

# ACC2203 Introduction to Managerial Accounting Handouts

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## Chapter 1 – Managerial Accounting & Cost Concepts

### Manufacturing Cost

- **Direct Material (DM)**
  - Raw materials that can become an integral part of the finished product
  - e.g. tire for a car
  - Costs can be traced directly / individually to the product
- **Direct Labor (DL)**
  - Labor cost to manufacture the product (“touch labor”)\*
  - E.g. wages of automobile assembly workers
  - It can be easily traced to individual units of product
  - \* Labor that is directly involved in producing the product
- **Manufacturing Overhead (MOH)**
  - All other manufacturing costs except DM and DL
  - Cannot be traced directly to the individual or specific product
  - Classification:
    - *Indirect Materials:* materials used to support the production process that are insignificant cost / difficult to trace to particular products, e.g., cleaning supplies in automobile assembly plant
    - *Indirect Labor:* labor that doesn’t directly involve in production work, e.g., factory security guard
    - *Other MOH:* e.g., depreciation\* (factory related), repair and maintenance cost, etc.
      - \* Depreciation, insurance, and property taxes related to Sales and Administration are not part of MOH.

### Non-Manufacturing Cost

- **Marketing and Selling Cost**
  - Costs incurred to secure orders and get the finished product to customers
  - E.g., advertising fee, freight cost, sales commissions, etc.
- **Administrative Cost**
  - General Management (Executive, organization, clerical costs) which are not related to manufacturing or marketing
  - E.g., CEO’ salary, controller’s salary, cost of having an administrative building

### Cost Behavior

→ How a cost reacts to changes with the level of activity

- **Variable Cost (VC)**
  - Varies, in total, in direct proportion to changes in the level of activity
  - If the activity goes up, the total variable cost goes up while the variable cost per unit is the same
- **Fixed Cost (FC)**
  - Remains constant, in total, regardless of changes in the level of activity

- If the activity goes up, total fixed cost remains the same while average fixed cost decreases and vice versa
- **Mixed Cost = Total Cost = Total VC + Total FC**
  - $Y = A + BX$
  - **Y** = Total mixed cost; **a** = total Fixed Cost; **b** = Variable Cost per Unit of activity; **x** = level of activity

Traditional vs Contribution Format Income Statement

<b>Traditional Income Statement</b>		<b>Contribution Format Income Statement</b>	
Revenue		Sales	
COGS*	(-)	VC	(-)
<hr/>		<hr/>	
Gross Profit		Contribution Margin	
Selling & Administrative Expenses	(-)	FC	(-)
<hr/>		<hr/>	
NOI / NOL		NOI / NOL	

\* **Cost of Goods Sold (COGS)** = Beginning inventory + Purchases – Ending Inventory

- COGS includes VC (DM, DL, Variable MOH) and FC (Fixed MOH)

## Chapter 2 – Job-Order Costing: Allocation Based Method

### Calculating Overhead Amounts using Allocation Base Method

- **Estimated OH**
  - Total OH we expect to incur during a period (estimate for the coming period)
  - It is used to calculate Predetermined OH Rate (POHR) at the beginning of period
  - **Predetermined Overhead Rate (POHR)**
    - $$\text{POHR} = \frac{\text{estimated total manufacturing OH}}{\text{estimated total amount of allocation base}}$$
- **Applied OH**
  - OH costs applied to product
  - Applied OH = POHR \* Actual amount of allocation based used
- **Actual OH**
  - Total actual OH incurred at the end of fiscal period

## Chapter 3 – Job Order Costing: Cost Flows and External Reporting

### Job-Order Costing

#### Cost of Goods Manufactured Schedule

#### Cost of Goods Sold Schedule

<b>Raw Materials</b>	<b>Work in Process (WIP)</b>	<b>Cost of Goods Sold</b>
Beginning RM Inventory	Direct Materials	Beginning FG Inventory
Purchases of RM (+)	Direct Labor (+)	COGM (+)
Total RM Available	Applied MOH (+)	Cost of Goods Available for Sale
Ending RM Inventory (-)	Beginning WIP Inventory (+)	Ending FG (-)
Total RM Used	Total WIP	Unadjusted COGS
Indirect RM in MOH (-)	Ending WIP (-)	Underapplied/Overapplied OH (+/-)
Direct Materials (DM)	Cost of Goods Manufactured (COGM)	Adjusted COGS

#### Underapplied vs Overapplied OH

- **Underapplied OH** = Actual OH > Applied OH (“we did not apply enough OH”)
- **Overapplied OH** = Actual OH < Applied OH (“we applied too much OH”)

## Chapter 4 – Activity-Base Costing

### Activity-Based Costing

- **Activity-Based Costing (ABC)**
  - Assign overhead costs more accurately to products by using activity cost pool (“cost bucket”)
- Activity Rates (per activity cost pool) =  $\frac{\text{estimated OH cost per activity}}{\text{total expected activity (each)}}$

Activity Measures	Activity Cost Pools	Estimated OH Costs	Expected Activities			Activity Rate
			Product A	Product B	Total Expected Activity	
Direct Labor-hours	Labor-related	\$ 800,000	100,000	400,000	500,000	\$ 1.6/DLH
Machine-hours	Machine-related	\$ 2,100,000	300,000	700,000	1,000,000	\$2.1/MH
Setups	Machine setups	\$ 1,600,000	3,000	1,000	4,000	\$400/setups
Machine-hours	General factory	\$ 2,000,000	300,000	700,000	1,000,000	\$2.00/MH

## Chapter 6 – Cost-Volume-Profit Relationships

### Cost-Volume-Profit Analysis

- Unit sales to Breakeven  $= \frac{FC}{CM \text{ per Unit}}$
  - Dollar sales to Breakeven  $= \frac{FC}{CM \text{ Ratio}}$
  - Unit sales to achieve Target Profit  $= \frac{FC + \text{Target profit}}{CM \text{ per Unit}}$
  - Dollar sales to achieve Target Profit  $= \frac{FC + \text{Target Profit}}{CM \text{ Ratio}}$
  - Margin of Safety = Total Sales – Breakeven Sales
  - Margin of Safety Ratio  $= \frac{\text{Margin of Safety}}{\text{Total Sales}}$
  - NOI or Profit  $= \text{Sales} - \text{VC} - \text{FC}$   
 $= (P * Q) - (V * Q) - \text{FC}$   
 $= (P - V) * Q - \text{FC}$   
 $= (\text{CM/unit} * \text{Quantity}) - \text{FC}$   
 $= \text{Contribution Margin} - \text{FC} \quad \text{OR}$
- NOI or Profit  $= (\text{CM ratio} * \text{Sales}) - \text{FC}$
- CM Ratio  $= \frac{\text{Contribution Margin}}{\text{Sales}}$

## Appendix 6A - The High-Low Method

### High-Low Method

- Variable Cost =  $\frac{\text{Change in Cost}}{\text{Change in Activity}} = \frac{Y_2 - Y_1}{X_2 - X_1}$
- Total Cost = Total Fixed Cost + Total Variable Cost  
Y = A + BX

## Chapter 7 - Segment Reporting (Contribution Format)

### Traceable and Common Fixed Costs

- **Total Fixed Cost** → Traceable Fixed Cost + Common Fixed Cost
  - **Traceable Fixed Cost**
    - FC incurred because a segment existed.
    - If the segment had never existed, the FC would not have been incurred.
    - If the segment were eliminated, the FC would disappear.
  - **Common Fixed Cost**
    - Supports the operations of more than one segment.
    - FC that is not traceable in whole or in part to any one segment.
    - CANNOT be Allocated (it's there even if the segment does not exist)
- **Segment Margin** = Segment's Contribution Margin – Traceable Fixed Cost

### Example of Segmented Income Statement (Contribution Format)

		<u>Company</u>	=	<u>Division A</u>	+	<u>Division B</u>
Sales		\$ 500,000	=	\$ 300,000	+	\$ 200,000
VC	(-)	(\$ 230,000)	=	(\$ 150,000)	+	(\$ 80,000)
CM		\$ 270,000	=	\$ 150,000	+	\$ 120,000
Traceable FC	(-)	(\$ 171,000)	=	(\$ 90,000)	+	(\$ 81,000)
Segment Margin		\$ 99,000	=	<u>\$ 60,000</u>	+	<u>\$ 39,000</u>
Common Fixed Cost	(-)	(\$ 85,500)				
NOI		<u>\$ 13,500</u>				

## Chapter 8 – Master Budgeting

### Cash Collection (Example)

Dixon Company budgets their sales for the following three months at \$200,000, \$500,000, and \$300,000. From past experience, the company has learned that 70% of a month's sales are collected in the month of sale, another 25% are collected in the following month of sale, and 5% are uncollectible. Accounts Receivable balance from previous month is \$30,000.

	Month 1	Month 2	Month 3
Sales	\$ 200,000	\$ 500,000	\$ 300,000
Cash* (e.g. 70% of sales)	\$ 140,000	\$ 350,000	\$ 210,000
Credit Sales Collected (e.g. 25% of sales**)		\$ 50,000	\$125,000
A/R Balance***	\$ 30,000		(+)
<b>Total Cash Collection of the Month</b>	<b>\$ 170,000</b>	<b>\$ 400,000</b>	<b>\$ 335,000</b>

\* = Cash Collected on the current month.

\*\* = Credit Sales will be collected in the month following the sale.

\*\*\* = Accounts Receivable Balance from previous month.

### Production Budget (Example)

The management of ABC Supply is in the process of preparing a production budget for the second quarter. The company expects the cost of goods sold to be \$143,000, \$130,000, and \$150,000 respectively, and desires to have an ending merchandise inventory at the end of each month equal to 50% of the next month's cost of goods sold. The inventory at the end of the first quarter was \$30,000.

	Month 1	Month 2	Month 3
Budgeted Sales / Budgeted COGS	\$ 143,000	\$ 130,000	\$ 150,000
Desired Ending Inventory (e.g. 50% of next month COGS)	\$ 65,000	\$ 75,000	
	(+)		
<b>Total Needs</b>	<b>\$ 208,000</b>	<b>\$ 205,000</b>	<b>\$ (TBD)</b>
Beginning FG Inventory	(\$ 30,000)*	(\$ 65,000)	(\$ 75,000)
(-)			
<b>Total Required Production / Purchases</b>	<b>\$ 178,000</b>	<b>\$ 140,000</b>	<b>\$ (TBD)</b>

\* \$30,000 was the beginning inventory from previous month

- The goal is to calculate the actual required production (for manufacturing company) or purchase (for merchandising company)
- Ending inventory of previous month = beginning inventory of the next month

## Accounts Receivable and Accounts Payable

- **Accounts Receivable**
  - If there is a remaining balance not collected in the current month (to be collected in the next month or next period), the amount becomes the Accounts Receivable balance of that month.
  - From Cash Collection: i.e., 25% credit sales from month 3's sales will be the A/R of month 3. (It will be collected in month 4)
- **Accounts Payable**
  - If the required purchase is not paid in the same month of the purchase, the amount is the Accounts Payable balance of that month. (e.g., you owe the money and will be paying it the next month)
  - From Production Budget: i.e., The payment for the merchandise purchased is made in the month following the purchase. \$140,000 will be the Accounts Payable balance of month 2 since it will be paid on month 3.

## Cash Budget

Beginning Cash		
Cash Collection	(+)	From Cash Collection
<hr/>		
Total Cash Available		
Cash Disbursement	(-)	From Production Budget & all cash expenses paid in the current period
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Excess (Deficiency) of Cash Available		
Borrowings	(+)	If you don't have enough cash to meet certain ending balance you desire
Repayment	(-)	Including the interest repayment
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Ending Cash Balance*		<i>Equals to the beginning cash balance of the next period</i>

\*The amount that will appear on your Balance Sheet of the period

## Chapter 9 – Flexible Budgeting and Variance Analysis

### Flexible Budgets and Flexible Budget Variance Analysis

**Flexible Budget** = Planning formula (or rate) \* Actual Activity

- The amount that you should have been earning or spending (adjustment from planning budget)

**Flexible Budget Variances** = Flexible Budget – Actual Result

- Compute the difference between Flexible Budget and Actual Result
- Favorable
  - Favorable when Flexible Budget > Actual Result
  - You spend less than what you should have been spending
  - *Except for Revenue – Higher actual Revenue than in the Flexible Budget is good!*
- Unfavorable
  - Unfavorable when Flexible Budget < Actual Result
  - You spend more than what you should have been spending
  - *Except for Revenue – Higher actual Revenue than in the Flexible Budget is good!*

## Chapter 10 - Performance Measurement in Decentralized Organizations

### Performance Measurement in Decentralized Organizations

$$\text{Return on Investment (ROI)} = \frac{\text{Net Operating Income (NOI)}}{\text{Average Operating Assets (AOA)}} \quad \text{OR} \quad \text{ROI} = \text{Profit Margin} * \text{Asset Turnover}$$

DuPont System

$$\text{ROI} = \frac{\text{NOI}}{\text{Sales}} * \frac{\text{Sales}}{\text{AOA}} \quad (\text{DuPont System}) \quad \text{Profit Margin} = \frac{\text{NOI}}{\text{Sales}} \quad \text{Asset Turnover} = \frac{\text{Sales}}{\text{AOA}}$$

$$\text{Residual Income} = \text{NOI} - (\text{MRRR} * \text{AOA})$$

- NOI = NI + Taxes + Interest (if you're given the NI, add back Taxes and Interest)
- MRRR = % of company's minimum required return

**Average Operating Assets** → average value of the operating assets between the beginning and end of a period.

- Average Operating Assets = Average of Cash + A/R + Inventory + Plant, Equipment
- Current Assets

## Chapter 11 – Differential Analysis: The Key to Decision Making

### Identifying Relevant and Irrelevant Costs and Revenues (Benefits)

- Differential and incremental costs and revenues that are relevant to decision making (may affect the company's performance)
  - Focus only on relevant costs (also called avoidable costs, differential costs, or incremental costs) and relevant benefits (also called differential benefits or incremental benefits).
  - Ignore everything else including sunk costs and future costs and benefits that do not differ between the alternatives.
- **Relevant Costs and Revenues (Benefits)**
  - A cost or revenue is only relevant with respect to a particular decision.
  - A cost or revenue is relevant if it differs across alternative courses of actions.
- **Avoidable Costs**
  - Cost that can be eliminated, in whole or in part, by choosing one alternative over another.
  - Avoidable costs are relevant costs
- **Opportunity Costs**
  - Potential benefit that is given up when one alternative is selected over another.
  - Opportunity costs are relevant costs
- **Sunk Costs**
  - A cost that has already been incurred and cannot be changed regardless of what a manager decides to do.
  - Sunk costs and unavoidable costs are IRRELEVANT costs and should be ignored when making decision.

### Make or Buy

Costs of producing 8,000 units of shifter internally each year are as follows, and an outside supplier offers to sell shifters for a price of \$19 each.

	Per Unit
Direct Materials	\$ 6
Direct Labor	\$ 4
Variable Overhead	\$ 1
Supervisor's Salary	\$ 3
Depreciation of special equipment	\$ 2
Allocated general Overhead	\$ 5
Total Cost	\$ 21

### Comparison of Making vs Buying

	(Per Unit)	
	Make	Buy
Direct Materials	\$ 6	
Direct Labor	\$ 4	
Variable Overhead	\$ 1	
Supervisor's Salary	\$ 3	
Depreciation of special equipment		
Allocated general Overhead		
Total Cost	\$ 14	\$ 19

- When you buy, you may not only pay the price to get the product. You will also incur some other costs that stay, and they are relevant to compare the total cost.
  - e.g. common fixed cost, variable selling and expenses, partial general OH stayed though buying from outside, etc.
- Financial Advantage/Disadvantage of buying = cost of making – cost of buying
  - Negative number – Cheaper to make the product than buying
  - Positive number – Cheaper to buy the product than making

### Special Order

- Calculate the additional contribution margin that the special order can yield
- No need to calculate general Fixed Cost (e.g., rent, utilities, general MOH, etc.) because it has been “covered” on general production

Price of the special order / product	
Variable Cost incurred	(-)
CM of the special order / product	
Fixed Cost of the special order / product*	(-)
NOI of the special order / product	

\*Fixed Cost of special order such as special equipment to make a specific product.

### Scarce or Constrained Resources

- Calculate CM per unit for each product
- Find the constraint/limitation, e.g., limited raw materials to produce multiple items → we need to find the raw materials used for each product.
- Calculate the CM per constraint, i.e., CM per pound (lb) → for every pound of raw materials used to make one product, how much contribution margin that product yields

	Product A	Product B
CM per unit	\$ 50	\$ 40
RM Needed (lb) → <i>constraint</i> (÷)	5 lb	2 lb
CM per RM Needed	\$ 10/lb	\$ 20/lb

### Sell or Process Further

- Ignore cost (joint cost) up to the split-off point
- **Profit/loss for further processing** = new selling price after further processing – original selling price at the split-off point – additional cost for further processing (or split-off cost)

## Adding and Dropping a Segment/Product Line

- It is similar to Chapter 7
  - Total Cost approach - Recreate the segmented contribution format Income Statement to identify the changes as a total (comparative format).
- Financial Advantage/Disadvantage of Dropping a segment:
  - Calculate the contribution margin that would disappear if the segment is dropped. (put this number as a negative number to denote it as a cash outflow)
  - Calculate the fixed costs that would be avoided if the segment is dropped (these costs will be positive numbers to denote as a cash inflow)
  - Add the amounts from the previous step. If the result is:
    - Negative number – financial disadvantage of dropping the segment
    - Positive number – financial advantage of dropping the segment
- Common Fixed Costs cannot be allocated among the product lines!