



RSM222

Intro to Managerial Accounting

Final Exam-AID

Review Package

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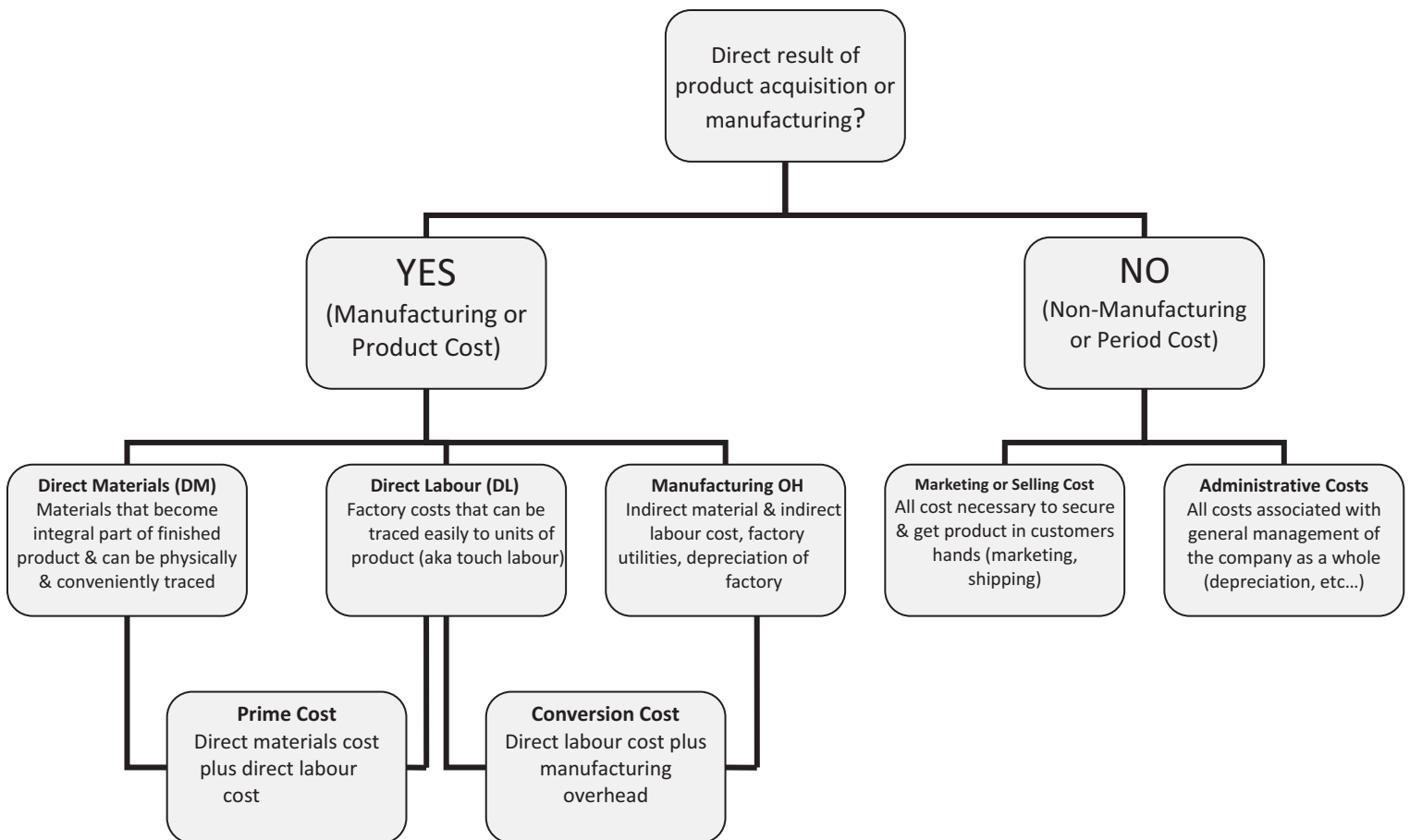
Preface: This package is intended for Rotman Commerce university students for additional study materials for RSM222 for the final 2014 exam. It is intended to aid, not replace studying with the required course materials.

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Topic 1: Cost Concepts, Behaviour & Cost Flows

MANUFACTURING COSTS:



PRODUCT VS. PERIOD COSTS (*Matching Principle*):

- **Product cost** → all costs involved in purchase or manufacture of goods (DM, DL & Man. OH)
 - Product cost 'attached' to product until sale (transferred to COGS & matched against revenue and expensed in period sold)
- **Period cost** → costs that are taken directly to the income statement as expenses in the period in which they are accrued (selling & admin expenses)

COST CLASSIFICATION

	Merchandising Entity	Manufacturing Entity
Balance Sheet (types of costs)	(1) Goods purchased from suppliers that await resale	(1) Raw (direct) materials (2) Work in Process (WIP) (3) Finished goods
Income Statement	COGS = Beg. Merchandise inventory + purchases – ending merchandise inventory	COGS = Beg. Finished goods inventory + COGM – ending finished goods inventory

Cost of goods manufactured: costs that include direct materials/labour & overhead used for products finished during the period

- **Total manufacturing cost** = DM + DL + Manufacturing overhead

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- **COGM** = Total manufacturing cost + beginning work in process inventory – ending work in process inventory

PURPOSE OF COST CLASSIFICATION	COST CLASSIFICATION
Preparing external financial statements	<i>Product costs (inventoriable)</i> <ul style="list-style-type: none"> ▪ Direct Materials ▪ Direct labour ▪ Manufacturing OH <i>Period costs (expensed)</i> <ul style="list-style-type: none"> ▪ Non-manufacturing costs (marketing/selling & admin costs)
Predicting cost behavior in response to changes in activity	<ul style="list-style-type: none"> ▪ <i>Variable cost</i> (proportional to activity) ▪ <i>Fixed cost</i> (constant in total)
Assigning costs to cost objects such as departments or products	<ul style="list-style-type: none"> ▪ <i>Direct cost</i> (can easily be traced) ▪ <i>Indirect cost</i> (cannot easily be traced; must be allocated)
Making decisions	<ul style="list-style-type: none"> ▪ Differential cost → difference in cost between 2 alternatives ▪ Incremental cost → increase in cost between 2 alternatives ▪ Sunk cost → any cost that has already been incurred & cannot be changed now or in the future (hence, irrelevant to decision making) ▪ Opportunity cost → potential benefit that is given up when one alternative is selected over another (should be considered in decision making)

COST CLASSIFICATION FOR PREDICTING COST BEHAVIOUR

- **Cost behavior** → way in which cost reacts or responds to change in level of activity
- **Variable cost** → costs that vary, in total, in direct proportion to changes in level of activity (variable costs in constant per unit, ie. direct materials vary directly with units)
- **Fixed cost** → cost that remains constant, in total, regardless of changes in level of activity w/in the relevant range (ie. straight line depreciation, monthly insurance costs)
 - If the FC is expressed on a per unit basis, it varies inversely w/in the level of activity
 - **Relevant range**: range of activity w/in which assumptions about variable & fixed cost are valid
- **Mixed cost** → contains both variable & fixed components (ie. wages: base salary + commission)

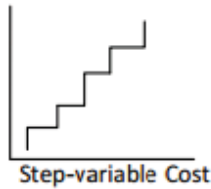
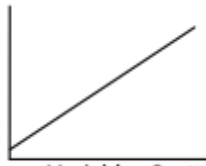
COST CLASSIFICATION FOR ASSIGNING COSTS TO COST OBJECTS

- **Cost object** → anything for which data are desired
- **Direct cost** → can be easily & conveniently traced to particular cost object under consideration
- **Indirect cost** → cannot be easily & conveniently traced to a particular object
- **Common cost** → incurred to support a # of cost objects but cannot be traced to them individually

COST BEHAVIOUR: ANALYSIS & USE

- **Activity base** → measure of whatever causes incurrence of variable cost (aka. Cost driver)
 - Ex. Total cost of picture film used will ↑ as # of pictures taken increase (therefore # of pictures taken in activity case for explaining cost)
- True-Variable (Proportional) vs. Step-variable Costs
 - **True-variable** → amounts that vary in direct proportion to level of production, can be stored as inventory if in excess (ie. direct materials)
 - **Step-variable** → are fixed within a particular range & change in increments relative to large changes in activity, cannot be stored as inventory (salaried staff, space, etc...)

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- Linearity Assumption & Relevant Range
 - Dealing w/ variable costs (except step-variable) assume that strictly linear relationship (but some have curve)
 - **Curvilinear costs** → relationship b/t cost & activity that is a curve rather than a straight line (but can be approximated using a straight-line in a relevant range)

- Fixed Costs (aka. capacity costs)
 - **Total fixed costs (TFC)** is constant, does not change depending on # of units, but per unit cost decreases as more units present
 - *Two types:*
 - **Committed fixed costs** → fixed costs that are difficult to adjust & that related to the investment in facilities, equipment & basic org. structure of the firm (ie, depreciation)
 - **Discretionary fixed costs** → arise from annual decision by management to spend in a certain fixed cost area, such as advertising & research (ie. managed fixed costs)
 - *Differences:* planning horizon → discretionary is SR (< 1 yr), committed is LR (>1 yr)
 - Discretionary costs can be cut for short-run periods w/ min. damage to long-run organizational goals
 - Discretionary costs - management isn't locked into its decisions (can be adjusted)
 - **What about labour?** Can be treated as either, depends on country/company regulation

- Mixed Costs (aka. Semi-variable costs)
 - Equation: $Y = a + bX$
 - $Y = \text{total fixed cost}$, $a = \text{total fixed cost (vertical intercept)}$, $b = \text{variable cost per unit of activity (slope)}$, $X = \text{level of activity}$ → steeper the slope, the higher the variable cost

ANALYSIS OF MIXED COSTS

- Very common, management must separate these:
- **Account analysis** → method of analyzing cost behavior in which each account under consideration is classified as either variable or fixed based on the analyst's prior knowledge of how cost in account behaves
- **Engineering approach** → detailed analysis of cost behavior based on an industrial engineer's evaluation of inputs that are required to carry out a particular activity & of the prices of those inputs
- Diagnosing Cost Behaviour w/ a Scattergram Plot
 - **Dependent variable** → responds to some casual factor, ie. Y (total cost)
 - **Independent variable** → acts as a casual factor, ie. X (activity)
 - **Linear cost behavior** → straight line is reasonable approximation for cost-activity relationship
 - **High-low method** → separating a mixed cost into its fixed & variable elements by analyzing the change in cost b/t high & low levels of activity (ie. least-squares regression method)

THE CONTRIBUTION FORMAT

- **Contribution approach** → an income statement format that is geared to cost behaviour in that costs are separated into variable & fixed categories (rather than by functional areas)
- **Contribution margin** → amount of remaining from sales revenues after all variable expenses have been deducted

$$\text{Variable cost} = \text{change in cost} / \text{change in activity}$$

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Topic 2: Job Order Costing

Absorption cost (aka. full costing) → costing method that includes all manufacturing costs as part of the cost of a finished unit of product; synonymous w/ full costing

PROCESS & JOB-ORDER COSTING

- **Process costing system** → costing system used in those manufacturing situations where a single, homogeneous product (such as cement or oil) flows in a continuous stream of the production process
 - Many units of the same product, costing determined by:
$$\text{Unit production} = (\text{total manufacturing cost}) / (\text{total units produced})$$
- **Job-order costing system** → costing system used in situations where many different products, jobs/services produced each period
 - used extensively in service industries & non-for-profit organizations

JOB-ORDER COSTING – OVERVIEW

- **Bill of materials** → listing of type & quantity of each major item of materials required to make product
- **Materials requisition form** → detailed source document that:
 - (1) specifies type & quantity of materials to be drawn from storeroom
 - (2) identifies the job to which the costs of materials are to be charged
- **Job cost sheet** → form prepared for each job that records materials, labor & OH costs charged to the job
- **Time ticket** → detailed source document that is used to record an employee's hour-by-hour activities during a day

CALCULATING PRE-DETERMINED MANUFACTURING OVERHEAD RATES

- **Allocation base** → measure of activity such as direct labour-hrs or machine-hrs used that is used to assign costs to cost objects
- **Predetermined overhead rate** → used to charge overhead costs to objects; rate is established in advance for each period by use of estimates of total manufacturing overhead cost & of total allocation base for period

$$\text{Predetermined Man OH rate} = \frac{(\text{Estimated total manufacturing OH cost})}{(\text{Estimated total units in allocation base})}$$

- Based on estimated rather than actual b/c predetermined in computed before period begins & is used to apply overhead costs to jobs throughout the period
- **Overhead application** → process of charging manufacturing OH cost to job cost sheets & to the work in process account

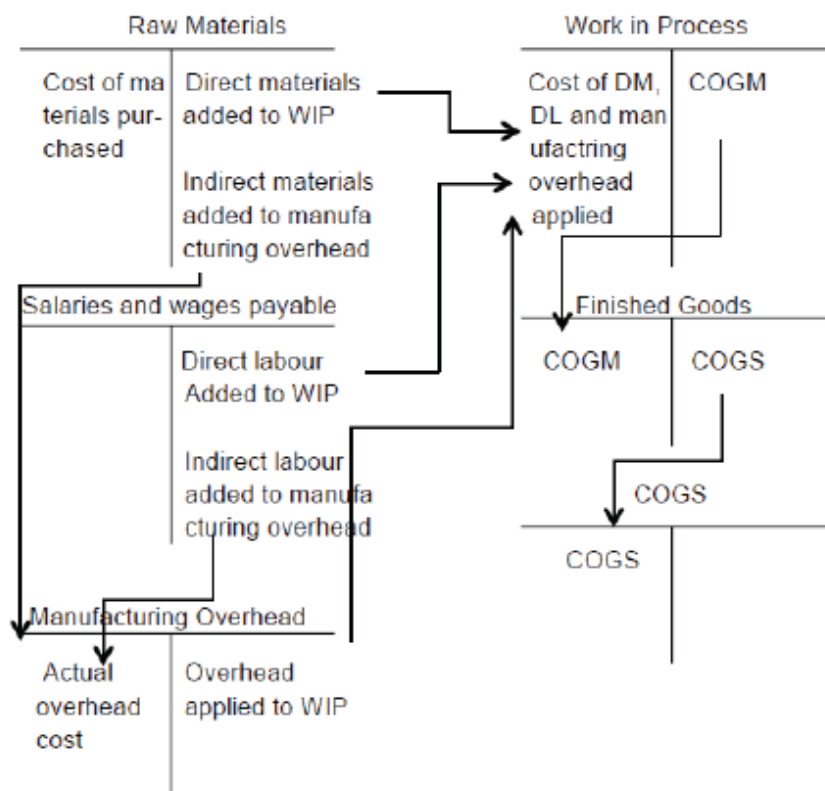
$$\text{Overhead applied to particular job} = \text{predetermined OH rate}$$

$$\times \text{amount of allocation base incurred by the job}$$

- **Normal cost** → cost system in which OH costs are applied to jobs by multiplying a predetermined OH rate by the actual amount of the allocation base incurred by the job
 - Managers may wish to use a predetermined OH rate instead of actual because:
 - Allows managers to know accounting system's valuation of completed jobs before end of period
 - Actual OH rates lead to fluctuations in OH rates & costs (seasonal) and are not purposeful/are misleading
 - Simplifies record-keeping
- **Cost-driver** → factor that causes OH costs (KEY POINT: allocation base should drive OH, hence labour not best – attributable to decreasing need of direct labour due to Δ 's in technology)

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JOB-ORDER COSTING – The Flow of Costs



APPLICATION OF MANUFACTURING OVERHEAD

- Concept of Clearing Account
 - When job completed, OH cost is released from manufacturing OH & is applied to WIP using the predetermined overhead rate
 - Actual OH is debited to manu. OH & amount calculated using predetermined rate is credited
 - Since predetermined rate is an estimate, causes OH cost to be over- or under-applied
 - OH cost determined with the predetermined rate appears on job cost sheet & WIP a/c

COST OF GOODS MANUFACTURED

- When good complete, cost transferred from WIP to FG & this amount is the COGM
- When good is sold, cost transferred from FG to COGS
 - Has to be done with the unit cost, as most likely not all products will be sold

COMPLICATIONS OF OVERHEAD APPLICATION

- *Under-applied overhead* → DR balance in overhead a/c, actual overhead > overhead applied
- *Over-applied overhead* → CR balance in overhead a/c, actual overhead < overhead applied
- **Why does over- or under-applying occur?**
 - Assumption that costs for every machine will be the same
 - Spending on overhead may not be controllable

Disposition of Under/Over-applied Overhead Rate

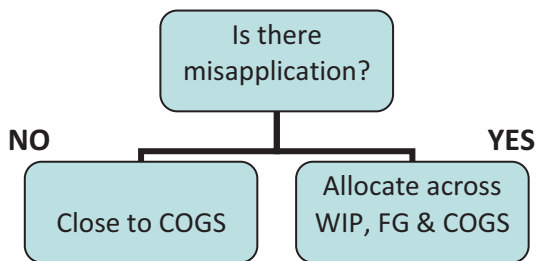
1. Close out to COGS
 - a. Under-applied: DR COGS, CR Manufacturing OH
 - b. Over-applied: DR Manufacturing OH, CR COGS
2. Allocated among WIP, FG, COGS
 - a. Determine current allocation of manufacturing OH

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- b. Calculate %'s (divide current allocation by total manufacturing overhead)
 - c. Allocate the under- or over-applied OH in the same percentages (Percent*current allocation)
 - d. Sum to determine the new total allocation & close via transactions
3. Carry forward to next period

General Model of Product Cost Flows

- Beginning of period:
Predetermined overhead rate = $\frac{\text{Estimated total Manu. OH cost}}{\text{Estimated total units in allocation base}}$
- During the period:
Total Manu. OH Applied = Predetermined OH x Actual total units of allocation base incurred during period
- At end of period:
Under-applied (over-applied) OH = Actual total Manu. OH cost
– Total Manu. OH applied



Topic 3: Process Costing

PROCESS-COST FLOWS

- **Processing departments** → any location of org where work is performed on a product and where materials, labour & overhead costs added to the product
- Must consist of 2 features:
 - 1) activity performed at department must be applied uniformly to all units passing through it and
 - 2) output must be identical

Compared to Job-Order Costing?

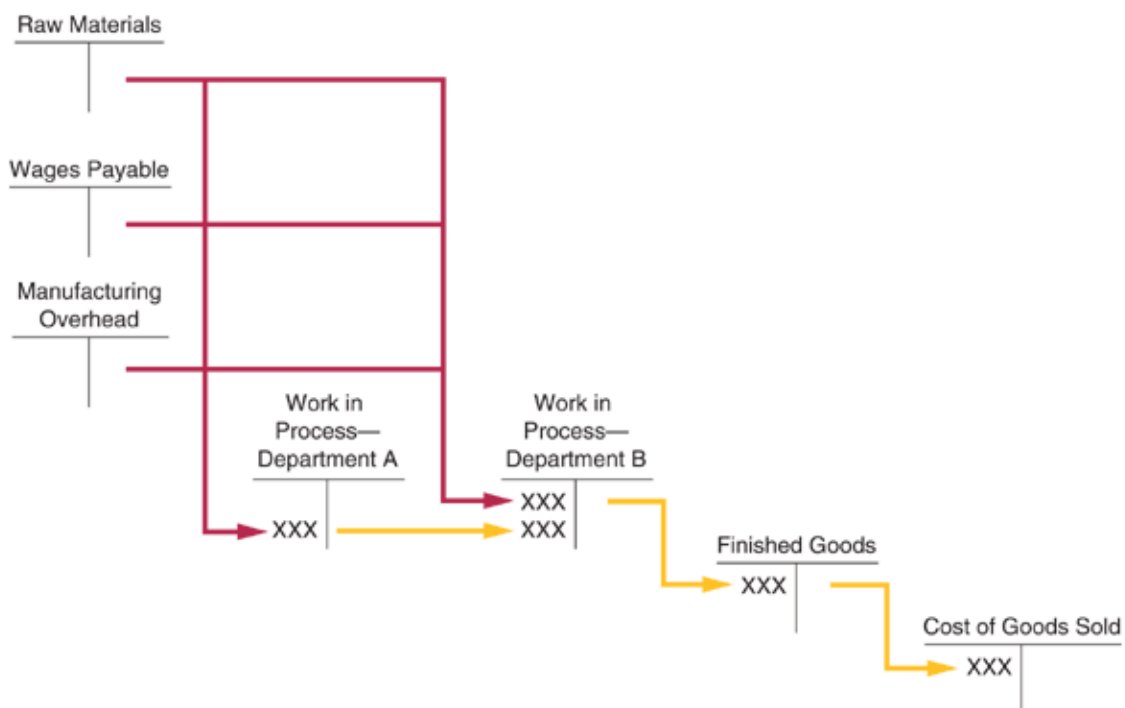
- **SIMILARITIES:** have same basic purpose, use same manufacturing accounts, flow of costs through manufacturing accounts basically same
- **DIFFERENCES:** in process costing: a) flow of units in costing is more continuous, b) costs are sorted by department rather than order, c) **production report** is used instead of job cost sheet

FLOW OF MATERIAL, LABOUR & OVERHEAD COSTS

- Average unit cost computed by dividing total production costs for period by # of units produced
- **NOTE:** separate Work in Process a/c for each processing department

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Job-Order Costing	Process Costing
<ol style="list-style-type: none"> 1. Many different jobs are worked on during each period, with each job having different production requirements. 2. Costs are accumulated by individual job, regardless of the accounting period during which the work is done. 3. The <i>job cost sheet</i> is the key document controlling the accumulation of costs by a job. 4. Unit costs are computed <i>by job on the job cost sheet</i>. 	<ol style="list-style-type: none"> 1. A single product is produced either on a continuous basis or for long periods of time. All units of product are identical. 2. Costs are accumulated by department, during an accounting period. 3. The <i>department production report</i> is the key document showing the accumulation and disposition of costs by a department. 4. Unit costs are computed <i>by department on the department production report</i>.



- Completed work from department A is transferred to Work in Process of department B, where it undergoes further work and is then transferred to Finished Goods
- Materials, labour & overhead can be applied in ANY department, not just the first (ie. **transferred-in cost**)
- Diagram: T-a/c model for Process costing flows

EQUIVALENT UNITS OF PRODUCTION

- **Equivalent units** → product of # of partially completed units & their percentage of completion with respect to a particular cost; # of complete whole units one could obtain from the materials and effort in partially completed units

$$\text{Equivalent units} = \# \text{ of partially completed units} \times \% \text{ completed}$$

- Can be calculated in 2 ways:
 - **FIFO method** → method for cost accounting in a process costing system in which equivalent units & unit costs relate only to work done during the current period
 - **Weighted-average method** → method of process costing that blends together units & costs from both the current and prior periods

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- **Equivalent units of production (W-A method)** → units transferred to next department (or to finished goods) during the period plus the equivalent units in the departments ending work in process inventory

Equivalent Units of Production = *Units transferred to the next department or to finished goods + equivalent units in ending work in process inventory*

COMPUTE & APPLY COSTS

- *Compute the cost per equivalent unit using the weighted-average method*
- Cost per equivalent unit—Weighted-Average Method

Cost per equivalent unit =
$$\frac{\text{cost of beg. WIP inventory} + \text{cost added during the period}}{\text{Equivalent Units of production}}$$

APPLYING COSTS—WEIGHTED-AVERAGE METHOD

- Assign costs to units using the weighted-average method
- Equivalent units are multiplied by the cost per equivalent unit to determine costs assigned to the units
- *Prepare a cost reconciliation report accounting for the costs transferred out and the costs in work in process inventory at the end of the period using the weighted-average method*

OPERATION COSTING

- There are hybrids of both job-costing & process-costing
- **Operation costing** → used when products manufactured in batches & when the products have some common characteristics; this system handles materials same way as in job-order costing, & labour & overhead the same as process-costing

FLEXIBLE MANUFACTURING SYSTEMS → heavily automated, activities organized around cells/islands of automated equipment

- Impact costing systems in several ways:
 - 1) Allow companies to switch their systems from a more costly job-order approach to a cheaper process costing or operation approach
 - 2) Through focus on cells rather than on departments

Topic 4: Activity-Based Costing

Activity-based costing → method based on activities that are designed to provide managers with cost information for strategic & other decisions that potentially affect capacity & therefore FC

TREATMENT OF COSTS UNDER THE ACTIVITY BASED COSTING MODEL

- Traditional absorption costing is for external fin. reports, ABC used for internal decision making
 - 1) Non-manufacturing & manufacturing costs are assigned on a cause-and-effect basis
 - 2) Some manufacturing costs may be excluded from product costs
 - 3) Numerous overhead cost pools (ie. group of overhead costs) are used, each of which is allocated to products and other cost objects using its own unique measure of activity
 - 4) Overhead rates, or activity rates, may be used on level of activity & capacity rather than on the budgeted level of activity

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NON-MANUFACTURING COSTS, MANUFACTURING COSTS & ACTIVITY-BASED COSTING

- In ABC, non-manufacturing & indirect manufacturing costs are included in OH
 - Costs only assigned to product if believed that cost would be affected by decision regarding product (some manufacturing costs left out & recorded as period instead)

COST POOLS, ALLOCATION BASES & ACTIVITY-BASED COSTING

- Appealing b/c uses more cost pools & unique measures of activity to better understand cost of managing product diversity
 - **Activity** → any event that causes consumption of overhead resources
 - **Activity cost pool** → accumulates costs relating to single activity measure
 - **Activity measure** → allocation base, measure of activity that drives cost (aka. cost driver)
 - 1) **Transaction driver**: simple count of # of times activity occurs
 - 2) **Duration driver**: measure of time required to perform activity (more accurate)

FIVE LEVELS OF ACTIVITY (ABC)

Levels	Description	Activity Cost Pool	Activity Measures
Unit-level activity	- Performed each time unit is produced - Should be proportional to number of units	Order size	Machine-hours
Batch level activity	- Incurred per batch - Based on number of batches	Customer orders	# of customer orders
Product level activities	- Relate to specific products - Carried out regardless of units produced/sold	Product design	# of product designs
Customer level activities	- Activities which support customers, not related to specific products	Customer relations	# of active customers
Organization sustaining activities	- Carried out regardless of anything	-	-

- In ABC care is taken to make sure that idle costs are not applied to product
- Idle capacity costs are considered to be period costs that are expensed on income statement

DESIGNING AN ABC SYSTEM (3 essential characteristics of ABC implementation)

- Top managers must strongly support implementation b/c leadership instrumental for ppl to accept change
- Top managers need to ensure that ABC data is linked to how ppl are evaluated & rewarded
- Cross-functional tea, should be created to design & implement system
- ABC MODEL: cost objects (ie. products & customers → activities → consumption of resources → cost)

TARGETING PROCESS IMPROVEMENTS

- **Activity-based management** → approach that, in conjunction with ABC, improves processes & reduces costs (important to determine what needs improvement)

Benchmarking → systematic approach of comparing performance of some aspect of an organization's operations to that of outstanding external companies or to other divisions w/in the same organization (can be *internal* or *external*)

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IMPLEMENTATION PROCESS

Step 1: Identify & define activities, activity cost pools & measures

- Activities should be grouped together at the appropriate level (& same group)
- ABC cost allocation process is a 2-type: OH allocated to activity cost pools, then to cost objects (*see above*)
- Costs of idle capacity & other organization sustaining costs not included in OH costs

Step 2: Assign OH costs to activity cost pools

- **First-stage allocation** → process by which overhead allocation costs are assigned to activity cost pools
- Workers (w/ usually first-hand knowledge) are interviewed to determine allocations (in terms of %'s)

Step 3: Calculate activity rates

- $Activity\ rate = total\ cost / total\ activity$

Step 4: Assign overhead costs to cost objects

- **Second-stage allocation** → process by which activity rates are used to apply costs to products & customers
- In order to calculate ABC cost, activity rate & activity are multiplied ($activity\ rate * activity$)

Step 5: Prepare management reports

- Most common are product & customer profitability reports (prepared to show that each product is profitable)
- **Product margin** → profit of product is function of product's sales & direct & indirect costs

COMPARISON OF TRADITIONAL & ABC PRODUCT COSTS

- 1) Review margins reported by traditional cost system & ABC
 - 2) Contrast the differences
- **Action analysis report** → shows what costs have been assigned to a cost object, such as a product or customer, & how difficult it would be to adjust the cost if there is a change in activity
 - 3 reasons why traditional & ABC report different product margins:
 - 1) Traditional allocates only manufacturing costs, ABC includes non-manu. costs too
 - 2) Traditional system allocates ALL manufacturing overhead costs using machine hours, volume-related overhead; ABC uses unique non-volume related allocation
 - Traditional system over-cost's high-volume products & under-cost's low-volume
 - 3) ABC system assigns non-manufacturing overhead costs (ie. shipping) to products on a cause-and-effect basis; traditional excludes these costs b/c they're classified as period

ABC & LIMITATIONS

- Not used on external reports because:
 - External reports don't require individual product costs
 - Difficult to change company's accounting system, may cause errors
 - ABC doesn't conform with GAAP
 - ABC based on interviews, won't satisfy auditors
- Limitations:
 - Implementation costly
 - ABC can misrepresent, must assess before making decisions based on ABC

Topic 5: CVP Analysis

BASICS OF CVP ANALYSIS

- CVP analysis: powerful tool, lets managers understand relationship b/c cost, volume and profit
 - Focuses on how profits are affected by: price of products, volume/level of activity, per unit VC, TFC, mix of products sold

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- **Contribution margin** → amount remaining from sales after variable expenses deducted
 - If CM not enough to cover fixed expenses, loss occurs
$$CM = \text{Revenue or sale} - VC$$
- **Break-even point** → level of sales at which profits are zero, defined as where total sales = total expenses or $CM = \text{total fixed costs}$

CVP RELATIONSHIPS IN GRAPHIC FORM

- **Cost-volume-profit graph** → highlights relationship over variety of activity ranges
 - (aka. **break-even chart**)
 - Simpler graph is **profit graph** → which uses one line to represent diff b/t costs and revenues
- $$Profit = \text{Unit CM} \times Q - \text{Fixed Expenses}$$

CONTRIBUTION MARGIN RATIO & APPLICATION

- **Contribution Margin ratio** → CM as a % of total sales
- The effect on operating income of any dollar change in total sales can be computed by simply applying the CM ratio to the dollar change
 - Ex. If company plans \$30 000 ↑ in sales, CM will ↑ by \$12 000 (\$30 000 x CM Ratio of 40%)
 - The larger a company's unit CM figure, the more effort/\$ they are willing to spend to improve profits

$$CM \text{ Ratio} = \frac{\text{Total CM}}{\text{Total Sales}} = \frac{\text{Unit CM}}{\text{Unit selling price}}$$

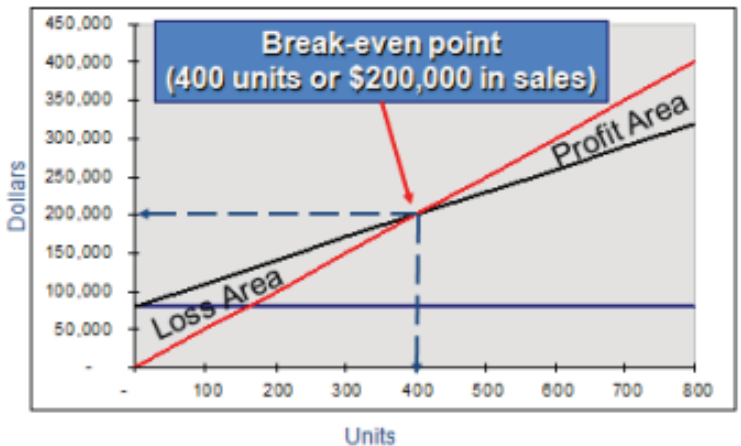
- **DECISION RULE:**
 - Make change if: ↑ in CM > ↑ in fixed costs; OR ↓ in CM > ↓ in fixed costs
 - Don't make change if: ↑ in CM < ↑ in fixed costs; OR ↓ in CM < ↓ in fixed costs
- **Incremental analysis** → an analytical approach that focuses only on those items of revenue, cost & volume that will cause change as a result of a decision

BREAK-EVEN ANALYSIS

- Can be computed 2 ways: 1) equation method 2) contribution margin method
- **Equation method** → computing using the contribution-format income statement
 - Rearrange profit equation ($\text{Sales} = \text{Variable expenses} + \text{Fixed expenses} + \text{Profits}$)
 - Since profits = 0 at break-even point, solve for Q:

$$\text{Sales}(Q) = \text{Variable expenses}(Q) + \text{Fixed expenses}$$

- Variable expense ratio → ratio of variables expenses to sales dollars
- **Contribution Margin Method** → method of computing where fixed expenses are divided by contribution margin per unit



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Short cut way, particularly useful for companies with many product lines

$$\text{BEP in Units Sold: } \mathbf{Break-even point} = \frac{\text{Fixed expenses}}{\text{Unit contribution margin}}$$

OR

$$\text{BEP in total Sales dollars \$: } \mathbf{Break-even point} = \frac{\text{Fixed expenses}}{\text{CM Ratio}}$$

TARGET OPERATING PROFIT ANALYSIS

- Determining level of sales to reach desired target profit
- CVP Equation → **Sales** = Variable expenses + Fixed expenses + Profits
 - when you know profits, and simply solve for Q
- Contribution Margin Method →

$$\mathbf{Units sold to attain target profit} = \frac{\text{Fixed expenses} + \text{Target operating profit}}{\text{Unit CM}}$$

- After-tax Analysis →

Profit after taxes = Before-tax profit – Taxes, so therefore you have to use the following:

$$\mathbf{Units sold to attain target profit} = \frac{\text{Fixed expense} + [\text{Target after tax profit}/(1-\text{tax rate})]}{\text{Unit Contribution Margin}}$$

$$\mathbf{Dollar sales to attain target profit} = \frac{\text{Fixed expense} + [\text{Target after tax profit}/(1-\text{tax rate})]}{\text{CMR}}$$

MARGIN OF SAFETY

- **Margin of safety** → excess of budgeted (or actual) sales over the break-even volume of sales

$$\mathbf{Margin of safety \%} = \frac{\text{Margin of safety in dollars}}{\text{Total budgeted (or actual) sales}}$$

CVP CONSIDERATIONS IN CHOOSING A COST STRUCTURE

- **Cost structure**: refers to relative proportion of FC to VC in an organization
 - Not one structure is better (ie. lots of VC, low FC or opposite), it really depends
- **Operating Leverage** → measure of how sensitive operating income is to given % change in sales
 - Operating Leverage** = CM/operating income
- **Degree of operating leverage** → measure, at a given level of sales, of how a % change in sales volume will affect profits → not constant, depends on the company's level of sales

$$\mathbf{Degree of operating leverage} = \frac{\text{Contribution margin}}{\text{Operating Income}}$$

$$\% \Delta \text{ Operating income} = \frac{\% \text{ change in sales}}{\text{Degree of operating leverage}}$$

$$\mathbf{Quantity} = \frac{\Delta \text{ Fixed expenses}}{\Delta \text{CM}}$$

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- **Indifference Analysis:** we can use CVP analysis to compare different cost structures (labour intensive vs. capital intensive)
 - **Indifference point:** $(CM \times Q \text{ \# of units being solved for}) - TFC$
 → Done for both alternatives, set equal to each other & indifference point is solved for

CONCEPT OF SALES MIX

- **Sales Mix** → relative proportions in which company's products sold, computed by expressing sales of each product as % of total sales (shift in high to low margin products may cause decrease in change in profits but increase in sales)
 - If sales mix changes, then break-even will also change
- **Multi-product CVP Analysis:** (break-even and target are the same)

$$\text{Overall CM Ratio} = \frac{\text{Total contribution margin, all products}}{\text{Total sales, all products}}$$

KEY ASSUMPTIONS OF CVP ANALYSIS

1. Selling price is constant
2. Costs are linear & can be accurately divided into variable (constant per unit) & fixed (constant in total) elements
3. In multiproduct companies, the sales mix is constant
4. In manufacturing companies, inventories do not change (units produced=units sold)

Topic 6: Variable Costing: Tool for Management

- Absorption costing: costing method used for external financial reporting purposes
- Variable costing: used for internal reporting purposes
 - focuses on cost behaviour, clearly separating fixed from variable costs
 - One of its strengths is that combines contribution approach and CVP concepts
- The difference in the two costing methods is evident in operating income figure



OVERVIEW OF ABSORPTION & VARIABLE COSTING

- In absorption costing, variable & fixed costs are mingled together whereas in variable costing, they are distinguished between
- **Absorption costing:**
 - Product costs: direct material, direct labour, manufacturing overhead (variable & fixed)
 - Period cost: variable & fixed selling & admin expenses
- **Variable costing (aka. direct or marginal costing):**
 - Product costs: direct materials, direct labour & ONLY variable manufacturing overhead
 - Period costs: fixed manufacturing overhead, variable & fixed selling & admin expenses
- *The unit cost figures under AC and VC differ by fixed manufacturing overhead per unit*

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CHOOSING A COSTING METHOD

- Advantages of Variable Costing and the Contribution Approach
 - Management finds it more useful
 - Consistent with CVP analysis
 - Net operating income is closer to net cash flow
 - Consistent with standard costs & flexible budgeting
 - Easier to estimate profitability of products & segments
 - Profit is not affected by changes in inventories
- Impact of fixed costs on profits emphasized

VARIABLE vs. ABSORPTION COSTING

- **ABS:** fixed manufacturing costs must be assigned to products to properly match revenues & costs
- **VAR:** fixed manufacturing costs are capacity costs & will be incurred even if nothing is produced
- External Reporting & Income Taxes
 - To conform to IFRS & GAAP requirements, absorption costing must be used for external financial reports in Canada
 - Since top execs are usually evaluated based on external reports to shareholders, they feel that decisions should be based on absorption cost income
 - Either variable or absorption costing can be used when filing income tax returns
- *In lean production (JIT) inventory system, production = sales, so difference b/t variable and absorption income tends to disappear*
 - Lean production produces good as per customer orders
 - Helps eliminate FG inventory & reduced WIP
 - Results in OI under VIC & AC to be equivalent

Topic 7: Budgeting

- **Budgets**→ important tools used by management to communicate financial objectives for coming years, allocate resources/coordinate activities across diff. functional areas of an organization

BASIC FRAMEWORK OF BUDGETING

- Budget: quantitative plan for the acquisition and use of financial & other resources over a specified future time period
- **Master budget**→ summary of a company's plan that sets specific targets for sales, production distribution & financing activities
 - Represents a comprehensive financial expression of management's plans for future & how they are to be reached
 - Culminates in a cash budget, budgeted income statement & budgeted balance sheet
- Planning VS. control (effective budget has BOTH)
 - **Planning**→ development of objectives & preparing budgets to achieve these goals
 - **Control**→ steps taken to ↑ likelihood that all objectives reached, & in a way that's consistent with firm policies
- Advantages of Budgeting
 - Communicate management's plans throughout the org; better understanding of org's goals & objectives by everyone
 - Force managers to think about and plan for future; lessens time that managers have to deal with daily emergencies
 - Budgeting process provides means of allocating resources to parts of org that can be used most effectively & are most needed; essentially, budgets are requests for resources needed to run operations

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- Budgeting process can uncover potential bottlenecks before they occur, by identifying demands that will be placed on all key activities & processes
- Coordinate activities of entire org by integrating plans of various areas; helps ensure everyone in org is pulling same direction
- Define goals & objectives that can serve as benchmarks for evaluating performance
- **Responsibility accounting** → System of accountability in which managers are held responsible for those items of revenue and cost over which they can exert significant influence—and only those items. Managers are held responsible for differences between budgeted and actual results
 - Central concept to any effective control/profit planning system
- Choosing a budget period
 - Ordinarily cover 1 year → divided into 4 quarters
 - **Continuous or perpetual budget** → 12-month budget that rolls forward one month (or quarter) as the current month (or quarter) is completed
 - May be difficult to accurately forecast sales and expenses beyond a year

PARTICIPATIVE BUDGET → method of preparing budgets where managers prepare their own budget estimates. These are then reviewed by manager's supervisors & any issues are resolved by mutual agreement, leading to completed budget

- ADVANTAGES:
 - Takes into account individuals at all levels of management (everyone has input/is recognized)
 - Budget estimates prepared by front line managers often more accurate (than top-level management)
 - Motivation is generally higher when individuals participate in setting their own goals (this creates commitment to goal)
 - No excuse not to meet budget (b/c front line manager set the budget themselves)
- **Budgetary slack** → difference b/t rev and expenses a manager believes can be achieved & the amounts included in the budget (ie. slack will exist when revenue budget set intentionally too low & expense budgets too high)
- **Budget committee** → group of key management personnel responsible for overall policy matters related to the budget program, coordinating the budget, handling disputes & approving final budget
- **Stretch budget** → budget that is highly diff. to achieve (attainment requires considerable changes)
- **Zero-base budget** → method in which managers are required to justify all costs as if program were being proposed for 1st time
 - Argued to be time consuming and costly

THE MASTER BUDGET: AN OVERVIEW

- **Sales budget** → detailed schedule showing expected sales for coming periods
 - typically expressed in units & \$
- **Cash budget** → detailed plan showing how cash resources will be acquired & used over a specified time period (divided into 4 parts)
 - Cash receipts listing all cash inflows excluding borrowing
 - Cash disbursements listing all payments excluding repayments of principal & interest
 - Cash excess or deficiency
 - Financing section listing all borrowings, repayments & interest
- **Production budget** → detailed plan showing # of units that must be produced during a period to meet both sales & inventory needs
- **Direct materials purchases budget** → detailed plan showing the amount of raw materials that must be purchased during a period to meet both production & inventory needs
- **Direct labour budget** → detailed plan showing labour requirements over specified time period

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- **Manufacturing overhead budget** → detailed plan showing indirect production costs that will be incurred over a specified time period
- **Ending finished goods inventory budget** → budget showing dollar amount of cost expected to appear on the B/S for unsold units at the end of a period
- **Selling & admin expense budget** → detailed schedule of planned expenses that will be incurred in areas other than manufacturing during a budget period

FLEXIBLE BUDGET

- **Static budget** → designed for only the planned level of activity
- **Flexible budget** → provides estimates of what revenues & costs should be for any level of activity w/in a specified range
 - May be prepared for any activity level
 - Shows costs that should have been incurred at the actual level of activity (enabling “apples to apples” cost comparisons)
 - Reveal variances related to cost control & improve performance evaluation
- **Flexible budget variance** → difference b/t actual & flexible budget amounts for revenues & expenses
- **Static budget variance** → difference b/t actual & static budget amounts for revenues & expenses
- **Sales volume variance** → diff b/t flexible & static budget amounts for revenues & expenses
- **Activity based budgeting** → type of budgeting in which emphasis is placed on budgeting that costs of the activities needed to produce & market the firm’s g/s

Topic 8: Standard Costing & Overhead Analysis

- **Management by exception:** system of management in which standards are set for various operating activities that are periodically compared to actual results (any differences that are deemed significant are brought to attention of management as exceptions)
- **Standard cost** → budgeted or estimated cost to manufacture a *single unit of product* or perform a single service
- **Standard costing system** → product costing method using unit norms for production costs (it is the *cost the firm should incur*)
- Two types of standards normally used:
 - **Quantity standards:** specify how much of an input should be used to make a product or provide a service
 - **Cost (price) standards:** specify how much should be paid for each unit of the input

GENERAL MODEL FOR VARIANCE ANALYSIS

- **Variance** → diff b/t standard prices & quantities and actual prices & quantities
- U=unfavourable, F=favourable

Direct Materials		
Price Variance	= AQ (AP – SP)	<i>Q = actual Q purchased</i>
Quantity Variance	= SP (AQ – SQ)	<i>Q = actual Q used</i>
Direct Labour		
Rate Variance	= AH (AR – SR)	
Efficiency Variance	= SR (AH – SH)	
Variable Overhead		
Spending Variance	= AH (AR – SR)	
Efficiency Variance	= AQ (AP – SP)	

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RESPONSIBILITY FOR LABOUR VARIANCES

- Production managers are usually held accountable for labour variances b/c they can influence
 - Mix of skill levels assigned to work tasks
 - Level of employee motivation
 - Quality of production supervision
 - Quality of training provided to employees
- Often finger pointing b/t management and floor level

OVERHEAD RATES & FIXED OVERHEAD ANALYSIS

- **Denominator activity** → activity figure used to compute the predetermined overhead rate

$$\text{Predetermined OH rate} = \frac{\text{Estimated total manufacturing OH cost}}{\text{Estimated total units in the base (MH, DLH, etc...)}}$$

$$\text{Predetermined OH rate} = \frac{\text{OH from flexible budget at denominator level of activity}}{\text{Denominator level of activity}}$$

- Predetermined overhead rate can be broken down into fixed & variable components
 - **Variable component:** useful for preparing & analysing variable OH variances
 - **Fixed component:** useful for preparing & analysing fixed OH variances

NORMAL COST vs STANDARD COST SYSTEMS

- **Normal cost system:** OH applied to work in process based on actual # of hrs worked in period
- **Standard cost system:** OH is applied to work in process based on standard hrs allowed for the actual output for period
- Two variances for fixed OH:
 - Budget variance → measure of diff b/t actual fixed OH incurred & budgeted fixed OH as contained in flex budget
 - Volume variance → measure of utilization of plant facilities
 - Arises whenever

$$\text{Volume Variance} = \text{fixed portion of predetermined OH} \\ \times (\text{denominator levels} - \text{standard hrs allowed})$$

- **Theoretical capacity** → volume of activity resulting from operations conducted 24/7, 365 days a yr, no downtime
- **Practical capacity** → productive capacity possible after subtracting unavoidable downtime from theoretical capacity

EVALUATION OF CONTROLS BASED ON STANDARD COSTS

- | | |
|--|--|
| <ul style="list-style-type: none">▪ Advantages:▪ Management by exception▪ Promotes economy & efficiency▪ Simplified bookkeeping▪ Enhances responsibility accounting | <ul style="list-style-type: none">▪ Disadvantages:▪ Emphasizing standards may exclude other important objectives▪ Standard cost reports may not be timely▪ Invalid assumptions about the relationship b/t labour cost & output▪ Favourable variances may be misinterpreted▪ Emphasis on negative may impact morale |
|--|--|

Topic 9: Reporting for Control & Transfer Pricing

- **Decentralized organization:** decision making is spread throughout the organization rather than being confined to a few top exec
- **Segment** → any part of an org. about which a manager seeks cost, revenue or profit data
- Two keys to building segmented income statements (based on cost behavior & whether traceable)
 - Contribution format should be used b/c it separates fixed from variable costs & enables the calculation of a CM
 - Traceable fixed costs should be separated from common fixed costs to enable the calculation of segment margin
- **Traceable fixed costs** → fixed costs that can be identified with a particular segment & that arise b/c of the existence of the segment
- **Common fixed costs** → support the operations of more than one segment but is not traceable in whole or in part to any one segment
- **Segment margin**, is best gauge of the *long-run profitability* of a segment
 - Segment Margin** = *CM of segment – traceable fixed costs of segment*
 - ASB requires companies in Canada to include segmented financial data in annual reports
 - Contribution approach doesn't comply w/ GAAP, so managers choose absorption approach instead

RESPONSIBILITY CENTRES

- **Responsibility centre** → any business segment whose manager has control over cost or profit or the use of investment funds
- Three primary types of responsibility centres:
 - **Cost centre** → segment whose manager has control over cost, but not revenues or investment funds
 - **Profit centre** → control over cost and revenues, but no control over the use of investment funds
 - **Investment centre** → control over cost, revenues and use of investment funds
- **Benefits of decentralization:**
 - Lower-level managers gain experience in decision making
 - Top management freed to concentrate on strategy
 - Decision-making authority leads to job satisfaction
 - Lower-level decision often based on better info
 - Lower-level managers can respond quickly to customers
- **Disadvantages:**
 - May be a lack of coordination among autonomous managers
 - Lower-level managers may make decision without seeing the “big picture”
 - Lower-level managers objectives may not be those of the organization
 - May be difficult to innovate ideas in the organization
- **Transfer price** → price charged when one segment of a company provides g/s to another segment of the company
 - Fundamental objective in setting transfer prices is to motivate managers to act in best interests of overall company
 - **Suboptimization** → overall level of profitability that is less than a segment or a company is able of making (occurs when managers do not act in the best interest of a company, or even their segments)

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- Three approaches to setting transfer prices:
 - Negotiating transfer prices
 - Transfers at the cost to the selling division
 - Transfers at market price
- **Negotiated transfer price** → transfer price agreed on by buyer/seller
- **Range of acceptable transfer prices** → range of transfer prices w/in which the profits of both the selling & purchasing division would increase as a result of transfer

Situation: Selling division...	Min P selling division would accept	Max P buying division would pay
w/ idle capacity	Transfer Price \geq variable cost per unit	Transfer price \leq cost from outside supplier If no outside supplier, Transfer price \leq expected net profit from sale to final customer
w/ no idle capacity	Transfer Price	
w/ some idle capacity	\geq variable cost per unit + [(Total contribution margin on lost sales)/(# of units transferred)]	

- General-transfer-pricing Rule:

Transfer price = Additional outlay cost per unit incurred because transferred
+ opportunity cost per unit to the organization because of transfer

- No excess capacity General rule: when selling division is operating at capacity, transfer price should be set at market price
- Excess capacity General rule: when selling division is operating below capacity, the min transfer price is the variable cost per unit

EVALUATING INVESTMENT CENTRE PERFORMANCE: RETURN ON INVESTMENT

- **Return on investment (ROI)** → operating income divided by average operating assets; also equals margin times turnover; the higher the return on investment of a segment, the greater the profit per dollar invested

$$\text{ROI} = \frac{\text{Operating income}}{\text{Average operating assets}} = \text{Margin} \times \text{Turnover} = \frac{\text{Operating income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average Operating Assets}}$$

- **Operating income** → income before interest and income taxes have been deducted
- **Operating assets** → cash, accounts receivable, inventory, PP&E & all other assets held for productive use in an organization
- Criticisms of ROI:
 - In absence of balanced scorecard, management may not know how to increase ROI
 - Managers often inherit many committed costs over which they have no control
 - Managers evaluated on ROI may reject profitable investment opportunities

RESIDUAL INCOME

- **Residual income** → operating income that an investment centre earns above the required return on its operating assets

Residual Income = Operating income – (Avg. operating assets x min. req. rate of return)

- *Economic value added* → concept similar to residual income

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- Residual income approach has one major disadvantage: cannot be used to compare performance of divisions of different sizes
- **Balanced scorecard** → integrated set of performance measures that is derived from and supports the organization's strategy
 - Three methods for outperforming competitors:
 - Cost leadership, differentiation, focus or niche

Topic 10: Relevant Costs for Decision Making

- **Relevant costs** → cost that differs b/t alternatives & will be incurred in future; synonymous w/ avoidable cost & differentiable cost
- **Avoidable costs** → cost that can be eliminated by choosing 1 alternative over the other; synonymous w/ relevant & differential cost
- Avoidable costs are relevant
- Unavoidable costs are irrelevant costs (ie. sunk costs & future costs that don't differ b/t alternatives ALWAYS irrelevant)
- Relevant Cost Analysis: 2-Step Process
 - Eliminate costs & benefits that do not differ between alternatives
 - Use the remaining costs & benefits that differ between alternatives in making the decision; costs that remain are the differential, or avoidable costs

KEEP OR DROP PRODUCT/SEGMENT

- Relevant costs & benefits:
 - Contribution margin (CM) lost if dropped
 - Fixed costs avoided if dropped
 - CM lost/gained on other products/segments
- Irrelevant costs:
 - Allocated common costs
 - Sunk costs
- Decision rule:
 - **KEEP IF:** CM lost (all products/segments) > fixed costs avoided + CM gained (other products/segments)
 - **DROP IF:** CM lost (all products/segments) < fixed costs avoided + CM gained (other products/segments)
- **Vertical integration** → involvement of a single company in more than one of the steps in the value chain from production to basic raw materials to the manufacture & distribution of a finished product
- **Make or buy decision** → whether an item should be produced internally or purchased from supplier

MAKE OR BUY

- Relevant Costs
 - Incremental costs of making the product (variable & fixed)
 - Opportunity cost of utilizing space to make the product
 - Outside purchase price
- Irrelevant costs
 - Allocated common costs
 - Sunk costs
- **Total relevant costs of making** = incremental costs + opportunity costs
- Decision rule:
 - **MAKE IF:** total relevant costs of making < outside purchase price
 - **BUY IF:** total relevant costs of making > outside purchase price
- **Special order** → one-time order not considered part of company's normal ongoing of business

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ACCEPT OR REJECT A SPECIAL ORDER

- Relevant Costs & Benefits
 - Incremental costs of filing order
 - Opportunity cost of filing order
 - Incremental revenues from the order
- Irrelevant costs
 - Allocated common costs
 - Sunk costs
- **Total relevant costs** = *incremental costs + opportunity costs*
- Decision rule:
 - **ACCEPT IF:** incremental revenues > total relevant costs
 - **REJECT IF:** incremental revenues < total relevant costs
- **Joint products** → 2 or more items that are produced from common input
- **Joint product costs** → costs that are incurred up to the split-off point in producing joint products
- **Split-off point** → that point in manufacturing process where some or all of the joint products can be recognized as individual products
- **Sell or process further decision** → whether joint product should be sold or processed further & sold later in a different form

SELL OR PROCESS FURTHER

- Relevant Costs
 - Incremental costs & revenues of further processing
- Irrelevant costs
 - Allocated joint product costs
- Decision rule:
 - **PROCESS FURTHER IF:** incremental revenues > incremental costs of further processing
 - **SELL @ SPLIT-OFF IF:** incremental revenues < incremental costs of further processing
- **Constraint** → limitation under which a company must operate
 - Company should select a product mix that max's total CM earned b/c fixed costs usually remain unchanged
 - Should promote products that earn highest CM in relation to constraining resource (rather than those w/ highest CM))

$$\text{Profitability index} = \frac{\text{contribution margin per unit}}{\text{quantity of constrained resource required per unit}}$$

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Topic 11: FORMULAS

Chapter 2:

Total Manufacturing cost = DM + DL + Manufacturing overhead

COGM = Total manufacturing cost + beginning work in process inventory - ending work in process inventory

Chapter 3:

Unit product cost = total manufacturing cost / total units produced (L, KG, bottles)

Beginning of period: Predetermined overhead rate = $\frac{\text{Estimated total manufacturing overhead cost}}{\text{Estimated total units in the allocation base}}$

During the period: Total manufacturing OH applied = Predetermined overhead rate * Actual total units of the allocation base incurred during the period

At the end of the period: Underapplied (over-applied) = Actual total manufacturing overhead cost – Total manufacturing overhead applied

Chapter 4:

Equivalent Units = # of partially completed units X percentage completed

Weighted average method:

Equivalent units of production = units transferred to the next department or to finished goods + Equivalent units in ending WIP

Cost per equivalent unit = $\frac{\text{cost of beg. WIP inventory} + \text{Cost added during period}}{\text{Equivalent Units of production}}$

Chapter 5:

First stage allocation = Costs * distribution of resource consumption across activity cost pools

Activity Rate (found for activity cost pools) = Total cost / total activity

ABC Cost (Second stage allocation) = Activity rate * activity

Product margin (calculated when costs are assigned to products) = Sales – DM – DL – OH costs

Product margin (using traditional system) = Rate * allocation base – COGS

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Chapter 6:

$$a + bX = Y$$

Variable cost (high low method) = Change in cost/change in activity

Fixed cost (high low method) = Total cost- variable cost element

- where total cost & corresponding x value for the variable portion are either the low or high activity

Chapter 7:

Contribution margin = Sales – Variable cost

Operating Income = Sales – Variable Expense – Fixed Expense

Contribution margin ratio = Total Contribution margin / Total Sales = Unit CM / Unit Selling Price

Sales = Variable Expense + Fixed Expense + Profit, where profit = 0

$$\text{BEP in units sold} = \frac{\text{Fixed expenses}}{\text{Unit contribution margin}}$$

$$\text{BEP in total sales dollar} = \frac{\text{Fixed expense}}{\text{CMR}}$$

$$\text{Units sold to attain target profit} = \frac{\text{Fixed expense} + [\text{Target after tax profit}/(1-\text{tax rate})]}{\text{Unit Contribution Margin}}$$

$$\text{Dollar sales to attain target profit} = \frac{\text{Fixed expense} + [\text{Target after tax profit}/(1-\text{tax rate})]}{\text{CMR}}$$

$$\text{Margin of safety \%} = \frac{\text{Margin of safety in dollars}}{\text{Total budgeted (or actual) sales}}$$

$$\text{Degree of operating leverage} = \frac{\text{Contribution margin}}{\text{Operating Income}}$$

Indifference point: CM * Q (num of units being solved for) – TFC

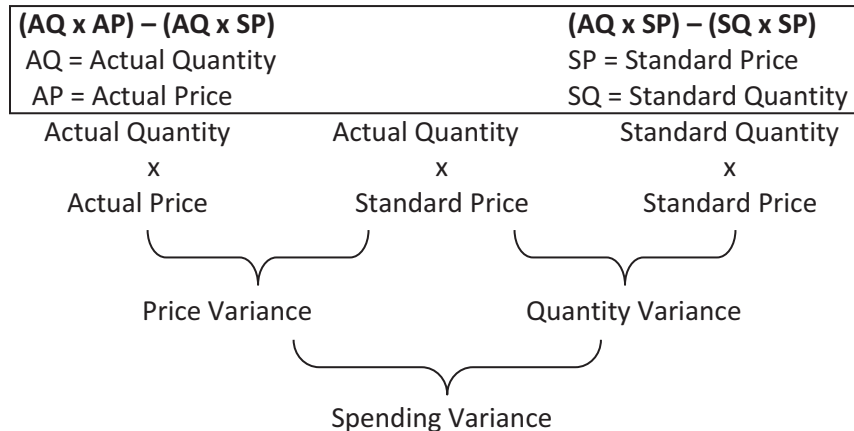
$$\% \Delta \text{Operating income} = \frac{\% \text{ change in sales}}{\text{Degree of operating leverage}}$$

$$\text{Quantity} = \frac{\Delta \text{ Fixed expenses}}{\Delta \text{ CM}}$$

$$\text{Overall CM Ratio} = \frac{\text{Total contribution margin, all products}}{\text{Total sales, all products}}$$

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Chapter 10:



Predetermined OH rate = $\frac{\text{Estimated total manufacturing OH cost}}{\text{Estimated total units in the base (MH, DLH, etc...)}}$

Predetermined OH rate = $\frac{\text{OH from flexible budget at the denominator level of the activity}}{\text{Denominator level of activity}}$

Chapter 11:

Volume variance = fixed portion of predetermined OH x (denominator levels – standard hrs allowed)

Transfer price = Additional outlay cost per unit incurred because transferred + opportunity cost per unit to the organization because of transfer

ROI = $\frac{\text{Operating income}}{\text{Average operating assets}} = \text{Margin} \times \text{Turnover} = \frac{\text{Operating income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Average Operating Assets}}$

Residual Income = Operating income – (Average operating assets x minimum required rate of return)

Chapter 12:

MAKE OR BUY: Total relevant costs of making = incremental costs + opportunity costs

ACCEPT OR REJECT A SPECIAL ORDER: Total relevant costs = incremental costs + opportunity costs

Profitability index = Contribution margin per unit / Quantity of constrained resource required per unit

Topic 12: Practice Questions

Chapter 7 – 2010 – Problem 1

ABC Company produces two products. The marketing department expects that the company can sell 1,000 units of product A and 1,100 units of product B per month. The company provides the following information:

	Product A	Product B
Unit sales price	\$210	\$270
Unit variable cost	\$110	\$120

Total fixed cost for 5 machines used to manufacture both products is \$120,000. It takes 1 machine hour to produce product A and 2 hours to produce product B. Each machine has a capacity of 680 hours/month.

- A) (4 marks) Assuming that sales mix is constant (ie. the company will sell 1.1 unit of product B for each unit of product A sold), how many units of product A and B should the company produce each month at the break-even point?
- B) (4 marks) One machine was broken unexpectedly and it will take a long time to get a new machine, so only 4 machines are in operation now. To maximize profit, how many units of product A and B should the company produce? What is the total profit (assume fixed costs remain unchanged).
- C) (6 marks) Before ABC gets a new machine to replace the one broken, the company can temporarily outsource product A (only A can be outsourced) at total costs of \$160/unit. Does the company need to change the production plan you suggested in b)? If so, how many units of product A and B now should be produced or outsourced? What's the total profit?

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Relevant Cost Analysis in a Variety of Situations – Chapter 12

Ovation Company has a single product called a Bit. The company normally produces and sells 60,000 Bits each year at a selling price of \$32 per unit. The company's unit costs at this level of activity are:

Direct materials	\$10.00
Direct labour	4.50
Variable manufacturing overhead	2.30
Fixed manufacturing overhead	5.00
Variable selling expenses	1.20
Fixed selling expenses	3.50
Total cost per unit	<u>\$26.50</u>

1. Assume that Ovation Company has sufficient capacity to produce 90,000 Bits each year without any increase in fixed manufacturing overhead costs. The company could increase its sales by 25% above the present 60,000 unit each year if it were willing to increase the fixed selling expenses by \$80,000. Would the increased fixed selling expenses be justified?
2. The company has 1,000 Bits on hand that have some irregularities and are therefore considered to be "seconds." Due to the irregularities, it will be impossible to sell these units at the normal price through regular distribution channels. What unit cost figure is relevant for setting a minimum selling price? Explain.
3. Due to a strike in its supplier's plant, Ovation Company is unable to purchase more material for the production of Bits. The strike is expected to last for two months. Ovation Company has enough material on hand to operate at 30% of normal levels for the two month period. As an alternative, Ovation could close its plant down entirely for the two months. If the plant were closed, fixed manufacturing overhead costs would continue at 60% of their normal level during the two-month period and the fixed selling expenses would be reduced by 20%. What would be the impact on profits of closing the plant for the two month period?
4. An outside manufacturer has offered to produce Bits and ship them directly to Ovation's customers. If Ovation Company accepts this offer, the facilities that it uses to produce Bits would be idle; however, fixed manufacturing overhead costs would be reduced by 75%. Since the outside manufacturer would pay for all shipping costs, the variable selling expenses would be only two-thirds of their present amount. Compute the unit cost that is relevant for comparison to the price quoted by the outside manufacturer.

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Chapter 10 - 2010 – Problem 3

DEF company manufactures a single product, DEF-1. It uses standard costing system to track the variances of different costs. Overhead costs are allocated based on labour hours. Each unit of DEF-1 needs 2 kilograms materials. Standard costs per unit for the product are as follows:

	Standard Quantity	Standard Price	Standard Cost/Unit
Materials	2 kilograms	\$?	\$?
Labor	1 labour hour	\$ 10	\$ 10
Overhead	1 labour hour	\$ 30	\$ 30

The operating data shown below is for the fiscal year 2009:

Units budgeted to be manufactured and completed: 10,000 units

Units actually manufactured and completed: 8,000 units

Actual total purchase cost of materials: \$20,000

Actual purchases of materials in kilograms: 20,000 kilograms

Actual materials used in production: 18,000 kilograms

Materials Quantity (usage) variance: \$2,400 Unfavourable

Actual hours of labour : 6,000 hours.

Labour rate Variance: \$6,000 unfavourable.

Answer the following questions:

- 1) (2 marks) What is the standard price of materials per unit?
- 2) (2 marks) What is the material price variance?
- 3) (2 marks) What is the total actual amount of labor costs?
- 4) (2 marks) What is the labor efficiency variance?
- 5) (4 marks) What are the variable overhead spending and efficiency variances?
- 6) (3 marks) Briefly list THREE advantages and THREE potential problems with the use of standard costs.