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Description: There have been arguments against the use of standard costing variance analysis for cost-control and performance evaluation in the modern manufacturing world. However standard costing variance analysis is still included in curricula and examination syllabuses and it continues to be widely used in practice. Strategies in the current manufacturing environment are usually based on objectives to improve quality, reducing manufacturing lead times and reducing inventories, through just-in-time (JIT) and advanced manufacturing technology (AMT). Standard costing is said to be counter-productive to such strategies.

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STANDARD COSTING AND ITS ROLE IN TODAY'S MANUFACTURING ENVIRONMENT

Mike Lucas argues that reports of the death of standard costing have been greatly exaggerated

In recent years, writers such as Kaplan and Johnson,[1] Ferrara[2] and Monden and Lee[3] have argued that standard costing variance analysis should not be used for cost-control and performance-evaluation purposes in today's manufacturing world. Its use, they argue, is likely to induce behaviour which is inconsistent with the strategic manufacturing objectives that companies need to achieve in order to survive and prosper in today's intensely competitive international economic environment.

Standard costing variance analysis continues, however, to be included in undergraduate curricula and professional examination syllabuses. Students, having struggled through the learning process, may be dismayed to discover that many consider the knowledge they have acquired obsolete.

It could be argued that standard costing variance analysis is still widely used in practice and this is sufficient justification for learning about it. The mainstream of management accounting, however, has always been prescriptive -- specifying best practice rather than merely descriptive -- simply describing what goes on in practice for better or worse. The inclusion of, and certainly the importance attached to, standard costing variance analysis in management accounting syllabuses is therefore an issue in need of clarification.

The case against standard costing

Drury,[4] for example, has described how the scientific management principles of F.W. Taylor provided the impetus for the development of standard costing systems. The scientific management engineers divided the production system into a number of simple repetitive tasks in order to obtain the advantages of specialisation and to eliminate the time wasted by workers changing from one task to another.

Once individual tasks and methods have been clearly defined it is a relatively simple matter to set standards of performance using work study and time and motion study. These standards of performance then serve as the basis for financial control: monetary values are assigned to both standards and deviations from standard, i.e. variances. These variances are then attributed to particular operations/ responsibility. centres.

Companies operating in today's manufacturing environment, however, are likely to have strategies based on objectives such as improving quality, increasing flexibility to meet customers' individual requirements, reducing manufacturing lead times and delivery times, reducing inventories and unit costs. To help achieve these objectives, manufacturing strategies such as just-in-time (IIT), advanced manufacturing technology (AMT) and continuous improvement are often applied. Kaplan et al argue that standard costing is counter-productive in such an environment.

The major criticisms levelled at standard costing variance analysis are as follows:

1 In a JIT environment, measuring standard costing variances for performance evaluation may encourage dysfunctional behaviour

The primary purpose of the JIT production system is to increase profits by decreasing costs. It does this by eliminating excessive inventory and/or work-force? Items will be produced only at the time they are needed and in the precise amounts in which they are needed -- thus removing the necessity for inventories. Running the business without inventories requires the ability to produce small batch sizes economically. In order to do so, set-up times must be reduced. Performance measures should therefore be such as to motivate managers and workforce to work towards reducing set-up times in order to achieve the sub-goal of economic small batch size as a prerequisite for achieving the lower inventories. Performance measures that benefit from large batch sizes or from producing for inventory should therefore be avoided; standard costing variances are just such measures!

Specifically:

(a) Efficiency variances measure labour hour input against the standard labour hours of the production achieved. Producing in smaller batch sizes will mean that more labour time is spent on machine set-ups and consequently the standard hours of output will be lower relative to the labour hour input -- resulting in adverse efficiency variances.
(b) The fixed overhead volume variance arises as a result of a given level of overhead expenditure being spread over a different number of units from the number budgeted. Adjusting output downwards to meet a fall in short-term demand will, however, mean fewer units to absorb the fixed overhead, resulting in an adverse volume variance. Hence managers may be motivated to produce for stock in direct contravention of the philosophy of JIT.
(c) Materials price variance: adverse materials price variances may result from buying in small quantities in order to keep stocks low as part of the JIT philosophy. Measuring this variance may therefore put pressure on purchasing managers

to buy in bulk to obtain quantity discounts and thus favourable price variances

2 In an AMT environment, the major costs are those related to the production facility rather than production volume related costs such as materials and labour which standard costing is essentially designed to plan and control .

Standard costing is concerned with comparing actual cost per unit with standard cost per unit. Fixed costs imputed to the product unit level are only notionally 'unit' costs. Any difference between the actual and standard fixed cost per unit is not therefore meaningful for controlling operations, as it does not necessarily reflect under or overspending --it may simply reflect differences in production volume. What matters is the total fixed overhead expenditure rather than the fixed overhead cost per unit.

Therefore, in an AMT environment, standard costing variances have at best a minor role to play and at worse they may be counter-productive insofar as they force managers to focus on the wrong issues. An activity-based cost management (ABCM) system may be more appropriate, focusing on activities that drive the costs in service and support departments which form the bulk of controllable costs.

3 In a JIT/AMT/continuous improvement environment, the workforce is usually, organised into empowered, multi-skilled teams controlling operations autonomously

The feedback they require is real time and in physical terms. Periodic financial variance reports are neither meaningful nor timely enough to facilitate appropriate control action.

4 In a total quality management (TQM) environment, standard costing variance measurement places an emphasis on cost control to the likely detriment of quality

TQM requires a total managerial and worker ethos of improving and maintaining quality, and of resolving problems relating to this. The emphasis of standard costing is on cost control; variance analysis is likely to pull managerial and worker interest away from perhaps critical quality issues. Thus cost control may be achieved at the expense of quality and competitive advantage.

5 A continuous improvement environment requires a continual effort to do things better, not achieve an arbitrary standard based on prescribed or assumed conditions

Ferrara[2] has suggested that standard costing based on engineering standards -- which in turn are predicated on the notion of a 'one best way' -- is only appropriate in the static, bygone world of cost-plus pricing (the world in which the Scientific Management School lived?). In such a world, a standard cost is established specifying what a product should cost and to this is added the required profit mark up to arrive at the selling price. Cost management then consists of ensuring that standards are adhered to.

In today's intensely competitive environment (the argument goes), we no longer look to the total unit cost in order to determine selling price; instead, we use the selling price to help determine the cost the market will allow. This allowable or target cost per unit is a market-driven cost that has to be achieved if desired profits are to be achieved. In a highly competitive, dynamic world there is likely to be considerable downward pressure on this allowable cost. Cost management must therefore consist of both cost maintenance and continuous cost improvement.

In such a competitive, improvement-seeking environment, of what value is standard costing based on predetermined engineering standards which creates a mind set of achieving the standard rather than of continuous cost reduction?

6 In a largely automated production system, it is argued, the processes are so stable that variances simply disappear

Gagne and Discenza," for example, contend that 'with the use of statistical quality control and automation, the production processes are very consistent and reliable. Variances often cease to exist'. If this is true, emphasis should be switched to the product design stage as most costs are effectively committed during this phase. A target cost that is achievable through the designer's efforts can be established and the designer then controls the design activities of a new product using the target cost as an economic guideline.[5]

The case for standard costing

Although the foregoing criticisms appear persuasive, surely the basic principle of standard costing variance analysis remains sound, i.e. specifying in advance what should be achieved and then measuring the extent to which it is being achieved. The unit cost of a product has profound implications for the firm's competitive position and is thus worthy of such control.

Clearly, however, the criticisms must be addressed. The following deals with the criticisms one by one and suggests modifications, where appropriate that will enable standard costing to continue to have a major role in cost control and performance evaluation.

1 In a JIT environment, measuring standard costing variances may give rise to dysfunctional behaviour There is no reason why standard costing should not be valuable in a JIT environment

(a) There may be some truth in the suggestion that a measure which compares the total cost of time (set up and operating) to the number of units produced might encourage production in large batches in order to reduce the proportion of time spent on machine set ups. If this is seen as a risk, alternative means of countering it might be:
- to exclude set up times from the labour input side of the equation and/or
- to adopt a counter balancing performance indicator which penalises/discourages long runs, e.g. inventory level or average batch size.

(b) The fixed overhead volume variance admittedly has no relevance for control purposes -- it does not arise as a result of over/under spending but simply as a result of variations in the number of units produced. Indeed, there is a strong case for not allocating non-volume related costs to the product unit level (and not, by implication, including them in standard costs). If non-volume related costs are allocated to the product unit level, the resultant unit cost will not be the incremental cost of producing a unit and will not therefore be appropriate for decision-making. A solution would be the use of a standard marginal costing system rather than a standard absorption costing system.
Alternatively, as suggested for (a) above, a counter-balancing measure may give similar results, e.g. stock levels.

(c) The tendency of measuring a materials price variance to encourage purchasing managers to buy in bulk and hence add to inventory can be obviated by the attitude of senior management to the interpretation of variances. As long as adverse variances are not used as a stick to beat managers with, but rather as part of a learning process with a view to improvement, their avoidance through dysfunctional behaviour need not be a major problem. Any such tendencies

towards dysfunctional behaviour may also be checked by measuring other indicators, e.g. inventory level.

2 In an AMT environment most costs are non-volume related

Advocates of ABCM have, quite reasonably, argued that fixed costs should not be imputed to the product unit level.[7] By implication, therefore, they cannot be controlled via a standard costing system. Critics, however, often go further, arguing that since in a JIT/AMT environment most costs are not volume-related, standard costing variance analysis does not have a significant role to play in cost management. This charge is not borne out by the empirical evidence! Fechner,[8] for example, cites surveys by Drury and Tayles (1994), Joyce and Blaney (1990) and Dean (1991), which have found that many manufacturing industries, in different countries, have overhead costs of no more than 30% of total cost (and some of this will be volume-related!). The 70% constituted by direct cost will, usually, be volume-related.

These findings are consistent with evidence cited by Drury[4] of surveys into AMT industries which suggest that:

(a) materials cost represents the largest percentage of total manufacturing cost;
(b) direct labour costs may account for up to 15% of total cost, i.e. large enough to warrant controlling!

With relational database technology, it may be a realistic option to operate two cost management systems:

* standard costing variance analysis for volume-related costs;
* ABCM for non-volume related costs.

3 In a JIT/AMT/continuous improvement environment, work teams need real time, quantitative (as opposed to financial) feedback

In addition to quantitative feedback, periodic financial information also has a role to play in:

(a) informing work teams of the financial implications of their activities. For example, a work team may be aware of a problem with materials yields. To improve yields, they may change the way they operate. This may result, however, in increased labour hour consumption which more than offsets the savings in materials costs. If real time feedback is required, integrated computerised manufacturing and accounting systems can now provide financial variance information in real time;
(b) facilitating management control at a more senior level. Senior management will usually wish to monitor the financial consequences of work team activities. Also an element of parochialism may exist for work teams, encouraging them to maximise their output/efficiency to the possible detriment of other functions or departments. Financial variances provide the overall picture. In addition, variance information (especially trends in variances) will be useful for senior management for planning purposes -- as described, for example, by Bromwich.[9]

4 Over-emphasis on cost control can be detrimental to quality

This is a danger which management should be aware of. This does not justify the abandonment of cost control, however! It simply reinforces the need to measure performance through a range of indicators-cost, quality, lead times, inventory levels and so forth.

5 Engineering standards are incompatible with continuous improvement

Whilst, historically, engineering standards have been the norm, this does not have to be so! Take for example, Japanese 'Kaizen costing' as used in Toyota plants.[3] The essential principle of controlling unit product cost embodied in standard costing is preserved, the only difference being that Kaizen uses the actual production cost of the previous year as the basis for comparison (rather than a predetermined engineering standard) and a target reduction rate is applied to this. The variance calculation is thus: (Cost Base - Target Reduction) - Actual Cost this Period

Whether this modification to traditional standard costing is appropriate will depend on circumstances. In some production technologies the scope for continuous improvement/cost reduction is very limited and maintaining engineering standards may be the overriding imperative.

Importantly, too, it should not be forgotten that previous year's actual costs (on which improvement is sought) may include low efficiency levels relative to standards that might be expected in the industry.

6 In a largely automated production system, most costs are committed at the product design stage

While many costs are, indeed, committed at the product design stage, there is usually considerable scope for cost variability at the production stage. This is exemplified by the manner in which Kaizen is intended to complement target costing. Target costing is applied in managing costs at the product design stage via value engineering. Kaizen is then used to encourage continuous improvement, i.e. cost reduction. It does this by targeting reductions to current unit costs and then comparing actual reductions against these targets.

Conclusion

The basic principle of accounting control embodied in standard costing remains sound. The constituents of the standard, the variances calculated and the way they are interpreted may need to change. A fruitful area for future research is the way in which organisations are retaining the cost control methodology inherent in standard costing but are adapting their systems to take account of the changing production environment.

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