COMM 354 Cost Accounting Midterm I

Limitations of the Income statement

- Summary-oriented, lacks detail needed for decision making
- Historical, not forward looking
- Uses IFRS/GAAP standards instead of company specific standards
- No details about R&D/SGA/etc., thus cannot differentiate between VC/FC and the depreciation hidden between #s
- *Lack of non-financial/qualitative info*
    - Capacity constraint = Ending inventory = Opening inventory + Additions - Withdrawals
    - Demand constraint
    - Efficiency factor
- *Irrelevant financial info for decision making*
    - Admin cost, CEO salary, depreciation, production manager salary
- Emphasizes faithful representation > economic relevance
- Manufacturing cost related to unsold products NOT shown on IS
- Non-cash items such as D&A included in expense
- Sunk cost can appear as expense (D&A), sunk cost is NEVER related to decision making
- Opportunity cost does not appear on IS

Financial statement suitability to decision making

- On the income statement, non-manufacturing overhead costs are an operating expense and are not included in COGS.
- Financial statements don't necessarily reflect the economic value (i.e. relevant value) of assets. This can lead to bad decisions.
- Financial statements don't reflect the value of internally-created intangible assets such as brand names. This can lead to bad decisions.
- Financial statements us absorption costing, which can be manipulated to lower COGS by over-producing for finished-goods inventory

Costs

- Legacy Costs are a form of committed fixed costs
- Committed fixed costs can never be eliminated
- Advertising is a discretionary fixed cost

Contribution margin & MFG vs. Non-MFG cost

- Items that DO NOT factor into decision making: FC, Sunk cost, Depreciation, other FC (rent/salary)
- Items that DO factor into decision making: VC, relevant operating expense (SGA), variable non-manufacturing costs
- Manufacturing costs = DM + DL + MOH
    - Variable MFG = labor, materials, utilities
    - Fixed MFG = insurance, equipment, buildings
- Non-manufacturing costs = period costs

Inventory equations

- Gross Margin (GM) = Revenue – COGS
- Operating income = GM – Operating expense (includes SGA)
- Profit margin = Gross profit / sales
- Inventory flow method (FIFO/LIFO/Average) is irrelevant

COGS

- *is NOT good for managerial decisions*
- includes inventory costs (accumulated until product sale)
- no period costs included
- excludes VC (VC that you want to included in CM analysis)
- excludes items that are relevant to decision making
- based on absorption/full costing

Effects of inflation and relationships

Volume is rising overtime: prior to adjustment – TC over, UVC over, FC under

Volume is declining overtime: prior to adjustment – TC over, UVC under, FC over
Overstating VC or FC never changes the actual cost, but:

- we use models to predict and make decisions, we lose predictive power by ignoring inflation
- need correct figures for budgeting and comparing alternatives
- can't do cost volume price analysis / CM analysis without knowing correct UVC and FC

Reasons to exclude inflation

- inflation distorts cost models and will therefore over/underestimate cost patters → inflation distorts the H/L calc
- nature of distortion
  - if volume is increasing: FC under (why we got negative FC), VC over, TC over
- incorrect model will lead to incorrect predictions
- managers are seeking information about costs so they can base decisions on good cost models. Decisions made on incorrect predictions will be incorrect
- Budgets will be based on the outcome of the cost models, you'll end up with a flaw model if inflation is included
- Even low levels of inflation can cause significant flaws in predictions
- The nature of the distortions will be different if volume is decreasing over time

Types of cost

1. *opportunity cost* – of holding investment instead of reselling or reinvesting
2. *historical cost/sunk cost* – costs already incurred and not recoverable, do not affect decision making; sunk cost represent impairment of asset value
3. *marginal cost of investment* – variable based on decision to not invest ($0) or invest, represent OC of investment
4. *allocated costs* – towards fixed and sunk cost
5. *fixed cost*
   a. Discretionary (one time payments, e.g. R&D)
   b. Committed (eg. Rent, salary, premium, "legacy costs")
      i. *Legacy cost* – cost you incur today for decisions made long ago
      ii. *ST profit* – easy to settle w unions
      iii. *LT obligations* – un-sustainable and result in legacy costs
      iv. *Other ST decisions w LT implications* – lack of pollution control, poison pill clause, not spending enough on R&D risking LT competitor innovation risk, avoiding CapEx, avoiding repair and maintenance

Decision making considerations (usually benefit > cost, meaning upfront cost should be covered by future benefits)
***ask: are allocated costs relevant? ***

1. *comparison of one-time cost vs. future revenue* – investments costs are committed cost of capital prior to any revenue stream, consider time value of money
2. *time value of money* – 10 year commitment is fixed at 10 yrs
3. *uncertainty and risk* – revenue stream is far into the future and NOT guaranteed; long-term decision that is not easily reversible and will involve significant costs
4. *business line* – is this expansion out of normal range of business and a diversification of business and deviates from their core competency (think significant management account issues such as cost structure, both variable and fixed costs)
5. *baseline of predictions* – how does not historical cost or operations alter baseline assumptions of prediction
6. ***after rejection of a special-order considerations,*** *things that might change your mind about rejecting the order*
   i. strategic value of the customer or insurance company may justify accepting order despite a negative S/T loss
   ii. may accept order to deal with threat of competition
   iii. requirement to pay VSGA may fall due to this being a special order (eg. Commission)
   iv. future growth suggests new PPE is required, may purchase earlier to increase capacity and accommodate
   v. if this is a one-time order or recurring? If a lower price will induce customer to accept partial order, will existing customers expect a price match → quantify both to see how low you can go (VC production)
7. **Mergers & Acquisition justification**
   i. What are they buying? Intellectual property, market share
   ii. *ST considerations* – ingredients, training, advertising, cannibalization
   iii. *LT considerations* – CapEx, space, new market entry
8. ***Costing***
   i. #s likely include allocated fixed and sunk costs
   ii. ***allocated costs*** *(may* include fuel, legal, labor (overtime, unions, substitutions), landing, payment to customers)
   iii. Sunk costs inclusion is not relevant, sunk cost take the form of D&A included in the allocated FC
   iv. Real costs that may have incurred (extra fuel, landing fees to reroute planes)

v. Opportunity costs should be considered relevant – is it included? Big cost is opportunity of lost sales? Do figures consider lost revenue and not cost that might have been saved by not flying
vi. ***"Soft number"*** – always be approached with skepticism as numbers provided by biased parties will have a tendency to provide biased numbers that favor their position

Non-financial issues you need to consider during special orders

1. future demand
2. will other customers expect a price match, will you lose existing customers?
3. is obsolesce an issue
4. could you increase overall demand with a decreased price
5. is it a one-time order or will it be repeated?

Question type 1: Contribution Margin/Large additional production

Calculate contribution margin

- Contribution Margin (CM) = Selling price – variable cost
- H/L method = Unit VC (choose base on constraint not $) → plug into <u>any</u> function to solve for FC → Total cost = FC + VC
- UCM = USP – UVC
- UVC = variable MFG + variable SGA

Calculate break-even

- Break-even = B/E = $\frac{Fixed\ Costs}{UCM} = \frac{relevant\ FMC + relevat\ FSGA}{UCM} = \#\ units\ to\ break-even$
  - Solve for FCs → plug into MFG/SGA cost function into <u>initial year</u> to find FMC → Total cost = FC + VC → TMC = (<u>VMC</u> x #) + FMC
  - Take irrelevant costs (depreciation or amortization) out of FMC & FSGA
  - Plug back into B/E equation

Notes

- FC are NOT relevant in H/L method
- don't need FC when calculating UCM, focus on relevant costs
- COGS are NOT relevant in calculating CM
- Draw table

	2000	2010	
Unit produced			Δ use in VMC
Unit sold			Δ use in VSC
Total MFG cost			Δ use in VMC
Total SGA cost			Δ use in VSC

Annual production capacity

Question type 2: special orders

2 considerations: 1) contribution margin, 2) capacity

1. Contribution margin
   - UCM = SP – VC → positive or negative
2. Capacity
   - Inventory flow t-chart
   - Check if Δ in CM/opportunity cost still yields positive CM for project

Full order only OR partial order

- Opportunity cost = TCM of special order – opportunity cost of capacity shortage from OG demand
- Price to pay to fulfill order = TCM of special order
- Capacity issues lead to opportunity costs

Partial orders

- # partial order = original special order # – capacity constraint #
- UVC = UMFG + USGA
- USP (new) = UVC + USP x profit requirement → UVC / (1 – requirement) = USP

Question type 3: opportunity cost/sunk cost considerations

- Revenue/Sales – Cost = Net Benefit/Cost – OC = true Net Benefit/Cost
- Opportunity Cost = value of next best alternative foregone

Note

- Last year's # is likely irrelevant

Question type 4: Cost Model & Inflation

Inflation adjustment factor = (year x annualized inflation) (year x+n annualized inflation) ← *all years inclusive*

Cost model ignoring inflation: use H/L method → UVC → FC

- $cost = FC + VC\ (\#units)$

Inflation adjustment → find adjusted UVC & FC

- Adjusted UVC
  - Reversing inflation > H/L method
  - Adjusted Δ production cost = ($\frac{year_{(high)}\ total\ cost}{inflation\ factor}$) – $Year_{(low)}\ total\ cost$
  - Δ unit is consistent
  - $slope = \ inflation\ adjusted\ UVC = \frac{adjusted\ \Delta production\ cost}{\Delta unit}$
  - Find FC through plug into year(lowe)
- Cost function adjustment
  - $reinflated\ TC = [\ FC + UVC\ (x\ units)] \times inflation\ factor$
- Expected profit = Revenue – Cost
- Unadjusted
  - growth = year 4 sales / year 1 sales
  - Cost = FC + VC
- Inflation-adjusted
  - growth = year 4 sales / (year 1 sales x inflation adjusted factor)

<u>Expected profit, adjusted for inflation</u>

- Remove inflation from high point by removing inflation by number of years
- H/L method
- Predict TC for year (n) and re-inflate TC by inflation factor

Note

- Inflation will always have an effect on growth, regardless of how marginal the rate seems
- Do NOT always assume volume will increase
- Possible case: prior to adjustment FC runs negative, 2 possibilities: 1) inflation, 2) years of lost, backtracking to early years
- Draw table

VC/scarce resource VC =	*Not adjusted*
	Inflation-adjusted
FC/year	*Not adjusted*
	Inflation-adjusted

Question type 5: Production, add/drop product line

Relevant cost to production decision making: Fixed OH, Variable OH

Determine relevant cost – total

- FOH/scare resource labor hours = $/DLH
- MOH = FOH + VOH → solve VOH for standard and super individually (use graph in notes)

Margin on standard product: UCM standard = USP – UVC → UVC = UDM + UDL + UVOH

Minimum USP required to justify converting standard into super

- VC incurred already so far + "incremental"/VC for conversion = total VC super

Opportunity cost of making 1 super from standard = loss of sale of 1 standard + scarce resource of DLH

Notes

- CM per until of scarce resource = CM / scarce resource * → rank production based on CM/SR

	Standard	Super
DL		
MOH = FOH + VOH		
#DLH	$\frac{DL\ total\ cost}{DL\ cost/hr}$	
DLH/unit	$\frac{DLH}{unit\ production}$	