

C H A P T E R F I V E : M A R G I N A L C O S T I N G A N D D E C I S I O N - M A K I N G

- ✓ **Definition of marginal costing:** “ The accounting system in which **variable costs** are charged to cost units and fixed costs of the period are written off in full against the aggregate **contribution**. Its special value is in recognizing cost behaviour, and hence assisting in decision making.”
- ✓ **Definition of variable cost:** “ The part of the cost of one unit of product or service which would be avoided if that unit were not produced, or which would increase if one extra unit were produced.”
- ✓ **Definition of contribution:** “ Sales value less variable cost of sales. It may be expressed as total contribution, contribution per unit or as a percentage of sales.”
- ✓ **E.g: Hoho Limited** makes 2 products, AA and BB in one department. Selling prices are RM110 per unit of AA and RM160 per unit of BB. The budgeted production and sales unit for Year 2006 are 2,000 units of AA and 800 units of BB, and there were no stocks of either product at the beginning of Year 2006. Material costs expected to be RM25 and RM40 for a unit of AA and BB respectively. Production hours for one unit are 4 hours and 6 hours for AA and BB respectively. Direct workers are paid RM9.00 per hour, and budgeted overheads for Year 2006 are :

Variable overhead	RM 47,360
Fixed overhead	<u>87,040</u>
	<u>RM134,400</u>

Required:

- a) Calculate the budgeted overhead absorption rate per direct labor hour for Year 2006
- b) Calculate the budgeted variable overhead absorption rate per direct labor hour for Year 2006
- c) Prepare a product cost for one unit of AA and one unit of BB to show the variable cost and contribution
- d) Calculate the budgeted total contribution made by each product, and the budgeted profit for the year

SOLUTION:

- a) Budgeted direct labor hours:

AA	2,000 units x 4 hours	8,000
BB	800 units x 6 hours	<u>4,800</u>
		<u>12,800</u>

Budgeted overhead: RM134,400

Overhead per direct labor hour (RM134,400 / 12,800 hours) RM10.50

- b) Budgeted direct labor hours 12,800 hours
 Budgeted variable overhead cost RM47,360
 Variable overhead rate per direct labor cost (RM47,360 / 12,800 hours) RM 3.70

	AA	BB
Material	RM 25	RM 40
Direct labor:		
4 hours x RM9.00	36	
6 hours x RM9.00		54
Variable Overhead :		
4 hours x RM 3.70	14.80	
6 hours x RM 3.70		<u>22.20</u>
Variable cost	<u>RM 75.80</u>	<u>RM116.20</u>
Selling price	<u>110.00</u>	<u>160.00</u>
Contribution	<u>RM 34.20</u>	<u>RM 43.80</u>

d) Total contribution:		
Contribution from AA	2,000 units x RM34.20	RM 68,400
Contribution from BB	800 units x RM43.80	<u>35,040</u>
Total contribution		103,440
(-) Fixed overheads		<u>87,040</u>
Profit		<u>RM 16,400</u>

✓ **E.g : Bola Company** makes 2 products, EE and YY in one department. The information all relates to budget Year 2008. There are no finished product stocks at the beginning of Year 2008

Product	EE RM / unit	YY RM / unit
Direct material cost	12.50	15.00
Direct labor at RM8.00 per hour	24.00	12.00
Variable production overhead	6.00	3.00
Selling price	70.00	48.00
	Units	Units
Production	9,000	12,000
Sales	8,500	10,400

Fixed production overhead RM315,000. Fixed administration, selling and distribution overhead, RM 121,000

Required :

- Prepare a profit statement for Year 2008 under an absorption costing
- Prepare a profit statement for Year 2008 under marginal costing

SOLUTION

a) Absorption Costing

Budgeted direct labor hours:	
EE 9,000 units x (RM24 / RM8)	27,000
YY 12,000 units x (RM12 / RM8)	<u>18,000</u>
	<u>45,000</u>

Fixed production overhead	RM315,000
Fixed overheads per direct labor hour (RM315,000 / 45,000 hours)	RM 7 per hour

Products cost :	EE RM per unit	YY RM per unit
All variable costs	42.50	30.00
Fixed production overhead absorbed at RM 7 per direct labor hour:		
3 hours x RM 7	21.00	
1.50 hours x RM 7		<u>10.50</u>
Production cost	<u>RM63.50</u>	<u>RM40.50</u>

Profit Statement in Absorption Costing:

	EE RM	YY RM	Total RM
Sales	<u>595,000</u>	<u>499,200</u>	<u>1,094,200</u>
(-)Production Costs:			
Direct materials	112,500	180,000	292,500
Direct labor	216,000	144,000	360,000
Variable production overhead	54,000	36,000	90,000

Fixed production overhead	<u>189,000</u>	<u>126,000</u>	<u>315,000</u>
Production cost	571,500	486,000	1,057,000
(-) Stock	<u>(31,750)</u>	<u>(64,800)</u>	<u>(96,550)</u>
Production cost of sales	<u>539,750</u>	<u>421,200</u>	<u>960,950</u>
Production profit	55,250	78,000	133,250
(-) Admin cost			<u>121,000</u>
Net profit			<u>12,500</u>

b) Profit Statement in Marginal Costing

	EE RM	YY RM	Total RM
Sales	595,000	499,200	1,094,200
(-) Production Cost:			
Direct materials	112,500	180,000	292,500
Direct labor	216,000	144,000	360,000
Variable Production Overhead	<u>54,000</u>	<u>36,000</u>	<u>90,000</u>
Total Variable production Cost	<u>382,500</u>	<u>360,000</u>	<u>742,500</u>
(-) Stock	<u>21,250</u>	<u>48,000</u>	<u>69,250</u>
Variable production cost of sales	361,250	312,000	673,250
Contribution	233,750	187,200	<u>420,950</u>
(-) Fixed overhead:			
Production			315,000
Admin			<u>121,000</u>
			<u>436,000</u>
Net loss			<u>(15,050)</u>

Dealing With Opening Stock

- Opening stock is the closing stock of the preceding product.
- Whether it was valued in the preceding period, absorption or marginal, it will be brought forward at that same valuation
- E.g; Assume Lana Limited** makes a single product. It is sold for RM48 per unit and 12,100 units are budgeted to be sold in year 2008. There were 250 units of the product in stock at 1 January 2008. For year 2008, variable production costs are budgeted as RM22 per unit, and fixed production costs are budgeted as RM180,000 for the budgeted production of 12,000 units. Fixed administration, selling and distribution overheads are budgeted as RM96,000. Costs in Year 2007 can be assumed to be the same as those budgeted for Year 2008.

Required :

- a) Prepare budgeted profit statement for Year 2008 using marginal costing and absorption costing

SOLUTION

Budgeted Profit Statement For Year 2008 Using Marginal Costing

Selling price per unit	RM 48.00
Variable cost per unit	<u>22.00</u>
Contribution per unit	<u>26.00</u>
Units to be sold	12,100 units

Total contribution			RM314,600
(-) Fixed Overhead:	Production	180,000	
	Admin	<u>96,000</u>	<u>RM276,000</u>
Profit			<u>RM 38,600</u>

Budgeted Profit Statement For Year 2008 Using Absorption Costing

	RM
Variable cost per unit	22.00
Fixed production overhead RM180,000 / 12,000 units	<u>15.00</u>
Full production cost per unit	37.00
Selling price	<u>48.00</u>
Production profit per unit	<u>11.00</u>
Units to be sold	12,100 units
Total production profit	133,100
(-) Admin. , selling & distribution	<u>96,000</u>
Profit	<u>37,100</u>

SHORT-TERM DECISION MAKING

- ✓ Making decision for the benefits of the organisation is the most crucial task of a manager in an organisation, especially in a business firm.
- ✓ One of the pre-requisite of making a good decisions is to be able to evaluate thoroughly each courses of action before deciding to choose one of them to be implemented.
- ✓ Short-term decision making is involved in deciding on matters that have a shorter financial implication.
- ✓ Short-term decisions are made frequently and the implementation of the decision usually takes a shorter period.
- ✓ Decisions making process:
 1. Define objectives or problems
 2. Identify alternative courses of actions
 3. Evaluate the alternative courses of actions identified
 4. Select the best alternative
 5. Implement the alternative selected and control
- ✓ The relevant costs and relevant revenues that is required for decision-making process is only those that will be affected by the decision.
- ✓ Opportunity cost also need to be included in evaluation of courses of actions in decision making
- ✓ **Opportunity cost is cost to measure the opportunity or benefit that foregone or sacrifice when the choice of one alternative course of action requires that an alternative be given up.** Example of opportunity cost is the sales revenue foregone from the sales of a product when the company decided to sell another product line.
- ✓ Opportunity cost considered relevant cost because it can influence the decision that is going to be made.
- ✓ Types of short term decision making:
 1. Make or buy decision
 2. Special order
 3. Add or delete
 4. Decision-making under limiting factors

Make Or Buy Decision

- ☒ Also known as outsourcing decision
- ☒ Managers of a firm is responsible to decide whether or not it is worthwhile for the firm to manufacture internally the products or components that the firm is going to sell or use in operation, or it is better off for the firm to acquire the goods or components from an external supplier
- ☒ Firms usually consider make internally when they want to fully-utilize the excess capacity and also to gain benefits from diversification of activities
- ☒ Managers have to choose which alternative will have the lowest relevant costs or the highest relevant revenues.
- ☒ Meaning, the firm should make internally products if the relevant costs of manufacturing the items are lower than the relevant costs of buying them from an external buyer.
- ☒ However, if the relevant costs of buying are cheaper, then the firm should buy the items from the external supplier.
- ☒ **E.g: Alfa Co.** is considering manufacturing 1,000 units of component Y. The components are for use in the production of product SOB. The estimated costs to produce a unit of component Y based on budgeted production 10,000 units is as follows :

Direct material costs	RM16.00
Direct labor costs	10.00
Variable production overhead	8.00
Fixed production overhead	<u>7.00</u>
Total production costs	<u>RM41.00</u>

BB Co. has been selling a unit of component Y at RM38.00. Advise the management of Alfa whether to manufacture the component or not??

SOLUTION

Determine the relevant cost of manufacturing the components:

Direct material costs	RM16.00
Direct labor costs	10.00
Variable production overhead	<u>8.00</u>
Total relevant manufacturing costs	<u>RM34.00</u>

Compare to the cost of buying from BB Co. is RM38.00, it is better for Alfa to manufacture the component internally because the firm can save RM4.00 per unit.

- ☒ **E.g. Supposed now** that Alfa has limited labor force. In order to work on the 1,000 components Y, the firm has to forego the production of 100 units of product UEL, which is sold for RM200.00 per unit. The marginal costs associated to the product being RM120.00. Please advise whether Alfa need to manufacture the components or not??

SOLUTION

Determine the relevant costs of manufacturing the component:

Direct material costs	RM16.00
Direct labor costs	10.00
Variable production overhead	8.00
Opportunity cost: $\frac{(RM200-120) \times 100 \text{ units UEL}}{1,000 \text{ units Y}}$	<u>8.00</u>
Total relevant manufacturing costs	<u>RM42.00</u>

Compare to the cost of buying from BB Co. is RM38.00, thus it is cheaper to buy the components Y from BB Co.

Special Order

- ☐ Business is sometimes having to decide whether to furnish special orders or not.
- ☐ Special orders are normally orders to purchase at a large volume but at a relatively lower profit than the normal market price.
- ☐ These special orders may be attractive when the firm is having excess capacity and the customer might someday become the regular customer of the firm. To decide on a special order, firm has to determine whether the special order can generate some contribution margin or not.
- ☐ If the special order can ensure firm obtaining extra contribution, then it is advisable to the company to accept the special order.

- ☐ **E.g. Tsin Fei Limited** is involves in manufacturing and selling of sport shoes branded “HTF” to local distributors. The company has the capacity to produce 18,000 pairs of “HTF” annually. The information extracted from the income statement of the company for the year ended 2006 is as follows:

Selling revenues (16,500 pairs)	RM891,000
(-) Costs:	
Direct materials costs	(363,000)
Direct labor costs	(198,000)
Factory overheads	(176,600)
Selling and administrative overheads	<u>(108,500)</u>
Net profits	<u>RM 44,900</u>

40% of the factory overheads are fixed overheads whereas only 30% of the selling and administrative overheads are variable.

Recently, Tsin Fei Limited received and orders from Lee Fang Co. for 1,500 pairs of “HTF”. The price offered was RM45.00 per pair. The sales manager of Tsin Fei is reluctant to accept the order because the price is too low compared to the market price. You are required to advise the management regarding the special order.

SOLUTION

Relevant costs of the special order per unit:

Direct material costs	RM22.00
Direct labor costs	12.00
Factory overheads: (176,600 x 60%) / 16,500	6.42
Selling and administrative overheads: (108,500 x 30%) / 16,500	<u>1.97</u>
Unit product cost	<u>RM42.39</u>

The relevant revenue of the special order = RM45.00 x 1,500 units = RM67,500

Whereas the relevant costs of production = RM42.39 x 1,500 units = RM63,585

The contribution margin from special order sales (67,500- 63,585) = RM 3,915

Based on the above, it is advisable for Tsin Fei to accept the special order because it will enable the company to get additional profit of RM3,915.

Add Or Delete

- ☐ Management of business sometimes has to face a very difficult situation when one or more of the firm’s sub-units such as product lines, departments or segments are continuously making losses.
- ☐ The last thing company able to do is probably discontinuing the product line, segments or even the departments

- ☛ Sometimes, the discontinuance decision can make the company performs better but, there are also possibility that the firm’s profitability will become even worst when decision is taken
- ☛ The decision rules regarding the discontinuance decision is as follows :
 - a) Discontinue a segment when the benefits of discontinuing is more than the costs
 - b) Proceed with the operation as usual when the discontinuing cost is more than the benefits
 - c) Add a segment when the benefits of adding segment are more than the costs related to it
 - d) Do not add the segment when the benefits of adding segment are less than the costs related to it

☛ **e.g : Kiki Company** currently operates 3 departments : Bedding, Furniture and Kitchen departments. The income statement of the company for the year ended March 2006 shows the Furniture department is making a loss as follows :

	BEDDING RM'000	FURNITURE RM'000	KITCHEN RM'000
Sales revenue	800	500	600
	<u>600</u>	<u>420</u>	<u>400</u>
(-) : Costs of sales	200	80	200
Gross margin			
(-) : Operating costs:	120	64	80
Head office overhead	30	20	20
Selling overhead	<u>20</u>	<u>27</u>	<u>10</u>
Administrative overhead	<u>30</u>	<u>(31)</u>	<u>90</u>
Net profit / (loss)			

The losses that Furniture department made had lowered down the overall company’s profit to RM89,000. He suggests that the department be closed permanently. The effect of the closure is studied and the following information is available:

- a) All costs of sales are variable and all of the selling overheads in the Furniture department will be eliminated
 - b) The sales in Bedding department is expected to increase by 20% however, Kitchen department sales is expected to reduce by 5%
 - c) The other departments will share the head-office overhead of the Furniture department equally
 - d) Only RM12,000 of the administrative costs in furniture department can be avoided because the staffs of the department will be transferred to Kitchen department
 - e) The company will incur an additional cost to close down department amounting RM29,000
- Should Furniture department to be close?

SOLUTION

	BEDDING RM'000	FURNITURE RM'000	KITCHEN RM'000
Sales revenue	960	0	570
(-) : Cost of sales	<u>720</u>	<u>0</u>	<u>380</u>
Gross margin	240	0	190
(-) : Operating costs :			
Head Office Overhead	152	0	112
Selling Overheads	30	0	20
Administrative overhead	20	0	25
Closure cost :	<u>00</u>	<u>29</u>	<u>00</u>
Net Profit / (Loss)	<u>38</u>	<u>(29)</u>	<u>33</u>

The company’s overall profit :	RM
- Before closing down Furniture	89,000
- After closing down Furniture	<u>42,000</u>

Reduction the closing down (RM89,000 –RM 42,000) 47,000

Based on the above, the company should not close down Furniture department because it will result in the company’s net profit decreasing by RM47,000.

Decision Making Under Limiting Factors

- Making short-term decision and implementing the decision is easier when the company is operating with sufficient resources and capacity.
- But, in reality, most of the time organizations have to operate under the condition of insufficient resources like shortage of labor or raw material to accomplish orders from customers.
- In this situation, firm has to decide whether or not to furnish the order under that condition, and how to optimize the profitability.
- **E.g: Red Company** manufactures three types of products in a mass production process namely, Jico, Kilos and Limo. The unit selling price and the products’ cost structures based on the budgeted production and sales units are as follows :

PRODUCTS	JICO RM	KILOS RM	LIMO RM
Material costs	4	6	8
Direct labor costs	10	9	7
Variable production costs	5	6	8
Fixed production costs	2	6	5
Selling price	29	31	30
Budgeted production and sales unit	5000	5000	5000

The companies direct labor hour and material requirement of each product are shown below:

PRODUCTS:	JICO	KILOS	LIMO
Direct labor (hour)	3	5	1
Material (kg)	2	3	4

Based on a recent market survey, it is expected that the demands for the three products for the coming month is as follows:

- 6000 units of Jico
- 5000 units of Kilos
- 4000 units of Limo

However, due to the market forces, the total direct labor hours available for the coming month are only 38,000 hours. Given the limited labor hours, you are required to advise the manager of the company as to the most profitable production mix of the company.

SOLUTION

Step 1: Identify The Limiting Factors

Total direct labor requirement :

PRODUCTS	JICO	KILOS	LIMO
Direct labor per unit :	3	5	1
No. of production and sales unit	6,000	5,000	4,000
Total direct labor hours required	18,000	25,000	4,000

Total direct labor hours required: 47,000
 Total direct labor hours available: 38,000
 Shortfall in direct labor hours (47,000 – 38,000) 9,000

Step 2: Determine The Ranking Of The Products According To The Highest Unit

Contribution margin per limiting factors (direct labor hour) :

PRODUCTS	JICO	KILOS	LIMO
Selling price	RM29	RM31	RM30
(-) : Variable cost	<u>RM19</u>	<u>RM21</u>	<u>RM23</u>
Unit Contribution margin	<u>RM10</u>	<u>RM10</u>	<u>RM 7</u>
Direct labor (hour)	3	5	1
Unit contribution per Direct Labor Hour : Unit Contribution Margin / Direct labor hour	RM 10 / 3 hours = RM3.33	RM 10 / 5 hours = RM 2.00	RM 7 / 1 hour = RM 7.00
Ranking	2	3	1

Step 3: Allocate The Scarce Labor Hours To The Product According To The Ranking Above:

Allocation of available labor hours:	38,000 hours
Produce Limo : 4,000 units x 1 labour hour	4,000 hours
Balance available : To produce Jico : 5,000 units x 3 labor hours	38,000 hours – 4,000 hours = 34,000 15,000 hours
Balance available: To produce Kilos : 3,800* units x 5 labor hours	34,000 hours – 15,000 hours = 19,000 19,000 hours

* With the available 19,000 labor hours can only produce 3,800 units (19,000 hours / 5 hours)

So, the most profitable production mix is:

- 4,000 units of Limo
- 5,000 units of Jico
- 3,800 units of Kilos

Calculation of net profit for the company :

Total contribution :		RM
Limo	4,000 units x RM7.00	28,000
Jico	5,000 units x RM10.00	50,000
Kilos	3,800 units x RM10.00	<u>38,000</u>
Total contribution		116,000
(-) : Fixed cost : 5,000 units x RM13.00		<u>(65,000)</u>
Net Profit		<u>51,000</u>

STANDARD COSTING AND VARIANCES

Standard Cost —————> A control technique, which compares standard costs, & revenue with actual results to obtain variances, which are used to stimulate, improved performance

- Meaning, standard cost is predetermined unit cost, which are used as measures of performance.
- Standard costs are target costs that should be incurred under efficient operating conditions.
- Standard costs different with budgeted costs because a budget relates to an entire activity or operation; but a standard presents the same information on a per unit basis.
- Standard costing is most suited to an organisation whose activities consist of a series of common or repetitive operations.

QP: Actual Quantity Purchased

$$\begin{aligned} \text{Material Price Variance} &= (\$1.00 - \$1.10) \times 19,000 \text{ kg} \\ \text{(Material A)} &= \$1,900 \text{ Adverse} \end{aligned}$$

- ☒ **E.g.:** For material B, the standard price is \$3.00, compared with an actual price of \$2.80. Company purchased 10,100kg of Material B.
- ☒ **Solution:** Material Price Variance = (SP – AP) x QP

$$\begin{aligned} \text{(Material B)} &= (\$3.00 - \$2.80) \times 10,100\text{kg} \\ &= \$2,020 \text{ Favourable} \end{aligned}$$
- ☒ Possible causes:
 - a) Actual prices may exceed standard prices because of a change in market conditions that causes a general price increase for the type of material used.
 - b) The price variance might therefore be beyond the control of the purchasing department
 - c) An adverse price variance may reflect a failure by the purchasing department to seek the most advantageous sources of supply
 - d) A favourable price variance might be due to the purchase of inferior quality materials, which may lead to inferior product quality or more wastage
 - e) A shortage of material leads to an emergency purchase being made at short notice. The supplier may incur additional handling and freight charges on special rush orders, and may therefore charge a higher price for the materials

2. Material Usage Variance

┌ This variance compare the standard quantity that should have been used with the actual quantity which has been used

┌ **E.g.:** The standard usage for the production of one unit of product Sigma is 2kg for material A. as 9,000 units of Sigma are produced, 18,000 kg of material A should have been used. However, 19,000kg are actually used, which means there has been an excess usage of 1,000kg. Standard price for 1 kg of material A is \$1.00 and actual price for 1 kg is \$1.10.

┌ **Solution:** Material Usage Variance = (SQ – AQ) x SP
 SQ: Standard quantity for production
 AQ: Actual quantity used for production
 SP: Standard price for material

$$\begin{aligned} \text{Material Usage Variance} &= (18,000 \text{ kg} - 19,000\text{kg}) \times \$1.00 \\ \text{(Material A)} &= \$1,000 \text{ Adverse} \end{aligned}$$

┌ **E.g.:** For material B, the standard quantity is 9,000 kg, but 10,100kg have been used. Standard price for Material B is \$3.00 per kg and actual price is \$2.80 per kg.

┌ **Solution:** Material Usage Variance = (SQ – AQ) x SP

$$\begin{aligned} \text{(Material B)} &= (9,000 \text{ kg} - 10,100 \text{ kg}) \times \$3.00 \\ &= \$3,300 \text{ Adverse} \end{aligned}$$

┌ Possible causes:

- a) The material usage variance is normally controllable by the production foreman.
- b) Careless handling of materials by production personnel, the purchase of inferior quality materials, pilferage, changes in quality control requirements or changes in methods of production

3. Total Material Variance

┌ **Total Material Variance = SC – AC**
 SC: Standard material cost for the actual production
 AC: Actual cost for the actual production

📖 **E.g.:** Material A has a standard price \$1.00 per kg and actual price \$1.10 per kg. Standard usage for production is 18,000 kg but actual usage was 19,000 kg.

📖 **Solution:** Total Material Variance = SC – AC
 (Material A) = (\$1.00 x 18,000kg) - (\$1.10 x 19,000kg)
 = \$ 2,900 Adverse

📖 **E.g.:** Material B has a standard price \$3.00 per kg and actual price \$2.80 per kg. Standard usage for production is 9,000 kg but actual usage was 10,100 kg.

📖 **Solution:** Total Material Variance = SC – AC
 (Material B) = (\$3.00 x 9,000kg) - (\$2.80 x 10,100kg)
 = \$1,280 Adverse

4. Labour Wage Rate Variance

🕒 Comparing the standard price per hour with the actual price paid per hour

🕒 **E.g.:** The standard wage rate per hour is \$3.00 and the actual wage rate is \$3.20 per hour. The actual labour hours were 28,500 hours.

🕒 **Solution:** Labour Wage Rate Variance = (SR – AR) x AH
 SR: Standard wage rate per hour
 AR: Actual wage rate per hour
 AH: Actual number of hours worked

Labour Wage Rate Variance = (\$3.00 - \$3.20) x 28,500 hours
 = \$5,700 Adverse

🕒 Possible causes:

- The wage rate variance may be due to a negotiated increase in wage rates not yet having been reflected in the standard wage rate
- Labour rate variance may also occur because a standard is used that represents a single average rate for a given operation performed by workers who are paid at several different rates

5. Labour Efficiency Variance

✂ Represent the quantity variance for direct labour

✂ The quantity of labour that should be used for the actual output is expressed in terms of **standard hours produced**

✂ **E.g.:** The standard time for the production of one unit of Product Sigma is 3 hours. Thus a production level of 9,000 units results in an output of 27,000 standard hours. However, 28,500 direct labour hours are actually required to produce this output.

✂ **Solution:** Labour Efficiency Variance = (SH – AH) x SR
 SH: Standard labour hours for actual production
 AH: Actual labour hours worked for production
 SR: Standard wage rate per hour

Labour Efficiency Variance = (27,000 hours – 28,500 hours) x \$3.00
 = \$4,500 Adverse

✂ Possible causes:

- The labour efficiency variance is normally controllable by the production foreman, and may be due to a variety of reasons
- E.g.:** The use of inferior quality materials, different grades of labour, failure to maintain machinery in proper conditions, the introduction of new equipment or tools and changes in the production processes will all affect the efficiency of labour
- An efficiency variance may not always be controllable by the production foreman, it may be due, for example, to poor production scheduling by the planning department, or to a change in quality control standards

6. Total Labour Variance

- ☒ Is the difference between the standard labour cost for the actual production (SC) and the actual labour cost for the production (AC).
- ☒ **E.g.:** The actual production was 9,000 units with a standard labour cost of \$9.00 per unit. The actual cost for labour is \$91,200.
- ☒ **Solution:** Total Labour Variance $= SC - AC$
 $= (9,000 \text{ units} \times \$9.00) - \$91,200$
 $= \$10,200 \text{ Adverse}$

7. Variable Overhead Variance

- ✓ A total variable overhead variance is calculated in the same way as the total direct labour and material variances
- ✓ **E.g.:** The output is 9,000 units and the standard variable overhead cost is \$6 per unit produced. The standard cost of production for variable overhead is thus \$54,000. The actual variable overheads incurred are \$52,000.
- ✓ **Solution:** Total Variable Overhead Variance $= SC - AC$
 SC: Standard variable overheads charged to production
 AC: Actual variable overheads incurred for production

$$\text{Total Variable Overhead Variance} = \$54,000 - \$52,000$$

$$= \$2,000 \text{ Favourable}$$
- ✓ It is normally assumed that variable overhead vary with direct labour or machine hours of input.
- ✓ The total variable overhead variance will therefore be due to one or both of the following:
 - i) A **price variance** arising from actual expenditure being different from budgeted expenditure
 - ii) A **quantity variance** arising from actual direct labour or machine hours of input being different from the hours of input, which should have been used

8. Variable Overhead Expenditure Variance

- ☒ To compare the actual overhead expenditure with the budgeted expenditure, it is necessary to flex the budget
- ☒ **E.g.:** Assumed that variable overheads will vary with direct labour hours of input the budget is flexed on this basis. Actual variable overhead expenditure is \$52,000, resulting from 28,500 direct labour hours of input. The standard variable overhead rate is \$2 per hour.
- ☒ **Solution:** Variable Overhead Expenditure Variance $= BFVO - AVO$
 BFVO: Budgeted flexed variable overhead for the actual direct labour hours of input
 AVO: Actual variable overhead cost incurred

$$\text{Variable Overhead Expenditure Variance} = (\$2 \times 28,500 \text{ hours}) - \$52,000$$

$$= \$5,000 \text{ Favourable}$$
- ☒ Possible causes:
 - a) The variable overhead expenditure variance on its own is not very informative
 - b) Any meaningful analysis of this variance requires a comparison of the actual expenditure for each individual item of variable overhead expenditure against the budget

9. Variable Overhead Efficiency Variance

- ✓ The difference between the standard hours of output (SH) and the actual hours of input (AH) for the period multiplied by the standard variable overhead rate (SR)

- ↓ **E.g:** Standard hours to produce 1 unit Product Sigma is 3 hours. But, 28,500 direct labour hours required producing 9,000 units of Product Sigma. Standard variable overhead rate is \$2.00 per hour but actual rate is \$1.82 per hour.
- ↓ **Solution:** Variable Overhead Efficiency Variance

$$= (SH - AH) \times SR$$

$$= [(3 \text{ hours} \times 9,000 \text{ units}) - 28,500 \text{ hours}] \times \$2.00$$

$$= \$3,000 \text{ Adverse}$$

10. Fixed Overhead Expenditure or Spending Variance

- ☒ With a variable costing system, fixed manufacturing overhead are not unitized and allocated to products.
- ☒ Instead, the total fixed overheads for the period are charged as an expense to the period in which they are incurred.
- ☒ Fixed overheads are assumed to remain unchanged in response to changes in the level of activity, but they may change in response to other factors.
- ☒ For example, price increases may cause expenditure on fixed overhead to increase.
- ☒ The fixed overhead expenditure variance therefore explains the difference between budgeted fixed overhead and the actual fixed overhead incurred.
- ☒ **E.g:** Budgeted fixed overhead expenditure is \$120,000 and actual fixed overhead spending \$116,000.
- ☒ **Solution:** Fixed overhead expenditure variance = BFO - AFO
 BFO: Budgeted fixed overhead
 AFO: Actual fixed overhead spending

$$\begin{aligned} \text{Fixed overhead expenditure variance} &= \$120,000 - \$116,000 \\ &= \$4,000 \text{ Favourable} \end{aligned}$$

11. Sales Variance

- 📖 Sales variance can be used to analyse the performance of the sales function on broadly similar terms to those for manufacturing costs.
- 📖 The most significant feature of sales variance calculations is that they are calculated in terms of profit or contribution margins, rather than sales values.

12. Total Sales Margin Variance

- ☒ Where a variable costing approach is adopted, the total sales margin variance seeks to identify the influence of the sales function on the difference between budget and actual profit contribution
- ☒ **E.g:** The actual selling price per unit is \$42.00 but budgeted selling price per unit is \$40.00. Budgeted sales are 10,000 units but actual sales were 9,000 units. Standard variable cost per unit is \$20.00.
- ☒ **Solution:** Total sales margin variance = AC - BC
 AC: Actual contribution based on standard unit costs
 BC: Budgeted contribution based on standard unit costs

$$\begin{aligned} \text{Total sales margin variance} &= (9,000 \text{ units} \times \$22) - (10,000 \text{ units} \times \$20) \\ &= \$2,000 \text{ Adverse} \end{aligned}$$

- ☒ Using the standard cost to calculate both the budgeted and the actual contribution ensures that the production variances do not distort the calculation of the sales variances.
- ☒ The effect of using standard costs throughout the contribution margin calculations means that the sales variances arise because of changes in those variables controlled by the sales function (i.e. selling price and sales quantity)

13. Sales Margin Price Variance

- ✂ Sales margin price variance is a difference between the actual selling price and standard selling price
- ✂ **E.g.:** The actual selling price is \$42 but the budgeted selling price is \$40. Standard unit variable cost is \$20. Actual selling units is 9,000 units but budgeted units were 10,000 units.
- ✂ **Solution:** Sales Margin Price Variance = $(ASP - SSP) \times AV$
 ASP: Actual selling price
 SSP: Standard selling price
 AV: Actual volume

$$\begin{aligned} \text{Sales Margin Price Variance} &= (\$42 - \$40) \times 9,000 \text{ units} \\ &= \$18,000 \text{ Adverse} \end{aligned}$$

14. Sales Margin Volume Variance

- ☞ To ascertain the effect of changes in the sales volume on the difference between the budgeted and the actual contribution, we must compare the budgeted sales volume with the actual sales volume.
- ☞ The use of standard margin ensures that the standard selling price is used in the calculation, and the volume variance will not be affected by any changes in the actual selling prices.
- ☞ **E.g.:** The budgeted sales are 10,000 units but the actual sales are 9,000 units. Standard contribution margin is \$20 per unit but actual contribution margin is \$22 per unit.
- ☞ **Solution:** Sales margin volume variance = $(AV - BV) \times SM$
 AV: Actual sales volume
 BV: Budgeted sales volume
 SM: Standard contribution margin

$$\begin{aligned} \text{Sales margin volume variance} &= (9,000 \text{ units} - 10,000 \text{ units}) \times \$20 \\ &= \$20,000 \text{ Adverse} \end{aligned}$$

Learning Outcomes

- Explain technique and terminology of marginal costing
- Prepare profit statement under marginal costing and absorption costing format
- Calculate contribution from divisions/segments/products and use that result to make decision as to continue or shut down
- Make a decision as to production mix when there are limiting factors
- Choose between make the product or buy the product
- Describe of standard costing and variances
- Calculation of variance
- Understand how the variance can arise

Basic Reading

1. T Lucey (2001) Costing; 5th ed. London: Continuum
2. C Drury (2000) Management & Cost Accounting; 5th ed. London: International Business Press
3. S. Derek (2000) LCCI Cost Accounting ; LCCI Examination Board Preparation Books

Revision Questions

1. In a period 2006, 20,000 units of product TT were produced and sold. Costs and revenues were:

	RM
Sales	100,000
Production costs:	
Variable	35,000
Fixed	15,000
Administrative and selling overheads (fixed)	25,000

Prepare operating statements based on both Absorption and Marginal Costing

2. In a period 2007, 20,000 units of product TT were produced and 18,000 units were sold. 2000 units being carried forward as stock for next period. Costs and revenues were:

	RM
Sales	100,000
Production costs:	
Variable	35,000
Fixed	15,000
Administrative and selling overheads (fixed)	25,000

Prepare operating statements based upon marginal costing and absorption costing principles.

3. What are the arguments for absorption costing?
 4. What arguments are there for the use of marginal costing principles in the routine costing system of an organisation?
 5. A company makes three products, the details of which are:

Product	Machine Hours per Unit	Variable Cost per Unit
A	4 hours	RM 48
B	2 hours	RM 72
C	3 hours	RM 42

48,000 hours of machine time will be available. The company is considering sub-contracting the products at the following buying-in prices:

Product A	RM68
Product B	RM80
Product C	RM58

Assuming company plans to sell 8,000 units of each product, please decide which products company should manufactures and which products company should sub-contracted and in what quantities.

6. The following is a draft budget for next year for the McPhee Company;

	<u>Product</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Total</u>
Units		10,000	40,000	50,000	
		RM	RM	RM	RM
Direct Materials		100,000	500,000	800,000	1,400,000
Direct labour		40,000	160,000	200,000	400,000
Variable Overhead		30,000	140,000	150,000	320,000
Fixed Overhead (apportioned) *		80,000	320,000	400,000	800,000
		250,000	1,120,000	1,550,000	2,920,000
Profit / (Loss)		30,000	(120,000)	150,000	60,000
Sales		280,000	1,000,000	1,700,000	2,980,000

* This is general fixed overhead of RM800,000, which has been apportioned on units sold.

Three policies are now being considered:

Policy 1 = The complete elimination of Product B to improve overall profitability

- Policy 2 = Increase the selling price of Product B to RM30 which will reduce demand by 25%
- Policy 3 = The elimination of Product B and its replacement by product D. Product D would have a contribution per unit of RM9 and a sales demand of 40,000 units. This halve the annual sales of Product C

Required : Showing your workings, state total profit or loss as a consequence of:

- a) Policy 1
 - b) Policy 2
 - c) Policy 3
7. NINI Ltd uses batch production methods to make a single product X. The budgeted annual output is 450,000 kg produced evenly over 12 months. The standard cost of a batch is as follows:
- | | |
|-------------------------------|------------------------------------|
| Direct material M602 | 80 kg at RM3 per kg |
| Direct material M547 | 20 kg at RM5 per kg |
| Direct labour - | 8 hours at RM6 per hour |
| Variable production overheads | - absorbed at RM45 per labour hour |
| Fixed production overheads | absorbed at RM3 per labour hour |
- The standard output is 90 kg of saleable product. Waste has no scrap value.

The actual results for Month 3 were:

		RM
Output	36,000 kg	0
Direct material M602	34,340 kg	96,152
Direct material M547	6,060 kg	36,360
Direct labour	3,232 hours	19,060
Variable production overheads		14,600
Fixed production overheads		9,800

Calculate the following variances :

1. Material price for each material
2. Direct labour rate
3. Direct labour efficiency
4. Variable overhead expenditure
5. Variable overhead efficiency
6. Fixed overhead expenditure
7. Fixed overhead volume