

**IMPACT OF STANDARD COST ON COST OF PRODUCTION IN THE NIGERIAN
MANUFACTURING FIRMS**

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ABSTRACT

The study examined the impact of standard cost on cost of production of some manufacturing firms in Nigeria. A sample of 147 respondents from about 26 manufacturing firms is used for the analysis. Both descriptive and inferential statistics techniques are used to analysis the responses of the respondents on various questions that bothers on value relevance of standard cost in cost control in their originations. Firstly the results shows that contrary to some opinions that standards cost techniques is no longer in vogue, the study finds out that about 85% of the manufacturing firms sampled are still applying standard cost techniques to cost control in their various organizations. Again the study shows that the decision of these manufacturing firms to continue to use standard cost is because of its effectiveness in minimizing the cost of raw material as well as overheads cost of the organization. However, application of standard cost to personnel cost appears not be in vogue. It is recommended that manufacturing firms should emulate these firms that are minimizing their cost via application standard cost and also find a way of applying it to labour cost efficiently.

Keyword: Standard cost, raw material cost, overheads cost, labour cost.

1. INTRODUCTION

Over the years, determination of costs at profitable level is achieved through setting of a standard for each element of cost in an activity process. The operation of standard costing system is therefore required for accurate preparation of standard costs for effective cost control system (Lynch, 2005). This is because a change of considerable importance in recent years is the realization that the struggle to determine the cost of products is usually very much rewarding if a well-established standard costing system is in place in an industrial environment. Most companies therefore set standards for and thereafter control the performance of their business operations. The techniques of standard costing helped in the attainment of such goals as to cost determination and profit estimation ().

CIMA as cited in Adeniji (2009), defines standard costing as the planned unit cost of the products, components or service produced in a period. Standard costing involves the setting of acceptable or expected level of costs for various activities, measuring actual cost of activities as they unfold, comparing actual cost with those predetermined and taking corrective action where necessary. ICAN (2006) also states further that the setting of standard costs for comparisms with actual costs will employ budgetary control and standard control tools.

Standard costing is therefore a method of ascertaining how much costs should be, and analysing the causes of variations between how much they are and how much they should be. It is equally regarded as a scientific method of developing a comprehensive series of cost standards to cover the activities of a business of comparing actual costs against cost standards in such a way that the causes of variations are revealed in full details, and of combining the variations to form a complete statement of profit and loss. The Accounting Tools (2015) opined that most companies don't use standard costing in its original application of calculating the cost of ending inventory, it is still, however useful for a number of other applications. Some of the uses which were highlighted in the Accounting Tool 2015 include: budgeting, inventory costing, overhead application and price formulation. Nearly all companies have budgets and many use standard costing calculations to drive product prices, so it is apparent that standard costing may still continue to be relevant in the foreseeable future (). In particular, standard costing provides a benchmark against which management can compare actual performance.

The relevance of standard costing in cost minimization and of course in profit measurement and maximization could also be salutary. This is because the overall objective of any business is to realise adequate profit. Profitability can be achieved basically in two ways; the maximization of revenue and the minimization of operating costs. Likert and Seashore (1998) argued that cost minimization is the only means through which profit is maximized rather than the maximization of revenue. It is also argued that most of the decisions made by management hinge on cost incurred for various activities. If profit is to be realised through cost minimisation, then it is pertinent that management of such firm must 'put in place control variables that would reduce the volume of operating costs.

However, despite all the advantages as stated above yet some companies are opting out of standard costing usage in cost evaluation in their various establishments, Today, however, there is a debate about the future of the value relevance of standard costing as means of industrial cost control. Indeed some academicians assert that this method is inappropriate in a modern industrial set up and environment (). Their argument is that standard costing may no longer meet the needs of modern day business as a result of the introduction of Advanced Manufacturing Technologies (AMT) such as Balanced Score cards (BSC), Activity Based Costing (ABC), Target Costing (TC), Just In Time (JIT), Total Quality Control (TQC), Shorter Product Life Cycles (SPLC), and in the face of decreasing emphasis on the labor cost in relation to the total production costs and intense global competition. These are the positions of writers such as Drury, 1999; Hilton, 2001; Joshi 2001, and Kaygusuz, 2006.

Consequently, this study is set out to assess the extent of usage of standard costing for cost control among manufacturing firms in Nigeria. Again, the implication of the application of standard costing on their cost of production ia an important area that requires assessment. Some empirical studies Larry (2015); Marie &Rao 2010) among others have been conducted around standard costing usage in the past focused more on the overall performance of the organizations using standard costing. This approach might over shadow the assessment of standard costing on cost control since organization performance entails many variables. The study will assess the value relevance of standard costing in cost control among Nigerian manufacturing firms by providing answers to the following research questions

Research Questions

- (i) What is the extent of usage of standard costing among manufacturing firms in Nigeria?
- (ii) What are the factors that account for the continue application of standard costing in cost control by the manufacturing firms?
- (iii) What is the impact of standard costing on cost of production of the manufacturing firms?

Objectives of the study

The major objective of the study is to investigate the value relevance of standard costing in cost control among manufacturing firms in Nigeria. Other sub objectives the study hopes to achieves are:

- (i) Examining the extent of usage of standard costing among the Nigerian manufacturing firms
- (ii) Determination of factors that account for continuous usage of standard costing among the manufacturing firms
- (iii) Assessing the impacts of standard costing on cost of production of the manufacturing firms

Scope of the study

The study focuses on the Nigerian manufacturing sector been the major sector of the economy where standard costing is widely in use. Also the sector has been shown to have diverse methods of performance evaluation. Therefore it is a suitable sector where the acceptability of standard cost as performance evaluation strategy can be assessed.

2. LITERATURE REVIEW

Barbole (2013), studied the impact of cost control and cost reduction techniques on manufacturing sector in Indian using descriptive statistics. The result revealed that the cost control and cost reduction are the activities necessary for ensuring objectives are fulfilled.

Adeniyi (2014), examined the standard costing and competitive advantage in the manufacturing industry using ANOVA. The result revealed that standard costing enhances cost advantage and quality advantage in competitive manufacturing industry, despite some teething problems encountered by firms in adopting the techniques.

Barbole (2013), examined the impact of cost control and cost reduction techniques on manufacturing sector in Indian economy applying survey method. The study revealed that for a business enterprise to survive, grow, and prosper. Cost Control and Cost Reduction are the activities necessary for ensuring objectives are fulfilled.

Emengini (2014), product cost management in relation to Activity-Based costing (ABC) by manufacturing companies in a developing country like Nigeria using student's t-test and Multivariate analysis variance (MANOVA). The study revealed that the product cost management through application of ABC and traditional costing is geared towards cost reduction and are good strategic cost techniques in controlling cost.

Lasisi and Nuhu (2015) examined the importance of cost control and the various cost control method used and their impact on the survival of Nigeria firms. The result revealed that

70% of the respondents were of the view that cost control has greatly helped in boosting profitability in the company and 13.3% were undecided while 16.7% disagreed. Seventy nine percent of those discussed with, strongly agree that cost management has boost the profitability of the company while 7% disagree and 14% undecided.

Ayodele and Alabi, (2014) investigated the effect of cost control using standard costing on building projects delivery in Nigeria by applying percentage. The study revealed that bill of quantities and other cost control techniques was utilizes on government building contracts while none of the cost control techniques was utilized by private developers.

Summary of empirical literatures and identification of gaps

The review of literature is an indication that there are few studies on impact of standard costing on cost of production of te manufacturing firms. Notwithstanding, the reviewed literature also indicates that standard costing is still in vogue as cost and performance evaluation methods in the manufacturing industry. The most common feature of the literatures reviewed is there focus on the effect of standard costing on performance or survival of the manufacturing industry which might not be able to expose the direct effect of cost of production sine many of them used financial performance indicators such as profit and earnings ratios. Again the few that investigated standard costin and cost reduction used another case study that is different from the manufacturing industry Ayodele and Alabi, (2014). Consequently, this is an indication that there exists some gaps in the literature in terms of investigating the effect of standard costing on cost of production of the manufacturing firms which has been described as one of the most relevant ways of assessing the value relevance of standard costing.

3. METHODOLOGY

This chapter therefore, describes the methods, approaches and designs in details, highlighting those methods used throughout the study and justifying the relevance of each approach and design, taking into account its practical applicability to the research.

Research Design

The design for this research work is approached with special emphasis on the population of the study, the sampling techniques, the instrumentation and the methods of analysis. This study is ex-post factor in nature. Furthermore, the study set out to examine the value relevance of standard costing in controlling cost of production among manufacturing firms in Nigeria. However, both secondary and primary sources of data will be explored.

Instrumentation for the Study

Questionnaires will be used to collect responses from relevant workers in the manufacturing firms selected for the study. The questionnaire will be developed by the researcher based on ideas about the usage of standard costing techniques in evaluating performance of the firm as well as appraisng general individual sub units in the manufacturing firm. The questionnaire to be used for the study will consist of five component parts.

The first part consists of questions delve on the background of the manufacturing firm. The years of incorporation, the sub sector it belongs, the staff strength, numbers of managers, the address among others will be included here. The section B of the questionnaire contains questions on the dependent variables. This aspect includes questions on usage and relevance of standard costing in the manufacturing firms. Section C of the questionnaires contains questions on other techniques that are alternative to standard costing which are premised on advanced

manufacturing technology AMT. it includes questions such as usage of just in time JIT, activity based cost management ABCM among others. Section D contains questions on the determinants of standard costing usage in the manufacturing firms in Nigeria. Some pertinent questions are asked here such as the possession of ERP system built for manufacturing and categorization of the company to cost centers among others.

Section E of the questionnaire delve on the Ratings of the assessment of value relevance of standard costing in Nigeria manufacturing companies. Questions such as the level of usage as well as the degree of practice of standard costing among others are asked here

Instrument scoring Scale

The scale of response on the questionnaire will tilt towards the nature of estimating techniques to be used for the study. Majorly logistic regression is hoped to be used to achieve most of the objectives therefore the dependent variable will be coded in binary format. That is, YES or NO response will be more appropriate for scoring the response to the questions that address the dependent variables.

However, for the questions that address the independent variables, descriptive statistics will be employed coupled with the fact that they will also be included in the logistic analysis. Apart from questions that will require specific answers like years of incorporation, numbers of staff etc, scales for other questions will take the following form: strongly Agree, Agree, Undecided, Disagree, Strongly Disagree. The calibrations for the positive items will be such that they will be scored: 5, 4, 3, 2 and 1. The negatively structured items were scored as follows: 1, 2, 3, 4, and 5. Depending on the way the questions are framed.

Validity and Reliability

The authors intend to adopt a method of checking the validity, reliability and consistency of our instrument and questions by including a few extra questions to respondents which deem essential for the study. The authors will use a technique of putting in two roughly equivalent or closely related questions but well separated in the questionnaire. With this, it will be possible to measure the consistency of answers. The authors will also adopt the split ballot technique by constructing two parallel forms of questionnaires that will be used with equivalent samples of our population. The two forms will have some of their questions in common, but certain other questions will be worded in different ways in order that the effects of the differences may be measured. At the end of this exercise, the authors will be able to reexamine and revise some of the questions and their sequence drawing from the results of our technique above as well as outside criticisms.

Sample Selection

Since it is not possible to cover all the staff in the 26 organization, tentatively an average of 10 relevant staff per organization is targeted particularly those in the accounting department since there is no available information on the total number of staff in the accounting departments of the 26 organizations. This gives a population total of 260 expected respondents. The famous Yamane technique sample selection techniques will be adopted by the study. The calculation of the sample size will be done as follows:

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

Where n = the sample size

N = the population size =260

e = acceptable sampling error

* 95% confidence interval is assumed (p=0.5)

By substitution in the formula

$$n = 260 / (1 + 260[0.05]^2), \quad n = 260 / 1.65, \quad n = 158 \text{ sample size}$$

The implication is that a total of 158 staff from the 26 organizations constitutes our sample size.

Model specification

Cost of production of the manufacturing firms is an important variable through which the value relevance of standard costing can be examined (Marie &Rao 2010). Consequently, the hypothesis to be tested here are H0: standard costing does not have significant impact on the cost of production of the manufacturing firms and H1: standard costing has significant impact on cost of production of the manufacturing firms. Here, total cost of production of the firms is the dependent variable and the model is stated thus:

$$C_{i,t} = f(msci) \dots \dots \dots (2)$$

Where, $C_{i,t}$ is the total cost of production of firm i at period t and as usual, the msc refers to the measures of standard costing (input variables). These are the independent variables. The input variables that measured with standard costing are cost of raw materials, labour cost and overhead expenses. Explicitly, the model is presented as follows:

$$C_{i,t} = \beta_0 + \beta_1 RM + \beta_2 LC + \beta_3 OVEX + \mu \dots \dots \dots (3)$$

As described in the instrumentation, responses to questions that are relevant to value relevance of standard cost in total cost of production are used as $C_{i,t}$. Also responses to questions that are relevant to influence of standard cost on the basic inputs like raw material, labour cost and overhead expenses,

Data Analysis Techniques

The data to be collected through responses given in the questionnaire personally delivered will be analysed through the use of both descriptive and inferential methods of analyses. The descriptive statistics includes: cross tabulation and simple percentages while the inferential statistics will be: Pearson’s correlation matrix which will be used to seek relationships between study variables and Multiple Regression which will be used to find out the variable with most influence on the dependent variables and ANOVA which will be used to find differences in the respondent because ANOVA test is used to determine the impact independent variables have on the dependent variable in a regression analysis.

Sources of data

Both primary and secondary data are used in this study. Questionnaires are used to elicit information from the relevant staff in the organization on value relevance of standard costing in cost of production of the firms. Also data on production cost of goods as overhead expenses of the firms are extracted from their annual reports of relevant years.

4. RESULTS AND DISCUSSIONS

Introduction

This section of the paper explains the empirical results and interprets them accordingly. The first focus of the study is to assess the extent of usage of standard costing in the manufacturing industry in Nigeria.

Extent of usage of standard costing in the Nigerian manufacturing sector

One of the objectives of this study is to investigate the extent of usage of standard costing among the manufacturing firms in Nigeria. Firstly a total of 158 questionnaires were distributed,

according to the sample size obtained but 152 respondents completed and returned the questionnaires, out of the 152 questionnaires returned 147 of them stated explicitly that standard costing is in use in their companies. This is an indication that standard costing is still widely accepted as a means of performance evaluation among the manufacturing firms in Nigeria. However, among the 147 respondent we sought to investigate the extent of usage of standard costing in their various companies through their responses to some questions.

Table 1. Response to the question; When was your company developed standard costing techniques?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	At the inception of the company	36	24.5	26.3	26.3
	Long after the company had started operations	101	68.7	73.7	100.0
	Total	137	93.2	100.0	
Missing	10	9	6.1		
	System	1	.7		
	Total	10	6.8		
Total		147	100.0		

Source: Field Survey, 2017

From table 1, it showed that 101 respondents which represent 68.7% submitted that the company adopted the usage of standard costing techniques long after the inception of the company. While, 36 respondents which represent 24.5% indicate that standard costing has been in use in their companies at the inception. The implication of this result is that standard cost is widely in use among these manufacturing firms.

Table 2. Response to the question; To what extent have these standards been developed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not well developed	1	.7	.7	.7
	fairly developed	2	1.4	1.4	2.1
	Well developed	63	42.9	43.4	45.5

	Very developed	well	79	53.7	54.5	100.0
	Total		145	98.6	100.0	
Missing	11		2	1.4		
Total			147	100.0		

Source: Field Survey, 2017

The table above which shows the perception of the respondents as to what the extent the standard costing techniques has been developed. The result shows that 142 respondents which represents 96.6% are in support of that the standard cost is well developed while just 3 respondents which represent 2.1% believed that standard cost is not well developed in their companies.

Assessing the value relevance of standard costing

The response rates to the questions of value relevance of standard costing as it affects total cost of production, raw material costs, labour costs and overhead costs of the manufacturing firms are presented in the following tables.

Table 3 :value relevance of standard cost in reduction in cost of production

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	3	2.0	2.0	2.0
	disagree	5	3.4	3.4	5.4
	indifferent	10	6.8	6.8	12.2
	agree	94	63.9	63.9	76.2
	strongly agree	35	23.8	23.8	100.0
	Total	147	100.0	100.0	

Source: Output of Author’s Data Analysis (2017)

The table above indicates that about 129 of the total 147 respondents representing about 87% of the respondents’ agree that standard cost application is very relevant to cost of production in the manufacturing firms. The implication of this result is that majority of the firms believes that application of standard cost to cost evaluation in their firms has contributed immensely to cost minimization in their various organizations. This is an indication for the strong support for the usage of standard cost in cost evaluations of these firms.

Table 4: reduces the cost of raw materials

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid strongly disagree	7	4.8	4.8	4.8
disagree	30	20.4	20.5	25.3
indifferent	2	1.4	1.4	26.7
agree	34	23.1	23.3	50.0
strongly agree	73	49.7	50.0	100.0
Total	146	99.3	100.0	
Missing System	1	.7		
Total	147	100.0		

Source: Output of Author’s Data Analysis (2017)

The responses statistics presented on table 4 are indications that 107 out of 147 respondents agree that application of standard cost reduce raw materials expenditure in their firms. This represents about 70% of the total respondents. The result further implies that standard cost is relevant in minimizing the cost of raw materials used in the organizations.

Table 5:reduces the cost of labour

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid strongly disagree	10	6.8	6.8	6.8
disagree	64	43.5	43.8	50.7
indifferent	62	42.2	42.5	93.2
agree	8	5.4	5.5	98.6
strongly agree	2	1.4	1.4	100.0
Total	146	99.3	100.0	
Missing System	1	.7		
Total	147	100.0		

Source: Output of Author’s Data Analysis (2017)

The responses presented in table 5 shows a clear departure from what we obtained in the two previous tables. The results show less support for usage of standard cost in wages and salaries evaluation. Just 7% of the respondents agree that standard cost is relevant in labour cost reduction. The perspectives of the respondents are that standard cost is not important in reducing labour costs in terms of wages and salaries. About 93% of the respondents do not agree that

standard cost is relevant in minimizing labour cost in their organizations

Table 6: reduces overhead expenses

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid strongly disagree	15	10.2	10.3	10.3
Disagree	13	8.8	8.9	19.2
Indifferent	3	2.0	2.1	21.3
Agree	59	40.1	40.4	61.6
strongly agree	56	38.1	38.4	100.0
Total	146	99.3	100.0	
Missing System	1	.7		
Total	147	100.0		

Source: Output of Author's Data Analysis (2017)

The response rate to the value relevance of standard cost in overhead cost reduction is displayed in table 6. It shows another support for the application of standard cost in the firms in the area of overhead cost reduction. The result shows that 78% of the respondents agree that application of standard cost brings about reduction in overhead costs of the manufacturing firms. This is a support for continuous usage of standard cost in overhead cost evaluation and analysis of the firms.

Presentation of the regression results

Table 7: Relationship between value relevance of standard cost and cost of major inputs

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.813	.299		12.757	.000
	material	.046	.001	.048	.562	.005
	labour	.244	.123	.234	1.986	.079
	overheads	.098	.007	.108	.919	.001

a. Dependent Variable: cost

Source: Output of Author's Data Analysis (2017)

The results on table 5 shows that the decision of the majority of the respondents to agree that standard cost is very relevant to cost minimization in the firms is strongly influenced by the effects of standard cost in raw material and overhead cost minimization. These are the two

variables that influence their decisions to support the continuous usage of standard costing in the firms. However, wages and salaries control appear not to be an important motivation for the continuous usage of standard cost among the firms. This is because its coefficient is not statistically significant.

Table 8 Model summary

Model Summary^b							
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
3	1.346 ^a	0.863	0.769	0.712112	.357	3.218	3

Model Summary^b			
Model	Change Statistics		Durbin-Watson
	df2	Sig. F Change	
1	134 ^a	.000	2.41213

a. Predictors: (Constant), overheads, material, labour
 b. Dependent Variable: cost

Source: Output of Author's Data Analysis (2017)

The results on table 6 confirmed the explanatory power of the independent variables as very high. The R square is 0.863. This is an indication that raw material costs, overhead costs and labour cost account for about 86% systemic change in the decision of the respondents to agree that standard cost is relevant in cost minimization. The durbin Watson statistics of 2.412 is an indication that there is no problem of autocorrelation in the estimated model. Therefore the estimated model is reliable.

Table 9: ANOVA^b

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	18.278	3	3.174	3.218	.029
	Residual	52.096	35	.948		
	Total	70.374	40			

a. Predictors: (Constant), overheads, material, labour

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	18.278	3	3.174	3.218	.029
Residual	52.096	35	.948		
Total	70.374	40			

b. Dependent Variable: cost

Source: Output of Author's Data Analysis (2017)

The results of the analysis of variance indicate that the standard cost model is statistically significant. In other words the model that describes the value relevance of standard cost in cost minimization is significant, this shows that the three independent variables have joint significant impact on their decision to agree that standard cost application to cost evaluation in the manufacturing firms is efficient. In other words, raw material cost, labour cost and overheads cost are strong determinants of efficiency of standard cost application in these manufacturing firms.

5. CONCLUSIONS AND RECOMMENDATIONS

The study has examined the relevance of standard costing in cost control among some manufacturing firms in Nigeria. From the empirical findings, it indicates that many of the manufacturing firms are still applying standard cost techniques to evaluate costs in their organizations.

Again, it can be concluded that the decision of the firms to continue to apply standard cost is the effect it has on raw material cost control and overhead cost control. It is clear from the results that all the firms that are still applying standard cost techniques in the area of cost control are motivated to continue using it despite the emergence of some new techniques is largely because its application brings about reduction in raw material cost as well as labour cost.

Again, it appears that the firms are still not applying standard cost to labour cost evaluation very well though few of them agree that standard cost is also applicable to labour cost evaluation and that it helps to cut excessive labour cost however this is not a significant factor that influence their decision to continue to use standard cost especially for cost control.

Major recommendation for this study is the manufacturing firms should not completely jettison the usage of standard cost for cost control in their organizations since it has been shown to be effective in controlling cost. Also, the manufacturers are also advised to find a means of applying standard cost to personnel cost evaluation since studies outside the country have shown that some manufacturing firms use standard cost to obtain optimum personnel cost.

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