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**SWP 53/89    STANDARD COSTING: A NEW WAY  
FORWARD BY GOING BACK TO BASICS**

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STANDARD COSTING: A NEW WAY FORWARD BY GOING BACK TO BASICS

Standard costing has, for many years, been a widely used accounting planning and control measure particularly for the engineering and production areas of businesses. However the technique has not been developed for use in other areas of these businesses and standard costing has had very limited applications in service industries, even though the same logic can be soundly applied with great benefits in the effectiveness of planning and the subsequent monitoring and control of actual events. This may be largely caused by the developing mis-use over time of the basics of standard costing in its original production orientated form, which has led to confusion over its conceptual base and has consequently generated a high degree of misunderstanding as to how standards can be applied in other areas. This lack of comprehension of the conceptual basis accounting techniques has been more generally referred to by Coulthurst and Piper(1), and Lawrence(2), and the area of standard costing provides an ideal illustration.

This developing mis-use has equally serious consequences in a production environment and has led to classic illustrations of management failing to gain the massive potential benefits available from the information technology revolution. In many companies the rapid decrease in computer costs and even more rapid increase in processing power has been used merely to computerise a standard costing system which was designed possibly 40 years ago and which is now fundamentally irrelevant to the radically changed production and competitive environment. Thus an increasingly over-sophisticated analysis of largely irrelevant information is possible and the key elements required for true decision support systems are being frustrated by the infrastructure of a poorly understood

standard costing system. Interestingly it appears that much of the reluctance to change comes not from accounting managers but from user managers who see standard costs as some "absolute measure" which they "feel they understand".

This article has therefore two apparently conflicting objectives - one is to argue that standard costing can and should be applied to many other areas of the business than is currently the case and the other is to argue that for many purposes for which it is currently used standard costing is actually detrimental and should be discontinued and replaced by a more beneficial decision support system. Hopefully the absence of real conflict in these objectives can be demonstrated by an initial review of the primary objectives and main benefits of standard costing systems. This review will be used to highlight the problems caused by trying to apply the concept to purposes where other techniques are of much greater value. The potential impact of the IT revolution on the practicality of these alternative techniques will be considered, which will lead into a consideration of the ways in which standards can be applied productively in service industries, including non-profit sectors, as well as in the non-production areas of manufacturing industry.

#### PRIMARY OBJECTIVES OF STANDARD COSTING

In order to review the primary objectives of standard costing it is necessary to go back to basics and to consider the pre-requisites for such a system of control to be practical. There is in fact only one such pre-requisite - there must be some determinable relationship between inputs and outputs for the operation under consideration. This relationship is physical not financial in that a measurable quantity of inputs leads to an expected quantity of outputs and can, of course, for planning purposes be used to determine required levels of input given desired outputs.

The CIMA, in their Management Accounting Guidelines Handbook, define this basic issue but do not clearly distinguish the importance of the physical relationship from the financial values associated therewith(3). For obvious reasons such a relationship gives rise to what is normally described as an "engineered cost" because an input-output equation is in control and these types of cost are differentiated from "discretionary costs" where no such definable control mechanism can be established. The significance of this distinction for management control measures does not seem to be widely appreciated and used in many businesses, but this will be highlighted later.

If this one pre-requisite is satisfied, it becomes practical and normally beneficial to use a system of comparing actual levels of input and consequent output to some expected (i.e. standard) level of input for this actual output achieved, so as to judge the efficiency of the operation. It is important to note that so far no mention has been made of costs in monetary terms and the most meaningful comparisons can often be done in physical units. Thus there is no requirement for value relationships to exist for this primary form of standard costing to be beneficial and able to provide control and decision making benefits by this physical comparison between expected or standard inputs and actual inputs used. As long as the engineering relationship remains valid, the comparison provides a good measure of efficiency and hence can be used to judge the "managerial performance" of the manager controlling the operation. Such a comparison says nothing about the effectiveness of the operation and hence the "economic performance" of that section of the business.

In many cases there is also a large problem caused by there existing not one but a multitude of alternative engineering relationships using a different proportionate mix of various

inputs, e.g. labour, capital and raw materials. As it is impossible to evaluate directly the attractiveness of reducing raw material usage by 0.2 tonnes by using 20 hours more of direct labour, or vice versa, it is necessary to introduce cost and value as the common currency which makes such a comparison meaningful. This reason for establishing cost prices into a standard costing format is of fundamental importance because it should start to highlight what types of cost prices are relevant, and it is in this apparently simple step that most of the problems of standard costing are introduced. For some reason the idea has developed that standard rates and prices acquire the same importance and should be held for the same period as the physical standard relationships. This should be self-apparent nonsense in many cases because these "standard" costs are not normally derived from some "determinable" relationship between inputs and outputs.

#### INTRODUCING MONETARY VALUES

One reason for needing costs has been stated as being to allow trade-off decisions to be made between alternative ways of achieving a desired level of output. This is clearly a classical financial decision requiring the use of relevant opportunity costs for the different inputs under consideration - i.e. any pre-planned standard cost price is irrelevant to any particular decision unless coincidentally it happens to approximate to the opportunity cost at the time of the decision. There are clearly other reasons for wanting to introduce monetary values into the otherwise physical relationship but again it is important to consider what costs are relevant in each instance.

It is clearly essential that financial information is available to enable soundly based economic decisions to be made on the planned or actual performance of the business sector. The acceptance of the financial implications of

the plans of the business is a primary reason for preparing budgets and this economically based decision must be dissociated from the normal managerial performance overtones. There are obviously a number of alternative types of decision which could be under consideration ranging from a new investment proposal through increase or decrease in existing facilities to completely closing down an existing business or division. The fundamental financial discipline of concentrating on future cash flows resulting from the specific decision makes it clear that the relevant costs may range from replacement costs to net realisable or salvage values and even the strongest advocates of standard costing could not logically argue the relevance of one set of standard values to all of these possible decisions.

Another reason for needing financially evaluated standards is that physically generated variances from standard do not adequately rank their importance to the business and thus indicate where management effort should be applied. For example an adverse usage variance of 2 tonnes of sand may seem significant in physical terms, particularly when compared to an adverse usage of a few ounces of gold or silver, but clearly in value terms the higher unit cost item may be more worthy of management attention. Thus it is relevant to have a standard price which is indicative of the relative value of each input but the emphasis for this purpose is on the indicative nature and there is not a requirement for some extreme level of accuracy. Any attempt at precision in setting standard prices is therefore pointless for this purpose and long-lived standard prices which are outdated may mislead management with regard to the important control areas.

#### ECONOMIC AND MANAGERIAL PERFORMANCE IN CONFLICT

This issue highlights one key aspect of managerial performance evaluation. It is now generally accepted that

the best measures of managerial performance include only areas which are controllable by the relevant manager and thus managerial performance will often be considered at a different level to that used for economic performance decisions. With regard to standard costing this often means splitting the responsibility for the control over variances from standard levels of performance into different areas of the business and into different accounting periods in some cases. The most common and clear example of this relates to price or rate variances which are normally identified at the time of purchase. This purchase variance may well differ in accounting period from the writing-off through the profit and loss account of the physical items involved. In all but the smallest businesses it is also normal for the management responsibility for price levels to reside in a buying function of some sort and not with the end user of the physical resources. Thus good managerial performance control often dictates that production and engineering managers are supplied with physical resources at the "standard price" with price and rate variances separately analysed. Thus production management can correctly concentrate on the control of the physical input-output relationships using a fixed currency measurement, which becomes a relative importance indicator and not an absolute economic measure.

Where this apparently sensible approach of segmented responsibility analysis is used a new form of decision support problem becomes apparent. By separating the price variance analysis from the usage variance analysis for managerial performance reasons the information required for economic performance decisions may become fragmented and harder to correlate when required. As already stated economic decisions require actual costs, and standards can only be used when they approximate to actual, i.e. when variances are insignificant. Thus standard prices do not aid

economic decisions because any significant variances must be added back to discover actual costs, but standard prices do not aid managerial performance assessment, other than in the sourcing areas as these non-controllable variances should be excluded from assessing production performance. This can, in practice, lead to uneconomic decisions being made by manufacturing areas because their performance assessment may be calculated using relative standard prices which have become outdated or distorted because of actual price changes during the period. These price variances will be analysed separately and the relative apparent costs to manufacturing will be unchanged, i.e. charged at standard. There is no incentive for manufacturing management to alter the relative utilisations to reflect these actual costs being incurred by the business, and their desired economic behaviour may not be matched by the managerial performance parameters being used in the business.

#### EXAMPLES

An example may make this clearer. Suppose Product X can be produced using either oil or coal as an energy source and both are available to the business. When setting the standards both have a standard price level of 100 but oil requires 8 units of input to only 5 units of input needed for coal. The lowest standard cost (500) is achieved by using coal. During the year the price of oil drops to an actual level of 50 compared to the standard of 100. Our sophisticated company extracts price variances at the point of purchase and uses them to judge the performance of its purchasing department. Thus the manufacturing department will continue to be charged 100 per unit for its oil usage and will be unwilling to adopt what is clearly in the economic interests of the business (by switching to oil the cost can be reduced to  $50 \times 8 = 400$  instead of the coal alternative of 500). If they altruistically changed to oil their managerial performance will show an adverse variance



due to the higher consumption rate of oil to coal when charged at the same standard value. Sophisticated companies will respond by saying that by the use of revision variances, flexed standards, or formulation variance allowances, etc. this problem can be analysed so that manufacturing are compensated to ensure they act in the overall interests of the group. This may be so but requires some complex analysis and can normally only be done retrospectively when the problem has been identified; this complexity also serves to confuse and misdirect management attention as well as significantly increasing the cost of the management information system. It is also blatantly unnecessary.

As long as the distinction between managerial performance and economic performance is remembered, the use of actual costs together with standard usage allowances would have encouraged manufacturing department to switch from coal to oil as the actual price fell because their total cost of usage would be seen as falling despite being allowed the required higher unit usage of the changed ingredient.

However, in the example, this company uses price variances to judge the performance of the purchasing department and thus if standard prices are not utilised there is an argument that this level of managerial control is being weakened. This is clearly nonsensical because there is not any input-output relationship which is being measured or controlled; all that is being assessed is how well purchasing can forecast future price levels, because their apparent evaluation is conditioned by the levels at which the price standards are set. For some items there may be little or no level of price fluctuation during the planning period, in which case the standard is not a relevant measure of performance anyway as there is no probability of change. Where there is the probability of violent fluctuation such

as there has been with oil recently and may be with many commodity type products, the use of actual price performance against the "best-guess" standard put in at some specific previous point in time as the major managerial performance measure seems incredible but it can also cause undesirable actions.

An example using foreign exchange rates may make this clear. A retailer imports products from the USA and one particular contract for one product costs \$540 each. The standard rate of exchange used in the budget is £1:\$1.50 and therefore the standard price allowance given to purchasing is £360 per unit. During the period sterling starts to strengthen to the point where even allowing for the costs of forward cover a rate of £1:\$1.80 can be achieved. By taking this rate purchasing department have locked in a favourable variance against their standard as the actual cost will be £300 per unit. However this good managerial performance may be undermined by an unsophisticated competitor who doesn't understand all these clever things like standards and forward cover rates but who buys the same product at the eventual spot rate at the time of delivery of £1:\$2 giving an actual cost of £270 and a considerable competitive advantage. In this example the ability and desire to beat some arbitrary and irrelevant managerial performance indicator may have seriously inhibited the economic performance of the business.

Thus it can be argued that standards have very good uses where relatively dependable relationships can be derived which provide good measures of expected results, but where unreliable guesses are somehow consecrated as "the standard", very dangerous results can ensue. One supposed solution to this problem of fluctuations is to produce "current standards" which mean that the standard costs are changed quite frequently through the year (see Edwards(4));

some companies have even gone so far as to change their standards monthly. It is difficult to see how anything as transitory as a monthly price can be felt to be a standard and how comparison back to this fleeting standard can be helpful to any aspect of management decision making. It must surely only confuse senior managers who cannot see any logical trend to performance but who must rely on their management accountants to tell them how their business is doing. What is also surprising is that companies who do this, and who presumably believe that they can meaningfully forecast these short-term price fluctuations, continue to bother with mundane pastimes such as manufacturing when they should be able to make a vast fortune investing in the forward markets based on the accuracy of their standards (i.e. short term forecasts of price levels).

#### A BETTER WAY TO USE STANDARDS

It is inevitable that a budget or any financial plan will be wrong and this in no way reduces the benefit of producing the plan, but this is not so true for purely speculative standards. Standards are relevant to predictable relationships between inputs and outputs; unfortunately the main relationships with sufficiently predictable results are physical not financial and in most cases standard prices introduce a form of distorting and spurious analytical accuracy.

This is where the new technology can be used to full advantage to generate true decision support systems. The justification for using standard monetary costs in the early period of standard costing was the sheer impracticability of trying to use actual costs for all types of decision analysis and thus standards were felt to be a good enough approximation. In periods of low inflation and relatively slow technological change and low price fluctuations this may be acceptable but today's competitive environment makes

the use of some previously set standard price as impractical as using actual costs used to be. However the processing power of modern computers and the use of even simple data-bases means that the physical relationships modelled by standard physical costs can be evaluated at the appropriate actual or latest forecast price, so that good decision support systems are now available. The decision support system can access the latest invoiced cost for any material purchased, or if more appropriate a later not yet delivered order cost can be accessed or even the forecast by purchasing department of material not yet committed for. Physical allocation systems and modelling routines make it possible to use opportunity costs where these are different to replacement cost levels. It is possible that the system will be unable to obtain automatically the net realisable value of any already held material if this is relevant to the decision, and this may require specific input as necessary.

Today's, and even more certainly tomorrow's technology, is demanding a much more innovative and decision orientated approach to financial analysis than is likely to be achieved under the old outdated standard costing systems in use in many companies. A move to actual costing while retaining engineering physical relationships could dramatically improve this situation without losing the original and key advantages of real standard costing. This move can now also remove the problems associated with old methods of 'actual' costing which relied solely on outdated historic average 'actual' costs on a fully absorbed basis, which were clearly of no relevance to decision making (see Glendinning(5)).

#### USING STANDARDS OUTSIDE MANUFACTURING

This type of analysis should clearly indicate those non-manufacturing areas of business where standard relationships

will be of benefit in both planning and controlling expenditure. This technique is of relevance wherever an input to output relationship can be defined and monitored and with some careful thought this will include most activities of the business to at least some degree. The analysis required has the added benefit of focussing management's attention on the key areas where discretion can be exercised and not wasting effort by impotently trying to change what is a closely defined engineering relationship. As well as significantly aiding investment decisions which can be judged by their ability to modify the engineering relationship and valued accordingly (e.g. the automation of a clerical process can be valued by looking at the clerical time saved per operation and valued by volume and the clerical cost rate), this non-manufacturing use of standards can throw up relationships which are principally financial but are equally useful. A good example here is in the area of direct sales forces and the level of discretion regarding this cost centre which can be exercised by the sales director. Table A sets out the type of expenses incurred in the normal sales force and at first sight the sales director may appear to have almost complete discretion regarding this mix of costs and if looking for a 15% reduction this can be achieved in a multitude of ways. A moment's consideration should alter this view because any significant reduction in the total cost will require a much more substantial reduction in any particular expense heading. It now becomes easy to see the nonsense towards which the company is heading (and which many companies seem to reach quite regularly), as they could put themselves in the position of underpaying their sales force relative to the market rates and finding their best sales people leaving. Alternatively cheaper cars could be obtained resulting in lower status for this company's sales people and lower effectiveness through longer journey times or more time off the road through break-downs, etc. Another great idea is to reduce the

total petrol budget which restricts the calls which can be made, or to restrict nights spent in hotels with a similar result - a combination of the two can leave the sales-force incapable of either driving home or staying away which could supposedly be looked on as a test of initiative! Obviously the other expense headings can be similarly analysed and it becomes clear that the true discretionary choice for the sales director is with regard to the number of sales people employed. The cost per person can effectively be regarded as an engineered input to output relationship, which will change over time as relative costs alter but which can nonetheless, be monitored and reviewed quite easily.

However at the businesses level it is not even true that the sales director has complete discretion over the number of sales people. In many businesses the field sales force's principle role is to make customer calls and take orders and it is clearly possible to model an engineering relationship regarding the number of calls made, the success rate of obtaining an order on any call, the average order value taken and the average gross margin achieved. This information if used with the physical number of calls which can be made by one sales person in a day (which is affected by the size of the sales force) and the desired call frequency by customer category can generate a planning model to help select the optimum size of sales force. As several of the factors are interactive (e.g. the more frequently the customer is called on the lower will be the success rate per call made) the optimum solution can be achieved by the iterative process of using linear programming. A simpler approach is to use a basic form of this model to calculate the cost of each call made given different sizes of sales force, and then using this cost to decide the required contribution per order taken and thus identifying those customers on whom the direct sales force can/cannot afford

to call. A very clear application of a good segment profitability model by customer.

Monitoring sales force efficiency by using the equation derived can also focus attention of sales management on changes in the relationships as well as specifically controlling sales work loads. It is important to note that using the relationships in a static way can only monitor efficiency; it may be that the sales force would be more effective by making less calls but spending more time demonstrating products at each call - the comparison of alternatives is exactly the same as the earlier example in the manufacturing area.

This use of standard costing in the sales area is by no means unique and can be extended to all areas where some predictive and monitorable relationship can be derived. As the relationships may not be as static as many in the manufacturing areas more attention needs to be paid to changes in the equation but this can lead to dramatically improved decision taking as the relationship becomes more clearly understood.

#### CONCLUSION

Thus a more rational application of the fundamental principles of standard costing can significantly assist decision making in many areas of almost any commercial enterprise, including service industries and the non-profit sector. The concentration on trying to understand the inter-relationships between inputs and outputs and hence what elements of expenditure are truly controllable where the manager can exercise discretion will enhance managerial performance evaluation and separate this element of control from the fundamental economic decisions about the overall performance of the business or sub-division thereof. It is now practical to use the power of information technology to

produce meaningful decision support information and not more comprehensively irrelevant comparisons of actual value to some budgeted value, where the budget basis has been considerably superceded. Such decision support systems, when coupled with sensible budgeting and rolling forecast systems which are also used properly and not mis-used, as they are in many companies, can provide the major business role for the new generation of financial managers.

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TABLE A

Sales Force Expense Headings

Salaries

Other payroll costs

Commission

Cars

Petrol

Other Travel

Accommodation & Subsistence

Entertaining

Samples

Training

Sundry