

# ENHANCING FIRMS SUSTAINABLE COMPETITIVE ADVANTAGE: THE MODERATING ROLE OF HARD TECHNOLOGY, BETWEEN RESOURCE VALUE AND INNOVATION. EXPERIENCE FROM NIGERIA'S MANUFACTURING SECTOR.

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**Abstract-** The purpose of this study is to investigate the moderating effect of environmental factor i.e. technology specifically the hard technology in the relationship between element of competitive advantage i.e. resource value and innovation in enhancing firms sustainable advantage. Data was collected through personal questionnaire from 166 manufacturing firms in Nigeria who are members of manufacturing association of Nigeria within North West and North Central zones, with 70% response rate. The results indicate that there is positive and significant relationship between resource value and innovation while moderated by hard technology. According to the result, manufacturers in Nigeria fully agree that hard technology is essential with unique valuable resources to enhancing sustainable competitive advantage a bit longer with continues innovations. This study adds knowledge to the theory and practice of competitive advantage particularly in Nigeria's manufacturing firms. Its theoretical and empirical significance adds more insight on the previous empirical studies in the field that is to say it gives guidelines to manufacturers in Nigeria on the impact of strategic management approaches on competitive advantage. For government and firms, the study provides avenue of creation and generation of competitive advantage in Nigeria and Africa as a whole since the phenomena is general.

**Keynotes:** Competitive Advantage, Resource value, Innovation, Technology, Sustainable Advantage.

## I. INTRODUCTION

Nigerian's income (national income) is from the sale of crude oil and its allied which is oscillating from one ill to another, this is posing difficulty in applying strategic management principles by manufacturers as manufacturing firms are facing neglect from the regulators. However, it is a thing of concern that even the oil which Nigeria produces, part of it is refined abroad and imported back to the country to meet-up local consumption, because the country's refineries have over the years been operating below capacity utilization (Daily Trust, 2010). The situation becomes more aggravated due to Nigerians preference for foreign good (Aluko et al. 2004; Ajayi, 1990).

There are few researches on strategic management in emerge markets i.e. developing economy. (Hussam and Hussien (2007), as such Manufacturers in Nigeria do not apply

properly strategic management concepts for future development hence this study intends to turn around the minds of regulators and manufacturers in Nigeria to focus on competitive advantage and push to -words sustaining it.

### A. Literature review

Prahalad and Hamel (1990) the study concludes that firms should combine their resources and skills into core competencies, loosely defined as that which a firm does distinctively well in relation to competitors. They also positioned that competitive advantage are realized only when the firm combines assortments of resources in such a way that they achieve a unique competency or capability that is valued in the market place. Day and Wensley (1988) focus on two categorical sources, involved in creating a competitive advantage i.e. superior skills and superior resources. Other authors have elaborated on the specific skills and resources that can contribute to sustainable competitive advantage.

A company's strategy indicates the choices its managers have made about how to attract and place customers (value), how to respond to changing conditions and compete successfully and grow the business (rareness), how to manage each functional piece of the business and develop needed capability and achieve performance target (inimitability). (Thompson, Strickland, and Gamble 2005). Manager's ability to separate powerful strategy from an ordinary or weak one is their ability to forge series of moves, both in the market place and internally, that makes the company distinctive as a reason for buyers to prefer its product and or services and produce a sustainable competitive advantage over rivals. Without competitive advantage a company risk of being beaten by stronger rivals hence to set strategy that put them apart from rivals in the mane of achieving sustainable competitive advantage and performance.

Regardless of whether a company's strategy changes gradually or shift, the important point is that a company's present strategy is temporary (temporary competitive advantage) and on trial, pending new ideas for improvement from management due to changing environmental conditions

and any other changes in the company's situation that managers believe warrant strategic adjustment (innovation).

In general terms, the business environment consists of the myriad of forces that are beyond the control of management in the short run, and thus pose threats as well as opportunities to firms. Mintzberg, (1979) is of the view that dimensions that collectively shape the business environment: their degree of dynamism, complexity, diversity, and munificence. These are held to be the most critical dimensions of the business environment with respect to strategic decision making. Dynamism refers to the speed and predictability of change in the environment, stemming from sources such as technological change, demand shift and competitive moves. Complexity refers to the extent that organizations are required to have a great deal of sophisticated knowledge about products, or any others, Diversity refers to the degree to which an organization is faced with homogenous or diffuse conditions. Munificence is the degree to which an environment supports the growth of organizations within it, which relates to the level of competitive pressures in the environment as exemplified by the intensity of competition and the bargaining leverage applied on companies by buyers and suppliers. (Mintzberg, 1979) Munificence is often measured in a reverse scale as environmental hostility (Ward et al 1995).

Alderson (1965) in his book dynamic marketing behavior was one of the first to recognize that firms should strive for unique characteristics in order to distinguish themselves from competitors in the eyes of customers. Hall (1980) and Henderson (1983) recognized the need for firms to possess unique advantages in relation to competitors if they are to survive. These arguments form the basis for achieving SCA.

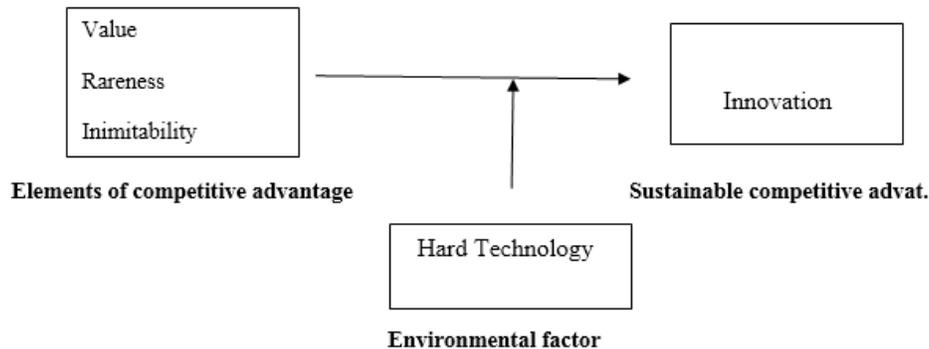


Figure 1 Relationship between ECA and SCA with Hard Technology as Moderator

C. Hypotheses

In this study three main hypotheses were formulated to test the relationship between the elements of competitive advantage and sustainable competitive advantage when moderated by environmental factor i.e. the relationship between resource value and innovation when moderated by hard technology, between resource rareness and innovation when moderated by hard technology and finally resource inimitability with innovation when moderated by hard technology.

O'Shannassay (2008), in his study on the SCA or temporary CA unveils that greater perceived environmental

O'Shannassay (2008) in his study on the SCA or temporary CA concludes that greater perceived environmental uncertainties in supply of finance and customers can erode resource value, resources rareness and CA resulting in weaker future organizational performance. The study stands that greater perceived environment uncertainty in the elements competitors, regulation and technology can act as a catalyst to enhance resource value and resource rareness and help a firm achieved competitive advantage. Also less perceived environmental uncertainty in the elements supply, finance and customer help firms build resource value and rareness and assist the firm in sustaining its CA. Skills, resources and the way organizations use them must constantly change, leading to the creation of continuously changing temporary advantage. (Foil 2001) the study concludes that every sustainable competitive advantage eventually be competed away.

B. Frame Work

Based on the literature reviewed the integrative framework of this study is on resources base view of the firm to determined power of resource value, rareness and resource inimitability on firm's competitive advantage and continuous innovation as a route for sustaining advantage while hard technology add fit between their relationship. The study examines the elements of competitive advantage in line with resources base view as the independent variable with three constructs i.e. value, rareness and inimitability as bases for firm's competitive advantage and innovation as an avenue for sustaining the advantage as the dependent variable while environmental factor ie hard technology as the moderator. See figure 1

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- H.1 there is positive relationship between value and innovation when moderated by hard technology
- H.2 there is positive relationship between rareness and innovation when moderated by hard technology
- H.3 there is positive relationship between inimitability and innovation when moderated by hard technology

**D. Research Design**

The study considers a survey method being a popular and common strategy in business research, because it allows for the collection of large amount of data from sizable population in a highly economical way. Therefore, this research considers questionnaire tool for data collections. Sunders et al. (2007), are of the opinion that research project for academic courses are time constrained, therefore in this study due to time management a cross-sectional strategy is employed, a study in which a group of individuals are

composed into one large sample and studied only at a single point in time.

**E. Data Analysis**

A total of 166 questionnaires were distributed to and personally administered on the respondents. A total of 116 questionnaires were collected, the overall response rate was 70% and to ensure the goodness of measurement exploratory factor analysis (principal component analysis) was conducted on elements of competitive advantage and innovation. In addition reliability test (Cronbach's Alpha) was done to measure the internal consistency of the items used on the questionnaire. These two methods were very important to assess the goodness of the measures (Sekaran, 2003). Correlation test was conducted to measure the relationship among the variable and regression analysis was also run in the study in order to test the relevance of the hypotheses.

**Table 3.7 Descriptive Statistics of the Variables (N=116)**

Variables	Mean	Std. Deviation
Inimitability	3.60	0.90
Rareness	3.73	0.09
Value	4.51	0.55
Hard Technology	4.01	0.83
Innovation	3.80	0.81

Source: Questionnaire distributed to Manufacturing Firms in Nigeria

**Table 3.8 Inter - Items Correlations of All Variables**

Variables	Mean	S/Deviation	Inimitab	Rareness	Value	Hard Tech	Innov
Implement	4.02	0.55					
Control	4.31	0.55					
Inimitab	3.60	.090	1.00				
Rareness	3.73	0.90	.415**	1.00			
Value	4.51	0.55	.363**	.257**	1.00		
HardTech	4.01	0.83	.080	.085	.205*	1.00	
Innov	3.80	0.81	.486**	.239**	.406**	.087	1.00

\*\*P < 0.01 \*P < 0.05

Source: Questionnaire distributed to Manufacturing Firms in Nigeria

**Table 1 Hierarchical Regressions: Moderating role of Environmental factor ( Hard Technology ) between Elements of Competitive advantage (value rareness and inimitability) sustainable competitive advantage (Innovation) (Beta coefficient)**

Variables	1	2	3
Inimitability	.419**	.450**	-.155**
Rareness	.013	.035	-1.680**
Value	.251**	.276**	2.071**
Hard Technology		-.161**	.653**
Value*Technology			-3.187**
Rareness*Technology			2.268**
Inimitability*Technology			.728*
F – Value	17.095**	14.042**	11.321**
R2	.324	.322	.396
Adjusted R2	.305	.322	.396
Δ R <sup>2</sup>	.324	.022	.088
F change	17.095**	3.627*	5.374*

\*\*p<0.001 \*p<0.50

Source: Questionnaire distributed to Manufacturing Firms in Nigeria

The F-change value was significant at the three steps as a condition for moderation. Therefore, Hard Technology stands to moderate the relationship between Value and Innovation ( $\beta=.2, 64$ ); Rareness with innovation ( $\beta=.1.71$ ) and partial support from Inimitability and Hard technology ( $\beta=.1.01$ ). R2 account for 40% and R2 change 11%. Therefore the three step regression coefficient table above shows that Hard Technology moderates the relationship between Value and Innovation ( $\beta=.26$  P-value  $<0.01$ ) ( $\beta=.26$  p-value  $<0.01$ ) and ( $\beta=-1.53$  p-value  $<0.001$ ) for the three steps. The table also indicates that Inimitability moderate the relationship with ( $\beta=.39$  p-value  $<0.01$ ), ( $\beta=.39$  p-value  $<0.01$ ) and ( $\beta=.35$  p-value  $<0.01$ ) respectively.

## II. DISCUSSIONS

In examining the moderating role of environment as the moderating variable i.e. hard technology in the relationship between elements of competitive advantage (value, rareness and inimitability) and sustainable competitive advantage (innovation) the dependent variable, the finding of this study indicated positive and significant relationship between the variables. The relationship between element of competitive advantage value and sustainable competitive advantage innovation when moderated by environmental factor hard technology was positive and significant, meaning hard technology fully moderate the relationship between value and innovation. This result is in harmony with previous researches, for example O'Shannassay (2008); Azhda et al (2004); Hoffmann (2000); Clulow et al (2007); Porter (1980) that greater perceived environmental uncertainty can erode resource value, resource rareness and resource inimitability and competitive advantage resulting in weaker future organizational performance. Competitive advantage in firm resources cannot last forever it diminish and reduce with time and imitation by competitions hence value of the resources always goes down if care is not taken the competitive advantage will lost its power. They substantiate further by saying greater environmental uncertainty in competitors due to dynamic nature of the environment and changes in technology, competitive advantage diminishes day by day.

Past studies (e.g. Barney 1991; Foil 2001; Mabey et al 1998) as well pronounced positive relationship. This positive relationship between value and innovation with moderation influence of hard technology as indicated by the findings of this study shows that manufacturers in Nigeria recognized the importance of technology in upgrading the resource value as an alternative for the enhancement of sustainable competitive advantages among firms as a result of continues innovation.

### A. Theoretical implication

This study of manufacturing firms in Nigeria contributed and supports the theory and various studies carried out by several scholars in the area of resource base view, above all its contributions to the Nigeria's firms and theory as well as to emerging economies.

The findings also provided evidence of relationship between elements of competitive advantage (Value, Rareness

and Inimitability) and sustainable competitive advantage (Innovation). This was found in Barney (1991); Newbert (2008) among other that are advocated of resource base view, that firm must identified and implement resource-based strategy (Value, Rareness and Inimitability) to sustain competitive advantage in producing product with more benefits inform of unique features (innovation). Particularly in the emerging economies Nigeria inclusive.

The framework of this study in base on Resource Base view, which assumes that competitive advantage, cannot last forever due to environmental uncertainties. The study decides Technology to play the moderating role between the elements of competitive advantage and sustainable competitive advantage. The findings from this study have shown that hard technology moderate the relationship between value and innovation and rareness with innovation. This support the conclusion of O'Shannassay (2008), that greater perceived environment uncertainty in the elements competitors, regulation and technology can act as a catalyst to enhance resource value, resource rareness and resource inimitability and help a firm achieve sustainable competitive advantage.

### B. Managerial Implication

The findings encouraged managers that, competitive advantage should be enhanced to proceed to the next level i.e. sustainable competitive advantage considering the environmental dynamism in such issues like technological changes among others. The findings from this study indicated that Manufacturers in Nigeria adopt proper use of hard technology enhancing value creating, rare and inimitable strategy which leads to sustainable competitive advantage in form of innovation, therefore they should continue with similar effort nonstop in the name of turning around the Nigeria's manufacturing sector and the attainment of its vision 20;20;20.

## III. LIMITATIONS OF THE STUDY AND SUGGESTIONS FOR FUTURE RESEARCH

There are number of issues that could be addressed in future researches aiming at developing a kind of comprehensive understanding of the impact of strategic management elements in enhancing sustainable competitive advantage in Nigeria's manufacturing firms. This stands a clear limitation for the study due to its inability to include service industry too. Hence future researches may consider other areas such as service firms among others with similar framework. Further research to employ other environmental factors like Economic, social, political and regulation factors among others.

## IV. CONCLUSION

The study indicated that manufacturers in Nigeria exerted efforts in promoting competitive advantage that to be sustained through the influence of value, rare and inimitability as independent variable with moderation effect of hard technology and innovation as the dependent variable. The use of technology by manufacturers in Nigeria enhance sustainable competitive advantage to some bit as they

capitalized on conventional technology Furthermore, the study on enhancing sustainable competitive advantage in the Nigeria's manufacturing sector discovered that resources based view theory has impact on firm's competitive advantage as well as sustaining the advantage further. This has been seen from various past researches and the findings from this study also supported the theory.

The findings provided empirical support for the theoretical framework, demonstrating the fact that the study had sufficiently addressed the research hypotheses The study also highlighted the implication, limitations and suggestions for future research.

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