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DOES THE USE OF STRATEGIC MANAGEMENT ACCOUNTING TECHNIQUES CREATES AND SUSTAINS COMPETITIVE ADVANTAGE? SOME EMPIRICAL EVIDENCE

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Abstract

This study examined the extent to which the usage of strategic management accounting (SMA) techniques such as customer accounting and competitor accounting can create and sustain competitive advantage, with a focus on the manufacturing sector in Nigeria. Data obtained from the annual reports of fifty-six (56) publicly-quoted companies covering a 10-year period (2008-2017) were analysed using descriptive statistics, cluster analysis, cross tabulation, Chi-square test of association, and discriminant analysis. Whereas the frequency of high-adopters of customer-based and competitor-focused techniques was less than those of low-adopters, the adoption rate of SMA was noted to be generally moderate. Further, the usage of SMA positively and significantly impact competitive advantage. The observation that intense users of SMA were able to consistently outperform competitors at both the industry- and sector-level in the long-term supports the conclusion that, to a large extent, SMA usage can both create and sustain competitive advantage. Seeing that it is not the mere adoption of SMA that sustains competitive advantage but its intense usage, organisations seeking strategies to improve their competitiveness may consider the rigorous application of SMA.

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JEL Classification: M4

1. *Introduction*

The remit of the management accounting function is to provide both financial and non-financial accounting information that will assist management at all levels to carry out managerial functions which include but is not limited to planning, control and decision-making. Planning involves establishing the objectives of the organisation and formulating relevant strategies that can be used to achieve those objectives. Planning can be either daily (operational), short-term (tactical) or long-term (strategic). Senior managers formulate long-term objectives (goals) and plans (strategies) for an organisation as a whole. Tactical planning takes the strategic plan and breaks it down into manageable chunks or short-term plans for individual areas of business to enable the strategic plan to be achieved. Senior and middle managers make short- to medium-term plans for the next year. Operational planning involves making day-to-day decisions about what to do next and how to deal with problems as they arise. Decision-making involves considering information that has been provided and making an informed decision. Control involves taking actions to ensure that plans are achieved. Managers use the information relating to actual results to take control measures and to re-assess and amend their original budgets or plans.

Beyond providing information to support management in their duties, management accountants also perform managerial roles such as planning, controlling, performance measurement and decision-making. In performing the *planning* role, management accountants use budgeting for short-term, medium-term and long-term. The management accountant's role of *controlling* includes performance evaluation using financial and non-financial performance measures. In the *measurement* role, management accountants attempt to measure cost, variances and profit, as well as overheads (factory burdens) allocation and apportionment [Ahl, 1999]. In executing *decision-making* role, management accountants provide information that enhances the quality of decision of management at operational, tactical and strategic levels. Management accountants ought to demonstrate awareness of business imperatives

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when they provide information for decision-making with inclusion of recommendations [see Ferreira, *et al.*, 2016; Emerton & Jones, 2019]. In expounding on the supportive role that management accounting provides for management, Simons (1951) cited in BPP (2009a) identifies three attributes of what is now called management accounting, such as *score-keeping* to see how the organisation is doing overall, *attention-directing* to indicate area that need to be investigated and *problem-solving*. It could thus be suggested that there is a connection between management accounting, organisation and society in that management accounting provides information that could enhance organisational effectiveness in achieving set goals; given that the organisation is an integral part of the society, organisational effectiveness is expected to positively affect the society. Thus, management accounting contributes to the society through its impact on the organisation.

Although management accountants perform conventional duties of planning, controlling and decision-making using management accounting techniques tailored to these functions, developments in the competitive business environment is expanding the responsibilities of *accountants in business* [Chartered Global Management Accountants, CGMA, 2014, 2015] beyond these narrowly-defined functions to now include strategy formulation and implementation. For management accountants to effectively discharge their strategy-related duties, management accounting practice would have to align with developments within and outside the organisation. The management accounting profession has been criticized in the past for failure to reinvigorate management accounting practice to align with changes in the external environment [Oyewo *et al.*, 2019]. This criticism provoked the development of strategy-driven and externally-oriented management accounting techniques called *strategic management accounting* (hereafter, SMA).

Notwithstanding that SMA as a management accounting concept has existed for a long time in accounting literature (since 1981 that Simmonds coined the terminology) [CIMA, 2002; Hoque, 2002], it is still being depicted as elusive [Roslender & Hart, 2002]. Most literature regarding SMA is at the conceptual levels, with little evidences from empirical studies [Subasinge & Fonseka, 2009]. It is paradoxical that there is high interest in SMA, yet empirical investigation is minimal [Langfield-Smith, 2008; Pavlatos, 2011]. There is need for more research as SMA is a vast field. The prevalence of studies on traditional management accounting (TMA) in management accounting literature reinforces the contention that SMA is largely an untapped research area [Cadez & Guilding, 2008; Al-Mawali, 2015]. Debates on the adoption rate and the benefits of SMA usage, amongst other issues, are still unsettled.

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There is a body of literature suggesting that SMA has been widely-adopted in developed countries including The United States of America (USA), Australia, United Kingdom, Finland, and Greece [see Cadez & Guilding, 2008; Abdel Al & McLellan, 2011; Abogun & Abomide, 2013; Abdullah & Said, 2015]. Diffusion of management innovations exists within nations but may differ across countries; thus, results on SMA adoption rate may not be generalisable. Considering that the role and organisational positioning of management accounting inevitably differs across organisations, cultures and countries [Ahmad & Zabri, 2015], the need to conduct country-specific studies on issues touching on SMA is crucial, especially in developing countries where the subject matter of SMA is under-researched including Nigeria.

The state of research on SMA in Nigeria still leaves much to be desired as the subject is yet to be rigorously investigated. Although some investigations have been conducted on sophisticated management accounting techniques, studies on TMA still dominate the management accounting literature. The paucity of studies on SMA in the Nigerian context has been documented by scholars [Ajibolade, 2010; Akenbor & Okoye, 2012; Abogun & Abomide, 2013; Oboh & Ajibolade, 2017]. Little is known on the adoption rate of SMA by companies operating in Nigeria. In lending credence to the paucity of empirical research on SMA in Nigeria, Akenbor & Okoye (2012) submit that despite the publicity SMA has received as a new direction that gives competitive edge to organisations, dearth of empirical studies on its adoption persists. In support, Abogun & Abomide, (2013, p. 23) lament that "there is however little evidence in this part of the world on the adoption level of these [SMA] initiatives and consequently its impact on the performance of firms in Nigeria".

Literature suggests that benefits such as value-creation, better strategic decision-making and gaining competitive advantage may ensue from the application of SMA [Aboramadan & Borgonovi, 2016; Holm, Kumar & Plenborg, 2016; Oboh & Ajibolade, 2017; Ojua, 2017]. Applying SMA to achieve sustainable competitive advantage is particularly applicable to companies operating in Nigeria. This is because the performance of a number of companies in Nigeria has been unsatisfactory [Ku *et al.*, 2010], and the deployment of SMA as an innovative management accounting practice could be a strategy to reinvigorate their competitiveness. However, empirical evidence on the outcomes of SMA usage in relation to creating and sustaining competitive advantage is still lacking. The motivation to undertake this research, using the manufacturing sector in Nigeria as a basis for study, stems from these observations.

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The objectives of the study are to: (i) determine the adoption rate of SMA; (ii) assess the impact of SMA usage on the competitiveness of companies; and (iii) evaluate the extent to which SMA usage can sustain competitive advantage.

Data obtained from the annual reports of fifty-six (56) publicly-quoted companies covering a 10-year period (2008-2017) were analysed using descriptive statistics, cluster analysis, cross tabulation, Chi-Square Tests of association, and discriminant analysis. Whereas the frequency of high-adopters of customer-based and competitor-focused techniques was less than those of low-adopters, the adoption rate of SMA was noted to be generally moderate. Further, the usage of SMA positively and significantly impact competitive advantage. The observation that intense users of SMA were able to consistently outperform competitors at both the industry- and sector-level in the long-term supports the conclusion that to a large extent, SMA usage can both create and sustain competitive advantage. Seeing that it is not the mere adoption of SMA that sustains competitive advantage but its intense usage, organisations seeking strategies to improve their competitiveness may consider the rigorous application of SMA.

The remaining part of the paper is organised into five Sections (2-6). Section 2 focuses on literature review and development of research hypotheses. After expounding on methodology in Section 3, results & analyses are covered in Section 4, followed by discussion of findings in Section 5. The paper is concluded in section 6.

2. *Literature Review and Hypothesis Development*

2.1. **The Concept of Strategic Management Accounting**

Various definitions have been attributed to the SMA terminology by scholars. Simmonds' (1981) initial conceptualisation of SMA was a collection of externally-orientated management accounting techniques that analyse data about a business and its competitors, used to develop and monitor the strategy of a business. The definition of strategic management accounting (SMA) has since undergone some refinements. Acknowledging that there is no comprehensive, universally-acceptable framework available in SMA literature [Roslender & Hart, 2003; Agasisti *et al.*, 2008; Yap *et al.*, 2013], newer attempts have been made to define the concept. Cooper & Kaplan (1988) state that strategic accounting techniques are designed to support the overall competitive strategy of the organisation in developing more refined product and service costs. Shank & Govindarajan (1989) regard SMA as the managerial use of cost information explicitly directed at the stages of the strategic management cycle.

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SMA consists of techniques that can lead to value-creation in organisations [Abdullah & Said, 2015], and can support strategic decisions such as pricing, outsourcing, process improvement, business process re-engineering (BPR). The Chartered Institute of Management Accountants (CIMA) cited in BPP (2009b) clarifies that SMA could provide information such as competitor costs, financial effect of competitor response, financial effect of competitor response, product profitability, customer profitability, pricing decisions, value of market share, capacity expansion, brand valuation, shareholder wealth, cash-flow, effect of acquisitions and mergers, decisions to enter or leave a business area, and introduction of new technology. In sum, SMA refers to the collection of modern and sophisticated management accounting techniques that focus on customers, competitors and other strategic issues including strategic planning, control, performance measurement, and decision-making.

The emergence of SMA techniques has been diverse, contradictory and iterative as the techniques have witnessed continuous addition and updating [Cinquini & Tenucci, 2007; Noordin *et al.*, 2009]. However, a widely applied taxonomy for grouping SMA techniques was developed by Cadez & Guilding (2008). By deriving sixteen (16) SMA techniques from prior studies, Cadez & Guilding (2008) refine the classification of the techniques into five broad groups of (i) costing; (ii) planning, control and performance measurement; (iii) strategic decision-making; (iv) competitor accounting; and (v) customer accounting. They argue that the first three groups align with the underlying theme of management accounting (costing, planning, control, performance management and decision-making), while the remaining two (competitor accounting and customer accounting) fall outside the purview of conventional management accounting but within the realm of SMA. The techniques under each category are as follows: (i) Costing including Attribute costing, Life-cycle costing, Quality costing, Target costing and, Value-chain costing; (ii) Planning, control and performance measurements including; Benchmarking, Integrated performance measurement; (iii) Strategic decision-making including: Strategic costing (also called strategic cost management), Strategic pricing and, Brand valuation; (iv) Competitor Accounting including: Competitor cost assessment, Competitive position monitoring and, Competitor performance appraisal; and (v) Customers Accounting including: Customer profitability analysis, Lifetime customer profitability analysis and, Valuation of Customers as Assets.

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Cadez & Guilding's (2008) taxonomy did not capture some SMA techniques investigated in other studies such as Activity Based Costing (ABC) / Activity Based Management [see Shank & Govindarajan, 1992; Ahl, 1999; Pavlatos & Paggios, 2007; CIMA cited BPP 2008; Alsoboa *et al.*, 2015], and Environmental Management Accounting [Alsoboa *et al.*, 2015]. While Guilding, Cravens & Tayles (2000), and Yap *et al.* (2013) exclude ABC among SMA technique, Shank & Govindarajan (1992) and Ahl (1999) consider it as one of the techniques.

Table 1 reveals this study's conceptualisation of SMA techniques as adapted from prior studies. This is made up of 16 techniques from Cadez & Guilding's (2008) list, with the addition of three (3) techniques (ABC, ABM and Environmental Management Accounting in asterisks) based on the review of literature, making a total of nineteen (19) techniques.

Table 1. Clustering of SMA Techniques

Category		Technique	Description
Costing	1	Attribute costing	The costing of specific product attributes that appeal to customers such as operating performance variables; reliability, warranty arrangements, and after sales service
	2	Life cycle costing	The appraisal of costs based on the length of stages of a product's life including design, introduction, growth, maturity, decline and eventually abandonment
	3	Quality costing	Prioritising quality by identification and control of the costs associated with the creation, identification, repair and prevention of defects
	4	Target costing	A method used during product and process design that involves estimating a cost calculated by subtracting a desired profit margin from an estimated (or market-based) price. The product is then designed to meet that cost
	5	Value-chain costing	An activity-based approach where costs are allocated to activities required to design,

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			procure, produce, market, distribute, and service a product or service
	6	Activity based costing*	A two-stage procedure used to assign overhead costs to products. In the first stage, significant activities are identified, and overhead costs are assigned to activity cost pools in accordance with the way the resources are consumed by the activities. In the second stage, overhead costs are allocated from each activity cost pool to each product line in proportion to the amount of the cost driver consumed by the product line
	7	Activity based management*	The use of information provided by an activity cost analysis (ABC) to improve organisational profitability
Planning, control and performance measurement	1	Benchmarking	The comparison of internal processes to an ideal standard.
	2	Integrated performance measurement	A measurement system which focuses typically on acquiring performance knowledge based on customer requirements and may encompass nonfinancial measures
	3	Environmental Management Accounting*	The practice of tracking, tracing and treatment of costs, earnings and savings incurred in relation to the company's environmental-related activities
Strategic decision making	1	Strategic costing (strategic cost management)	The use of cost data based on strategic and marketing information to develop and identify superior strategies that will produce a sustainable competitive advantage
	2	Strategic pricing	The analysis of strategic factors, such as competitor price reaction, elasticity, market growth, and economies of scale, in the pricing decision process
	3	Brand valuation	The financial valuation of a brand through the assessment of brand strength factors such as: leadership, stability, market,

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			internationality, and trend, combined with historical brand profits
Competitor Accounting	1	Competitor cost assessment	The provision of regularly scheduled updated estimates of a competitor's unit cost
	2	Competitive position monitoring	The analysis of competitor positions within the industry by assessing and monitoring trends in competitor sales, market share, volume, unit costs, and return on sales
	3	Competitor performance appraisal	The numerical analysis of a competitor's published statements as a part of an assessment of a competitor's key sources of competitive advantage
Customer Accounting	1	Customer profitability analysis	Calculating profit earned from a specific customer based on costs and sales that can be traced to a particular customer
	2	Lifetime customer profitability analysis	Extending the time horizon for customer profitability analysis to include future years. The practice focuses on all anticipated future revenue streams and costs involved in servicing a particular customer
	3	Valuation of customers as assets	A technique that involves the calculation of the value of customers to the company. This may involve computing the present value of all future profit streams attributable to a particular customer

Source: Authors' compilation (2019)

There is need for strategy and, by extension, the use of SMA techniques in the contemporary business environment to survive and outsmart competitors. As management would be interested in enshrining qualitative, behavioural, motivational and environmental concerns in organisational strategy [Kaplan, 2013], these non-financial factors are often more difficult to estimate and quantify, thus requiring the adroitness of management accountants. The management accounting function will have to therefore support management in strategy formulation and implementation through the use of SMA techniques [Bromwich & Bhimani 1994].

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Consequent on the diffusion of SMA, management accountants are now seen as strategic partners on the account of their involvement in the implementation of business imperatives [CGMA, 2014, 2015; Pitcher, 2015].

2.2. **Strategic Management Accounting and Sustainable Competitive Advantage**

The disapproval of TMA techniques restricted to planning, control and decision-making within the organisation, devoid of any external orientation undoubtedly paved way for the emergence of SMA [Bhimani & Bromwich, 1992; Drury, 1992]. The limitations of TMA such as internal focus and restriction to analysis of structured, quantitative data [Bromwich & Bhimani, 1989], concentration on operational issues [Chenhall & Langfield-Smith, 1998], and inappropriateness for strategy formulation, monitoring and implementation [Kaplan & Atkinson, 1989] should ordinarily rouse the switch from TMA to SMA by any organisation that wants to bolster its competitiveness in the complex business environment. This is because SMA can create considerable value by providing more relevant information that is required for the success of modern day organisations [Guilding *et al.*, 2000; Aboramadan & Borgonovi, 2016; Ojua, 2017].

Benefits of SMA usage may therefore be expected in the way of gaining and sustaining competitive advantage [International Federation of Accountants, IFAC, 1998; Roslender & Hart, 2002; Oboh & Ajibolade, 2017]. Competitive Advantage refers to superior performance of an organisation over other organisations operating in the same industry [Holm *et al.*, 2016]. Studies have linked competitive advantage to organisational performance [see Porter & Millar, 1985; Barney, 2002; Kushwaha, 2011; Njuki *et al.*, 2013]. The long-term orientation and the future outlook characterising SMA suggest that its application should enable organisations sustain competitive advantage by consistently improving and maintaining an above-industry-average performance not only in the short-run but also in the medium- to long-term. Dimensions of competitive advantage which may accrue on the account of SMA usage are financial and non-financial such as customer satisfaction, product development, product quality and financial returns.

In spite of the submissions on the benefits of SMA adoption, some scholars have doubted the essence of its usage, claiming that little is known on the value it adds to the organisation [see Lord, 1996; Tomkins & Carr, 1996; Mevellec & Lebas, 2010 cited in Abdullah & Said, 2015]. For instance, whilst Sulaiman, Ahmad & Alwi's

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study (2004) finds that management accounting practices help to create value, Mevellec & Lebas (2010) counter that many medium-sized firms are doing well with minimal adoption or no application of management accounting techniques in some instances. They contend that large-sized firms have been shown to respond slowly to implementing management accounting tools which result to underperformance of firms; hence the use of SMA may not therefore add value as anticipated. Overall, investigations on the benefits of SMA adoption report mixed outcomes. While some studies report positive association between SMA usage and superior performance [Cadez & Guilding, 2008; Abdel Al & McLellan, 2011; Fowzia, 2011; Akenbor & Okoye, 2012; Abdel Al, & McLellan, 2013; Abogun & Abomide, 2013; Eker & Aytaç, 2016; Oboh & Ajibolade, 2017], others report low benefits [see Hyvonen, 2005; Angelakis *et al.*, 2010; Yap *et al.*, 2013). However, this study posits that:

H1: The usage of SMA has a significant positive impact on sustainable competitive advantage of companies.

3. *Methodology*

3.1. **Population and Sample Selection**

The population of the study is comprised of manufacturing companies listed on the main board (first-tier security market) of the Nigerian Stock Exchange (NSE). A sampling frame of all companies engaging in manufacturing activities was constructed based on the categories of industry sector provided by the NSE. Using this criterion, as at December 2017, seven industry sectors emerged in the categories of Agriculture (4), Consumer Goods (21), Healthcare (8), Industrial Goods (17), Conglomerate (5), Natural Resources (4), and Information & Communications Technology (3) making a total of 62 firms.

On the list, 4 firms have discontinued operations, 1 firm merged with another, and 1 firm is no longer engaged in manufacturing activities but trading business. These 6 firms were excluded from the study, leaving a total of 56 firms in the categories of Agriculture (4), Consumer Goods (18), Healthcare (7), Industrial Goods (16), Conglomerate (5), Natural Resources (4), and Information & Communications Technology (2). All the 56 remaining firms were selected. Thus the study applied a census survey. A census involves the inclusion of all elements of the population of a study in the sample selection. Since one hundred percent response rate is unlikely, the use of census survey is justified in this study to ensure the sample is large enough for statistical analysis.

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3.2. **Data-Collection Method**

Data were collected from the annual reports of the fifty-six (56) study companies covering a 10-year period (2008 to 2017). Since the companies are publicly-quoted, their audited published accounts are widely circulated and are available in the public domain.

3.3. **Measurement of Variables**

(i) *SMA Adoption*

SMA adoption was measured through a scale developed by the researcher, bearing in mind the aspects of SMA that are usually disclosed through annual reports. Unlike other categories of SMA practice (costing; planning, control & performance measurement; and strategic decision-making techniques) that are seldom disclosed in company documents available in the public domain, annual reports typically contain assertions on customers'/distributors' activities and competitors' actions. Thus, the study focused on evaluating customer-based and competitor-focused SMA techniques divulged in annual reports of study companies.

Three (3) measures of customer accounting were developed: (i) disclosure on tracking of turnover, cost, and profitability per customer; (ii) naming of major customers/ key accounts/ main distributors; (iii) discussion on activities of distributors in reaching customers or enhancing sales operations [this is premised on the philosophy that organisations could deploy superior distribution network and retail capabilities to increase customer engagement]. Further, four (4) measures of competitor accounting were developed such as; (i) mention of company's position in relation to competitors; (ii) impact of competitors' action on the company's activities; (iii) Naming of competitors/ disclosure on the number of competitors; (iv) disclosure on strategy to improve competitive position/ outperform competitors in the future. Altogether, these seven (7) items were used to gauge the adoption rate of SMA. The checklist was validated by three experts (a senior Academic specialising in Management Accounting and two well-experienced Management Consulting experts who are both ICAN (The Institute of chartered Accountants of Nigeria) and CIMA (Chartered Institute of Management Accountants, UK) qualified. The feedbacks obtained from the critiquing were used to sharpen the measurement instrument.

The annual reports of companies were content-analysed for disclosure in respect of these items and scored accordingly using the checklist. If disclosure was made in respect of an item, it is scored '1', and no disclosure is assigned '0'. The use of the

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annual reports as a source of gauging the adoption of SMA is informed by the consideration that such reports are mainstream in communicating financial and non-financial information to stakeholders. As annual reports are used to communicate governance issues of an entity, internal matters including the use of modern management accounting techniques are expected to flow into such documents [Ajibolade & Oyewo, 2017a]. The aspects of the annual report containing information on SMA practice were: Company profile, Chairman Statement, Managing Director's or Chief Executive Officer's Report, Report of the Directors, Chief Finance Officer's review, and Standalone reports on activities of Strategic Business Units (SBUs). To ensure an extensive review and wide coverage of management accounting practice, the annual reports for the 10-year period was examined for each firm. The company's website was also visited to assess disclosure in respect of the research subject matter. Prior studies have used a similar approach of content-analysing annual reports to assess management accounting practice of companies [see Ajibolade & Oyewo, 2017a, 2017b].

(ii) *Sustainable Competitive Advantage*

Sustainable competitive Advantage, in the context of this study, refers to the ability of an organisation to consistently improve and maintain an above-average performance in the medium- to long-term at both the industry level (the category from the seven groups earlier enumerated where a firm operates) and sector level (collection of all the firms across the seven groups/ collection of industries). Competitive advantage was measured at both the industry level and the Sector level. The average Turnover for each of the seven industries and the manufacturing sector as a whole were computed. The Turnover of individual firms was then compared with both the industry average and sector average Turnover over the 10-year period (2008-2017). If a firm's Turnover consistently exceed either the industry or Sector average Turnover, it means the company was able to sustain its competitive advantage and is scored '1'. Conversely, if a firm's Turnover falls below either the industry or subsector average, it implies absence of sustainable competitive advantage and is scored '0'.

3.5. **Method of Data Analysis**

Statistical techniques applied to analyse data were descriptive statistics, cluster analysis, cross tabulation, Chi-Square Tests of association, and discriminant analysis.

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4. ***Results and Discussion***

4.1. **Adoption Rate of SMA**

Table 2a presents descriptive statistics on the adoption level of SMA. 33 (58.9%) firms have scores of 0 to 4, while 23 (41.1%) of the firms scored from 5 to 7.

Table 2a. Adoption Rate of SMA

Score		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	7	12.5	12.5	12.5
	1	4	7.1	7.1	19.6
	2	7	12.5	12.5	32.1
	3	5	8.9	8.9	41.1
	4	10	17.9	17.9	58.9
	5	12	21.4	21.4	80.4
	6	10	17.9	17.9	98.2
	7	1	1.8	1.8	100.0
	Total	56	100.0	100.0	

Table 2b. Descriptive Statistics on SMA Adoption Rate

			Statistic	Std. Error
SMA Accounting Score	Mean		3.57	0.274
	95% Confidence Interval for Mean	Lower Bound	3.02	
		Upper Bound	4.12	
	5% Trimmed Mean		3.62	
	Median		4.00	
	Variance		4.213	
	Std. Deviation		2.053	
	Minimum		0	
	Maximum		7	
	Range		7	
	Interquartile Range		3	
	Skewness		-0.427	0.319
	Kurtosis		-1.008	0.628

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In Table 2b, the Minimum value of SMA adoption level is 0, the maximum is 7, the Median is 4.0 and the Mean (M) is 3.57. These points are represented in the Box plot and stem-and-leaf plot presented in Appendices 1 and 2. The negative skewness coefficient of -0.427 indicates that there are more data points concentrated to the left of the Mean (low adoption score). In essence, there are more low adopters of SMA than high adopters.

Table 2c. Extreme Values on SMA Adoption Rate

			Case Number	Value
SMA Adoption rate	Highest	1	33	7
		2	6	6
		3	10	6
		4	16	6
		5	17	6[a]
	Lowest	1	56	0
		2	53	0
		3	31	0
		4	30	0
		5	21	0[b]

a. Only a partial list of cases with the value 6 is shown in the table of upper extremes.
b. Only a partial list of cases with the value 0 is shown in the table of lower extremes.

Table 2c presents the extreme values for SMA adoption. The first five highest scores are 7, 6, 6, 6 and 6 respectively. Also, the first five lowest scores are all 0s. In Table 2d, the 50th percentile is 4.0, while the 75th percentile is the score of 5.0. This implies that at least half of the firms scored 4.0 and below.

The various M-Estimators, used to explore the characteristics of the population such as sample average, range from 3.60 to 3.69 (Table 2e). This is consistent with the Mean of 3.57 (Table 2b), which is an equivalent of 51% on the 7-point measurement scale. Based on the results in Tables 2a and 2b, it is concluded that the adoption rate of customer-based and competitor-focused SMA techniques by manufacturing companies in Nigeria is moderate (research objective one).

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Table 2d. Percentiles Distribution for SMA Adoption Rate

	Percentiles						
	5	10	25	50	75	90	95
Weighted Average SMA Score (Definition 1)	0.00	0.00	2.00	4.00	5.00	6.00	6.00
Tukey's Hinges SMA Score			2.00	4.00	5.00		

Table 2e. M-Estimators for SMA Adoption Rate

	Huber's M-Estimator[a]	Tukey's Biweight[b]	Hampel's M-Estimator[c]	Andrews' Wave[d]
SMA Adoption Score	3.69	3.67	3.60	3.67

a. The weighting constant is 1.339.
b. The weighting constant is 4.685.
c. The weighting constants are 1.700, 3.400, and 8.500
d. The weighting constant is 1.340*pi.

4.2. **SMA Usage and Sustainable Competitive Advantage**

Firms were categorised into two groups based on their SMA adoption score. Firms with scores from 5-7 (i.e. those with adoption score of 71.4% and over) were regarded *intense users of SMA*, while others with score ranging from 0-4 were designated *non-intense users of SMA*. The use of the 5.0 criterion (equivalent of 71.5% on the 7-point scale) for dichotomising adopters was informed by the consideration that a 70% adoption rate represent a substantial degree of usage.

The distribution of SMA usage intensity in Table 3 shows that 23 (41.1%) firms are intense users while 33 (58.9%) are non-intense users.

To examine the nexus between SMA usage and competitive position more closely, firms were grouped based on their competitiveness. Hierarchical cluster analysis (using the Wald cluster method and squared Euclidean distance interval), was applied to group firms into three groups of: (i) those earning above-average

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Turnover at both industry and sector level (cluster 3, labelled 'High-flyers'); (ii) those realising above-average Turnover at either industry or sector level (cluster 2, labelled 'Moderate Performers'); (iii) those with below-average Turnover at both industry and sector levels (cluster 1, labelled 'Laggards'). Results of the analysis of intensity of SMA usage and competitive position are presented in Table 4.

Table 3. Intensity of Use of SMA

SMA usage Intensity	Frequency	Percent	Valid Percent	Cumulative Percent
Not intense	33	58.9	58.9	58.9
Intense	23	41.1	41.1	100.0
Total	56	100.0	100.0	

Table 4. Intensity of SMA Usage and Competitive Position of Firms

FIRM CODE	Intensity of SMA Usage	Did Company Turnover exceed INDUSTRY AVERAGE over the period?	Did Company Turnover exceed SECTOR AVERAGE over the period?	CLUSTER GROUPING [3 cluster]	Competitive Position
1	Not intense	0	0	1	Laggard
2	Not intense	0	0	1	Laggard
3	Not intense	1	0	2	Moderate Performer
4	Not intense	1	0	2	Moderate Performer
5	Not intense	0	1	3	High-flyer
6	Intense	0	0	1	Laggard
7	Not intense	0	0	1	Laggard
8	Not intense	1	1	3	High-flyer
9	Intense	1	1	3	High-flyer
10	Intense	1	1	3	High-flyer

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11	Intense	1	1	3	High-flyer
12	Intense	0	1	3	High-flyer
13	Not intense	0	0	1	Laggard
14	Not intense	0	0	1	Laggard
15	Intense	0	0	1	Laggard
16	Intense	1	1	3	High-flyer
17	Intense	1	1	3	High-flyer
18	Not intense	0	0	1	Laggard
19	Intense	0	1	3	High-flyer
20	Intense	0	1	3	High-flyer
21	Not intense	0	0	1	Laggard
22	Not intense	0	0	1	Laggard
23	Not intense	1	0	2	Moderate Performer
24	Intense	1	0	2	Moderate Performer
25	Intense	1	0	2	Moderate Performer
26	Not intense	0	0	1	Laggard
27	Intense	0	0	1	Laggard
28	Not intense	0	0	1	Laggard
29	Intense	0	0	1	Laggard
30	Not intense	0	0	1	Laggard
31	Not intense	0	0	1	Laggard
32	Not intense	0	0	1	Laggard
33	Intense	0	0	1	Laggard
34	Not intense	0	0	1	Laggard
35	Intense	0	0	1	Laggard
36	Not intense	0	0	1	Laggard
37	Not intense	0	0	1	Laggard

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38	Not intense	0	0	1	Laggard
39	Not intense	0	0	1	Laggard
40	Intense	1	1	3	High-flyer
41	Not intense	0	0	1	Laggard
42	Not intense	0	0	1	Laggard
43	Intense	0	0	1	Laggard
44	Not intense	0	0	1	Laggard
45	Intense	1	1	3	High-flyer
46	Not intense	0	0	1	Laggard
47	Intense	0	0	1	Laggard
48	Not intense	0	0	1	Laggard
49	Intense	1	1	3	High-flyer
50	Intense	1	1	3	High-flyer
51	Not intense	1	0	2	Moderate Performer
52	Intense	1	0	2	Moderate Performer
53	Not intense	0	0	1	Laggard
54	Not intense	0	0	1	Laggard
55	Not intense	1	0	2	Moderate Performer
56	Not intense	0	0	1	Laggard

Source: Authors' Analysis for the Study (2019)

The trend observable in Table 4 is that intense users of SMA belong to the high-flyer group in most cases. In effect, high-adopters of SMA were able to consistently achieve above-average performance in the industry where they operate and the manufacturing sector at large (research objective three).

(a) *Result from Cross-Tabulation Analysis and Chi-square test of Association*

Cross-Tabulation and Chi-square test of association was applied to examine whether there is any relationship between SMA usage and competitive position (Tables 5a and 5b).

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Table 5a. Cross-Tabulation of SMA Usage and Competitive Position of Study Firms

		Intensity of use of SMA		
		not intense	Intense	Total
Competitive Position	Laggards	26	8	34
	Moderate performers	5	3	8
	High-Flyers	2	12	14
Total		33	23	56

In Table 5a, 12 out of the 14 high-flyers are intense users of SMA. This contrasts sharply with 26 out of the 34 laggards that are not intense users. It therefore appears that the intense use of SMA leads to the sustenance of competitive position (research objective three).

Table 5b. Chi-Square Tests of Association Between SMA Usage and Competitive Position

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.893[a]	2	0.000
Likelihood Ratio	16.668	2	0.000
Linear-by-Linear Association	14.818	1	0.000
N of Valid Cases	56		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 3.29.

Chi-square p value of 0.000 is significant at 1% (Table 5b), thereby confirming that there is a positive and significant association between SMA usage and Competitive position (research objective two).

(b) *Result from Discriminant Analysis*

To examine the adoption rate of SMA across competitive positions, the Mean of SMA adoption rate for the three classes of competitiveness was computed (Table 6).

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Table 6. Adoption Rate of SMA across Competitive Positions

Competitive Position	Adoption rate of SMA	N	Std. Deviation
Laggards	2.82	34	2.022
Moderate Performers	4.25	8	1.165
High-Flyers	5.00	14	1.664
Total	3.57	56	2.053

Table 7a. Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	0.716	17.692	2	0.000

Table 7b. Classification Results[a]

			Predicted Group Membership			
		Competitiveness Position	Laggards	Moderate Performers	High-Flyers	Total
Original	Count	Laggards	26	0	8	34
		Moderate Performer	5	0	3	8
		High-Flyers	2	0	12	14
	%	Laggards	76.5	0.0	23.5	100.0
		Moderate Performers	62.5	0.0	37.5	100.0
		High-Flyers	14.3	0.0	85.7	100.0

a. 67.9% of original grouped cases correctly classified.

The Mean adoption rate of SMA are in the ascending order of 2.82 (Laggards), 4.25 (Moderate Performers), and 5.00 (High-flyers). The adoption rate of SMA seems to vary proportionately with the degree of firms' competitiveness, with High-flyers recording the highest adoption rate and Laggards witnessing the lowest adoption rate. This buttresses the inference that the usage of SMA positively impact competitive advantage (research objective two).

To examine the extent to which the intensity of SMA usage determines the classification of Firms into their competitive positions, discriminant analysis was employed (results presented in Tables 7a to 7c).

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Table 7c. Functions at Group Centroids

	Function
Level of Competitiveness	1
Laggards	-0.410
Moderate Performers	-0.083
High-Flyers	1.043

The function generated by the discriminant analysis is statistically significant ($p = 0.001 < 0.01$) [Table 7a], implying that the intensity of SMA usage significantly determines the competitive position of firms. The hit ratio of the discriminant analysis at 67.9% (addition of figures along the principal diagonal; 26 + 0 + 12 = 38/56) (Table 7b) suggests that the discriminant function was fairly accurate in categorising firms into their competitive position based on the usage intensity of SMA. The function at group centroids generated the coefficients of -0.410, -0.083 and 1.043 for the competitive positions of Laggards, Moderate Performers, and High-Flyers respectively (Table 7c). The emergence of the High-flyers as the group with the highest coefficient of 1.043 amongst the class of competitiveness connotes that the intense usage of SMA has the strongest connection with this group (the High-flyers). In effect, the extensive use of SMA should lead to high-ranking competitive position.

Overall, the results in Tables 4 to 6 establish that to a large extent, the usage of SMA positively and significantly impact competitive advantage (research objective two), and the intense use of SMA can sustain the competitiveness of firms (research objective three).

4.3. **Test of Hypothesis**

Chi-square test of association established that there is a significant association between SMA usage and competitive position ($p = 0.000 < 0.01$) [Table 5b]. SMA adoption rate vary proportionately with the degree of competitiveness, with High-flyers recording the highest adoption rate and Laggards witnessing the lowest adoption rate (Table 6). Discriminant analysis result proves that intensity of SMA usage was able to categorise firms into the three levels of competiveness ($p = 0.000 < 0.01$) [Table 7a], with a hit ratio of 67.9% establishing that the discriminant function was fairly accurate (Table 7b). Intense usage of SMA has the strongest

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connection with High-flyers (Table 7c). H1 is therefore retained and it is concluded that *the usage of SMA has a significant positive impact on sustainable competitive advantage of companies.*

5. ***Discussion of Findings***

Result suggests that although the frequency of high-adopters of innovative management accounting techniques such as customer accounting and competitor accounting was less than those of low-adopters (Tables 2a, 2b and 2d), the adoption rate of customer-based and competitor-oriented SMA techniques was noted to be generally moderate (Tables 2b and 2e) (research objective one). This observation is similar to the results of prior studies on SMA usage in other countries (for example, Askarany, 2009; Jack, 2009; Abdel Al & McLellan, 2011; Fowzia, 2011; Karanja *et al.*, 2013), as well as in Nigeria (see Chiekezie *et al.*, 2014; Ojua, 2016).

The usage of SMA positively and significantly impacts competitive advantage (research objective two). Further, the use of SMA appears to sustain competitive advantage (research objective three), hence the acceptance of H1. From the 56 companies investigated, 23 firms representing 41.1% intensely apply SMA (Table 3). 15 out of the 23 intense users of SMA (representing 65.2%) were able to consistently outperform competitors over the 10-year period at either the industry- or sector-level (Table 5a), while 12 from the 23 intense users (a proportion of 52.2%) were able to sustain competitive advantage at both – the industry and sector levels. The usage of SMA is significantly associated with the competitiveness of firms (Table 5b). Whereas firms outperforming competitors at both industry and sector levels (the high-flyers) have the highest adoption rate of SMA (M = 5.00), other firms performing above-the-average at either the industry or sector level (the moderate performers) have higher adoption rate (M = 4.25) than firms performing below average at both the industry and sector levels (the Laggards) [M = 2.82] (Table 6). Thus, the intensity of SMA usage is directly related to the competitiveness of firms. Result in Table 7c establish that the extensive use of SMA should lead to high-ranking competitive position.

The observation that the usage of SMA enhances the competitiveness of firms is consistent with some studies from other countries [Adler *et al.*, 2000; Cadez & Guilding, 2008; Abdel Al & McLellan, 2011; Fowzia, 2011; Abdel Al & McLellan, 2013; Alsoboa *et al.*, 2015; Anna, 2015; Ahmad & Zabri, 2016; Eker & Aytaç, 2016], and studies conducted in Nigeria [see Akenbor & Okoye, 2012; Abogun & Abomide,

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2013; Chiekezie *et al.*, 2014; Oboh & Ajibolade, 2017]. This study found no evidence to support the contentions of scholars doubting the essence of management accounting techniques [for example, Lord, 1996; Tomkins & Carr, 1996; Mevellec & Lebas, 2010].

6. ***Conclusion***

This study examined the extent to which the usage of SMA techniques such as customer accounting and competitor accounting could create and sustain competitive advantage. Analysis of data obtained from the annual reports of fifty-six (56) publicly-quoted manufacturing companies in Nigeria revealed that the adoption rate of SMA is moderate (research objective one). The usage of SMA positively and significantly impacts competitive advantage (research objective two). The observation that intense users of SMA were able to consistently outperform competitors over the 10-year period under investigation at both the industry- and sector-level supports the conclusion that, to a large extent, SMA usage sustains competitive advantage (research objective three).

Seeing that the overall adoption rate of SMA by the study companies was moderate at best, the inability of manufacturing companies in Nigeria to favourably compete at the international market may not be unconnected to the unappreciable level of SMA implementation, among other challenges. It is not the mere adoption of SMA that sustains competitive advantage *per se* as established by the result of this study, but its intense usage. To this end, organisations seeking strategies to improve their competitiveness may consider the rigorous application of SMA.

Acknowledging that the extensive application of SMA would impose requirements on the resources and organisational structure of adopters, management of companies is importuned to remove or at least diminish whatever hindrance that may confront its implementation which may include human barrier, lack of technological equipment, cost, or the subsuming of management accounting function within the financial accounting system. Given the future-orientation of SMA, it is important to stress that the benefits of its usage may not materialise in the short-run but in the medium- to long-term — this is crucial in order not to get discouraged when benefits of implementation do not accrue immediately.

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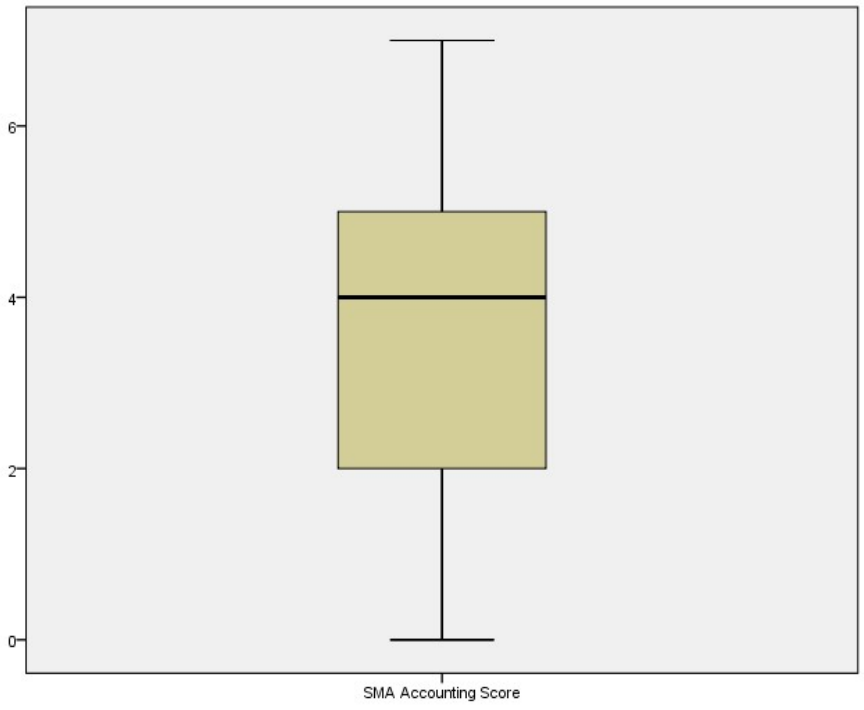
APPENDIX 1: BOX AND WHISKER PLOT FOR SMA ADOPTION RATE



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APPENDIX 2: STEM-AND-LEAF PLOT FOR SMA ADOPTION RATE

Frequency Stem & Leaf

7.00 0 . 0000000
4.00 1 . 0000
7.00 2 . 0000000
5.00 3 . 00000
10.00 4 . 0000000000
12.00 5 . 000000000000
10.00 6 . 0000000000
1.00 7 . 0

Stem width: 1
Each leaf: 1 case(s)