

Chapter 11 Solutions

Question 11.1

What are standard costs and why is a standard costing system considered more useful than comparing actual costs to budget?

A standard cost is a predetermined calculation of what a cost should be under specified working conditions. Standards can be set for materials, labour and overheads. Setting a standard involves the establishment of two components for each cost type, the volume required and the unit cost attached to that volume.

A standard costing system provides more than a benchmark for measuring actual performance. A standard costing system enables more accurate pricing of products based on detailed cost analysis which in turn facilitates budgeting. Standard costing facilitates more detailed variance analysis leading to a deeper level of investigation and better management decision-making. In addition standard costing involves setting efficiency targets for employees stimulating cost consciousness. In addition, the setting of standards involves determining the best materials and practices, which may lead to economies. A standard costing system allows an overall improvement in the financial control of the business.

Question 11.2

a) Briefly explain the following terms

Standard cost

A standard cost is a predetermined calculation of what a cost should be under specified working conditions. Standards can be set for materials, labour and overheads. Setting a standard involves the establishment of two components for each cost type, the volume required and the unit cost attached to that volume.

Materials usage variance

The materials usage variance is the difference between what was actually used and what should have been used for the actual production volume, based on standard cost per item of materials. It is calculated using the formula (standard cost per unit – actual cost per unit) x actual quantity used.

Labour rate variance

The labour rate variance is the difference caused by paying more or less than the standard labour rate per hour. It is calculated using the formula (Standard rate per hour – actual rate per hour) x actual hours worked.

Labour efficiency variance

The labour efficiency variance is the difference caused by using more or less labour hours than the standard labour hours allowed for the actual production volume, based on the standard rate. It is calculated using the following formula (Standard hours allowed – actual hours) x standard rate per hour.

b) Outline the process for developing standards of efficiency and usage for both direct labour and direct materials

Setting standards for labour efficiency: This is effectively the average time a direct labour employee takes to perform tasks related to a unit of production. This is quite difficult to establish as a number of tasks may have to be separately identified in the preparation of a unit of production. Also, other more subjective variables need to be considered such as skill, experience, motivation, working conditions and training. Generally, each operation is studied and an allowed time agreed, usually after a time and motion study is carried out.

Setting standards for material usage: This is based on product specifications derived from an intensive study of the make-up of each product. It must take into account losses that may be caused by wastage, pilferage and deterioration of materials while in stock. Ultimately the business needs to set a standard that will indicate that if they plan to produce 50 units of production, then 1,000 kgs of material X will be needed. Thus they need to take into account the quality of the materials purchased, the quality of equipment used to develop the materials (which is related to the level of waste), the storage conditions and security.

Question 11.3

a) Outline the advantages of standard costing

- More accurate pricing of products based on detailed cost analysis.
- Carefully planned standards are an aid to more accurate budgeting.
- The business will have a more simplified stock control system, as all materials purchased are valued at standard cost rather than LIFO or FIFO value systems.
- More detailed variance analysis leading to a deeper level of investigation and better management decision-making.
- A target of efficiency is set for employees and cost consciousness is stimulated.
- The setting of standards involves determining the best materials and practices, which may lead to economies.
- An overall improvement in the financial control of the business.

b) Briefly outline the problems involved in setting standards

Standards should be attainable and should not assume perfect or ideal conditions. This would lead to unrealistic standards and large adverse variances as well as demoralised staff. This can happen when standards are set from the top down in an autocratic styled organisation.

Built into any standard should be certain allowances for what is termed 'normal loss'. This could include factors such as machine breakdowns and unavoidable material wastage.

Standards, although realistic and with allowances built in, should also have a motivating affect on employees. In performing different tasks, different employees will have different levels of ability and motivation. If standards are perceived to be unfair then employees may be unmotivated to achieve the standard.

Employees must be involved in the standard setting process where it affects them, especially in terms of the efficiency standards. This can ensure a fairer and more motivating standard is set.

In setting standards, management must accept and anticipate some degree of variability between actual performance and the standard set. These variations or variances can be positive or negative, however what is important is the degree of variation or variance. This will dictate the level and extent of investigations. For example should a variance be only 1 per cent of the standard, then it may be ignored. However with extremely large positive or negative variances, it should be asked whether standards were set either too high or too low. Also management must be aware that departments can show extremely large positive variances by cutting training or research budgets which might affect the long-term profitability of the business.

Standards have to be revised, especially if the level of variance is extreme, as this would indicate the standard is meaningless. Also should there be any change in work practices, materials used, materials cost or wage rates, then standards need to be adjusted. Ideally, any revisions should take place when the business is preparing its annual budget.

Question 11.4

a) Prepare a work sheet showing the fixed and flexible budgets, actual results and variances for March

		Fixed		Flexible		Actual	Variances	
Sales	units	3000		3500		3,500		
Selling price		5		5		5.2		
	€	€	€	€		€	€	
Sales		15000		17500		18,200	700	F
Less cost of sales								
Mat A	2.50	7,500	2.5	8750	(1400 x 5.5)	7,700	1,050	F
Mat B	0.75	2250	0.75	2625	(925 x 3.5)	3,237.50	-612.50	A
Mat C	1.00	3000	1	3500	(1500 x 2.4)	3,600	-100	A
		12,750		14,875		14,537.5		
Gross profit		2,250		2,625		3,662.5	375	F

b) Calculate the materials price and usage variances

Materials price and usage variances:

	Price	Usage	Total
	(std price - act price) x act usage	(Std usage -act usage) std price	
Ingredient A	(5.00 - 5.5) x 1400	(1750 - 1400) 5.00	
	(700) A	1750 F	1050 F
Ingredient B	(3.0 - 3.5) x 925	(875 - 925) x 3	
	(462.5) A	(150) A	(612.5) A
Ingredient C	(2.5 - 2.4) x 1500	(1400 - 1500) x 2.5	
	150 F	(250) A	(100) A
	(1012.5) A	1350 F	337.5

Note the standard usage is calculated as 3,500 units x 0.5 (ingredient A); 0.25 (ingredient B) and 0.4 (ingredient C)

c) Prepare a statement reconciling the budgeted gross profit to actual

	€	€
Budget gross profit		2250.00
Sales price variance	700.00	
Sales margin volume variance	375.00	
Materials price variance (700 + 462.5 - 150)	-1012.50	
Materials usage variance (1750 - 150 - 250)	<u>1350.00</u>	<u>1412.50</u>
Actual gross profit		<u>3662.50</u>

d) Briefly comment on the significance of the variances calculated Overall actual gross profit is €1412.5 or 62.7% greater than budgeted. The main reasons for this are as follows

Sales price variance: The business has achieved a higher average price than budgeted. It budgeted on an average price of €5.00 but achieved €5.2 and increase of 4%. This ensures a positive price variance of €700 and thus actual profit was 31% (700/2250) greater due to this price variance. Management should assess the reasons for this including questioning the budgeted target set.

Sales margin volume variance: Despite achieving a higher price the business managed to increase sales volume by 500 units or 16.67% (500/3000). This created a positive variance of €375 and thus actual profit was 16.67% higher due to the increase in sales. Again management must question the budget figure. Was it too easily achievable? Were there random events that influenced the sales level.

Materials variances: The overall materials cost variance is a positive variance of €337.5. This can be further analysed and can be broken into its two components parts as follows

Materials price variance: This is an adverse variance of €1012.5. The business paid more for their materials than they expected. This is a significant variance as it amounts to 45% of budgeted profit. In particular Materials A and B had adverse price variances whereas Materials C had a small positive variance. Management must investigate reasons for these variances. Did the purchasing manager seek competitive pricing to ensure the best value is obtained in purchasing? Did the company avail of quantity discounts. How often are the standards reviewed to reflect reality? Was there simply a general increase in the price of materials

Materials usage variance: This is a positive variance of €1350 and is very significant as it amounts to 60% of budgeted profit. Possible reasons for this variance are The standard of quality of the materials purchased. Good quality materials can lead to less materials wastage. This could be in conjunction with an adverse materials price variance.

The quality and age of the equipment used. If the company is using more up to date equipment this can lead to greater levels of efficiency.

Maybe the standard for materials usage needs to be revised.

Question 11.5

a) Prepare a statement showing, for expenses only, fixed and flexible budgets, actual expenses, and variances, for the month

Budgeted and Actual Expenses					
		Fixed Budget	Flexible Budget	Actual	Variances
Per Visitor		120,000	115,000	115,000	
	€	€	€	€	€
Variable Expenses					
Food costs	4.20	504,000	483,000	528,000	-45,000 A
Direct labour	4.40	528,000	506,000	493,500	12,500 F
Variable o/h	1.40	160,000	161,000	178,600	-17,600 A
	10.00	1,200,000	1,150,000	1,200,100	-50,000 F
Fixed overheads		150,000	150,000	144,300	5,700 F
Total expenses		1,350,000	1,300,000	1,344,400	-44,400 A

Note the figures that make up each variance is marked in bold

The variances are as follows:

Food cost variance	45,000 A
Direct labour variance	12,500 F
Variable overhead variance	17,600 A
Variable costs volume variance	50,000 F
Fixed overhead variance	5,700 F

b) Calculate all relevant expense variances

Materials cost variances

Materials price variance	Standard price - Actual price	x	Actual Quantity	
	(2.80 - 3.20)	x	165,000	-66,000 A
Materials usage variance	Standard Quantity - Actual quantity	x	Standard price	
	(172,500 - 165,000)	x	2.80	21,000 F
Materials cost variance				-45,000 A

Labour cost Variances

Labour rate variance	Standard rate - Actual rate	x	Actual Hours	
	(11.00 - 10.50)	x	47,000	23,500 F
Labour efficiency variance	Standard hours - Actual hours	x	Standard rate	
	46,000 - 47,000	x	11.00	-11,000 A
Labour cost variance				12,500 F

Variable overhead variances

Variable overhead rate variance	Standard rate - Actual rate	x	Actual Hrs		
	(3.50 - 3.80)	x	47,000	-14,100	A
Variable overhead efficiency variance	Standard hours - Actual hours	x	Standard rate		
	(46,000 - 47,000)	x	3.50	-3,500	A
Variable overhead cost variance				<u>-17,600</u>	<u>A</u>

c) Prepare a statement reconciling budgeted and actual expenses

Reconciliation of Budgeted with Actual Expenses

	€	€	€
	(F)	A	
Original budgeted expenses (120,000 visitors)		1,350,000	
Variable cost volume variance (-5,000 visitors)		<u>-50,000</u>	F
Flexible budget expenses (115,000 visitors)		1,300,000	
Food price variance		66,000	
Food usage variance	-21,000		
Labour rate variance	-23,500		
Labour efficiency variance		11,000	
Variable overhead expend variance		14,100	
Variable overhead efficiency variance		3,500	
Fixed overhead expend variance	-5,700		
	<u>-50,200</u>	<u>94,600</u>	<u>44,400</u> A
Actual Expenses (115,000 visitors)		<u>1,344,400</u>	

d) Give possible reasons for the variances

Variable cost volume variance (F)	The business selling less and thus variable costs fall
Food price (A)	Higher inflation, higher quality, less bulk discounts, Cost standards not revised regularly
Food usage (F)	Less waste, higher quality materials.
Labour rate (F)	Softening labour market, lower grade, lower overtime premiums, cost standard not revised regularly
Labour efficiency (A)	Lower calibre staff, lack of training, less motivation/supervision
Variable oh rate (A)	More time worked, inflation in service costs (e.g. electricity)
Variable oh efficiency (A)	Same as for labour, less efficient use of service.
Fixed oh expend (F)	Lower inflation, lower quality service, lower fixed salaries

Question 11.6

a) Prepare the fixed and flexible budgets, actual results and variances, for the month of January

	Fixed	Flexible	Actual	Variance	
Sales (units)	1000	1200	1200		
	€	€	€	€	€
Selling Price	50	50			
Sales revenue	50000	60000	100,000	40,000	F sales price variance
Less Variable costs					
Materials	€15 15000	18000	15,840	2,160	F Materials cost variance
Labour	€20 20000	24000	28,050	-4,050	A Labour cost variance
Variable	€6 <u>6000</u>	<u>7200</u>	<u>7,800</u>	-600	A Variable o/h variance
Total variable costs	41000	49200	51690		
Contribution	9000	10800	48310	1800	F Sales margin vol var

b) Calculate the sub-variances

Materials variances

	(std price - act price) x act quantity used	
Price	$(0.15 - 0.12) 132,000 = 3960 \text{ F}$	3960 F

	(std usage - act usage) x std price	
Usage	$(120,000 - 132,000) \times 0.15$	<u>(1800) A</u>
		<u>2160 F</u>

Labour variances

	(std rate - act rate) x actual hours	
Rate	$(5.00 - 5.5) \times 5,100$	(2,550) A

	(std hours - act hours) x std rate	
Efficiency	$(4,800 - 5100) \times 5.00$	<u>(1,500) A</u>
		<u>(4,050) A</u>

c) Briefly discuss the above materials and labour variances and state how, in many respects, they are related

The overall materials variance is €2160 favorable. This can be further analyzed into materials price and materials usage. The materials price variance is €3,950 favorable. Ultimately the business was able to source cheaper materials than they budgeted for. In fact materials were 20% (0.03/0.15) less than the standard set in the budget. This is extreme variance and it questions the frequency of reviewing standards in the business.

The company also has an adverse materials usage variance of €1,800. This was due to using 10% more materials (12/120) than the standard required. While questioning the standard, one must also question whether the cheaper materials were lacking in quality and thus lead to more waste and an adverse usage variance.

The labour cost variance is €4,050 negative. This can be further analysed into labour rate and efficiency. The labour rate is €2,550 due to the fact that the labour rate was 10% greater than the standard used in the budget. Management must assess was this due to an unforeseen event or due to the fact that the standard should have been reviewed prior to agreeing the budget.

The labour efficiency variance is €1,500 adverse reflecting the difference between the estimated hours worked in the budget to the actual hours worked. At a 1200 unit production run the standard hours set was 4,800. Actual hours worked was 5,100. This is an increase of

6.25%. This variance can also be related to the fact that cheaper materials were sourced. If these materials are inferior, they can result in increased waste not just in terms of materials but also labour time and thus lead to adverse labour efficiency variances.