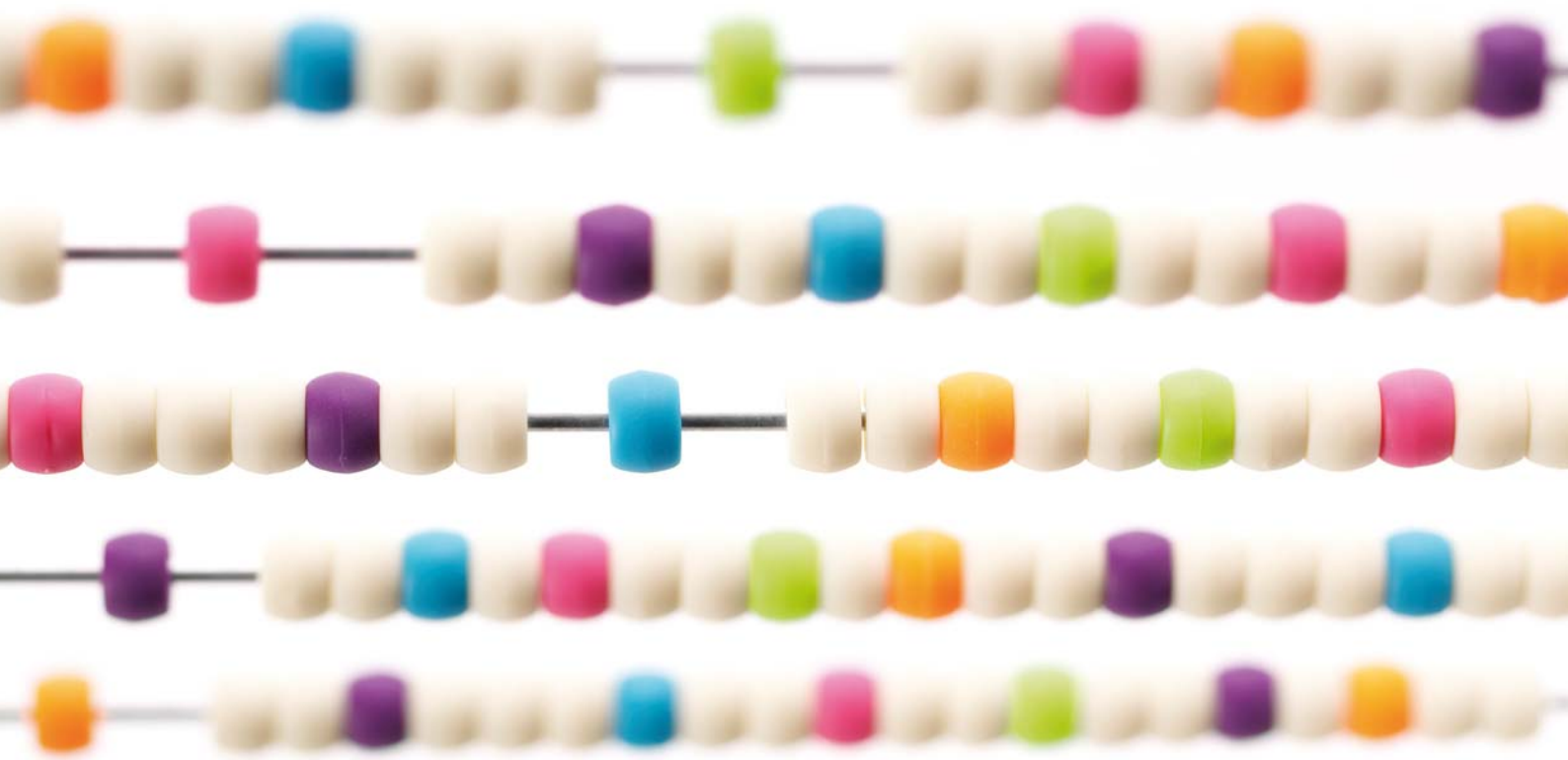


# Standard Costing and Variance Analysis

Topic Gateway Series No. 24



## About Topic Gateways

Topic Gateways are intended as a refresher or introduction to topics of interest to CIMA members. They include a basic definition, a brief overview and a fuller explanation of practical application. Finally they signpost some further resources for detailed understanding and research.

Topic Gateways are available electronically to CIMA members only in the CPD Centre on the CIMA website, along with a number of electronic resources.

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CIMA members and students should sign into My CIMA to access these services and resources.

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# Standard Costing and Variance Analysis

## Definition and concept

### Standard cost

'The planned unit cost of the product, component or service produced in a period. The standard cost may be determined on a number of bases. The main use of standard costs is in performance measurement, control, stock valuation and in the establishment of selling prices.'

*CIMA Official Terminology, 2005*

### Variance analysis

'The evaluation of performance by means of variances, whose timely reporting should maximise the opportunity for managerial action.'

*CIMA Official Terminology, 2005*

## Context

In the current CIMA syllabus students will learn and may be examined on this topic in Paper C1, Fundamentals of Management Accounting and in Paper 1, Management Accounting Performance Evaluation. Study systems for these papers are available from CIMA Publishing.

## Related concepts

Cost accounting, performance measurement; budgeting and control

## Alternative concepts

Activity based costing, throughput accounting, marginal costing.

## Overview and comparison

Standard costing is a control system that enables any variances from standard cost or budget to be analysed in some detail. This allows for more effective cost control.

A standard costing system consists of the following four elements:

1. Setting standards for each operation.
2. Comparing actual with standard performance.
3. Analysing and reporting variances arising from the difference between actual and standard performance.
4. Investigating significant variances and taking appropriate competitive action.

## **Standard costing and variance analysis application**

### **Standard costing**

This is generally best suited to organisations with repetitive activities. It is probably most relevant to manufacturing organisations with repetitive production processes. Standard costing cannot be applied easily to non-repetitive activities because there is no clear basis for observing and recording operations. It is difficult to determine a clear standard.

Two commonly used approaches are used to set standard costs.

1. Past historical records can be used to estimate labour and material usage.
2. Engineering studies can be used. This may involve a detailed study or observation of operations in terms of material, labour and equipment usage.

The most effective control is achieved by identifying standards for quantities of material, labour and services to be used in an operation, rather than an overall total product cost. Variances from standard on all component parts of cost should be reported to identify the cause – and ultimate responsibility – for the variance from standard.

### **Variance analysis**

Variance analysis involves breaking down the total variance to explain:

1. How much of it is caused by the usage of resources differing from the standard
2. How much is caused by cost of resources differing from the standard

Together, variances can help to reconcile the total cost difference by comparing actual and standard cost. The main purpose of variances is to provide reasons for off-standard performance. In this way, management can improve operations, correct errors and deploy resources more effectively to reduce costs.

## Direct material standards and variance analysis

Direct material standards are derived from the amount of material required for each product or operation. This should take into account the most suitable material for the product specification and design. It should also include any anticipated wastage or losses in the process.

Direct material standards should also consider the standard price of the material, based on the most suitable and competitive price as required by the most suitable quality of material. These prices should also include economic order quantity, discounts and credit terms offered by suppliers.

The standard material used and the standard cost of the material are combined to calculate the standard material cost. By comparing the actual material price and the actual material used with the standards calculated, the material price and the material usage variance can be determined.

## Material mix and yield variances

The direct material usage variance measures the change in total material cost caused by using a non-standard amount of material in production. It is also possible to subdivide this variance into a direct material mix variance and a direct material yield variance. This is mostly undertaken in process industries where a standard input mix is the norm.

Identifiable components of input are combined during production to produce an output in which the individual components are no longer separately identifiable. It is sometimes necessary to vary the input mix. As a result, this may lead to an output from the process that will differ from what was expected.

The material mix variance therefore measures the change in cost caused by an alteration to the constituents of the input mix. The material yield variance measures the change in cost brought about by any deviation in output from the standard process output.

## Direct labour standards and variance analysis

Direct labour standards are derived from the analysis of activities required for different operations. Often a time and motion study is carried out to determine the most efficient production method, including operating conditions, equipment required and best practice.

Following this, the time is analysed to determine the standard hours required to complete an operation. Standard wage rates are identified using rates of pay for employees required to carry out the operation, which are normally set by the company. This standard time and standard wage rate are combined to calculate the standard labour rate.

### **Overhead standards – variable overheads**

Where overheads vary with activities, a standard variable overhead rate is used. However, several different activity measures exist and it is important for the organisation to identify which measure influences overhead cost the most. For example, volume related variable overheads could vary with direct labour, machine hours, material quantities or number of units. In practice, the most frequently used are direct labour hours or machine hours.

The variable overhead rate per unit is applied to the standard labour or machine usage to calculate a standard variable cost per unit. The two variances calculated for variable overheads are:

1. The variable overhead expenditure variance, which is equal to the difference between the budgeted flexed variable overheads for the actual direct labour or machine hours of input, and the actual variable overheads incurred.
2. The variable overhead efficiency variance, which is the difference between the standard hours of input and the actual hours of input for the period, multiplied by the standard variable overhead rate.

### **Overhead standards – fixed overheads**

These overheads are largely independent of changes in activity and remain unchanged in the short term over wide ranges of activity. The budgeted annual fixed overhead is divided by the budgeted level of activity to determine the standard fixed overhead rate per unit of activity.

Machine hours are normally used for machine-related overheads and direct labour hours are used for more labour-related overheads. This standard rate is applied to the standard labour or machine usage per unit to calculate the standard fixed overhead cost for a product.

The total fixed overhead variance is the difference between the standard fixed overhead charged to production and the actual fixed overhead incurred. An under- or over-recovery of overheads may occur because the fixed overhead rate is calculated by dividing budgeted fixed overheads by budgeted output. If actual output or fixed overhead expenditure differs from budget, then an under or over recovery will occur.

Therefore under- or over-recovery may be due to a fixed overhead expenditure variance arising from actual expenditure differing from budgeted expenditure. Alternatively, a fixed overhead volume variance may arise from actual production differing from budgeted production.

### **Other variances – sales variances**

Sales variances can be used to analyse the performance of the sales function in a similar way to those for manufacturing costs. Sales variances are calculated in terms of profit or contribution margin, rather than on sales value.

### **Other variances – planning and operational variances.**

Some variances will arise due to factors that are almost or entirely within the control of management. These are referred to as operational variances.

Variances that occur from changes in factors external to the business are referred to as planning variances. As planning variances are not under the control of operational management, it cannot be held accountable for them.

## **In practice**

### **Standard costing and variance analysis in practice**

In a recent CIMA research study on Contemporary Management Accounting Practices in UK Manufacturing, over 70% of UK manufacturing companies studied employed standard costing practices. All companies which used standard costing set standards for material costs, while 90% set standards for labour costs and nearly 70% set standards for overheads. Available from:

[www.cimaglobal.com/researchexecsummaries](http://www.cimaglobal.com/researchexecsummaries)

[Accessed 14 March 2008]

However, standard cost variances often do not appear as part of profit and loss information. Over half of companies using standard costing based their reports on actual costs. Some companies added back variances, while others updated material standards so that they approximated actual costs. Despite not appearing in the account, most of the standard cost companies calculated some material and labour variances for control purposes. Overhead variances were much less well used and reported, and only one company sub-divided both variable and fixed overheads.

The conclusion from the report was that although most manufacturing companies do use standard costing, they tend to be very selective in their use of variance analysis, especially overhead variances. The use of fixed overheads was particularly scarce.

- The analysis of variances facilitates action through 'management by exception'. Here managers concentrate on business areas that are performing below or above expectations. Managers can largely ignore those that appear to be conforming to expectation.
- The setting of standards and revision and monitoring encourages reappraisal of methods, materials and techniques. This leads to cost reductions and process improvement.
- A properly developed and understood standard costing system with full participation and involvement creates a positive attitude towards cost control throughout the organisation.
- Modern technology and reporting software has allowed for variance analysis to be undertaken automatically without the need for complex manual calculations. Microsoft Excel Work Essentials is a commonly used tool to undertake variance analysis.

### Reported drawbacks

- Standard costing principles are at odds with modern business trends such as continual improvement and responding to individual customer needs. The 'McDonaldisation' of society has led to criticisms of standardising services in order to reduce costs, but at the risk of reduced customer service and individuality. The problem is that driving down costs is often associated with:
  - Reduced quality
  - The externalisation of costs
  - A lack of attention to the individual needs of customers



All these factors seem to contradict modern thinking about the direction in which business practice is moving in many areas of the economy.

The two underlying principles of standard costing are that:

1. A standard set before a period is a satisfactory measure throughout the period.
2. The performance is acceptable if it meets this standard.

These principles are at odds with the spirit of JIT (Just in Time) manufacturing. JIT organisations adopt a climate of continuous improvement and the idea of normal levels of wastage and inefficiency is unacceptable because of the drive to zero wastage and increasing efficiency. Consequently, standard costing may become less used in modern manufacturing environments.

- Standard costing and variance reporting may be time consuming and expensive to run.
- If the standard is incorrect or outdated, any comparison with actual is also likely to be incorrect or misleading. In modern business environments with rapidly changing conditions, standards quickly become out of date and lose their control and motivational effects.
- Elaborate and complex variances, especially overhead variances, are often not well understood by managers and are ineffective for control purposes.
- There are several reasons why actual results may differ from standard. The combination of the four factors below makes standard costing and variance analysis very difficult in practice.
  1. Variance may occur as a result of an error in measuring the actual outcome.
  2. The standard may be out of date because of a change in operating conditions.
  3. Variances might result from inefficient or efficient operations.
  4. Variances can be caused by random, uncontrollable factors.

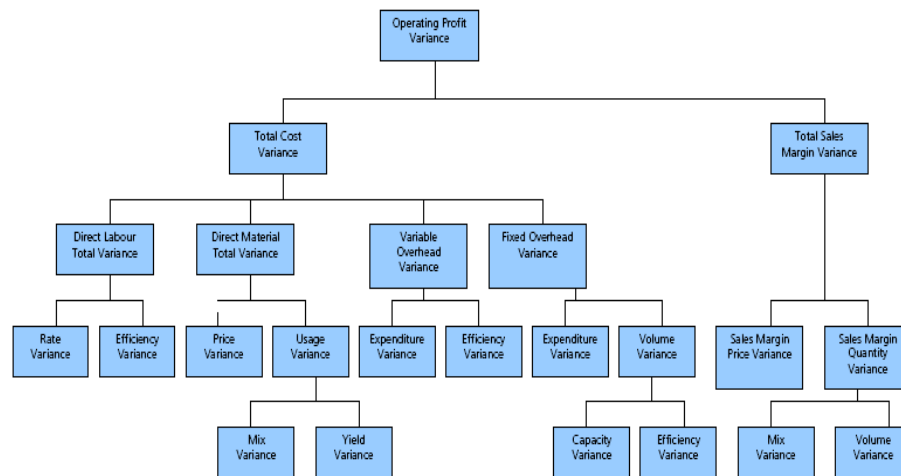


Chart of common variances. Adapted from Lucey, T. (1996). *Costing*, 5th ed. p. 432

## Further information

### Case research reports

Marginson, D., Ogden, S. and Frow, N. (2006). *Budgeting and innovation: complements or contradictions?* (PDF 94KB). CIMA Research Report. Available from: [www.cimaglobal.com/researchfullreports](http://www.cimaglobal.com/researchfullreports) [Accessed 14 March 2008]

This report is primarily about budgeting in organisations, but discusses the nature of budget variance analysis and its role.

Dugdale, D., Jones, C. and Green S. (2004). *Contemporary management accounting practices in UK manufacturing*. (PDF 45KB). CIMA Research Executive Summary. Available from: [www.cimaglobal.com/researchexecsummaries](http://www.cimaglobal.com/researchexecsummaries) [Accessed 14 March 2008]

This report investigates whether internal management accounting policies and reporting are currently dominated by financial reporting requirements. It seeks to establish the nature of innovative forms of management information. Part of this analysis involves the study of variance analysis in practice in modern organisations.

## CIMA articles/study notes

CIMA Study Notes – FM October 2005

This article examines why interpreting variances is challenging as a result of them being caused by a range of different elements. It highlights why the value of variances is not in providing solutions to problems, but in attracting management attention and identifying the likely responsibility for the variance. Available from:

[www.cimaglobal.com/financialmanagement](http://www.cimaglobal.com/financialmanagement)

[Accessed 14 March 2008]

CIMA Study Notes – FM April 2005

This article summarises the findings of the CIMA Research Report *Budgeting and innovation: complements or contradictions?* Available from:

[www.cimaglobal.com/financialmanagement](http://www.cimaglobal.com/financialmanagement)

[Accessed 14 March 2008]

CIMA Study Notes – FM March 2005

This article examines the claim that traditional 'static optimisation' approach to performance evaluation through comparison of actual and standard costs tends to avoid modern thinking in areas such as total quality management, value engineering and continuous improvement.

Much discussion about management accounting now revolves around the way in which shorter product life cycles, increased product customisation and a bigger service element marginalise the whole standard cost concept. Available from:

[www.cimaglobal.com/financialmanagement](http://www.cimaglobal.com/financialmanagement)

[Accessed 14 March 2008]

## Articles

Full text available from Business Source Corporate

[www.cimaglobal.com/mycima](http://www.cimaglobal.com/mycima)

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Barlas, S. et al. *How does your company measure performance?* Strategic Finance, December 2004, Volume 86, Issue 6, pp 17-21

Lucas, M. *Standard costing and its role in today's manufacturing environment.* Management Accounting, April 1997, Volume 75, Issue 4, pp 32-34

Nassiripour, S and Xu, L. *A new method towards better comprehension of variance analysis.* Journal of Accounting and Finance Research, Winter II 2004, Volume 12, Issue 7, pp 34-40

Walker, J. *Management accounting fundamentals*, Financial Management, June 2005, pp 43-46

## Articles

Abstract only from Business Source Corporate [www.cimaglobal.com/mycima](http://www.cimaglobal.com/mycima)  
[Accessed 14 March 2008]

Emsley, D. *Redesigning variance analysis for problem solving*. Management Accounting Research, March 2001, Volume 21, Issue 1, pp 21-40

Yeldon, E. *Topsy-turvy world of variances*. Accountancy, November 2000, Volume 126, Issue 1287, pp 132-134

## Books

Drury, C. (2004). *Management and cost accounting*. 6th ed. London: Cengage Learning (formerly Thomson Learning)

Kaplan, R. and Atkinson, A. (1998). *Advanced management accounting*. 3rd ed. Harlow: FT/ Prentice Hall

Lucey, T. (1996). *Costing*. 5th ed. Carnforth: Letts Educational

Scarlett, B. (2005). *Management accounting performance evaluation*, 2006 ed. London: CIMA Publishing

Walker, J. (2006). *CIMA learning system fundamentals of management accounting*. London: CIMA Publishing

*CIMA Official Terminology*. (2005). London: CIMA Publishing

## Websites

The Microsoft website provides some useful examples and exercises for variance analysis use in Microsoft Office Excel Work Essentials.

<http://office.microsoft.com/en-gb/default.aspx>

[Accessed 14 March 2008]

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