



commerce
undergraduate
society



COMM 294

**FINAL REVIEW
SESSION**

Prepared by Sarah Wang

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PROFESSIONAL
ACCOUNTANTS
BRITISH COLUMBIA

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Budgeting

Production Budget

| | |
|---|---------------------------------|
| | Budgeted sales |
| + | <u>Desired ending inventory</u> |
| = | Total need |
| - | <u>Beginning inventory</u> |
| = | Required production |

Direct Materials Budget

| | |
|---|------------------------------------|
| | Production |
| x | <u>Materials per unit</u> |
| = | DM required for production needs |
| + | <u>Desired ending DM inventory</u> |
| = | Total need |
| - | <u>Beginning DM inventory</u> |
| = | Required DM purchases |

Direct Labour Budget

| | |
|---|---|
| | Units of production (production budget) |
| x | <u>DL per unit</u> |
| = | Required #DLH |

Manufacturing Overhead Budget

| | |
|---|--------------------------------------|
| | Budgeted DLH |
| x | <u>Variable MOH rate</u> |
| = | Variable MOH costs |
| + | <u>Fixed MOH costs</u> |
| = | Total MOH costs |
| - | <u>Non-cash costs (depreciation)</u> |
| = | Cash disbursement for MOH |

Selling & Administrative Expense Budget

$$\begin{aligned} & \text{Budgeted sales (units)} \\ \times & \text{ Variable SG\&A rate} \\ \hline = & \text{ Variable SG\&A expenses} \\ + & \text{ Fixed SG\&A expenses} \\ \hline = & \text{ Total SG\&A expenses} \\ - & \text{ Non-cash costs} \\ \hline = & \text{ Cash SG\&A expenses} \end{aligned}$$

Cash Budget

$$\begin{aligned} & \text{Beginning cash balance} \\ + & \text{ Cash collections} \\ \hline = & \text{ Total cash available} \\ - & \text{ Cash disbursements (DM, DL, MOH, SG\&A, PPE, Dividend)} \\ \hline = & \text{ Excess (Deficiency)} \\ +/- & \text{ Financing (borrowing, repayments, interest)} \\ \hline = & \text{ Ending cash balance} \end{aligned}$$

Static vs. Flexible Budgets

Static Budgets

- Prepared for a single, planned level of activity

Flexible Budgets

- Prepared for any level of activity within the relevant range

Difference between 2 budgets @ different number of hours: Due to lower activity

Difference between Budget vs. Actual @ same number of hours: Due to poor cost control

Question 1: Budgeting

Central Perk Café has provided you with the following sales budget:

| | |
|----------|-----------------------------|
| January | 41,000 bags of coffee beans |
| February | 31,000 bags of coffee beans |
| March | 25,000 bags of coffee beans |
| April | 31,000 bags of coffee beans |
| May | 25,000 bags of coffee beans |

The inventory of finished goods at the end of each month should equal 20% of the next month's sales. However, on December 31, the finished goods inventory totaled only 6,000 units (bags).

Each bag of coffee bean requires 3 layers of packaging. Since the production of this packaging by Central Perk's supplier is sometimes irregular, the company has a policy of maintaining an ending inventory at the end of each month equal to 30% of the next month's production needs. This requirement was met on January 1 of the current year.

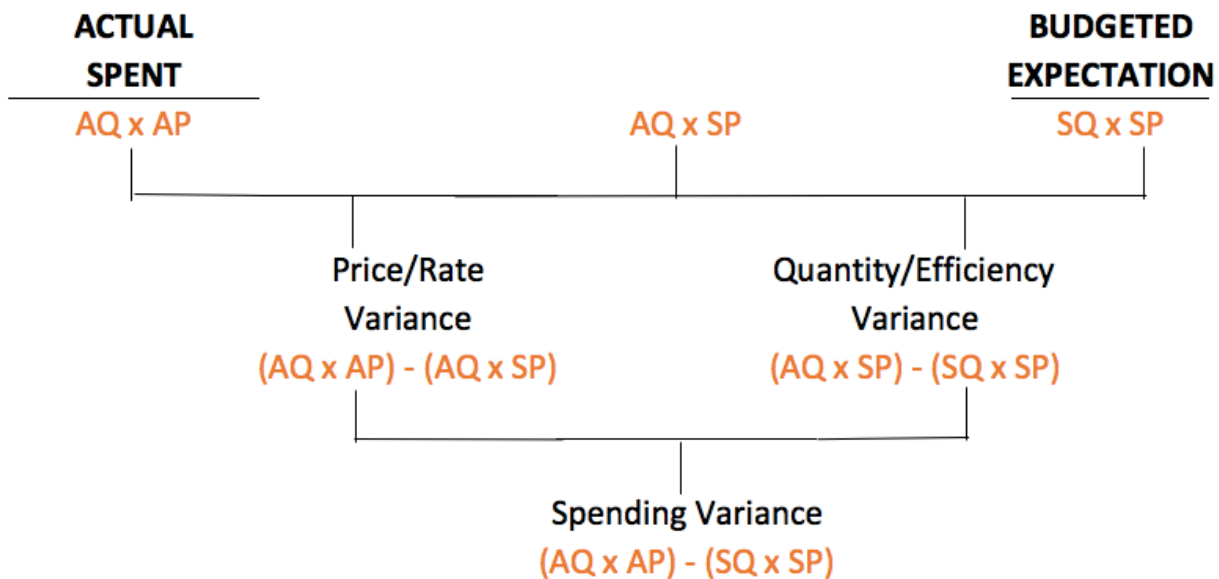
Required:

Prepare a budget showing the quantity of packaging to be purchased each month for January, February and March, as well as in total for the quarter.

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Standard Costing & Variance Analysis

Variance Analysis Model



AQ = Actual Quantity

SQ = Standard Quantity

AP = Actual Price

SP = Standard Price

If Actual Costs > Standard Costs → Unfavourable → (+) value

If Actual Costs < Standard Costs → Favourable → (-) value

Direct Materials

DM Price Variance (MPV) = $(AQ_p \times AP) - (AQ_p \times SP)$

= $AQ_p \times (AP - SP)$

(based on amount purchased)

DM Quantity Variance (MQV) = $(AQ_u \times SP) - (SQ_u \times SP)$

= $SP \times (AQ_u - SQ_u)$

(based on amount used)

Direct Labour

$$\begin{aligned}\text{DL Rate Variance (LRV)} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \text{AH} \times (\text{AR} - \text{SR})\end{aligned}$$

$$\begin{aligned}\text{DL Efficiency Variance (LEV)} &= (\text{AH} \times \text{SR}) - (\text{SH} \times \text{SR}) \\ &= \text{SR} \times (\text{AH} - \text{SH})\end{aligned}$$

Note:

Rate = Price

Efficiency = Quantity

R = Rate

H = Hours

Variable Manufacturing Overhead

$$\begin{aligned}\text{VMOH Spending Variance (VOSV)} &= (\text{AH} \times \text{AR}) - (\text{AH} \times \text{SR}) \\ &= \text{AH} \times (\text{AR} - \text{SR})\end{aligned}$$

$$\begin{aligned}\text{VMOH Efficiency Variance (VOEV)} &= (\text{AH} \times \text{SR}) - (\text{SH} \times \text{SR}) \\ &= \text{SR} \times (\text{AH} - \text{SH})\end{aligned}$$

Question 2: Standard Costing Variance Analysis

Mr. Boba is the owner of Chatime, a bubble tea store. He uses standards established by the National Boba Association based on performances by other bubble tea store chains from various parts of the country, such as Coco and Share Tea:

| | |
|--|--------|
| Direct Labour: 0.2 hrs @ \$12.50/hr | \$2.50 |
| Direct Materials: 35 L of tea @ \$0.20/L | \$7.00 |
| Total cost for 40 bubble teas | \$9.50 |

Actual operating results for Chatime are provided below:

| | |
|-----------------------------------|-----------|
| Number of bubble teas produced | 120,000 |
| Actual direct labour hours worked | 860 |
| Total actual direct labour cost | \$10,320 |
| Materials (tea) purchased | 160,000 L |
| Materials used in production | 152,000 L |
| Price paid for materials | \$0.19/L |

Mr. Boba is anxious to find out how his store is performing based on national standards. Please help him by computing all labour and material variances.

The next page is left blank for you to show your work.

Variable vs. Absorption Costing

| Relationship between Production & Sales | Effect on Inventory | Relationship between Absorption and Variable Net Operating Income |
|---|---------------------|---|
| Production > Sales | Inventory increases | Absorption > Variable |
| Production < Sales | Inventory decreases | Absorption < Variable |
| Production = Sales | No change | Absorption = Variable |

Variable Costing Income

- Only affected by changes in unit sales
- Not affected by changes in unit produced
- When sales increase, net operating income increases

Absorption Costing Income

- Influenced by changes in unit sales AND units of production
- Producing more units (even if they are not sold) can increase net operating income → due to lower FMOH allocated per unit

Reporting for Control

Segment Reporting

- Sales
- Variable costs
- = Segment CM
- Traceable/Controllable FC (to each specific segment)
- = Segment margin
- Common FC (to the entire company)
- = Net operating income

Traceable FC: eliminated if the segment did not exist

Common FC: would remain if the segment did not exist

Question 3: Segment Reporting

Mr. Boba, the owner of Chatime, has recently expanded the Broadway location to include a restaurant that sells Boba Pizza. The bubble tea store takes up 1000 sq ft, and the restaurant takes up 4000 sq ft. He is concerned because it seems that the restaurant is not doing so well. He wants to know whether or not he should close the restaurant (but keep the bubble tea store).

The following income statement has been provided. In addition, he tells you that common fixed costs are allocated based on square footage.

| | Chatime | Bubble tea store | Restaurant |
|----------------|----------------|-------------------------|-------------------|
| Sales | \$ 800,000 | \$ 450,000 | \$ 350,000 |
| Variable costs | (300,000) | (120,000) | (180,000) |
| CM | 500,000 | 330,000 | 170,000 |
| Traceable FC | (130,000) | (40,000) | (90,000) |
| Segment margin | 370,000 | 290,000 | 80,000 |
| Common costs | (200,000) | (40,000) | (160,000) |
| Profit | \$ 170,000 | \$ 250,000 | \$ (80,000) |

Please advise Mr. Boba whether or not he should eliminate the restaurant, and explain why/why not.

Return on Investment (ROI)

$$\text{Return on Investment (ROI)} = \frac{\text{Operating Income}}{\text{Invested Capital}}$$

where: *Invested Capital* = *Average Operating Assets* =

$$\frac{\text{Beginning Assets} + \text{Ending Assets}}{2}$$

Decision: If ROI > Target (hurdle rate) → good!

How to increase ROI?

- Reduce operating expenses
- Increase sales
- Reduce invested capital (operating assets)

Problems with ROI

- Managers may under-invest in new equipment
- Managers may avoid good investments that would dilute their ROI
- Managers may avoid expenses in the short-run that would hurt the business in the long-run
- Managers may not know how to increase ROI
- Managers often inherit committed costs that they can't control

Residual Income (RI)

Residual Income (RI) = Income – Capital Charge

where: *Capital Charge = Invested Capital x Cost of Capital*

Decision: If $RI > \$0 \rightarrow$ good!

Advantages of RI

- Encourages managers to invest in profitable projects that would be rejected had they used ROI
 - Eliminates tendency to under-invest in new assets
 - No problem with ROI dilution

Disadvantages of RI

- Dollar figure \rightarrow not useful when comparing large vs. small projects/segments
- Requires estimate of divisional cost of capital

Transfer Pricing

- When one segment of a company provides goods/services to another segment of the same company
- Shifts profits between divisions but does not affect profit of the entire company
- Must take opportunity costs into account
- Transfer pricing methods:
 - Market-based
 - Cost-based
 - Negotiated – depends on capacity available

Negotiated Transfer Prices

- Highest acceptable price to buying division = cost of buying from outside supplies
- Lowest acceptable price to selling division

$$\begin{aligned} & \textit{Minimum transfer price} \\ & = UVC + \frac{\textit{Total CM lost from outside sales}}{\textit{\# units transferred}} \end{aligned}$$

3 scenarios:

1) Supplying division has excess capacity

- No outside sales lost
- *Transfer price* \geq *UVC*

2) Supplying division has **no** excess capacity

- All internal sales come at expense of outside sales
- If 1 internal sale is traded for 1 external sale, then:

$$\textit{Transfer price} \geq \textit{UVC} + \textit{UCM from outside sale}$$

3) Supplying division has **partial** excess capacity

- Some internal sales come at expense of outside sales
- *Minimum transfer price*

$$= UVC + \frac{\textit{UCM} * \textit{\# units of sales lost}}{\textit{\# units transferred}}$$

Question 4: Transfer Pricing

Pearson Spector Design makes suits for rich lawyers in New York. The company has two divisions: Buttons and Suits.

The Suits Division wishes to purchase 50,000 buttons per year. It currently buys these buttons from an outside supplier for \$30 per button. The Button Division has a production capacity of 300,000 buttons. Currently, they sell their buttons on the market for \$35 per button. It costs them \$18 to manufacture each button.

a) Suppose the Button Division is already operating at capacity selling to the outside market. What is the minimum transfer price they would accept from the Suits Division? Will this transaction go through?

b) Now suppose the Button Division is still operating at capacity, but it can avoid \$5 in sales commissions for internal sales. What is the minimum transfer price they would accept from the Suits Division?

c) If the Button Division had ample capacity, what would be the minimum transfer price they would accept from the Suits Division?

d) Suppose the Suits Division requires a special type of button instead of the regular buttons that the Button Division produces. The variable cost for each special button would be \$25. The Button Division currently has no ample capacity, and the production of 50,000 special buttons will displace 55,000 regular buttons from production. In this case, what is the minimum transfer price that the Button Division would accept?

Relevant Costs for Decision Making

Identifying Relevant Costs

Relevant costs:

- Avoidable/differential costs
- Opportunity costs

Irrelevant costs:

- Costs that do not differ between alternatives
- Sunk costs
- Unavoidable costs
- Joint costs (irrelevant after split-off point)

Total vs. Differential Cost Approaches

Total Approach:

- Compare 2 contribution format incomes statements for the 2 alternatives

Differential Approach:

- Only analyze costs that differ between the alternatives

Both approaches should provide the same answer/conclusion

Add/Drop Decision

Keep segment if $CM\ lost > (FC\ avoided + CM\ gained)$

*Tip: Sometimes keeping/dropping a segment both result in a loss → look at which decision MINIMIZES the loss

Make/Buy Decision

If avoidable cost to buy $>$ avoidable cost to make → MAKE

Special Orders

- One-time order that is not part of the company's ongoing business
- Opportunity costs are common as the special order often comes at the expense of some normal orders

If incremental revenue $>$ incremental costs (i.e. Positive ICM) → ACCEPT

Question 5: Special Orders

Minions Kevin, Bob and Stuart have started their own company that produces banana holders. They have provided you with the following information:

| | |
|------------------------------|---------------|
| Last year's ending inventory | 3,400 units |
| Demand for this year | 132,000 units |
| Annual production capacity | 160,000 units |
| Unit selling price | \$25 |
| Unit variable costs | \$12 |

A special order for 40,000 banana holders was received for a contract price of \$575,000. Should Kevin, Bob and Stuart accept this order? Why or why not?

Utilization of a Constrained Resource

- If one limited resource restricts the company's ability to satisfy all demand, there is a constraint

To optimize net benefit, rank products produced based on ***Contribution Margin per Unit of Scarce Resource***

→ this will maximize total CM for the sales mix

Question 6: Utilization of a Constrained Resource

Spongebob's Bakery produces 3 products: banana bread, chocolate chip cookies and blueberry muffins. Information regarding the selling prices, unit costs, as well as the weekly demand for each product are given below:

| | Banana Bread | Chocolate Chip Cookies | Blueberry Muffins |
|------------------|---------------------|-------------------------------|--------------------------|
| Selling price | \$ 80 | \$ 60 | \$ 90 |
| VC | \$ 50 | \$ 40 | \$ 55 |
| FC (allocated) | \$ 25 | \$ 8 | \$ 22 |
| Spongebob's time | 10 min | 5 min | 7 min |
| Demand | 125 | 100 | 150 |

Each week, Spongebob can only work up to 40 hours (2,400 minutes). How much of each product should be produced in order to maximize Spongebob's operating income?

Joint Costs (Sell or Process Further)

- **Joint products:** two or more products produced from a common input
- **Split-off point:** the point in the manufacturing process where each joint product is recognized as separate products
- **Joint costs are irrelevant in decisions regarding what to do with a product from the split-off point forward**
- **Byproducts:** low-value or zero-value products produced in the process (unavoidable)

Continue processing after split-off point if incremental revenue > incremental costs (i.e. ICM > 0)

Joint Cost Questions: 2 decisions

- 1) Assuming we produce anything at all, what should we produce/sell to maximize contribution margin?
 - Put joint costs aside
 - Determine what maximizes ICM after split-off point
- 2) Should we produce anything at all?
 - Compare joint costs to ICM (think of joint costs as “mini fixed costs”)
 - If ICM > joint costs → PRODUCE

Question 7: Joint Costs (Sell or Process Further)

Sushi Company specializes in the processing and cooking of salmon. They have a large amount of salmon on hand, and are trying to decide whether to sell it as Sashimi or to cut it up to make Salmon Maki and Salmon Nigiri. Here are the costs and selling price information for Sashimi:

| | |
|--|-------------|
| Unprocessed salmon (cannot be sold directly) | \$18 per KG |
| Processing costs to make Sashimi | \$3 per KG |
| Selling price for Sashimi | \$25 per KG |

If not sold as Sashimi, the salmon could be further cut up at a cost of \$3 and made into Salmon Maki and Salmon Nigiri. 1 KG of Sashimi will yield 3 rolls of Salmon Maki and 8 Salmon Nigiri. The Salmon Maki can be sold for \$5 per roll and each Salmon Nigiri can be sold for \$2.

Sushi Company has 100 KG of unprocessed salmon. What should they produce for sale?