\ rate \times SR$

Fixed overhead volume variance: the difference between the overhead budgeted for the normal standard hours and the overhead applied

Fixed OH volume variance=

$FOH \text{ master (static) budget } NCH \text{ at standard } FOH \text{ rate } \times SR - TSHA \text{ (at standard } FOH \text{ rate)} \times SR$

- NCH = normal capacity hours
- TSHA = total standard hours allowed



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

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

Causes of MOH variances:

- Cause of unfavourable variance may be due to:
  1. A higher than expected use of indirect materials, indirect labour and factory supplies
  2. Increases in indirect manufacturing costs (fuel, maintenance costs, etc)
- Production department can be responsible for OH volume variance if cause is either:
  1. Inefficient use of direct labours
  2. Machine breakdowns

- When the cause is **lack of sales orders** the production department is not responsible

## VARIANCE REPORTS AND BALANCED SCORECARD

### REPORTING VARIANCES

- Form, content, frequency of variance reports → vary for all companies
- One approach: prepare weekly report for each department that has primary responsibility for cost control
  - Materials price variances: reported to purchasing dept
  - All other variances: reported to production dept
- Explanation column: completed after purchasing dept manager has been consulted
- Top mgmt looks for significant variances in the report

### STATEMENT PRESENTATION OF VARIANCES

- Income statements prepared for mgmt: under standard cost accounting system, COGS is stated at standard cost and variances are disclosed separately
  - Unfavourable variances: **increase COGS**
  - Favourable variances: **decrease COGS**

### BALANCED SCORECARD

- Uses financial and non-financial measures in an integrated system that links performance measurement and a company's strategic goals
- Does the following:
  - Employees both financial and non-financial measures
  - Creates link so that high-level corporate goals can be communicated all the way down
  - Provides objectives for non-financial measures such as product quality rather than vague statements
  - Integrates all of company's goals into single performance measurement system so that too much weight will not be placed on any single goal
- Four perspectives to evaluate company performance:
  1. Financial
  2. Customer
  3. Internal process: internal operating processes that are critical to success
  4. Learning and growth: how well company develops/retains employees

<b>Financial perspective</b>	<b>Internal process perspective</b>
Return on assets	Percentage of defect-free products
Net income	Stockouts
Credit rating	Labour use rates
Share price	Waste reduction
Profit per employee	Planning accuracy
<b>Customer perspective</b>	<b>Learning and growth perspective</b>
Percentage of customers who would recommend the product to a friend	Percentage of employees leaving in less than one year
Customer retention	Number of cross-trained employees
Response time per customer request	Ethics violations
Brand recognition	Training hours
Customer service expenses per customer	Reportable accidents

**Illustration 12-43** Examples of objectives within the four perspectives of the balanced scorecard

### STANDARD COST ACCOUNTING SYSTEM

- Double-entry system of accounting
- Standard costs are used in making entries, variances are formally recognized in the accounts
- Can be used with either job-order or process costing
- In this chapter → using **standard cost job-order cost accounting system** based on 2 assumptions:
  - Variances from standards are recognized at the earliest opportunity
  - The work in process account is maintained using only standard costs

### JOURNAL ENTRIES

- Major difference between entries in this chapter and those in chapter 3 is the **variance accounts**

\*refer to book for examples

### LEDGER ACCOUNTS

<b>Raw Materials Inventory</b>		<b>Materials Price Variance</b>		<b>Work in Process Inventory</b>	
(1) 12,600	(4) 12,600	(1) 420		(4) 12,000	(7) 52,000
<b>Factory Labour</b>		<b>Materials Quantity Variance</b>		<b>Finished Goods Inventory</b>	
(2) 31,500	(5) 31,500	(4) 600		(7) 52,000	(8) 52,000
<b>Manufacturing Overhead</b>		<b>Labour Price Variance</b>		<b>Cost of Goods Sold</b>	
(3) 11,400	(6) 10,000		(2) 420	(8) 52,000	
	(9) 1,400	<b>Labour Quantity Variance</b>			
		(5) 1,500			
		<b>Overhead Budget Variance</b>			
		(9) 1,000			
		<b>Overhead Volume Variance</b>			
		(9) 400			

**Illustration 12A-1** Cost accounts with variances