STATISTICAL COST CONTROL

— By —
J. D. DU TOIT,
Financial Analyst, Iscor

Accountancy is the logical representation of the financial condition of an economic undertaking and of the changes in that condition, so far as they can be evaluated in money. The original form of capital is ready money; this is changed via raw materials, wages and general costs into goods, the sale of which again brings ready money into the undertaking, normally in a greater amount than there was originally. Accountancy should reflect this flow of capital at once and correctly and it should particularly show whether the expenses incurred by the undertaking are completely transformed into goods or are used for building new, or enlarging existing plants. The more accurately the movements of capital are reflected the better is the purpose of accountancy achieved.

Accountancy and costing are the main tools of economic control, and economic control means making sure that one of the main purposes of an enterprise, its profitableness, has been obtained in the most economic way, i.e. to the highest possible degree with the lowest possible means. It is in fact the verification for the management of an enterprise whether and how this difficult compromise of the simultaneous balance between technical, commercial, and psychological considerations, has solved its problem. It is clear from this definition that economic control must use beside the main tool of accountancy and costing any other method available to find out the actual state of affairs in the enterprise on the one hand and to put at the management's disposal means of future improvement on the other hand.

Various connotations are atached to the word "control" but basically, explicity or implicitly, all the schools of thought see "control" as a process. One school of thought stresses the probabilistic element of control, and consequently sees a phenomenon that can be predicted, at least within limits associated with a given probability to be controlled. As a process, control has four principal ideas:

(i) The goal, which states what is to be done.

(ii) The procedure, which specifies how and when something is to be done, who is to do it, and what constitutes satisfactory performance.

(iii) The verification, which indicates how well the task was carried out.

(iv) Continuing activity to improve the performance standards.

Therefore by implication, cost data is of no value for control purposes in the absence of a yardstick to measure the performance. This yardstick or standard stresses the level to which costs should be reduced and the success of a standard cost system depends on the reliability and accuracy of the standards.

Hence the primary objective of the standard cost accounting system is to indicate areas where some follow-up is desirable and this objective is accomplished by means of realistic standards,

together with detailed procedures which are employed to report actual performance so that the variances can be determined. These variances are classified by source into components, viz. materials price, materials usage, labour rate, labour efficiency, volume, etc. Different breakdowns or further refinements may be used.

But it is ironic that after all this precision, decisions relative to which variances to investigate, are made without an organised framework. In the absence of a framework these variances are termed significant if they exceed some subjectively determined money amount or percentage of the standard, viz. a variance in excess of ten per cent of standard is identified as significant or even five per cent may be used as cut-off point.

Certain variations in cost belong to the category of chance variations about which little can be done other than to revise the process. Besides chance variations, there are variations produced by assignable causes. These are relatively large variations that are attributable to special causes consisting of differences among machines; among workers; among materials; in each of these factors over time; and in their relationships to one another.

The problem facing financial management is to decide whether the observed variance between an actual measurement and the established standard is acceptable, or constitutes an exception to acceptable performance and therefore should be the basis for some corrective action.

Variations in cost measurements are expected, even though the factors contributing to these measurements remain unchanged for all practical purposes. It is for management to develop a framework wherein these variances can be objectively evaluated and it is essential that in this framework attention should be given to the concepts of chance and probability which are inherent in the process and the performance standards.

Among the many statistical control techniques which have been perfected the control chart ranks among the more important. The control-chart method is a device for carrying out, on a factual basis, the cost accountant's separation of variation into usual and unusual components. It compares actual cost variation of the components with the control limits that have been set up for those costs.

At the basis of theory of control charts is a differentiation of the causes of variation in performance. Two distinct types of causes are involved. Random or chance causes encompass the whole host of small influences lying behind the particular measurements or results. Each of these influences have a relatively minor effect but all taken together give variability to the resulting measurements, irrespective of whether they are held as constant as is possible. This variation is natural to every process and is due to chance cause. The associated cost variances are therefore to be expected and are natural.

On the other hand, assignable causes are those which come in intermittently or perhaps permanently to make changes in the process of such magnitude as to be of practical importance. The fundamental problem of financial management is to decide when to assume that an assignable cause has been responsible for some apparently unusual performance, and when to attribute such performance to chance.

Managerial decisions are subject to two types of errors. The first is to conclude that a variation is of practical importance when in reality the whole discrepancy is due only to chance causes. This type of error leads financial management to hunt for an assignable cause when none exists.

The second type of error management can make is to miss noting the presence of some assignable case. Such errors miss evidences of impending or actual trouble.

Both types of error have economic considerations. The probability of committing an error of the first type can be reduced to zero by increasing the upper decision limit. The difficulty then is that this would raise the probability of committing an error of the second type. Likewise the converse is true. The problem to be resolved by financial management involves striking the best balance between committing these two types of error.

In order to institute and maintain control, it is necessary to be able to state the prior expectations concerning cost variances and then to test the hypothesis that these expectations are being satisfied. The statistical control of cost variances can be accomplished with the aid of control charts. These charts are a form of record that indicates the need for investigating conditions, processes. or labour for causes of cost variances beyond that caused by chance variables.

The control limits of the chart are statistically computed and strike the economic balance between the two kinds of errors previously mentioned, viz. looking for trouble that does not exist and failing to look for trouble that does exist. A control chart therefore is a statistical device with which financial management can control by the principle of exception the cost variances associated with the production operations. It permits financial management to find problems that need attention and to avoid dealing with those that need no attention.

In a later contribution the techniques of preparing control charts and their interpretation will be discussed.