

Effect of Activity Based Costing on the Performance of Small Manufacturing Firms in Nigeria.

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Abstract

The scanty literature on ABC and small manufacturing firms, and low adoption rate of ABC among Nigerian firms motivate the study of the “effect of activity based costing on the performance of small manufacturing firms in Nigeria”. The objectives of the study were to determine: the effect of ABC on performance growth and productivity; the relationship in the application of ABC in the overhead apportionment on: performance growth and productivity of Nigerian firms; the extent to which activity based costing information lead to achievement of operational cost reduction. Five research questions and hypotheses were formulated for the study. Correlation and causal comparative design with a population of 88 small manufacturing firms in Imo State, out of which 12 firms were selected using a purposive sampling technique. Data collected from reports and accounts of selected firms were analysed using SPSS 20 (t-test and spearman’s correlation). The findings are that: ABC has a significant effect on: the performance growth, and productivity of small manufacturing firms; Application of ABC in the overhead apportionment has a significant positive relationship with performance growth and productivity of Nigeria firms; The use of ABC information in decision making significantly leads to reduction in cost of operation. Based on the findings, we recommend that: Organization irrespective of the size, nature and type should try as much as possible to adopt activity based costing in their management process; In order to achieve total cost reduction using ABC information, organization should implement the seven stages in the implementation of ABC as advocated by Hongren et al (2003); Activity based costing is an invaluable tool for achieving corporate performance in multi-product organization, small and medium scale firms that has multi product mix should change from traditional to ABC system.

Key Words: *Activity Based Costing; Performance; Performance Growth; Productivity; Cost reduction; Small Manufacturing Firms; Imo State.*

INTRODUCTION

Background to the Study

The goal of any costing system is to provide relevant and timely information to management of corporate resources in production of goods and services, and to improve competitiveness in terms of cost, quality and profitability. Amidst the changes which the business world has witnessed during last few decades, traditional cost accounting system has been found to be faltering. The criticism basically revolves around overhead allocation techniques used in traditional costing system. Activity based costing is an alternative to traditional costing (Abul and Abkullah 2009).

Dandag and Tjjani (2005), noted that the main difference between the two is that the traditional cost accounting system operate on assumption that producing goods and services is what causes cost to occur, while Activity based costing (ABC) assumption is that activities cause cost and that goods or

services and customers are the reasons that activities must be performed. ABC approach assigns an organization resources cost through activities in the products provided to its customer cost and profitability (Wikipedia 2008). It is generally used as a tool for understanding product and customer cost and profitability. As such ABC has predominantly been used to support strategic decision such as pricing, out sourcing and identification and measurement of process improvement. The ABC method was designed in the United States during the 80's (Cooper and Traplan 1988). It is a refined cost system which enables classifying more costs as direct, to expend the number of indirect-cost pools and to identify cost drivers (Wegmarn 2008). ABC favors better cost allocation using smaller cost pools called activities using cost drivers, the cost of these activities are the basis for assigning cost objects such as products or services.

Many research study have been carried out in Nigeria on activity based costing with mix result (Rafiu and Tajudeen 2012; Debor and Eragbhe 2005; Dandago and Jijjani 2005; Abdullahi and Abdul 2009; Ahmed 2011; Azende and terungwa 2012). However, the research studies that have been carried out on activity based costing (ABC) in Nigeria in respect to its impact on productivity/performance so far are scanty. The main focus in Nigeria has been on the adopting, practicability and applicability in different industries even though the use of ABC in Nigerian firms are rarely common, most of these firms stick into traditional cost accounting system (Ahmed 2011).

To the best of the researcher's knowledge, the available literature on activity based costing in relation to productivity/performance and small manufacturing firms were the work of Sinika and Hanna (2012), and Chung and Khan (2013), which were not carried out in Nigeria. Even then those works were based on qualitative and survey design. Most of the researches carried out in Nigeria were subjected to analysis of the current literature and percentage analysis otherwise called descriptive statistics and qualitative research design. However, the objective of the study is to cover up these gaps, by examining the effect of activity based costing on the productivity of small manufacturing firms in Nigeria using quantitative design and inferential statistics.

During 1980's many managers become dismissed with their cost accounting system (Reyhanoglu, 2008). One of the reasons is that traditional cost system that allocate fixed overhead, including labour are often arbitrary, not necessarily related and directly associated to production (Polimeni, Frank, Febozzi, Arthur, and Adelberg 1991). In the current manufacturing environment, resource are often unrelated to direct labour, such misallocations can lead to management effort to place the winning products (Abdul and Abdullahi 2009). Traditional accounting methods fall short in providing management with the strategic information needed in today's operating environment (Michael and Cheolkyu 1999; and Kaplan, 2007). Innovative managerial accounting techniques can assist in the development and implementation of the strategic management process (Sharma & Gupta, 2010). Managerial accounting systems such as activity-based costing (ABC) can play an important role in bridging the information gap and supporting management decision making that may correlate productivity with the high volume of overhead thereby improving organization performance growth (Brimson, 1991; and Maiga & Jacobs, 2006).

Using single pool of indirect costing and overhead apportionment bases such as direct labour are no longer considered good enough, such misallocation can lead management to ineffective and inefficient decision which in turn lead to non-value added cost and sunk cost. Traditional costing mislead in making product mix decision and plant performance as a result affect the input-output relationship which in turn lead to decline in productivity. Many organization sales are increasing while profits are declining as a result of ineffective costing system which in turn impacts negatively on the overall productivity of the organization which in turn affect the growth (Abdul and Abdullahi 2009).

However, empirical research has found mixed results from ABC adoption and its ability to improve performance growth (Bromwich Bhimani, 1989; Gordon & Silvester, 1999; Innes & Mitchell, 1995; and Innes, Mitchell, & Sinclair, 2000). The use of ABC in the small manufacturing firms in Nigeria are

still not common, notwithstanding the advantage of ABC adoption and application in manufacturing firms as a result of the literature stating that ABC is costly to operate, hence the small manufacturing firms run away from its use due to the capital intensive of the model. The objective of this study is to confirm previous research that ABC organizations succeed or fail to improve productivity, and performance growth due to how well they fit their strategies, structures, and managerial accounting practices to the complex business environment.

The specific objectives of the study are:

1. To examine whether ABC influence performance growth of small manufacturing firms in Nigeria.
2. To ascertain the effect of ABC on the productivity of small manufacturing firms in Nigeria.
3. To examine the extent to which activity based costing information lead to achievement of operational cost reduction.
4. To determine the relationship between overhead cost and performance growth of ABC firms in Nigeria.
5. To establish the relationship in the application of activity based costing in the overhead apportionment and organization productivity of Nigerian firms.

For the purpose of this study, the following null hypotheses were formulated;

- H0₁ ABC has no significant influence on the performance growth of small manufacturing firms in Nigeria.
- H0₂ There is no significant difference between the productivity of ABC firms and the productivity of non-ABC firms in Nigeria.
- H0₃ The use of activity based costing information in decision making does not significantly lead to operational cost reduction.
- H0₄ There is no significant relationship between overhead cost and performance growth of ABC firms in Nigeria.
- H0₅ Application of activity based costing in the overhead apportionment has no significant relationship with organizations productivity of Nigerian firms.

This study covers the effect of activity based costing on performance of small manufacturing firms in Nigeria. The researcher used sampling population of 12 small manufacturing firms in Imo State. Again, a sample of 10years financial reports and accounts from 2004 to 2013 were used. Also, this work covers only formal small manufacturing firms who keep good financial records, any other small firm (informal) are not included in this work. This research does not cover large manufacturing firms especially those quoted in the stock market.

REVIEW OF THE RELATED LITERATURE

Theoretical Framework

Change is a common thread that runs through all businesses regardless of size, industry and age. Our world is changing fast and, as such, organizations must change quickly too. Organizations that handle change well thrive, whilst those that do not may struggle to survive. This study considers a range of change theories that might be applied to innovations like ABC, and considers how small manufacturing firms can promote acceptance of ABC in the costing system of their product.

Whether you are supporting ABC implementation, or any other innovation/change project, consider whether there are elements of these theories that might assist you in your change efforts. Due to low level of adoption of ABC among Nigeria firms, consequently, on an overall level, the study is based on an Eclectic Research Approach. The primary objective for such an approach is to attain a broad picture of the research issues. There are some underlying assumptions behind using an eclectic approach. First,

it is assumed that different types of knowledge can be gained by using different approaches and therefore it is possible to more fully understanding a concept if it is studied from a different viewpoints. Second, there is the assumption that individual researchers are not bound by specific paradigms but free to choose from a variety of research approaches. Rogers's diffusion theory of innovation explain the reason Nigerian small manufacturing firms delayed the decision to adoption improved overhead costing system, while Lewin's change management theory explain how to manage the three stages of change (changing from traditional costing system to activity based costing system), while Technology Acceptance Model explain why ('perceived ease of use' and 'perceived usefulness') small firms accept or reject Activity based costing. Therefore the three change theory form the bases of this study.

Empirical Review

Bromwich and Bhimani (1989) observed that though activity-based costing corrects the product-cost distortions, no such study has been done to demonstrate that it increases the profitability of the firm. Anand Sahay, and Saha (2005) observed that success at cost management could have substantial impact on the firm value. They argued in favour of integrating activity-based cost management systems with the measures of shareholder value such as economic value added. The resultant integrated cost management system could provide a better governance mechanism for improving processes, optimizing the use of capital and thus, create shareholder value.

Gordon and Sylvester (1999) examines the performance of ten ABC user firms' vis-à-vis their matched size and industry-controlled counterparts who have not adopted activity-based costing. Though ABC user firms had abnormal returns on the date of announcement, they were not statistically significantly different from their counterparts. Thus, they questioned the adoption of activity-based costing if it does not lead to the creation of firm value.

Malmi (1999) found that firms superior performance subsequent to activity-based costing adoption revealed that the ABC adoption decision was the 'rational value enhancing choice' and it was not a fad or fashion or forced selection. Shield and McEwen (1996) in Anand et al (2005) reported that 75% of the ABC-users found it to be a financially beneficial decision. The success in ABC implementation is based on top management support, compensation and training.

Innes, Mitchell and Donald. (2002) in Anand et al (2005) examines the association between the extensive use of activity-based costing and plant level operational and financial performance indicators such as cycle time, quality, manufacturing cost improvements and return on assets. The quality variable was captured through finished product first pass quality yield in percentage terms, and scraps and reworks cost as a percentage of sales. The survey questionnaire was mailed to 25,361 US firms who subscribed to Industry Week. They received a response from 2789 firms, resulting in a response rate of 11%. They found that 26% of the respondents did use activity-based costing extensively. They found moderate evidence that activity-based costing use is positively associated with manufacturing performance. They demonstrated through path analysis that activity-based costing use has a positive indirect association with manufacturing cost reduction through improvements in quality and cycle time. No significant association with return on assets of activity-based costing use was observed.

Kennedy and Affleck-Graves (2001) examines the link between activity-based costing implementation and the creation of shareholder value using Rappaport's (1986) framework and event study methodology. They got responses from 47 ABC users and 187 non-ABC users. They found that choice of management accounting system such as activity-based costing for a sample of UK firms had a significant impact on firm value (27% over three years from the beginning of the year in which activity-based costing was first introduced). The impact of activity-based costing on firm performance may be indirect through the mediating influence of other variables (Shields, 1995).

Anand et al (2005) noted Douglas and Bouwman (2002) in their survey of 210 internal auditors found that the firms with diverse product portfolio and with a high proportion of overhead cost when they have

adopted activity-based costing along with other strategic initiatives such as JIT and TQM, resulted in substantial improvement in their return on investments. The other enabling conditions for the efficacy of the ABC in the organizations are sophisticated information technology systems, absence of excess capacity and competitive environment.

Terungwa (2012) establish if the application of TD-ABC in small scale service oriented businesses in Makurdi metropolis of Benue State will enhance their performance in terms of profitability. Regarding the goal of this study, the research design is an application research by case study. The researcher randomly selected out of the identified small scale service businesses one Restaurant and studied it using questionnaires, interviews to get data for this work. The result showed that using TD-ABC system, in comparison with their existing method provides more data on cost and profitability of customers served. The conclusion was that managers of small service businesses can make use of time equations in TD-ABC to calculate necessary time for activities engaged in delivering a unit of service.

Sinikka and Hanna (2012) examined if the small firms' past financial performance drives the adoption of ABC and explore whether the extent of ABC use leads, in turn, to improvements in firms' financial performance in the immediate future. In sum, the survey results indicated that small firms with adequate financial resources as well as firms experiencing declining growth tend to use ABC and such use facilitates their subsequent growth and profitability. Small firms seem to benefit from using ABC.

The recent work of Chung and Khan (2013) studied an analysis of activity-based costing (ABC) project implementations, after analyzing ABC project implementations in various industries, they observed that Activity-Based Costing (ABC) is primary used to enhance productivity and efficiency in the business process; to help create budgets and set prices; to identify customer costs and improve customer relations; to make decisions on strategic issues; and to address external negotiation issues. ABC has been often used together with other management tools and methods depending on the overall objectives of specific initiatives.

Nitin and Dalgobind (2013), Current Trends of Application of Activity Based Costing (ABC), based on literature survey, found out that the model of activity based costing can be used in every type of organization. It has been successfully implemented and used by many large companies like industries, institutions, or public sector.

Douglas & Bouwman (2002) investigated the improvement in financial performance that is associated with the use of Activity-Based Costing (ABC), and the conditions under which such improvement is achieved. Internal auditors furnish information regarding company financial performance, extent of ABC usage, and enabling conditions. Confirmatory factor analysis and structural equation modelling are used to investigate the relationship between ABC and financial performance.

Innes, Mitchell, and Donald (2000) reviewed the results of two UK surveys of activity-based costing (ABC) in the UK's largest companies. These provide an opportunity to assess the changes which have occurred in the ABC adoption status of companies over a recent five year period. 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 put in and the levels of success and importance which participants attribute to them.

A lot of practitioners explain that ABC systems are expensive to implement, time consuming and hard to adjust. For instance, Kaplan & Anderson (2007) described the ABC system of Hendee Enterprises, a Houston-based manufacturer of Awnings. They explain that the ABC software took three days to calculate costs for the company's 150 activities, 10,000 orders and 45,000 line items. McChlery et al. (2007) stated that financial pressures facing UK universities have increased the demand for good financial management information. The government wants higher education institutions to adopt standardized full economic costing. This article describes an activity based management (ABM) model which has been successfully used to cost institutions' activities down to appropriate levels of focus,

linking the activities to income streams and arriving at a form of value added. The model is extremely flexible allowing information to be collected for different levels of focus: faculty, department, programme, and module/project or support unit.

Feridun & Al-Kha (2006) investigated the link between the practice of Activity Based Costing (ABC), Just-in-Time (JIT), and Total Quality Management (TQM) as strategic initiatives and the improvement in corporate financial performance of 56 industrial shareholding companies in Jordan. Analysis shows that 26.8% of the companies under consideration use 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 the financial managers, but such awareness is not reflected in the implementation of these initiatives. Furthermore, strong evidence emerges that the use of strategic initiatives leads to improvement in financial performance of the companies under consideration.

Askarany & 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. Using the results of above surveys, they examined the level of association between attributes of innovation and the diffusion of activity based-costing. The findings suggest that the relatively low implementation of ABC across firms implies that decision makers remain unconvinced that whether ABC's advantages over traditional accounting techniques are high enough to pursue them to implement ABC in practice. In other words, they suggest that one of the main influential factors significant to the implementation of ABC links to its attributes in terms of its relative advantage over traditional techniques; its complexity; its compatibility; the observability of its results and its trialability.

Sharma and Gupta (2010) represented 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. **In the historical development of concepts and techniques of cost it accounts that have shifted the attention of management practitioners toward alternative methods of costs allocation.** Exploring the past, current, and future trends of cost accounting in Indian companies, they highlights the distinctive features of Activity-based costing vis-à-vis conventional costing methods and the Activity based costing implementation process. It shows that Activity-based costing is a definite improvement over the traditional methods on the premise that the costs are collected on the basis of activities rather than products and it can effectively contribute to the top managerial decision-making process. They examine the feasibility of hybrid methods of costing and its use by Indian companies. Finally, they establish that in spite of superiority of Activity based costing over other costing methods, awareness about it and its implementation is still low in India as compared to the developed countries.

Boris and Petr (2011) presented a basic overview of the application of Activity-Based Costing in an urban mass transport company which operates land public transport via buses and trolleys within the city. The case study was conducted using the Activity-Based Methodology in order to calculate the true cost of individual operations and to measure the profitability of particular transport lines. The case study analysis showed the possible effects of the application of the Activity-Based Costing for an urban mass transport company as well as the limitations of using the ABC methodology in the service industry. The users indicated that, the ABC model is very useful for profitability reporting and profit management. Also, the paper shows specific application of the Activity-Based Methodology in conditions of urban mass transport companies with regional specifics.

Nelson (2011) study explained the costing technique of reputable foam and mattress manufacturing company in Liberia with a view to cross check the relevance and importance of activity based costing technique on its costing operation. The researcher obtains the organization manufacturing cost data for two sizes (6 and 10 inches) of the company's product between July 2008 and June 2009. It was observed that the organization is using the traditional costing system which is volume related technique.

Subjecting the cost obtained to ABC system, there is a cumulative cost savings on the company's operation. The hypothesis generated for the study was subjected to t-test analysis and the result shows that activity based costing system allows an organization to have a realistic and effective costing procedure that can enhance organization manufacturing activities.

Emmanuel (2013), investigated the impact and possible concomitant improvement in financial performance consequent upon the use of activity based costing (ABC) and the conditions under which such improvement is achievable in the South African public sector. The case study method was employed to collect and analyse data relating to improvement in financial performance, perception and success of ABC in the Buffalo City Municipality in the Eastern Cape Province of South Africa. The study reveals that ABC provides significantly more accurate and useful information than traditional cost accounting. The results indicated further that management strongly agree that ABC utilisation improves insight into causes of cost; provides better cost control and cost management; provide better understanding of cost reduction opportunities; improves managerial decision making; and provides more accurate information for product or service costing and pricing. Management also agrees that ABC use improves financial performance.

Summary of Related Literature

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METHODOLOGY

Research Design

Causal-comparative research and correlational research were used, in order determine whether there is a significant difference on the productivity and performance growth between firms that use ABC system and firms that use traditional costing system, and the need to determine the relationship of the variables that ABC directly affect (overhead) and the productivity of small manufacturing firms. The data collection for this research work was derived from secondary sources. The secondary sources were obtained from published literatures such as textbooks, journals, internet publications and Annual report of 12 small manufacturing firms in Imo State. The main sources of data used for this study are the reports and accounts of the sampled population, which were collected from the accounts department of the head office.

Population and Selection of Sample Size.

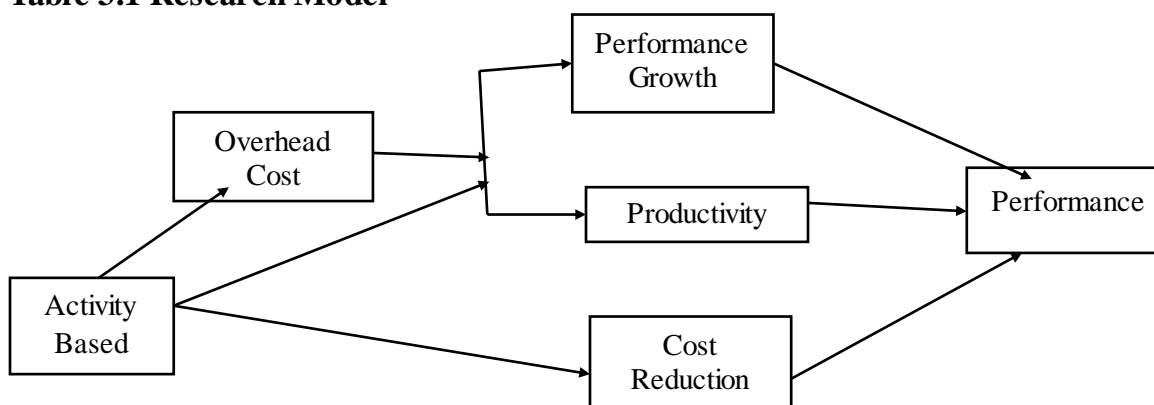
The population of this study consist of all the small manufacturing firms in Nigeria. However, for the purposes of accessibility, the population was restricted only to the formal sector of small manufacturing firms in Imo State. The accessible population of this study is all the small manufacturing firms located in Imo State which is 88 firms according to *2010 National MSME Collaborative Survey Published May 2012*. In the determination of sample size, purposive sampling technique was adopted because of the

nature of the research. The accessible population are 88 firms drawn from Imo State. Out of the 88 firms, the researcher determined firms that manufactured more than one product and keeps its records and account in Imo State. Thereafter, the researcher determined firms that use activity based costing (currently 6 firms) and match them with firm that use traditional costing system (6 firms), which make it a total of 12 firms that were selected for the study. Therefore, the sample size of this study is 12 firms.

Model Specification

From the theoretical and literature review, it was observed that there is a causal link between ABC, and organizational performance and productivity; and also there is relationship between ABC and cost of operation of firms. In this section, we pursue this same objective further by specifying our model. The model is to express in a diagrammatical form, the causal effect and relationship of ABC on our dependent variables (performance growth, productivity and cost of operation). The model is presented diagrammatically in a singly model as shown below:

Table 3.1 Research Model



Source: Researcher's proposed model 2015

Table 1 Variables Measurement

Model	Variables	Measurements
1	ABC	Compares ABC and non-ABC Variables
2	Overhead cost of ABC firms	Overhead cost of ABC
3	% Performance Growth	Current year performance divided by 2004 year performance multiply by 100 (in percentage)
4	% productivity	Total revenue divided by Total cost multiply by 100 (in percentage)
5	Operational cost reduction	Total cost of operation

Source: Researchers variable measurement 2015

Method of Data Analyses

The data collected from the reports and accounts were further calculated to obtain the variables needed to test hypotheses and the variables were presented in tables and charts in section four before testing for significance. The major statistical tests used in the analyses of the data are t-test for hypotheses one, two and three; and Spear man's rank correlation for hypothesis four and five. The t-test were used to determine the significance difference or otherwise of the sampled data of the one that use ABC and the

one that do not use ABC, on the other hand, Spearman's rank correlation were used to determine the relationship between the variables in the said hypotheses of firms that uses ABC.

Decision Rule

Reject H_0 (Null hypothesis) if computed value is greater than table or critical value, otherwise accept H_0 . When H_0 is accepted, H_1 will be rejected and when H_0 is rejected H_1 will be accepted.

Note that the researcher allowed 5% level of significance i.e. the data were test at 95% confidence level. Note also that SPSS statistic will used for the analyses.

RESULTS, DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS

Results

In the analyses of data IBM SPSS statistics 20 is used. Paired sample T-test, is use for hypotheses: one, two and three, while spearman's rank correlation was adopted for hypotheses: four and five. The two statistical tools determined the significance level in which null hypotheses will be based for acceptance or rejection. Since all the test are one tail test, and SPSS (t-test) is two tailed test by default, adjustment is made on the significance level by dividing the significance level of two tailed test produced in SPSS by 2 in order to reflect the one tailed test critical value. The reporting of the result was based on APA Style.

T-Test Result for Hypothesis One, Two and Three

Table 2 Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	ABC Performance Growth	199.7480	10	62.22834	19.67833
	Non-ABC Performance Growth	158.2890	10	31.85706	10.07409
Pair 2	ABC Productivity	175.9680	10	6.98261	2.20810
	Non-ABC Productivity	125.9790	10	3.51250	1.11075
Pair 3	ABC Cost of Operation	20.6480	10	5.25050	1.66035
	Non-ABC Cost of Operation	27.4570	10	7.94328	2.51188

Researchers computation 2016, using SPSS 20

Table 3 Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	ABC Performance Growth & Non-ABC Performance Growth	10	.892	.001
	ABC Productivity & Non-ABC Productivity	10	-.395	.259
Pair 3	ABC Cost of Operation & Non-ABC Cost of Operation	10	.992	.000

Researchers computation 2016, using SPSS 20

Table 4 Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 ABC Performance Growth - Non-ABC Performance Growth	41.459	36.75528	11.62304	15.16586	67.75214	3.567	9	.006
Pair 2 ABC Productivity - Non-ABC Productivity	49.989	8.97003	2.83657	43.57222	56.40578	17.623	9	.000
Pair 3 ABC Cost of Operation - Non-ABC Cost of Operation	6.8090	2.81777	.89106	-8.82471	-4.79329	-7.641	9	.000

Researchers computation 2016, using SPSS 20

Decision:

Hypothesis one: Since the calculated value (3.567) of t-test is greater than t-critical (0.003) at 1-tailed i.e. $P < 0.01$, we therefore reject H_0 and accept H_1 and conclude that:

“ABC has a significant influence on the performance growth of small manufacturing firms in Nigeria”

Hypothesis two: Since T-calculated (17.622) is greater than the critical value (.0005) i.e. $P < 0.01$, we reject H_0 , and accept H_1 and conclude that:

“There is significant difference between the productivity of ABC firms and the productivity of non-ABC firms in Nigeria.”

Hypothesis three: Since the calculated value of t-test (-7.641) is greater than t-critical (0.00025) at one tailed test, i.e. $P < 0.01$, we therefore reject H_0 and accept H_1 and concludes that:

“The use of activity based costing information in decision making significantly leads to operational cost reduction of small manufacturing firms in Nigeria.”

Spearman's Rho Results for Hypotheses Four and Five
Table 5 Correlations for hypotheses four and five

			ABC Overhead Cost	ABC Performance Growth	ABC Productivity
Spearman's rho	ABC Overhead Cost	Correlation Coefficient	1.000	.976**	.818**
		Sig. (1-tailed)	.	.000	.002
		N	10	10	10
	ABC Performance Growth	Correlation Coefficient	.976**	1.000	.867**
		Sig. (1-tailed)	.000	.	.001
		N	10	10	10
	ABC Productivity	Correlation Coefficient	.818**	.867**	1.000
		Sig. (1-tailed)	.002	.001	.
		N	10	10	10

** . Correlation is significant at the 0.01 level (1-tailed).

Researchers computation 2016, using SPSS 20

Decision:

Hypothesis four: Since r-calculated (0.976) is less than the r-critical (0.0005), i.e. $P < 0.01$ we reject H_0 and accept H_1 and concludes that: *“There is a significant relationship between overhead cost and performance growth of ABC firms in Nigeria.”*

Hypothesis five: Since the computed value of r (0.818) is greater than critical value of r (0.002), i.e. $P < 0.01$, we reject H_0 and accept H_1 and conclude that: *“Application of activity based costing in the overhead apportionment has a significant positive relationship with organizations productivity of Nigerian firms.”*

Discussion of Findings and Conclusion

From the analyses of data in section four, we discovered that the value of t-calculated and r-calculated are greater than the critical value, i.e. $P < 0.01$ for all the hypotheses tested. The t-calculated are 3.567, 17.622, and -7.645 for hypotheses one, three, and five respectively, and r-calculated are 0.976 and 0.818 for hypotheses two and four respectively. Based on these results, we reject all the null hypotheses and accept all the alternate hypotheses. Analysis of hypothesis one shows that performance growth of ABC firms and non-ABC firms are strongly correlated, however there is a significant difference between

performance growth of ABC firms and non-ABC firms. ABC firms have a mean score of 199.75% while non ABC firms have 158.29%, showing that ABC firms performance grow more than non ABC firms on average. This finding is consistent with many literature reviewed in chapter two (see Sinikka and Hanka 2012, Emmanuel 2013, Kennedy and Affleck-Graves 2001, Terungwa 2012, and many others), however the findings is inconsistent with the study of Bromwich and Bhimani (1989), and Gordon and Sylvester (1999), the difference in the finding may be as a result of inadequate development of ABC as at that time or incorrect application of ABC by the firm they studied.

Hypothesis two shows that ABC and non-ABC productivity are negatively correlated although the correlation among their productivity are not statistically significant. This shows that ABC has ability to change the status of firm's productivity, that firm declining to growth can use ABC to achieve productivity growth productivity. The mean score of ABC firm's productivity is 175.97 while that of non-ABC is 125.98. This our findings is consistent with Chung and khan (2013), when they found that ABC is primarily used to enhance productivity and efficiency in manufacturing process of small manufacturing firms. Other studies supporting our findings are Sininika and Hanna (2012), Malmi (1999) and Shield and McEwen (1996).

Second hypothesis analysed shows that ABC firms cost of operation significantly correlate with non-ABC cost operation, which means that cost of operation of ABC firms move the same direction however, the cost of ABC firms are significantly lower than non ABC firms. The mean score of ABC cost operation is 20.65 while that of non-ABC firms is 27.46 with mean difference of 6.81, which is statistically significant. This is in line with the conclusion of Nelson (2011), Anderson and Young (1998), and cooper (1998), and Kaplan (1988) that application of activity based costing information in decision making significantly leads to operational cost reduction of an organizations.

Hypothesis four shows that performance growth of ABC firms significantly correlate with its overhead cost, showing that $\text{N}1$ increase in Overhead cost also increase performance growth, hence, ABC firms increase in overheads means that the performance growth of the firms will also increase in the same direction. ABC support manager to answer question of what is the cost of acquiring the new competences compared to the improved process. Is it preferable to develop the competences internally or to acquire it on the market? Our finding support recent work of Nitin and Dalgobind (2013) when they pointed out that in transferring its clear picture, ABC has ability to make champions of individuals of specific goods or services byrevealing numerous organizational changes, which resulted from the process of implementation, such as closer connection between management accounting and other operational functions.

The fifth hypotheses tested revealed that ABC overheads significantly correlates with firm's productivity. Our finding confirms the findings of Gamal et al (2012) when they conclude that, with application of ABC, every increase in the overhead cost will ensure increase in the productivity of the firm. Like the paragraph above, this finding also confirms the work of Chung and Khan (2013),

Based on the results of hypotheses tested, the followings finding were made:

- (i) ABC has a significant influence on the performance growth of small manufacturing firms in Nigeria.
- (ii) There is a significant positive relationship between overhead cost and performance growth of ABC firms in Nigeria.
- (iii) Activity based costing has a significant effect on the productivity of small manufacturing firms that use ABC.
- (iv) Application of activity based costing in the overhead apportionment has a significant positive relationship with organization's productivity of Nigeria firms.
- (v) The use of activity based costing information in decision making significantly leads to reduction in cost of operation.

Recommendations

- (i) Organization irrespective of the size, nature and type should try as much as possible to adopt activity based costing in their management process. It is recommended for small and medium scale firms that have multi product mix to change from traditional to ABC system.
- (ii) Any organization who wants to improve their performance, growth, and productivity in the decision making and management process should incorporate activity based costing and activity based management in their decision support system. Nigerian firms should stand up and embrace effective cost system that will eliminate waste, and non-value added activity and in turn reduces operational cost.
- (iii) The difficult in the identification of cost drivers and cost pools can be solved by hiring/outsourcing the service of professional to identify cost driver and cost pool and review it periodically or as the need arise. The need for ABC of any organization arise as a need to increase overhead cost arises, as a result of this, the activity based costing must be used to apportion overhead so as to correlate the increase in overhead with financial productivity.

REFERENCES

- Abdul A. and Abdullahi I.O. (2009). The Practicability Of Activity-Based Costing System In Hospitality Industry. Keffi: *JOFAR*. Retrieved from <http://ssrn.com/abstract=1397255>.
- Ahmed, A.M. (2011). The Practicability of Activity-Based Costing (ABC) In The Nigerian Retail Banks. *Kano Business Intelligence Journal*, January, 4(2), 23-50.
- Anand, M. Sahay, B. S. and Saha, S. (2005). *Activity-Based Cost Management Practices in India: An Empirical Study Decision*, 32(1), 123-152.
- Anand, M., Sahay, B.S. and Saha, S. (2005). Activity-Based Cost Management Practices in India: *An Empirical Study Decision*, 32(1), 123-152.
- Anderson, W and Young, M.S. (1999). *The Impact of Contextual and Process factors on the Evaluation of Activity-Based Costing Systems Accounting, Organizations and Society*, 24 (7)525-559
- Askarany, D and Yazdifar, H. (2007). Why ABC is Not Widely Implemented?. *International Journal of Business*, 7(1) 645-683.
- Boris P and Petr N, (2011). Activity-Based Costing Application in an Urban Mass Transport Company. *Journal of Competitiveness*, 6(1), 1-17.
- Brimson, K. (1991). Linking Strategy to Operations. London. *Journal of Cost Management*, 3(1) 1-18
- Bromwich, M. and Bhimani, A. (1989). *Management accounting: Evolution not Revolution*. London, UK: Chartered Institute of Management Accountants.
- Chung, H.M., and Khan P. (2013). Analysis of Activity-Based Costing (ABC) Project Implementations. Long Beach: *journal of management accounting research*, 21, 234-242.
- Cooper, R. (1988). The Rise of Activity-Based Costing— Part One: What is an Activity-Based Cost System?. *Journal of Cost Management*, 3(4), 45–53.

- Dandago, K. I. and Tijjani, B. (2005). *Cost and Management Accounting*. Kano:Gidan-Dabino Publishers.
- Debor, E. L. and Eragbhe, E. (2005). *Implementing Activity - Based Costing in the Health Service Industry: A survey of some private clinics in Benin City, Nigeria*. Bayero International Journal of Accounting Research 1(2) 56-67.
- Douglas, C. M, and Bouwman, J. (2002). The Association between Activity-Based Costing and Improvement in Financial Performance. *Management Accounting Research*, 13(1), 78- 92.
- Emmanuel, K.O.(2013). Activity-Based Costing Approach to Financial Management in the Public Sector: The South Africa Experience. Thohoyandou: *European Scientific Journal*, 19(1), 191-209.
- Feridun, M. and Al-Khadash, H. (2006). Impact of Strategic Initiatives in Management Accounting on Corporate Financial Performance: Evidence from Amman Stock Exchange. *Managing Global Transitions*, 4(4), 299-312.
- Gamal S, Ehab K.A., Mohamed A. and Magda H. I, (2012). A Suggested Framework for the Integration of Activity-Based Costing (ABC) in a Lean Environment to Enhance Companies Competitive Position - A Case Study in Egypt. AAA 2012 Management Accounting Section (MAS) Meeting Paper.
- Gordon, L. A., and Silvester, K.J. (1999). *Stock Market reactions to Activity-Based Costing Adoptions*. Journal of Accounting and Public Policy, 18(3), 229-251.
- <http://www.accountingcoach.com/online-accounting-course/35Dpg01.html>
- <http://www.accountingcoach.com/terms/A/activity-based-costing.html>
- Innes, J, and Mitchell, F.(1995). *A survey of activity-based costing in the UK's largest companies*. Management Accounting Research, 6 (2) 137-153.
- Innes, J, Mitchell F, and Donald S. (2000). Activity-Based Costing in the UK's Largest Companies: A Comparison of 1994 and 1999 Survey Results. *Management Accounting Research*, 11(3), 981-995.
- Kaplan, R. S. (1988). *One Cost System is not enough*. Harvard Business Review (January-February) 61-66.
- Kaplan, R. S., and Anderson, S R. (2007). *Time-Driven Activity-Based Costing: A simpler and more powerful path to high profits*. Boston, Massachusetts: Harvard Business School Publishing Corporation.
- Kennedy, T. and Affleck-Graves, J. (2001). The Impact Of Activity-Based Costing Data Techniques On Firm Performance. *Journal of Management Accounting Research*, 13(1), 19-45.
- Maiga C. and Jacobs F., (2006). Activity Based Costing: A Strategy For Achieving Cost Objective. *International Journal of Logistics Management*, 18,(2) 34-49.
- Malmi, T. (1999). *Activity-Based Costing Diffusion Across Organizations: An exploratory empirical analysis of Finnish firms*. Accounting, Organizations and Society. 24(8) 649-672.

- McChlery, S. McKendrick, J., and Rolfe, T (2007). Activity-Based Management Systems in Higher Education. *Public Money & Management*, 27(5), 674-683.
- Michael, B. and Cheolkyu, H. (1999). Activity Based Costing Systems and Incremental Costs. *Management Accounting Research*, 10(1), 236-257.
- Nelson C.O. (2011). The Role Of Activity Based Costing On Organizational Pricing System – A Case Study Of Teetoo Foam And Mattress Industry, Liberia. Monrovia: *JORIND (9) 1*. Retrieved from www.transcanpus.org/journals. www.ajo/inforjournals/jorind
- Nitin, K. and Dalgobind, M. (2013). Current Trends Of Application Of Activity-Based Costing (ABC): A Review. Solan: *Global Journal Of Management And Business Research (D) 8(3)*, 136- 150.
- Polimeni, S. et al (1991). *Cost Accounting Third Edition*. Singapore:Mc Graw-Hill, Inc.
- Rafiu O. S. and Tajudeen J. A (2012). Activity Based Costing Adoption Among Manufacturing Companies In Nigeria. Ile-Ife: *Journal Of Modern Accounting And Auditing*, 8(1) 56-91.
- Reyhanoglu, M. (2008). *Activity Based Costing System: Advantages and Disadvantages*. Retrieved from: <http://ssrn.com/>
- Rogers, E. (2003). *Diffusion of Innovations (5th Edition)*. New York. The Free Press.
- Sharma G. L., and Gupta P. K, (2010). Activity Based Costing: Strategic Implications for Indian Companies. *LBS Journal of Management & Research*, 4(3) 548-562.
- Shields, M. (1995). An Empirical Analysis of firms' implementation experiences with activity-based costing. *Journal of Management Accounting and Research*, 7 (Fall) 148-166.
- Sinikka, J. and Hana S. (2012). Lagging Effect Of The Use Of Activity-Based Costing On The Financial Performance Of Small Firms. *Journal of Small Business Management*, 50(3), 78-106.
- Terungwa, A. (2012) "Practicability of Time-driven Activity-based Costing on Profitability of Restaurants in Makurdi Metropolis of Benue State, Nigeria", *Journal of Contemporary Management*, 11(3), 765-792.
- University of Twente (n.d.). Theory of Planned Behaviour/Reasoned Action Available at: <http://bit.ly/HnYD9y> (accessed 28 October 2014).
- Wikipedia Free Encyclopaedia, 2008. @ www.google.com
- Young, G.J. Charns, M.P. and Shortell, S.M. (2001). Top manager and network effects on the adoption of innovative management practices: a study of TQM in a public hospital system. *Strategic Management Journal* 22(10): 935-51.

Appendix: Data Presentation

ABC Performance Growth	Non-ABC Performance Growth	ABC Productivity	Non-ABC Productivity	ABC Cost of Operation	Non-ABC Cost of Operation	ABC Overhead Cost
298.33	192.4	181.86	121.51	29.03	39.2	13.65
273.22	190.11	178.63	122.55	27.68	36.95	14.62
244.35	163.88	178.44	120.92	24.82	34.33	11.22

225.94	173.38	181.51	124.7	22.08	30.77	9.7
204.39	190.11	178.16	129.22	20.83	28.52	9.2
190.17	159.7	179.11	126.18	19.15	26.73	7.25
171.13	156.27	176.74	129.76	17.77	23.02	6.08
154.39	144.49	174.1	130.87	16.6	20.52	6.17
135.56	112.55	173.47	126.31	14.7	18.75	5.13
100	100	157.66	127.77	13.82	15.78	4.07

Researcher's computation from financial statement of the selected firms 2004 to 2013

List of Selected Firms

ABC Firms	Non – ABC Firms
I.Shiloh Niger Global Enterprises - Owerri	I.Expert Industry and Agro Ltd – Nwaorieubi
II.Nura Industry Ltd – Atta	II.Dobeck Nigeria Ltd – Owerri
IIIUgochukwu Best Venture – Nkwere	III. Gozie Nwachukwu Ltd – Owerri
IV.Snow Poly Industry Enterprises – Orlu	IV. Future D. I Industry Ltd – Orji
V. Shanghai Industry Ltd – Obomlili	V.U. Sunny and Bros Ltd – Okigwe
VI.Emma Nosike and Sons Nig Ltd Owerri	VI.Francis Akabueze and Sons Enterprises – Oguta