

A12 Cost Accounting (II)

Chapter 26 Cost-Volume-Profit Analysis

Contribution margin

— 每單位邊際貢獻是指每單位售價多於每單位變動成本的金額。

$$\text{Unit contribution margin} = \text{Unit selling price} - \text{Unit variable costs}$$

— 總邊際貢獻是指總銷售收入多於總變動成本的金額。

$$\text{Total contribution margin} = \text{Total sales revenue} - \text{Total variable costs}$$

— 在有限因素下進行本量利分析

$$\text{Contribution margin of limiting factor} = \text{Unit contribution margin} / \text{Unit Limiting factor}$$

Example 12

Suppose BAFS Catering Ltd provides two kinds of lunch boxes, the detailed breakdown of variable costs as follows:

	Local Lunch box	Continental Lunch box
	\$	\$
Sales prices	20	30
Variable costs:		
Direct materials	(3)	(5)
Direct labour	(2)	(4)
Overheads	(3)	(3)

Suppose each direct labour hour costs \$20 and **only 14,000** direct labour hours are available. The budgeted demands (in units) for local and continental lunch boxes are 120,000 units and 30,000 units, respectively.

- (a) Calculate unit contribution margin for local lunch box
- (b) Calculate unit contribution margin for continental lunch box
- (c) Calculate the limiting factor per unit of local lunch box
- (d) Calculate the limiting factor per unit of continental lunch box
- (e) Calculate the unit limiting contribution margin of local lunch box
- (f) Calculate the unit limiting contribution margin of continental lunch box
- (g) Suppose the budgeted demands (in units) for local and continental lunch boxes are 120,000 units and 30,000 units, respectively. State the production quantity of each product which will maximise the total contribution of BAFS Catering Ltd.

(a)

(b)

(c)

(d)

(e)

(f)

(g)

Contribution margin ratio

$$\text{Contribution margin ratio(\%)} = \frac{\text{Unit contribution margin}}{\text{Unit selling price}} \times 100\% = \frac{\text{Total contribution margin}}{\text{Total Sales revenue}} \times 100\%$$

HKDSE (2013, 6)

(Cost-Volume-profit analysis)

Eva Company manufactures stainless steel mailboxes. The budgeted income statement for the year 2014 is as follows:

	\$
Sales	960,000
Direct material cost	(120,000)
Direct labour cost	(150,000)
Fixed production overheads	(190,000)
Variable production overheads	(66,000)
Fixed administrative overheads	(57,000)
Net profit	<u>377,000</u>

REQUIRED: (a) Compute the contribution margin ratio (as a percentage) for the mailboxes

(a) _____

Break-even point calculation methods (保本點的計算方法)

Contribution margin method (邊際貢獻計算法)

In unit (以售出單位計算)

$$\text{Break-even point (in units)} = \text{Total Fixed costs} / \text{Unit contribution margin}$$

In amount (以售出金額計算)

$$\text{Break-even point (in dollars)} = \text{Break-even point (in units)} \times \text{Unit selling price}$$

HKDSE (2015, 4)

(Cost-Volume-profit analysis)

Peter Company plans to sell 3,000 pairs of shoes at \$350 per pair. Relevant financial information is given below:

	\$
Fixed production overheads	150 000
Fixed selling and administrative expenses	228 000
Direct materials per pair of shoes	45
Direct labour per pair of shoes	55
Variable production overheads per pair of shoes	18
Sales commission per pair of shoes	22

- (a) Calculate the contribution margin for each pair of shoes.
(b) Calculate the sales quantity of shoes at the breakeven point.
(b) Calculate the sales amount of shoes at the breakeven point.

(a) _____
(b) _____
(c) _____

Contribution margin ratio method (邊際貢獻率計算法)

— 利用邊際貢獻率計算保本點

$\text{Break-even point (in dollars)} = \text{Total Fixed costs} / \text{Contribution margin ratio}$
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HKDSE (2013, 6)

(Cost-Volume-profit analysis)

Eva Company manufactures stainless steel mailboxes. The budgeted income statement for the year 2014 is as follows:

	\$
Sales	960,000
Direct material cost	(120,000)
Direct labour cost	(150,000)
Fixed production overheads	(190,000)
Variable production overheads	(66,000)
Fixed administrative overheads	(57,000)

(a) Compute the contribution margin ratio (as a percentage) for the mailboxes

(b) Compute the breakeven sales of the mailboxes for 2014.

(a) _____

(b) _____

Target profit analysis (目標利潤分析)

$\text{Units sold} = \frac{\text{Fixed costs} + \text{Target net profit}}{\text{Unit Contribution margin}}$

$\text{Sales revenue} = \frac{\text{Fixed costs} + \text{Target net profit}}{\text{Contribution margin ratio}}$

HKDSE (2013, 6)

(Cost-Volume-profit analysis)

Eva Company manufactures stainless steel mailboxes. The budgeted income statement for the year 2014 is as follows:

	\$
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Direct material cost	(120,000)
Direct labour cost	(150,000)
Fixed production overheads	(190,000)
Variable production overheads	(66,000)
Fixed administrative overheads	(57,000)

REQUIRED:

(a) Compute the contribution margin ratio (as a percentage) for the mailboxes

(b) How much sales revenue does Eva Company have to earn in order to achieve a target profit of \$403,000?

(a) _____

(b) _____

Margin of safety (安全邊際)

In amount (以售出金額計算)

$\text{Margin of safety (in revenue)} = \text{Actual/Budgeted sales revenue} - \text{Break-even sales revenue}$

In unit (以售出單位計算)

$\text{Margin of safety (in unit)} = \text{Actual/Budgeted sales unit} - \text{Break-even sales unit}$
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Margin of safety ratio (安全邊際率)

— 可以以百分比表示安全邊際，這就是所謂的安全邊際率。

$\text{Margin of safety ratio (\%)} = \frac{\text{Margin of safety (in units)}}{\text{Actual/Budgeted sales (in units)}} \times 100\% = \frac{\text{Margin of safety (in \$)}}{\text{Actual/Budgeted sales (in \$)}} \times 100\%$
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Classwork 8

1 Eggplant Ltd produces and sells a single product. The costs per unit are as follows:

Direct materials	\$100
Direct labour	\$60
Variable manufacturing overheads	\$10
Fixed manufacturing overheads	\$8.5
Variable non-manufacturing overheads	\$20
Fixed non-manufacturing overheads	\$4

Fixed costs for the year amount to \$1,000,000. The budgeted sales volume is 80,000 units and the selling price is \$280 per unit.

(a) Calculate: (i) Contribution margin ratio, (ii) Break-even sales revenue and (iii) Margin of safety ratio

(a) (i) _____

(ii) _____

(iii) _____