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ANTECEDENTS TO CHOICE OF MANAGEMENT ACCOUNTING PRACTICES AMONG MANUFACTURING COMPANIES IN NIGERIA

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Abstract

Globalization brings in new technology and makes a developing country open to greater competition. These changes in business environment have brought about changes in some firms characteristics. A structure questionnaire asking the respondents about changes in their firms characteristics and management accounting practices over a period of five years(2011-2015) was administered once among the management accountants/finance controllers of 154 manufacturing companies in Nigeria which are not listed on Nigeria Stock Exchange. 133 useful responses were subjected to factor analysis, reliability test and logistic regression. Factor loading of 0.4 was used as a threshold for factor analysis and 0.7 cronbach's Alpha was used for reliability tests. The study found out that manufacturing companies in Nigeria were not exempted from dynamic business environment as they increasingly used their competitive strategy, culture and Advanced Manufacturing Technology. The study established that firms' strategy, firms' culture and manufacturing technology have significant effect on management

accounting practices. Since changes in firms' characteristics determine the choice of management accounting practices, we recommend that management accounting system design should be dependent on firms' characteristics. Since manufacturing technology was the major driver of choice of management accounting practices, the study recommends that undergraduate accounting students and accountants in industries should be practically exposed to manufacturing process.

Keywords: Management Accounting Practices, Firms strategy, Firms culture, Manufacturing technology, Nigeria

INTRODUCTION

With the advent of globalization which turns the whole world into a global village, businesses all over the world including the local companies from developing nations are now exposed to international competition and advanced technology. Globalization brings in new technology and makes a developing country open to greater competition(Kassim, Md-Mansur, & Idris, 2003). These changes in business environment have brought about changes in some firms characteristics such as firms strategy, firms culture, firms size and manufacturing technology among others(Abdel-Kader & Luther, 2008; Baines & Langfield-Smith, 2003; Mat & Smith, 2014). With the advent of digital technologies, a variety of issues relating to pricing strategies, cost management and control mechanisms are evident as there are alterations in management accounting systems, structures, thinking, and practices (Bhimani, 2003).These changes may affect the choice of management accounting practice (MAP) in an organization and may also result in the need for the firm to reconsider its existing organizational design and strategies in order to fit with the changing environment (Mat & Smith, 2014; Mat, 2010).

These changes in business environments have been argued as reasons why change in management accounting is inevitable(Johnson & Kaplan, 1987; Kaplan, 1984; Watts, Yapa, & Dellaportas, 2014). Management Accounting Practices (MAP) includes cost practices, budgeting, and information for decision making, strategic analysis and performance analysis using management accounting techniques (Horngren, Datar, Foster, Rajan, & Ittner, 2009).The traditional management accounting practices such as standard costing, marginal costing and absorption costing have been criticized of being too weak to cope with the dynamic environment of the 21st century business because they are subservient to financial accounting and hence produces information that is too late, too aggregated and too distorted to be relevant for managers' planning and control decisions (Johnson & Kaplan, 1987; Kaplan, 1984; Watts et al.,

2014; Waweru, 2010).New management accounting practices which are more sophisticated than the traditional techniques have been developed and suggested for practices(Ajibolade, 2013 ; Bhimani & Bromwich, 2010). The new practices include activity based costing, balanced scorecard, target costing, life cycle costing, total quality management, Just in time, throughput accounting and backflush accounting among several others(Askarany& Smith, 2008; Mat, 2010; Waweru & Uliana, 2008).However, despite the heavy criticisms of the traditional techniques and a lot of benefits ascribed to the modern practices by many authors, the extant literature shows that the traditional techniques are still being used in advanced, emerging and developing economies whereas the new techniques have not been fully embraced by many firms(Ajibolade, 2013; Askarany, Smith, & Yazdifar, 2007; Badem, Ergin, & Dury, 2013; Oyerogba, 2015).

After several decades of neglect, specifically since the advent of crude oil in 1970s, the attention of the Nigerian government has now been shifted to resuscitating manufacturing sector as a way out of the economic recession which the recent persistent shortfall in oil revenue has caused the country. Nigeria is a mono economic nation which heavily relies on oil revenue accounting for about 80% government revenue and 90 % of foreign exchange earnings (Anyaehie & Areji, 2015). The reliance on oil revenue has led to a significant setback to other sectors including manufacturing sector.

Nigerian manufacturing sector is confronted with various challenges including; high geographical concentration, high production costs, low value-added, serious capacity underutilization; high import content of industrial output and low level of foreign investment in manufacturing (Anyaehie & Areji, 2015; Ayeni, 2012). Since early 1990s, Nigeria has undergone a significant decline in manufacturing activity losing approximately 8,708 manufacturing jobs due to plant shut-downs and relocations(Ayeni, 2012).

Arguments have been advanced by Söderbom, Teal and Wambugu (2002) that a key policy issue that Nigerian government should face is to understand and address the factors that will enhance the efficiencies of companies which shall consequently increase their competitiveness. Ayodele and Falokun(2003) posit that the adoption of the combination of suitable management techniques with suitable technology and other resources can solve the problem of low productivity. Moreover, management accounting has been suggested as an important management technique that can help ensure efficiency in the use of companies' resources(IFAC, 1998). However, prior studies have identified the scarcity of studies on management accounting systems in developing countries, particularly among non-listed and small and medium enterprises(Hopper & Bui, 2016; Hopper, Tsamenyi, Uddin, & Wickramasinghe, 2009; López & Hiebl, 2015; Mat & Smith, 2014; Mat, 2010).

This study has responded to calls from earlier researchers by investigating antecedents to choice of management accounting practices among manufacturing companies in Nigeria that are not listed on Nigeria Stock Exchange. The study established that competitive strategy, firms' culture and manufacturing technology significantly influenced the choice of management accounting practices by making the manufacturing companies in Nigeria to increasingly use advanced management accounting techniques in response to changes in firms' characteristics.

THEORETICAL REVIEW

System Approach Theory

The evolution of System approach theory can be traced to General System Theory advanced by a Biologist – Ludwig Von Bertalanffy as a response to the increasing fragmentation and duplication of scientific and technological research and decision making in the first half of the 20th century(Laszlo & Krippner, 1998).System theory was propounded by von Bertalanffy in 1937 when he first presented his idea of a 'General System Theory' in a philosophy seminar at the University of Chicago. It became an interdisciplinary theory in 1950s when Kenneth Boulding, an economist, Anatol Rapoport, a mathematician and Ralph Gerard a physiologist came together in 1954 at the Palo Alto Center for Advanced Study in the Behavioral Sciences(Laszlo & Krippner, 1998).

Laszlo and Krippner (1998) define a system as a group of interacting components that conserves some identifiable set of relations with the sum of the components plus their relations (i.e., the system itself) conserving some identifiable set of relations to other entities (including other systems). Ackoff (1981) posits that a system is a set of two or more interrelated elements with the following properties:

1. Each element has an effect on the functioning of the whole.
2. Each element is affected by at least one other element in the system.
3. All possible subgroups of elements also have the first two properties.

According to the system approach theory, all parts of a system are related to each other and any change in one part of a system may require the consideration of appropriate change(s) in other parts of the organisation, otherwise, the system may not work properly(Kellett & Sweeting, 1991). Therefore, based on the above assertion of a system approach theory, the study makes the following propositions:

$H_0$1: Firms competitive strategy does not significantly influence the choice of management accounting practices.

$H_0$2: Firms culture does not significantly influence the choice of management accounting practices

$H_0$3: Firms manufacturing technology does not significantly influence the choice of management accounting practices

EMPIRICAL REVIEW

There are many confounding empirical and theoretical findings on the causes of choice of management accounting practices. The association of various factors with the choice of management accounting practices is quite controversial. Studies investigating the effect of firms strategy, firms culture and manufacturing technology on the choice of management accounting practices have produced confounding results(Baines & Langfield-Smith, 2003; Budi & Nusa, 2015; Mat & Smith, 2014; Mat, 2010; Ominunu, 2015).

Firm Strategy and Management Accounting Practices

Baines and Langfield-Smith(2003)investigated the effect of firms' competitive strategy on management accounting practices among 700 manufacturing firms in Australia and conclude that changes in firms' competitive strategy towards product differentiation strategy leads to choice of modern management accounting practices. Using a survey of Russian enterprises and path analysis, Chenhall, Kallunki and Silvola(2011)confirm that product differentiation is associated with innovation and management accounting practices. Similarly, using a sample of 350 manufacturing firms, Spencer, Joiner and Salmon(2009) also suggest that differentiation strategy is associated with new management accounting techniques. The study of Ghasemi *et al*.(2015) also suggests that changes competitive strategy of the 120 sampled manufacturing companies in Iran lead to changes in Management accounting practices towards strategic management accounting. However, having empirically investigated 215 manufacturing firms from a chosen sample of 1,000 in Malaysia using structural equation model, Mat (2010) argue that there is no significant association between competitive strategy and Management accounting practices.

Firm Culture and Management Accounting Practices

The influence of organizational culture on management accounting practices has been the interest of many researchers in the field for a long time (Bhimani, 2003). The extant literature suggest that success or failure of a management accounting system is influenced by the cultural values held by the users of that management accounting system(Bhimani, 2003). Organizational culture is the totality of values, symbols, meanings, assumptions, and expectations capable of organizing a group of people working together(Budi & Nusa, 2015).The findings of Ominunu(2015) reveal that organizations in Nigeria have low and poor culture

towards the deployment and use of Management accounting and information systems. Investigating the reality of transferability and transfiguration of Japanese style management and production system (JMPS) in other countries, in the context of the global economy, Kawamura(2011) suggests that Japanese Multinational firms encountered challenges in US when they wanted to apply Japanese style of production as conditions differ from that of the home country; hence, they adapted to local conditions..

Kevin, Kristal and Robert(2011) established that cultural dimension teamwork/respect for people is the most important factor in enhancing the use of TQM practices, while more outcome oriented and innovative business units were also found to use TQM practices to a greater extent in Australia. Naranjo-Valencia, Jimenez-Jimenez Valle(2011) also empirically established that organizational culture is a clear determinant of innovation strategy. Empirical work of Budi and Nusa(2015) and Chenhall *et al*.(2011) also indicate the significant influence of organizational culture on the choice management accounting practices.

Manufacturing Technology and Management Accounting Practices

Although Information Technology (IT) and accounting come from different background and history(Moorthy, Voon, Samsuri, Goplan, & Yew, 2012), today, they are inseparable(Maria do Céu & Alves, 2010). Accounting has been practiced since 8500 BC till today and there are not many changes to the way accounts are maintained, but IT is changing fast and changing every day as new technologies, launched today, become obsolete within couple of months (Moorthy et al., 2012).Taking a cue from the earlier studies, arguments have been advanced that new technology would change management accounting system design. For instance, Haldma and Lääts (2002) argue that new technology will lead to a change in cost structure. This is made possible because once the manufacturing technology becomes more advance, the management accounting practices also becomes more complex and sophisticated to cope precisely with the manufacturing process (Mat, 2010).

In the same vein, Ajibolade (2013) investigated the effect of manufacturing technology on the management accounting practices and established that manufacturing technology is positively and moderately correlated with management accounting practices among 200 manufacturing companies in Lagos and its immediate environ. Also, Allahyari and Ramazani (2011) claim that technological changes affect management accounting changes in Iran. Askarany and Smith (2008), Askarany *et al.* (2007) and Ern, Abdullah and Yau (2015) among others also established a causal relationship between manufacturing technology and management accounting practices. However, some empirical studies claim that manufacturing

technology does not affect the choice of management accounting practices(Baines & Langfield-Smith, 2003; Hyvonen, 2003).

RESEARCH METHOD

A carefully designed survey instrument was adopted to find the relation in changes in firms' characteristics on management accounting practices among manufacturing companies in Nigeria over a period of five years (2011-2015). The questionnaire was personally handed over to the management accountants/Head of Account/Finance unit or their representatives in some cases. 154 companies were randomly selected out of the 448 manufacturing companies in Lagos and its immediate environs which were extracted from the Main directory of Manufacturers Association of Nigeria.

The research instrument developed by Baines and Langfield-Smith (2003) was adapted to measure manufacturing technology, firms strategy and management accounting practices. Respondent were asked to state how they have used the advanced manufacturing technologies on a 5-point likert rating scale ranging from never used to very frequently used. The scale adopted from Khandwalla (1977) was also used to measure the complexity of their manufacturing process ranging from customized production, small batch of similar goods, large batch, mass production and continuous production representing increasing level of complexity and standardization. Likewise, they were asked to rate their level of automation on a 5 point likert rating scale from very little automation to completely automated. The composite figure of all the indicators was used.

In like manner, management accounting practices was measured based on their level of usage during the period of five years (2011-2015). The use of 15 modern management accounting techniques including; activity based costing, activity based budgeting, activity based management, target costing, throughput accounting, backflush costing, life cycle costing, product profitability analysis, quality costing, kaizen costing, balanced score card, just in time, value chain analysis, benchmarking and shareholders' value analysis/ economic value added (EVA) was tested on 5 point Likert rating scale from "never used" to "very frequently used". All the aforementioned techniques were reduced to a construct to measure management accounting practices. The average was found, the index value below average was regarded as traditional management accounting practices and coded as "0" while the index value above average was regarded as modern management accounting practices and coded as "1".

Firms' strategy was equally measured by asking respondents on how they have used some innovation and cost leadership strategy on a 5 point likert rating scale from "significantly less used" to "significantly used more". Some of the innovation strategies that were examined

include; Involving customers in product design, allowing customers to set price, Make dependable delivery promises, Provide high quality products, Provide effective after sales service & support. The indicators for cost leadership strategy include Cost-plus based and market based product costing & pricing, Make changes in design & introduce quickly, Ensuring a cheaper selling price than competitors and ensuring a lower cost of production. All these indicators were reduced to a construct to measure the firms' strategy.

Similarly, firms' culture was measured using five dimensions of culture which include; innovation/risk orientation culture, emphasis on outcome culture, emphasis on people culture, aggressive culture and team-based culture. It adapted the instrument developed by(O'Reilly, Charles, & David, 1991). It was also measured on a 5 point Likert rating scale from "strongly less emphasised" to "strongly emphasised". The items were also reduced to a construct to measure the firms' culture.

The data collected for the study were subjected to factor analysis, reliability test and logistic regression tests to ensure the validity of the instrument, reliability of the measurement and establish a causal relationship between the firms' characteristics and management accounting practices respectively.

RESULTS AND DISCUSSION

Response Rate

Nine companies refused to participate in the research and five of those that showed interest did not complete the questionnaire. Therefore, the total response gotten was 140 .However, seven responses were incomplete reducing the useful responses to 133.The response rate is 86.4% based on sample size.

Factor Analysis

Factor Analysis and reliability tests were also conducted for the study. The factor loading below .04 was not considered for further statistical analysis. This acceptance implies that data gathered had relatively high internal consistency and could be generalized as a reflection of the opinion of all respondents in the target population on the effect of changes in firm characteristics on management accounting practices among the manufacturing companies in Nigeria. The reliability test was performed using Cronbach's Alpha with a benchmark of 0.7. The outcomes of the test which show Cronbach's Alpha values of .079, .075, .082 and .087 for firms strategy, firms culture, manufacturing technology and management accounting practices respectively imply that instrument of measurement was reliable.

Correlation Analysis

A pearson moment correlation was used to find the relation among the variables of the study. This was done before data for management accounting practices was turned to binary. Table 1 shows that management accounting practices and manufacturing technology are positively and significantly correlated with a coefficient of .649 at .01 level of significance. Likewise, .444 shows that management accounting practice and firms strategy are positively and significantly associated at 1% level of significance while .254 also indicates a positive and significant relation between firms culture and management accounting practices at 1% level of significance. The direction and strength of the relationship among the predictors can also be inferred from the table. Technology and strategy are positively and significantly related and likewise firms strategy and firms culture. However, there is no significant relation between firms culture and manufacturing technology.

Table 1. Correlations

		TECHNOLOGY	FIRMS STRATEGY	FIRM CULTURE	MANAGEMENT ACCOUNTING PRACTICES CONTINOUS
TECHNOLOGY	Pearson Correlation	1	.440**	.128	.649**
	Sig. (2-tailed)		.000	.142	.000
	N	133	133	133	133
FIRMS STRATEGY	Pearson Correlation	.440**	1	.463**	.444**
	Sig. (2-tailed)	.000		.000	.000
	N	133	133	133	133
FIRM CULTURE	Pearson Correlation	.128	.463**	1	.254**
	Sig. (2-tailed)	.142	.000		.003
	N	133	133	133	133
MANAGEMENT ACCOUNTING PRACTICES CONTINOUS	Pearson Correlation	.649**	.444**	.254**	1
	Sig. (2-tailed)	.000	.000	.003	
	N	133	133	133	133

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

Firms Strategy and Management Accounting Practices

Omnibus tests of model coefficient for firms' strategy give a Chi-square of 10.883 with additional 1 degree of freedom. This is a test of null hypothesis that adding another variable to the model has significantly increased the researcher's ability to predict the decisions made by the respondents. Since the model is significant at 0.05 level of significance, the hypothesis is rejected, implying that adding another variable to the model has not significantly changed the prediction about respondents' decision.

Table 2. Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
	Step	10.833	1	.001
Step 1	Block	10.833	1	.001
	Model	10.833	1	.001

The essence of-2 Log likelihood is to see whether adding another variable to the model would lead to a significant reduction in its value. Cox & Snell R Square can be interpreted like R^2 in multiple regressions but cannot reach the maximum of 1. Nagelkerke R Square can also be interpreted like R^2 in multiple regressions and it can reach 1(Field, 2009). However, it should be noted that the value of psudo-R^2 are usually low. -2 Log likelihood (-2LL) for firms strategy is 170.215. Cox & Snell R Square is .078 while Nagelkerke R square is .105. This implies that firms' strategy contributes about 10.5% variation in management accounting practices.

Table 3. Model Summary For Firms Strategy

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	170.215[a]	.078	.105

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

The classification tables shows that 33.9% of traditional management accounting practices were correctly classified while 83.1% of modern management accounting practices were correctly classified. The overall percentage of classification is 62.4% which implies a good fitness of the model.

Table 4. Classification Table[a]

Observed			Predicted		
			MANAGEMENT ACCOUNTING PRACTICES		Percentage Correct
			0	1	
Step 1	MANAGEMENT ACCOUNTING PRACTICES	0	19	37	33.9
		1	13	64	83.1
	Overall Percentage				62.4

a. The cut value is .500

Interpreting regression equation involves relating the explanatory variables to the business question that the equation was developed to answer. However, given the non-liner nature of logistic regression, it is difficult to interpret the relations between the predictor and the probability that y=1 directly. Notwithstanding the above limitation, statisticians have shown that the relation can be interpreted using a concept called the odd ratio(Field, 2009; Gujarati, 2004). The odd in favour of an event occurring is defined as the probability that the event will occur divided by the probability that the event will not occur(Anderson, Sweeney, & Williams, 2011). The variables in the equation output table shows that the regression equation is$\ln odds = -2.863 + 0.191(Strategy)$. The p-values .002 indicates that firm strategy significantly influence the choice of modern management accounting practices at .05 level of significance. The variable in the equation output table also gives Exp (B) values. This is better known as odd ratio predicted by the model. The table shows that changes in firms strategy influences changes in modern management accounting practices 1.210 times than it influences traditional management accounting practices. Therefore, the following null hypothesis is not accepted.

$H_0$1 Firm strategy does not significantly influence the choice of management accounting practices.

Table 5. Variables in Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	STRATEGY	.191	.063	9.250	1	.002	1.210
	Constant	-2.863	1.064	7.244	1	.007	.057

a. Variable(s) entered on step 1: STRATEGY.

The result of this investigation contradicts the claim of Mat (2010) and Mat and Smith (2014) that changes in firms strategy do not have significant effect on changes in management

accounting practices. However, this finding is supported by the claims of many earlier authors in similar studies that firms' strategy significantly influences the choice of management accounting practices. Their studies specifically established a causal relationship between differentiation strategy and management accounting practices(Baines & Langfield-Smith, 2003; Chenhall *et al*., 2011; Ghasemi *et al*., 2015; Spencer *et al*., 2009). This study has established that firms combine innovation and cost leadership strategy in responding to competitive environment. This in turn influences their choice of management accounting practices.

Firms Culture and Management Accounting Practices

In like manner, Omnibus tests of model coefficient for firms' culture give a Chi-square of 5.597 with additional 1 degree of freedom. Since the model is significant at 0.05 level of significance, the hypothesis is rejected, implying that adding another variable to the model has not significantly changed the prediction about respondents' decision.

Table 6. Omnibus Tests of Model Coefficients For Firms Culture

		Chi-square	df	Sig.
Step 1	Step	5.597	1	.018
	Block	5.597	1	.018
	Model	5.597	1	.018

-2LL for firms culture is 175.451, Cox & Snell R Square is .041 while Nagelkerke R square is .055. This implies that firms' culture contributes about 5.5% variation in management accounting practices.

Table 7. Model Summary For Firms Culture

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	175.451[a]	.041	.055

a. Estimation terminated at iteration number 3 because parameter estimates changed by less than .001.

Table 8 shows that 33.9% of traditional management accounting practices were correctly classified, 85.7% of the modern management accounting practices were correctly classified while the overall percentage of correct classification is 63.9% which implies a good fitness of the model.

Table 8. Classification Table for Firms Culture

Observed			Predicted		
			MANAGEMENT ACCOUNTING PRACTICES		Percentage Correct
			0	1	
Step 1	MANAGEMENT ACCOUNTING PRACTICES	0	19	37	33.9
		1	11	66	85.7
	Overall Percentage				63.9

a. The cut value is .500

Similarly, the variables in the equation output in table 9 shows that the regression equation is$\ln odds = -1.772 + 0.191(Firm\ culture)$. The p-values .021 also indicates that firm strategy significantly influences the choice of modern management accounting practices at .05 level of significance. The odd ratio /Exp (B) values equally shows that changes in firms culture influences choice of modern management accounting practices 1.288 times than it influences traditional management accounting practices. Therefore, the following null hypothesis is not accepted.

$H_0$2 Firm culture does not significantly influence the choice of management accounting practices.

Table 9. Variables in Equation

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1[a]	CULTURE	.172	.075	5.304	1	.021	1.188
	Constant	-1.772	.923	3.684	1	.055	.170

a. Variable(s) entered on step 1: CULTURE.

This study shows that manufacturing companies in Nigeria emphasized certain cultures that caused them to use modern management accounting practices. It however contradicts the finding of Ominunu (2015) who claims that organizations in Nigeria have low and poor culture towards the deployment and use of Management accounting and information systems. However, the findings of this analysis lends credence to the claims of many earlier authors (Budi & Nusa, 2015; Chenhall *et al*., 2011; Kawamura, 2011; Kevin, Kristal, & Robert, 2011; Naranjo-Valencia, Jimenez-Jimenez & Valle, 2011). Kawamura(2011) suggests that Japanese Multinational firms encountered challenges in US when they wanted to apply Japanese style of

production as conditions differ from that of the home country; hence, they adapted to local conditions. The study was based on some comprehensive field surveys in North America in 2000–2001.

Firms Manufacturing Technology and Management Accounting Practices

Similarly, Ominibus test of model coefficient for manufacturing technology gives a Chi-square of 47.209 at .05 level of significant.

Table 10. Omnibus Tests of Model Coefficients for manufacturing technology

		Chi-square	df	Sig.
	Step	47.209	1	.000
Step 1	Block	47.209	1	.000
	Model	47.209	1	.000

-2LL for manufacturing technology is 133.838 while Cox & Snell R Square is .299 while Nagelkerke R square is .402. This implies that manufacturing technology causes about 40.2% variation in management accounting practices.

Table 11. Model Summary For Manufacturing Technology

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	133.838[a]	.299	.402

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

In the same vein, the variables in the equation output table shows that the regression equation is $\ln odds = -6.055 + 0.289(manufacturing\ technology)$. The equation implies that changes in manufacturing technology causes 28.9% changes in management accounting practices. The p-values .000 also indicates that firm manufacturing technology significantly influences the usage of modern management accounting practices at .05 level of significance. Exp (B) values also known as odd ratio also implies that changes in firm manufacturing technology influences choice of modern management accounting practices 1.336 times than it influences choice of traditional management accounting practices. Therefore, the following null hypothesis is not accepted.

$H_0$3 Changes in manufacturing technology does not significantly influence the choice of modern management accounting practices.

Table 12. Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	TECHNOLOGY	.289	.053	30.273	1	.000	1.336
	Constant	-6.055	1.188	25.991	1	.000	.002

a. Variable(s) entered on step 1: TECHNOLOGY.

This finding contradicts the finding of Baines and Langfield-Smith (2003) that the increased use of advanced manufacturing technology did not result in increased use of modern management accounting practices in Australia. In like manner, this study does not enjoy the support of previous findings that there is no particularly significant impact of ERP on the practice of management accounting(Hyvonen, 2003).

Notwithstanding, the outcome of this analysis lends credence to the findings of several earlier authors that manufacturing technology significantly influence the choice of management accounting practices. Specifically, they established that the increased use of advanced manufacturing technology significantly leads to increased use of modern management accounting practices(Ajibolade, 2013; Allahyari & Ramazani, 2011; Ern *et al.*, 2015; Ismail & Isa, 2011; Mat & Smith, 2014; Sunarni, 2013).

Overall Model

The overall omnibus test of 51.304 with the p-value of .000 at 3 degree of freedom also implies that the model is good.

Table 13. Overall Omnibus Tests of Model Coefficients

		Chi-square	Df	Sig.
Step 1	Step	51.304	3	.000
	Block	51.304	3	.000
	Model	51.304	3	.000

The overall -2LL is 129.744, Cox & Snell R square is .320 and Nagelkerke R square is .430.The lower value of -2LL and the increased values of Cox & Snell R square and Nagelkerke R Square compared with the individual models implies good fit of the overall model.

Table 14. Overall Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	129.744[a]	.320	.430

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Table 15 shows that the overall percentage of correct classification of traditional management accounting practices is 71.4%, while the overall percentage of correct classification for modern management accounting practices is 93.5%. Overall percentage of correct classification is 84.2%

Table 15. Correctness of Classification

Classification Table[a]

Observed			Predicted		
			MANAGEMENT ACCOUNTING PRACTICES		Percentage Correct
			0	1	
Step 1	MANAGEMENT ACCOUNTING PRACTICES	0	40	16	71.4
		1	5	72	93.5
	Overall Percentage				84.2

a. The cut value is .500

Table 16 shows that only the manufacturing technology significantly influences the choice of management accounting practices at 5% level of significance. This implies that only the model with manufacturing technology is the optimal model.

Table 16. Variables in Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	CULTURE	.189	.101	3.516	1	.061	1.208
	TECHNOLOGY	.297	.057	26.770	1	.000	1.346
	STRATEGY	-.015	.089	.029	1	.865	.985
	Constant	-8.288	1.874	19.548	1	.000	.000

a. Variable(s) entered on step 1: CULTURE, TECHNOLOGY, STRATEGY.

SUMMARY AND CONCLUSION

In response to various calls on research into management accounting practices in less developed countries particularly among Non-listed companies and Small and medium size

firms, this study has answered the call by investigating the antecedents to choice of management accounting practices among non-listed manufacturing firms in Nigeria. The study revealed that firm' characteristics including firms' strategy, firms' culture and firms manufacturing technology have drastically changed between the period 2011-2015. The changes took the form of increased use of product differentiation strategy and cost leadership strategy, increased emphasis on innovation/risk orientation culture, aggressiveness culture, outcome oriented culture, people oriented culture, and team based culture. The changes also occurred in form of increased use of advanced manufacturing technology and modern management accounting practices.

Manufacturing firms used both innovation strategy and cost leadership strategy during the period. The study reveals that the more the firms used innovation and cost leadership strategy, the more they used advanced management accounting techniques. It implies that in competing favourably in an increasingly competitive environment; firms need to combine both innovation strategy and cost leadership strategy. This also implies that modern management accounting techniques are not only useful in innovation strategy but also useful in a situation when both innovation and cost leadership strategies are combined. The firms using innovation strategy cannot afford to ignore modern management accounting practices that provide both financial and non-financial information frequently and elaborately.

In the same vein, the outcome of the study shows that firms' culture has significant effect on management accounting practice. The more they emphasised innovation/risk orientation culture, emphasis on people culture, emphasis on outcome culture, aggressiveness culture and team based culture, the more they used modern management accounting techniques that can provide sophisticated information for management to make informed decision. When organisations are after quality, customers' satisfaction and innovation, they cannot but use modern management accounting practices.

Similarly, the study has established that manufacturing technology has significant effect on management accounting practices. Manufacturing companies in Nigeria have increased their use of some Advanced Manufacturing Technologies (AMT) during the period of this study (2011-2015). The study also shows that many of them operated complex manufacturing process which implies advancement in manufacturing technology. The more they used advanced manufacturing technologies, the more they practice modern management accounting techniques. This is because; the traditional management accounting techniques are less suitable in a machine intensive production system where overhead costs are much larger than direct labour cost.

In conclusion, this study has empirically established causal relations between firms' characteristics and management accounting practices. Specifically, the study reveals that changes in firms' strategy, firms' culture and firms manufacturing technology are antecedents to choice of management accounting practices.

The studies show that manufacturing technology is a major driver of changes in management accounting practices. To this end, we recommend that accounting students in higher institution should be thought modern manufacturing process and be practically exposed to it. We also recommend the same exposure for accountants in industries so that they can retain their relevance.

Although this study has tremendously contributed to our understanding on the effect of changes in firm characteristics on management accounting practices yet, there are some limitations that need to be highlighted. The study concentrated on manufacturing companies whereas the evidence of management practices exists in other sectors such as service and public sectors. Therefore, any generalization of the results beyond manufacturing sectors should be made with cautions.

The study considered only modern management accounting techniques to determine the users of modern management accounting practices and users of traditional management accounting practices. The non-users of modern management accounting techniques are assumed to be users of traditional management accounting practices. Moreover, each of the variables of the study comprises several indicators which were reduced to constructs, which limit the extent to which constructs represent the variables measured. In addition, the data was collected at one point in time rather than repeatedly. This study could not account for time-lag effect of changes in competitive environment and firm characteristics on management accounting practices.

The limitations listed above however, do not invalidate the results and findings of the study. Despite the limitations, the study has shed light on the effect of changes in firms' characteristics on management accounting practices and broadened our understanding. The limitations are highlighted just to acknowledge their existence and point the attention of the readers to areas of further research.

Therefore, we suggest that future researchers should consider service and public sector and find the effect of management accounting practices on performance. We also recommend that a repeated longitudinal survey design and case studies of 1 or 2 companies.

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