THE CONCEPT OF LEAN ACCOUNTING AND ITS APPLICABILITY IN JUST-IN-TIME TRANSACTIONS IN NIGER MILLS PLC AND UNICEM PLC. CALABAR, CROSS RIVER STATE

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ABSTRACT:

The study examined the concept of Lean Accounting and its Applicability on Just-In-Time Transactions in Niger Mills Plc. and Unicem Plc. Calabar, Cross River State, Nigeria. Specifically the study was to determine, whether the use of Lean Accounting and Just-In-Time Transactions, reduce cost and enhance productivity and profitability of companies. The survey research design was used, while questionnaires, for primary data collections. Secondary data comprising companies' financial statements and literatures from previous contributors were equally employed. The Pearson Correlation Coefficient, Student t-test and the OLS were applied for data analysis. It was discovered that, Lean Accounting and Just-In-Time Transaction reduce cost of production and enhance productivity; though most companies in Cross Rivers State are yet to apply them. It was therefore recommended that companies should be encouraged to gear uptowards this world acclaimed accounting tools that reduce cost and enhance productivity and profitability.

Keyword: Lean Accounting, Just-In-Time transactions, Value Stream, Value Chain, Supply chain

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1.1 Introduction:

All profit making organizations often have their major objective of profit maximization which can only be achieved through effective and efficient management of both human and material resources.

According to CIMA (1991) management accounting is an integral part of management concerned with identifying, presenting and interpreting information used for formulating strategy, planning and controlling activities, decision making, optimizing the use of resources, disclosure to employees and safeguarding assets; an important tool that can be used for the achievement of these managerial functions is the standard costing.

Standard costing techniques therefore represent an integral part of management accounting control techniques which also include the budgetary system and responsibility accounting statement (Adeniyi 2004). Manufacturing firms and other profit oriented organizations therefore use management accounting to achieve their aim of profit maximization through efficient and effective use of human and material resources. In recent times, operating managers of major manufacturing firm in the world over as well as Nigeria, have developed negative attitudes against established organizational standards, thus making standard costing hitherto referred as traditional standard costing to be exposed to long lead times, increase in inventorial costs amongst others. The exposure led to the advocation of lean accounting.

According to Emiliani (2007) lean accounting is an offshoot of lean manufacturing that seeks to eliminate waste from a company's capital resources by applying lean manufacturing principles to the company's financial functions.''

Lean accounting is a series of methods and techniques that provide accounting, control and measurement within companies embracing lean, world class or agile manufacturing principles. Underlying the methods of lean accounting are profound changes from the traditional approach to accounting, control, and measurement. These profound changes reflect the same ideas and practical approaches used to implement lean thinking. Under the heading of Lean Accounting are a number of the techniques that, when used in combination, totally change the way a manufacturer approaches the control of the company (Pettersen, 2009).

Horgren, Datar, Foster, Rajan, and Ittner (2008) opined that another approach for simplified product costing in just in time (JIT) system is lean accounting and successful JIT production requires companies to focus on the entire value chain from suppliers to manufacturer to customers in order to reduce inventories, lead time and waste. This is where this paper draws it significance.

1.2 Statement of problem:

Traditional cost accounting sees inventory as an asset, whereas inventories, generate more costs incurred on storage, maintenance and insurance, leading to an overall increase in inventory cost significantly affecting cost of goods sold. Identified also are inefficiency and ineffectiveness in time management involved in production and delivery of products to customers otherwise called lead time.

Most manufacturing entities in Nigeria adopts the standard costing system by calculating all associable cost of productions, but are alien to the reduction of such costs within the value chain and are ravaging in the establishment of unattainable standards, and exhibition of negative attitude towards established standards, failing to key into the sustainability drive, using limited resources to achieve gigantic productivity which lean accounting and JIT portend. The purpose of this paper therefore is to evaluate the concept of lean accounting and its applicability on just-in-time transactions in Niger Mills Plc and UNICEM Plc. Calabar, Cross River State. The specific objectives of the study are:

1. To identify the significance of lean accounting to just-in-time transactions
2. To explore the applicability of value stream costing techniques in Nigerian manufacturing firms.
3. To see if the elimination of some irrelevant transaction in our firm can lead to increase in productivity and profitability.

To this end, the following questions were raised:

1. Is there any significant relationship between lean accounting and just in time transactions?

2. Can value stream costing technique be successfully applied in manufacturing firms in Nigeria?

2.1 Literature Review:

According to the CIMA (1989), Management Accounting is "the process of identification, measurement, accumulation, analysis, preparation, interpretation and communication of information used by management to plan, evaluate and control within an entity and to assure appropriate use of and accountability for its resources.

In the late 1980s, accounting practitioners and educators were heavily criticized on the grounds that management accounting practices (and, even more so, the curriculum taught to accounting students) had changed little over the preceding 60 years, despite radical changes in the business environment. Professional accounting institutes, perhaps fearing that management accountants would increasingly be seen as superfluous in business organizations, subsequently devoted considerable resources to the development of a more innovative skills set for management accountants (Baggaley, 2003).

The distinction between 'traditional' and 'innovative' accounting practices can be illustrated by reference to cost control techniques such as variance analysis, used in conjunction with innovative techniques such as life cycle cost analysis and activity-based costing (Radnor & Bucci 2010).

Both lifecycle costing and activity-based costing recognize that, in the typical modern factory, the avoidance of disruptive events (such as machine breakdowns and quality control failures) is of far greater importance than (for example) reducing the costs of raw materials. Activity-based costing also deemphasizes direct labor as a cost driver and concentrates instead on activities that drive costs, such as the provision of a service or the production of a product component (Womack, Daniel and Daniel, 1990).

As the management of manufacturing firms struggle through ages to cut cost, avoid waste, and improve on customer satisfaction, around 1920's, Toyota company of Japanese discovered what

is now known and called leaning accounting as lean manufacturing after a visit to Ford Motor company (Womack, Daniel and Daniel,1990).

2.2 Lean accounting:

Lean accounting is a series of methods and techniques that provide accounting, control and measurement within companies embracing lean, world class or agile manufacturing principles. Underlying the methods of lean accounting are profound changes from the traditional approach to accounting, control, and measurement. These profound changes reflect the same ideas and practical approaches used to implement lean thinking. Under the heading of Lean Accounting are a number of the techniques that, when used in combination, totally change the way a manufacturer approaches the control of the company, (Radnor & Bucci, 2010).

Horgren, Datar, Foster, Rajan, and Ittner (2008) opined that another approach for simplified product costing in just in time (or lean production) system is lean accounting. Successful JIT production requires companies to focus on the entire value chain from suppliers to manufacturer to customers in order to reduce inventories, lead time and waste.

Lean accounting is a costing method that supports creating value for the customer by costing the entire value stream, not individual products or departments thereby eliminating waste in the accounting process, (Baggaley, 2003).

According to Maskell (2008) Lean accounting is associated with accounting, control, measurement, management methods that truly reflect lean thinking and lean practice. To him, leans accounting leads to a better decision making by providing accurate, understandable, and actionable cost and profitability information. Lean accounting saves time and money eliminating much of the waste associated with traditional accounting and control systems. To him, lean accounting motivates lean improvement over the longer- term by providing measurement and reporting information that is thoroughly lean focus.

Lean Accounting provides accurate, timely and understandable information that can be used by managers, sales people, operations leaders, accountants, lean improvement teams and others. The information gives clear insight into the company's performance; both operational and financial.

The Lean Accounting reporting motivates people in the organization to move lean improvement forward. It is often stated that "what you measure is what will be improved." Lean accounting measures the right things for a company that wants to drive forward with lean transformation, (Fiume & Cunningham, 2003).

2.2.1 Lean Manufacturing:

Lean manufacturing is based on managing the product value stream from raw material to end customer rather than focusing or managing separate asset and companies. For lean manufacturing procedure to be effectively achieved, it needs lean thinking. Jones (2006) specified five principles of lean thinking as follow:

- Specify value from the stand point of the end customer
- Identify the value stream for each product family or line
- Link value-creating steps so the product can flow
- Enable your customers to pull what they need
- Manage towards perfection – where every actions and assets create value.

It therefore follows that if you define value from the standpoint of the end customer you realize that only a tiny fraction of the actions and time actually create value. In a typical factory, this might be 5% and in a whole value stream (from raw materials to end customer) it is usually less than 1%. The rest of the steps are only necessary because of the way companies are currently organized and because of past decisions about assets and technology. So the greatest opportunity for performance improvement is to reconfigure operations across the value to remove these wasted steps. These wastes steps that consume value were developed by Taiichi Ohno and as reported by Jones, (2006) these steps: Overproduction, inventories, defects, waiting, excess transportation, excess movement, and excess processing.

The benefits of Lean Accounting:

- ✓ Provide accurate, timely, and understandable information to motivate the lean transformation throughout the organization, and for decision-making leading to increased customer value, growth, profitability, and cash flow.

- ✓ Use lean tools to eliminate waste from the accounting processes while maintaining thorough financial control.
- ✓ Fully comply with generally accepted accounting principles (GAAP), external reporting regulations, and internal reporting requirements.
- ✓ Support the lean culture by motivating investment in people, providing information that is relevant and actionable, and empowering continuous improvement at every level of the organization (Fiume & Cunningham, 2003).

Inventory valuation:

This is yet another serious advantage of lean accounting; it is unavoidably behind most lean applications. This is justified by the fact that important aspect of financial control is the evaluation of inventory. Lean manufacturing always leads to substantial inventory reductions. When inventories are low and under good control (using pull systems, single-piece flow, supplier partnerships, etc.), the valuation of inventory becomes much less complex. Lean Accounting contains a number of methods for valuing inventory that are simple, accurate, and often visual. Several of these methods do not require any computer-based inventory tracking at all (Fiume & Cunningham, 2003).

Where does Lean Accounting apply?

This kind of question comes into the mind of anybody who hears this concept for the first time. Frankly speaking, most lean methods as well as Lean Accounting, was developed to support manufacturing companies, and most of the implementation of Lean Accounting has been within manufacturing organizations. Now that lean methods are moving into other industries like financial services, healthcare, government, and education there are some initial examples of the application of Lean Accounting in these industries. However, there are as yet no published cases of the use of lean accounting outside of manufacturing (Maskell & Baggaley 2003).

2.3 Just in time (JIT) transaction:

JIT is a revolutionary production system and it is in every sense opposite of batch production. It employs minimum materials, equipments, man power, utility, space, time and money, (Masaaki,

2006). JIT produces a product within a shortest lead time and meet the diversified demand of customers and delivers the product just-in-time.

Quality is ensured by keeping small inventories and through the use of flow production. Small inventories eventually leads to one piece flow namely one work piece, moving from process to process. This enables operators to make 100% inspection of each piece. In flow production, unlike in the isolated highlands approach of the batch production, processes are arranged in a flow and any quality rejected and created in one process can be identified in the next process immediately.

Compared to the traditional product costing methods, the focus on value streams and cost is consistent with emphasis on JIT on improvements in the value chain from suppliers to customers.

2. 4 Value chain, supply chain analysis and key success factors:

Customers demand from companies much more than a fair price. They expect a quality product or service delivered in a timely way. These multiple factors drive how a customer experiences a product or service and the value or usefulness a customer derives from the product or service (Horgren, Datar, Foster, Rajan, and Ittner, 2008).

Value-chain analysis:

According to them, Value chain is the sequence of business functions in which customer usefulness is added to products or services. A typical manufacturing organization shows six business functions: R & D, design, production, marketing, distribution, and customer service.

Each of these business functions is essential to satisfying its customers and keeping them satisfied (and loyal) over time. Companies use the term customer relationship management (CRM) to describe a strategy that integrates people and technology in all business functions to enhance relationships with customers, partners, and distributors. CRM initiatives use technology to coordinate all customer-facing activities (such as marketing, sales, calls, distribution, and post-sales support) and the design and production activities necessary to get products to customers.

The usual order in which different business-function activities physically occur do not, however, imply that managers should proceed sequentially through the value chain when planning and managing their activities.

Companies gain (in term of cost, quality, and the speed with which new products are developed) if two or more of the individual business functions of the value chain work concurrently as a team. For example, inputs into design decisions by production, marketing, distribution, and customer service managers often lead to design choices that reduce total costs of the company.

Management accountants track the costs incurred in the value-chain category. Their goal is to reduce cost in each category and to improve efficiency.

Supply-chain analysis:

Companies can also implement strategy, cut costs, and create value by enhancing their supply chain. The term **supply chain** describes the flow of goods, services, and information from the initial sources of materials and services to the delivery of products to consumers, regardless of whether those activities occurs in the same organization or in other organizations.

Many companies play a role in bringing these products to consumers and cost management emphasizes integrating and coordinating activities across all companies in the supply chain, as well as across each business function in an individual company's value chain, to reduce costs. For example, both Coca-Cola Company and Pepsi Bottling Group contract with their suppliers (such as plastic and aluminum companies and sugar refiners) to frequently deliver small quantities of materials directly to the production floor to reduce materials-handling costs. Consider another example: To reduce inventory levels in the supply chain, Wal-Mart is asking its suppliers such as Coca-Cola to be responsible for and to manage inventory at the Coca-Cola warehouse and Wal-Mart, (Horgren, Datar, Foster, Rajan, and Ittner, 2008).

Key success factors:

Customers want Companies to use the value chain and supply chain to deliver ever improving levels of performance regarding several (or even all) of the following:

- **Cost and Efficiency:** Companies face continuous pressure to reduce the cost of the products or services they sell. To calculate and manage the cost of products, the management accountant tries to understand the tasks or activities (such as setting up machines or distributing products) that cause costs to arise. Managers monitor the marketplace to determine prices that customers are willing to pay for products or service. Management accountants calculate a target for a product by subtracting the operating income per unit of product that the company thinks it can earn from the "target price". Managers work with management accountants to achieve the target cost by eliminating some activities (such as rework) and by reducing the costs of performing activities in all value-chain functions – from initial R & D to customer service.

- **Quality:** Customers expect high levels of quality. Total quality management (TQM) is a philosophy in which management improves operations throughout the value chain to deliver product and services that exceed customer expectations. TQM encompasses designing the product or service to meet the needs and wants of customers, as well as making products with zero (or minimal) defect and waste and with low inventories. Management accountants evaluate the costs and revenue benefits of TQM initiatives.

- **Time:** Time has many components. New-product development time is the time it takes for new products to be created and brought to market. The increasing pace of technological innovation has led to shorter product life cycles and the need for companies to bring new products to market more rapidly. The management accountant measures the costs and benefits of a product over its life cycle.

  Customers-response time describes the speed at which the organization responds to customer request. To increase customer satisfaction, organizations must complete activities faster and meet promised delivery dates reliably. Delays or bottleneck occurs when the work to be performed exceeds the available capacity. To increase output in these situations, managers need to increase the capacity of the bottleneck operation. The management accountant's role is to quantify the costs and benefits of relieving the bottleneck constraints.

- **Innovation:** A constant flow innovative products or services are the basis for ongoing company success. The management accountant helps managers evaluate alternative investment decisions and R & D decisions.

2.5 Value Streams:

Value streaming includes everything an entity does in creating value for a customer that it can reasonably associate with a product or product line. Among the costs in a value stream would be the expenses a company incurs to design, engineer, sell, market and ship a product as well as costs related to servicing the customer, purchasing materials and collecting payments on product sales.Value stream help to guide the continuous improvement team in their "pursuit of perfection" activities (Jusko, 2007)

Value stream costing, is a simple summary direct costing of the value streams. The value stream costs are typically collected weekly and there is little or no allocation of "overheads." This provides financial information that can be clearly understood by everybody in the value stream which in turn leads to good decisions, motivation to lean improvement across the entire value stream, and clear accountability for cost and profitability. Weekly reporting also provides excellent control and management of costs because they can be reviewed by the value stream manager while the information is still current (Stenzel, 2007).

3.0 RESEARCH METHODOLOGY:

3.1 Research Design:

The survey research design was adopted, while both primary and secondary data were used. The primary data were elicited from respondents while the secondary, from previous researchers and companies financial statements. The stratified sampling technique was equally used on the two companies studied. These companies were UNICEM and Niger Mills both in Cross Rivers state, Nigeria, and the sample size of 132 respondents was considered adequate having carried out a sample size determination using the Yaro Yamani techniques on the population of 197 staff of the companies.

The Pearson Correlation Coefficient and Students t-test were used for hypothesis one, while multiple regression was used on hypothesis two.

The Pearson Product-Moment Correlation Coefficient and Students distribution test of significance (t-test) were denoted as:

$$r = \frac{n\sum XY - \sum X\sum Y}{\sqrt{n\sum X^2 - (\sum X)^2}\ \sqrt{n\sum Y^2 - (\sum Y)^2}} \quad \text{and} \quad tt = r\sqrt{\frac{n-2}{1-r^2}}$$

While the Multiple regression was denoted as: $Y_1 = b_0 + b_1x_1 + B_2X_2 + B_3X_3 + £$

4.0 Research Results and Findings:

The data elicited from the respondents on the applicability of lean accounting on just in time transactions are presented in table 4.01 and 4.02 below

Table 4.01: With just-in-time transactions, companies use information systems to collaborate and coordinate with suppliers to receive supplies just in time before the supplies are needed on the production line.

	Frequency	Percent
SD	4	3.4
D	17	14.5
A	38	32.5
SA	58	49.6
Total	117	100.0

Field survey, 2012

Table 4.02: Lean accounting on quality, cost, flexibility, and customer response time encourages productivity.

	Frequency	Percent
SD	7	6.0
D	21	17.9
A	39	33.3
SA	50	42.7
Total	117	100.0

Field survey, 2012

Table 4.01 shows that 4 respondents strongly agreed that, "with just-in-time transactions, companies use information technology systems to collaborate and coordinate with suppliers to receive supplies promptly before the supplies are needed on the production line". 17 (14.5%) of the respondents disagreed to it; 38 respondents agreed, while 58 respondents strongly agreed.

Table 4.02 shows that 7 (6.0%) respondents strongly agreed that, "Lean accounting on quality, cost, flexibility, and customer response encourages productivity". 21 (17.9%) of the respondents disagreed; 39 (33.3%) agreed and 50 (42.7%) strongly agreed.

4.1 Test of hypotheses:

Hypothesis one

H_o: there is no significant relationship between lean accounting and just in time transactions.
H_1: there is a significant relationship between lean accounting and just in time transaction.

Table 4.03

Pearson correlation coefficient result of Lean accounting and JIT

Variable Cal	$\sum X$ $\sum Y$	$\sum X^2$ $\sum Y^2$	r – cal.
Lean Accounting	366	1242	0 .73
JIT	384	1342	

Source: SPSS analysis 2012

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} = \frac{.73\sqrt{4-2}}{\sqrt{1-(.73)^2}} = \frac{1.0324}{\sqrt{0.467}} = 2.210$$

From the test of significance, the calculated t-value of 2.210 was found to be greater than the critical- value 1.96 needed for significance at 0.05%.

We therefore reject the null hypothesis and accept the alternative hypothesis that states that there is a significant relationship between lean accounting and just in time transactions.

Hypothesis two

$H_{o:}$ There is no significant relationship between value stream costing and the productivity of the firms.

$H_{1:}$ There is a significant relationship between value stream costing and the productivity of the firms

The regression estimation of equation was adopted and used for this test and the summary of the test result is shown in table below

Table 4.04

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.982[a]	.963	.945	4403.68263

A. Predictors: (Constant), Overhead, Labour, Material

Table 4.05

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-147157.652	41091.018		-3.581	.012
	Material	1.444	.160	.842	9.009	.000
	Labour	.979	.260	.336	3.765	.009
	Overhead	6.324	2.123	.267	2.979	.025

a. Dependent Variable: PRODUCTIVIITY

Decision rule

The effect of value stream variables such as material, overhead and labour on productivity, as revealed in the above table shows that, inventory was found to be significant and positively associated with productivity ($p < 0.05$), Thus H_1 was retained. Overhead was found to be significantly associated with the productivity. Thus H_1 was retained and Labour, was also found to be significantly associated with productivity.

Hence, the null hypothesis that specified that 'there is no significant relationship between value stream costing and the productivity of the firms' was rejected and the alternative hypothesis specifying that there is "a significant relationship between value stream costing and the productivity of the firms" was accepted.

Discussion of findings:

From the empirical evaluation, it was discovered that:

There is a significant relationship exists between lean accounting and just in time transactions; and there is a significant relationship between value stream costing and the productivity of the firms".

Others findings include: Lean accounting is capable of improving company's profitability and productivities by actively engaging all employees in cost-cutting and improvement of operations.

The use of lean accounting as a tool to eliminate waste from the accounting processes while maintaining thorough financial control was seen to be viable and requires a smooth flow of product maintenance throughout the operations. While, Lean accounting practices make for more quality-focused, empowered work teams, and a more visual performance management system and can instigate staff to become more actively involved in moving the company forward towards its strategic goals.

With just-in-time transactions, companies can use information technology systems to collaborate and coordinate with suppliers to receive supplies promptly when the supplies are needed on the production line, while there is a need for strong buyer-supplier relationships in a just-in-time environment.

Conclusion:

Lean Accounting provides accurate, timely and understandable information that can be used by managers, sales personnel, operations leaders, and accountants and can significantly affect just in time transactions of companies. Lean accounting information gives clear insight into the company's performance, both operational and financial. Lean Accounting report motivates people in the organization to move lean improvement forward. It is often stated that "what you measure is what will be improved." Lean accounting measures the right things for a company that wants to drive forward with lean transformation, (Fiume & Cunningham, 2003). The information, reports, and measurements can be provided quickly and easily and it enhances production process within the shortest lead time and meets the diversified demand of customers and delivers the product just-in-time. However, the application of lean accounting by manufacturing companies in Nigeria is relatively low.

Value stream costing as an attribute of lean accounting, significantly affect the productivity of firms as it enhance cost efficiency, improved quality and encourage management accountants to achieve the target cost by eliminating some activities (such as rework) and by reducing the costs of performing activities in all value-chain functions – from initial R & D to customer service. The value stream costing techniques also leads to shorter product life cycles and the need for companies to bring new products to market more rapidly.

Recommendations:

Manufacturing organization should introduce Lean accounting method as a support to the creation of value for their customer by costing the entire value stream, and not individual products or departments as was the case in the use of traditional cost accounting method thereby eliminating waste in the accounting process.

Companies should pay more attention to its entire value chain from suppliers/manufacturers to customers in order to reduce material cost, overhead cost, lead times, and waste, thereby using limited resources to achieve higher productivity as a means of keying into the federal government's sustainable development agenda.

Companies should adopt appropriate information technology systems that will help to collaborate and coordinate with suppliers to receive supplies promptly when needed on the production line, and make sure that finished goods are made available as soon as demand are placed on them and they should also develop a value stream map that specifies departmental activities and their required time frame.

To this end, the lack of a management accountant capable of harnessing the value stream costing techniques through: the reduction of inventory, lead times and waste, to achieve prompt production and delivery of products as at needed, could be a major weakness as well as a threat to a growing economy like Nigeria.

Management accountants should therefore engage in continuous efforts of tracking economic activities in the value chain, focusing on where change is needed, and be conscious of the fact that a product will not succeed or fail based on cost, price, quality or performance alone; time is an increasing important factor in the market place.

If this is done, companies may be able to significantly reduce business costs and meet consumers demand on time; and the reducing these costs can improve the gross profit of the company and allow managers to find new opportunities for growing the business through extra business profits.

Growing and expanding the business may also allow the company to increase their market share in the economic environment and push competitors out of the industry or sector.

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