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An Empirical Investigation of Value-Chain Analysis and Competitive Advantage in the Nigerian Manufacturing Industry   *(Pp. 188-198)*

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Abstract
This research work was designed to examine the impact of the Value-Chain Analysis on Competitive Advantage of manufacturing firms in Nigeria. To achieve this purpose, hypothesis was formulated and a review of related literature was made. The population of this study consists of those manufacturing companies quoted in the Nigerian Stock Exchange Factbook of 2009. A total of One hundred (100) of such companies was identified. The data for this study were collected through the secondary sources such as the companies' Annual Reports of various years and CBN Statistical Bulletin of 2009. The hypothesis stated in this study was statistically tested with the Multiple Regression Analysis. Our findings revealed that the Value-Chain Analysis has a positive but insignificant impact on Competitive Advantage of a manufacturing firm in Nigeria. Based on the above, it was recommended that –manufacturing firms in Nigeria should welcome a change from the

Functional-Based Costing to an Activity-Based Costing for the effective Value-Chain Analysis and accountants in Nigerian manufacturing firms should be adequately equipped through seminars, workshops and conferences for the transformation of Value-Chain Analysis to strive.

Keywords: Value-chain analysis, competitive advantage, value-chain framework, market share, operational efficiency

Introduction

For a company to survive in highly competitive environment of today, it must at least temporarily achieve a competitive advantage. Barney (2002) says that "a firm experiences competitive advantage when its actions in an industry or market create economic value and when few competing firms are engaging in similar actions." He went on to tie competitive advantage to performance, arguing that "a firm obtains above-normal performance when it generates greater-than-expected value from the resources it employs. There are many ways for a firm to achieve this advantage and two generic ones are – price leadership and differentiation. Price leadership is simply when a company creates a distinctive position in the market through product functionality, service, or quality (Donelan and Kaplan, 1998). If either of these two management strategies is chosen to be implemented by a company, value-chain analysis can help the firm focus its plan and thus achieve a competitive advantage (Hansen and Mowen, 2000). According to Drury (2008), the value chain analysis is a means of increasing customer satisfaction and managing costs more effectively.

Value-chain analysis is a concept from strategic management, which was first described and popularized by Michael Porter in his 1985 bestseller "Competitive Advantage: creating and sustaining superior performance". According to Ikwouria and Gate (2008), value chain is the sequence of activities required to make a product or provide a service. It is a linked set of value-creating activities all the way from basic raw materials sources for components suppliers through to the ultimate end-use product or service delivered to the customer. Value chains shape market access since it identifies key players and lead firms within the chain and enables "clear understanding of the "rules of the game" (Porter, 1985).

The value chain categorizes the generic value-adding activities of an organization or industry where primary activities (i.e. line functions) and support activities (i.e. staff functions) are identified and the cost and value drivers are determined for each value activity. Primary activities include –

inbound logistics, operations (production), outbound logistics, marketing and sales, and services (maintenance) while support activities covers administrative infrastructure management, human resource management, research and development and procurement.

However a critical review of extant literature revealed very scanty empirical studies on value chain analysis and competitive advantage. The few available ones are of foreign origin and therefore their findings are not compatible to the Nigerian situation. It is against this backdrop that this study is being consummated to investigate the impact of Value-Chain Analysis on competitive advantage of a manufacturing firm. It is therefore hypothesized that Value-Chain Analysis has no significant impact on Competitive Advantage of a manufacturing firm in Nigeria.

Review of related literature
The value chain approach traces the connections from buyers to the producers. As this is done, gaps become evident and form the basis for establishing priorities for action. The implication is that linkages are given closer attention since the quality of linkages and support systems play a critical role in enabling firms and the industry sector to be more competitive. Value chain analysis therefore is an attempt to understand how a business creates customer value by examining the contribution of different activities in the business. It is a tool used to examine, coordinate and optimize linkages in the value chain. The linkages express the relationships between the performance of one activity and its effect on the cost and performance of another activity. It recognizes and accepts that the competitiveness of individual companies depends upon the competitiveness of the value chain to which it belongs (Doneland and Kaplan, 1998). The value chain analysis helps the firm to identify bottleneck activities; which part of the chain holds up progress in others? And which bottlenecks deserve priority attention of management? It ultimate goal is to maximize the value creation while minimizing costs. According to Drury (2008), co-coordinating individual parts of the chain together creates the conditions to improve customer satisfaction, particularly in terms of cost efficiency, quality and delivery. A firm which performs the value chain activities more efficiently and at low cost, than competitors will gain a competitive advantage.

There are two forms of value chain - the company's internal value chain and the industry value chain

(a)   **The Company Internal Value Chain** – A company's internal value chain includes all the physical and technological activities within the company that add value to the product. The key to to evaluating a company's internal value chain is to understand the activities that give the company a competitive advantage, and then pinpoint and exploit those advantages better than other companies in the industry. This analysis is done in four steps:-

(i)   **Identify the value chain activities** – To identify the value chain activities, the following tasks are to be performed;

-      Look for discrete activities, which create value in different ways. They will include different costs, different cost drivers, separable assets, and different personnel involved, for example, contrasting product design activities with advertising activities.

-      Identify structural, procedural, and operational activities. Most companies emphasize operational activities, but proponents of value chain analysis state that focus is too narrow and only deals with the short run and will not be able to give the company an overall competitive advantage.

(ii)   **Determine which activities are strategic** – To determine which activities are strategic, a company must identify which product characteristics are valued by existing customers. A company should then find characteristics that it can exploit, and therefore create value for future customers. Examples of these characteristics are quality, service, or any tangible or intangible product features.

(iii)   **Trace costs of activities** – The company needs an accounting technique that traces costs to different value chain activities. This is important for a company to focus on these value-added processes, so they will be able to manage them more efficiently.

(iv)   **Improve management of value chain activities** – To achieve a competitive advantage, a company must manage their value chain better than their competitors. This means reducing a company's to a cost while enlarging the competitive advantage (Shanks and Weiss, 2007). But this does not mean that all costs have to be reduced, it means that all costs that do not adversely affect the competitive advantage can and should be reduced.

(b)   **The Industry Value Chain** - The value chain of an industry starts with the raw materials manufacturers and finishes with the delivery of the final product to the customer. The key to analyzing the industry value chain is to comprehend and use the advantage of a company's comparative strength within the industry.

All industries begin with a raw material and end with a sale to a customer. There are many links within the process. There are upstream links and downstream links. Each separate link stands for an independent, economically viable segment of the industry. To establish which links in the industry value chain are separate, Donelan and Kaplan (1998) stated that answers to the following questions will help to solve the problem – is there a market for the output of this link in the industry value chain, or can a market price be determined objectively? Are there any companies that produce and sell only within this link of the chain? If the answer is yes to either of these questions, then the industry under consideration may be a separate link in the industry value chain. Then after the industry value chain is determined, a company should examine the relative strength of its position, in any separate link, in the industry value chain. A company's position within the industry link can be found by using a myriad of measurement, including industry margins, return on assets, benchmarking, and capital budgeting. When a company then finds where it has deficiencies in relative industry strength, it can go back to the internal chain activities to improve its standing with its competitors and then gain a competitive advantage (Donelan and Kaplan, 1998).

A framework of the Value-Chain is represented in figure 1.

Previous empirical studies
Previous empirical studies that relate the Value-Chain Analysis to Competitive Advantage are discussed below. Porter (1985) was the first to advocate using value chain analysis to gain competitive advantage. According to him, the aim of the value chain analysis is to find linkages between value-creating activities which result in lower cost and or enhanced differentiation. These linkages can be within the firm or between the firm and its suppliers, and customers. Other empirical research efforts that relate value chain analysis to competitive advantage, include Coopers and Lybrand (1996); Urbig (2003); and Schiebel (2005), Cooper and Lybrand (1996) conducted a study on 213 companies in Pakistan to examine "the impact of value chain analysis on the profit margin of firms". The findings indicated a

correlation co-efficient of 0.74 (i.e. 74%) of the relationship between value-chain analysis and profit margin of the firm. This implies that increases in the adoption of value chain analysis by companies will bring about 74% increases in profit. The study equally shows that 57% of the respondents agreed that the value chain analysis is a useful technique in minimizing the operational cost of a business. This gives the firm the opportunity of cost-leadership position in the industry thereby resulting to superior performance. However, Cooper and Lybrand (1996) do not consider other performance variables such as market share. Urbig (2003) conducted a pilot study to investigate "the implications of the value chain for firm and industry analysis", among selected companies in Berlin. The study revealed that the value chain analysis enables companies' executives to control cost drivers better than the competitors and thus creating above average performance in operational efficiency, profitability, market share, customers' satisfaction, innovations, quality, and assets utilization. There is the need to also conduct a similar study in other countries as ours to validate whether environmental differences and respondent characteristics could cause a major difference in the researcher findings. Schiebel (2005) in her Ph.D dissertation on "value chain analysis and competitive advantage in telecommunication firms in the United Kingdom", administered a total of one thousand three hundred and sixteen (1316) copies of questionnaire on staff of marketing department of telecommunication companies to elicit their responses on the relevance of value chain analysis in gaining competitive advantage. The data from her study, which were analysed using the mean scores, indicated that the value chain analysis does not only reveal cost advantages but also brings attention to several sources of differentiation advantage relative to competitors. It equally identifies those activities that are critical to buyer satisfaction and market success. This enables the firm to achieve above-average customer satisfaction (i.e. customer loyalty), market share, and profit, margin. A similar study is equally necessary for the manufacturing industry to examine its significance.

The theoretical exposition of the value chain analysis looks so interesting and glorious, but its implementation and application is faced with a few challenges. According to Donelan and Kaplan (1998), systems are not designed to assign costs to value-added activities, but with the introduction of activity-based costing (ABC) if well implemented, that problem of assigning costs to activities can be solved. Second, it can be difficult to find accurate return on sales and return on asset data to determine the value chain. But,

rough estimates can be used to give some in sight into the value chain. Lastly, not only do estimates make the value chain difficult to determine, but many industries have very complex value chains.

Even though there are a few challenges to a value chain approach, it can be a very effective Strategic Management Accounting tool (Puolamaki, 2006). When competition is fierce, companies must precisely manage their activities and costs to sustain their competitive advantage.

Model specifications

The model designed for this study is as represented thus:

MKTS=

$$f(\alpha_o \log + \beta_1 \log OPEREF + \beta_2 \log NPBT + \beta_3 \log INV. + ei)$$
………(ii)

Where;   NPBT = Net Profit before Tax

α = Regression Constant

MKTS = Market Share

OPEREF = Operational Efficiency

INV. = Investments

ei = Stochast

β^3 = Regression Co-efficients

Methodology

For the purpose of this study, the survey method of research design was employed by the researchers. The choice of this design is because it offers the researcher the opportunity to generate a large volume of data from different organizations and institutions thereby providing a valid generalization of research findings. More so it investigates beliefs, opinions, attitude, preferences or disposition of the population elements without subjecting them to any form of manipulation and control (Akenbor,2011).

In this study, the researcher focused attention on those manufacturing companies quoted in the Nigerian Stock Exchange Factbook of 2009. A total number of one hundred (100) of such companies was identified. The data for this study were collected through secondary sources such as the companies' financial statements

and the Central Bank of Nigeria (CBN) statistical bulletin for a period of fifteen (15) years (i.e 1994-2008).

There are two main variables in this study-Value-Chain Analysis and Competitive Advantage. Value-Chain Analysis was measured by the firm's operational efficiency using asset turnover while Competitive Advantage was measured using the Firm's Market Share.

In testing the hypothesis in this study, a multiple regression analysis was employed, which was computed with the aid of the Econometric Views (E-Views) version 3.1 Statistical Package.

Hypothesis testing
Ho: Value Chain Analysis has no significant impact on Competitive Advantage of a manufacturing firm.

In testing this hypothesis, the Market Share (MKTS) of the selected companies for a period of fifteen (15) years was regressed against Operational Efficiency (OPEREF), Net Profit before Tax (NPBT), and Investment (INV.) as shown in the table below.

Table 1 shows a multiple correlation co-efficient of 0.87, which is close to one (1) from the positive side. This suggests that there is a strong positive relationship between the dependent variable (MKTS) and the Independent Variables (OPEREF, NPBT, and INV).

    a)   For 1% increase in OPEREF, MKTS increases by 42.36%

    b)   For 1% increase in NPBT, MKTS increases by 114.97%

    c)   For 1% increase in INV, MKTS decreases by 68.17%

The multiple co-efficient of determination (r^2) of 0.76 suggest that about 76% variation in MKTS is attributed to OPEREF, NPBT and INV. In other words, about 24% variance in MKTS is due to other variables other than OPEREF, NPBT, and INV, hence the model is a good fit.

Although the P-Values associated with NPBT and INV, that is 0.0002 and 0.0387 indicate a significant impact, the P-Value associated with OPEREF (0.8091), revealed an insignificant impact. Therefore the result suggests that the Value-Chain Analysis has a positive impact on the market share of a manufacturing firm though insignificant.

Conclusion and recommendations

A critical examination of a linked set of value creating activities to eliminate non value-added activities for cost reduction and enhanced differentiation has been reported by many scholars and researchers as a viable strategy for increased market share. Urbig (2003) reported that the value chain analysis enables companies' executives to control cost drivers better than competitors and thus creating above-average performance in operational efficiency, profitability, market share, customers' satisfaction, innovation, and quality and assets utilization. Schiebel (2005) indicated that the value-chain does not only reveal cost advantages but also brings attention to several sources of differentiation advantage relative to competitors. Her findings revealed that value-chain analysis enhances a firm's market share and profit margin.

In this study, a strong positive relationship was found between Value-Chain Analysis and Competitive Advantage of manufacturing firms in Nigeria. This lends support to previous studies such as Urbig (2003), Schiebel (2005), Hansen and Mowen (2002). A possible reason for lack of a significant relationship between these variables could be attributable to the inability of firms to identify activity drivers. Where activity drivers are not properly identified, a value-added activity may wrongly be eliminated from the value chain thereby reducing the maximum value creation of the firm. Based on our findings, it is recommended that-

(i) Manufacturing firms in Nigeria should welcome a change from the Functional-Based Costing to an Activity Based Costing for effective Value-Chain Analysis. Resistance to such a change can be managed through – proper education of organizational members on the need and benefits of the change; involvement of organizational members or their representatives in decisions initiating such a change; and provision of incentives to organizational members to encourage their acceptance of the change.

(ii) Accountants in Nigerian manufacturing firms should be adequately equipped through seminars, workshops and conferences for the transformation of Value-Chain Analysis to strive.

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Figure 1: The Value Chain Framework
The Value Chain

Primary Activities
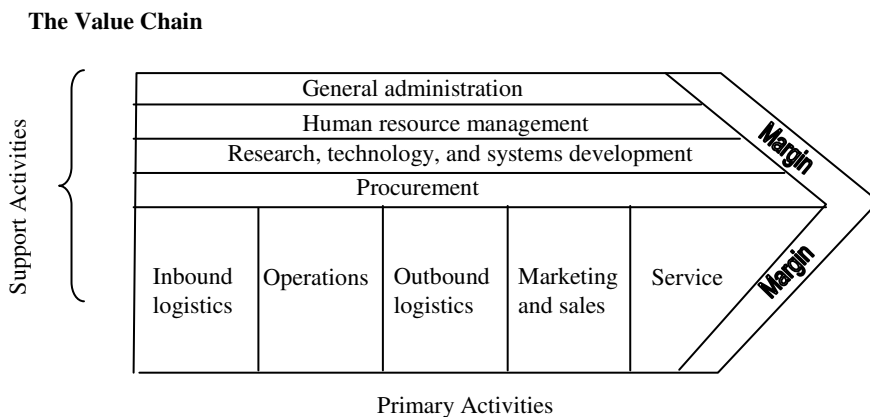
Source; Porter, M.E. (1985) Competitive Advantage-Creating and Sustaining Superior Performance; New York; The Free Press; pp198

Table 1; Multiple Regression Analysis with MKTS Against OPEREF, NPBT, and INV

Statistical Variables	Co-efficient	Std. Error	t-statistic	P-Value
Intercept ($\propto$)	-2.247570	2.311934	-0.972160	0.3519
OPEREF	0.423563	1.711323	0.247506	0.8091
NPBT	1.149727	0.205118	5.605188	0.0002
INV	-0.681677	0.290443	-2.347022	0.0387
R	0.87			
R^2	0.76	Mean Dependent Var.		1.13
		S.D. Dependent Var.		0.32
Adjusted R^2	0.69			

Source: E-Views Version 3.1 Window Output