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Editorial

The Editor-in-Chief has great pleasure in presenting Volume 1, Issue Number 2, December 2018 of the **Journal of Accounting and Management** to the Nigerian Defence Academy Community and the world at large. The contributions of the authors and reviewers to the success of this edition are highly appreciated.

Associate Professor Joshua Okpanachi, PhD

The Editor-in-Chief

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Costing Techniques and Decision Making among Manufacturing Firms in Kwara State

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Abstract

The contemporary manufacturing environment is shaped by the improvement in technology resulting in the situation of manufacture of multiple products by firms and the attendance increase in manufacturing overhead costs. The traditional costing techniques cannot cope with the increase in overheads resulting in the provision of incomplete information. Thus, manufacturing firms have to employ sophisticated costing techniques to generate complete information. Hence, the objectives of this study were to: establish the influence of contemporary costing techniques on the provision of information for decision making; and examine the effect of technology growth on the provision of product related information for managerial decision making. This study sampled 28 manufacturing firms in Kwara State and used structured questionnaire in data collection from accountants in the sampled firms. Ordered logit regression was used in data analysis. The study found that costing techniques of SMA significantly influence the provision of information for decision; and technology growth significantly affects the provision of product related information for managerial decision making. The study concludes that contemporary costing techniques can enhance the generation of information for managerial use in decision making in manufacturing firms. Hence, it is suggested that manufacturing firms should implement these costing techniques as they can deliver accurate information about product cost, customers and competitors

Keywords: costing techniques, information for decision making, manufacturing firms.

1. Introduction

The contemporary business environment is characterized by intensive competition which demands that firms use the right information for business decision making. Cost and management accounting system is meant to provide relevant information to the management for the purpose of making effective decisions. The various techniques of the traditional management accounting were found not to be adequate for the contemporary firms as the information from these systems was not broad and accurate enough to be used in taking strategic decisions. Thus, the traditional management accounting technique such as absorption costing has become obsolete since the information produced is usually distorted and not relevant for taking strategic decisions. Due to the competitive nature of the modern business, accurate product cost information is required by firms to be able to secure competitive advantage. To be able to compete in the market effectively, firms require all types of information relating to their products, customers and competitors whether financial or non-financial. The traditional management accounting because of its nature, which just provides information for financial reporting cannot supply the needed complete information. The traditional management accounting information is restrictive, less accurate and incomplete and no focus on strategic orientation in its activities. These limitations led to the emergence of strategic management accounting (SMA) which classified contemporary costing techniques such as: activity-based costing /management, target costing, quality costing, attribute costing and value chain costing as costing class of SMA. These costing techniques class of strategic management accounting is particularly relevant for the provision of product cost information and other relevant information for managerial decisions.

The implementation of contemporary costing techniques has been highly facilitated by the development of advanced technology both in information processing and manufacturing. Due to improvement in manufacturing technology companies can now produce multiple and diverse products from a single manufacturing plant. With improvement in manufacturing technology production techniques such just-in-time production, computer aided manufacturing and use of robots for manufacturing are now possible. Thus, the contemporary manufacturing environment is now more machine intensive than labour intensive. Also, with the advent of latest information technology mass of transactions can now be processed within a short time. The implication of this improvement in technology is the increase in overhead costs arising from depreciation expense, power consumption cost, engineering cost and data processing cost etc. With increase in overhead cost, the effective allocation of overheads becomes a challenge in product costing. Hence, there is need for the employment of improved costing systems to which strategic management accounting has provided a technique like activity-based costing for use in effective tracing of overheads to products. The traditional management accounting is not able to provide the desired complete and accurate information for managerial use because it lacks strategic orientation. Strategic orientation entails a firm not only looking inward but also externally focus and forward looking for the purpose of generating complete information for strategic decisions. Strategic management accounting tools such as target costing, life cycle costing, quality costing, attribute costing and value chain costing are market, external and forward oriented techniques that are relevant for providing complete and accurate information for managerial use. Empirical studies on contemporary costing techniques in Nigeria remain scanty as only few studies have been carried out in Nigeria. Therefore, there is need to investigate the role of contemporary costing



techniques in generating information for managerial use in decision making in Nigerian manufacturing environment. The specific objectives of this study are to: examine the influence of contemporary costing techniques on the provision of information for managerial decision making in the sampled manufacturing firms in Kwara state; and assess the impact of technology growth on the provision of product related information for managerial decision making. The following hypotheses were formulated based on the objective of the study:

H₁: Costing techniques have no significant influence on information for decision making in manufacturing firms in Kwara State.

H₂: Technology growth has no significant influence on information for decision making in manufacturing firms in Kwara State.

The rest of this paper is organized into - literature review; methodology; data analysis and discussion of results; and conclusion and recommendations.

2. Literature Review

Contemporary costing techniques are modern techniques of costing and they are contained in the costing class of Strategic Management Accounting (SMA). Strategic management accounting as defined by the originator, Simmonds (1981) is the provision and analysis of management accounting data about a business and its competitors for use in developing and monitoring business strategy. Some other authors have refined Simmonds concept of this subject by giving it their own definitions. Roslender and Hart (2003) who defined strategic management accounting as a generic approach to accounting for strategic positioning; and by this he attempted to integrate insights from management accounting and marketing within a strategic framework. Langfield (2008: 206) defined strategic management accounting as "strategic management accounting entails taking a strategic orientation to generation, interpretation and analysis of management accounting information and competitors' activities provides the key dimension for comparison". Finally, strategic management accounting can be regarded as taking a strategic approach to the generation of information for managerial use. Notwithstanding, these definitions have proved clearly that the scope of the traditional management accounting has been greatly extended.

The modern costing techniques are meant for the determination of accurate cost information of a product or service, including the cost of their attributes and quality. These techniques also provide customer information. First, Activity Based Costing /Management (ABC/M). This is a modern technique of determining accurate product cost using multiple cost drivers in allocation of overheads costs. Allocation of cost is based on the premises target activities consumes resources and products consume activities (Cooper & Kapland, 1999). ABC strategic focus is in the support of the management of the activities through which it is possible to define actions for achieving a competitive advantage (Kapland, 1998; Shank & Govindarajan, 1989; Cinguni & Tenucci, 2010). Second, attribute costing is a technique of costing of the different features of a product by viewing product attributes as cost objects (Bromwich, 1990). The attributes of product determine the taste which the consumers have for it; therefore, there is the need to ensure that cost relating the attributes of products are properly managed to ensure good produce features. Attribute costing is an important planning practice that has a forward-looking orientation (Cooper, 1996, Roslender & Hart, 2003, 2010).

Third is life-cycle costing, which is aimed at determining the total cost of a product throughout its life cycle (from the design, through introduction, growth and maturity) (Shield and Young, 1991; Wilson, 1991; Dunk, 2004). Its long - term perspective and market orientation qualify it as part of SMA tools (Cinquini & Tenucci, 2007; Shank & Govindavajan, 2012). Fourth is quality costing which as a product quality has become a precondition for competing in the market its cost must be properly determined and adequately managed. Quality costing serves this purpose by determining and controlling the cost of achieving high quality products that satisfy the customer (Alnawaiseh, 2013; Cinquini & Tenucci, 2007). This technique classifies and monitors cost as deriving from quality failure prevention, appraisal, and internal and external failures (Heagy, 1991). Fifth is target costing, which is a tool of reducing the product costs over its life cycle (Swenson, 2003). It is the maximum amount of cost that can be incurred on manufacturing products and with maintaining to earn the intended gross profits from the products or services (Alnawaiseh, 2013). Target cost results from the difference between the product price derived from the market and a desired target profit (Cinquini & Tenucci, 2010). This tool of SMA has a great external market orientation (Roslender & Hart, 2003, 2010). Sixth is value chain costing, which was developed by Porter (1985) was proposed by Shank and Govindaranjan (1989, 1992a, b) as an approach of accounting that considers all the activities performed from the design to the distribution of the product (Cinquini & Tenucci, 2010). It has a strategic implication as it exploits the economics and efficiencies derivable from the external linkages between the company as well as suppliers and customers (Dekker, 2003).

Managers take various types of decision during the day-to-day operation of a business as well as in planning for the future (Warren, Reene & Duchac, 2009). Since one of the major functions of management is decision making, it is very important that relevant information are supplied to perform this function. Decision making involves the selection of a course of action from among two or more possible alternatives so as to arrive at a solution for a given problem (Trewartha & Newport, 1982). Effective decision can only be made when the right information is supplied at the point of making such a decision. It has been noted that when a system is designed to provide correct information to managers, decision processes work extremely well and task will be accomplished (Daft & Lengel, 1983). Contemporary costing techniques which are contained in SMA costing class are designed to



provide relevant and broader information to the managers for making strategic decisions. Some of the decisions that can be taken with the use of SMA information are product cost and pricing decisions; strategic cost management decisions (Monden, 1989); profit planning decisions and capital investment decision (Bhimani, Horngren, Datar & Foster, 2008); marketing decisions (Roslender & Hart, 2003) etc. The major information provided by the modern costing techniques of is basically information relating to a product or service, customers and competitors. This is further examined hereafter.

First, Product related information. In today's competitive environment, the focus is on strategic product and services characteristics such as operational performance, good product finishing, low cost to customer's high reliability and quality, good after-sales services and quick response to customer demand (Bromwich, 1992). For a company to achieve competitive advantage the above enumerated strategic variables must be taken seriously (Noordin et al 2009). Accurate costing technique product cost information can lead to cost advantage thereby achieving competitive advantage that leads to maximization. The following product related information can be provided by contemporary costing techniques: value creating activities, level of cost management of research and development cost, internal failure cost, external failure cost, defect prevention cost, quality assurance cost, product positioning cost, market penetrating cost, life cycle cost, product attribute, etc.

Second is customer information. This type of information is very important for achieving a competitive edge by a company and a focus on customer is part of strategic approach (Kaplan & Norton 1996). In business because the customer is key to success, he is regarded as the king, hence, customer's satisfaction must be pursued by all firms that will achieve competitive advantage (Porter 1985). The ability to meet customers taste can enhance a firm's market share and sustenance of their product in the market. Customer information from SMA techniques that can be relevant for decision making are: customer warranty claims, customer profitability, forecast of customer service cost, forecast of customer future profits, and forecast of customer profit earned (Al-Mawali & Amoush (2013). Third is competitor information. This type of information relates to the information about a firm's competitors in the market place. This type of information is useful to a firm in understanding of the strategies of its competitors and this can enhance a its competitive advantage and aid in monitoring of the progress of its own strategy in comparison with the competitors' own (Noordin et al., 2009). Achieving competitive advantage is a result of a company's superiority in relation to its competitors (Noordin et al., 2009). The following competitor's information include can emanate from modern costing systems: competitors pricing system, competitor's market share, competitor's quality program, competitor's growth rate, competitor's sales trend, competitors' costs structure, competitors' profitability, competitors cost reduction programs, competitor's technology investment, research and development investment of competitors.

This study is based on Contingency theory. The business environment is becoming increasingly competitive; making it difficult for firms to survive. In this competitive environment, contingency factors are fast becoming a key instrument in business success. In management accounting research attention is focused on the contingency variable to help managers make effective decisions since these variables have a significant influence on management accounting system and decision - making process (Gul & Chia, 1994; Chapman, 1997; Gerdin & Grene, 2004). The assumptions of the contingency theory in management accounting is based on the premise that it is necessary to identify the relationship between contingency factors from external organizational environment, on the basis of accounting designs, approaches and techniques (Soheilierad & Sofian, 2016). In market orientation the coupled with rapid technological advances, constantly changing customers demand (Schulza, Wub & Chonk, 2010), such uncertain factors can significantly influence the implementation of SMA techniques.

Contingency theory has been commonly used in management accounting- based research as well as in strategic management (Henri, Boiral & Roy 2016; Lopez-Valeiras, Cadez & Guilding 2012). The essential idea of management accounting contingency theory is based on the premise that there is no universally appropriate management accounting system that can be applied for all organizations in all circumstances (Otly, 1980). This implies that the design of management accounting system applied in an organization should match the situation and conditions in which the organization is operating, to enhance performance (Al-Mawali, 2015). The contingency theory holds that there will be good result if a good fit exists between the management accounting and control system and the contextual variables e.g. market orientation, technology growth, perceived environment uncertainty, business strategy, and firm size. This study is specifically anchored on contingency variable as it postulates that technology growth as a contingency factor can affect the provision of information for managerial decision - making in manufacturing firms.

Ranijak and Rogosik (2012) investigated the practices of SMA in Croatia and their implication on provision of relevant and timely information for management use. It also examined the synergistic effect of the different SMA techniques on cost control and reduction. The study sampled 65 companies in Croatia and collected data using questionnaire mailed to the accounting manager in each firm. Data collected were analyzed descriptively and Man Whitney test statistics and one- way ANOVA were in testing the hypotheses formulated. The study found that activity-based costing and quality costing are the most widely used SMA techniques in Croatian sampled companies. The study also shows that the fundamental purpose of SMA of providing relevant and timely information was fulfilled. It further shows a positive synergistic effect of the different SMA techniques implementation on cost control and reduction. This implies that SMATs are complementary. This is in line with the studies of Kaplan and Norton (2001) which supports the use of complementary techniques of SMA.



Akosoylu and Aykan (2013) studied the compliance of medium and large-size enterprises in Kayeri, Turkey, with SMAT and determined the effect of SMAT on perceived performance of businesses. The effect of SMAT on perceived performance of business was hypothesized. The sample was made up of 212 accounting managers of the sampled survey. Data were collected through questionnaire survey distributed to accounting managers of businesses. Multiple regression analysis was used to analyze the data collected. The result of the study revealed that the participating businesses had a usage intensity of above average for 16 of 17 SMATs. It also showed that SMA has a positive impact on perceived performance. Alsoboa, Al-Ghazzawi and Joudeh (2015) investigated the impact of strategic costing techniques on performance of Jordanian-listed manufacturing companies. It examined the extent of the usage of strategic costing technique (SMA) by the companies sampled. The study employed current research designed. The study sampled all companies and collected relevant data using questionnaire. The method of analysis adopted were descriptive statistics test of homogeneity of variance, the variance inflation factor test (VIF), one sample t-test and multiple regressions. The study revealed that the sampled companies use all of strategic costing techniques. The result of the study also showed that strategic costing techniques significantly influence performance of the sampled companies. Life cycle costing and value chain costing do not significantly influence performance.

Egbunike, Ogbodo and Onyali (2014) investigated the use of SMA techniques for sustainability performance measurement. It examined whether the use of SMA techniques would provide information for environmental performance measurement, social performance measurement and economic performance measurement. The study sampled 81 accountants distributed across product-sector organizations. Questionnaires were used in collection of data for the study. Multiple regression analysis was the main method of analysis used. This study revealed that sustainability performance measurement is a multi-faceted activity, requiring managers to implement strategic techniques capable of capturing information from diverse areas of corporate environment. The study further found that SMA techniques are capable of providing information for environmental performance management, social performance measurement and economic performance measurement and management. The study concluded that sustainability is at the forefront of modern business corporations, as enlarged stakeholder interest necessitates that managers of corporations should go beyond meeting shareholders' interest (economic interest) to a broader scope encompassing social and environmental concerns. This study however lacks study area and not linked to any theory.

Ojua (2016a) studied management perceptions of the role of SMA techniques in decision-making in selected petroleum marketing firms in Nigeria. The study sampled fifty (50) petroleum marketing firms in Apapa area of Lagos randomly. Data used were collected through the administration of questionnaires. Both descriptive analysis (by mean and standard deviations) and Pearson Product Movement Correlation Co-efficient were used in analyzing the data collected. The result of the study indicated that there is limited trust by managers on the use of SMA techniques for decision-making and pricing policies. This study concluded that management have reservations in applying SMA techniques in decision-making. There is the need for further research to confirm or refute this study. Ojua (2016b) investigated the extent of application of SMA practices by local Nigerian manufacturing enterprises in making effective decision. The study sampled ten (10) manufacturing companies operating in Agbara Industrial Estate, Ogun State. Structured questionnaire was used in collecting primary data from the sampled firms. The study employed the Pearson Movement Correlation Co-efficient in data analysis. This study shows that there is no significant relationship between the adoption of SMA practices and decision-making system of the sampled management firms. The entire results show that the use of SMA practices in many Nigerian manufacturing enterprises is not only low, but also management knowledge about the tools and importance are yet to be appreciated. This study calls for a further research to determine the sustainability of this assertion. In the light of the empirical review made, the following gaps have been identified to be filled by this present study. Firstly, the investigation of contemporary costing techniques and information for managerial appears not to be common in Nigeria. Secondly, SMA information elements have not been well researched in Nigeria.

3. Methodology

The survey research design was employed in this study as it allows generalization to be made from large population when representative samples are drawn. The population of this study is made up of 30 manufacturing firms located in Kwara State that are registered and were paid up members of the Manufacturers Association of Nigeria (MAN), Kwara State branch as at December, 2016. The sample size of the manufacturing firms selected was determined statistically as 28 firms. This sample size was calculated using Taro Yamani formula (Okoire as cited in Imeoparia, 2013). This study employed primary data and collected with the use of a structured questionnaire. The questionnaire used in data collection was structured in such a way to collect the relevant data required for the study. 84 copies of questionnaires were distributed to: Cost accountants, management accountants and financial accountants / chief accountants/finance directors of the sampled firms who served as the target informants. Out of the total copies of questionnaires administered only 51 copies were returned after several visits to the sampled firms. Of the received figure only 49 copies were properly and completely filled. The variables in this study were measured as follows:

Information for Managerial Decision - Making (INFMD). This variable was measured using 19 items of strategic management accounting information adopted from Noordin et al (2009); Noordin et al. (2014) and Noordin et al (2015) with some little modification



to suite the purpose of this study. Each respondent was required to indicate the extent to which strategic management accounting (costing class) techniques provide: product related information, competitor information, and customer information for managerial decision making. This was anchored by a seven-point Likert scale ranging from '1' (NO extent) to '7' (Great extent). Product Related Information (PRI) for managerial decision making. The variable was measured using seven-point Likert scale ranging from '1' (NO extent) to '7' (Great extent) for adopted from Noordin et al (2015) with some little modifications to suite the purpose of this study. Costing techniques. This was measured using seven (7) point Likert scale from '1' (NO extent) to '7' (Great extent) for 6 items consisting of contemporary costing techniques: Activity – based costing / management, Attribute costing, Target costing, Life cycle costing, Quality costing, and Value chain costing adopted from Cravens and Guilding (2001); Guilding and Mc Manus (2002); Cadez and Guilding (2007, 2008). Technology growth. This was measured using a seven-point Likert scale ranging from 1 (Strongly disagree) to 7 (Strongly agree) for items adopted from Rattanaphatttan and Ussahawanitchakit (2010). The following regression models estimated in the study are stated in ordered logistic form:

$$\text{Prob (INFMD} \leq j|x) = a + \beta_1 \text{ COSTG} + U \dots\dots\dots (1)$$

$$\text{Prob (PRI} \leq j|x) = a + \beta_3 \text{ TEGC} + U \dots\dots\dots (2)$$

Whereas:

a = intercept, j = order of response range 1 to 7, x = independent variable in the model, $\beta_1 - \beta_3$ = parameter of estimate INFMD= Information for managerial decision making, COSTG = Costing class of SMA, APSD = Accountant participation in strategic decision making, PRI = Product related information, TEGC = Technology Growth, U = Error term. The data collected in the study have been analysed using ordered logistic regression. This technique was used as both dependent and independents variable are all ordered variables.

4. Results and Discussion

Reliability test was carried out and the results of the Cronbach alpha statistics for all the 6 variables measured are presented in Table 1. From the table, it can be seen that the Cronbach's alpha statistics of the variables vary from 0.644 to 0.962. These scores are high as they are more than the suggested minimum of 0.60 and the results indicate a very strong internal stability and consistency with which the instrument measured the concepts (Sekaran, 2003).

Table 1
Reliability Statistics

Items	Cronbach's Alpha	Number of Items
Strategic Management accounting (SMA)	0.962	41
Costing (COSTG)	0.912	6
Product Related Information (PRI)	0.911	7
Competitor Information (CI)	0.885	6
Customer Information (CUI)	0.904	6
Technology Growth (TECG)	0.851	4

Source: Researcher's STATA analysis results (2017)

The ordered logit regression results of model 1 can be seen in Table 2. From the table, the coefficients of COSTG indicates that it has a positive effect on information for managerial decision making (IMDM). The marginal effects of 0.0273 for COSTG indicates that a unit increase in the usage of each of these techniques will give rise to the probability (likelihood) that information for managerial decision making (IMDM) will improve by 2.7%. In reference to the significant of the result, the costing techniques of strategic management accounting significantly influence the provision of information for managerial decision making since it has a p-values of 0.049 at 5% level of significance. In overall, the result shows that hypothesis (H_1) which states that: Contemporary costing techniques have no significant influence on information for managerial decision making in manufacturing firms in Kwara State not accepted.

Table 2
Costing Techniques and Information for Managerial Decision Making

Independent Variable	Coefficient	Marginal effect	Stand. Error	Z- Stat.	P- Value
Costing (COSTG)	0.4060	0.0273	0.0132	2.01	0.049
Pseudo R2	0.0359				
LR - chi2	5.79				
Prob > chi2	0.0161				

Source: Researcher's Extract from STATA analysis results (2017)

From Table 3, the coefficient of Technology growth of 0.5316 indicates that technology growth (TECG) is positively related to information for managerial decision making (IMDM). The marginal effect of 0.0110 in the result shows that technology growth (TECG) has a significant impact on information for managerial decision making (IMDM) with p-value of 0.022 at 5% level of



significance. This implies that an improvement of technology will give rise to the probability that the provision of information for managerial decision making will improve by 1.1%. Overall, the results of the model are significant at 5% level and the hypothesis (H₂) stating that: Technology growth has no significant effect on the provision of product related information for managerial decision making is not accepted.

Table 3

Technology Growth and Information for Managerial Decision Making

Independent Variable	Coefficient	Marginal effect	Standard Error	Z-Statistic	P-Value
Technology Growth (TECG)	0.5316	0.0110	0.0118	2.30	0.022
Pseudo R ²	0.0359				
LR-chi2	5.79				
Prob (chi2)	0.0161				

Source: Researcher's STATA analysis results (2017)

On the objective of determining the influence of contemporary costing techniques on the provision of information for managerial decision making, the study found that these techniques influence the provision of information for managerial decision making in the sampled firms. This implies that the implementation of activity-based costing / management, target costing, life cycle costing, quality costing, value chain costing, and attribute costing can enable manufacturing firms generate the following information such as – product cost, product defect prevention cost, product quality failure cost, product attributes cost, cost management programmes throughout a product life cycle, research and development cost reduction programmes, and value creating activities. Thus, contemporary costing techniques can deliver product related information, customer and competitor information for managerial decision. The finding of this study is in agreement with the works of Noordin *et al* (2014) and Noordin *et al* (2015) that found out that product related information is generated from strategic management accounting (SMA) costing techniques. The study also found out that the use of composite costing techniques can generate relevant and timely information relating to product. This finding is also in agreement with the study of Ranijak and Rogosik (2012). The second objective was achieved with result of hypothesis (H₂) in the study. It was found that technology growth significantly influences the provision of product related information for managerial decision making. Improved information technology can enhance the provision of the following product related information: value creating activities, research and development cost reduction programmes, cost management programmes throughout product life cycle, product attributes, product quality failure cost, product defect prevention cost, and product cost information. This can only be achieved with the use of hi-tech information system. With highly developed information processing technology, relevant information can be provided for managerial decision making. This finding is consistent with the study of Chai-Amonphaisal and Ussahawanitchakit (2010) which found that advanced technology can enhance SMA implementation in the provision of information for decision making.

5. Conclusion and Recommendations

From the finding of this study contemporary costing techniques such as activity-based costing / management, target costing, life cycle costing, quality costing, value chain costing, and attribute costing when properly implemented can provide product related information, competitor information and customer information for managerial decision making. It is also possible that technology growth can enhance the provision of product related information for managerial decision making in manufacturing firms. Arising from the findings, the study recommends that costing techniques such as activity-based costing / management, target costing, life cycle costing, quality costing, value chain costing, and attribute costing should be implemented by manufacturing firms as they are relevant for the provision of accurate cost information. Future research efforts should be focus on the implementation of contemporary costing techniques in service firms.

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