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IMPACT OF ACTIVITY BASED COSTING ON FIRMS' PERFORMANCE AND FIRMS' VALUE CREATION FUNCTION: THE NIGERIAN EXPERIENCE

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ABSTRACT

The advent of globalization and its attendant competitive pressures appear to imply that the more successful firms will be those that evolve strategic initiatives continually. Such strategic initiative is to reduce cost through the use of cost management techniques; and one of such technique is activity-based costing. This paper, examined the impact of the adoption and implementation of activity-based costing, as a contemporary cost management technique tool, on firm's performance using Nigerian quoted companies. The study adopted a survey methodology. Data were collected from 38 manufacturing companies with offices located in Lagos State, Nigeria using a questionnaire. The data were analyzed using Kendall t-tab correlations and regression analysis. Results obtained suggest that the adoption of activity based costing significantly influence firm's performance and that it has a significant positive relationship with firm's value creation function.

Key words: Activity based costing, Firm's performance, Firm value creation, Nigeria

Introduction

In the wake of global economic depression, business leaders and top-level managers are focusing more intently on the bottom line, redefining priorities based on current realities most of which, of course, are unfortunate. For most companies, the immediate priority is clear: implement cost reductions. The best approach usually, is reducing expenses while maintaining high level of quality and service that costumers have come to expect (Hewitt, 2009). With organisations already strapped of resources and faced with unfortunate realities such as market compression, falling stock prices and fewer growth opportunities, the challenge is to identify the reductions and investments that will yield the largest immediate savings and future returns.

IBM Corporation (2009) observed that in a

challenging economic environment, success is founded upon three things: a strong focus on value, a willingness to exploit opportunities, and the ability to act with speed. A key element of the focus on value is a pragmatic and robust approach to reducing cost. Contrastingly, Steve (2010) however, found out that many businesses see increased sales as the only route to greater profit. The active cost reduction program is usually based on one simple reason. According to Steve (2010), a company can work extremely hard to obtain one incremental dollar of revenue, which will yield a net profit of perhaps five percent but gaining that extra revenue dollar will be uncertain, and it may be difficult to attain the targeted profit. Alternatively, and using the same profit percentage, a cost reduction of one dollar would have required twenty dollars of revenue to generate. In view of this, a cost reduction is entirely within the control of a

company and far within the easy reach of firms than the pursuit of extra revenue.

Cost reduction and review programmes recognise that the reduction or removal of unnecessary costs can often contribute to bottom-line performance in a more immediate and direct way than sales effort alone. Cost reduction review programmes help companies identify unnecessary costs within their activities and develop creative and imaginative ways of reducing or removing them. Cost reduction review programmes concentrate on sustainable cost reduction that will contribute to business growth (Delmar, 2002; IOMA, 2006; McCormick, 2009). Thus, according to Cinquini and Tenucci (2006), strategic cost reduction involves making the tough choices about which cost, profit or investment centre should have investment and/or expenses reduced or eliminated. The flip side is to decide which centre should have continued or increased investment for growth. This decision is a strategic one which is meant for top management.

Strategic cost reduction is about focus (Delmar, 2002). It requires focusing limited resources on fewer segments that are determined to be good opportunities and not pursuing other opportunities that are determined to be less attractive. Strategic cost reduction reduces expenses in a focused way, improving short-term profit by reducing some major expenses and investments. It also frees up some resources to invest in the best opportunities to increase the chances of success, future growth and profits.

The modern business environment is characterised by the intensification of global competition, the rapid pace of automation and computer technology, environmental and safety issues, short product life-cycle, consumers' need for high quality and innovative products at reasonable prices. In such challenging environments, a company's survival depends among other things on its capacity to produce and market innovative products that satisfy levels of quality and price expected by its market niche (Bonzemba and Okano 1998 in Slater, 2010). Manufacturers face the difficulty of having to match the lower prices of global competitors and still offer the highest quality products customers demand.

Monplaisir, Malikane and Ojah (2009) believed that a firm's economic growth opportunities reside in strategic initiatives that differentiate products and/or reduce production costs. Consequently,

firms have traditionally pursued strategic initiatives characterized by a preponderance of either product differentiation or cost saving. The advent of globalization and its attendant competitive pressures appear to imply that the more successful firms will be those that evolve strategic initiatives continually. According to a CBN Business Survey, Anyanwu (2000) having identified high cost of production as a major threat to growth and performance sustainability, suggested that controlling production costs should be given priority attention if the performance of Nigerian manufacturing firms will be boosted. According to Anyanwu (2000), the cost reduction procedure should aim at reducing waste and optimising the use of resources. And that the adoption of strategic planning is one sure way of reducing costs and boosting productivity. This process usually begins by evaluating the organisation's current products, processes and procedures with the aim of determining its strengths and weaknesses, set new targets, and design measures to achieving the set targets. One major objective of this is to reduce cost through the use of cost management techniques; and one of such technique is activity-based costing.

This paper therefore aims at examining the impact of the adoption and implementation of activity-based costing, as a contemporary cost management technique tool, on firm's performance, using Nigerian quoted companies. To achieve this aim, the following propositions were made:

- H₀₁:** Activity-Based Costing does not have any significant impact on firm's profitability.
- H₀₂:** Activity-Based Costing does not have any significant relationship with firm's value creation function

The remaining part of the paper is structured into various sections: literature review, methodology, results and conclusion.

Literature Review

Although traditional costing systems have worked well for many decades and may continue to be useful today to value inventory and measure the cost of goods sold, however, practitioners are facing various challenges using the traditional costing systems in today's competitive environment (Zaman, 2009). As a veritable alternative to traditional costing systems, contemporary tools such as the activity-based costing (ABC) have evolved. The activity-based cost management model has revolutionized costing systems and has been described as a 'revolutionary'

cost management system that, if appropriately implemented, would enable firms to recover their competitiveness and profitability (Johnson, 1992). According to Welfle and Keltyka (2000), activity-based costing, as a strategic cost management tool, plays a vital role in that it aids cost and management accountants in a globalize world, who are now expected to be team players in such areas as product development, profitability analyses, quality process and improvements, and the evaluation of overall company performance. The activity-based costing literature (Anderson and Young, 1999; Cooper and Kaplan, 1991) argued that the potential strategic benefits from ABC arise from improved information for make versus buy, product mix, outsourcing, and other strategic decisions. The operational benefits arise from improved insight into the economics of production associated with better understanding of production activities and the root causes or drivers of costs.

The ABC approach measures the costs of objects by first assigning resource costs to the activities performed by the organisation, and then using causal cost drivers to assign activity costs to products, services, or customers that benefit from or create demand for these activities (Hornigren *et al*, 2005). ABC proponents contended that this approach captures the economics of the production process more closely than traditional unit-based cost systems, thereby providing more accurate cost data (Cooper and Kaplan, 1991). Garrison and Noreen (2006) claimed that activity based costing systems provide detailed information on the value-added and non-value-added activities performed by the organisation, the costs associated with these activities, and the drivers of activity costs. This information allows managers to reduce costs by designing products and processes that consume fewer activity resources, increasing the efficiency of existing activities, eliminating activities that do not add value to customers, and improving coordination with customers and suppliers.

In contrast to claims by ABC proponents, analytical studies suggest that the cost data provided by ABC systems need not be more accurate than the costs reported by traditional unit-based systems. Noreen (1991), for example, demonstrated that ABC systems only provide relevant costs for decision-making if the linear and separable cost function assumptions embedded in ABC are accurate. Datar and Gupta (1994) in Ittner, Lanen and Larcker (2002) showed that

improving the specification of cost allocation bases and increasing the number of cost pools in ABC systems can actually increase product cost measurement errors. Bromwich and Hong (1999) however added a caution that the desirability and ability of ABC procedures to produce relatively accurate cost estimates varies with competitive markets, input markets and the organisation's underlying technology, and concluded that ABC systems are only preferred under specialized conditions. This conclusion aligns with the finding of Liaquat (2006). Liaquat (2006) carried out an empirical study to find out the application of contemporary management accounting techniques in Indian. The focus of the study was to find evidence on how widely traditional and contemporary management accounting practices were adopted by Indian industry. The investigations revealed that improvement of overall profitability and cost reduction were the motivating factors for using management accounting in Indian companies. The researcher found a positive association between the adoption of ABC and company characteristics (e.g. degree of customization, pressure of competition, business size, and proportion of overhead to total cost). Hence, the study concluded that the application process of ABC and other cost management systems should take into consideration such contingent factors as organisation's underlying technology, competitive pressure and complexity of production.

Ajibolade (2008) examined the relationship between sophisticated MAS designs (such as Activity Based Costing and Balanced Scorecard) and performance. The study, comparing the means of companies employing less sophisticated MAS designs and those employing highly sophisticated designs revealed that the companies' performance index of companies employing less sophisticated MAS was found to be different from the performance of companies employing more sophisticated systems. This difference was found to be statistically significant, hence a positive and strong correlation ($r = 0.626$ at $p = 0.01$) was observed between MAS designs and performance.

Isa and Thye (2006) examined the usage of management accounting practices in manufacturing firms in Malaysia. They also studied the relationship between product variety, complexity of production process, level of competition, company size, overhead expenses and usage of advanced management accounting practices. Significant

positive relationships were indicated between line production process (least complex) and advanced management accounting techniques and also between job shop order (most complex) production process and traditional management accounting techniques. A major highlight of the findings of Isa and Thye (2006) is the contradiction in the notion that usage of advanced management accounting techniques is related to the more complex production processes as established by different studies (for example, Malik, Saif, Anjum and Hassan, 2011). Advanced management accounting techniques (AMATs) usage was also found to be significantly and negatively related to perceived competition. In contrast to Cooper and Kaplan (1991); Welfle and Kelyka (2000), the result implied that usage of AMATs does not necessarily correlate with higher level of perceived intensity in market competition. In fact, the negative coefficients suggested low usage of AMATs as perceived competition increased.

Based on the examination of responses conditional on ABC-adoption, Anand *et al* (2004) revealed that firms that adopted ABC were significantly more successful in capturing accurate cost information for value chain analysis and supply chain analysis vis-à-vis firms who had not adopted ABC. Ittner *et al* (2002), using a large sample of manufacturing plants, also established a modest evidence that ABC usage is positively associated with manufacturing performance. On average, extensive ABC usage is associated with higher quality levels, greater decreases in cycle time, and larger increases in first pass quality and is indirectly associated with manufacturing cost reductions through quality and cycle time improvements. However, Ittner *et al* (2002) observed that extensive ABC use has no significant association with return on assets. Instead, weak evidence exist, that the association between ABC and accounting profitability is contingent on the plant's operational characteristics.

Anand *et al* (2004) found out that the extent of ABC adoption in the service sector had not been found significantly different from that in the manufacturing sector. Adler *et al* (2000) conducted a survey that asked management accountants, in New Zealand manufacturing businesses, to indicate the techniques adopted in their business. While many studies have focused on particular techniques such as ABC or target costing, Adler *et al* (2000) provided a questionnaire that included a

vast array of management accounting techniques to provide a fuller set of response options. Traditional management accounting techniques, such as full costing, direct costing and standard costing were found to be used more often than advanced management accounting techniques, such as strategic management accounting. The study by Adler *et al* (2000) is generally consistent with the lack of adoption of advanced management accounting techniques as stated by the Ainikkal (1993), but inconsistent with (Zaman, 2009) study, where it was found that firms in Australia adopted ABC, and cost of quality techniques and also that big firms were more likely to use modern accounting techniques. Zaman (2009) undertook a study which looked into the impact of Activity Based Cost Management on Austrian firms found from a regression model developed, that ABC as measures of strategic cost allocation method, increased efficiency, and increased effectiveness and have positive and significant effect on overall firms' performance in Australia.

Drury, Braund, Osborne and Tayles (1993) found that ABC was widely considered, but not used extensively. Standard costing, payback analysis, and target profit and return on investment were widely used. Management accountants still appeared concerned with product costing and profitability. Krumwiede (1998) reported the activity-based costing adoption status and factors affecting its success. Krumwiede's study, unlike many other research findings which tilted towards lower adoption, revealed a reasonably high adoption status for activity-based costing. 49% of the respondent firms had adopted the activity-based costing systems. 25% of the non-adopting companies were considering its introduction in their organisation. Only 5% of the respondent firms had rejected it after careful examination.

Swenson and Barney (2001), in a survey of 166 users of ABC costing, reported that most adopters used ABC to improve product costing, to assist in cost reduction, and to better assess the profitability of its products and customers. Other common uses were for process improvement, cost estimation, pricing, and performance measurement. Many of the surveyed firms are in the manufacturing industry, and ABC was critical in finding competition responses to industry price competition, identifying unprofitable products, and identifying unprofitable customers.

Another 2005 survey drawn from 528 responses

from the financial services industry, manufacturing, and communications and public service sectors, found that improved product costing, better analysis of both product and customer profitability, and process improvement were the key goals of the ABC system. The usage of ABC was comparable across industries, though the manufacturing and financial services industries placed more emphasis on product and customer profitability, while in the public sector the key emphasis was on product costing and process improvement (Hansen and Mowen, 2002).

Methodology

This study adopted survey design that is non-experimental, and that are primarily exploratory in nature and provide descriptive measures which can also be used for predictive purposes. The study used the survey design following the formulation of a questionnaire as a survey instrument. Senior managers in the accounting and finance functions were required to complete the questionnaire. The study population comprised of manufacturing firms quoted on the Nigerian Stock Exchange and that have operational head offices located in Lagos State. The sample consisted of thirty-eight manufacturing companies in Lagos State. The questionnaire was constructed using a five-point linear numeric scale and three (3) copies of the questionnaire were given to each company. Data were analyzed using regression analysis and Kendall tau_b test statistics.

In testing hypothesis I, both simple regression analysis and the Kendall tau_b test statics (a non-parametric tools best appropriation for correlation analysis involving categorical data) was used. Kendall tau_b was used to test hypothesis II. In applying the Simple Regression Analysis and Kendall tau_b test, the Statistical Package for Social Sciences (SPSS), release 17 was used. The regression model developed is given as:

$$\text{Profitability} = \alpha_0 + \alpha_1 \text{Cost Management Techniques} + \varepsilon$$

Where:

$$\text{Profitability} = \text{Return on Capital}$$

Employed (being the dependent variable)

Cost Management Techniques = the adoption or non-adoption of Activity Based Costing (being the independent variables)

α_0 = Intercept or constant of the equation;

α_1 = as coefficient of the independent variable; and

ε = error term.

Formally, Kendall tau_b test, in the approximate form is denoted as:

$$\tau_b = \frac{(\text{number of concordant pairs}) - (\text{number of discordant pairs})}{\sqrt{N_1} \times \sqrt{N_2}}$$

where N_1 = number of data pairs not tied in a target feature

N_2 = number of data pairs not tied in another target feature

Results

The Result of Hypothesis One

H₀₁: Activity-Based Costing does not have any significant impact on firm's profitability.

H₀₂: Activity-Based Costing does not have any significant relationship with firm's value creation function

From the regression analysis, Table 1 summarizes the model by displaying the adjusted R² to be .143 meaning that only 14.3% of the dependent variable could be significantly predicted by the independent variables. Table 2 summarizes the result of the analysis of variance by revealing the P value to be 0.011, meaning that the independent variable (activity based costing (as a contemporary cost management technique), predicted the variation in the dependent variable at a 0.05 level of significance. Table 3 displays the relative impact of the independent variable on the dependent variable. From Table 3, it could be seen that the adoption and implementation of the contemporary cost management technique (Activity Based Costing) is positively significant to firm's financial performance at a 0.05 level of significance.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.408	.166	.143	10.85829

a) Predictors: Cost Management Technique (Activity Based Costing)

b) Dependent Variable: Return on Capital Employed

Source: Field Survey

Table 2: ANOVA

Model	Sum of Square	df	Mean Square	F	Sig.
1 Regression	846.781	1	846.781	7.182	.011
Residual	4244.488	36	117.902		
Total	5091.269	37			

a) Predictors: Cost Management Technique (Activity Based Costing)

b) Dependent Variable: Return on Capital Employed

Source: Field Survey

Table 3: Coefficients

Model	Unstandardized Coefficient		Standardized Coefficient	t	Sig.
	B	Std. Error	Beta		
1 Constants	11.064	2.172		5.095	.000
Cost Management Technique (Activity Based Costing)	9.950	3.713	.408	2.680	.011

a) Dependent Variable: Return on Capital Employed

Source: Field Survey

From the correlation output in Table 4, p-value of 0.001 is less than 0.01 (α), the null hypothesis is therefore rejected and the alternative hypothesis accepted which states that: Activity Based Costing, a contemporary cost management technique, has significant impact on firm's profitability. The result further shows that with a correlation coefficient of 0.314, there is a considerably significantly positive correlation between the adoption and implementation of activity based costing (as a contemporary cost management technique) and firm's financial performance measured by return on capital employed.

Table 4: Correlation Analysis

			Technique Adoption Status	Mean of Perceived Impact on Profitability
Kendall's tau_b	Technique Adoption Status	Correlation Coefficient	1.000	0.314**
		Sig. (2-tailed)		0.001
		N	102	102
	Mean of Perceived Impact on Profitability	Correlation Coefficient	0.314**	1.000
		Sig. (2-tailed)	0.001	
		N	102	102

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

Source: Field Survey

The Result of Hypothesis Two

H_{02} : Activity-Based Costing does not have any significant relationship with firm's value creation function

From the correlation output in Table 5, p-value of 0.000 is less than 0.01 (α), the null hypothesis is therefore rejected and the alternative hypothesis

accepted which states that: Activity Based Costing; a contemporary cost management technique has significant impact on firm's value creation function. The result further shows that with a correlation coefficient of 0.346, there is the existence of a considerably significantly positive correlation between the adoption and implementation of activity based costing (as a contemporary cost management

Table 5: Correlation Analysis

			Technique Adoption Status	Mean of Perceived Impact on Profitability
Kendall's tau_b	Technique Adoption Status	Correlation Coefficient	1.000	0.346**
		Sig. (2-tailed)		0.000
	Mean of Perceived Impact on Value Creation Function	N	102	102
		Correlation Coefficient	0.346**	1.000
		Sig. (2-tailed)	0.000	
		N	102	102

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

Source: Field Survey

Conclusion

Hypothesis one revealed that Activity Based Costing impacts on the Return on Capital Employed (ROCE) as a veritable measure of profitability. The results of the hypothesis testing which involved the use of simple regression analysis and kendall's tau_b correlation analysis showed that a firm's financial performance (profitability) is positively significantly influenced by its adoption and implementation of contemporary cost management techniques. The regression analyses showed that there is a significant relationship between the adoption and implementation of the contemporary cost management technique and Return on Capital Employed (as a measure of financial performance). Also, the correlation analyses conducted revealed that, for the contemporary cost management technique (Activity Based Costing) under consideration, the nature of the relationship subsisting between the independent variables (adopted cost management technique) and Return on Capital Employed is positively significant.

The result of this hypothesis is in agreement with existing research findings. Focusing on two sophisticated management accounting system, Activity Based Costing and Balance Scorecard, according to Ajibolade, (2008), the analyses of companies' performance index (for companies employing less sophisticated MAS) was found to be different from the performance of companies employing more sophisticated systems. This difference was found to be statistically significant, hence a positive and strong correlation ($r = 0.626$ at $p = 0.01$) was observed between MAS designs and performance.

Hypothesis two attempted to determine the impact of contemporary cost management techniques on operational performance by measuring the effect of

the adoption and implementation of contemporary cost management on firm's value creation function. A remarkable agreement was achieved among the respondents on the perceived impact of the adoption and implementation of cost management technique on firm's operational performance measured by improvement in product quality and enhancement of their value creation function.

This finding, which corroborates that of Ajibolade, 2008; Liqiat, 2006; Anand *et al*, 2005; Ittner *et al*, 2002, revealed that contemporary cost management techniques focuses on costs associated with activities and also evaluates whether those activities add value, thus providing a means of understanding how to most effectively reduce costs. Contemporary cost management technique literature in so many ways juxtapose the result obtained from the analysis and results of answers provided to some of the research questions. Anderson and Young (1999) argued that "operational" benefits arise from improved insight into the economics of production associated with better understanding of production activities and the root causes or drivers of costs. Swenson and Barney (2001) in a survey of 166 users of ABC costing reported that most adopters used ABC to improve product costing, to assist in cost reduction, and to better assess the profitability of its products and customers.

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