

Usage and Impact of Activity Based Costing (ABC) Technique on the Performance of Selected SMEs in Lagos State, Nigeria

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Abstract

Over the years, managing cost and other performance variables over the entire value chain has become of paramount importance to management accountants and corporate businesses especially the Nigerian SMEs. The issue of Activity Based Costing (ABC) as a major modern cost management method of waste reduction and performance enhancement in the business organisations still remain unresolved. This study investigated the usage and impact of ABC on the performance of SMEs in Lagos State, Nigeria. Expost-facto survey research design was adopted. The population of the study was 5,984 SMEs in all the Local Governments in Lagos State while a sample of 536 respondents was determined based on predetermined criteria. A five point likert-scale type questionnaire used to collect data was validated by experts and yielding coefficient of 0.782 Cronbach Alpha. The statistical tools employed were ANOVA and ANCOVA, Pearson's Product Moment Correlation Coefficient and Student-t for statistical significance of the regression relationship. In a three-way interaction effects of ABC usage of Manufacturing, General Trading and Agro-Allied Businesses observed, the results revealed that there was no significance difference in the usage of ABC method of SMEs in Lagos State, Nigeria where ($P > 0.05$). The usage of ABC method significantly determined the survival of SMEs where ($P < 0.05$). Similarly, the usage of ABC method significantly determined profitability of these SMEs where ($R^2 = 0.37$); F-statistics = 43.955; and ($P < 0.05$). In conclusion, the modern cost management methods are major significant factors determining the performance of SMEs in Lagos State. Management should always take into consideration these costing methods when making decisions and design cost management policies that would enhance firm performance. These policies should be used as tools for planning and forecasting while they should be reviewed from time to time to incorporate the local environmental factors. Furthermore, management should always evaluate managers' performance to enhance good corporate governance.

Keywords: *Activity Based Costing (ABC), Product qualities, Profitability, SMEs, Survival*

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Background to the Study

In today's business environment, the SMEs in Nigeria are either in the category of those that use ABC as a cost control measure or those that do not use ABC at all. Olabisi, Sokefun and Oginni (2012) affirmed that in recent years, companies have reduced their dependency on traditional accounting systems by developing different cost management systems. Researches revealed that the Lagos State which is the study area of this work is a micro-Nigeria where every ethnic group is well represented in its population and it is the commercial nerve of the country with the largest concentration of industries (Obokoh, 2010). Brimson (1997) confirmed that there are different methods of waste reduction and performance in the business organisations like Activity Based Costing (ABC) Technique, Target Costing Technique, Kaizen Costing, Tear-Down-Analysis, Just-In-Time (JIT), Total Quality Management (TQM), Balanced Score Card and Productive Maintenance.

Their effects are significant in improving overall performance of the whole organisation. This study focuses on ABC technique as cost reduction and performance enhancement technique in the Small and Medium Scale Enterprises (SMEs). However, Activity Based Costing Technique was developed as a direct response to the problem that could arise as a result of the allocation of overhead on the basis of direct labour (Cooper & Kaplan, 1995; Horngren, Datar & Rajan, 2015). Lindahl (1997) confirmed that over the course of the last decade, a management tool called Activity Based Costing (ABC) has become one of the more widely embraced of new management methods. He further confirmed that in most cases, a company's traditional accounting system adequately measures the direct costs of products and services, such as material and labour. As a result, ABC implementation typically focuses on indirect costs. Dubilela and Rundora (2014) in their study on the implementation of ABC in the SMEs in developing country confirmed that the implementation of ABC precedes the creation of a costing system that provides management with reliable cost information.

Literature reveals that, some of the basic variables for measuring performance include annual profits, annual turnover, corporate social responsibility, products' qualities, workers efficiency, value of investment, long term stability and solvency (Olabisi Sokefun & Oginni, 2012). They further opined that extant literature revealed that only few empirical studies substantiate the implementation of modern cost management methods in assessing the performance of SMEs in Nigeria. In addition, that there are thousands of SMEs in Nigeria today facing certain problems ranging from shortage of production to product qualities, segregation of revenue and costs into areas of personal responsibility while wastages during production process are rapidly growing day by day in this sector of the economy. From the review of previous researches, Alireza and Mahdi (2012) confirmed that majority of ABC research works were still done in developed countries while very little researches have been conducted in developing countries, like Nigeria. Thus, it is necessary to identify whether the Nigerian culture and way of doing business may have a different impact on the extent of ABC adoption and implementation. Secondly, majority of ABC researches reviewed adopted the behavioural and organisational variables identified by Shield (1995) to investigate factors influencing ABC success. Another gap identified in the literature is that some previous researches did not specify the ABC implementation stages.

Ayoade (2005) opined that SMEs operate in a volatile environment that is not conducive for business survival while Adeniji (2011) confirmed that the empirical finding substantiating the adoption of ABC Technique by SME as to control cost of production possibly record profit is not really available and Bahar (2014) confirmed that ABC adopters believed that, the major problems encountered during the course of the design and implementation of the ABC system are lack of adequate internal resources and difficulties associated with gathering the data required. The SMEs in Nigeria are either in the category of those that use ABC as cost control measure or those that do not use ABC at all. It is expected that further confirmation should be made to know the differences in the usage of ABC by SMEs in Lagos State. Those that use ABC as cost reduction or cost strategy may adopt different application methods. Time driven ABC suffers from the following spheres: it lacks the ability to identify activities in the first implementation step, such as practical capacity costs rate, uniform capacity costs rate, manager's time estimation for each activity, determination of unused capacity as well as lack of data accuracy, and limitations of managerial decision makings (Wamazi, 2016). Oseifuah (2014) found out that not many municipalities have implemented ABC while Rundora, Ziemerink and Oberholzer (2013) found that the ABC users have been in business significantly longer than the non-users, ABC users firms are significantly larger than the non-user firms and Elhamma and Fei (2013) in their study on the relationship between activity based costing, business strategy and performance in Moroccan enterprises, concluded that the management system based on ABC method results in a better performance for enterprises that have adopted it.

Therefore, this study seeks to investigate the differences in the usage of ABC by SMEs and find out the effect on the performance of the selected SMEs in Lagos State. Furthermore, it is expected of scholars in the field of accounting to investigate if the usage and application of ABC as a method of cost reduction and wastages affect profitability and efficiency of the selected SMEs in Lagos State. However, Olabisi, Sokefun and Oginni, (2012) concluded that those businesses that fail to apply ABC method are faced with the challenges of high production cost, high rate of wastages and loss of profit. As a result, some SMEs have failed to continue production and curtailing their operations because of going concern problem. A going concern is where there is a currently operating business that is expected to continue to function as such and remain viable in the foreseeable future (Business dictionary, 2019). This is what it is expected of SMEs in Nigeria. The few literature reviewed by the researcher confirmed that there is a Gap in knowledge regarding usage of ABC Technique in cost control. This technique has not been adequately investigated to find out its effect on profits of SMEs. Hence, there is the need to examine the association between the usage of ABC technique and performance of the selected SMEs in Lagos State as well as finding out the relationship that exists between ABC usage and the survival of the selected SMEs. The research is limited to SMEs in Lagos State because there is a high concentration of SMEs in that region of the country and Lagos is the Nigerian commercial capital city.

Literature Review

Activity Based Costing (ABC) falls within the field of accounting while cost accounting was first introduced by Louisville and Nashville railroad in 1860s. Activity-based costing enabled a company to decide the actual unit costs and relate indirect costs to production volume (Accounting Coach Dictionary, 2019). Later in the 1880s, complex companies such as Carnegie Company (a steel producer in USA) started to use cost accounting to identify quantity and the cost of materials and labour for each product (Yousif, Yousif & Paulsson, 2011). Cost accounting in the 21st century took a new step in the car industry when Alfred Sloan and General Motors with the collaboration of Ford started to use more advanced techniques in cost accounting to measure a car's success in the market by measuring return on investment and equity. It allowed General Motors to measure the profitability of high-end products (Yousif, Yousif & Paulsson, 2011). Sartorius, Eitzen and Kamala (2007) illustrated an example to explain the relationship between ABC and the contingency factors. They stated that increasing fixed costs leads to a need for more accurate cost allocation technique such as ABC and that large sized firms are more likely to adopt ABC than smaller firms due to the size of overheads, number of activities needs to be coordinated as well as limited resources.

According to organisational change theory, changes in organisations could be classified into four categories: technology, products, structure, and culture (Ruhanita & Daing, 2006). Anderson (1995) conducted longitudinal investigation of ABC process in General Motor (GM) from a period of 1986 to 1993. In his research, he examined the effects of organisational variables and contextual variables, and segmented ABC implementation into four stages, initiation, adoption, adaptation and acceptance. He found that organisational factors, such as top management support and training for the ABC system affected various stages of ABC significantly while contextual variables, such as competition, relevance to managers' decisions and compatibility with existing systems produced different degree of impact on different stages of ABC. Shield (1995) found out that technical variables were not associated with ABC success.

Similarly, Norris (1997) agreed with shield's findings that the association between ABC success and behavioural and organisational variables is stronger than with technical variables while impact of behavioural, organisational and technical variables should be focused at individual level. McGowan and Klammer (1997) concluded that employees' satisfaction with ABC implementation was positively related to clarity of objectives and quality of ABC information. Krumwiede (1998) found top management support and resources as the crucial factors explaining ABC success and Mitchel (2000) agreed that top management influenced ABC success significantly. In another study conducted by Khalid and Innes (2005) using a questionnaire survey among largest 100 firms in Saudi Arabia, ABC adoption was found to be positively related to diversity of products. In Malaysia, Ruhanita and Daing (2006) conducted a mail survey and a case study to examine the factors influencing ABC success, especially at adoption stage. They found that the significant factors were cost distortion, decision usefulness, information technology and organisational factors. In addition, the findings showed that decision

usefulness, top management support, link ABC to performance measure and compensation influenced the ABC success adoption significantly.

A study of one Chinese manufacturing firm was carried out by Lana and Fei (2007) in China. Their research aimed at examining some key success factors pertinent to ABC implementation within Chinese organisational and cultural setting. The findings revealed that top management support, hierarchical and communication structure and high proportion of dedicated professionals were significant factors in determining ABC success implementation. Majid and Sulaimon (2008) found that at every stages of ABC, the dominant factors influencing ABC success were also different. Hajiha and Alishah (2011) in their study on implementation of time-driven ABC system and profitability analysis in the hospital industry in Iran, concluded that managers of time could decrease time spent and increase profitability. Yousuf, Yousuf and Paulsson (2011) confirmed that non-ABC methods are not able to accurately assign indirect costs to activities and since ABC is an ideal model for this type of job, managers become more positive toward the model. Salawu and Ayoola (2012) opined that when ABC is implemented properly in an organisation that uses good technology, it can provide managers with accurate product-cost data that can be used to make better decisions about pricing and process improvements. Although the cost involved in implementing ABC is high, especially for organisations that still need to invest in good technology, the benefits of implementing ABC outweigh the costs.

Mulalo (2017) through semi-structured interviews, the study found that the steps and factors generally associated with successful ABC implementation are partially followed, but undefined duplicated activities exist, due to insufficient training and limited technology while Alireza and Mahdi (2012) opined that ABC concerns itself with way in which indirect costs is best associated with the production of different products and product group. Olabisi, Sokefun and Oginni (2012) kaizen Cost Management Technique and Profitability of Small and Medium Scale Enterprises (SMEs) in Ogun State, Nigeria. The study examines the relationship that exists between Kaizen cost management technique and profitability of small and medium scale enterprise in Ogun State, Nigeria. The result of statistical test of hypothesis shows that there is significant relationship between Kaizen cost management technique and profitability of SMEs. A further test of significant relationship between cost components and profitability of SMEs using Regression Analysis shows that only fixed cost reliably predicted the average annual profit by a factor of 0.099.

Methodology

Expost-facto survey research design method was adopted. The study population was made up of 5,984 small and medium scale enterprises, which had been identified through a preliminary review and retrieval from the database and business directory of SMEs in all the Local Governments in Lagos State while a sample of 536 respondents was determined based on a predetermined criterion. The study population consisted of SMEs from Manufacturing, General Trading and Agro-Allied Businesses while a total of 536 copies of

questionnaire were distributed as Manufacturing (179), General Trading (179), Agro-Allied (178). These enterprises are within the definition of National Council of Industries (2001) and are registered as businesses in Nigeria by the Corporate Affairs Commission (CAC), Abuja. Three hundred and fifty six (356) copies of the questionnaire representing (66%) were returned out of which three hundred and one (301) copies (56%) were properly filled and subjected to regression and correlation analysis. A five point likert-scale type questionnaire used to collect data was validated by experts and yielding an overall reliability coefficient of 0.782 Cronbach Alpha. The statistical tools employed were ANOVA and ANCOVA, Pearson's Product Moment Correlation Coefficient (PPMCC) and Student-t for statistical significance of the regression relationship.

Results and Discussion

The general objective of this study was to establish the relationship between ABC and SMEs performance in Lagos State. Having done the regression analysis, three hypotheses were formulated and tested. It is necessary to see the implication on the hypotheses of this study.

Hypothesis One

There is no significant difference in the usage of ABC technique of the selected SMEs in Lagos State.

Table 1: Correlation Matrix Table for overall ABC usage in SMEs

	Overall usage of the SMEs	ABC usage in Manufacturing	ABC usage in General Trading	ABC usage in Agro-Allied
ABC usage of SMEs	1			
ABC usage in Manufacturing	-0.103	1		
ABC usage in General Trading	-0.086	-0.157	1	
ABC usage in Agro-Allied	-.0116	-0.218	0.153**	1

Note: ** Indicates correlation value (r) is significant at the 0.05 level (2tailed)

Source: Researcher's data analysis result, 2018'

Table 1 above presents the correlation matrix of the usage of ABC methods of SMEs. We attempted to observe the strength and the direction of the overall ABC usage in the selected group of SMEs. The above table shows that the overall ABC usage in Manufacturing has negative (-.103) and significant relationship with overall ABC usage of the SMEs. This implies that overall ABC usage in manufacturing and overall ABC usage of the SMEs are inversely related.

The overall ABC usage in General trading also has negative (-.086) and significant relationship with overall ABC usage of the SMEs. This implies that overall ABC usage in general trading and overall ABC usage of the SMEs are indirectly related. The overall ABC usage in Agro-Allied has a negative (-.116) and significantly relationship with overall ABC usage of the SMEs. This suggests that overall ABC usage in agro-allied and overall ABC usage of the SMEs is indirectly related. In addition, other explanatory variables are indirectly related to each other except for usage in agro-allied that is positively and significantly related to general trading at 0.05 level of significant.

Table 2: Overall ABC usage in SMEs between and within groups using ANOVA

ANOVA					
OBSERVATIONS	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	0.133	2	0.067	.000	1.000
Within Groups	27848.800	12	2320.733		
Total	27848.933	14			

From the table above, based on ANOVA, the P-value is 1.000. since P value (1.000) is greater than 0.05 level of significant, therefore we accept null hypothesis and conclude that the usage of ABC technique does not have significant difference in SMEs.

Table 3: Tests of Between – Subjects effects of ABC usage in Manufacturing, General Trading and Agro-Allied using ANCOVA

Model	Sum of Square	Df	Mean Square	F	Sig.
1 Correlated Model	3527.265	196	284.108	6.348	.085
Intercept	6330.024	1	6440.023	121.632	.055
X01	741.896	1	743.897	16.043	.072
Usage Man.	211.887	2	43.316	.912	.702
Usage Gen.	76.706	1	211.988	4.511	.061
Usage Agro.	528.784	1	78.903	1.653	.342
Usage Man x Usage Gen.	640.765	2	453.903	.508	.405
Usage Man x Usage Agro	,320	2	329.282	.973	.201
Usage Man x Usage Gen. x Usage Agro	785.008	2	784.772	6.722	.003
Usage Gen. x Usage Agro	4.007	2	4.007	6.852	.059*
Usage Man x Gen. x Usage Agro	4401.741	761	.585		
Error	674.712	1148			
Total	670.705	1147			
Corrected Total					

Source: Researcher's Data Analysis Result, 2018

The result in table 3 using ANCOVA, revealed that there was no significant difference in the usage of ABC technique in Manufacturing ($F_{(2,95)} = .912$; $p > 0.05$). Also, there was no significant difference in the usage of ABC technique in General Trading ($F_{(1,95)} = 4.511$; $p > 0.05$). In addition, there was no significant difference in the usage of ABC technique in Agro-Allied ($F_{(1,95)} = 1.653$; $p > 0.05$). There was no significant two-way interaction effects of ABC usage in Manufacturing and General Trading ($F_{(2,95)} = .508$; $p > 0.05$). Also, there were no significant two-way interaction effects of ABC Usage in Manufacturing and Agro-Allied ($F_{(2,95)} = .973$; $p > 0.05$). However, there were significant two-way interaction effects of ABC Usage in General Trading and Agro-Allied ($F_{(1,95)} = 6.722$; $p > 0.05$). In a three-way interaction effect of ABC Usage technique of Manufacturing, General Trading and Agro-Allied observed, there were no significant differences in their ABC Usage ($F_{(2,95)} = 6.852$; $p > 0.05$). In effect, the null hypothesis was therefore accepted by these findings. The implication of these findings is that ABC Usage technique will not differ in its application for SMEs in Lagos State. Therefore, the first objective is achieved, research question one answered and hypothesis on tested.

Hypothesis Two

There is no significant relationship between usage of Activity Based Costing (ABC) technique and survival of selected SMEs in Lagos State.

Results:

Table 4a: Coefficients

Model	Unstandardized Coefficients		Unstandardized Coefficients	T	Sig
	B	Std. Error			
(Constant)	3.232	.141		22.980	.000
ABC method in majorly Used in Product Costing in my Organization	.144	.036	.117	3.992	.000

Source: Researcher's Data Analysis Result, 2018

Table 4b: ANOVA

ANOVA^b

Model	Sum of Squares	Df	Mean Square	f	Sig.
1. Regression	11.156	1	11.156	15.940	.000 ^a
Residual	802.747	1147	700		
Total	813.902	1148			

Source: Researcher's Data Analysis Result, 2018

Table 4c: Model Summary

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.117 ^a	.014	.013	.837	.502

Source: Researcher's Data Analysis Result, 2018

Interpretation of the above tables

This hypothesis tested the significant relationship between the usages of activity based costing (ABC) technique and the Survival of selected SMEs in Lagos State. Two variables were considered for this test. The predictor (Independent Variable) which is “ABC technique is majorly used in product costing in my organization”. Application of ABC technique affects survival of an Organization. The model summary table gives the correlation efficient R to be 0.117 and R-Squared of 0.014. This result revealed a very weak relationship between the variables used only 1.4% variation in the dependent variable can be accounted for by the independent variable. The standard error of the estimate is 0.837. However, the ANOVA tables shows that the model is significant with p-value of $0.000 < 0.05$. Also, the sum of square regression and residual are 11.156 and 802.747 respectively with mean square of 11.156 and 0.700 respectively. The F-value is 15.940.

The coefficients for the model are 3.232 (constant) and 0.144 for “ABC” technique is majorly used in product costing in my organization. The standard error for the constant and the independent variables are 0.141 and 0.036. The t-value for the independent variable is 3.992 with p-value of $0.000 < 0.05$. This result shows that ABC method is significant and majorly used in product costing though its contribution to product costing is minimal. The model is that application of ABC of ABC method affects the survival of an organization = $3.232 + 0.144 \text{ ABC}$. The second objective achieved while research question two answered and hypothesis two tested and rejected.

Results

Table 5a: Coefficients Table

Coefficients ^a

Model	Unstandardized Coefficients		Unstandardized Coefficients	T	Sig.
	B	Std. Error			
(Constant)	3.154	.128		24.700	.000
ABC method in majorly Used in Product Costing in my Organization	.218	.033	.192	6.630	.000

Source: Researcher's Data Analysis Result, 2018

Table 5b: Model Summary

Model Summary ^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.192 ^a	.037	.036	.759	.453

Source: Researcher's Data Analysis Result, 2018

Table 5c: ANOVA

ANOVA ^b

Model	Sum of Squares	Df	Mean Square	f	Sig.
1. Regression	25.348	1	25.348	43.955	.000 ^a
Residual	661.456	1147	.577		
Total	686.804	1148			

Source: Researcher's Data Analysis Result, 2018

Interpretation of the above tables

This hypothesis tested the significant relationship between the usage of Activity Based Costing (ABC) Technique and Profitability of selected SMEs in Lagos State. The dependent variable is Profitability which gives more accurate analysis and the independent variable is ABC which gives more accurate analysis.

technique which is majorly used in product costing in the SMEs. There is a very weak positive relationship between the two variables ($R=0.192$) and 3.7% of variation in profitability analysis is accounted for by ABC technique in product costing. Also, the ANOVA table shows that the model is adequate in establishing the relationship between the variables with p-value of $0.000 < 0.05$. The sum of square regression and residual are 25.348 and 661.456 respectively while the F-value is 43.955. The coefficients table gives the standard error for the constant and the independent variables to be 0.128 and 0.033 with t-values of 24.700 and 6.630. The model that ABC gives accurate profitability analysis = $3.154 + 0.128 \text{ ABC technique}$ is majorly used in product costing in the SMEs. The p-value for the independent variable is $0.000 < 0.05$ which means the null hypothesis is rejected while the alternative hypothesis is accepted. Hence, there is a significant relationship though very small between the usage of ABC method and profitability of SMEs in Lagos State. The third objective achieved while research question three answered and null hypothesis three has been tested and rejected.

Conclusion

The findings of this study did not contradict opinions of the prior researchers, having filled the missing gap in the literature. This study is an effort to reveal the insight dynamics for the usage and impact of modern cost management methods on performance of SMEs in Lagos State, Nigeria. In the light of prior studies, key explanatory variables were identified to know relationships and efforts toward the determination of SMEs performance. The outcome of this research as empirically proved. (i) there is no significant difference in the usage of Activity-Based Costing (ABC) technique of selected SMEs in Lagos State, (ii) There is a significant relationship between the usage of Activity-Based Costing (ABC) Technique and the survival of selected SMEs in Lagos State; (iii) There is a significant relationship between the usage of Activity-Based Costing (ABC) Technique and Profitability of Selected SMEs in Lagos State.

This simple means that Activity-Based Costing (ABC) Technique is a significant factor in determining the performance of selected SMEs in Lagos State. It was also evident from the empirical results of the study that SMEs were facing some major challenges in Nigeria which had continued to face growth and performance. These modern cost management methods are relevant in understanding organizational behaviour and management decisions. Their importance lies not only in their relationship with product qualities, liquidity and stability but with their impact on the firm performance as a whole.

Furthermore, the usage of activity based costing technique had significantly improved the liquidity and profitability of the SMEs investigated through cost reduction and application of the modern cost management techniques to their operations. Therefore, from the empirical analysis carried out, the ABC system is a major determinant of the performance of SMEs in Nigeria.

Recommendations

This Study examined the usage and impact of Activity-Based Costing (ABC) system on performance of SMEs in Lagos State. Based on the study, the following recommendations re made:

First, the SMEs in Nigeria should ensure that they produce quality goods and services through the adoption of activity based costing technique; second, management should always take into consideration activity based costing technique when making decisions and design a cost management policy that will enhance firm performance. Moreover, this policy should be used as tools for planning and forecasting while these policies should be reviewed from time to time to incorporate the local environmental factors; third, management should carefully understudy the modern cost management methods that could be employed to improve the performance of business enterprises in Nigeria. Fourth, attention should be given to any loopholes found in the usage of any of these methods while necessary steps should be taken to close up the gaps. Fifth, corporate firms should consider activity based costing technique in assessing managers' performance.

Suggestions for Further Studies

The issue of activity based costing technique of selected SMEs however, needs further studies by future researchers. Therefore, the following matters are suggested:

1. Future researchers might consider the relationship between ABC system and Performance in Lagos State Industry;
2. Further research that will replicate this study by using more comprehensive data and representative samples of Large Scare Industry from Nigeria would shed more lights on issues raised in this study and other related studies;
3. Future researcher should investigate generalization of the findings beyond Nigeria;
4. Future researchers can consider the usage and impact of the cost management methods such as tear down costing, Kaizen costing technique, value analysis, target costing and many more as opposed to ABC system.

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