

Implementation Effect of Lean Accounting Practices on Financial Performance of Listed Industrial Goods Firms in Nigeria: A Literature Review

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Abstract

One of the drastic changes that has taken place in the manufacturing sector is the emergence of lean production systems and its associate: the lean accounting. The study is a literature review meant to examine the implementation effect of lean accounting practices on the financial performance of listed industrial goods firms in Nigeria. The focus of this modern approach is to help reduce unit cost while increasing production efficiency. The literature review findings revealed that many manufacturing firms, in an attempt to reduce costs, have unwittingly adopted certain aspect(s) of lean manufacturing system, along with the existing traditional accounting system. Also, the level of lean accounting consciousness in Nigeria is very low, even among academics and professionals. The study, thus conclude implementation lean accounting practices is laudable but lack of or low level of awareness impede the derivation of the perceived benefits by many Nigerian industrial goods firms. The study therefore suggests, amongst others; the necessity of lean accounting with among the listed industrial goods firms in Nigeria as it leads to the optimal provision of appropriate information and better use of the establishment's resources at reduced costs.

Keywords: Lean accounting, Waste, Traditional Accounting System, Financial performance, Value Stream Costing

INTRODUCTION

In the contemporary time, manufacturing environment is increasingly becoming impulsive day by day through advancement in technology, information and communication technology as well as globalization. This requires manufacturing sector to be flexible and adaptive to changes, and remained proactive. The ability to sense the frequent changes and act accordingly distinguishes on firm from the other. The industrial goods firms are not immuned to the production environment volatility, in so much as the sector's performance is driven by the forces of demand and supply for its goods and services based on the prevailing economic conditions, which may cause significant variations in the economic activity level in the sector. Howbeit, not all business activities in the sector slow down simultaneously. While some sub-sector may lag, others may lead the economic cycle. In consequence, the industrial goods sector should be sensitive to trend of events taking place in the sector in order to align globally, as the importance of the sector to the socio-economic development of the nation cannot be ignored or overlooked.

Consequently, one of the drastic changes that has taken place in the manufacturing environment is the emergence of lean production birthed in Japan by Toyota Motors Company through the efforts and experience of Taiichi Ohno, one of the pioneers (Sakichi Toyoda, Kiichiro Toyoda and Taiichi Ohno) of Toyota Motors Company, Japan. Being faced with shortages in both capital and resources after the world war II and with accumulation of high volume of inventory as a result of mass production caused much waiting by customers and waste. He re-engineered the traditional manufacturing processes and created a more efficient and reliable approach that eliminated waste, and continuously improving quality for value addition (Womack & Jones, 2003; Rosa & Machado, 2012). The innovation brought a paradigm shift in manufacturing processes, which was tagged "Toyota Production System (TPS)". The success of TPS motivated United States and European companies, such as Ford Motors; to adopt it under the title "Just-in-Time (JIT)" to remain competitive with Japanese industry. Later on, due to global implementation of

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TPS, it was renamed: “Lean Management” in the United States in the early 1980s (Pepper & Speeding, 2009; Chen & Taylor, 2009; Habadullah, 2013).

Empirical evidences available in advanced countries showed that manufacturing companies have implemented lean production processes in their manufacturing systems (Naseem et al., 2021; Mohsin et al., 2020a; Salamat et al., 2020; Majeed et al., 2020a; Naseem et al., 2020b; Soliman, 2020; Amusawi, Almagtome & Shaker, 2019; Teixeira, dos Santos, Akkari, & Munhoz, 2019; Daferighe, James & Offiong, 2018; Farhana & Amir, 2009; Okpala, 2013; Keitany & Riwo-Abudho, 2014; Maleka, Hove & Karodia, 2014; Mustapha, et al, 2014; Uzochukwu & Ossai, 2016). However, companies that implemented lean manufacturing later discovered that the traditional accounting system was incompatible with lean philosophy. In other words, the traditional accounting system could not handle lean principles. The traditional accounting systems promote mass production, and consider high inventory a value that increases profit, which are contrary to lean thinking (McVay, Kennedy & Fullerton, 2013). Again, the traditional accounting systems emphasize exploitation of full production capacity as against lean philosophy that emphasizes optimization of flow and creation of value for customers (Maskell & Kennedy, 2007). In response a modern management accounting approach: Lean accounting; emerged that helped resolve the deficiencies of the traditional accounting methods in Lean manufacturing firms. Further studies revealed that companies across Europe, United Kingdom and the United States that implemented lean production and its associate, lean accounting; recorded impressive financial performance than their counterparts that have not (Fullerton & Wempe, 2009; Hong & Modi, 2011; Hofer, Eroglu & Hofer, 2012; Marodin & Saurin, 2013; Thanki & Thankkar, 2014; Onyeizugbe & Ossai, 2016).

For the Nigerian manufacturing sector to be globally aligned; there is need to restructure its operations and exert a desire for problem solving on quality to compete internationally and expand the capacity of its share and profit. Also, the need to replace outdated methodologies with new and flexible approaches such as lean production is inevitable (Okocha & Daud, 2020). From extant literature reviewed, many firms that unwittingly implemented aspect(s) of lean manufacturing processes to reduce costs, are implementing the new manufacturing system along with the traditional accounting system. That is without corresponding implementation of lean accounting practices (Okpala, 2013a; Okpala, 2013b; Daferighe, James & Offiong, 2018; Okocha & Wan Norhayate, 2021; Okocha & Daud, 2020; Gupta & Sharma, 2016; Helleno et al, 2017; Henao et al., 2019). The two questions raised are: “What is the current level of lean accounting consciousness of industrial goods firms in Nigeria?” Secondly “What is the effect of lean accounting on the financial performance of firms in this sector?” This study is, therefore; motivated by the desire of the researcher to contribute to the level of responsiveness and understanding of the importance of lean accounting and its advancement in the industrial goods sector of the Nigerian economy.

LITERATURE REVIEW

Lean Accounting

Lean accounting is an accounting support to lean operations and the use of lean tools within the accounting area (Debusk & Debusk, 2012). It is a collection of principles, practices and tools that are used by lean companies to measure the business, control operations, and make sound financial decisions, ultimately improving all financial results (Karko, 2015). Okpala (2013) defines lean accounting as the application of lean methods to company’s accounting control and measurement processes to support lean management to achieve lean philosophy. Lean accounting is a wide spectrum of changes in managing, evaluating and controlling accounting processes of firms that implement lean strategies (Ahakchi, et al. 2012; Cesaroni & Sentuti, 2014). The basic goals of lean accounting are to eliminate waste, errors and clarify information; and to bring about a radical change in accounting and control. It is to conduct measurement processes to stimulate change and provide the required value to the customers (Soleimani, et al., 2019). Lean accounting draws knowledge from such lean tools like kaizen (concerned with continuous improvement), target costing (concerned with time and cost reduction as well as quality improvement), value stream (concerned with value added activities aimed to deliver

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quality goods/services to customer), Just-in-time (discourse mass production and accumulation of inventory), sales operations and financial planning – SOFP- (concerned with eliminating wasteful annual budgeting choreography most firms engaged in), back flush accounting (concerned with loss reduction at all levels), as it's tools build up lean accounting systems. To this end, we describe lean accounting as the assemblage of principles, practices, tools and techniques of lean thinking to provide accurate, timely and easy to understand accounting information for planning, control and decision making, and to promote lean transformation. Lean accounting was initially developed to support lean manufacturing companies, however today; it is fast moving into the other sectors of economic endeavours.

Consequently, in *accounting*, lean accounting is applied to all departments of an organization to have overall meaningful changes and excellent results. The reasons for the application of lean improvement methods to the accounting processes lays in its ability to refine company's operations, encourage finance department staff to learn about lean methods through actual hands-on experience and freeing up finance department time by removing waste in the process (Okpala, 2013; Maskell & BMA Inc Team, 2007). In *performance measurement*, the control of production and other processes is achieved by visual performance measurements at the shop-floor and value stream level. This measurement eliminates the need for the differencetracking and variance reporting favoured by traditional accounting systems. The continuous improvement is motivated and tracked using value stream performance boards which is updated weekly and used by the value stream continuous improvement team to identify areas and level of improvement, initiate PDCA (Plan-Do-Check-Adjust) projects, and monitor their progress (Chen & Cox, 2012). In financial reports for lean, the lean operations report is classified into value stream costing, financial statements and transaction costs elimination. The value stream costing reports consists of a simple summary of direct costs of the value streams overheads allocation to provide financial information that can be clearly understood by every worker in the value stream. This in turn leads to excellent decisions, motivate lean improvement across the entire value stream and show clearly accountability for cost and profitability.

Objectives of Lean Accounting

Lean philosophy is not about reduction in the size of an economic unit but rather to exploit idle energy, improve quality of products and services, eliminate waste and wasting in order to add value to customers (Debusk, 2012). Lean mission is to help firms move towards the overall goal of continuously and consistently delivering value to customers. It tries to precisely specify value from customers' perspective; identify the value stream; create continuous flow; implement demand-driven systems - "pull" and not "push" - and strive for perfection (Andersch, 2014). The five key objectives of lean accounting are: (1) To eliminate waste (2) To eliminate error and defects (3) To free up capacity (4) To simplify processes to help gain better understanding, and (5) To speed up process. The above-highlighted five significant goals can be achieved by replacing traditional accounting practices with lean accounting practices (Enoch, 2013; Muhammad, et al, 2021).

Transition to Lean Accounting

In addition to tracking the success of lean practices on the manufacturing floor, lean accounting should itself be lean. Its processes should be streamlined and should not require more effort and resources than necessary. To transit to a lean accounting system, the approach mirrors the 5Ss approaches of Kaizen. First, *sort* your accounting operations, evaluating them with an eye toward determining which steps provide the most value relative to the time they take. Discard processes that are not necessary for legal accounting requirements. Also eliminate steps and reports that do not give quality information about how well your lean systems are working. After sorting your processes, *set* them in order by developing a sequence of tasks that makes the most of your accounting time and also yields the best possible information. For example, when evaluating workflow it makes sense to track inventory purchases before recording sales figures because the inventory is necessary to generate the sales rather than vice

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versa. Next, **shine** your processes by eliminating unnecessary steps and upgrading your spreadsheets and platforms so that they will provide the best-quality information with the least amount of input and backtracking. Once your systems have been tightened and cleaned, **standardize** your lean accounting processes by creating written protocols and training personnel to follow these clear procedures accurately and consistently. Create standards and schedules for recording information and relaying it to employees who rely on these figures to understand and evaluate their production and purchasing activities. Finally, **sustain** your lean accounting practices by following through and doing the scheduled tasks on schedule and making sure your employees do the same. Evaluate these processes regularly and update them as often as necessary, especially as systems and circumstances evolve. Keep accounting and production staff informed about changes you have implemented, especially when these changes affect their work and their responsibilities.

Value Stream Costing

This costing method does not use detailed data and procedures to calculate costs, but does it at the value stream level. Ease, simplicity and understandability to most company employees, not just accountants, are the characteristics of the value stream costing (Baggaley & Maskell, 2003). Traditional costing methods pay attention to the selection of adequate bases for the allocation of overhead costs to cost objects. The choice of inappropriate keys to allocate the increased mass overhead costs to cost objects lead to the presentation of distorted information on product costs. Some products are burdened with higher or lower overheads than they actually caused. In value stream costing, all costs in the value stream are considered direct. The information necessary to calculate the value stream profit is collected at the production floor, linking all overheads to the value stream as a whole, without the need to use labor hours as the basis for allocation.

Waste Management

Extant literature reviewed provide various definitions of waste because it disguises itself in different ways, according to the context in which it appears (Mascitelli, 2007; Poppendieck, 2017; Thurer, Tomasevic, & Stevenson, 2017; Okpala, 2013; Ofileanu & Topor, 2014; Daferighe, James & Offiong, 2018; Okocha & Wan Norhayate, 2021). Waste refers to any activity that is not necessary from the view point of product or service and the customer is not willing to pay for it. Such activity should be eliminated. Also, an activity that is necessary from the product or service point of view and the customer is not willing to pay for it is considered non-value added activity, and should be reduced or eliminated subject to evaluation of other factors. However, an activity is considered value added if it is necessary from the point of view of product or service and the customer is willing to pay for it. Waste in production could be caused by people (employees, suppliers, and etcetera), processes, information, and assets. Lareau (2002) maintained that “people waste” occurs when work environment is not properly structured resulting in the underutilization or misuse of work powers; “process waste” occurs when the organization’s processes are not adequately designed or properly executed; “information waste, occurs when there is information asymmetry (information are not available at a time when it is mostly needed); and “assets waste” occurs when the resources of the company are underutilized or mismanaged. Rossi, Morgan & Shook, (2017) in their study sub-divided waste into;

- 1) Overproduction – Producing more, faster, or at an earlier stage than is required by the next process (or customer);
- 2) Over-processing – Performing unnecessary processing on a task.
- 3) Waiting – Waiting for work to be completed by a previous process or person;
- 4) Defects – Any kind of correction, such as late engineering changes;
- 5) Movement – Excess movement or activity during task execution;
- 6) Inventory – Build-up of more material or information than required; and
- 7) Transportation – The movement of documents/information/project tasks from person to person

Womack & Jones (2003) and Rosa & Machado (2012) maintained that lean management philosophy is an antidote for waste and they define five fundamental principles to eliminate such waste, which include

value creation; value stream analysis; optimizing flows; pull system application; and striving for perfection.

Cost Reduction and Lean Accounting

Cost reduction, simply put; is the process of reducing further from the current level of costs to a lower level through changing working conditions that facilitate producing the same product but at a lower cost (Okutmus, 2015). In other words, cost reduction is the optimal use of resources in a way that reduces the areas of misuse. Costs reduction contributes to increasing the competitiveness of firms, and helps the organization to achieve consumer satisfaction with regard to the quality of goods or services provided and within the appropriate price. Draziclutilsky et al. (2016) stressed that reducing cost does not mean reducing the level of quality; rather, cost reduction converges with maintaining product quality and within specified goals.

On influence of lean accounting on cost reduction; several studies have confirmed that by eliminating waste through application of tools of lean accounting, costs are directly reduced (Almashkor, 2021; Daferighe, James & Offiong, 2018; Awadallah & Al-Siddiq, 2018; Kocamiş, 2015; Okpala, 2013). Further, Lean accounting reduces the need for reporting and analysis metrics, thereby reducing waste in resources and activities that do not addvalue to products and production processes. Since the primary goal of lean accounting is to eliminate waste and reduce costs, the best way, therefore; to reduce costs is the application of lean accounting system, which contributes to the accurate allocation of costs along the flow thereby leads to lowering the unit cost. Impliedly, in lean accounting system, costs reduction is directly proportional to waste elimination, meaning, the more waste is eliminated the more cost is reduced. In the production process, the wastes to be eliminated are waste from: *Over production* - when products are produce more than theconsumers' require, the remaining is non-value added to the organization, and amounts to waste. *Defective products*: when products are bad, or below standard due to mistakes they are considered defective. This increases production cost and constitute waste. *Waiting time*: this is idle time. Time as an organizational resource should not be wasted. *Over Processing*: when processing jobs are done excessively beyond requirement it constitutes waste and incurs additional cost. *Stocks*: Inventory/warehouse costs. *Transportation*: cost of moving products and human-ware. Unnecessary motion: Unnecessary motion that is non-value adding during the production process can result to waste.

Traditional Accounting and Lean Accounting

Traditional accounting systems uses costing methods designed to support mass production and cannot identify the financial impact of the lean improvements taking place throughout the lean thinking implemented company, thus; provides misleading information prompted by variance analysis, make or buy, out-sourcing, product rationalization and profitability, which are considered extremely inimical to companies with lean aspirations (Okpala, 2013; Maskell & BMA, 2007; Fiume & Cunningham, 2003). As a company progresses with lean thinking, many fundamentals of its management system changes and traditional accounting control and measurement methods become inadequate and unsuitable (Mascitelli, 2011). In consequence, lean thinking organizations sought after clearer understanding of the true costs associated with processes and value streams and this need is supported by lean accounting. It focuses on true performance measurements; prepares a simple summary of direct costing of the value streams; it enables decision making and reporting based on a box score; it encourages preparation of financial reports on timely basis; the income statements are presented in plain language for easy understanding; it embraces radical simplification and eliminates transactions and control bottle-neck; it activates changes from a deep understanding of the value created for the customers; lean accounting eliminates traditional budgeting through monthly sales, operations and financial planning processes - SOFP; it encourages value-based pricing; and has ability to track the financial impact of lean changes throughout the organization. The above reasons for implementing lean accounting methods motivate people/management in the organization to move lean improvement forward and assist the role of accounting function from mere bookkeeping and routine financial reporting to strategic partnering with the company leaders to

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achieve quick success (Ed. Stenzel, 2007), It empowers continuous improvement at every level of the organization leading to increased customer value, growth, profitability and cash flow. Lean accounting presents income statements in a simple easy to understand and use method. The statements do not include misleading data relating to standard costs and ambiguous variance figures favoured by traditional accounting methods. This makes it action oriented. It changes stakeholders question from “What does this mean?” to “What should we do?”

Financial Performance

Financial performance are those measures that reflect the performance of the whole company in terms of profitability and portray the ability of firms to create value (Galeazzo & Furlan, 2018). Financial performance measures could be more consequential than operational performance measures given the levels of lean maturity in current production environments.

Lean Accounting and Accounting Education

Accounting is the language of business, and as a language should be updated in line with business trends. The goal of an accounting education is not to prepare for a life time recording of debits and credits, but to learn a language and tools to assist a business toward better performance. As business environment continuously improve the process and make serious progress in the transition to lean manufacturing, the firms have to continuously improve the accounting method, keep accountant folks updated, educate them and get them involved in every step taken. This is to avoid the serious disconnect that will occur between the operations and accounting (Byrne & Womack, 2012). Lean accounting methods can be readily adjusted to meet a firm’s specific needs and it rigorously maintain adherence to GAAP and external reporting requirements and regulations.

Empirical Review

Almaskhor (2021) studied the impact of integration between throughput accounting and lean accounting on cost reduction in industrial companies obtained data from a sample of Saudi companies. A quantitative methodology was adopted for the purpose of achieving the research objectives, questionnaire were administered online among a sample of one hundred (100) managers and accountants in Saudi industrial goods companies. The collected responses were analyzed by SPSS 23 and the results showed the importance of using throughput accounting and lean accounting in Saudi industrial companies, Moreover, the study concluded that there is a statistically significant, positive and strong correlation between the integration of lean accounting and throughput accounting on cost reduction in Saudi industrial goods companies, and that these two systems are complementary in their ability to reduce costs. The researcher recommended the necessity of using throughput accounting in conjunction with lean accounting in Saudi industrial companies for optimal use of the firms’resources. Udeze, Ugbam & Ugwu (2020) in their study: Effect of Lean Manufacturing on performance in the Nigerian manufacturing sector, specifically sought to establish the nature of the relationship between leanness and organizational performance and to ascertain the extent lean supply chain integration can affect competitiveness in the Nigerian manufacturing organizations. To achieve these objectives, two research questions along with two hypotheses were raised. The population of the study was 2703 employees of the selected manufacturing organizations, whereby a sample size of 336 was obtained using Godden (2004) statistical formula for determining sample size for finite population. Out of the 336 copies of the questionnaire distributed, 326 copies were returned and used for analysis. Hypothesis one was tested using Pearson Product-Moment Correlation Coefficient while hypothesis two was tested with linear regression analysis. The study revealed a positive correlation between leanness and organizational efficiency ($r = .663$, $p < .05$) and that lean supply chain integration significantly affected competitiveness in the manufacturing organizations ($t = 25.146$, $F = 0.000 < 0.05$). Thus, this implies that leanness in the organization resulted in efficiency. The study concluded that the leaner the entire production processes of an organization, the better its

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chances to sustain competitiveness. Based on the findings, the study recommends that as a matter of policy, leanness should be practiced in every facet of the organization to enhance efficiency.

Abdalla and Job (2018) examine the effect of selected lean management practices on financial performance of private hospitals in Kenya. The study adapted a descriptive design with the use of cross-sectional data. The target population was 40 private hospitals in Mombasa County. A census survey was carried out on all the private hospitals in Mombasa County with questionnaire used to collect primary data. Out of the 40 research instruments distributed, 37 were received and analyzed using SPSS, which produced both descriptive and inferential statistics. The findings revealed that all the lean management practices had a significant and positive relationship with financial performance. Okpala (2013) in an exploratory research investigated the application of lean accounting as a strategy to achieving lean business philosophy in Nigeria manufacturing firms. He studied 53 manufacturing firms listed in the Nigeria Exchange, and the findings revealed that lean accounting correlated positively with lean business philosophy but due to ignorance, implementation is insignificant in Nigeria. Iranmanesh et al (2019) studied the effect of lean manufacturing practices on firms' environmental performance by considering lean culture as a moderator. Data were gathered through a survey of 187 manufacturing firms in Malaysia and were analyzed using the partial least squares technique. The results indicate that process and equipment, product design, supplier relationships, and customer relationships have a positive and significant effect on sustainable performance. It also observed that lean culture positively moderated the effects of process and equipment and supplier relationships on sustainable performance. These results have important implications for enhancing the sustainable performance of manufacturing firms through lean manufacturing practices. Timm (2015) examined the problem of lack of adoption of lean-accounting techniques like value-stream costing in lean-manufacturing enterprises. The purpose of this non-experimental explanatory study was to investigate factors that influence the adoption of lean accounting. Using the technology acceptance model (TAM), based on the theory of reasoned action and the theory of planned behavior, the study examined whether management accountants' perceptions of the ease of use (PEOU), or perceived usefulness (PU) of value-stream costing may influence their intention to implement (BI) value-stream costing. The 2,307 attendees of the Lean Accounting Summit from 2005–2013 were invited to participate in an online survey; 70 attendees agreed to participate. Descriptive statistics, Pearson correlation coefficient, and multiple regressions were calculated. Statistically significant positive relationships emerged between PEOU, PU, and the intention to implement value-stream costing. Also, PEOU and PU for the individual accounted for 51% of the variance of BI, and PEOU and PU for the organization accounted for 49% of the variance of BI. This study added to the understanding how management accountants' perceptions positively influence their intention to implement value-stream costing.

Kadhim, Kadhim & Azeez (2020) conducted a study to determine the level of integration between lean accounting and activity-based public budgeting for providing useful information to evaluate the public sector firms' performance. The research sample consisted of 55 individuals in the public sector. The research hypothesis was tested. Findings significantly showed that lean accounting integrated with activity-based public budgeting for public firms' performance. The study concluded that the integration between lean accounting and activity-based public budgeting leads to providing financial and non-financial information to improve the efficiency of performance evaluation in public firm. This integration supports managers to decrease the idle capacities and generate important recommendations which improve the public sector firm's performance in future. Muhammad, et al., (2021) carried out the first study ever on lean accounting in Pakistan to create better understanding of lean accounting and how industries of Pakistan perceive lean accounting implementation and, as well explored the barriers to the adoption of lean accounting approach and the mitigation strategies. The study adopted a qualitative approach. Semi-structured interviews were conducted to collect data from managers of Textile industries to investigate the barriers and mitigation strategies. The appropriate tests were applied via Vivo 12 to summarize the interviews. The findings indicated a strong and positive perception of industrialists

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regarding the impact of the lean accounting approach on operational and financial efficiency in an organization. The study concluded that organizations can gain a competitive advantage by adopting this whole new approach. Of course, there are some barriers in its Implementation, but these barriers can be mitigated efficiently and conveniently. Ofileanu & Topor (2014) carried out a study on lean accounting: An ingenious for cost optimization. They uphold the views of earlier studies on lean accounting (Maskell & Baggaley, 2012; McVay, Kennedy & Fullerton, 2013), and maintained that lean accounting is a necessity for companies that have implemented lean manufacturing system.

Samad, Shu & Ogar (2017) conduct a study to examine the role of leanaccounting for value creation. The study employed qualitative approach to examine theaccounting methods applied by account preparers of industrial companies in Sweden.The findings of the study revealed that the financial statements preparers employmodern accounting methods because traditional accounting methods do not fit the process of leanaccounting. Lawal and Abdullahi (2020) studiedon impact of lean accounting on the financial performance of private hospitals in KadunaState. The data of the study was collected using questionnaires that are structured in a five-point Likert scale. Forty questionnaires were distributed to the management of Private hospitals, out of which thirty-eight questionnaires were filled and returned. Th edata of the study were analyzed using regression techniques and the result of theanalysis revealed that lean accounting has a significant and positive impact on thefinancial performance of private hospitals in Kaduna State. Therefore, the study concluded that the model of the study has significant ability to predict the relationshipbetween lean accounting and financial performance of private hospitals in KadunaState. In line with the findings, the study recommended that manufacturing and service enterprises should undertake to train their staff on the lean principles andpractice of lean accounting and ensure its full incorporation into the productionprocess

METHODOLOGY

This study is a literature review and so data are gathered from secondary sources, which include journals, textbooks, Internet/websites of relevant organizations, both within and outside Nigeria. In addition, the personal experience of the research as a follower of lean philosophy with keen interest, one-on-one discussion with colleagues in the college, as well as peer-to-peer discourse with course mates also brought in to bear

RESULT AND DISCUSSION

Based on the literature review and the peer-to-peer discussionswith colleagues and course-mates,the following are the findings with respect to current levels of lean accounting consciousness of of leanaccountingas well as the implementation effect on the financial performance listed industrial goods firms in Nigeria.It was found that;

- i. Lean accounting emerged to resolve the inadequacies of traditional accounting systems in leaned industries. This finding supports the position of proponents of lean accounting (Maskell & Baggaley, 2006; Maskell & BMA Inc. Team, 2007; Fiume & Cunningham, 2003)
- ii. Lean accounting is gaining global recognition and acceptance as accounting system concerned with eliminating waste, reducing costs/loss, and creating values for customers. This is in line with the findings of Hong & Modi, (2011); Hofer, Eroglu & Hofer, (2012); Marodin & Saurin, (2013); Thanki & Thankkar, (2014).
- iii. All lean organizations should implement lean accounting as traditional accounting systems are incompatible with lean thinking. This is consistent with the position of McVay, Kennedy & Fullerton (2013)
- iv. Companies that implemented lean accounting in their lean enterprises recorded higher financial performance than their counterparts that do not. This finding supported the findings of Abdalla & Job (2018); Lawal & Abdullahi (2020)

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- v. That the implementation of lean accounting practices is gaining global recognition and acceptance. This is in support of Martinez (2014) findings.
- vi. That the current level of awareness of lean accounting practices in Nigeria is still low as evidence by the literature reviewed. This is in line with the study carried out by Okpala (2013) whose finding correlated positively with lean business implementation, but due to ignorance lean accounting implementation is insignificant. That few firms in Nigeria that unwittingly adopted and implemented lean production in part are still maintaining the traditional accounting systems, which are incompatible with lean philosophy.
- vii. That ignorance, lack of expertise, policy framework and resources deficiency are the limiting factors mitigating against the adoption and implementation of lean accounting practices in Nigerian listed industrial goods firms. The finding corroborates the view of Timm (2015).
- viii. That initial costs of adopting and implementing lean accounting is high, but pays off in the long run, that is it has long term benefits.
- ix. That there is a gap between the academia and the industry with respect to promoting lean accounting practices, and it is consistent with the view of Bryne & Womack (2012), which posited that businesses should continuously improve the accounting method, keep accountants updated, educate them and get them involved in every step taken, to avoid serious disconnect that will occur between the operations and accounting.

CONCLUSION AND RECOMMENDATIONS

The study concludes that lean accounting supports lean manufacturing and is capable of enhancing financial performance of listed industrial goods firms in Nigeria through waste elimination, cost reduction and continuous improvement in order to add value to customers. The study, therefore, recommends as follows:

- i. The professionals and the academia must canvass and create impactful awareness on the benefits of lean accounting and advocate for the need for manufacturing firms, particularly; industrial goods firms to be lean in order to be globally compliant.
- ii. Nigerian manufacturing companies that are lean should implement lean accounting system because maintaining the old traditional accounting system may result in giving misleading information to management, which would lead to taking wrong direction.
- iii. Lean industrial goods firms should train their accounting staff on lean accounting principles and practices and ensure its full implementation as the world is inching towards lean products and services.
- iv. In assessing and ranking the performed firms in manufacturing sector, leanness of the organization should be among the criteria. This will form a good source of pressure on regulatory authorities to provide a policy framework
- v. Lean accounting could be introduced as a topic in accounting courses for enhanced awareness and development of lean accounting experts

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