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## **IMPERATIVES OF VARIANCE ANALYSIS FOR COST CONTROL IN BUSINESS ORGANIZATIONS – AN EMPIRICAL STUDY OF DELTA STATE**

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### **Abstract**

*This study was carried out to investigate the imperatives of variance analysis for cost control in business organizations: An empirical study of selected firms in Delta State, Nigeria; A set of structured questionnaire was used as the instrument for data collection and administered on 60 respondents of the firms under study randomly using Yaro Yamene formula. Applying this formula, the sample size from a population of 70 is 60 respondents at 95% confidence level. Data analysis was made and the hypotheses formulated were tested using Kruskal Wallis one-way analysis of variance by rank. The findings revealed that positive and significant relationship exists between variance analysis in providing directions to the causes of non-performance as against standard performance and enhances management improvement in operations. It was concluded that variance analysis is necessary for organizational performance and growth. The study, however recommended among others, variances based upon scientifically established standards, existence of objective criteria for measuring inputs and outputs and standards should be set and variances analyzed for each responsibility centre for sound variance analysis.*

**Key words:** Imperatives; Variance Analysis; Cost Control; Business Organizations

### **Introduction**

Analysis of variance is the most important job in the proper implementation of a standard cost system. Cost variances are just meaningless figures unless adequately analyzed and intelligently interpreted. Only through the medium of this analytical device can the figures tell the story of what is happening and point the way to improvement procedures. Here is where the standard cost system leaves the realm of

technical accounting and dull debits and credits and enters the atmosphere of interpretive and creative analysis for management guidance.

Variance is a term used for the difference between actual cost and standard cost. A favourable variance occurs if actual costs are less than standard cost. Ordinarily, favourable variance is assumed to imply efficient performance. An unfavourable variance arises if actual cost exceeds standard cost. An unfavourable variance is supposed to indicate inefficient performance. However, whether performance is really efficient or inefficient will be known only when variances are analyzed in detail by their causes.

### **Statement of the Problem**

The word variance will represent the difference between the standard cost of production and the actual cost of production or the difference between the budgeted revenue and the actual revenue. The process of classifying a given variance into its sub-variance is described as variance analysis. A given variance may be interpreted to represent adverse or favourable to the organization depending on the differences. For example, a given variance will represent adverse if the standard cost of production is lower than the actual cost of production or budgeted revenue is considered to be higher than the actual revenue. On the other hand, a variance will be interpreted to mean favourable to the organization if the standard cost of production is higher than the actual cost of production or the budgeted profit is lower than the actual profit. The focus of this study is to offer an empirical evidence on how variance analysis helps to control cost.

### **Objectives of the Study**

The two main objectives of the study are:

- i. To identify the extent to which variance analysis provide directions to the causes of non-performance as against standard performance.
- ii. To find out whether variance analysis enhances management improvement in operations.

### **Research Questions**

The following two questions were raised to guide the study.

- i. To what extent does variance analysis provides directions to the causes of non-performance as against standard performance?
- ii. Does variance analysis enhances management improvement in operations?

### **Research Hypotheses**

For the purpose of this study the following hypotheses are considered relevant.

1. Variance analysis significantly help in providing directions to the causes of non-performance as against standard performance.
2. Variance analysis enhances management improvement in operations.

### **Scope of the Study**

The scope of the study comprised of selected firms in Delta State located in Warri, Asaba, Ughelli and Sapele. The task of this study was on imperatives of variance analysis for cost control in business organizations.

### **Literature Review**

#### **Concept of Variance Analysis in Perspective**

Arora (2006) defines variance analysis as the process of analyzing variances by subdividing the total variance in such a way that management can assign responsibility for any off-standard performance. According to I.C.M.A. London, terminology,

variance analysis is the resolution into constituent parts and the explanation of variances. An important aspect of variance analysis is the need to separate controllable from uncontrollable variances. A detailed analysis of controllable variances will help the management to identify the persons responsible for its occurrence so that corrective action can be taken.

Idornigie (2005) views variance as the deviations of actual performance from standard performance. They are indicators of sub-standard performance or super-standard performance. When the costs of actual activity are higher than the standard cost we have adverse variance. on the contrary, when the actual costs are lower than the standard (expected) cost we have favourable variance. Favourable variances point to efficiency while unfavourable or adverse variances point to inefficiency.

### **Types of Variances**

According to Pandey (2005), there are two types of variance. They are:

#### **1. Favourable and Unfavourable Variances**

When the actual cost is less than standard cost, it is known as "favourable" or "credit" variance. On the other hand, where the actual cost is more than standard cost, the difference is referred to as "unfavourable" or "adverse" or "debit" variance. In other words, any variance that has a favourable effect on profit is favourable variance and any variance which has an adverse or unfavourable effect on profit is unfavourable variance. Assuming that standard costs have been correctly set, favourable variance is a reflection of efficiency and unfavourable variance indicates inefficiency.

#### **2. Controllable and Uncontrollable Variances**

"If a variance can be regarded as the responsibility of a particular person with the result that his degree of efficiency can be reflected in its size, then it is said to be a controllable variance". For example, excess usage of material is usually, the responsibility of the foreman concerned. However, if the excessive usage is due to material being defective, the responsibility may rest with the Inspection Department for non-detection of the defects.

If a variance arises due to certain factors beyond the control of management, it is known as uncontrollable variance. For example, change in the market prices of materials, general increase in the labour rates, increase in the rates of power or insurance premium, etc. are not within the control of the management of the company.

Responsibility for uncontrollable variance cannot be assigned to any person or department.

The division of variance into controllable and uncontrollable is extremely important. The management should place more emphasis on controllable variance as it is these variances which require investigation and possibly corrective action. The controllable variances, on the other hand, may be ignored. This follows the well known principle of exception whereby those matters which are going right are not given attention and any deviations from efficient performance are investigated.

### **Causes or Sources of Variance**

According to Jhingan (2004) variances will arise from the following sources:

#### **Material Variances**

##### **1. Price Variances**

- a. Paying higher or lower price than planned.
- b. Gaining quantity discounts by buying larger order quantities than planned.

- c. Buying higher or lower grade/quality of materials than planned.
- d. Buying substitute materials whose price is different from the planned.
- e. Panic buying

**2. Usage Variance**

- a. Quality of materials
- b. Substitute materials
- c. Technical efficiency
- d. Human efficiency or skill
- e. Pilferage
- f. Difference in yield from that planned.

**Labour Variances**

**1. Rate Variance**

- a. Labour unionism and higher rates.
- b. Different grades of labour used.
- c. Change in labour remuneration method.

- d. Change in method of production which may require different grades of labour input.

**2. Efficiency Variance**

- a. Change in operation method facility used by labour which affects efficiency.
- b. Grade of labour used.
- c. Workshop organization.
- d. Adequacy of supervision.
- e. Grade of materials used.
- f. Working condition.

**General Causes**

Outside the specific cause listed above, variances can generally arise from the following sources:

- a. Inappropriate or incorrectly set standards.
- b. Wrong implementation of standard set as when more or less IS input than standard.
- c. Mis-measurement of actual results.

**Objectives and Significance of Variance Analysis**

Arora (2006) listed the three objectives of variance analysis to include: performance evaluation, cost control and management by exception. A firm operating a standard cost system calculates variances for each element of cost for which standards have been set. Once variances have been calculated, they are analyzed to determine:

- 1. Where did variance occur?
- 2. Which cost elements were at variance with standards and by what amount?
- 3. What were the causes for the occurrences of variances?
- 4. Who were responsible for variances?

Such an analysis thus brings out the significance of variances in terms of their sources, causes and responsibility.

- a. Variance analysis system helps in evaluating individual performances by highlighting the difference in terms of costs between attained performance and

- desired performance.
- b. Variance analysis helps in assigning responsibilities to individuals. Realistically set standards provide challenge to individuals and motivate them to achieve the performance targets.
  - c. A variance analysis system, combined with an appropriate reporting mechanism helps management to rely on the principle of management by exception. Suitably prepared variance reports call top management attention only to exceptional variances. Variances ranging between certain limit are disposed off at lower levels of management. The variance reports are also condensed in such a way that management is able to understand the implications of variances a detailed and time consuming study of number of facts and figures.

### **Methodology**

All the manufacturing organizations in Nigeria constituted the population of the study. the number is somewhat infinite. Therefore, the researcher decided to limit the target population to selected manufacturing organizations in Delta State namely; Warri, Asaba, Sapele and Ughelli. A sample size of 60 was selected from a population of 70 using the Yaro Yamene's formula which is given as:

$$\frac{N}{n} = \frac{1}{1 + N(e)^2}$$

Where

n = Sample size sought

e = Level of significant = 0.05 or 95%

N = Population size = 70

$$n = \frac{70}{1 + 70(0.05)^2} = \frac{70}{1 + 0.25} = \frac{70}{1.25} = 60 \text{ respondents}$$

Applying the formula the sample size from a population of 70 is 60 respondents at 5% confidence level.

The simple random sampling method was used to select the respondents. The study was conducted using the survey research design. Survey research design according to Olaitan, Ali, Eyo and Sowande (2000) is a plan, strategy, structure, that the investigator wants to adopt in order to obtain solution to research problems using questionnaire in collecting, analyzing and interpreting the data. The design is suitable for the study because it uses questionnaire to seek information from respondents. The data used in this study were obtained from both primary and secondary sources of data. The instrument of primary data collected was the questionnaire and face-to-face interview. The instruments were validated by experts to authenticate the relevance of the instrument. Secondary data were collected from textbooks, and publications on variance analysis.

Data collected were collated and analyzed using percentages. In addition, the hypotheses formulated were tested using Kruskal Wallis one-way analysis of variance by rank.

### **Findings and Discussions**

Hypothesis One (1) was tested using Kruskal Wallis one-way analysis of variance by

rank.

**Test Statistic:** Kruskal Wallis one-way analysis of variance by rank.

Degree of freedom =  $K - 1 = 2 - 1 = 1$

Table value  $X^2 = 0.05 = 3.841$

Level of significance = 0.05

**Decision rule:** Reject  $H_0$ , if  $H$  calculated  $> X_{tab}$

**Sampling Distribution**

$$H = \frac{12}{N(N+1)} \sum_j^k \frac{R_j^2}{n_j} - 3(N+1)$$

Where;

$k$  = Number of samples

$n_j$  = Number of cases in  $j^{th}$  sample

$N = \sum n_j$ , the number of cases in all samples combined

$R_j$  = Sum of  $K$  of ranks in  $j^{th}$  sample (column)

$k$

$\sum$  = Directs one to sum over the  $k$  samples (column)

$J$

**Computation**

**Table 1:** Variance analysis and the provision of directions to the causes of non-performance as against standard performance

<b>Responses</b>	<b>Frequency</b>	<b>Percentage</b>
Strongly Agree	29	48.33
Agree	25	41.67
Undecided	3	5.00
Strongly Disagree	1	1.67
Disagree	2	3.33
<b>Total</b>	<b>60</b>	<b>100</b>

**Source:** Field Survey, 2015

Ranking all the observations for the  $k$  groups in a series assigning ranks from 1 to  $N$  we have.

**Table 2:** Ranks of groups

<b>Frequency</b>	<b>Percentage</b>
8	10
7	9
4	6
1	2
4	5
<b>Total <math>R_1 = 23</math></b>	<b><math>32 = R_2</math></b>

**Source:** Computation from Table 1

$$\begin{aligned}
 R_1 &= \text{Sum of 1}^{\text{st}} \text{ column of rank} \\
 &= 8 + 7 + 4 + 1 + 3 = 23 \\
 R_2 &= 10 + 9 + 6 + 2 + 5 = 32 \\
 H &= \frac{12}{N(N+1)} \sum_{j=1}^J kR_j^2 - 3(N+1) \\
 &= \frac{12}{10(10+1)} \left( \frac{23^2}{5} + \frac{32^2}{5} \right) - 3(10+1) \\
 &= \frac{12}{110} \left( \frac{529}{5} + \frac{1024}{5} \right) - 33 \\
 &= 0.10909 (105.8 + 204.8) - 3 \\
 &= 31.3197.
 \end{aligned}$$

**Decision**

Since the calculated value of 31.3197 > X<sup>2</sup> table 3.841, we reject the null hypothesis and accept H<sub>1</sub> the alternative hypothesis. This implies that variance analysis helps in providing directions to the causes of non-performance as against standard performance. This finding was supported by the view of Eferakeya (2013) who stressed that the purpose of variance analysis is to provide directions to the causes of non-performance as against standard performance so that management can improve operations, enhance efficiency, control resources more effectively and minimize costs.

**Table 3:** Variance analysis and management improvement in operations

Responses	Frequency	Percentage
Strongly Agree	30	50
Agree	24	40
Undecided	3	5.00
Strongly Disagree	2	3.33
Disagree	1	1.67
<b>Total</b>	<b>60</b>	<b>100</b>

Source: Field Survey, 2015

**Table 4:** Ranks of groups

Frequency	Percentage
8	10
7	9
4	6
3	5

1	2
<b>Total R<sub>1</sub> = 23</b>	<b>R<sub>2</sub> = 32</b>

**Source:** Computation from Table 3

$$\begin{aligned}
 H &= \frac{12}{N(N+1)} \frac{kR^2_j}{\sum^{NJ}} - 3(N+1) \\
 &= \frac{12}{10(10+1)} \left( \frac{23^2}{5} + \frac{32^2}{5} \right) - 3(10+1) \\
 &= 0.10909 (105.8 + 204.8) - 3 \\
 &= 95.123.
 \end{aligned}$$

**Decision**

Since the calculated value of 95.123 > X2 table 3.841, we reject the null hypothesis and accept **H1** the alternative hypothesis. This implies that variance analysis enhances management improvement in operations.

This is supported by the view of Adeniji (2013) who stressed that a variance analysis system, combined with an appropriate reporting mechanism, helps management to rely on the principle of management by exception. Suitably prepared variance reports call top management attention only to exceptional variances; variances ranging between certain limit are disposed off at lower levels of management. The variance reports so condensed in such a way that management is able to understand the implications of variances without a detailed and time consuming study of number of facts and figures.

**Conclusion**

The study examined the imperatives of variance analysis for cost control in business organizations - An empirical study of Delta State, Nigeria. The study revealed that there is positive and significant relationship between variance analysis in providing directions to the causes of non-performance as against standard performance and also

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in enhancing management improvement in operations.

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**Recommendations**

In view of the findings and conclusion of the study, the following recommendations are, however, recommended for sound variance analysis in organizations.

- a. Variances must be based up scientifically established standards. If the standard of performance is not meaningful, variance cannot be a meaningful measure of performance.
- b. Objective criteria must exist for measuring inputs and outputs. This implies that costs should be classified and recorded in an unbiased and systematic manner.
- c. Variance analysis system should be' designed to pinpoint the responsibility

centre. Standards should be set and variances should be analyzed for each responsibility centre.

d. The quantity of output should be clearly defined, the quantitative measurement of output should be accurate.

e.

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