Activity Based Costing and Product Pricing Decision: the Nigerian Case

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Abstract: This paper examined activity based costing and product pricing decisions in Nigeria so as to ascertain whether activity based costing have the ability to enhance profitability and control cost of manufacturing firms. Towards this end, a multiple correlation and regression estimation technique was used in analyzing the data obtained in the study. The study found that activity based costing affects product costing and pricing decision. In addition, the results showed that improved profitability and cost control can be achieved by implementing activity based costing approach by manufacturing firms. The implication is that traditional costing approach fails in many pricing situations by arbitrarily allocating indirect cost and activity based costing helps in allocating indirect cost accurately. Thus, it was recommended amongst others that activity based costing need to be practiced, maintained and implemented by manufacturing firms since it has a broad range of uses for a wide variety of company functions and operations in the area of process analysis, strategy support, time-based accounting, monitoring wastage, as well as quality and productivity management.

Keywords: Activity Based Costing; Traditional Costing; Manufacturing Firms; Nigeria

JEL Classification: D4

1. Introduction

There are vast literatures in management accounting that offers many paradigms of big companies that have given up traditional methods and applied a new method known as 'Activity-Based Costing' (ABC). These business firms have discovered that many products that are manufactured generate losses and not profits due to the phenomenon that traditional costing arbitrarily allocates indirect cost. Cooper and Kaplan (1998) opine that activity based costing is used as a tool for understanding product cost and profitability based on the production or performing processes by manufacturing firms. This paper contends that activity based costing approach captures the economies of the production process more closely and accurately than traditional costing system, thereby providing more "precise" cost data for business firms. Additionally, activity based costing has predominantly been used to support

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strategic decisions such as pricing decision, outsourcing, identification and measurement of process and improvement initiatives. Thus, the focus of this study is basically on one aspect of strategic decision – 'pricing decision' of products. Towards this end, this study examined activity based costing and product pricing decision in the manufacturing industry of Nigeria. The remaining part of this paper is divided into four (4) sections: 2.Review of Literature, 3.Methodology, 4.Results and Discussion and 5.Conclusion and Recommendations.

2. Extant Literature

Several studies have examined activity based costing and product pricing decision in different countries with diverse techniques. The diverse techniques of investigation have yielded dissimilar results, sometimes sharply dissimilar, sometimes modestly. In developing economies like Nigeria, such issues have not been vastly explored in the management accounting literature. The reason for this could be that many big manufacturing firms believe that traditional costing system is still the best as compared to activity based costing system. For instance in a study by Hutton et al. (1996), they found that many cost reduction programs carried out in an activity based costing environment are inappropriate for manufacturing firms. Contrarily, a survey study by Krumwiede (1998) of some manufacturing firms in U.S. found evidence that the direction and level of importance of activity based costing varies by stage due to many factors. The study showed that a high quality information system may lead to rejecting activity based costing before adoption or abandoning it after implementation has started. Bromwich and Hong (1999) studies showed that without activity based costing; the cost systems give correct signals in decision making, such as in pricing, in altering the product portfolio, in make or buy and outsourcing decisions and in cost management. Furthermore, Marinus and Bouwman (2002) investigated the improvement in financial performance that is associated with the use of Activity-Based Costing and the conditions under which such improvement is achieved. Confirmatory factor analysis and structural equation modeling technique were used to investigate the relationship between ABC and financial performance. The study found that internal auditors furnish information regarding company financial performance, extent of ABC usage, and enabling conditions. Innes et al. (2000) assessed the changes which have occurred in the ABC adoption status of companies over a recent five year period in two UK manufacturing firms. The study showed that for the ABC users, some comparative information is provided on the nature of the ABC systems in use, their designers, the uses to which they have been putting and the levels of success and importance which participants attribute to them are of significant value to manufacturing firms. Thus, ABC significantly affects product pricing decision.

Roztocki (2001) examined the use of the Integrated ABC-and-EVA Information System for the management of new technology projects. The study found that there are advantages associated with integrating Activity Based Costing with Economic Value Added, especially in measuring financial performance. In addition, the study showed that activity based costing and economic value added has positive impacts on project costing. Kerr and Larson (2002) investigated whether ISO and activity based costing are two useful tools for logisticians. The study found that relatively few firms are using both ISO and ABC. They suggested that practicing logisticians view ISO and ABC as separate initiatives. In addition, the study showed that both of these tools can support efforts to improve customer service and/or reduce total costs. Bjornenak and Mitchell (2002) analyzed activity based costing literature which has been accumulated in the UK and USA accounting journals over the fourteen year period since the first articles on ABC emerged. The evidence used both longitudinal and cross-sectional approach to gain insights into how ABC started, how it has been communicated, how it has been researched, how it is constituted, how it has generated attention and how it has developed and changed. The study found that activity based costing is better off than traditional costing method practiced by manufacturing firms.

Roztocki and Weistroffer (2005) proposed a framework for evaluating information technology investments, integrating value chain analysis with activity-based costing and fuzzy logic. The study proposed method that is particularly useful for businesses in emerging economies, where an uncertain economic environment is often combined with a lack of dependable, historical accounting data. The study found that activity based costing is useful for businesses in emerging economies. Feridun and Al-Khadash (2006) investigated the link between the practice of Activity Based Costing, Just-in-Time and Total Quality Management as strategic initiatives and improvement in corporate financial performance of 56 industrial shareholding companies in Jordan. The study found that 26.8% of the companies used at least one of the strategic initiatives. The awareness level of the importance of using the strategic initiatives is found to be significantly high among financial managers, but such awareness is not reflected in the implementation of these initiatives.

Askarany et al (2007) studies explored the implementation level of activity based costing as compared to traditional based costing system for the past two decades. The study found that the level of implementation of ABC is still lower than those of traditional management accounting techniques. The study concluded that traditional management accounting techniques are unable to satisfy the users of such techniques in terms of providing them with timely and detailed information. Askarany and Yazdifar (2007) used the results of two survey studies to explore the most important contextual factors influencing the implementation of activity based-costing across firms. The finding suggests that the relatively low implementation of

ABC across firms implies that decision makers remain unconvinced whether ABC's advantages supersedes traditional costing techniques to an extent that is high enough to pursue them to implement ABC in practice.

Anand et al. (2005) studied activity-based cost management practices followed by India firms. The aim is to understand whether India firm practices cost management in a value-chain analytic framework. The study found that firms who have adopted ABC were significantly more successful in capturing accurate cost information for value chain analysis and supply chain analysis vis-a-vis the firms who had not adopted ABC. Sharma and Gupta (2010) studies signified that in the present scenario of cut-throat competition, both on price and quality, increasing consumer demands and product differentiation, the traditional costing system has become obsolete and even have led to strategic failures in many organizations when various costs especially the overheads, are incorrectly allocated to product lines. Their study showed that activity-based costing is a definite improvement over the traditional methods on the premise that the costs are allocated on the basis of activities rather than products and it can effectively contribute to the top managerial decision-making process. Askarany et al. (2012) applied the innovation diffusion theory to examine organization size, industry and location on the decision to adopt activity based costing. The results revealed that organizations are more likely to adopt ABC when they attach a high level of importance to the relative advantages offered by innovations, are large. The thoughts in the management literature are that of the superiority of activity based costing over traditional costing vice-versa. Moreover, empirical evidence suggests that there are relatively few cases of research on activity based costing and product pricing decision in emerging economies like Nigeria. However, this present study tried to take a stand towards ascertaining whether activity-based costing have the ability to capture accurate data that can influence product costing, pricing decisions, enhanced profitability as well as improvement in cost control of manufacturing firms in Nigeria.

3. Methodology

This study was carried out in Nigeria to see whether activity-based costing have the ability to capture accurate data that can influence product costing, pricing decisions, enhanced profitability as well as improvement in cost control of manufacturing firms. The study is designed to follow a quantitative method.

3.1. Method of Data Analysis

In order to ascertain the effect of activity based costing on product pricing decision of manufacturing firms in Nigeria, a multiple correlation and regression analysis

were employed. The analysis was done via the Statistical Package for Social Sciences (SPSS). Data was collected from primary source (questionnaire).

3.2. Model Specification

The empirical model in this study takes product costing, pricing, profitability and cost control as the independent variables and activity based costing as dependent variable. The empirical model of the study is given as:

$$\mathbf{ABC_i = \beta_0 + \beta_1 PCP_i + \beta_2 PROF_i + \beta_3 CM_i + U_t}$$

Where:

ABC_i = Activity Based Costing
PCP_i = Product Costing and Pricing
$PROF_i$ = Profitability
CC_i = Cost Control
U_t = Error Term
$\beta_0, \beta_1, \beta_2, \beta_3$ = Regression coefficients

4. Results and Discussion

This section presents the results from the SPSS Software. The analysis were done in sections, first was the descriptive statistics, followed by correlation analysis. The regression analysis concludes this section.

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Dev.
PCP_1	517	2.00	4.00	3.8790	1.2993
PCP_2	517	1.00	4.00	3.1091	1.1848
$PROF_1$	517	1.00	4.00	3.2994	1.4949
$PROF_2$	517	1.00	4.00	3.5122	1.4040
CC_1	517	4.00	4.00	4.7019	1.0484
	517	1.00	4.00	4.5133	1.8484
CC_2	517	4.00	4.00	3.5029	.58484
	517	1.00	4.00	3.5551	.74848
ABC_1	517	3.00	4.00	4.7019	.75875
ABC_2	517	2.00	4.00	3.4921	1.0303
ABC_3	517	1.00	4.00	3.9991	.91920
ABC_4	517	1.00	4.00	4.3202	1.3030
ABC_5	517	2.00	4.00	4.0230	1.0030
ABC_6					
ABC_7					

Source: SPSS Output

From table 1 above the minimum value of the mean for the dependent variable of activity based costing is 3.1 with a standard deviation of 1.18 and the maximum value of the mean is 4.7 with a standard deviation of 1.05. This positive high mean value indicates that most respondents agree that activity based costing enhances product costing and pricing decisions. In addition, the mean and standard deviation for the independent variables (product costing and pricing, profitability and cost control) were with seven items on five point Likert scale. Since the mean score for all the seven items is greater than 3.0, it could be argued that activity based costing enhances product costing and pricing decisions.

Table 2. Pearson Correlation

		ABC_i	PCP_i	$PROF_i$	CC_i
ABC_i	Correlation	1			
	Sig. (2-tailed)				
	N	517			
PCP_i	Correlation	.195	1		
	Sig. (2-tailed)	.087			
	N	517	517		
$PROF_i$	Correlation	.378**	.382*	1	
	Sig. (2-tailed)	.003	.015		
	N	517	517	517	
CC_i	Correlation	.657	.387**	.437**	1
	Sig. (2-tailed)	.000	.001	.004	
	N	517	517	517	517

Source: SPSS Output

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the .005 level (2-tailed).

The table below shows the results of the Pearson correlation analysis among the variables. From table 2, of the total of three explanatory variables tested in this study, there is a significant correlation between the three of the independent variables (product costing and pricing, profitability and cost control) and the dependent variable (activity based costing). The correlation between product costing and pricing and activity based costing has a very week value. Based on the results in the table above, there are positive relationships between activity based costing and most of the independent variable; these shows that most of the variables used in the model are supported.

Table 3. ANOVA Result (Goodness of Fit Statistic)

Model		Sum of Squares	df	Mean Square	F.	Sig.
1	Regression	19.246	7	4.840	77.341	.000[a]
	Residual	23.424	510	.447		
	Total	27.423	517			

Source: SPSS Output

a. Predictors: (Constant), PCP, PROF, CC

b. Dependent Variable: ABC

The multiple regression analysis was used to examine whether one or more independent variables influence the variation on dependent variable. The functional relationship between variables in this study is therefore, activity based costing as a function of product costing and pricing, profitability and cost control. However, to show how well the model containing those of three explanatory variables actually explains the variations in the dependent variable, i.e. activity based costing, it is necessary to test it through goodness of fit statistics. In table 3 above, it is observed that the independent variables give a significant effect on the dependent variable, where f-value is 77.341 with p-value of less than 0.05 (i.e. $p<0.000$) indicating that, overall, the model used for the study is significantly good enough in explaining the variation on the dependent variable. To ensure the statistical adequacy of the model, the goodness of fit can also be measured by the square of the correlation coefficient also called R^2.

Table 4. Goodness of Fit through R Square (Model Summary)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.925[a]	.852	.743	.54312

Source: SPSS Output

a. Predictors: (Constant), PCP, PROF, CC

As shown in table 4 above, both R^2 and adjusted R^2 measure the fitness of the model i.e. they measure the proportion of the variation in dependent variable explained by the model. But since adjusted R^2 is the modification for the limitation of R^2 the value of the adjusted R^2 is considered to measure the fitness of the model. In the table above, the value of adjusted R^2 is 0.743, indicating that the independent variables in the model explained 74% variation on the dependent variables. Thus, we can understand that the model of the study is providing a good fit to the data. This outcome empirically indicates that the independent variables in this study are the major determinants of activity based costing. Furthermore, the result of the

regression model revealed that there exist a significant relationship between the independent variables and dependent variable.

Table 5. Regression Analysis on Activity Based Costing

Variables	Coefficients	t-statistic	Prob.
Constant	4.214	8.358	.000
Product Costing and Pricing	.098	2.726	.008
Profitability	.122	2.642	.010
Cost Control	.174	2.495	.015

Source: SPSS Output

As shown in table 5 above, of the three explanatory variables tested in this study, product costing and pricing (p-value=0.008), profitability (p-value=0.01) and cost control (p-value= 0.015), were statistically significant at 5 percent or lower. The result also reveals that there is a positive relationship between all the independent variables and activity based costing.

5. Conclusion/Recommendation

There is a vast literature establishing results across different countries on the effect of activity based costing on product pricing decision. This study examined activity based costing on product pricing decision of manufacturing firms in Nigeria. The conclusion reached is that activity-based costing serve as a product pricing decision tool. This is because it provides financial support data structured in a fashion fundamentally different from accounting data provided in the books of accounts. In addition, activity based costing enhances profitability and leads to improvement in cost control of manufacturing firms in Nigeria. This is because activity based costing help in tracing what initiates the costs and where to apply efforts to curb inflationary costs and this can be of particular value in tracking new products. Thus, activity based costing have effect on product pricing decision. Based on the above, it was recommended that activity based costing need to be practiced, maintained and implemented by manufacturing firms. This is because activity based costing methods have a broad range of uses for a wide variety of company functions and operations in the area of process analysis, strategy support and time-based accounting, monitoring wastage, as well as quality and productivity management. Majority of the studies have examined the effect of activity based costing on product pricing decision in different countries. Future research need to be conducted on the "Benefits and Challenges Associated with Activity Based Costing in different countries".

6. Reference

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