Chapter 14

MORE VARIANCE ANALYSIS

1. Introduction

In this chapter we will look more at variances and several ways of making them more useful to management.

Planning and Operational variances involve further analysis of the variances to assist management in deciding where more investigation should be focussed; whereas Mix and Yield variances looks at a specific situation where conventional variances might be misleading; and finally we will take another look at labour idle time variables.

2. Planning and Operational variances

We discussed in the previous chapter that the purpose of variance analysis is to assist management in exercising control by identifying areas where perhaps there are operational problems.

We also discussed possible reasons for variances. Although these included factors such as inefficiency of the workforce – a factor that perhaps may be controlled for the future – they also included factors such as an increase in raw material prices and an incorrect standard having been used in the budgets. These last two are examples of factors that certainly can not be controlled and where it would be silly to waste time re-investigating each month. It would make more sense to compare actual results with a standard that reflects any changed conditions and is therefore realistic.

2.1. Planning variance (or revision variance)

This is a classification of variances calculated by comparing the original budget (or ex **ante budget**) to a budget revised for any permanent changes to a more realistic budget (**ex post** budget).

Operational variance

This is a classification of variances calculated by comparing actual performance with a revised (or ex post) budget. These variances are worth investigating more as they are variances caused by operating factors that potentially might be controllable.

Example 1

Original budget:

Standard cost of materials:	10 kg at $5 per kg
Budget production:	10,000 units

Actual results:

Production:	11,000 units
Materials:	108,900 kg at $4.75 per kg

Since preparation of the budget the price per kg has changed to $4.85 and the usage to 9.5 kg per unit.

Calculate the expenditure and usage variances, and analyse each into planning and operational variances.

Example 2

Original budget:

Standard cost of labour:	8 hrs at $4 per hour
Budget production:	20,000 units

Actual results:

Production:	24,000 units
Labour:	190,000 hrs for $769,500

Since preparation of the budget the price per hour had increased to $4.10 and the time had been revised to 7.5 hrs per unit.

Calculate the rate of pay and efficiency variances, analysed into planning and operational variances.

3. Mix and Yield variances

3.1. It is quite common in practice for one product to use several different materials.

For example, a desk may use wood for the top and metal for the legs.

For each of the materials we can calculate price and usage variances in the normal way, and usually this is sufficient for our purpose.

However, suppose we were manufacturing a mixed fruit juice that contained a mixture of strawberry juice and banana juice. To calculate usage variances for each material separately would be of little use – if we used less strawberry juice than budgeted, we would automatically use more banana juice. We would therefore end up with one variance favourable and one adverse, and yet the overall effect on costs could be either favourable or adverse depending on which juice was the most expensive.

In this situation, when the materials may be substituted for each other (or are **substitutable**) then we look at all the materials together and analyse the usage variance into the following variances:

- **mix variance**

  this shows the effect of changing the proportions of the mix of materials input into the process

- **yield variance**

  this shows the difference between the actual and expected output or yield from the process

Example 3

The standard material cost per unit of a product is as follows:

		$
Material X	2 kg @ $3 per kg	6
Material Y	1 kg @ $2 per kg	2
		8

The actual production during the period was 5,000 units and the materials used were:

Material X	9,900 kg costing $27,000
Material Y	5,300 kg costing $11,000

Calculate the total materials cost variance; the materials price variance; the materials usage variance; the mix variance; and the yield variance.

3.2. Other mix variances

Although the calculation of mix variances most commonly relates to materials, exactly the same sort of situation could be relevant for labour if there were more than one grade (paid at different rates) that were substitutable.

The approach would be exactly the same as for materials.

Slightly less obvious (although essentially the same approach) is the situation where sales are 'substitutable'.

For example, suppose a company sold two types of desk which although similar had different profit margins. Clearly the company would hope for higher sales, but they would also be interested in the mix of sales – it would be better if customers bought more of the desks giving higher profit p.u., even if it were to mean selling fewer of the desks that gave lower profit p.u..

Again, in this situation, the approach used for materials may be useful.

Example 4

Olga plc sells three products – A, B and C.

The following table shows the budget and actual results for these products:

	A	*B*	*C*
Budget:			
Sales (units)	200	100	100
Price (p.u.)	$20	$25	$30
Cost (p.u.)	$17	$21	$24
Actual:			
Sales (units)	180	150	170
Price (p.u.)	$22	$22	$26
Cost (p.u.)	$16	$18	$25

Calculate the total sales margin variance, and analyse into the sales price variance; the sales mix variance; and the sales quantity variance.

4. Advanced Idle Time variances

When we looked at labour variances in the previous chapter, we said that any difference between the hours paid and the hours worked was Idle Time.

However, since there is likely to be some idle time in almost every business, it would be more sensible to build some idle time into the budget and then an idle time variance would only occur if the actual idle time were more or less than budgeted.

We will look at the 'rules' with an example.

Example 5

A company budgets that each unit will take 7.6 hours to make.

It budgets on paying workers at the rate of $5.70 per hour, and that 5% of the hours paid for will be idle.

The actual results (for production of 1000 units) are:

Hours paid: 8,200 hours at a cost of $50,020

Hours worked: 7,740 hours

(a) Calculate what will appear on the standard cost card as the labour cost per unit
(b) calculate the effective standard cost per hour worked
(c) calculate the total labour variance
(d) Analyse the total variance into rate of pay, idle time, and efficiency variances.

5. Activity Based Costing Variances

You will remember from an earlier chapter that ABC is a way of allocating overheads to products using cost drivers.

The main reason for doing this was not just to encourage cutting the total cost of the overhead, but also to encourage more efficient use of the overhead.

For example, we may have had an overhead cost for despatch of $100,000 and a total of 5,000 despatches. This would mean that it was costing $20 per despatch. We could reduce the cost per despatch by either cutting the total cost (an expenditure variance) or by increasing the number of despatches (an efficiency variance).

Example 6

The following information is available for a period:

	Budget	Actual
Production	48,000 units	50,400 units
Activity level	2,000 despatches	2,200 despatches
Total overhead cost of despatching	$120,000	$126,720

Calculate the total overhead variance for despatching, and analyse into the expenditure and efficiency variances.

6. The application of standard costing (and variance analysis) in the modern environment.

Modern management places great emphasis on quality - Total Quality Management (TQM), and on increasing efficiency and reducing waste - Just In Time (JIT).

However, traditional standard costing tends to make allowances for waste and for idle time, which is contrary to the TQM and JIT culture.

Traditional variance analysis focuses on quantity rather than quality. This could mean, for example, using lower quality material to save money. This would again be contrary to the TQM and JIT culture.

Another element of the TQM culture is the idea of trying to achieve continuous improvement. Traditional variance analysis does not really accomodate this.

When you finished this chapter you should attempt the online F5 MCQ Test