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Management Accounting Performance Evaluation

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Management Accounting Performance Evaluation

Bob Scarlett

Managerial Level Paper P1

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Absorption costing concept

Definitions

Absorption costing – an approach to costing that assigns production overheads to products through the use of an overhead absorption rate

Overhead absorption rate – the means of attributing overhead costs to individual products, based on the Units produced, labour hours used or some such basis

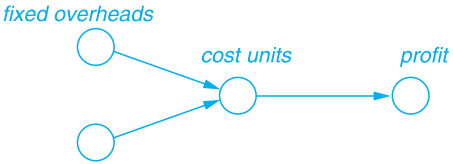
Predetermined overhead absorption rate – an overhead absorption rate, based on budgeted overhead and the budgeted level of output and/or activity

Under/over absorption of overheads – the difference between overheads absorbed and overheads incurred

Key points

⇨ The overhead absorption rate adopted should be the one which most meaningfully reflects the manner in which overhead costs are incurred. For example, if most overheads relate to the employment of labour, then direct labour hours provide the appropriate overhead absorption rate ('OAR')

Absorption costing concept



Absorption costing

⇨ An under/over absorption of overheads arises where the actual overheads incurred differs from the overheads absorbed. This can happen because (1) actual fixed overheads differ from that budgeted for and/or (2) the actual level of activity differs from that budgeted for

Absorption costing concept

Example

ABC Ltd produces the Unit. Budget details for period 99 include – £ 1,000 fixed overheads, 100 Units output and sold (giving an OAR of £ 10 per Unit), £ 5 variable cost per Unit and £ 20 selling price per Unit. Actual results for the period are £ 1,000 fixed overheads, 110 Units output, £ 550 variable costs, 105 Units sold and £ 2,100 sales revenue. A profit statement for period 99, using the absorption costing principle, appears as follows:

	£	
Sales revenue		2,100
Production costs:		
Variable	550	
Fixed (110 Units @ £ 10)	1,100	
	1,650	
Closing stock (5 Units @ £ 15)	75 (w1)	
Cost of sales		1,575
Gross profit		525
Over/(under) absorption of overheads		100 (w2)
Net profit		625

Workings:

(w1) cost per Unit is £ 5 variable plus £ 10 fixed (predetermined) per Unit = £ 15

(w2) £ 1,100 absorbed (110 Units @ £ 10) fixed overheads less £ 1,000 actual fixed overheads

Marginal costing concept

Definitions

Marginal cost – the part of the production cost of one Unit of a product that would be avoided if that Unit were not produced, or the amount by which cost would increase if one extra Unit were produced

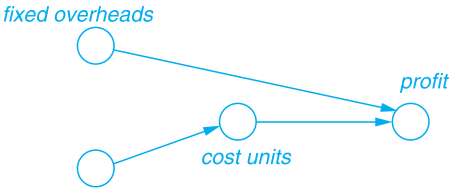
Marginal costing – the accounting system in which variable costs are charged to cost Units and fixed costs of the period are written off in full against contribution

Contribution – sales revenue less marginal cost of Units sold. Contribution may be expressed as a total figure, as per Unit figure or as a percentage of sales revenue

Key points

⇨ Contribution is arrived at by deducting the variable cost only of the Units sold from the sales revenue figure

Marginal costing concept



Marginal costing

⇨ Fixed costs (or fixed overheads, almost by definition) are charged in their entirety to profit for the period, to give a marginal costing version of profit

Marginal costing concept

Example

Take the example of ABC Ltd used in the previous section to illustrate absorption costing, but now prepare a profit statement using marginal costing

	£	
Sales revenue		2,100
Production costs:		
Variable	550	
Closing stock (5 Units @ £ 5)	25	
Cost of sales		525
Contribution		1,575
Fixed overheads		1,000
Net profit		575

Costing concepts compared

Definitions

Reconciliation – the practice of taking two different figures which relate to the same metric or piece of information, and explaining why the two figures differ through an exercise in analysis

Performance measurement – the process of assessing how successful or unsuccessful a business entity is in achieving its objectives. Those objectives are conventionally expressed in the form of financial metrics, such as profit or cash flow

Decision making – the practice of selecting between alternative courses of action on the basis of information assembled for the purpose. Typically, alternative courses of action are evaluated on the basis of how far they will contribute to the achievement of the objectives of the business entity

Key points

- Absorption costing and marginal costing will usually give two alternative versions of profit. The differences between the two are based essentially on movements in stock levels arising from the different principles applied in the valuation of stock

Costing concepts compared

⇨ The two concepts may be compared as follows:

Absorption costing

- is consistent with the requirements of financial accounting standards
- provides a measure of performance, which links particular costs with the benefits they give rise to
- values stock at full production cost

Marginal costing

- provides a measure of performance that places the focus on 'decision relevance'
- a cost which will be incurred, regardless of activity, is charged to profit when it is incurred
- values stock at marginal or variable cost only

Example

Take the example of ABC Ltd used in the previous two sections and reconcile the two alternative versions of profit that emerge from use of absorption and marginal costing

Absorption costing profit	£ 625
Absorbed fixed costs in closing stock (5 Units @ £ 10)	50
Marginal costing profit	575

Costing in job, batch and process industries

Definitions

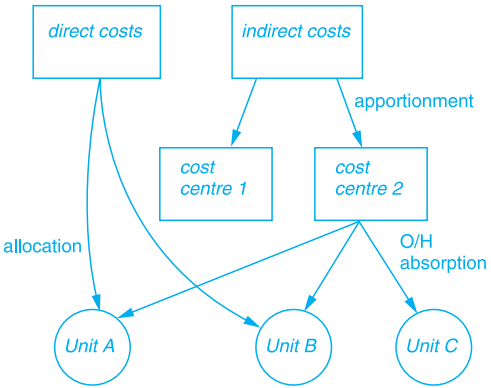
Job costing – a form of specific order costing, in which costs are attributed to individual jobs or orders. This practice is used in industries where production takes place in the form of discrete customised orders – e.g. a double glazing business

Batch costing – a form of specific order costing, in which costs are attributed to batches of products. This practice is used in industries where production of individual products is discontinuous – e.g. a components manufacturer

Process costing – the method applicable where output of product is continuous and the cost of individual Units in a given period has to be based on a specific valuation principle. This practice is used in industries such as oil refining

Production cost per Unit in process industries

Key points



⇨ All three forms of costing specified above involve application of the same basic set of principles, involving the allocation, apportionment and absorption of costs, in order to determine what is the cost of a cost Unit. However, cost accounting in a process-based environment involves certain refinements to the basic model

Production cost per Unit in process industries

Definitions

Production cost per Unit – the production cost per Unit used for accounting purposes. This is normally worked out by taking the costs charged to the process account for the period and dividing through by the Units produced, or Units output, in the period

Work in progress (WIP) – Units in production which are only partly complete at the start or end of the accounting period

First in first out (FIFO) – a stock valuation principle which can be applied to the accounting treatment for WIP in a process industry. FIFO assumes that the oldest stock available is the first issued

Average – a stock valuation principle which can be applied to the accounting treatment for WIP. The average method assumes that opening stock is merged with current period acquisitions and that issues are comprised of a weighted blend of the two elements

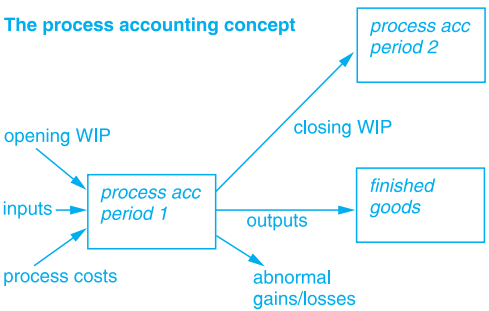
Production cost per Unit in process industries

Key points

The point of departure in a process costing exercise is to determine the production that has been achieved in a given period – with that production expressed in 'equivalent complete Units.' That last figure is typically:

Units completed in the period − (opening WIP × degree of completion) + (closing WIP × degree of completion)

The process accounting concept



Production cost per Unit in process industries

⇨ The relevant charges to and from the process accounts are influenced by the accounting policies that are used – specifically with reference to use of FIFO or Average stock valuation principles

Example

DEF Ltd operates process 33. In the current period, opening WIP was 10 Units, 40% complete, valued at £ 40. Costs totalling £ 1,200 were charged to the process in the period and 80 Units were completed. Closing WIP was 15 Units, 60% complete. What valuation should we place on the 80 Units completed and the 15 Units closing WIP, using (1) the FIFO principle and (2) the Average principle?

In both cases, the charges to the process 33 account in the period total £ 1,240 and the problem is to determine how much of that amount should be carried forward as closing WIP on the process account into the next period and how much should be credited to the process account for completions

FIFO

Production in equivalent units for the period is 85 Units (that is, 80 Units completed + 9 Units closing WIP − 4 Units opening WIP). That gives a Unit production cost of £ 14.118 (that is, £ 1,200/85 Units). Accordingly:

Closing WIP	£ 127	(£ 14.118 × 15 Units × 60%)
Completions	1,113	((£ 14.118 × 70 Units) + (£ 14.118 × 10 Units × 60%) + £ 40)
Total	1,240	

Production cost per Unit in process industries

Tip – an easy way to calculate completions is to treat it as a balancing figure (that is, £ 1,240 – £ 127)

Average

Output for the period in equivalent Units is 89 Units (that is, 80 Units completed + 9 Units closing WIP). That gives an average Unit production cost of £ 13.933 (that is £ 1,240/89 Units). Accordingly:

Closing WIP	£ 125	(£ 13.933 × 15 Units × 60%)
Completions	1,115	(£ 13.933 × 80 Units)
Total	1,240	

Valuation of process losses

Definitions

Process loss – this is a quantitative loss of material (which may be expressed in numbers of Units or kg weight) which takes place during the operation of a process. Typically, where a process loss occurs then the output from the process is less than the input – e.g. the tonnes of crude oil input to an oil refinery is usually greater than the tonnes of refined product emerging from it

Normal loss – is a process loss which is expected to occur when the process is operating at normal efficiency

Abnormal loss – is a process loss which is in excess of the normal loss. Where the actual loss is less than that which is normal, then an 'abnormal gain' is said to have occurred

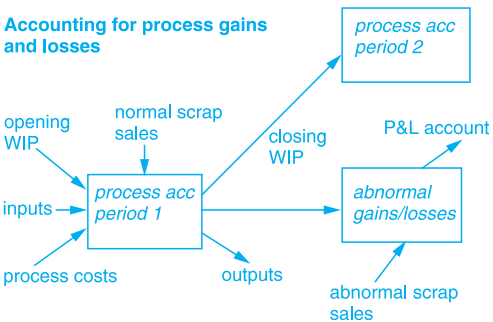
Scrap sales – this is a revenue derived from the sale of the product of process losses. Typically, such revenue should be very small relative to the economics of the whole process

Valuation of process losses

Key points

- The purpose of any cost accounting system is to identify the key outputs (in the form of useful Units and abnormal process losses) of an operation and attribute costs to those outputs in a meaningful way as a guide to performance evaluation and decision making.
- Scrap sales should be small relative to the economics of the whole process. If they start to assume a significant proportion of the total credits to the process account, then they should be considered as by-products or joint products of the process and accounted for accordingly

Accounting for process gains and losses



Valuation of process losses

Example

GHI Ltd operates process 44. In the current period, 200 kg are input to the process (cost £ 2,000) and process operating costs are £ 1,000. 5% process losses are 'normal' and scrap sales are £ 1 per kg process loss. What entries should be made on the process account if (1) it achieves an output of 190 kg and (2) it achieves an output of 185 kg?

In both cases, input and process costs totalling £ 3,000 would be charged to the account

(1) 190 kg output – normal efficiency

The process cost per kg is £ 15.737, that is (£ 3,000 – £ 10 normal scrap sales)/190 kg output

The following entries are credited to the process account:

Normal scrap sales	£ 10
Completions	2,990 (£ 15.737 × 190 kg)
Total	3,000

Valuation of process losses

(2) 185 kg output – 5 kg abnormal losses
The process cost per kg is taken to be £ 15.737 – see (1) above

The following entries are credited to the process account:

Normal scrap sales	£ 10
Completions	2,911 (£ 15.737 × 185 kg)
Abnormal losses	79 (£ 15.737 × 5 kg)
Total	3,000

In addition, £ 79 would be charged and £ 5 credited (for abnormal scrap sales) to an abnormal loss account

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The Theory and Practice of Standard Costing

Key learning system questions

1.1 Overhead variances
1.2 Sales variances
1.3 Materials cost variances

Topics

- The determination of a standard cost
- Labour and material cost variances
- Overhead cost variances
- Sales variances
- Standard costing and the budgetary control report

The determination of a standard cost

Definitions

Standard cost – the predetermined Unit cost of the product, component or service, produced in the period. A standard cost normally incorporates a given level of efficiency and a budgeted level of output

Standard labour cost – the number of direct labour hours required to produce a Unit × the planned hourly rate paid to the labour force

Standard materials cost – the quantity of direct materials (expressed in kg or similar) × the planned price per kg of that material

Standard variable overhead cost – the standard quantity of the overhead absorption base per Unit × the variable overhead absorption rate

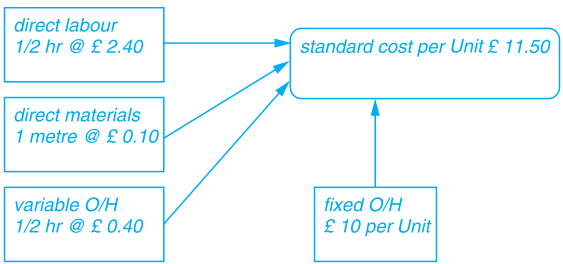
Standard fixed overhead cost – the standard quantity of the overhead absorption base per Unit × the fixed overhead absorption rate

The determination of a standard cost

Key points

⇨ Direct labour costs and material costs are assumed to be fully variable. Variable overhead costs are, by definition, fully variable. Fixed overhead costs are absorbed into cost Units at a predetermined OAR, based on budget figures – budget fixed O/H (say £ 1,000) divided by budget output (say 100 Units)

The standard cost of a unit



The determination of a standard cost

Example

Taking all the above information, the associated standard cost of a Unit is:

Labour	£1.20	(½ hour @ £2.40)
Materials	0.10	(1 metre @ £0.10)
Variable overheads	0.20	(1 Unit @ £0.20 or ½ hour @ £0.40)
Fixed overheads	10.00	(£1,000 budget cost/100 Unit budget output)
Total	11.50	

Note that:

(1) The standard cost per Unit has a usage component (1/2 hour direct labour and 1 metre of materials), a price component (£2.40 per labour hour, £0.10 per metre) and a volume component (100 Units per period budget output)

(2) There is a direct link between standard cost and budget. In the case of labour, materials and variable overhead – the standards determine the budget. In the case of fixed overhead, the budget determines the standard. The budget for 100 Units output is £1,150

(3) If 110 Units are actually produced, the standard cost of that 110 Units is £1,265 (that is £11.50 $\times$ 110 Units), regardless of budget Units output

Labour and material cost variances

Definitions

Labour rate variance – the difference between the standard and actual hourly rate paid, multiplied by the actual hours worked

Labour efficiency variance – the difference between the standard and actual hours worked, multiplied by the standard hourly rate

Materials price variance – the difference between the standard and actual price paid per kg (or metre), multiplied by the actual kg used

Materials usage variance – the difference between the standard and actual kg used, multiplied by the standard price per kg

Favourable variance – a variance (usually denoted 'fav') that causes profit to rise

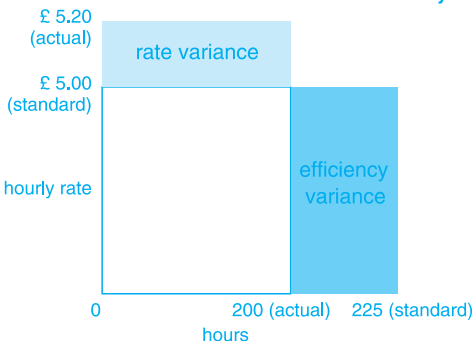
Adverse variance – a variance (usually denoted 'adv') that causes profit to fall

Labour and material cost variances

Key points

⇨ A labour cost variance is the difference between the standard labour cost of the output achieved and the actual labour cost incurred. This may be analysed into efficiency and rate components. The same logic may be applied to a material cost variance, analysed into usage and price components

Labour cost variance analysis



Labour and material cost variances

Example

The standard labour cost of a Unit is 1.5 hours @ £ 5.00 per hour. In the current period, 150 Units are produced and 200 hours are worked @ £ 5.20 per hour. Calculate the labour cost variance in the period and analyse it into efficiency and rate components. The cost variance is £ 85 fav (£ 1,125 standard – £ 1,040 actual), analysed as follows:

Standard labour cost	£ 1,125	(150 Units × 1.5 hours × £ 5)
Labour efficiency variance	125 fav	((225 standard hours – 200 actual hours) × £ 5)
Labour rate variance	40 adv	((£ 5.00 standard rate – £ 5.20 actual rate) × 200 hours)
Actual labour cost	1,040	(200 hours × £ 5.20)

Overhead cost variances

Definitions

Variable overhead cost variance – the difference between the standard variable overhead cost and the actual variable overhead cost for the output achieved

Fixed overhead volume variance – the difference between the standard fixed overheads for the output achieved and the budgeted fixed overheads

Fixed overhead expenditure variance – the difference between the budgeted fixed overheads and the actual fixed overheads

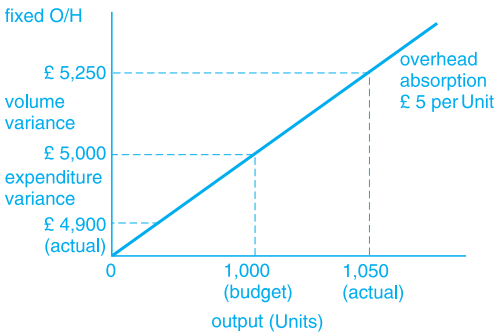
Key points

⇨ If the overhead absorption rate is something other than an amount per Unit produced, then it is possible to analyse the variable overhead cost variance into efficiency and expenditure variance components

Overhead cost variances

⇨ If actual output differs from budget output then standard fixed overheads will differ from budget fixed overheads – and this difference is the fixed overhead volume variance. When actual fixed O/H differs from budget O/H then a fixed overhead expenditure variance has occurred

Fixed overhead cost variance analysis



Overhead cost variances

Example

JKL Ltd's budget for the current period includes 1,000 Units output, £2,000 variable overheads, £5,000 fixed overheads. Actual results are 1,050 Units output, £2,200 variable overheads and £4,900 fixed overheads. The variance analysis for JKL's overhead costs in the period is:

Standard overheads	£7,350	(£7 per Unit × 1,050 Units)
Variable overhead variance	100 adv	((1,050 Units × £2) standard − £2,200 actual)
Fixed overhead volume variance	250 fav	((1,050 Units actual − 1,000 Units budget) × £5)
Fixed overhead expenditure variance	100 fav	(£5,000 budget − £4,900 actual)
Actual overheads	7,100	(£2,200 variable + £4,900 fixed)

Overhead cost variances

If we are now told that variable overheads are attributed to the Unit at an overhead absorption rate of £ 0.20 per labour hour, that each Unit requires 10 standard hours to produce (note that the standard variable overhead cost remains at £ 2 per Unit) and that 9,500 labour hours were actually worked in the period, then we can analyse the variable overhead cost variance into efficiency and expenditure components as follows:

Variable overhead efficiency variance	£ 200 fav ((10,500 hours standard – 9,500 hours actual) × £ 0.20)
Variable overhead expenditure variance	300 adv ((9,500 hours × £ 0.20) – £ 2,200)
Total	100 adv

Tip – never attempt more than you are required to. Unless you are specifically required to analyse a variable overhead cost variance into its efficiency and expenditure components, do not attempt it

Sales variances

Definitions

Standard profit per Unit – the standard selling price per Unit, less the standard cost per Unit

Sales volume profit variance – the difference between budget Unit sales and actual Unit sales, multiplied by the standard profit per Unit

Sales volume contribution variance – the difference between budget Unit sales and actual Unit sales, multiplied by the standard contribution per Unit

Selling price variance – the difference between the standard selling price per Unit and the actual selling price per Unit, multiplied by the actual number of Units sold

Sales variances

Key points

- The sales volume profit variance reconciles the budget profit with the standard profit for the Unit sales achieved. It indicates the impact on profit of making Unit sales above or below the budget level. In the context of a marginal costing system (where fixed overhead costs are not absorbed into products), then the sales volume contribution variance performs the same function by reconciling budget contribution with standard contribution
- The selling price variance is one element in reconciling standard profit with actual profit. Note that the cost variances form the other element in this last reconciliation. The selling price variance indicates the impact on profit of making sales at above or below standard prices

Example

MNO Ltd's budget for the current period includes sales of 100 Units with a £15 standard cost at a standard selling price of £20. Actual results are 110 Units sold at a price of £19 each. What are the sales variances?

Budget profit	£500	(100 Units budget × £5 standard profit)
Sales volume profit variance	50 fav	((110 Units actual – 100 Units budget) × £5)
Standard profit	550	(110 Units × £5)
Selling price variance	110 adv	((£19 actual selling price – £20 standard) × 110 Units)

Standard costing and the budgetary control report

Definitions

Budgetary control – the continuous comparison of budget with actual results as a method of measuring performance and/or as a guide to action

Financial reporting – the practice of preparing financial statements containing information required for management and other purposes

Performance metric – a measurement used to indicate the standard of performance. Most metrics involve comparison of one thing with another – e.g. budget with actual

Benchmark – one element in the construction of a performance metric – e.g. a standard cost or a standard selling price provides possible internal benchmarks with which actual costs and selling price can be compared

Standard costing and the budgetary control report

Key points

⇨ The whole scheme of things involves preparing periodic (typically monthly) statements, which reconcile budget profit with actual profit

The principles involved in budgetary control reporting are:

- one has to use either the budget or standard as a benchmark, against which performance is measured
- generally, a below benchmark performance is considered 'bad,' while above benchmark is 'good'
- the reconciliation may involve a variance analysis of the kind considered above
- but, it may involve a straight comparison of actual and budget
- both standard costing and budgetary control are exercises in 'static optimisation'
- they work on the assumption that there is a 'best way' of doing things and that way is the standard

Standard costing and the budgetary control report

Example

Let us return to the MNO Ltd example in the previous section and add information to the effect that actual costs incurred in the period are £1,520. Prepare a control report reconciling budget and actual profit

Budget profit	£500	
Sales volume profit variance	50 fav	
Standard profit	550	
Selling price variance	110 adv	
Cost variances (total)	130 fav	((110 Units × £15 standard) – £1,520 actual)
Actual profit	570	((110 Units × £19) revenue – £1,520 costs)

Even in this highly summarised form, it can be seen that performance has been above that budgeted for and the variance analysis exercise incorporated in the control report gives some indication of which factors have contributed to this. One's appreciation of these factors may prompt action to correct an adverse variance, or action to exploit a favourable variance

Standard Costing and Performance Evaluation

Key learning system questions

4.7 & 4.8 Planning and operational variances
13 The worth of standard costing
18 Behavioural issues

Topics

- Mix and yield variances
- Planning and operational variances
- Investigation and interpretation of variances
- Behavioural issues
- McDonaldisation

Mix and yield variances

Definitions

Materials mixture variance – that part of the materials usage variance that arises from having used a mix of materials that is different to that, which is standard. It is the cost impact of departing from the standard mix of input materials

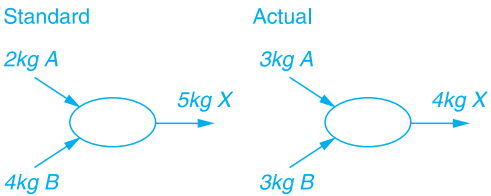
Materials yield variance – that part of the materials usage variance that arises from having achieved an output yield that is above or below that, which is standard for the quantity of materials that was input. It is the cost impact of achieving a yield that is above or below standard

Labour mix variance – that part of the labour efficiency variance that arises from having used a mix of labour grades that is different to that, which is standard. It is identical in concept to the materials mixture variance

Sales mix variance – that part of the sales volume variance that arises from having sold a mix of goods that is different to that, which is standard. It is similar in concept to the materials mixture variance

Mix and yield variances

Key points



Mix/yield variances

Tip – mix and yield variances can be calculated using several alternative methods. Always use the simple method shown in the Example, unless you are specifically required to do otherwise

⇨ The mix variance is 1 kg A adverse plus 1 kg B favourable. The yield variance is 1 kg X adverse. The only other issue is the £ value to be placed on these kg variances

Mix and yield variances

Example

PQR Ltd produces product C, using ingredients A (cost £1.00 per kg) and B (cost £1.60 per kg), in the proportion 1 is to 2 by weight. The standard output of 6 kg input (2 kg A and 4 kg B) is 5 kg of C. In the current period, 300 kg of A and 300 kg of B are input, giving an output of 400 kg of C. Analyse the material usage variance

The standard materials requirement of 400 kg of C is 160 kg of A and 320 kg of B. The usage variance is:

Ingredient A	£140 adv	((160 kg standard – 300 kg actual) × £1.00)
Ingredient B	32 fav	((320 kg standard – 300 kg actual) × £1.60)
Total	108 adv	

This may be analysed as follows:

	Actual	Std mix	Mix var	kg price	Mix var
A	300 kg	200 kg	100 kg adv	£1.00	£100 adv
B	300 kg	400 kg	100 kg fav	£1.60	£160 fav
Materials mixture variance					£60 fav

600 kg input gives 500 kg standard C output. Actual C output was 400 kg, so the materials yield variance is 100 kg of C adverse, which is £168 (100 kg × £1.68 per kg standard). Note that mixture + yield = usage variance

Planning and operational variances

Definitions

Planning variance – that part of the variance which arises from the original standards having been inappropriate or incorrect, given the circumstances which later emerged

Operational variance – that part of the variance which is based on revised standards and which meaningfully reflects the level of performance that has been achieved

Ex-ante standard – the standard based on the original plans, budgets and forecasts

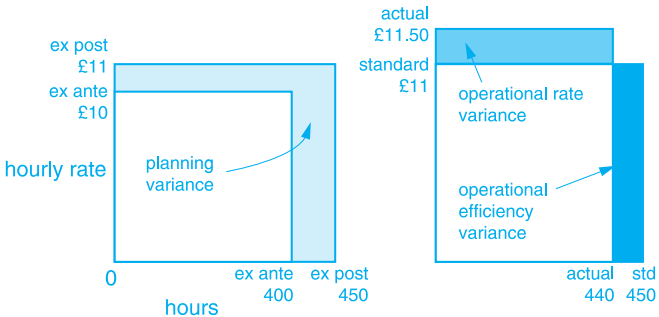
Ex-post standard – the standard based on plans, budgets or forecasts which have been revised after the budget and original standard have been calculated

Key points

⇨ One can approach calculation of the planning variance with varying degrees of refinement. The simplest method is to calculate the difference between the ex-ante and ex-post standards and report that as the planning variance. The operational variances are then calculated on the ex-post standards

Planning and operational variances

Operational and planning variances



This illustrates the case given in the Example below

Planning and operational variances

Example

STU Ltd produces 100 Units in the current period using 440 hours of labour and incurring a wage cost of £ 5,060. The original standard labour cost for a Unit was for 4 hours labour, paid at £ 10 per hour. At the end of the period it was reported that conditions in the labour market had been such that, during the period, less productive labour had to be used, paid at a rate of £ 11 per hour and causing the standard hours per Unit to rise to 4.5. Calculate the labour cost variances

Ex-ante standard labour cost	£ 4,000	(100 Units × 4 hours × £ 10)
Planning variance	950 adv	
Ex-post standard labour cost	4,950	(100 Units × 4.5 hours × £ 11)
Labour efficiency variance (operational)	110 fav	((450 hours standard – 440 hours actual) × £ 11)
Labour rate variance (operational)	220 adv	((£ 11.00 standard – £ 11.50 actual) × 440 hours)
Actual labour cost	5,060	

Note that the planning variance is simply a balancing figure

Tip – this is another case where you are wise to do no more than is required. Where several factors have caused ex-ante and ex-post standards to diverge, then calculation of a number of planning variances is possible – but complicated. Calculate one planning variance only unless required to do otherwise

Investigation and interpretation of variances

Definitions

Controllable variance – is one which arises as a result of factors which are under the control of the responsible manager. Controllable variances are generally worth investigating, since action can be taken to eliminate or exploit them if that is deemed appropriate

Uncontrollable variance – is one which arises as a result of factors which are beyond the control of the responsible manager. For example, an adverse material price variance as a result of a rise in world commodity prices is not controllable by the manager and he/she cannot be held to account for it

Significant variance – is one of a size that justifies the cost of its investigation

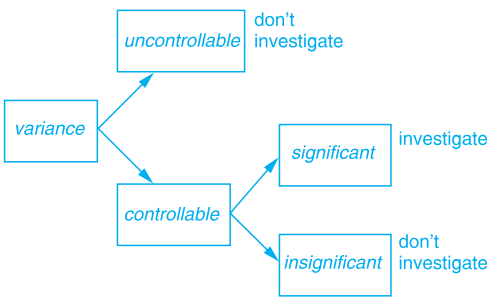
Insignificant variance – is one of a size that does not justify the cost of its investigation. Typically, the cost of investigation exceeds the benefit from any corrective action that such an investigation might prompt

Investigation and interpretation of variances

Key points

⇨ Variance analysis in the context of budgetary control works on 'the principle of exception.' Variances relate to things which are divergences from plan. However, one has to be selective in deciding which variances to investigate, since investigation has a cost. The conventional model may be illustrated as follows:

Investigation of variances



Investigation and interpretation of variances

Arguments in favour of the model:

- there is no point in investigating variances which relate to things which no one can do anything about
- there is no point in investigating things that are trivial or have minimal impact on the overall outcome
- one should focus attention on things that matter and that one can do something about

Arguments against the model:

- it is not possible to state whether or not a variance is controllable until it has been investigated; a price variance can be caused by a movement in world prices (uncontrollable) or incompetent buying (controllable)
- it is not possible to state whether or not a variance is significant until it has been investigated; a 0.001% usage variance may be caused by material quality (insignificant) or staff theft (significant)
- it is rules-based rather than principles-based

Behavioural issues

Definitions

Goal congruence – a situation in which the individual parts of an organisation work harmoniously towards the achievement of organisational objectives. Control systems should seek to achieve this

Dysfunctional behaviour – the result of a failure of goal congruence. This arises when individual parts of an organisation act in a manner that is not in the best interests of the organisation as a whole. A badly designed control system may induce dysfunctional behaviour

Targets – a performance metric incorporated in a control system. A standard cost is normally set as a target which is known to be attainable under given circumstances. Such a target can be pitched at alternative levels and the motivational impact of a standard may depend on how challenging it is

Participation – the practice of involving the managers responsible for the achievement of a standard in its setting. The extent to which managers have participated in the setting of standards may influence the legitimacy of those standards and their motivational impact

Behavioural issues

Problems in performance evaluation system design:

- ⇨ The inducing of dysfunctional behaviour
- ⇨ Issues of legitimacy
- ⇨ Issues of motivation
- ⇨ Incompatibility with New Economy values

McDonaldisation

Definitions

McDonaldisation – a social and organisational phenomenon, associated with the development and delivery to market of high volume, simple, homogenous products. The worldwide operations of the McDonalds fast food chain is taken to exemplify this approach

Scientific management – a body of traditional management theory and technique, associated with the idea that there are optimum working methods associated with the production of any given good or service, that these methods are capable of scientific determination. The term 'Taylorism' is often used as a euphemism for scientific management

Diagnostic reference groups – a standardisation practice applied in healthcare management, involving the classification of patients into a number (usually around 700) of groups, according to the illness and the treatment they are to receive. Typically a healthcare provider (e.g. a hospital) will receive a flat daily fee from a healthcare funder (e.g. an insurance company) for a given DRG admission

McDonaldisation

Key points

Arguments in favour of McDonaldisation and DRGs include the following:

- it promotes efficiency; the repetitive use of standardised production method promotes low Unit costs
- it promotes predictability and calculability; it facilitates the prediction of production costs and minimises costs of consumers as a result of the latter being aware of what they are buying
- it promotes controllability through allowing easy comparison of standard and actual costs
- it minimises 'transaction' and 'agency' costs associated with the contracting out of public services

Arguments against:

- it cuts across New Economy concepts of product customisation and short life cycles
- it induces the supply of pre-packaged services which may not be best suited to the individual needs of customers
- it promotes adherence to predetermined standards, rather than seeking continuous improvement

Basic Aspects of Management Accounting

Key learning system questions

1.5 Cost behaviour
3.4 Overhead cost determination
4.1 Cost volume profit analysis

Topics

- Cost volume profit analysis
- Limiting factors
- Relevant costs
- Opportunity costs

CVP analysis

Definitions

Cost structure – the manner in which the costs of an operation vary with the level and structure of output. The management accountant may model a cost structure in the form of fixed, variable and semi-variable costs – reflecting the way in which different costs vary with output

Revenue structure – the manner in which the revenues of an operation vary with the level and structure of Unit sales. The accountant may develop a model of revenue structure to take account of the nature of the market

Break even point – the level of output at which neither a profit nor a loss is made. The break even point can be expressed in the form of Units made and sold, sales revenue or percent of capacity worked

Margin of safety – the difference between the break even point and the forecast level of sales

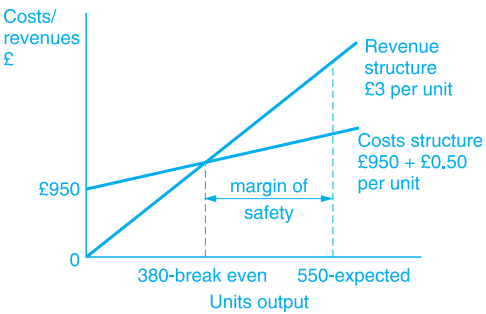
Key points

⇨ Take the case of an operation with a cost structure being £ 950 plus £ 0.50 per Unit produced and a revenue structure being £ 3 per Unit sold

CVP analysis

⇨ **Tip** – more complex situations of cost and revenue structures are more likely to appear in MAPE's sister paper MADM than in MAPE itself

CVP analysis



⇨ Contribution per Unit is £ 2.50 and the break even point is 380 Units. If the expected sales is 550 Units, then the margin of safety is 170 Units or 31% of expected sales. The viability of any operation is usually influenced by a risk-reward trade-off. An appreciation of the margin of safety is one way of handling this

Limiting factors

Definitions

Contribution maximisation – the objective that should normally guide short-term decision making. The decision may be a choice between discrete alternatives, or deciding on a point at which to operate on some range (e.g. a pricing decision), but, in either case, the option should be selected which maximises contribution

Limiting factor – the constraint that determines how far operations can be extended in a given operational situation. An operation may be confronted with several constraints, but the limiting factor is the one that constrains things the most

Principal budget factor – the limiting factor which is identified as part of a budgetary planning exercise. Once identified, the principal budget factor is the constraint around which the budget is built

Contribution per unit of the limiting factor – the performance metric that is usually used to determine the ranking of alternative uses of the limiting factor

Limiting factors

Key points

Tip – for MAPE examination purposes, the principal budget factor will never be too difficult to pick out. It will usually be obvious from inspection and will not require any form of mathematical analysis to identify

Identifying the principal budget factor

constraints

labour *500 units capacity*	*materials* *unlimited capacity*
machine hours *300 units capacity* *- the limiting factor*	*marketing demand* *400 units capacity*

⇨ Many things can become limiting factors and a particular factor may not always be obvious at the outset of a practical business planning exercise. For example, there were very high levels of unemployment in the UK during the early 1980s. But, even then, certain skills were always in short supply

Limiting factors

Example

ABC Ltd produces three products; details are as follows:

	A	B	C
Market demand (Units)	20	40	40
Machine hours per Unit (hours)	1	2	2.5
Contribution per Unit (£)	5	9	6

Only 160 machine hours are available. What order should the three products be ranked in, when determining the production budget for the coming period?

There are two constraints here – market demand and machine hours. Available market demand does not prevent all 160 machine hours being used, but the reverse is not the case. If all market demand were satisfied, then this would require that 200 machine hours be used. So, machine hours is the limiting or principal budget factor and the products should be ranked according to contribution per machine hour. This gives:

Product	Cont. per mac. hr	Rank
A	£5.00	first
B	4.50	second
C	2.40	third

Rationing the 160 available machine hours according to this ranking would give production of 20 Units of A, 40 Units of B and 24 Units of C – giving a total contribution of £604, which is the maximum that can be extracted from this situation

Relevant costs

Definitions

Relevant cost – a cost which will be incurred or avoided, depending on the decision that is made. Such a cost may be described as being 'decision relevant'

Irrelevant cost – a cost which will be incurred, regardless of the decision that is made. Such a cost may be described as being 'not decision relevant' and should normally be excluded from one's appraisal of the options

Relevant revenue – revenue which will be incurred or lost, depending on the decision that is made. Such revenue is decision relevant and should be included in one's appraisal of the options

Sunk cost – such a cost is one that has already been incurred at the time of the decision, and is therefore no longer decision relevant. This is so, regardless of the fact that the cost concerned may be directly associated with a given option

Relevant costs

Key points

⇨ In deciding whether or not a cost is decision relevant, one often has to look behind the output of cost accounting systems and consider the fundamental economics of the operation

An item is decision relevant if:

- it is a cost that varies directly with the level of output
- it is an increment of fixed costs that may or may not be incurred, depending on the decision made
- it is some benefit that may or may not be foregone, depending on the decision made
- it is an item of revenue that may or may not be achieved, depending on the decision made

An item is not decision relevant if:

- it is a fixed cost that will be incurred, regardless of the decision made
- it is a cost that has already been incurred or committed to
- it is a revenue that has already been achieved
- it is a cost or benefit that will be incurred or achieved, regardless of the decision made
- it is merely an accounting entry which is not matched by an actual cash flow

Relevant costs

Example

VWX Ltd produces the Unit at a variable cost of £ 10 and an absorbed fixed overhead cost of £ 5. If an overseas customer offers to buy one additional Unit for £ 14, and this will not affect any other sales, then should this offer be accepted?

From an accounting point of view, the sale of one Unit at £ 14 will result in a loss of £ 1. However, the £ 5 absorbed fixed overheads may be considered not decision relevant. They relate to costs that will be the same, regardless of whether or not the offer is accepted. The £ 5 absorbed costs are simply an accounting entry that has no cash flow consequence. On that basis, acceptance of the offer will generate a £ 4 positive contribution and so it should be accepted. However, see comments made above concerning the nature of cost variability

Opportunity cost

Definitions

Opportunity cost – the benefit that is lost as the result of taking a particular course of action. An opportunity cost may arise directly or indirectly as the result of selecting a particular option

Contribution foregone – the amount of contribution that might have been obtained from option B if option A is adopted as an alternative to option B. The contribution foregone from B is the opportunity cost of selecting option A

Key points

- An opportunity cost arises when one is selecting between discrete alternative courses of action. If option B has to be declined in order to accept option A, then there is an opportunity cost attached to running A. That opportunity cost is the contribution lost from not being able to run B
- The link between options may arise because of resource constraints or customer preferences. For example, some customers will not place orders with a supplier who also supplies one of that customer's competitors. If the supplier does not research the position thoroughly, then he/she may accept an order from a new customer and only become aware of the opportunity cost of accepting that order at some later date

Opportunity cost

Tip – in the context of MAPE, issues pertaining to opportunity cost are most likely to arise in the context of budgetary planning (see Chapter 5) and inter-divisional transfer pricing (see Chapter 9)

Example

STU Ltd is able to accept Job A or Job B – but not both. The revenues and variable costs associated with the two alternative jobs are as follows:

	A	B
Revenues	£ 50	45
Variable costs	30	30
Contribution	20	15

It is obvious that Job A would be selected in place of Job B, because it generates an extra £ 5 contribution. But, how might this logic be restated in a manner that refers to the opportunity cost associated with taking Job A in preference to Job B?

Job A		
Revenues	£ 50	
Variable costs	(30)	
Opportunity cost of B	(15)	the contribution lost by not running Job B
Net contribution	5	

Selecting Job A in place of B generates a positive £ 5 net contribution – hence A should be selected

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The Theory and Practice of Budgeting

Key learning system questions

1.10 Budgeting
3.1 Forecasting
25 Budget preparation

Topics

- Budgeting as a concept
- Budgets, cash budgets and rolling budgets
- Time series analysis
- PPBS, ZBB and ABB
- Beyond budgeting

Budgeting as a concept

Definitions

Budget – a financial statement relating to the planned operations of an organisation over a given time period. The budget may contain information relating to any or all of assets, costs, revenues and cash flow

Budgetary planning – the element of planning future output and activities which contributes to the preparation of a budget

Budgetary control – the practice of evaluating performance through periodic comparison of results budgeted for with those actually achieved

Top-down budgeting – the practice of top-management establishing budgets for the component parts of an organisation and then passing those budgets down to subordinate managers for implementation

Bottom-up budgeting – practice of allowing subordinate managers to prepare budgets for the parts of the organisation they are individually responsible for, and then consolidating the departmental budgets to form a budget for the whole organisation

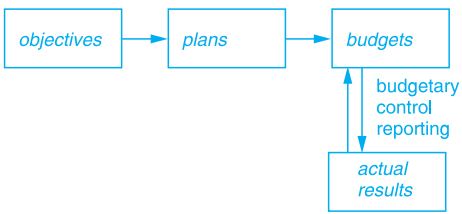
Budget interval – the time segments into which a budget is divided

Budgeting as a concept

Key points

⇨ The purpose of a budget is (1) to provide a coherent plan of action, expressed in terms of money for the whole organisation and/or for parts of the organisation and (2) to provide a benchmark against which actual performance can be measured. These two elements provide the planning/decision making and control/performance evaluation aspects which are central to what management accounting is all about

The budgetary process



Budgeting as a concept

Example

Y Ltd's one year budget with quarterly intervals appears as follows:

£'000	Q1	Q2	Q3	Q4	Year
Sales	45	55	60	55	215
Production costs	20	25	30	35	110
Overhead costs	10	10	10	15	45
Profit	15	20	20	5	60

This budget amounts to a projected profit and loss account. One can equally prepare budgets which amount to projected cash accounts (the cash flow budget) or balance sheets (capital budgets)

Comparison of these quarterly budgets with the actual results achieved provides 'control' over the operation. Note that the comparison can take the form of a straight actual to budget match, or it can take the form of a variance analysis exercise of the kind explored above

The logical thrust behind budgetary control is that management's attention is concentrated on those parts of the operation where actual and budget diverge. The idea is that such a divergence indicates an area where a problem needs to be corrected or where an opportunity might be exploited

Budgets, cash budgets and rolling budgets

Definitions

The master budget – the budget into which all subordinate budgets are consolidated. It usually consists of a budgeted profit and loss account for the whole organisation for an entire year

Operational budgets – a budget for the revenues and expenses expected in a coming period. Typically, operational budgets will be prepared for each individual department (see discussion of responsibility accounting in Chapter 6) and will be split into budget intervals (typically monthly or quarterly) for control purposes

Cash budgets – a budget of the projected cash inflows, outflows and balances over the budget period. It amounts to a statement of the projected entries on the cash account for the period

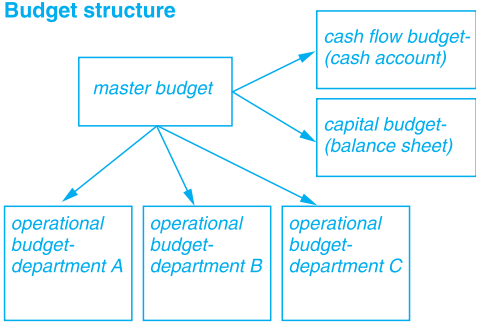
Rolling budgets – a budget that is continuously updated, by adding an additional interval period to the budget as each budget interval expires. Thus, as quarter 1 ends, the budget is updated by the removal of figures for quarter 1 and the addition of figures for quarter 5

Budgets, cash budgets and rolling budgets

Key points

⇨ The master budget is usually highly summarised and amounts to an aggregation of a large number of subordinate budgets

Budget structure



⇨ The individual component budgets will typically be divided into budget intervals for control purposes

Budgets, cash budgets and rolling budgets

Example

The 1 year operational budget for division X appears as follows:

Operational Budget	£'000
Sales	160
Operating costs	100
Equipment depreciation	25
Profit	35

The opening cash balance was £10,000, sales are made on average 3 month's credit terms, opening debtors were £30,000. All costs are paid for on cash terms. A purchase of new equipment costing £15,000 is planned. You are required to prepare division X's cash flow budget for the period

Cash Flow Budget	£'000	
Opening balance	10	
Cash from customers	150	(30 opening debtors + 160 sales – 40 closing debtors)
Cash to suppliers	(100)	
Equipment purchase	(15)	
Closing balance	45	

Time series analysis

Definitions

Time series model – a mathematical representation of how some variable behaves over time, having regard to a general direction of movement (the trend) and periodic variations linked to seasonality

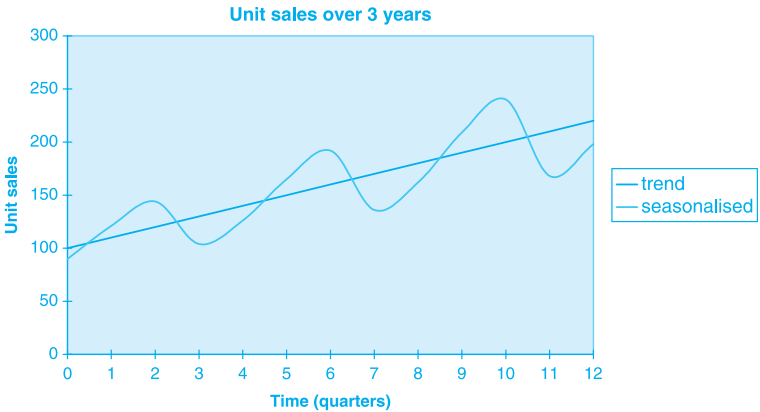
Trend – a general direction in the movement of some variable over time. Typically, actual movements will be based around that trend, but subject to cyclical and/or seasonal variations

Seasonal variation – a predictable variation above or below trend, in the movement of a variable over time. That variation relates to the season that is in consideration

Random variation – an unpredictable variation above or below trend, adjusted to allow for seasonality. Random variations typically relate to events that are wholly unpredictable, but are bound to arise from time to time

Tip – if you come to the topic 'cold' then the above points are incomprehensible. Go straight to the example and the illustration on page 72. The topic is one which is easy to illustrate but difficult to explain

Time series analysis



The diagram illustrates a time series analysis. Monthly Unit sales over time follow a trend represented by the equation $y = 100 + 10x$, with y as Units and x as Time (quarters). Sales are subject to seasonal variations – being trend +10% for the first quarter in each year, +20% for the second quarter, −20% for the third quarter and −10% for the fourth quarter

Note that the trend can be 'curvilinear' and the seasonal variations can be absolute amounts rather that percentages

Time series analysis

Example

C Ltd sells Units and quarterly Unit sales in year 1 were as follows – 65 (q1), 80 (q2), 70 (q3) and 85 (q4)
Inspection of these figures indicates a trend in Unit sales (see illustration), which may be represented by the equation $y = 50 + 10x$, where $y =$ Unit sales and x is the quarter number (with year 1 – quarter 1 being '1')
How might these figures be used to develop a time series model, in order to forecast Unit sales in each quarter of year 2, using (a) an additive modelling approach and (b) a multiplicative modelling approach?
The point of departure is to take the actual Unit sales and compare the trend figures with the actual figures for year 1, in order to determine the seasonal variation for each quarter. This variation can be expressed as (a) a lump sum for each quarter (the additive model) or (b) a percentage of trend (the multiplicative model)

C Ltd – Unit sales time series analysis

	Period	Units sold	Trend	(a) Variation	(b) Var %
Year 1 q1	1	65	60	5	8.333
Year 1 q2	2	80	70	10	14.286
Year 1 q3	3	70	80	−10	−12.500
Year 1 q4	4	85	90	−5	−5.556

One may then apply these variation figures to trend projections, in order to produce a quarterly forecast for Unit sales in year 2. The two modelling approaches produce two alternative forecasts under headings (a) and (b)

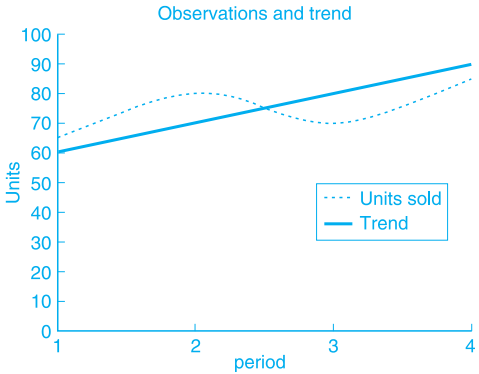
Time series analysis

Unit sales, budget for year 2

	Period	Trend	Year 2 add. (a)	Forecast mult. (b)
Year 2 q1	5	100	105	108
Year 2 q2	6	110	120	126
Year 2 q3	7	120	110	105
Year 2 q4	8	130	125	123

Note that this is the simplest possible example. In particular, we are basing our analysis on only one set of observations (those for year 1). In practice, one would prefer to calculate the seasonal variations on the basis of the average of two or three sets of observations

Time series analysis



PPBS, ZBB and ABB

Definitions

Discretionary cost – a cost which can be altered in any given time period by the budget holder, without fundamentally affecting the output of a process. For example – in a manufacturing process, quality control costs are discretionary, whereas direct material costs are not discretionary

Programme-planning budgeting system (PPBS) – the practice of preparing budgets on the basis of programmes of activities, rather than on a departmental basis. For example, in a local authority, programmes of activity may require the support of several departments. 'Welfare of the elderly' may draw on social services, housing, libraries and police. The PPBS approach involves preparing budgets for programmes and then deriving departmental budgets from these

Zero-based budgeting (ZBB) – the practice of preparing budgets through assembling packages of possible activities and seeking to determine the most cost-effective way of achieving particular objectives. In adopting this approach, zero spend for each department is initially assumed

Decision packages – the discrete packages of possible activity that are considered for inclusion in a ZBB

Activity-based budgeting (ABB) – the practice of budgeting for activities achieved rather than for items of cost to be incurred

PPBS, ZBB and ABB

Key points

⇨ PPBS, ZBB and ABB are all considered to be modern approaches to budgetary planning. What they all have in common is that they place an emphasis on the outputs of the process being budgeted for, rather than the inputs to that process. They seek to achieve the most cost-effective way of achieving given objectives

Arguments in favour of modern approaches to budgeting:

- they are pro-active and objective-oriented
- they seek to find the optimum means of achieving desired results
- they ignore traditional departmental boundaries
- they are particularly well adapted to the management of discretionary costs, which are tending to become an increasingly large part of total spend in the modern manufacturing and service environment

Arguments against:

- they cut right across traditional departmental boundaries and, in so doing, avoid the responsibility accounting concept
- the establishment of budgets for discretionary costs may be, quite properly, an inherently political process – and the traditional practice of adjusting budgets year by year on an incremental basis may be well suited to this
- the concept of trying to find optimum means of achieving given objectives inevitably has subjective elements and techniques, such as ZBB, may involve an element of 'pseudo-science'
- they may be expensive to install and operate

PPBS, ZBB and ABB

Example

The budgets for the public cleansing department of a local authority may be presented in two different ways:

Traditional Chart of Accounts approach	£'000	*ABB approach*	£'000
Wages	140	Street sweeping	84
Materials	28	School cleaning	68
Vehicle hire	35	Park cleaning	39
Equipment hire	18	Graffiti removal	30
Total	221	Total	221

Note that the traditional approach places an emphasis on the inputs, while the ABB approach places an emphasis on outputs. The ABB approach has much to commend it in the context of planning and decision making, but be aware that the traditional approach may facilitate the more routine functions of cost control

Beyond budgeting

Definitions

Budget-constrained management style – an approach to management governed by 'static optimisation.' Management is motivated only to meet budget and may be induced to do things (by act or neglect) that are not in the best long-term interests of the business

Value drivers/levers – the things around and within a business operation that ultimately determine its ability to generate value. These may include things like sales volume, market share or product development activity

New economic paradigm – the idea that the performance of a business is not adequately or fully measured through traditional financial metrics like profit and cash flow. Rather, it is best measured through consideration of value drivers and concepts of strategic advantage

Key points

⇨ Budgetary control and planning form a part of a general historical thrust in management that includes scientific management, standard costing, manufacturing resource planning (MRP) and enterprise resource planning (ERP). These all turn around the idea that operational efficiency and effectiveness can be best achieved through elaborate planning of activities. It follows from this that performance can be best evaluated by comparing actual

Beyond budgeting

results with plan (or budget). This approach is open to criticism on several grounds. A move away from budgeting is associated with the 'Beyond Budgeting Round Table'

Arguments in favour of Beyond Budgeting:

- a budget constrained management is unlikely to actively seek out or exploit new opportunities
- budget compliance does not facilitate 'flexibility,' the ability to respond quickly to events as they happen
- budget compliance and associated traditional performance metrics are inherently backward looking, tending to favour the achievement of short-term or obsolete targets
- the modern economy moves and changes so frequently that elaborate planning is not worthwhile
- performance evaluation is best linked to those value drivers which determine the long-term performance of the business

Arguments against:

- operating on a 'free-wheeling opportunism' basis, and without a plan, exposes a business to all sorts of risks
- it makes the business vulnerable to the whims and personal interests of its managers
- the use of performance evaluation technique, linked to 'value drivers' rather than profit, can result in managers being paid generous performance-related bonuses, while profits and the share price both fall
- the budgeting process has a role to play in the legitimisation of decisions within a large, complex operation; this goes rather beyond the mathematics of the exercise

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Budgetary Control

Key learning system questions

19 Control system theory
30 Budgetary control reporting
10 Flexible budgets

Topics

- Control system theory
- Responsibility accounting
- Flexible budgets
- Behavioural aspects of budgeting

Control system theory

Definitions

The control loop – the mechanism by which information associated with the output of a process is reported, appraised and used to prompt corrective or exploitive action at the input point. The flow of physical inputs, physical outputs and information form 'the loop'

The sensor, comparator and effector – component parts of the control loop. In the context of a budgetary system, the sensor is the management accounting system, the comparator is the budgetary control report and the effector is management's ability to adjust inputs and costs

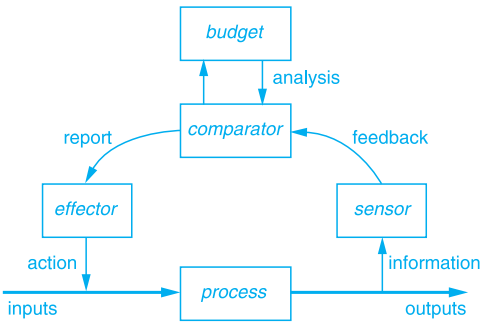
Information feedback – information on what has happened in the past. Negative feedback prompts action to return to a norm (e.g. a report of above-standard Unit costs prompting action to get costs back to standard), while positive feedback prompts action to reinforce a movement away from a norm (e.g. a report of above budget sales volumes might prompt action to lift the level production and increase sales still further)

Information feedforward – information on what is expected to happen in the future. For example, a budgetary control report may include a latest forecast of what sales will be to the end of the current year

Control system theory

Key points

⇨ Control system theory and the control loop concept apply in engineering, science and business contexts. The following diagram illustrates the control system theory



Control system theory

Features of a well-designed and operated control system include:

- neutrality; the control system should not distort the process it is meant to serve
- timeliness; feedback should be prompt and frequent
- cost-effectiveness; the system should not cost more to install and operate than the benefits it provides
- accuracy and relevance; feedback from the system should be accurate and only provide needed information

Problems that can arise with control systems include:

- they distort the process they serve; for example, application of the brakes on a car may cause it to swerve to the right; business control systems can produce similar unintended outcomes
- delayed information may prompt incorrect actions; for example, if a report that costs are rising above standard is delayed, then action to reduce costs may take place at a time when costs have returned to the standard of their own accord – and intended negative feedback becomes positive as action taken forces costs away from standard again
- system costs are rarely reported specifically and can often be far higher than people imagine
- useful system feedback and information can often be submerged in background 'noise'

Responsibility accounting

Definitions

The budget centre – a section of an organisational entity for which control may be exercised and budgets prepared. Typically, a budget centre is a well-defined department or function in an organisation with its own responsible management

Cost, profit and investment centres – sections of an organisational entity for which control may be exercised and financial results reported. Typically, such centres are well-defined departments with their own management. A cost centre is one for which costs are only reported (e.g. an assembly line), a profit centre is one for which profit is reported (e.g. a single supermarket within a large chain) and an investment centre is one for which both profit and capital employed are reported

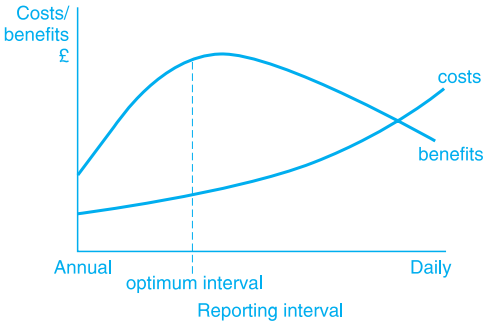
Budgetary control reports – periodic reports for each budget centre, which seek to evaluate performance through comparison of results budgeted with those actually achieved. Typically, such reports have the same frequency as the budget interval. If the annual budget is split up into months then the associated control report will be prepared on a monthly basis

Responsibility accounting

Key points

⇨ The budget interval can be weekly, monthly, quarterly or half-yearly. The provision of information involves a cost-benefit trade-off. Note that excessive information may have a negative impact

The economics of financial reporting



⇨ In order for budgetary control to be effective, the structure of the budget centres must precisely match that of the cost and profit centres. If any mismatch arises, then budget/actual comparison is not 'like-with-like'

Responsibility accounting

Example

⇨ The September budgetary control report for the Heavy Equipment division of D Ltd might be as follows:

HE Division
Operating Statement
September 2004
£ millions

	Quarter (01/06–30/09)			*Year to Date (01/01–30/09)*		
	Actual	*Budget*	*Variance*	*Actual*	*Budget*	*Variance*
Sales	24.1	22.9	+ 5.2%	84.0	92.4	−9.1%
Costs	18.6	18.8	− 1.1%	69.6	70.1	−0.7%
Profit	5.5	4.1	+34.1%	14.4	22.3	−35.4%

Presentation of the actual to budget variance % is an exercise in 'horizontal analysis'

Flexible budgets

Definitions

The fixed budget – a budget based on an ex-ante planned level of output. Where that planned level of output differs from actual, then sales and fixed overhead volume variances appear in a variance analysis exercise

The flexible budget – a budget being used for control purposes that has been revised to bring it into line with the ex-post actual level of output. Such a revision must be based on a model of the operation's cost and revenue structures (see Chapter 4)

Interpolation – where the model being used to flex the budget is based on an analysis of output levels above and below the actual level of output, then using that model is an exercise in interpolation

Extrapolation – where the model being used to flex the budget is based on an analysis of output levels, all of which are either above the actual output level or below it, then using that model is an exercise in extrapolation. It is generally considered that extrapolation is less reliable than interpolation

Flexible budgets

Key points

⇨ The use of a flexible budget in the preparation of control reports, is often considered to provide a more meaningful evaluation of performance than would be the case with a fixed budget. The logic is that a comparison of actual results with a flexed budget is more a case of like-with-like

Arguments in favour of flexible budgeting:

- the comparison of a fixed budget with an actual result may be uninformative if actual output or activity levels diverge significantly from budget
- a fixed budget does not provide a meaningful benchmark for performance evaluation purposes
- the flexed budget incorporates an appreciation of cost and revenue structures that adds to the control exercise
- it removes volume variances (fixed overhead and sales) from the variance analysis exercise

Arguments against:

- the elimination of volume variances may avoid the provision of useful information concerning capacity utilisation
- use of a flexed budget to provide a performance benchmark may be a case of 'moving the goalposts'
- a volume variance may reflect some important aspect of management performance and its full impact on profit should be reported

Flexible budgets

Example

Z's output and production costs are 100 Units and £1,500, respectively, for April and 150 Units and £2,000, respectively, for May. One may deduce that Z's cost structure is £500 fixed costs per month plus £10 per Unit variable cost – and these may be adopted as standards. The selling price of a Unit is £20. If output in January is 100 Units (budget) and 120 Units (actual), while £1,850 production costs (actual) are incurred, then the budgetary control report for January may be structured in one of the two ways

(1) Use of fixed budget		(2) Use of flexible budget	
Budget profit	£500 (w1)	Budget profit	£700 (w2)
Sales volume variance	100 (fav)	Cost variances	150 (adv)
Standard profit	600	Actual profit	550
Fixed overheads volume variance	100 (fav)		
Other cost variances	150 (adv)		
Actual profit	550		

Notes: w1 — 100 Units × £5 standard profit per Unit, w2 — (120 Units × £20) — (£500) — (120 Units × £10). The volume variances are based on a standard cost per Unit of £15 (£10 variable plus £5 absorbed fixed) and a standard profit per Unit of £5 (£20 selling price less £15 cost)

Behavioural aspects of budgeting

Definitions

Motivation – the manner in which managers are induced to act by pecuniary or social aspects of a performance evaluation system. In the context of a budgetary control system, this means the manner in which managers are induced to act by the need to conform to budget

Budget negotiation – the manner in which budgets are set, through a process of negotiated agreement between budget holders and those to whom they report. This is one aspect of a bottom-up or participative approach to budgeting

Budget padding – the practice of budget holders seeking to negotiate an element of 'slack' into their budgets, in order to ensure that those budgets are easy to achieve

Controllability – a term referring to those activities lying under the control of the budget holder, the associated costs of which should properly be included in the budget. A cost which is genuinely uncontrollable should not be included in the budget of a given budget holder – or should be clearly identified and reported as being uncontrollable

Behavioural aspects of budgeting

Key points

⇨ The concepts of cost controllability, goal congruence, dysfunctional behaviour and the budget-constrained management style have been encountered earlier. All of these apply to the practice of budgetary control. Individual budget holders may be induced to do things which are not in the best interests of the organisation as a whole, in order to meet their individual budgets, if a regime of budgetary control is enforced insensitively

Specific behavioural issues and problems arising from the practice of budgetary control include:

- establishing budgets involves an element of negotiation between the budget holder and the budget controller; when such negotiation becomes confrontational then in-fighting can become entrenched
- managers may seek to avoid responsibility for 'uncontrollable costs' attributed to their budgets; one should be aware that few costs are genuinely uncontrollable and it is just a matter of determining who controls what costs
- managers of discretionary costs may reduce spending during the early and middle part of the year to minimise the chance of a budget over-run, but accelerate spending late in the year in order to avoid an under-spend
- managers may attempt to 'pad' their budgets with unnecessary costs, in order to make that budget easy to achieve – this is also known as the problem of 'budgetary slack'
- in many contexts, the practice of budgeting becomes a channel through which political processes may work, in order to legitimate plans and spending; the adoption of techniques such as ZBB may obstruct this

Budgeting and Performance Evaluation

Key learning system questions

3.5 Balanced scorecard
15 Performance metrics and the new economy
31 Budgets and performance evaluation

Topics

- Financial performance metrics
- Non-financial performance indicators
- External benchmarking
- Balanced scorecard
- The not-for-profit sector

Financial performance metrics

Definitions

Budget compliance – a performance metric based on the extent to which a budget holder achieves the level of performance incorporated in the budget. That level of performance may be based on any aspect of the budget, such as cost, revenue, profit or ROCE

Return on capital employed – profit divided by capital employed (the book value of net assets). Many refinements are possible in calculation of ROCE; for example, the capital employed figure used can be the end year or year average figure

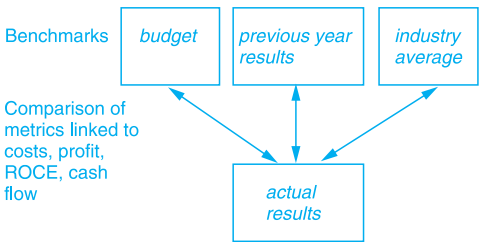
Cash conversion period – days stock + days debtors – days creditors. This is a measure of liquidity, reporting the time that it takes to convert the cash outflow associated with a purchase into a cash inflow associated with a sale

Horizontal analysis – the practice of measuring performance through the comparison of current actual figures for cost, revenue, cash flow, etc. with relevant benchmarks, such as budget or previous year actual figures. An example of horizontal analysis can be seen in the specimen budgetary control report given in Chapter 6

Financial performance metrics

Key points

Financial performance metrics



⇨ All performance metrics gain meaning only when compared with some benchmark. That benchmark may be any of the three possibilities shown in the diagram

Financial performance metrics

Key issues concerning the use of financial performance metrics:

- knowing that your profit margin on sales is 15% can be useful – but it becomes far more useful when one compares this with the budget margin of 16%, or the previous year margin of 18%, or the industry average of 25%; performance is a relative thing
- traditional financial performance metrics are essentially 'backward looking;' they report what has happened over a short period in the immediate past and give little indication of what will happen in the future
- it is easy to adopt the position that any performance deviation from benchmark is an adverse development that should be corrected; however, new projects generally cause financial metrics to decline in the short-term
- a reliance on alternative metrics, linked to the 'new economic paradigms' of the late 1990s, produced unfortunate results in some cases; traditional financial performance metrics linked to profit, cash flow and return on capital are important factors that cannot be ignored in any performance evaluation regime

NFPIs

Definitions

Non-financial performance indicator (NFPI) – a measure of performance, based on non-financial information, which may be assembled without taking output from the accounting system

The Peters principle – 'what gets measured gets done.' A tendency for managers to focus their efforts on doing things that are the subject of performance measures, at the expense of those things which are not – regardless of their relative importance to the well-being of the organisation

Forward-looking performance indicator – a performance indicator relating to something that contributes to the long-term development of the organisation. For example, 'number of product innovations brought to market' might not contribute to current period profit, but it contributes to the growth prospects for the business in the long-term

NFPIs

Key points

- The use of NFPIs addresses some of the limitations identified with the traditional financial performance metrics. NFPIs generally seek to provide a forward-looking element to performance evaluation. An NFPI is typically a metric which relates to some area of the organisation's operation that matters – the Peters principle
- An NFPI can have both quantitative and qualitative aspects. For example, one NFPI might be that we have achieved a 5% market share (a quantitative indicator), while another might be that most of our customers consider us to be their supplier of first choice (a qualitative indicator)

Arguments in favour of NFPIs:

- they are essentially forward looking, in that they relate to things that contribute to the long-term development of the business
- specific NFPIs can be selected for each division of the business that relate to the individual characteristics of those divisions
- they are not vulnerable to the choice of accounting policy, or what happens on the last day of the accounting year

Arguments against:

- they can be too vague and can be selected in order to convey a particular impression
- what matters is 'the bottom line' in terms of profit earned; NFPIs often relate to possible events that may happen in the future and are accordingly heavily discounted
- they may be used to disguise poor management performance in the current period

NFPIs

Example

BAA plc (formerly the British Airports Authority) attempts to evaluate its performance in terms of the quality it is able to offer to customers

It has identified about twelve key success factors, which include access, aesthetics, cleanliness, comfort, staff competence, staff courtesy, reliability, responsiveness and security. These take on board the factors that customers appreciate when using an airport – short distances to walk from point of arrival to point of departure, safety from attack or robbery, easy availability of luggage trolleys and wheel chairs, etc.

BAA carries out regular surveys, involving interviews with customers, consultant reports, analysis of operational data and monitoring customer feedback. Appropriate indicators for each factor are reported and studied through comparison between different airports and trend analysis overtime. For example, if airport A persistently reports a higher level of theft from customers than other airports, then this might prompt the introduction of additional security measures at airport A . If complaints about staff courtesy at airport D have been on a persistent upward trend overtime, then this might prompt enquiries into staff supervision at that site and/or additional staff training

External benchmarking

Definitions

External benchmarking – the establishment, through data exchange between different organisations, of targets and metrics which may be used to assess relative levels of performance (having particular regard to areas of underperformance) in the participating organisations. The term 'internal benchmark' has already been encountered in the context of standard costing

Benchmark partner – an organisation that participates in a benchmarking scheme, through exchange with another, of information pertaining to performance evaluation

Best practice – the operational practices used by the benchmark partner which performs at the highest standard, according to those metrics which are judged most appropriate

Intra-group benchmarking – a situation in which groups of companies in the same industry agree that similar units within the participating companies will exchange operational data on their processes

Key points

⇨ Benchmark partners do not always have to operate in the same sector. The standard example of benchmarking given in management texts is that of Xerox and L. L. Bean. The former sought to improve its warehousing and distribution operation and did so by comparing its own operations (in the office equipment sector) to that of L. L. Bean (a catalogue marketing business). L. L. Bean was the acknowledged 'best practice' distributor and Xerox improved its own performance by bringing its practices into line with those of Bean

External benchmarking

Arguments in favour of external benchmarking:

- it gets away from the 'static optimisation' approach to performance evaluation associated with standard costing and budgeting
- it invites comparison of performance with best practice in comparable operations and thereby gives a clear focus on opportunities for improvement
- it is entirely compatible with New Economy approaches to performance management, such as TQM and continuous improvement

Arguments against:

- any benchmark partner is exposing itself to the possibility of disclosing commercially sensitive information to a competitor
- when one is comparing information from two different sources, one cannot be certain that the different sets of information have been compiled in a compatible manner
- it is always difficult to be sure that one is comparing likes; no two businesses are identical and trying to make them the same, may not always be productive
- differences between businesses may reflect different ways of doing things that give each an advantage in particular areas of the market; in trying to make one the same as the other then one may end up destroying subtle competitive advantages that enable each to survive

Balanced scorecard

Definitions

The balanced scorecard approach – an approach to performance evaluation to assist management in strategic policy formulation. It places an emphasis on metrics linked to the organisation's critical success factors

Critical success factors – those things in the operation of an organisation that contribute most to its long-term development and well-being. A CSF is very similar in concept to the 'value driver' or 'value lever' encountered in our earlier discussion of the beyond-budgeting concept. CSF metrics are inherently 'forward looking'

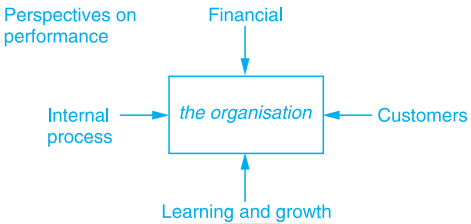
Strategic policy formulation – the development of courses of action calculated to achieve the organisation's goals and objectives

Key points

⇨ The balanced scorecard is a systematic approach to performance evaluation that draws on the use of both financial performance indicators and NFPIs. It was popularised in the early 1990s by the writings of the American academics Kaplan and Norton. The central thrust of the balanced scorecard is that each business and business segment has its own individual critical success factors. Performance may be best evaluated by identifying CSFs and adopting performance metrics linked to those CSFs. Since each business and segment is different, then each will have different CSFs and performance metrics – hence each has its own scorecard, balanced to allow for its own circumstances. A target might be set for each of the metrics that is adopted

Balanced scorecard

The balanced scorecard



⇨ A scorecard may end up containing a large number of performance goals which are not all consistent and some of which may be contradictory. For example, an internal process goal to minimise labour costs may conflict with a learning and growth goal linked to staff retention and development. The whole exercise can become so vague that it loses meaning

The NFP sector

Definitions

Not-for-profit (NFP) organisation – an organisation whose objectives are not primarily to make a profit. Such organisations include local authorities, government departments, executive agencies, charities, sports clubs, professional societies and so on. Many of these organisations have business operations linked to them (e.g. Oxfam shops), but such business operations are ancillary to the main objectives of the organisations

Efficiency – the extent to which the resources deployed by the NFP organisation are utilised. For example, if a local authority department workforce has a capacity of 1,000 hours in a period and achieves 1,100 standard hours output in that period, then this gives the impression of an efficient operation

Effectiveness – the extent to which the NFP organisation achieves its objectives through minimum use of resources, by deploying an optimum mix of different means to achieve given ends. This idea has been encountered earlier in our discussion of budgetary planning (see Chapter 5)

Means and ends – an NFP organisation can usually use a number of different means to achieve a given end (or objective). For example, youth crime can be contained through policing, social work, educational services and leisure facilities. The key thing is to find a combination of the four means that contain youth crime at an acceptable level – at the minimum possible cost

The NFP sector

Key points

- ⇨ Performance evaluation in the NFP sector is complicated by the fact that objectives are often imprecise and the achievement of those objectives involves using a mix of different approaches
- ⇨ Be aware that an operation can be efficient in its detailed use of resources, but be, nevertheless, ineffective in achieving its objectives. Conversely, it is sometimes found that an inefficient operation can be curiously effective

Example

One objective of most local authorities is 'the containment of street crime.' There are various means of achieving this. The traditional method is the deployment of police foot patrols – but there are alternatives. A CCTV system, linked to a control office, can be used to alert fast response units (officers in cars) whenever an incident occurs. Street crime is often perpetrated by youths who are truanting from school, so the deployment of school truant officers, social services or youth employment services, can also achieve a result

Offering 'more bobbies on the beat' is always popular with voters. But, experience has shown that police foot patrols have their use, but only up to a point. Extending them beyond that point is a waste of money and one has to turn to the alternatives if one wishes to improve performance

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Developments in Management Accounting

Key learning system questions

16 Modern manufacturing management technique
2.5 ABC
24 ABC and variance analysis

Topics

- MRP1, MRP2, ERP and SCM
- JIT and TQM
- ABC and ABM
- Constraints theory and throughput accounting

MRP1, MRP2, ERP and SCM

Definitions

MRP1 – 'material requirements planning.' A system that allows planned production to be expressed, in the form of a full listing of the required materials and components. MRP is sometimes described as a computer software system, since it is invariably run using computer facilities

MRP2 – 'manufacturing resource planning.' MRP1, extended to include a listing of labour, machine, facility, transport and finance utilisation

ERP – 'enterprise resource planning.' An advanced development of MRP2, extended to include sales and customer details – and which may offer a degree of integration with the budgeting system

SCM – 'supply chain management.' The ultimate development of MRP and ERP, which extends the planning model into relations with suppliers and customers. Thus, production scheduling in business A may also automatically prompt the scheduling of component production in A's supplier business B

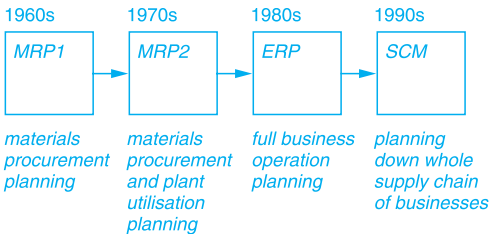
Key points

⇨ MRP was a development of the 1960s, associated with the advent of computerisation. MRP uses a computer model to project the resource requirements of a particular production plan. Thus, if one plans the production of a certain number of Units over a given period of time, then the MRP model will produce a schedule for the required acquisition and availability of components. This was a move away from more traditional manufacturing

MRP1, MRP2, ERP and SCM

practices, which involved the maintenance of 'stock bins,' which were replenished when stock levels fell below a reorder quantity. ERP appeared in the late 1980s and is a further development of MRP. ERP, typically, is a planning model for the whole operation, incorporating sales and cash flow – closely linked to budgeting

Approaches to production management



⇨ MRP, ERP and SCM are all essentially planning models. Current writing suggests that these models may be going out of favour as a response to the advent of 'the lean enterprise.' The latter is an operation built around the 'pull' or flexibility concept

JIT and TQM

Definitions

JIT – 'just in time.' An approach to production management that involves the acquisition of materials, components and other resources at the moment they are required, rather than holding stocks which are drawn on as required

Pull system – an approach to production scheduling that involves responding to demand (both internal and external) as it emerges, rather than preparing a production plan and then seeking to match activity to that plan

TQM – 'total quality management.' A management philosophy recognising the pivotal role that quality plays in the modern business environment. TQM recognises the high service content in modern products and the role that staff–customer relations play in delivering that service content

Lean enterprise – a business which operates using very limited resources by relying heavily on JIT, Pull and TQM concepts

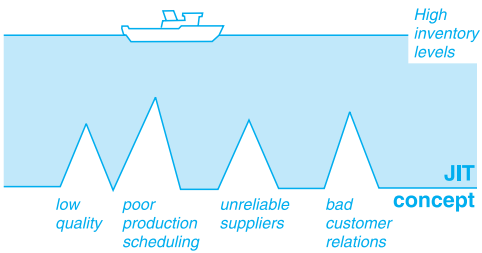
Teams and empowerment – a TQM organisation operates with short chains of command and wide spans of activity. Employee empowerment is considered to liberate the talents of employees and teamwork to promote coordination

Backflush costing – an approach to cost accounting that avoids detailed tracking of costs. Most variants of backflush costing involve crediting the standard costs of completed goods to a Raw and In Progress ('RIP') account, with the balance on that account at any time being stock and WIP. A JIT environment involves low stocks and few cost variances – so backflush costing may be entirely appropriate

JIT and TQM

Key points

⇨ JIT involves the acquisition of materials on a strictly 'only as needed' basis. High inventory levels can be used to compensate for a variety of shortcomings in the operation. Moving towards JIT requires high standards



⇨ The modern lean enterprise is one that typically relies heavily on JIT, a pull production system and at least some aspects of TQM. It relies less heavily on more traditional management and accounting practices

ABC and ABM

Definitions

ABC – 'activity-based costing.' An approach to the attribution of overhead costs to products, on the basis of a full appreciation of the activities that give rise to the overhead costs and how far those activities relate to cost units at the product and batch level

Cost driver – a factor that causes a change in the cost of an activity. The cost of individual activities are collected in 'cost pools' for accounting purposes and then attributed to products using cost drivers

ABM – 'activity-based management.' The use of activity-based cost information for management purposes, such as cost reduction programmes, cost modelling and customer profitability analysis

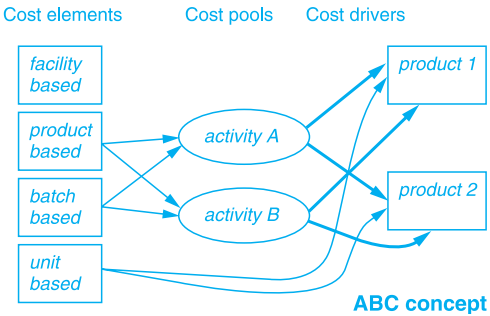
ABT – 'activity-based technique.' The whole body of modern management techniques which place an emphasis on the analysis of activity. ABC, ABM and ABB are all ABTs

Key points

⇨ The advent of ABTs has been one of the most significant developments in management accounting over the last 20 years and ABC is the most high-profile single technique under that heading. ABC involves distributing overhead costs between activity-based 'cost pools' and then attributing overheads to products using cost drivers

ABC and ABM

⇨ The logical thrust behind ABC is that most overhead costs are variable – although they tend to vary with activities rather than Unit output. ABC is particularly appropriate to the treatment of product and batch-related overhead costs. It may have less to offer as regards the treatment of Unit and facility-related overhead costs, which are not directly associated with specific activities.



ABC concept

ABC and ABM

⇨ ABC-generated information may be used for a variety of management purposes, ranging through performance evaluation, product pricing, transfer pricing and general decision making. Such use of ABC information is known as ABM. The use of ABTs has been the subject of debate. Areas of controversy include whether or not ABC information is more or less 'decision relevant' than traditionally generated cost information and whether or not ABC cuts across the responsibility accounting principle by avoiding use of departmental cost centres

Example 1

XY Ltd manufactures many products including X and Y. Production of both takes place at a rate of 10 Units per hour and the total production is 500 Units of each in the period. Overheads in the period are £ 100,000 and a total of 20,000 direct labour hours are worked on all products. *If the business uses a traditional overhead absorption rate of £ 5 per labour hour then the overhead cost of both X and Y will be £ 0.50 per Unit*

Enquiry reveals that X manufacture is organised in the form of two production runs per period and Y manufacture is organised in the form of 10 production runs per period. Enquiry also reveals that overhead costs mainly relate to 'batch level activities' associated with machine set-ups and materials handling for production runs. If there are a total of 1,000 production runs in the period, then overheads may be attributed to products at a rate of £ 100 per run. On that basis, the overhead cost of X will be £ 0.40 (2 runs × £ 100/500 Units) and the overhead cost of Y will be £ 2.00 (10 runs × £ 100/500 Units). *The reported Unit overhead costs of £ 0.40 (X) and £ 2.00 (Y) are activity-based*

Example 2

DEF Ltd produces the Unit and all overheads are associated with the delivery of Units to its customers. Budget details for the period include £ 8,000 overheads, 4,000 Units output and 40 customer deliveries. A standard delivery (1 activity) is of 100 Units and costs £ 200. Actual results for the period are £ 7,800 overheads, 4,200 Units output and 38 customer deliveries

The overhead cost variance for the period is:

Actual cost	£ 7,800
Standard cost	8,400 (4,200 Units at £ 2 per Unit standard cost)
Cost variance	600 fav

Adopting an ABC variance analysis approach gives the following result:

Activity variance	£ 800 fav ((42 standard − 38 actual deliveries) × £ 200)
Expenditure variance	200 adv ((38 deliveries × £ 200) − £ 7,800)
Cost variance	600 fav

Constraints theory and throughput accounting

Definitions

TOC – 'theory of constraints.' An approach to production management which aims to maximise throughput, by concentrating on the use of bottleneck resources, which act as constraints to production

Throughput – in the context of TOC, throughput is the difference between sales value and the cost of materials and direct expenses

Throughput accounting – an approach to management accounting which focuses on reporting performance in terms of use of bottleneck resources. For example, a key throughput accounting performance metric is 'product return per minute', which is Unit throughput for the product/minutes spent in bottleneck resource

Bottleneck resource – the activity or capability within an organisation that has a lower capacity than other activities in the production chain, thereby limiting throughput. It is similar in concept to the limiting factor or principal budget factor, encountered in other areas of management accounting

Constraints theory and throughput accounting

Key points

- TOC is a 1980s development of the JIT concept. It takes the view that all costs, other than direct materials and expenses, are essentially fixed and that what a business should seek to do is maximise its throughput (sales – material costs) in any given period. To that end, it should seek to identify its 'bottleneck' resource and schedule production in a manner calculated to generate the maximum throughput from that bottleneck resource
- Throughput accounting is a TOC-related approach developed in the early 1990s. It sought to report performance in a manner consistent with TOC, involving the use of product performance metrics like 'throughput per hour'

Arguments in favour of TOC and throughput accounting:

- they are intelligent approaches to production management which actively seek to optimise the use of scarce resources
- they provide performance metrics which act as guides to action
- they reflect the underlying economics of a manufacturing operation

Arguments against:

- throughput accounting provides only a very partial impression of product performance
- TOC and throughput accounting reflect a particular model of business economics which does not always apply
- Practical adoptions of throughput accounting have been few; potential users have 'voted with their feet'

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Responsibility Centres and Transfer Pricing

Key learning system questions

4.9 Transfer pricing
22 Performance metrics
39 Divisional performance evaluation

Topics

- Divisional organisation as a concept
- Performance metrics
- Inter-divisional transfer pricing

Divisional organisation as a concept

Definitions

Division – a division is an organisational unit with its own responsible management. It is normally a profit and/or investment centre for accounting purposes. For management purposes, it is normally intended to function as if it were a stand-alone business, with its management placed in the same risk-reward position as if they were the owners of that business

Divisional performance – the manner in which the performance of a division is assessed. This can make use of the full range of financial and non-financial metrics. Typically, the managers of a division receive a reward linked to divisional performance, in order to induce them to act in a manner calculated to maximise the value of the division

PRP – 'performance-related pay.' The practice of rewarding management according to the performance of their division. The metric or metrics used to link pay to performance will normally be established in a manner calculated to link performance to shareholder value

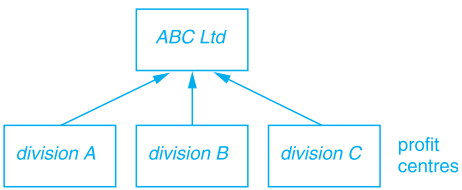
Value-based management – the practice of running a division in a manner calculated to maximise the value of the owners' shareholding. Appropriately chosen performance metrics and PRP structures are needed to achieve this

Divisional organisation as a concept

Key points

⇨ The financial control of a large, complex organisation may be assisted by its division into a number of discrete administrative units (or 'divisions'), each of which has its own responsible management. The managers of each division are rewarded according to the results they achieve – as measured by an appropriate metric

The divisionalisation concept



⇨ This approach to management structure also has a strategic dimension. Experience has shown that a large, commercial business is not best run along civil service lines

Performance metrics

Definitions

ROI – 'return on investment,' otherwise known, in its varied forms, as return on capital employed ('ROCE'), return on net assets ('RONA') or accounting rate of return ('ARR'). It is the operating profit generated by a division, divided by the net book value of assets engaged in the division. Both figures are calculated according to conventional accounting standards

RI – 'residual income.' This is the operating profit generated by a division, less the notional cost of finance associated with the net book value of the assets engaged in it. The cost of finance is normally based on the weighted average cost of capital (WACC) to the company as a whole, although this may be varied if the cost of capital to the division is different to the company's WACC for some reason

EVA – 'economic value added.' A revised version of RI. In calculating EVA, the relevant finance charge is more likely to be based on the replacement cost of assets than on their book value. Hence, EVA is more an economic metric than an accounting one

CFROI – 'cash flow return on investment.' The present value (a concept explored in MADM, the sister paper of MAPE) of projected future cash flows. This is a forward-looking performance metric of the most extreme kind

Performance metrics

Key points

⇨ The classic divisional performance indicator is ROI. This compares current period operating profit to the book value of assets engaged in earning that profit. This and RI are nowadays considered to be limited indicators, because (1) they are based on accounting figures which are vulnerable to the accounting policies and (2) they relate only to what has happened over a short period in the past, and are entirely 'backward looking'

Arguments in favour of ROI:
- expressed as a percentage, it is easy to compare it with current bank interest rates
- it is a relative measure, which allows operations of different sizes to be meaningfully compared
- it serves as a useful proxy for shareholder value, since the latter is linked to profit and capital employed

Arguments in favour of RI:
- it is an absolute measure and does not encourage concentration on small cores of high-yield business
- as an absolute measure, it is less likely than ROI to discriminate against new investments
- it relates to 'the bottom line' and that is what ultimately matters

⇨ However, whatever its claimed merits, RI is still an accounting measure and EVA is a modern variant which is more closely linked to underlying business economics

Performance metrics

Example 1

In the current year, division X expects to generate a profit of £ 20k on capital employed of £ 100k. Its manager is paid a salary bonus, linked to the ROI that the division generates each year. The manager is considering a project which will involve an investment in new equipment of £ 20k and will generate an annual profit of £ 3k for the next 10 years. You are required to comment on the situation and explain how it might be affected by the adoption of RI (based on a 5% cost of capital) as the key performance metric for PRP purposes

As things stand, adoption of the project would cause the current year divisional ROI to fall from 20% (£ 20k/£ 100k) to 19% (£ 23k/£ 120k) and the manager might reject the project on that ground alone. Yet the project looks like quite a good one – it appears to generate an annual cash inflow of £ 5k (£ 3k profit plus £ 2k depreciation) for 10 years in exchange for a £ 20k investment

The impact of adoption of the project on RI would be to increase it from £ 15k (£ 20k – (£ 100k × 5%)) to £ 17k (£ 23k – (£ 120k × 5%)). Hence, RI would favour the adoption of a beneficial project

ROI is a relative metric, whereas RI is an absolute metric. RI may be more satisfactory from the point of view of inducing correct decision-making behaviour

Performance metrics

Example 2

Division Y makes and sells Units, which have a variable cost of £ 50 each and a selling price of £ 95 each. Y has fixed costs of £ 50,000 per year. The manager of Y is paid a bonus, linked to divisional profit, and it has been reported to him that the forecast sales for 2005 are 1,000 Units. You are required to comment on the manager's likely reaction to this and on how he/she might view an increase in 2005 production to 1,250 Units

The profit with production/sales of 1,000 Units is:

Sales	£	95,000
Cost of sales:		
Fixed costs	50,000	
Variable costs	50,000	
		100,000
Profit		(5,000)

The profit with production of 1,250 Units is:

Sales	£	95,000
Cost of sales:		
Fixed costs	50,000	
Variable costs	62,500	
Closing stock (w1)	(22,500)	
		90,000
Profit		5,000

Note: w1 – the full cost per Unit is £ 90 (£ 50 VCs plus £ 40 absorbed FCs) and closing stock is 250 Units

The manager might be induced to increase production in order to increase profit. Clearly, such action would not increase shareholder value. Analysts would perceive that the action was simply a mathematical manipulation, which did not offer any economic advantage to the business – and they would probably 'mark the share down' of the parent group company

Inter-divisional transfer pricing

Definitions

Transfer price – the price charged for the transfer of goods and/or services from one division of a business to another division of that same business

Neutrality – the avoidance of distortional effects by the transfer pricing system. A neutral transfer pricing system is one that does not influence the manner in which the business behaves

Equity – the extent to which a transfer pricing system achieves a fair and just distribution of profit between the divisions which are trading with one another

Administrative efficiency – the extent to which a transfer pricing system delivers benefits in excess of its own administrative costs. An administratively inefficient system is one which costs more to operate than the benefits it delivers

Inter-divisional transfer pricing

Key points

⇨ A range of alternative different transfer pricing systems are possible. What is appropriate depends on the circumstances of each case, but certain general observations can be made. In adopting a transfer pricing system, one has to reconcile different priorities under the headings of neutrality, equity and administrative efficiency. To some extent, devising a transfer pricing system may amount to an exercise in reconciling the irreconcilable

Criteria	Neutrality	Equity	Efficiency
Transfer price policy			
Market price	no	possibly	yes
Marginal cost	no	no	yes
Full cost	no	possibly	yes
Opportunity cost	yes	yes	possibly
Two-part tariff	possibly	yes	yes

⇨ Broadly, the upper and lower limits for what is possible as a transfer price are defined by marginal cost (below which the transferor division will not agree to transfer) and market selling price (above which the transferee division will not agree to transfer)

Inter-divisional transfer pricing

- It is generally agreed that the transfer should benefit both divisions, so some figure intermediate between the limits should be adopted, or the figure should vary between the limits, according to circumstances
- A transfer price system which is based on some intermediate position between marginal cost and market price, reflects the twin considerations that the transfer should be above marginal cost, in order to give the transferor a fair contribution, but it should be below market price, given that the transfer involves no marketing costs or risk
- All sorts of other compromises are commonly encountered, but one should always be aware of their potential to induce sub-optimal behaviour in the business as a whole

Arguments in favour of transfer pricing:
- it is an essential element in the operation of a divisional organisation structure
- it may facilitate practical decision making in the context of a large, complex organisation
- if applied sensitively, it allows meaningful performance evaluation for the component parts of an organisation

Arguments against:
- it involves significant administrative costs, which are not always specifically reported
- it creates a potential for sub-optimal decision making
- it may produce a distorted impression of profit earned by individual divisions

Inter-divisional transfer pricing

Example (1)

AB Ltd has two Operating Divisions – A and B. A manufactures the Unit (marginal cost £ 5, market selling price £ 10) while B manufactures the Product (each requiring 1 Unit, a marginal cost of £ 3 and a market selling price of £ 12). In the absence of any considerations, other than those stated, is the manufacture of the Product to the advantage of AB Ltd and will a transfer pricing system, based on market price, induce the manager of B to manufacture the Product?

The manufacture of the Product incurs a total marginal cost of £ 8 to AB Ltd and generates a sales revenue of £ 12. Clearly, it is to the advantage of AB Ltd to manufacture and sell the Product

However, if Units are transferred from A to B at the market price of £ 10, then the manager of B might reject product manufacture, on the ground that each product gives division B a loss of £ 1 – that is, £ 12 sales revenue less the £ 13 marginal cost to the division (£ 10 transfer price + £ 3 marginal cost)

Inter-divisional transfer pricing

Example (2)

Taking the case described in Example (1), you are now told that A is operating at full capacity and the transfer of a Unit to B involves loss of an outside sale. Would a market price-based transfer pricing system now induce optimal behaviour from the point of view of AB Ltd as a whole and what general observation might we draw from the situation?

The manufacture of the Product incurs a total marginal cost of £ 8 to AB Ltd, results in a foregone contribution of £ 5 (from lost outside sale of a Unit) and generates sales revenue of £ 12. Hence, it is a bad deal from the point of view of AB Ltd, since it generates a net loss of £ 1. The manager of B would still reject the Product and, in this situation, that is the correct decision from the point of view of AB Ltd

The general conclusion one draws from the two cases considered, is that using market price as the basis of a transfer pricing system may or may not produce optimum behaviour in the organisation as a whole – it all depends on circumstances. Use of opportunity cost as transfer price would give rise to a transfer price of £ 5 in Example (1) and £ 10 in Example (2) – which induces the correct behaviour in both the cases and is arguably equitable in both the cases

Tip – problems relating to transfer pricing almost invariably turn around performance evaluation and decision-making situations, wherein a transfer pricing system gives a misleading impression and/or induces inappropriate decisions to be made. Reference to 'opportunity cost' as the optimum transfer pricing system is almost invariably relevant to discussion of such problems