

## Chapter 1 and 2

### Schedule of COGM:

Beginning Direct materials  
+ Purchased Direct materials  
= Direct materials available for use  
- Ending Direct materials  
= Direct materials used  
  
+ Direct Manufacturing Labour  
  
+ OH costs  
  
= Total manufacturing OH costs  
+ Beginning WIP  
  
= Total manufacturing OH costs to account for  
- Ending WIP  
= COGM

+ Beginning FG  
= COGAS  
- Ending FF  
= COGS

### Merchandising Company

\*Only inventory is Finished Goods

Merchandise FG (BI)  
+ Purchases  
= COGAS  
- Ending Inventory (FG)  
  
= Cost Of Sales

Ending Inventory:

Merchandise Inventory(FG)  
- Sales  
  
= Merchandise FG ending inventory

## Chapter 5

### Traditional Costing:

Total overhead costs / Direct manufacturing Labour hour = Predetermined Rate

Unit Cost = Direct Materials + Direct Labour(\*labour required) + MOH (\*labour required)

Labour Hours / Units = Hour required per unit

### ABC Costing:

<u>Activity Base(1)</u>	<u>Cost Driver(2)</u>	<u>Total Budget Cost(3)</u>	<u>Activity(4)</u>	<u>Pool Rate</u>
Purchase-Orders	#orders	Cost from departments'	actual #	(3)/(4)
Maintenance	#Machinehrs	" "	" "	" "
Setting Up	#Setups	" "	" "	" "

### 4 Hierarchies:

1. Facility-Sustaining Costs- Executive Salaries
2. Product-Sustaining Costs- Quantity of Setups
3. Batch-Level Costs- Number of batches- inspection also included
4. Output Unit-Level Costs- total units, kilos, litres, etc.

### ABC Benefits

1. Reliable budgeted costs
2. Clearer picture of which product is allocating what costs
3. Elimination of cross-subsidization
4. Profitability
5. Performance Evaluation more reliable

## Chapter 17

Process Costing:

Manufacturing Company- units receive similar or same amount of Direct Material and conversion costs

Homogenous Company- products like oil, milk, tv, dish- direct material and conversion costs

Direct Costs- assigned

Indirect costs- allocated

3 methods to calculate the cost driver rates for the direct materials used:

1. Weighted Average Method

2. FIFO method

3. Standard Costing Method

1. Weighted Average Method

<u>Flow Of Production</u>	<u>Physical Units Transferred-In</u>	<u>Direct Material</u>	<u>Conversion Cost</u>
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Beginning WIP

Transferred In during the period

Total Units to account for

Completed and Transferred Out

Ending Work In Process

Total Units to accounted for

Units completed to date

Cost for EU

Beginning Work In Process

Cost added during the period

Total Cost to account For

Divided by Equivalent Units

Cost Per Equivalent Unit

Assignment Of costs:

Completed and Transferred Out

Ending Work In Process

Total cost accounted for

## 2.) FIFO Method

Flow Of Production   Physical Units   Transferred-In Costs   Direct Material   Conversion Costs

Beginning WIP

Transferred In units during the period

To account for

Completed and Transferred Out:

From Beginning WIP

(Beginning WIP unit \* (100% - transferred in %; 100% - Direct Material %; 100% - Conversion %))

Started and Complete

Ending WIP

Accounted For

Work done in current period only

Cost for EU

Beginning WIP

Costs added during current period

Divide by EU done in current period

(Divide by only the cost that was added during period)

Cost per Equivalent Unit

To Costs to Account For

Completed and Transferred Out:

Beginning WIP

Cost added to Beginning WIP in current period

Total From Beginning Inventory

Started and Completed

Total Costs of Units Completed and Transferred Out

Ending WIP

Total Costs accounted For

\*\*\*\* Standard Method is exactly same as FIFO method; just a few changes

## Chapter 7 and 8

### Direct Material Variance

<b>Actual Quantity</b>	<b>Actual Quantity</b>	<b>Budgeted Input allowed for actual output</b>
<b>* Actual Price</b>	<b>* Budgeted Price</b>	<b>* Budgeted Rate</b>
Price Variance	Quantity (Efficiency) Variance	

### Flexible Budget Variance

### Direct Labour Variance

<b>Actual Quantity</b>	<b>Actual Quantity</b>	<b>Budgeted Input Allowed For actual output</b>
<b>* Actual Price</b>	<b>* Budgeted Price</b>	<b>* Budgeted Rate</b>
Rate Variance	Efficiency Variance	

### Flexible Budget Variance

- \*\*\*\* Actual DML Hours = the same actual quantity hours Fixed OH and Variable OH use
- \*\*\*\* Allocated DML Hours= the same budgeted input hours for actual output are used for Allocated Fixed and Variable OH
- \*\*\*\*\* Direct Materials Quantity/Efficiency Variance breaks down to: Direct Material Mix Variance and Direct Material Yield Variance

### Mix and Yield Variances

\*\*Done for each product

<b>Actual Total Qty Used</b>	<b>Actual Total Qty Used</b>	<b>Budgeted Qty to Be Used</b>
<b>*Actual Input Mix%</b>	<b>*Budgeted Input Mix%</b>	<b>*Budgeted Input Mix%</b>
<b>*Budgeted Rate</b>	<b>*Budgeted Rate</b>	<b>*Budgeted Rate</b>
Total Mix Variance	Total Yield Variance	

### Total Efficiency/Quantity Variance



- 1. Fixed OH control.....285 k
  - Salaries, lease, tax, insurance....285k
- 2. WIP Control.....230k
  - Fixed OH Allocated.....230 k
- 3. Fixed OH allocated.....230 k
  - Fixed OH Spending Variance.....9k
  - Fixed OH Production Variance.....46k
  - Fixed OH Control.....285k

Record variance for the period

- 4. COGS.....9k
  - Fixed Overhead Spending Variance....9k

Write-Off unfavourable variance to COGS

- 5. Fixed OH Production Volume Variance.....41.4k
  - COGS.....41.k

To write-off favourable variance to COGS

Variable Overhead Variance

<b>Actual Cost:</b>		<b>Flexible Budget:</b>	<b>Allocated:</b>
Actual Input	Actual Input	Budgeted Input allowed for actual	Budgeted Input
<u>*Actual Rate</u>	<u>*Budget Rate</u>	<u>output * Budgeted Rate</u>	<u>allowed for actual</u>
			<u>output * Budget Rate</u>

Spending Variance      Efficiency Variance      Never A Variance  
 Flexible Budget Variance

Total VMOH Variance= Actual Cost – Allocated Cost

**\*\*\*\*Variable Efficiency Variance Reasons:**

- 1. Machine Malfunction
- 2. Poor Production Scheduling
- 3. Poor Quality of Materials

**\*\*\*\*Variable Spending Variance Reasons:**

- 1. Fringe benefits- paid for idle time

**2. Statutory holidays- have limited workers working**

**3. Statutory holiday- lower utility costs**

**4. Classification change- indirect to direct cost**

**5. Variable OH includes- variable utilities cost, quantities of supplies used, manufacturing labour portion of vmoh, and purchase negotiations with supplier**

**\*\*\*Variances- Favourable are credited, Unfavourable are debited**

**\*\*\*\*\* Flexible Budget Variance VOH – Efficiency Variance VOH = Spending VOH Variance**

**\*\*\*\*\*Efficiency Variance VOH / VOH Rate = Excessive hours worked**

**\*\*\*\*\* Actual Hours worked- Excessive hours worked= Budgeted hours that was allowed for work**

**\*\*\*\*\* Actual Hours Worked= Actual Cost for working / Actual Working Rate**

## Chapter 16

- Revenue allocated to distinct types of sales but are not traceable
- Internal Revenue Allocation Occurs when bundles are sold

2 alternatives to allocating Revenue:

### 1.) Stand Alone Method:

1. Standalone (Selling Price)- fails to recognize differences in pricing policies or strategic classifications- best for cost-leadership strategy
2. Unit manufacturing Costs- reliable depending on costing system used (cross-subsidization a problem if traditional costing used)- best choice for cost-plus pricing policy
3. Physical Units- Simple but not sensible if products unit prices are wildly different
4. Standalone product revenue- best choice for target pricing policy

A.) Standalone Selling Price- Do it for as many products there

$(\text{Stand-alone price}) / (\text{Total Stand-alone price of all products}) * \text{Suite Price}$

B.) Unit Manufacturing Cost- Do it for as many products that are there

$(\text{Unit Price}) / (\text{Total Unit price for all products}) * \text{Suite Price}$

C.) Physical Units- Allocate the price of suite evenly to as many products

D.) Stand-Alone Product Revenues- Do it for as many products there

$(\text{Stand-Alone Revenue for Product}) / (\text{Total Revenue for Product Revenue}) * \text{Suite Price}$

### 2.) Incremental Revenue Allocation Method

- Rank the individual products in a bundle first and then uses the ranking to allocate the bundled revenues

-Ranks:

1. First Rank- Primary Product

2. Second Rank- First Incremental Product

3. Third Rank- Second Incremental Product

\*\*Stand-Alone Price of rank 1 is allocated, then Stand-Alone price of rank 2 (if there is enough space in the suite to allocate the full stand-alone price) and then Suite price minus allocated revenue for the third rank

- 3 ways to decide ranks:

1. Survey Customers

2. Use Internal Data

3. Top management decides

**2 Other Allocation Methods(Shapley Method):**

**1.) Shapley Method- used if equal quantities of the products are sold in the bundle**

**2.) Weighted Shapley Method- Used when products in bundles don't sell equally**

**\*\*\*Shapley Method overcomes Zero-Sum Game issue**

**1. Shapley Method- Allocates the product as primary product and first incremental product within the suite and adds the 2 and then divides by 2 to get the cost.**

**2. Weighted Shapley Method- Allocates by getting the percentage of each Stand-alone revenue and multiplies by the suite price, and then adds the 2 prices and divides by 2.**

**Variances For Revenue**

- **Static Budget Variance = (Actual CM – Static Budget CM)**
- **Flexible Budget Variance= (Actual CM – Flexible Budget CM)**
- **Sales Volume Variance= (Actual Sales QTY in Units – Static Budget Sales QTY in Units) \* Budgeted Contribution Margin Per Unit**

**i.) Sales- Volume Variance breaks down to :**

- 1. Sales Mix Variance**
- 2. Sales-Quantity Variance**

**Sales Mix and Sales-Quantity Variance**

**\*\*\*Do it for each product**

<b>Actual Units of All Products Sold</b>	<b>Actual Units of all products sold</b>	<b>Budgeted Units of all</b>
<b>* Actual Sales Mix</b>	<b>* Budgeted Sales Mix</b>	<b>products sold</b>
<b>* <u>Budgeted Contribution Margin/unit</u></b>	<b>* <u>Budgeted CM/Unit</u></b>	<b>* Budgeted Sales mix</b>
		<b>* <u>Budgeted CM/unit</u></b>
	<b>Sales Mix Variance</b>	<b>Sales-Quantity Variance</b>
	<b>Sales-Volume Variance</b>	

**\*\*\*\*\*Sales-Quantity Variance breaks down to:**

- 1. Market Share Variance- variances are in managers control and used to evaluate them**
- 2. Market Size Variance- Outside managers control**

### Market Share and Size Variance

Actual Market Size	Actual Market Size	Budgeted Market Size
* Actual Market Share %	* Budgeted Market Share%	*Budgeted Market Share%
<u>*Budgeted Average CM/Unit</u>	<u>* Budgeted Avg CM/Unit</u>	<u>*Budgeted Avg CM/Unit</u>

Market Share Variance

Market Size Variance

Sales-Quantity Variance

### Customer Profitability Analysis

Revenues	xx
Sales Discounts	<u>xx</u>
Net Sales	xx
(Standard) COGS	<u>xx</u>
Gross Margin	xx
Customer Relating Costs:	
Purchase Handling	xx
Order taking	xx
Delivery Vehicles	xx
Rush orders	xx
Visits to customers	<u>xx</u>
Total Costs	<u>xx</u>
Customer-Level	
Operating Income	<u>xx</u>

### Drop Customer

\*\*\*Compare Total costs(all departments) under keep customer vs Particular Departments cost(Drop Customer)

<u>Keep Customer</u>	<u>Drop Customer</u>	<u>Difference in savings or loss from dropping</u>
Sales (Revenue)	Loss on sales	(Loss)
Operating Costs		
Total Operating Costs		
Operating Income		

**Add a Customer (Replace)**

**\*\*focus is on particular department only**

	<b><u>Dropping Account</u></b>	<b><u>Adding Account</u></b>
Revenue		
COGS		
Operating Costs + Corporate Costs		
Total Costs		
Effect On Operating Income (Loss)		

**Add or Drop Branch**

**\*\*Focus on all the departments in that particular branch**

	<b><u>Costs saved and loss in Revenues from dropping Branch</u></b>	<b><u>Incremental Revenue and Operating costs from adding Branch</u></b>
Revenue		
COGS		
Operating Costs + Corporate		
Total Costs		
Effects on OI (Loss)		

## Chapter 9 and 10

### Theoretical Capacity Denominator Level:

1. No delays or shutdown
2. CRA opposes it
3. Increases production volume variances
4. Reduces the amount of FOH assigned to inventory
5. Products to be produced at full capacity/hr \* hours a day \* 30 days
6. Used to measure the cost of the product
7. Production-Volume Variance= (Denominator Level in Outputs units – Actual Output Units)  
\* Budgeted Fixed MOH rate per output unit  
i.) if number is positive then its Unfavourable
8. GAAP opposes it

### Practical Capacity Denominator Level:

1. Accounts for shut downs in factory- holidays, maintenance, etc
2. Also called off-limited idle capacity
3. GAAP and CRA recommend this over Theoretical
4. Used to measure the cost of the product
5. Production-Volume Variance= (Denominator Level in Outputs units – Actual Output Units)  
\* Budgeted Fixed MOH rate per output unit
6. Product to be produced(net of off-limit idle capacity)/hr \* hours a day \* days of operation  
(net of off-limit idle)

### Normal Capacity Utilization:

1. Can face downward demand spiral
2. GAAP recommended
3. Measures the capacity over a period of time (2 or 3 years)
4. Not useful for performance evaluation
5. No feedback
6. Lower income than master budget
7. Production-Volume Variance= (Denominator Level in Outputs units – Actual Output Units)  
\* Budgeted Fixed MOH rate per output unit
8. Used to set selling price

### Master Budget Capacity:

1. Denominator level usually lower or close to actual sales
2. GAAP does not prefer it
3. CRA prefers it for tax purpose
4. Faces downward demand spiral- as master budget output goes down fixed costs per unit increases
5. States higher income than all the other capacities
6. Used to measure selling price
7. Production-Volume Variance= (Denominator Level in Outputs units – Actual Output Units)  
\* Budgeted Fixed MOH rate per output unit

### 3 Product Costing Alternatives:

1. Variable Costing(Direct Costing)- Includes all variable manufacturing costs into inventory
  - i.) Variable Direct materials
  - ii.) Variable Direct Labour
  - iii.) Variable MOH
2. Absorption Costing (Full Costing)- Includes all variable manufacturing costs and fixed into inventory
  - i.) Variable Direct Materials
  - ii.) Variable Direct Labour
  - iii.) Variable MOH
  - iv.) Fixed MOH- Fixed MOH / Denominator Level
3. Throughput Costing(Strict Variable Costing)- only includes direct materials in inventory
  - i.) expenses every other cost
  - ii.) can eliminate deferral of manufacturing fixed costs

- Absorption Costing uses normal capacity utilization
- Absorption costing has production volume variances
- Variable Costing does not have production volume variances
- Income Effects:
  1. Production = Sales Variable and Fixed have same income
  2. Production > Sales Variable low income Fixed High Income
  3. Production < Sales Variable High Income Fixed Low income

### Differences In operating Income

**(Absorption Costing Operating Income – Variable Costing Operating Income) = (Fixed Manufacturing Costs In Ending Inventory – Fixed Manufacturing Costs in Beginning Inventory)**

### Variable Costing Break Even

- $Q$  (sales in units) =  $\text{Total Fixed Costs} + \text{Target Operating Income} / \text{Contribution Margin per unit}$
- $x$  (sales in dollar) =  $\text{Variable expense\% } x + \text{Fixed expense in dollar} + \text{target profit in dollar}$
- $\text{Fixed Expense} / \text{CM per unit} = \text{sales in units}$
- $\text{Fixed Expense} / \text{CM Ratio} = \text{Sales in dollar}$
- $\text{Margin of safety} = \text{Budgeted sales} - \text{Breakeven dollar}$
- i.)  $\text{Breakeven dollar} = \text{Fixed Expense} / \text{CM ratio}$

### Absorption Costing Break Even

- $Q(\text{Sales in Units}) = (\text{Total Fixed Cost} + \text{Targeting Operating Income} + (\text{Fixed MOH cost rate} * (\text{Breakeven sales in units} - \text{units produced}))) / \text{CM per unit}$

### Linear Cost Function

1.  $Y = a + bx$

- $a = \text{fixed cost (the y-intercept)}$
- $b = \text{variable cost (slope: rise over run)}$
- $Y = \text{Total (Mixed) Cost}$

#### A.) High- Low method:

- $\text{Variable Cost} = \text{change in cost}(\text{High cost} - \text{Lows Cost}) / \text{Change in Activity}(\text{High activity} - \text{low activity})$
- Pick high or low activity and the high or lows activity cost

#### B.) Graph method

- Y-intercept is fixed cost
- Variable is the slope

## Cost Estimation Methods:

### **1. Industrial Engineering Method**

- Also called “work measurement method”
- Uses time and motion studies
- Can be time-consuming and costly
- Engineer makes an analysis
- example- equipment usage, labour requirement

### **2. Conference Method**

- Uses analysis and opinions gathered from various departments of an organization
- Can cause “paralysis by analysis”

### **3. Account Analysis Method**

- Widely used in industry
- May be distortions due to the time lag between incurring a cost and receiving benefits
- each account is classified as fixed or variable cost
- fixed costs is the SUM of all the classifications labeled fixed
- variable cost is the SUM of the classifications of variable costs Divided by the TOTAL ACTIVITY

### **4. Quantitative Analyses**

- High-Low Method:  $y = a + bx$
- Ordinary Least Squares Linear Regression Method