

# Ask a simple question

**Grahame Steven**

If you can understand the straightforward logic behind variances, you won't have to waste time and effort remembering the relevant formulas when you come to revise

**M**any candidates fail to calculate variances correctly because they find it hard to memorise the formulas. This problem is exacerbated by the fact that different textbooks adopt different formulas. Students are unlikely to gain an understanding of variance analysis if they take a rote-learning approach, since the calculation tends to become an end in itself.

Although it's necessary to know how to calculate variances, there is an effective alternative method that should improve your understanding of variance analysis and help you to handle data that doesn't "fit" the formulas. The key to this approach is to realise that variances are calculated to answer simple questions.

Perfect Pictures Ltd (PPL) buys large sheets of mounting cardboard. It cuts these into smaller, ready-to-frame sizes that it sells in packets to retailers. PPL operates a marginal costing system – ie, fixed production overheads are not charged to products – and it doesn't hold raw materials. All variances are charged to the profit and loss account at the end of each month. Tables 1 to 5 contain budget data, actual data, total budget, actual results and a reconciliation between budget and actual profit for Landscape, one of PPL's main products.

Direct cost variances are concerned with direct materials, direct labour and variable overheads. These variances are calculated in order to answer two questions:

- Was the cost of the resource more or less than expected?
- Was more or less of the resource used than expected?

So, did PPL pay more or less for the cardboard than it expected? The budget cost of buying the cardboard was set at £1.20 per square metre. The actual cost was £1.18. So it cost 2p per square metre less than expected. But what is the total variance? The total amount of cardboard that was actually used multiplied by the favourable variance of 2p per square metre:  $5,300\text{m}^2 \times £0.02 \text{ per m}^2 = £106$  favourable.

Did PPL use more or less cardboard than expected? How much should have been

## 1 Budget data for Landscape

Selling price	£12 per packet		
Sales	1,000 packets		
Raw materials	5m <sup>2</sup>	£1.20 per m <sup>2</sup>	£6.00
Direct labour	0.1 hours	£4.00 per hour	£0.40
Variable overheads (electricity)	15 joules	£0.02 per joule	<u>£0.30</u>
			£6.70
Fixed overheads	£2,500		

## 2 Actual data for Landscape

Selling price	£12.05 per packet
Sales	960 packets
Production	1,050 packets
Raw material cost	£1.18 per m <sup>2</sup>
Raw material usage	5,300m <sup>2</sup>
Labour rate	£3.90 per hour
Labour	110 hours
Joule rate	£0.022 per joule
Joules	15,000
Fixed overheads	£2,600

used to make 1,050 packets? Answer: 5,250 square metres (1,050 x 5). How much was used? Answer: 5,300 square metres. So PPL used 50 square metres more than expected. But how much did this cost PPL? The final answer is £60 adverse (that is,  $50 \times £1.20$ ). Standard cost is used to value the usage variance, because the price variance takes account of the difference between budget and actual cost.

This method can be used to analyse direct labour and variable overheads, as the same questions apply to these resources as well:

- Did PPL pay more or less than the budget rate per hour? Answer: 10p less per hour. How many hours were worked? Answer: 110 hours. What is the total variance? Answer: £11 favourable.
- Did PPL use more or fewer labour hours than expected? How many hours should have been used? Answer: 105 hours. Did PPL use more or fewer hours? Answer: five hours more. What is the variance? Answer: £20 adverse.

- Did PPL pay more or less than the budget rate per joule? Answer: £0.002 more per joule. How much electricity was used? Answer: 15,000 joules. What is the total variance? Answer: £30 adverse.
- Did PPL use more or less electricity than expected? How many joules should have been used? Answer: 15,750 joules. Did PPL use more or less electricity? Answer: 750 joules less electricity. What is the variance? Answer: £15 favourable.

This method makes the calculations – the arithmetic becomes intuitive. It also helps you to calculate variances when data is presented in unexpected ways. Students sometimes panic when the data in an exam question doesn't fit their formulas. For instance, a question may present the total actual cost of direct labour (£429), the total average use of direct materials (5.0471m<sup>2</sup>) etc. But it's important to know that, although the data has changed, the questions remain the same. Students who know why variances are calculated are in a better position to answer them as a result, since they will apply their understanding to the problem instead of trying to fit the data to a formula.

The reconciliation has three further variances: sales volume contribution, sales price and fixed overhead expenditure variances.

The sales volume contribution variance is calculated to determine if total contribution was higher or lower than expected. Did PPL sell more or fewer products than expected? Answer: 40 fewer. What was the impact on profits? Answer: £212 adverse (that is,  $40 \times [£12 - £6.70]$ ). Standard

**3 Total budget for Landscape**

Sales	<b>1,000 packets</b>	£12,000
Cost of sales		<u>£6,700</u>
Gross profit		£5,300
Fixed overheads		<u>£2,500</u>
Net profit		£2,800

price and cost is used because the other variances in the reconciliation calculate price, cost and usage fluctuations.

Sales price variance ascertains whether the selling price was higher or lower than expected. So was the selling price above or below budget? Answer: 5p above per product. What is the total variance? Answer: £48 favourable (that is, 960 x £0.05).

The fixed overhead expenditure variance determines whether actual costs were above or below budget. Did PPL spend more or less money than expected? Answer: £100 adverse (that is, £2,500 – £2,600).

Although many students consider the calculation of variances to be difficult, understanding the reasons why variances are calculated will aid this process and help students to cope with “difficult” data. ■

**Grahame Steven is a lecturer at Napier University, Edinburgh**

**4 Actual results for Landscape**

Sales	<b>960 packets</b>	£11,568
Cost of sales		£6,432
Material price variance		£106
Material usage variance		-£60
Labour rate variance		£11
Labour efficiency variance		-£20
Variable overhead expenditure variance		-£30
Variable overhead efficiency variance		<u>£15</u>
		£22
Gross profit		£5,158
Operating expenses		<u>£2,600</u>
Net profit		£2,558

**5 Reconciliation for Landscape**

Budgeted net profit		£2,800
Sales volume variance	<b>-40 packets</b>	-£212
Sales price variance		£48
Material price variance		£106
Material usage variance		-£60
Labour rate variance		£11
Labour efficiency variance		-£20
Variable overhead expenditure variance		-£30
Variable overhead efficiency variance		£15
Fixed overhead variance		-£100
Actual net profit		£2,558

# Paramount pictures

**Bob Scarlett**

It's a simple idea: identify who's best at an activity that your organisation needs to improve and learn from what they do. So why isn't everyone benchmarking?

*“Benchmarking is the process of improving performance by continuously identifying, understanding (studying and analysing), and adapting outstanding practices and processes found inside and outside the organisation, and implementing the results”*

*The American Productivity and Quality Centre, 1997*

**B**enchmarking is an approach to performance management that starts with the premise that, whatever the process – be it supply, production, sales or services – our performance can best

be measured and managed by comparing it with that of an appropriate entity which is already achieving world-class performance. The entity we use to provide the benchmark needn't operate within the same sector. The benchmark can be from another organisation (an “external” benchmark) or a different segment within the same organisation (an “internal” benchmark).

A benchmark provides a standard of excellence against which to measure and compare. Benchmarks are performance measures – for instance, “how many?” (eg, customers served per employee per hour); “how quickly?” (eg, delivery time to customer); “how high?”

(eg, the proportion of sales giving rise to repeat business); and “how low?” (eg, proportion of defective products).

To be meaningful, a benchmark should relate to a key performance indicator – ie, something within the business's process that has a major influence on its results. Establishing benchmarks is a necessary part of the exercise, but it does not in itself provide an understanding of best practice. And nor does knowledge of the benchmarks necessarily lead to improvements. Benchmarking is the learning of lessons about how best performance is achieved. Rather than merely measuring performance, it focuses