

Chapter

# 10

## Standard costing and variance analysis

## 10.1 Introduction to standard costing

A standard cost is a planned (budgeted) or forecast unit cost for a product or service, which is assumed to hold good given expected efficiency and cost levels within an organisation. A standard cost normally represents the planned (budgeted) or forecast unit cost for material, labour and overhead expected for a product or service.

Variance analysis is part of a budgetary control process, whereby a budget (or standard) for costs and revenues, is compared to the actual results of the organisation e.g. financial analysis of the differences between standard and actual costs. This information can be used to improve operational performance through control action then taken by management.

### Standard costing is useful for

- The preparation of budgets e.g. more accurate planning or forecasting.
- Controlling the organisation through exception reporting e.g. standard or budgeted costs and revenues, compared with actual results. Any differences that do not conform to expectations is investigated.
- Inventory valuation e.g. accounting convention IAS 2 inventory allows manufacturing organisations to use standard costing as an external accounting method to value raw materials, work-in-progress and finished goods inventory.
- Standard costing can also simplify cost bookkeeping (see chapter 11).
- Motivating and rewarding staff e.g. by the use of standards as goals or targets, and often financial incentives to motivate staff.

### Types of standard cost

- **Ideal standard** e.g. a standard attained under the most favourable operating conditions, no allowance for any waste, scrap, idle time or production stoppage. This type of standard is normally unrealistic or unattainable in reality; staff could be demotivated because such targets set would rarely be achieved.
- **Attainable (or expected) standard** e.g. a standard that could be achieved by staff, given a reasonable (not perfect) level of effort from them. Some allowances would be made for delays or inefficiencies that are expected to occur during production or delivery of a service.
- **Current standard** e.g. a standard based on current and existing operating conditions. Management must continually attempt to improve cost and efficiency levels by the continual introduction of attainable (or expected) standards (as explained above).
- **Loose standard** e.g. a standard loosely set and therefore easy to achieve by staff.
- **Basic standard** e.g. the first standard ever used by the organisation, often used as a yardstick to monitor trends for improvement made over time.
- **Historical standards** e.g. any standard used historically in previous periods.

## 10.2 Limitations (criticisms) of standard costing

- ✗ Sometimes it can be hard to define a 'current' or 'attainable standard' especially with the complexity and diversity of modern manufacturing. Traditionally manufacturers produced a small range of products using mass production techniques. Nowadays products have shorter lifecycles and different batches of many different products can be produced.
- ✗ With more automation of manufacturing operations today and less human intervention, labour standards are becoming less valuable as management information. Automation produces greater uniformity and consistency of products made, with less likelihood of material and labour variances actually occurring.
- ✗ Standard costing is an internal not external control measure e.g. too internally focused on maximising efficiency and minimising cost. Organisations need to consider other external factors such as competition, customers and other global environmental factors, not just internal cost and efficiency levels. Quality, innovation and customer satisfaction have become far more important to survive as an organisation today.
- ✗ Even when variances are identified there could be uncontrollability of any exceptions highlighted e.g. discounts lost due to a reduction in the quantity of material ordered or seasonal price fluctuations within the financial period. In these cases very little control action (if any) can be taken by management and care must also be taken to avoid blame. Often the reason or causes of variances even when found are sometimes overlooked or not investigated at all.
- ✗ The revision to standards may be too infrequent to guide or improve performance over time e.g. the life cycle of products are much shorter in a modern manufacturing environment and the environment more dynamic. Standards quickly become out of date due to frequent and continuous change.
- ✗ Modern manufacturing techniques such as TQM and quality circles mean as manufacturers aim for near perfection, the frequency and materiality of variances should not occur so often. Today focus is more on quality and customer satisfaction not the minimisation of cost.

### Practical advice for setting standards

1. Use challenging but realistic targets. Link higher financial reward to the higher achievement of more challenging targets and perhaps moderate incentives for easier targets to achieve.
2. Consult with and allow staff to participate when setting targets, this can help improve their motivation, reduce frustration and increase job satisfaction.
3. Clear trust and communication must be developed between management and staff, management must avoid be over critical if very challenging targets have not been achieved.
4. Good planning is essential to ensure whatever standards or targets that are used, they are realistic and achievable. Frequent periodic reviews of standards or targets are required to ensure they are attainable.

### 10.3 Information to help create a standard cost

Information for a standard (budgeted) cost e.g. for a product or service.

<b>Standard material price</b> <ul style="list-style-type: none"><li>• Supplier contracts, quotations and estimates.</li><li>• Previous supplier invoices and cost trends.</li><li>• Websites of material/component suppliers.</li><li>• Discounts available for bulk purchases.</li><li>• Seasonality/volatility of material prices.</li><li>• Differences in quality of material/components and therefore differences in price.</li><li>• Inflation rates expected for material/component prices.</li></ul>	<b>Standard material usage</b> <ul style="list-style-type: none"><li>• The quality of material e.g. levels of wastage and scrap maybe higher for more inferior material/components and vice versa.</li><li>• Specification and design of the product or service e.g. determines directly the material usage.</li><li>• Normal wastage levels expected during delivery of a service or manufacturing of a product.</li><li>• Estimations based upon previous consumption of material/components e.g. quality of litres, kilos etc issued from stores to production <math>\div</math> volume of products made = average material consumption.</li></ul>
<b>Standard labour rate</b> <ul style="list-style-type: none"><li>• Market rates for different skills and grades of staff.</li><li>• Wage inflation rates expected.</li><li>• Existing internal rates from payroll records e.g. bonus schemes, overtime or piece work rates currently in use.</li></ul> <p>The standard (budgeted) wage rate per hour normally incorporates any level of bonus or overtime expected for a period, based upon forecast output.</p>	<b>Standard labour efficiency</b> <ul style="list-style-type: none"><li>• Idle time expected e.g. non-productive time during processes.</li><li>• Time and motion studies.</li><li>• Time sheets e.g. total hours worked <math>\div</math> volume of products made = the average time per unit.</li><li>• Skill and expertise of staff e.g. skilled staff work quicker or more efficiently.</li><li>• The learning curve or learning rate expected when untrained staff or new processes are introduced.</li><li>• Motivation and morale of staff often creates quicker performance.</li></ul>

### **Standard overhead rate**

- A variable or fixed overhead rate per unit can be obtained by dividing the total forecast (budgeted) overhead for a period, by a forecast (budgeted) level of activity e.g. labour hours worked, machine hours run or products and services made (output).
- Review and monitor variable overhead rates used in past periods and consider expected inflation rates.
- Cost relationships can be found by using techniques such as the high-low method or a scatter graph as a way of separating variable and fixed cost.

### **Example 10.1**

Wood Plc makes wooden tables and chairs from natural timber. To make one unit of product consisting of one table and four chairs, it consumes 60Kg of timber; but this is before accounting for an expected 20% wastage of timber, due to wood shavings and scrap in the cutting process. 100Kg of timber costs Wood Plc £50.

**What is the standard cost of material to make one unit of product?**

## 10.4 Fixed and flexible budgeting

### Fixed budget

A budget set prior to the control period and not subsequently changed in response to changes in activity, costs or revenue.  
(CIMA)

A fixed budget provides details of costs, revenues or resource requirements for a single level of activity. A fixed budget is normally not changed once it has been prepared. For budgetary control purposes, the actual results are compared at the end of the financial period, but no account is taken, if the actual activity level is different from the budgeted activity level. An example of a fixed budget is a master budget.

Fixed budgets are a more useful form of budgeting for service organisations, where often a high proportion of budgeted total cost is fixed. Fixed cost remains constant or does not vary significantly with an activity level, therefore even if the actual activity level is different from the budgeted activity level, you still have a good yardstick to compare the two, due to fixed cost not expected to change.

### Flexible budget

A **flexed budget** is a budget that has been revised or adjusted using the actual level of sales or output achieved as its activity level.

Flexing variable costs from original budgeted levels to the allowances permitted for actual volume achieved while maintaining fixed costs at original budget levels.

(CIMA)

A flexible budgeting system often produces many budgets projecting costs and revenues over different ranges of production or sales volumes. Flexible budgets are also amended (flexed) if the actual level of activity turns out to be different from the budgeted level of activity. A flexible budget is therefore flexed to correspond to the actual activity level for a period. When a budget is flexed it would give an appropriate level of revenue and cost as a yardstick to compare on a like for like basis to actual results, meaningful variances or exceptions to the budget, can then be highlighted for management attention.

Flexible budgeting recognises different cost behaviour patterns e.g. costs will rise or fall with the volume of sales or output achieved, this is a better system for control purposes. They are useful at the planning stage for 'what if?' analysis e.g. what if sales volume falls by 20%, what would be the effect on revenue, cost or contribution?

### Benefits of flexible budgets

1. Useful at the planning stage for 'what if?' analysis.
2. Can be flexed at the end of a period to correspond and be compared to actual results achieved, giving better information for control purposes.

### Example 10.2

Butlins is a business that offers packaged holiday deals in three locations within the UK. In each location the business operates a restaurant that serves many different meals and puddings through out the day to guests staying over in chalets, on the holiday parks. One such serving counter has been of major concern for management, the all week Sunday lunch counter, as it is expensive to run.

The stand uses two staff on different shifts to cook and serve meals at the counter, the standard cost and price of the hungry man roast of the day is as follows:

#### Standard cost information for 1 meal

	£ Per meal
Chicken 0.3kg @ £2.50 per kg	0.75
Vegetables 0.5kg @ £0.50 per kg	0.25
Labour 15 mins @ £9.00/hr	2.25
Variable overhead 15 mins @ £2.00/hr	<u>0.50</u>
	3.75
Standard contribution	<u>8.20</u>
Selling price (included in packaged price)	<u>11.95</u>

The budget each week aims to sell 500 meals. Fixed budgeted overhead for each week is £2,500. For week 43 the following actual information was obtained.

Meals actually sold were 476 and the revenue earned £5,688.

#### Ingredients purchased

	Chicken	Vegetables
Purchased	180kg (£405)	250kg (£140)
Used	165kg	220kg

#### Chef wages for week 43

Hours paid	120 hours (wages paid £1,200)
Hours worked	114 hours

6 hours were idle due to ovens failing on Tuesday afternoon

Variable overhead                      £150

Fixed overhead                          £2,750

Standard costing is used to value any material inventory at the end of a period.

**Produce the original budget, a flexed budget based upon actual sales volume achieved and compare this to actual results in order to calculate any budget variances?**

## 10.5 Variance analysis

Variance analysis is a budgetary control technique, which compares planned (budgeted) or forecast costs and revenues to actual financial results, it measures the differences between standard (budgeted) and actual performance. Variance analysis is used to improve operational performance through control action by management e.g. investigation of any variance causes and correction of them to prevent in future any further deviations from plan.

### Reasons why variances occur

- Inaccurate data used to compile standards, inaccurate compilation of the budget or inaccurate compilation of actual financial results.
- Standard used either not realistic or out of date.
- Efficiency of how operations were undertaken and performed by staff during the period e.g. mistakes made, poor decisions made, lack of effort etc can all lead to actual results be worse than expected.
- Random or chance events occurring e.g. sudden economic down turn such as the credit crunch, volatility of exchange rates, weather and commodity prices.

The budgetary planning process involves the production of budgets or forecasts using the most realistic standards for cost and efficiency levels. The budgetary control process identifies areas of responsibility for management and staff and then frequently compares actual results against the budget or standards used. The original budget would have normally forecast a different number of units produced and sold, compared with the actual number of units produced and sold, a flexed budget is therefore prepared e.g. the original budget flexed (redrafted based on actual units produced and sold), to compare with actual costs and revenues. When a flexed budget is compared with actual results this is on a like for like basis and therefore a meaningful yardstick to calculate variances. Variances can be subdivided and analysed further to help management determine where control action is needed.

A variance is the difference between planned, budgeted or standard cost and the actual cost incurred. The same comparisons may be made for revenues.

(CIMA)

There are many variance proforma calculations that need to be learned and applied as part of your studies. These proforma are essential to learn and practice in order to truly understand and interpret what variances mean. Once variances have been calculated either F or A is used as terminology to indicate favourable or adverse differences between actual and standard performance. Favourable means that actual results were better than standard. Adverse means that actual results were worse than standard. Remember variances are just reconcilable differences between a budget (standard) and actual results so in the case of an adverse variance this would mean that actual cost will be higher or profit lower when compared to the budget, and vice versa if a variance was favourable.



**Within example 10.2 the following budget variances were calculated**

- The total material variance for chicken £11 (A) and vegetables £6 (A)
- The total labour variance £129 (A)
- The total variable overhead variance £88 (F)
- The total fixed overhead variance £370(A)

**(A) = Adverse**

Indicates the organisation performed worse than expected in comparison to budget.

**(F) = Favourable**

Indicates the organisation performed better than expected in comparison to budget.

**Note:** These total (budget) variances above can be sub-divided further to provide more effective management information for control purposes. **Your syllabus does not require you to understand fixed overhead variances** and therefore no further discussion will take place regarding this.

## 10.6 Variances ‘calculations (proforma) to learn’

### Sales variance proforma

<b>Sales price variance</b>		<b>£</b>
	Did sell (actual quantity sold x actual selling price)	X
	Should sell (actual quantity sold x standard selling price)	(X)
	<b>Sales price variance</b>	<u>X</u>
	This measures the impact on profit when actual units sold were at a lower or higher price than the standard (budgeted) price.	
<b>Sales volume (contribution) variance</b>		<b>Units</b>
	Did sell (actual quantity sold)	X
	Should sell (original budgeted quantity sold)	(X)
		X
		x Standard Contribution per unit
	<b>Sales volume (contribution) variance</b>	<u>X</u>
	The sales volume (contribution) variance measures the difference between the original and flexed budgeted contribution. It measures the impact on contribution, when actual sale of units is more or less than the original budgeted sale of units. This method of calculation would be applied when marginal costing is used by the organisation.	

## Cost variance proforma

<b>Material price variance</b>	<div> <div>£</div> <div> Did spend (actual quantity purchased x actual price) X  Should spend (actual quantity purchased x standard price) (X)  <b>Material price variance</b> X </div> </div> <p>The material price variance measures the impact on contribution or profit when the actual quantity of material purchased was at a lower or higher price than the standard price. This variance calculation always uses the quantity of material purchased <u>never material used</u> if there is a difference between material purchased and used in a question.</p>
<b>Material usage variance</b>	<div> <div>kg/litres/units</div> <div> Actual production did use X  Actual production should use  (actual production x standard usage) (X)  X  x Standard Price  <b>Material usage variance</b> X </div> </div> <p>The material usage variance measures the impact on contribution or profit when the actual quantity of material used was a lower or higher amount than standard usage. This variance calculation always uses the quantity of material used <u>never material purchased</u> if there is a difference between material purchased and used in a question.</p>
<p style="text-align: center;"><b>Total material variance equals material price variance +/- material usage variance</b></p>	
<b>Labour rate variance</b>	<div> <div>£</div> <div> Did spend (actual hours paid x actual rate) X  Should spend (actual hours paid x standard rate) (X)  <b>Labour rate variance</b> X </div> </div> <p>The labour rate variance measures the impact on contribution or profit when the actual hourly rate paid, was at a lower or higher rate than the standard rate. This variance calculation always uses actual hours paid <u>never hours worked</u> if there is a difference between hours paid and worked in a question.</p>

<b>Labour efficiency variance</b>	<div style="text-align: right;"> <b>Hours</b>            Actual production did take            Actual production should take            (actual production x standard hours)         </div> <div style="text-align: right;">           X            (X)            X            x Standard Rate per hour  <u>X</u> </div> <p><b>Labour efficiency variance</b></p> <p>The labour efficiency variance measures the impact on contribution or profit when the actual quantity of labour hours worked was at a lower or higher amount than standard efficiency. This variance calculation always uses actual hours worked <u>never hours paid</u> if there is a difference between hours paid and worked in a question.</p>
<b>Labour idle time variance</b>	<div style="text-align: right;"> <b>Hours</b>            Actual hours paid            Actual hours worked            Idle time         </div> <div style="text-align: right;">           X            (X)            X            x Standard Rate per hour  <u>X</u> </div> <p><b>Labour idle time variance</b></p> <p>The idle time variance measures the impact on contribution or profit when labour hours paid is different to labour hours worked. <b>Tip:</b> The idle time variance in your exam will always be adverse.</p>
<p style="text-align: center;"> <b>Total labour variance</b>  <b>equals labour rate variance</b>  <b>+/- labour efficiency variance</b>  <b>+/- labour idle time variance</b> </p>	
<b>Variable overhead expenditure variance</b>	<div style="text-align: right;"> <b>£</b>            Did spend (actual hours worked x actual variable overhead rate) X            Should spend (actual hours worked x standard variable overhead rate) (X)  <b>Variable overhead expenditure variance</b> <u>X</u> </div> <p>The variable overhead rate variance measures the impact on contribution or profit when the actual rate paid, was at a lower or higher rate than the standard rate. This variance calculation always uses actual hours worked <u>never hours paid</u> if there is a difference between hours paid and worked in a question. It is assumed that no variable overhead would be incurred during any periods of idle time.</p>

<b>Variable overhead efficiency variance</b>	Actual production did take	<b>Hours</b> X
	Actual production should take (actual production x standard hours)	(X) X
		x Standard Rate per hour
	<b>Variable overhead efficiency variance</b>	<u>X</u>
<p>The variable overhead efficiency variance measures the impact on contribution or profit when the actual quantity of labour hours worked was at a lower or higher amount than standard efficiency. This variance calculation always uses actual hours worked <u>never hours paid</u> if there is a difference between hours paid and worked in a question. <b>Tip:</b> Similar proforma to the labour efficiency variance e.g. if staff work more efficiently when compared to standard, labour cost and variable overhead can be saved due to the saving in staff time.</p>		
<p align="center"><b>Total variable overhead variance equals variable overhead expenditure variance +/- variable overhead efficiency variance</b></p>		

#### Other relevant cost variances (fixed overhead)

<b>Fixed overhead expenditure variance</b>	Actual fixed overhead expenditure	X
	Budgeted fixed overhead expenditure	(X)
	<b>Fixed overhead expenditure variance</b>	<u>X</u>

### Example 10.3

Butlins is a business that offers packaged holiday deals in three locations within the UK. In each location the business operates a restaurant that serves many different meals and puddings through out the day to guests staying over in chalets, on the holiday parks. One such serving counter has been of major concern for management, the all week Sunday lunch counter, as it is expensive to run.

The stand uses two staff on different shifts to cook and serve meals at the counter, the standard cost and price of the hungry man roast of the day is as follows:

#### Standard cost information for 1 meal

	£ Per meal
Chicken 0.3kg @ £2.50 per kg	0.75
Vegetables 0.5kg @ £0.50 per kg	0.25
Labour 15 mins @ £9.00/hr	2.25
Variable overhead 15 mins @ £2.00/hr	<u>0.50</u>
	3.75
Standard contribution	<u>8.20</u>
Selling price (included in packaged price)	<u>11.95</u>

The budget each week aims to sell 500 meals. Fixed budgeted overhead for each week is £2,500. For week 43 the following actual information was obtained.

Meals actually sold were 476 and the revenue earned £5,688.

#### Ingredients purchased

	Chicken	Vegetables
Purchased	180kg (£405)	250kg (£140)
Used	165kg	220kg

#### Chef wages for week 43

Hours paid	120 hours (wages paid £1,200)
Hours worked	114 hours

6 hours were idle due to ovens failing on Tuesday afternoon

Variable overhead                      £150

Standard costing is used to value any material inventory at the end of a period.

**Prepare an operating statement for week 43 which reconciles the difference between the budgeted and actual contribution?**

### 10.7 Reasons why variances occur

- Inaccurate data used to compile standards, inaccurate compilation of the budget or inaccurate compilation of actual financial results.
- Standard used either not realistic or out of date.
- Efficiency of how operations were undertaken and performed by staff during the period e.g. mistakes made, poor decisions made, lack of effort etc can all lead to actual results be worse than expected.
- Random or chance events occurring e.g. sudden economic down turn such as the credit crunch, volatility of exchange rates, weather and commodity prices.

### 10.8 Possible operational causes of sales variances

Possible causes or reasons for variances have been included in the table below.

<b>Sales price variance</b>	<ul style="list-style-type: none"><li>• Unplanned price increases for the product or service sold.</li></ul>
	<ul style="list-style-type: none"><li>• Unplanned price reductions e.g. attracting additional business by offering discounts or price promotions.</li></ul>
Interdependence (sales price and volume (demand) are both connected to each other) e.g. a lower price for the product or service sold would normally cause an adverse sales price variance, however the effect of lowering price is normally to sell more, so the sales volume variance would be expected to be favourable, and vice versa.	
<b>Sales volume variance</b>	<ul style="list-style-type: none"><li>• Seasonal changes in demand for the final product or service sold.</li></ul>
	<ul style="list-style-type: none"><li>• Economic (business) recession or boom.</li></ul>

## 10.9 Possible operational causes of cost variances

<b>Material price variance</b>	<ul style="list-style-type: none"> <li>• Different sources of supply may cost more or less.</li> </ul>
	<ul style="list-style-type: none"> <li>• Unexpected general price increases or decreases.</li> </ul>
	<ul style="list-style-type: none"> <li>• Alteration in quantity discounts.</li> </ul>
	<ul style="list-style-type: none"> <li>• Alteration in exchange rates for imported materials or components.</li> </ul>
	<ul style="list-style-type: none"> <li>• Substitution of a different grade of material which is cheaper or more expensive.</li> </ul>
	<ul style="list-style-type: none"> <li>• Standard set at mid-year price, due to seasonal fluctuations and price volatility, so one would expect a favourable price variance for part of the year and an adverse variance for the rest of the year.</li> </ul>
<p>Interdependence (material price and usage both connected to each other) e.g. a lower price for material obtained would give a favourable material price variance, but if an inferior quality it could cause more wastage and therefore an adverse material usage variance, and vice versa.</p>	
<b>Material usage variance</b>	<ul style="list-style-type: none"> <li>• Higher or lower incidence of scrap, wastage, evaporation etc.</li> </ul>
	<ul style="list-style-type: none"> <li>• Alterations to product design e.g. product now consumes more or less material.</li> </ul>
	<ul style="list-style-type: none"> <li>• Substitution of a different grade of material e.g. cheaper and more inferior material can create more wastage.</li> </ul>
<b>Labour rate variance</b>	<ul style="list-style-type: none"> <li>• Unexpected national wage increases.</li> </ul>
	<ul style="list-style-type: none"> <li>• Overtime and bonus payments different from the standard 'average' plan.</li> </ul>
	<ul style="list-style-type: none"> <li>• Substitution of a different grade of labour which is cheaper or more expensive.</li> </ul>
<p>Interdependence (labour rate and efficiency both connected to each other) e.g. a lower rate for labour skills obtained would give a favourable labour rate variance, but if these staff are inexperienced and face a steep learning curve, this could cause less efficiency and therefore an adverse labour efficiency variance, and vice versa.</p>	
<b>Labour efficiency variance</b>	<ul style="list-style-type: none"> <li>• Improvement in the efficiency of working methods or conditions e.g. through training or new technology.</li> </ul>
	<ul style="list-style-type: none"> <li>• Introduction of new incentive schemes e.g. higher productivity or efficiency bonuses could make staff work more quickly.</li> </ul>
	<ul style="list-style-type: none"> <li>• Substitution of a different grade of labour e.g. less skilled staff normally means they are less efficient.</li> </ul>



<b>Variable overhead rate variance</b>	<ul style="list-style-type: none"> <li>• Unexpected price changes for variable overhead items.</li> <li>• Seasonal effects e.g. heat and light in winter. (This arises where the annual budget is divided into four equal quarters of thirteen equal four-weekly periods without allowances for seasonal factors. Over a whole year the seasonal effects would cancel out.).</li> </ul>
<b>Variable overhead efficacy variance</b>	<ul style="list-style-type: none"> <li>• This variance is interdependent on the labour efficiency variance therefore see reasons for labour efficiency variances.</li> </ul>
<b>Fixed overhead expenditure variance</b>	<ul style="list-style-type: none"> <li>• Changes in prices relating to fixed overhead items e.g. rent increase.</li> </ul>

### 10.10 Interdependent (interrelated) relationships between variances

Sometimes two variances together can be explained by the same reason.

- When the sales volume contribution variance is adverse, the sales price variance is normally favourable, vice versa. As an example if the business were to **reduce selling price** (adverse sales price variance) this could stimulate **more demand** for the product because of the cheaper selling price (favourable volume variance).
- When the material usage variance is adverse, the material price variance is normally favourable, vice versa. As an example if the business purchases a higher quality grade of material used, there maybe **less wastage** (favourable usage variance) but higher quality material will normally **cost more** (adverse price variance).
- When the labour efficiency variance is adverse, the labour rate variance is normally favourable, vice versa. As an example if the business takes on more apprentices rather than skilled labour there maybe **less efficiency** (adverse efficiency variance) but apprentices or less skilled labour will normally **cost less** (favourable rate variance).
- The same causes of the labour efficiency variance will explain the variable overhead efficiency variance. When one is adverse the other will also be adverse and vice versa.
- There can be many other interdependent reasons e.g. higher quality material and more experienced labour will both cost more (adverse price and rate variances) but if this helps create a better quality of product, the sales volume may increase (favourable sales volume variance).

## 10.11 Working backwards with variances

Actual financial data can be found from standard or budgeted financial data by using the same variance proforma given earlier within this chapter.

### Example 10.4

Butliness had a problem with the accountant; he left in a fume and took all the actual financial accounting information with him as revenge. You have been called in from a temping agency to sort out the mess. The following information has been provided to you.

#### Operating statement for week 43

Budget	4,100
Sales volume variance	<u>197(A)</u>
Flexed budget	3,903
Sales price variance	<u>nil</u>
	3,903

Cost variances	<u>F</u>	<u>A</u>	
Chicken price variance	45		
Chicken usage variance		55	
Vegetable price variance		15	
Vegetable usage variance	9		
Labour efficiency variance	45		
Labour rate variance		120	
Idle time variance		54	
V/OH efficiency variance	10		
V/OH overhead expenditure variance	<u>78</u>		
	<u>187</u>	<u>244</u>	= 57(A)
Actual contribution			<u>3,846</u>

#### Standard cost information for 1 meal

	£ Per meal
Chicken 0.3kg @ £2.50 per kg	0.75
Vegetables 0.5kg @ £0.50 per kg	0.25
Labour 15 mins @ £9.00/hr	2.25
Variable overhead 15 mins @ £2.00/hr	<u>0.50</u>
	3.75
Standard contribution	<u>8.20</u>
Selling price (included in packaged price)	<u>11.95</u>

**Additional information known**

- Actual hours paid were 6 more than worked due to an electrical fault with the ovens.
- Closing stock for chicken and vegetables rose during this period by 15kg and 30kg respectively.

**You are required to**

- Calculate the actual sale of meals
- Calculate the actual hours worked by the chefs
- Calculate the actual quantity of chicken purchased
- Calculate the actual price paid per Kg for chicken
- Calculate the actual variable overhead expenditure

## Key summary of chapter

A standard cost is a planned (budgeted) or forecast unit cost for a product or service, which is assumed to hold good given expected efficiency and cost levels within an organisation. A standard cost normally represents the planned (budgeted) or forecast unit cost for material, labour and overhead expected for a product or service.

### Types of standard cost

- Ideal standard
- Attainable (or expected) standard
- Current standard
- Loose Standard
- Basic Standard
- Historical Standards

### Practical advice for setting standards

1. Use challenging but realistic targets.
2. Consult with and allow staff to participate when setting targets.
3. Clear trust and communication between management and staff.
4. Standards or targets used must be realistic and achievable.

### Standard costing can be used for

- Preparation of budgets
- Controlling performance
- Inventory valuation
- Simplifying cost bookkeeping
- Motivating and rewarding staff

### Criticisms of standard costing

- ✗ Sometimes it can be hard to define a 'current' or 'attainable' standard
- ✗ Less human intervention means labour standards are becoming less valuable.
- ✗ Automation produces greater uniformity and consistency of product therefore less likelihood of material and labour variances actually occurring.
- ✗ Standard costing is an internal not external control measure.
- ✗ Uncontrollability of any exceptions highlighted.
- ✗ Revision to standards too infrequent to guide or improve performance over time.
- ✗ Modern manufacturing techniques such as TQM and quality circles means the frequency and materiality of variances should not occur so often.

## Fixed budget

A budget set prior to the control period and not subsequently changed in response to changes in activity, costs or revenue.

(CIMA)

## Flexible budget

A **flexed budget** is a budget that has been revised or adjusted using the actual level of sales or output achieved as its activity level.

Flexing variable costs from original budgeted levels to the allowances permitted for actual volume achieved while maintaining fixed costs at original budget levels.

(CIMA)

## Variance analysis

Variance analysis is a budgetary control technique, which compares planned (budgeted) or forecast costs and revenues to actual financial results, it measures the differences between standard (budgeted) and actual performance. Variance analysis is used to improve operational performance through control action by management e.g. investigation of any variance causes and correction of them to prevent in future any further deviations from plan.

A variance is the difference between planned, budgeted or standard cost and the actual cost incurred. The same comparisons may be made for revenues.

(CIMA)

## Reasons why variances occur

- Inaccurate data used to compile standards.
- Standard used either not realistic or out of date.
- Efficiency of how operations were undertaken and performed by staff.
- Random or chance events occurring.

There are many variance proforma calculations that need to be learned and applied as part of your studies. These proforma are essential to learn and practice in order to truly understand and interpret what variances mean. Once variances have been calculated either  $\text{F}$  or  $\text{A}$  is used as terminology to indicate favourable or adverse differences between actual and standard performance. Favourable means that actual results were better than standard. Adverse means that actual results were worse than standard. Remember variances are just reconcilable differences between a budget (standard) and actual results.

## Variances proforma to learn

<b>Sales price variance</b>		<b>£</b>
	Did sell (actual quantity sold x actual selling price)	X
	Should sell (actual quantity sold x standard selling price)	(X)
	<b>Sales price variance</b>	<u>X</u>
	<p>This measures the impact on profit when actual units sold were at a lower or higher price than the standard (budgeted) price.</p>	
<b>Sales volume (contribution) variance</b>		<b>Units</b>
	Did sell (actual quantity sold)	X
	Should sell (original budgeted quantity sold)	(X)
		X
		x Standard Contribution per unit
	<b>Sales volume (contribution) variance</b>	<u>X</u>
	<p>The sales volume (contribution) variance measures the difference between the original and flexed budgeted contribution. It measures the impact on contribution, when actual sale of units is more or less than the original budgeted sale of units. This method of calculation would be applied when marginal costing is used by the organisation.</p>	

### Cost variance proforma

<b>Material price variance</b>	<div style="float: right; text-align: right;">£</div> <p>Did spend (actual quantity purchased x actual price) X</p> <p>Should spend (actual quantity purchased x standard price) (<u>X</u>)</p> <p><b>Material price variance</b>                      <u>X</u></p>
<b>Material usage variance</b>	<div style="float: right; text-align: right;">kg/litres/units</div> <p>Actual production did use X</p> <p>Actual production should use (actual production x standard usage) (<u>X</u>)</p> <p style="text-align: right;">X</p> <p style="text-align: right;">x Standard Price</p> <p><b>Material usage variance</b>                      <u>X</u></p>
<p><b>Total material variance equals material price variance +/- material usage variance</b></p>	



## **Solutions to lecture examples**



## Chapter 10

### Example 10.1

Wood Plc makes wooden tables and chairs from natural timber. To make one unit of product consisting of one table and four chairs, it consumes 60kg of timber; after an expected 20% wastage due to wood shavings and scrap in the cutting process. 100kg of timber currently costs Wood Plc £50.

What is the standard cost of material to make one unit of product?

#### **Solution**

The standard usage of material is 60kg of timber to make one unit of product, but this is only 80% of material usage, given that 20% of timber is expected to be scrapped in the process. Therefore the total material used to make one unit of product would be 60kg (80% before wastage)  $\times (100\% \div 80\%) = 75\text{kg}$ .

#### **Standard cost of material to make one unit of product:**

$(75\text{kg} \div 100\text{kg}) \times £50 \text{ (per 100kg)} = £37.50 \text{ per unit of product.}$

### Example 10.2

	<b>Original Budget</b>	<b>Flexed Budget</b>	<b>Actual Results</b>	<b>Budget Variances</b>
Production and sales	<u>500</u>	<u>476</u>	<u>476</u>	
	<b>£</b>	<b>£</b>	<b>£</b>	<b>£</b>
Sales	<u>5,975</u>	<u>5,688</u>	<u>5,688</u>	nil
Chicken	375	357	368	11(A)
Vegetables	125	119	125	6 (A)
Labour	1,125	1,071	1,200	129(A)
Variable overhead	<u>250</u>	<u>238</u>	<u>150</u>	<u>88(F)</u>
	<u>1,875</u>	<u>1,785</u>	<u>1,843</u>	<u>58(A)</u>
<b>Contribution</b>	<b>4,100</b>	<b>3,903</b>	<b>3,845</b>	<b>58(A)</b>
Fixed overhead	<u>2,500</u>	<u>2,500</u>	<u>2,750</u>	<u>250(A)</u>
Profit	<u>1,600</u>	<u>1,403</u>	<u>1,095</u>	<u>308(A)</u>

#### **(A) = Adverse**

Indicates the organisation performed worse than expected in comparison to budget.

#### **(F) = Favourable**

Indicates the organisation performed better than expected in comparison to budget.

### Notes

- The £368 actual charge for chicken, is the actual cost of chicken less the standard cost of closing inventory e.g. (£405 less (15kg x £2.50)). It is normal practice for standard costing systems to value inventory using standard cost.
- The £125 actual charge for vegetables is the actual cost of vegetables less the standard cost of closing inventory e.g. (£140 less (30kg x £0.50)). It is normal practice for standard costing systems to value inventory using standard cost.
- The total budget variances are calculated by comparing actual revenue and costs to the flexed budgeted revenue and costs. Actual revenue and costs would **never be compared to the original budgeted revenue and costs**, this would not provide a meaningful yardstick for comparison
- You might in a question, have to split a semi-variable or mixed cost into its fixed and variable components in order to produce a flexible or flexed budget.

### Example 10.3

An operating statement reconciles budgeted to actual contribution earned for a period. The variances will be the reconcilable items within the operating statement.

**Note:** The short hand form of calculating each variance has been demonstrated below, this will help you save time in your exam. You are advised to practice the below calculations also using the proforma variance calculations given within chapter 10.

#### Operating statement for week 43

Budget (500 x £8.20)	4,100
Sales volume variance (476-500) x £8.20	<u>197(A)</u>
Flexed budget for 476 meals	3,903
Sales price variance 476 x (£11.95-£11.95)	<u>nil</u>
	3,903

Cost variances	<u>F</u>	<u>A</u>
Chicken price variance 180kg x (£2.25-£2.50)	45	
Chicken usage variance (165kg -143kg) x £2.50		55
Vegetable price variance 250kg x (£0.50-£0.56)		15
Vegetable usage variance (220kg-238kg) x £0.50	9	
Labour efficiency variance (114hrs-119hrs) x £9	45	
Labour rate variance 120hrs x (£10-£9)		120
Idle time variance (6hrs x £9)		54
V/OH efficiency variance (114-119hrs) x £2	10	
V/OH overhead expenditure variance 114hrs x (£1.32-£2)	<u>78</u>	
	<u>187</u>	<u>244</u> = <u>57(A)</u>
Actual contribution		<u>3,846</u>

#### **(A) = Adverse**

Indicates the organisation performed worse than expected in comparison to budget.

#### **(F) = Favourable**

Indicates the organisation performed better than expected in comparison to budget.

#### **\* Proof**

Sales	5,688
Chicken	405
Closing stock (15kg x £2.50)	(38)
Vegetables	140
Closing stock (30kg x £0.50)	(15)
Labour	1,200
V/OH	<u>150</u>
	(1,842)
Contribution	<u>3,846</u>

## WORKINGS

### Sales volume variance

	<b>meals</b>
Did sell	476
Should sell (as per original budget)	<u>500</u>
	24
x Standard profit per meal sold	<u>x £8.20</u>
	<u>197 (A)</u>

### Chicken price variance

	<b>£</b>
180kg did cost	405
180kg should cost (180kg x £2.50)	<u>450</u>
	<u>45 (F)</u>

### Chicken usage variance

	<b>kg</b>
476 meals did use	165
476 meals should use (x 0.3kg)	<u>143</u>
	22
x Standard Price	<u>x £2.50</u>
	<u>55 (A)</u>

### Vegetable price variance

	<b>£</b>
250kg did cost	140
250kg should cost (250kg x £0.50)	<u>125</u>
	<u>15 (A)</u>

### Vegetable usage variance

	<b>kg</b>
476 meals did use	220
476 meals should use (x 0.5kg)	<u>238</u>
	18
x Standard Price	<u>x £0.50</u>
	<u>9 (F)</u>

### Labour rate variance

120 hours paid did cost	1,200
120 hours paid should cost (120 hours x £9)	<u>1,080</u>
	<u>120 (A)</u>

### Labour efficiency variance

	<b>hours</b>
476 meals did take (hours worked)	114
476 meals should take (x 0.25 hours)	<u>119</u>
	5
x Standard Rate	<u>x £9.00</u>
	<u>45 (F)</u>

**Labour efficiency variance**

	<b>hours</b>
476 meals did take (hours worked)	114
476 meals should take (x 0.25 hours)	<u>119</u>
	5
x Standard Rate	<u>x £9.00</u>
	<u>45 (F)</u>

**Labour idle time variance**

	<b>hours</b>
Hours paid	120
Hours worked	<u>114</u>
	6
x Standard Rate	<u>x £9.00</u>
	<u>54 (A)</u>

**Variable overhead expenditure variance**

	<b>£</b>
114 hours worked did cost	150
114 hours worked should cost (114 hours x £2)	<u>228</u>
	<u>78 (F)</u>

**Variable overhead efficiency variance**

	<b>hours</b>
476 meals did take (hours worked)	114
476 meals should take (x 0.25 hours)	<u>119</u>
	5
x Standard Rate	<u>x £2.00</u>
	<u>10 (F)</u>

**Fixed overhead expenditure variance**

	<b>£</b>
Actual fixed overhead expenditure	2,750
Original budgeted fixed overhead expenditure	<u>2,500</u>
	<u>250 (A)</u>

### Example 10.4

#### Calculate the actual sale of meals

Did sell	476 ( <b>balance figure</b> )
Should sell	<u>500</u> (£4,100 budget ÷ £8.20 Std Cont/Per unit)
	24
Standard contribution per meal	<u>x £8.20</u> (Given)
Given	<u>197</u> (A)

#### Calculate the actual hours worked by the chefs

476 meals did take	114 ( <b>balance figure</b> )
476 meals should take (476 x 0.25 hrs)	<u>119</u>
	5
Standard rate per hour	<u>x £9.00</u> per hour (given)
Given	<u>45</u> (F)

Hours paid would have been 114 hours worked plus 6 hours idle time = 120 hours

#### Calculate the actual quantity of chicken purchased

476 meals did use	165 kg ( <b>balance figure</b> )
476 meals should have used (x 0.3kg)	<u>143</u> kg
	22 kg
Standard price per kg	<u>x £2.50</u> (given)
Given	<u>55</u> (A)

#### Calculate the actual price paid per Kg for chicken

165kg used above + a 15kg rise in closing inventory level = 180kg purchased.

180kg did cost	405 ( <b>balance figure</b> )
180kg should cost (x £2.50 kg)	<u>450</u>
Given	<u>45</u> (F)

£405 actual cost of chicken ÷ 180kg purchased = actual price £2.25 per kg.

#### Calculate the actual variable overhead expenditure

114 hrs worked did cost	150 ( <b>balance figure</b> )
114 hrs should have cost (x £2 per hour)	<u>228</u>
Given	<u>78</u> (F)

The 114 hours worked was obtained from the labour efficiency calculation above.