COMM 305 Notes
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Chapter 6: CVP

Sales /per unit	x
Variable Costs /per unit	(x)
Contribution Margin /per unit	x
Fixed Costs	(x)
Net Income Before Tax	x
Income Tax	(x)
Net Income After Tax	x

Break-even analysis

B/E in units = FC/CM per unit

B/E in Sales $ = FC/CM ratio

CM ratio = CM/Sales

*Tip: Whenever you see the word ratio, take the name of the ratio and divide it by sales. i.e. CM ratio = CM/Sales

Target Operating Income:

In units = (FC + TOI)/ CM per unit
In Sales $ = (FC + TOI)/ CM ratio

Target Operating Income with Tax Implications:

In units = (FC + TOI Before Tax)/ CM per unit
In Sales $= (FC + TOI Before Tax/ CM ratio

*Tip: Just know the TOI with tax implication formulas as it applied for all situations.

Margin of Safety

MOS in units = Actual units sold – B/E units
MOS in sales $ = Actual sales $ - B/E sales $
MOS ratio = MOS/Sales

Operating Leverage

Measures the sensitivity of net income in relation to a change in sales volume.

Formula = CM / Operating Income

High operating leverage:
CM = high → VC = low
Operating Income = Low → FC high

Low operating leverage:
CM = low → VC = high
Operating Income = high → FC low

Chapter 7: Incremental Analysis

Relevant/ Differential cost → Future costs and revenues that will be changed by a decision

Opportunity cost → In choosing to take one action, the company may have to give up the opportunity to benefit from some other action. The lost benefit is the opportunity cost.

Sunk cost → Costs that have already been incurred and will not be changed of avoided by any future decision

1. Accept an order at a special price

Context: Someone is requesting to buy "x" number of units, usually at a discounted price.

Decision factor:
- Does the company have enough excess capacity to service this order?
- If yes, is the requested buying price > variable cost?

Conclusion: If both decision factors are met, then the company will accept the order at a special price. Why? The company has idle capacity that it's currently paying fixed MOH on, therefore, they could earn additional contribution margin to cover these fixed expenses, even though it will most likely be a smaller CM/unit.

2. Make or Buy

Context: Continue manufacturing products or outsource.

Decision factor:
- Based purely on a financial decision, choose the cheaper alternative

- Sometimes non-financial factors are more important. Think why someone wouldn't want to outsource even if there was a financial incentive. i.e. Loss of control, quality issues, employee layoffs, etc.

3. Sell or Process Further

Context: Should you sell a product as is or produce it further and sell as another product. i.e. Sell milk as milk, or process is further and sell it as cream.

Decision factor:

- As long as incremental revenues are greater than incremental costs, produce further.
- Joint costs: the costs you incur to produce the current product are considered a sunk cost because whether you decide to sell as is or produced further, you have already incurred those costs (they are not avoidable).

Conclusion: Process further if IR>IC since you will make an additional profit. TRICK* sometimes there is no demand for the product you want to produce further, therefore even if you can make an additional profit per unit, you won't be able to sell it!

4. Retain or Replace Equipment

Context: Sometimes new equipment can lead to better efficiency and operating cost savings for the company. The decision here is whether to keep the old equipment or replace it with the new/ more efficient equipment.

Decision factor:

- Basically, perform a NPV analysis (discounting cash flows not required for 305)
- Note that the book value of the old equipment is a sunk cost!

Conclusion: Determine if investing in the new machinery will save the company $ over the useful life of the machine.

5. Eliminate unprofitable segment

Context: A company may have several product lines/ segments and one of them may be unprofitable. The question is whether the company should get rid of a product line/ segment if it's not making profit.

Decision Factor:

- Put the information into a CVP analysis (separate variable and fixed costs)
- If the unprofitable segment has a positive contribution margin and fixed costs cannot avoided, then don't eliminate.

- If more fixed costs can be avoided by eliminating the segment in relation to the CM lost, then eliminate the segment.

Conclusion: Even though a segment is not earning profit, it can help cover some of the total company's fixed cost given that it has a positive contribution margin. If by eliminating the segment the company can avoid/reduce fixed cost greater than the CM it's generating, then it would make sense to eliminate it.

6. Allocate limited resources

Context: Company's would love to produce and sell products that generate the highest CM/unit, but they are usually bounded by a limited resource (i.e. machine hours).

Decision factor:

- Shift sales mix to the product that generate the highest CM/ limited resource

Conclusion: The company should focus on selling products that generate the highest CM per machine hour if they are bounded by machine hours.

Chapter 8

* This chapter focuses on the differences between product costs and period costs.

Product costs: Manufacturing costs (DM ,DL, Vmoh, Fmoh) which go through WIP, FGI and are only expensed when sold through COGS. These are also known as inventorial costs because they remain on the balance sheet (WIP & FGI) until they are sold.

Period costs: Usually operating expenses which are expensed in the period they are incurred (hence the name period costs).

Product costs are expensed when **sold**.
Period costs are expensed when **incurred**.

Step process for chapter 8

1. Determine the product costs under each method

Absorption	Variable	Throughput
DM	DM	DM
DL	DL	
V.MOH	V.MOH	
F.MOH		

→ DM, DL, V.moh & F.moh are all product costs under absorption costing.

→ F. MOH will be considered a period cost under variable costing.

→ DL, V.moh & F.moh will be considered period costs under Throughput costing

2. Know how to make an income statement under each method.

Absorption	
Sales	x
COGS	(x)
Gross margin	x
Variable S&A	(x)
Fixed S&A	(x)
Net Income	x

Variable	
Sales	x
V.COGS	(x)
V. S&A	(x)
CM	x
F. MOH	(x)
F. S&A	(x)
Net Income	x

Throughput	
Sales	x
COGS	(x)
Gross margin	x
DL	(x)
V.MOH	(x)
F.MOH	(x)
V. S&A	(x)
F. S&A	(x)
Net Income	x

3. This step is to determine which method will have the higher net income.

If units produced > units sold
Then, Absorption NI > Variable NI > Throughput NI

Think about it… If more units are produced that sold, there should be inventory left over. The method with the most product costs should have a higher income when there's inventory left over because those expenses will only be incurred through COGS when those units are sold.

If units produced < units sold
Then, Absorption NI < Variable NI < Throughput NI

If units produced = units sold
Then, Absorption NI = Variable NI = Throughput NI

4. This step determines the difference of net income between both methods.

[product cost "method 1" – product cost "method 2"] x end inventory units

5. Normal absorption costing.

- The only difference under this method is F.MOH per unit is based on the budgeted production units instead of the actual production.
- You will only be asked to compare normal absorption with absorption. Follow steps 1-4 above.
- When making the income statement, you will have to adjust the COGS for the production volume variance.
- Production volume variance = (Actual units produced – Budgeted units produced) x Budgeted F.moh rate.

Chapter 9: Internal & External Pricing

Internal Transfer Pricing

Situation 1: Excess capacity

Example: Buyer requests 10, 000 units of product "a", Seller has 10, 000 units of excess capacity.

Min TP = Internal variable cost *
Max TP = Market price

* Internal variable cost = the variable cost you would incur to transfer internally. Normally, you wouldn't incur selling and administrative costs to transfer internally.

Situation 2: No excess capacity

Example: Buyer requests 10, 000 units of product "a", Seller has 0 units of excess capacity.

Min TP = Internal variable cost + opportunity cost*

* Opportunity cost = Selling price – external variable cost. The OC is the contribution margin you could have made selling the product to an outside buyer. The buying division will have to compensate the selling division for that lost profit since they will have to forgo those external sales to service the internal request. Note: external variable costs include selling and administrative expenses.

Max TP = Market price

Situation 3: The buying divisions request surpasses the selling divisions excess capacity

Example: Buyer requests 10, 000 units of product "a", Seller has 4, 000 units of excess capacity.

Min TP = Internal variable cost + [OC x (# units given up/ # units requested)]

In this example, the seller will have to forgo selling to the external market 6, 000/ 10, 000 units requested. Therefore, 6, 000 out of the 10, 0000 units requested will have an opportunity cost.

Mac TP = Market price

Situation 4: The selling division can use the excess capacity to sell another product

Example: Buyer requests 10, 000 units of product "a", Seller has 10, 000 units of excess capacity. Seller can use the excess capacity to produce 20, 000 units of product "b" for a contribution margin of $5 per unit.

Min TP = Internal variable cost + [OC x (# units given up/ # units requested)]

→ Min TP = Internal variable cost + [5 x (20, 000/10, 000)]

The seller will be giving up 20, 000 of product "b" to produce 10, 000 unit of product "a" and could have made $5 per unit for product "b".

Max TP = Market price

External Pricing

Target Cost = sales – desired profit

Cost plus pricing steps:
1) Determine cost base under each method
2) Calculate markup %
3) Calculate markup $
4) Find target selling price

	Full cost	Absorption	Variable
1) Cost base:	DM DL V + F. Moh V + F. S&A	DM DL V + F. Moh	DM DL V.Moh V.S&A

2) Markup % [ROI/cost base] [(V + F S&A + ROI)/cost base] [(FC + ROI)/cost base]

3) Markup $ = M-U % x cost base ---------->

4) TSP = Cost base + markup $ ---------->

Chapter 10: Budgeting

Sales budget

	Q1	Q2	Q3	Q4
Selling price/ unit				
* Expected # units sold				
Total expected sales $				

Production budget

Required sales (units)
+Desired end inventory
- Beg inventory
= Required production (units)

DM budget

Required production (units)
* DM per unit
Total DM required
+ Desired ending DM
- Beg DM
= Total DM purchases
* price per DM
= Total $ DM purchases

Cash collection schedule

Cash collected from sales

Sales from:	Q1	Q2	Q3	Q4
Q1	x	x		
Q2		x	x	
Q3			x	
Q4				x

Cash payment schedule

Cash paid to suppliers

Purchases from:	Q1	Q2	Q3	Q4
Q1	x	x		
Q2		x	x	
Q3			x	
Q4				x

Cash Budget

	Q1	Q2	Q3	Q4	Total
(a) Beg. cash balance					
(b) Cash receipts:					
Cash from sales					
*anything else to receive in cash					
(c) Total cash available (a + b)					
Disbursements:					
Cash paid to suppliers					
DL paid					
V. moh					
F. moh (REMOVE AMORTIZATION → not a cash expense)					
* anything else you paid cash for					
(d) Total disbursements					
Excess / (Deficiency) (c-d)					
Financing:					
+Borrow					
-Repay:					
principle					
Interest					
Ending cash balance					

To determine the maximum possible principle repayment, you can make on financing:
= [(Excess- minimum required ending cash balance) / 1 + (annual int. rate x (# months held/12))]

Chapter 11

Static budget

Standard rate * budgeted units

Flexible budget

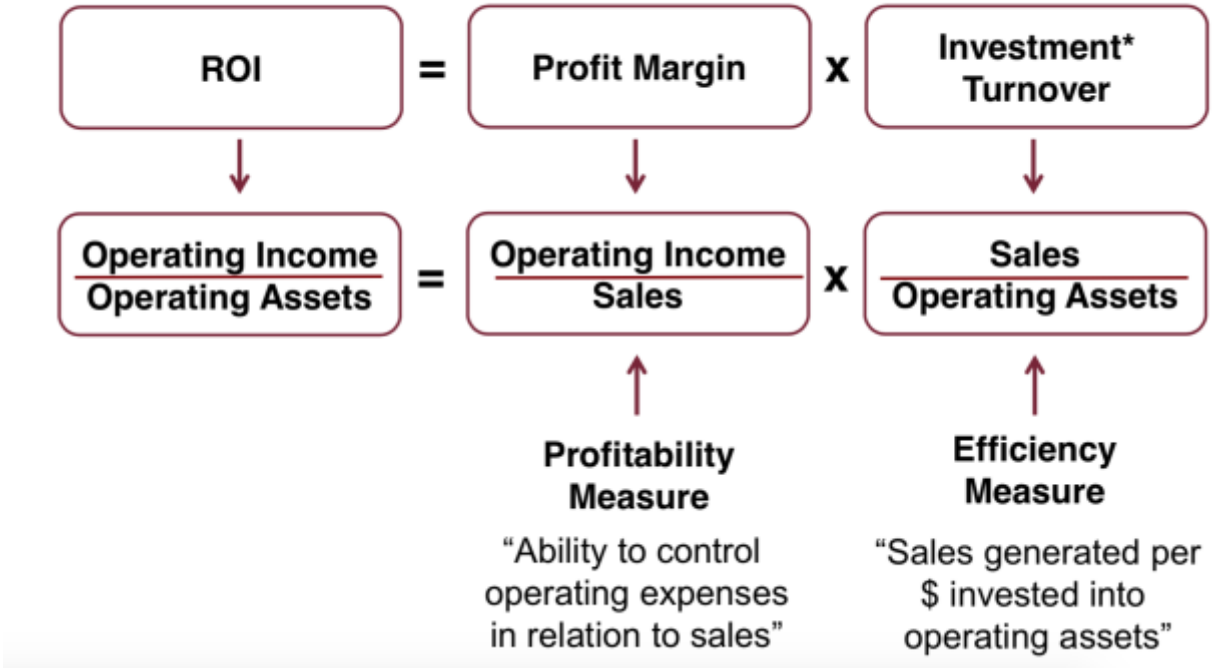
Standard rate * Actual units

Cost center: Responsible for costs only
Profit center: Responsible for revenue + costs
Investment center: Responsible for revenue, costs & ROI

Residual income formula:

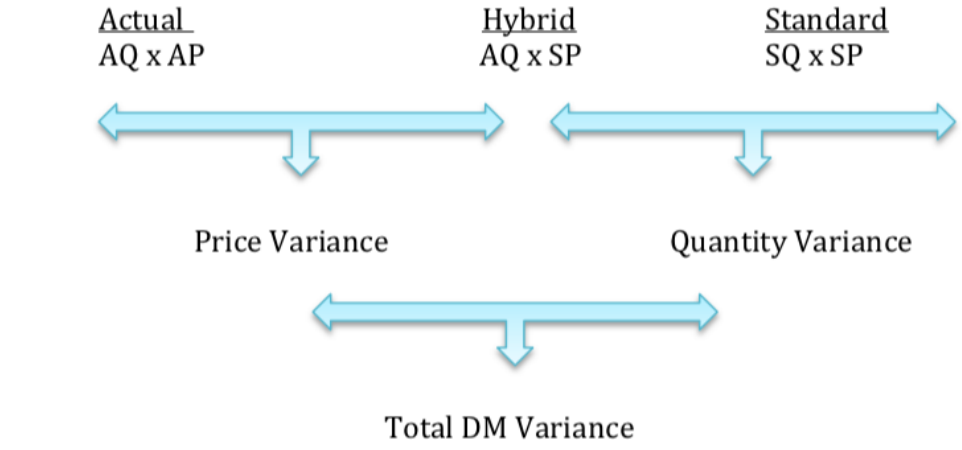
= Controllable Margin - Minimum Rate of Return x Average Operating Assets

DuPont Profitability Analysis (DuPont System of Financial Control):

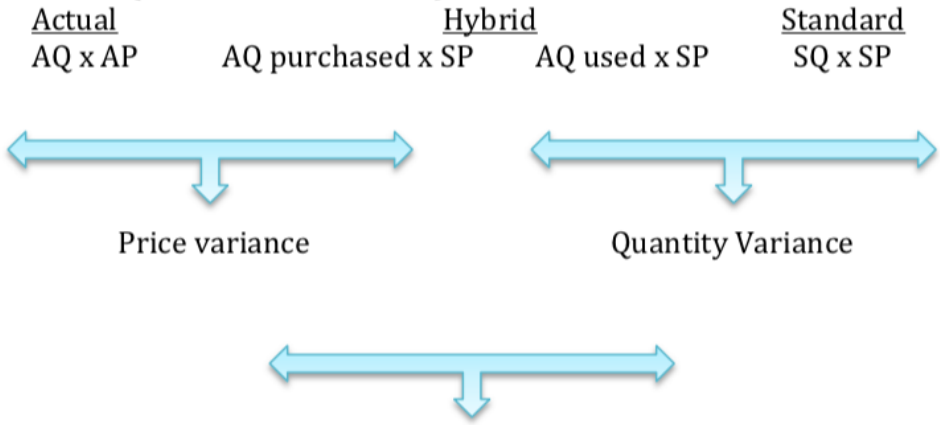


Chapter 12: Variances

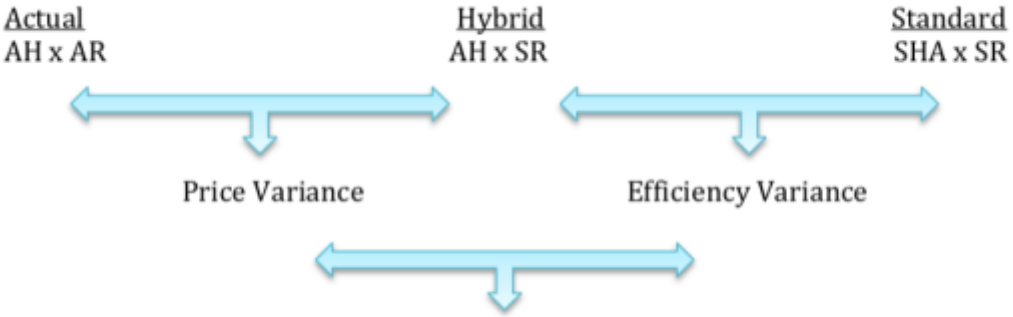
DM Variance



DM Variance (Purchased and used)



DL Variance



*** **Standard Hours Allowed** = Actual units produced x Standard DL hour per unit
*** For (SHA x SR) they give you a SR based on units or based on DL hour.
1,000 actual units produced x $20 DL costs per unit = $20,000 → per unit produced
1,000 actual units produced x 2 DL hours per unit x $10 cost per DL = $20,000 → per DL hour

V.MOH Variance

Actual	Hybrid	Standard
AH x AR	AH x V. MOH Rate	SHA x V.MOH Rate

Price Variance | Quantity Variance

Total V. MOH variance

*** V. MOH rate = (Variable Estimated Overhead ($) / Budgeted Activity level)

F.MOH Variance

Actual	Master Budget	Standard
AH x AR	Normal Hours/ Budgeted hours x F.MOH Rate (Also used in V&F. Moh rates)	SHA x F.MOH Rate

Price Variance | Production Volume Variance

Total F. MOH Variance

*** F. MOH Rate = (Fixed Estimated Overhead ($)/ Budgeted Activity Level)

Total Overhead Variance→ Think Over/Under applied.
= (Total V.MOH Variance + Total F.MOH Variance)
Or = (Total budgeted overhead variances + Production volume variance)

Total budgeted overhead variance= Total V.MOH variance + F.MOH spending variance
*** Omit production volume variance

Production volume variance= (AH-SHA) x F.MOH rate