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Organizational Capabilities and Performance of Manufacturing Companies in Developing Economies

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Abstract: *The purpose of this research is to investigate the relationship between organizational capabilities and manufacturing performance using multidimensional measure within the context of developing countries. The work is part of the ongoing research that has conducted in Nigeria. Data was collected from 313 selected Chief executives officers, managers and, owner-managers of manufacturing companies in Nigeria through structured questionnaires. The analysis was done using PLS-SEM version 3.0 and the result show a positive effect for all the exogenous latent variables (marketing, research and development and, technological capabilities) on endogenous latent variable (organizational performance). This study contributes to the literature on the importance of competencies. It also serves as guides for managers to pursue policies that enhance organizational capabilities.*

Key Words: Capabilities, Manufacturing, Performance, Developing Economies.

1.0 Introduction

The manufacturing organizations are so important such that no country regardless of the level of development can overstate its relevance because of the contribution regarding employment creation, revenue generation and sustainable development (Mike, 2010). However, in most developing countries, the performance of the segment has not been impressive for many years. For example, recent reports indicate that the average manufacturing value added to GDP of 10 selected developing countries from Asia between 2010 and 2013 is estimated at 17.82% compared to 10 selected African countries with average of 8.45% within the same period (World Bank, 2014). By implication, African countries are worst affected by the poor performance in the sector even among the developing countries.

Studies have shown that improving manufacturing performance in a competitive environment requires organizations to identify, acquire and utilize distinctive capabilities (Barney, 1991). Many customers are concerned about the abilities of the companies to offer products or services that are capable of satisfying their changing needs (Ulrich & Smallwood, 2004).

A lot of research works conducted on capabilities by employing either a single dimension or multidimensional measures to assess the impact of capabilities on the performance of organizations. They have been carried out within the context of Europe, America, and Asia (Bolívar-Ramos, García-Morales, & García-Sánchez, 2012;

Nedzinskas, Pundziene, Buoziute-Rafanaviciene, & Pilkiene, 2013; Tan, Mavondo, & Worthington, 2011). Researchers have given little attention to the developing countries in the sub-Saharan African region. This paper has taken up the responsibility to fill this gap by determining the extent to which capabilities impact on the performance of manufacturing companies in the African sub-Saharan region.

2.0 Literature Review

2.1 Organizational capabilities

Capabilities are a combination of interconnected skills and knowledge used through an organizational process which enhances the abilities of firms to make optimum use of their assets to gain competitive advantage and improve performance (Day, 1994). Similar terms have also been used, such as core or organizational competence, firm-specific expertise, resource deployments, and intangible assets (Prahalad & Hamel, 1990). While stressing the relevance of capabilities, Barney, (1991) opined that if organizations are to be fully integrated into the fast changing business environment and achieve high performance through competitive advantage, managers need dynamic capacity for the alignment and allocation of human, the physical and organizational capital. Similarly, Mooney, (2007) describes competence as a firm capability that is known to be the principal value generating activity of the organization. It was proven that every firm has various value generating activities. But core competence is identified within an industry for

generating more values than other activities. The authors' further explained the distinctive capabilities or competencies as those skills which are related to knowledge and facilities which are clearly identified by the customers for their superiority when compared to other particular firms in the same industry which perform similar services.

Few research were conducted on capabilities in Nigerian context pay much attention to services sector using a single dimension as a measure. For example, Ringim, Razalli, and Hasnan, (2012) used information technology capabilities and performance of banks. In a similar work, (Akinbola, Adegbuyi, and Otokiti, (2014) employed market capabilities and organizational performance within telecommunication service industry. There are other researchers that looked at distinctive capabilities which are concerned with manufacturing achievement in Nigeria, make use of single dimension to measure the relationship. For instance, Azubuike, (2013) examines the impact of technological innovation on manufacturing performance. Therefore, this paper is an attempt to fill this gap by using multidimensional measure for capabilities

Stakeholders have viewed the concept from various dimensions by different researchers (Lang, Lin, & Vy, 2012; Ting, Wang, & Wang, 2012). For example Tan et al., (2011) identify marketing orientation, manufacturing capabilities, innovativeness and learning orientation dimensions. While Gebauer, Johnson, & Enquist, (2012) operationalized capabilities as dynamic capabilities and operational capabilities in their study of public transport services. However, this study is adopting three dimensions of capabilities from the works of Hsiao & Chen, (2013) and Huang, (2011) which encompasses: Marketing capabilities, research and development capabilities and technological capabilities.

2.2 Organizational performance.

There has been disagreement among researchers and practitioners regarding the conceptual definition and the measurement of organizational performance (Lenz, 1980). There are many variations in the conceptual definitions of corporate performance. These include inconsistent targets and lack of clarity in the objectives of the organizations (Morgan and Rego, 2009). Striteska and Spickova, (2012) add that organizations that are facing the issues of varying objectives from different stakeholders such as the directors, managers, employees and customers may have difficulties in conceptualizing the performance of its organization. Since the stakeholders in such firms tend to perceive firms performance from different angles based on their individual or group interests which are sometimes in conflict.

This study has adopted a two-dimensional measure of return which covers the subjective as well as the objective criteria. This test comprises of items related to; net profit, gross profit, market share, annual sales, and management development including overall performance (Nandakumar, Ghobadian, & O'Regan, 2010).

2.3 Marketing capabilities and Manufacturing performance

Marketing skills have to do with the abilities of companies to understand their customers (current and potential), create relationships with them by recognizing their product needs, providing them with suitable channel distribution and logistics supports (Day, 1994). Vorhies & Morgan, (2005) also described it as the firms' ability to utilize the marketing mix activities effectively in transforming their available resources into valuable outputs. From the resource based point of view, we argue that manufacturing companies with better marketing capabilities tend to perform higher than those with inferior capabilities. The authors base this postulation on the fact that marketing capacities are part of the intangible resources of manufacturing concerns and having it enhances their competitive advantage and performance (Barney, 1991).

This postulation is line with previous studies. For example, findings of Ngo and O'Cass, (2012) in research conducted in Australia in which manufacturing and service companies were the participants indicates that marketing capability improves organizational ability to deploy available resources efficiently to gain optimum performance. A similar finding in the work of Tan and Sousa, (2015), shows that there is a positive relationship between marketing capabilities and export performance mediated by competitive advantage. Moreover, above outcomes align with the findings of Akinbola et al., (2014) in which the researchers make use of customers of telecommunication companies in Nigeria as the participants and found a positive and strong relationship between marketing capabilities and performance. This paper, therefore, hypothesized that:

H1. Marketing capabilities have a positive and significant correlation with the performance of manufacturing companies.

2.4 Technological capabilities and performance

Manufacturing organizations have been operating in highly competitive business environments in which technological change is rapid (Agha, Alrubaiee, & Jamhour, 2012). Variations in the operating environment ignited by customers, competitors and technologies compel manufacturing organizations to acquire and utilize technological capabilities. As such it is necessary for all firms to invest in technical skills if they want to remain in business (Gouvea da Costa & Pinheiro de Lima, 2009). The technological capability has to

do with company ability to engage in the use of improved equipment and processes in response to the changing environment to achieve optimum results. Firm superiority in technology on continuous bases enhances their competitive advantage and performance (Hsiao & Chen, 2013).

Available research findings indicate that advanced manufacturing technology has substantial impacts on flexible manufacturing competence (Zhang, Vonderembse, & Cao, 2006). For example, the research conducted by Ortega, (2010) indicates that firms with greater technological capabilities have the highest on performance compared to other factors. However, the investigation was carried out in Spain and restricted to the Information and Communication sub-sector of manufacturing. Similarly, research conducted in Nigeria shows that there is a strong positive relationship between technological innovation capabilities and performance (Azubuike, 2013). The sample size of ten (10) firms is however too small, and the participating companies were limited to plastics manufacturing sub-sector. Finally, Ringim et al., (2012)'s results also indicate that information technology capability has a significant positive relationship with the performance of Banks in Nigeria. In view the above findings this study, therefore, hypothesized that:

H2: Technological capabilities have a significant positive relationship with the performance of manufacturing companies.

2.5 Research and development capabilities

Manufacturing concerns need to invest on Research and Development up to or beyond the minimum

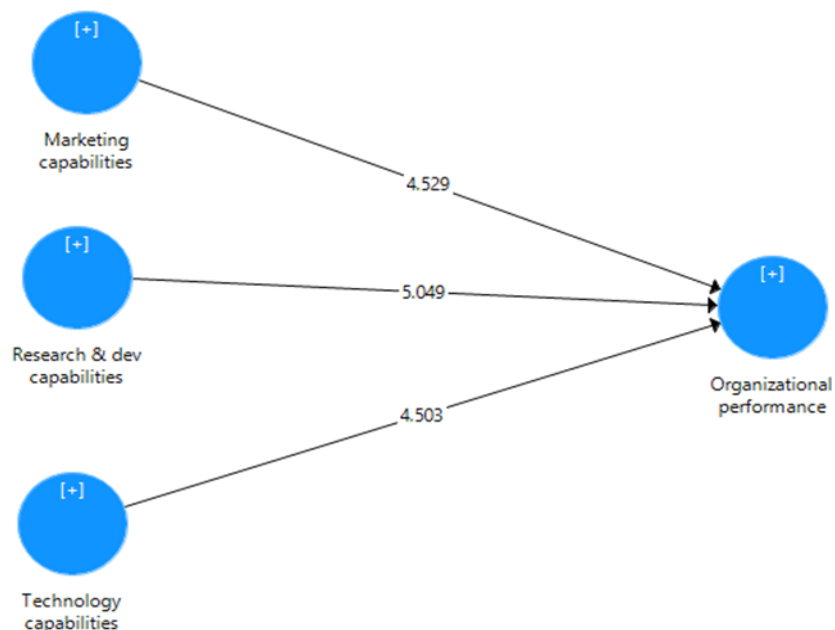
level if they want to earn the returns that are higher than their investment to improve organizational performance (Wang, 2011). Research and development are usually the primary sources of innovation and new product development. As such it forms part of corporate resources and a source of sustainable competitive advantage.

Existing literature indicates that investment in research and development is capable boosting organizational performance. For instance, Bhagwat & Debrune, (2011), in their investigation to determine the contribution of Research and Development and advertising to the performance of pharmaceutical companies, it was discovered that each one percentage increase in R & D expenditure results in additional one-quarter earnings per share EPS above the investment. The above finding agrees with the work of Ghaffar & Khan, (2014) which also investigated the extent to which research and development affect firm performance. However, the two research works were limited to a single manufacturing sub-sector (pharmaceuticals). Research and development strategy is also found to be an essential factor that explained the variance in all performance dimensions which includes; innovation performance, financial outcomes, market position and growth (Trivellas, 2012).

On the contrary, earlier findings by Erickson & Jacobson, (1992) indicate that expenditures on Research and development could not generate up to the estimated average revenue for a given period of study. This study, therefore, hypothesized that

H 3 Research and development capabilities are positively related to the performance of manufacturing company.

Figure1. Research framework



3.0 Methodology

Nigeria was selected for this research due to the position of the country in Africa. Its' population is over 177 million people which is the largest in the continent and number eight in the world (CIA, 2014). Quantitative survey was conducted among manufacturing companies that are members of Manufacturers Association of Nigeria MAN within the southwest geopolitical zone of Nigeria. The questionnaire was adapted from different sources (Hsiao & Chen, 2013; Huang, 2011; Nandakumar et al., 2010). The survey instrument was categorized into three sections: The respondents' demographic data, the electricity service quality dimensions, and the organizational performance.

The questionnaires were circulated through drop-off and collection method. While using this method, the researchers are expected to physically drop the questionnaires with the selected respondents and retrieve them when they have been duly completed. The process was followed and through it 319 questionnaires were returned out which 313 were found useful further analysis.

To assess both the measurements as well as the structural models, Partial least squares structural-

equation model (PLS-SEM) was use to analyze the data. PLS-SEM was use because many researchers have suggested the use of PLS-SEM especially when data have failed the normality test (Cassel, Hackl, & Westlund, 1999; Reinartz, Haenlein, & Henseler, 2009; Wetzels, Odekerken-Schröder, & van Oppen, 2009).

3.1 Findings and discussions

3.1.1 Participants' demographic profiles

Most of the participants in this research were male (82.7%) and, the majority (45.2%) of them have degrees and professional qualifications depicting the requirement for their offices as managers, senior managers and chief executives officers of their companies. The age group of the participating companies shows that majority (46.6%) of them fall within the age range of between 20 and 29 years. When we look at the participating companies concerning their sizes, the data shows that more than 80% (261) of them fall into Small-medium enterprises SMEs. Whereas, we found that less than 20% (52) of them belong to large manufacturing organizations. Table1.0 below gives detailed demographic features of all the respondents.

Description	Frequency	Percentage (%)
Gender		
Male	259	82.7
Female	54	17.3
Highest academic qualification		
National Diploma	7	2.2
HND/Degree	39	12.5
Postgraduate qualifications	125	39.9
Academic & Professional qualifications	142	45.4
Job position in the company		
General manager/C E O	14	4.5
Senior manager	34	10.9
Manager	127	40.6
Owner manager	138	44.1
Others	0	0.0
Company age		
Less than 10 years	29	9.3
Between 10 and 19 years	132	42.2
Between 20 and 29 years	146	46.6
30 years and above	6	1.9
Industry classification		
Chemical and pharmaceutical	60	19.2
Basic metal and iron/fabricated metal products	46	14.7
Domestic/industrial plastic rubber and foam	41	13.1
Pulp paper and paper products/Printing and publishing	27	8.6
Electrical and electronic products	17	5.4
Textiles and leather products	11	3.5
Wood and furniture products	18	5.8
Non-metallic mineral products	9	2.9
Motor vehicles and miscellaneous assembly	26	8.3
Food beverages and tobacco	58	18.5

Description	Frequency	Percentage (%)
Company annual income		
Below N5 million	87	27.8
Between N5 million and N500 million	174	55.6
Above N500	52	16.6
Number of employee		
Between 1 and 10 employees	92	29.4
Between 11 and 200 employees	171	54.6
Above 200employees	50	16.0

Source: The researcher

3.1.2 Measurement model

The objective of assessing measurement model in PLS-SEM is to determine convergent and discriminant validities. Convergent validity expresses the extent to which items represent the given constructs they are meant for (Hair, et al., 2006). We examined this through factor loadings, composite reliability and Average Variance Extracted AVE and the three of them met the recommended threshold of 0.7, 0.7 and 0.5 respectively as shown in Table one below (Gholami, Sulaiman, Ramayah, & Molla, 2013).

Table1. Measurement model

Constructs	Items	Factor loading	Composite reliability	Cronbach's alpha	AVE
Marketing capabilities	mkt1	0.903	0.937	0.899	0.833
	mkt2	0.945			
	mkt3	0.888			
Organizational performance	Opf4	0.861	0.957	0.95	0.69
	Opf5	0.822			
	Opf6	0.823			
	Opf7	0.792			
	Opf8	0.806			
	Opf9	0.815			
	Opf10	0.822			
	Opf11	0.826			
	Opf13	0.865			
	Opf14	0.872			
	R&D capabilities	R&D 2			
R&D 3		0.924			
R&D 4		0.904			
Technological capabilities	tec1	0.823	0.919	0.889	0.694
	tec2	0.859			
	tec3	0.845			
	tec4	0.837			
	tec5	0.799			

Source: Researchers

The second aspect is the discriminant validity. It measures the extent to which each construct is distinct from other constructs in the model (Chin, 2010). There is the need to fulfill two conditions to determine discriminant validity; the values of AVE for reflective constructs should be higher than the squared inter-construct correlation and should be higher than their cross-loadings (Fornell & Larcker, 1981; Hair, Ringle, & Sarstedt, 2011). Table 2 below compares the square root of the AVE for each construct with the correlation of the remaining constructs and it is an indication of the

acceptability of validity for all constructs in this framework.

The author also assessed the model for multicollinearity by measuring each indicator's variance inflation variance (VIF) and Table 2 below shows that marketing capabilities, research development capabilities, and technological capabilities have VIF of 4.78, 4.89 and 1.94 respectively. These constructs are free from multicollinearity since all of them have VIF with less than 0.5 in line with the suggestion of (Hair et al., 2011).

Table 2. Discriminant validity and VIF assessment

Constructs	1	2	3	4	VIF
1 Marketing capabilities	0.912				4.78
2 Organizational performance	0.811	0.831			
3 Research & Dev capabilities	0.884	0.818	0.906		4.89
4 Technological capabilities	0.673	0.697	0.681	0.833	1.95

Source: Researchers

3.1.3 Structural Model Assessment

Assessment of structural model and the conceptual framework requires three measurements. The first is the coefficient of determination R-square R^2 , which the predictive accuracy of the model, path coefficients and their corresponding t-values (Hair et al., 2011; Sarstedt, Ringle, Smith, Reams, & Hair, 2014). The path coefficient should be significant. Hair et al., (2011) categorized the significance level of R^2 into three; 0.75, 0.5 and 0.25 described as substantial, moderate and weak respectively. Therefore, the R^2 value for the endogenous construct in this study which is 0.73 is considered moderate and acceptable. This implies that, the three exogenous variables are capable of predicting up to 73% of the variability in organizational performance (endogenous variable).

To obtain t-values and standard error, bootstrapping procedure with resamples of 5000 was used. From Table 3 below, we first look at the hypothesis one H1. The findings ($\beta = 0.480$, t-value = 4.503, p-value = 0.000) support the hypothesis which states the existence of positive significance relationship between marketing capabilities and organizational performance. This outcome is in

agreement with the previous studies (Carlos & Sousa, 2015; Ngo & O'Cass, 2012). The findings ($\beta = 0.480$, t-stat = 4.503; p-value = 0.000) second hypothesis H2, which states there is a significant positive relationship between research and development and organizational performance. The finding is in alliance with the previous studies of (Azubuike, 2013; Ringim et al., 2012). Lastly, the findings ($\beta = 0.074$, t-value = 5.049, p-value = 0.000) support the third hypothesis H3, which states that there is a significant positive relationship between research and development capabilities and organizational performance. The findings align with the work of (Bhagwat & Debrune, 2011; Ghaffar & Khan, 2014). To assess the magnitude of and direction of the relationships between two variables, calculation of effect size is necessary (Durlak, 2009).

For the purpose of this study, the effect size f^2 of each of the following exogenous variables marketing capabilities, research and development capabilities and technological capabilities are; 0.086, 0.105 and 0.089 respectively. The three of them, therefore, have a small effect on the endogenous variable organizational performance (Cohen, 1988).

Table 3. Hypothesis table

Path coefficient	SE	t-statistics	p-value	Decision
Mkt cap -> Org performance	0.074	4.529	0.000	supported
Tech cap -> Org performance	0.480	4.503	0.000	supported
R&D cap-> Org performance	0.074	5.049	0.000	supported

4.1. Conclusion and Implication

These findings indicate that capabilities are good predictors of organizational performance in the manufacturing sector based on the perception of CEOs, managers and owner-mangers of manufacturing companies in Nigeria. It can therefore be deduced that, manufacturing firms that have better capabilities in marketing, research and development, as well as technology tend to perform better than those with less capabilities. This study, therefore, recommends that manufacturing companies should try to improve their capabilities in the three areas that have been investigated to boost their performance.

This paper is a contribution to the literature on capabilities and performance of manufacturing sector in developing economies particularly the sub-Saharan Africa. It can also serve as input to managers in their decision making that are aimed at improving the performance of their organizations.

This study, however, have its limitation to the nature of the research design and data collection method used bearing in mind that we used cross-sectional design in which case we collected the data within a limited time. As such it does not provide for possible variance in perception of the respondents that may relate to time. The authors recommend that future research to use a longitudinal design to take care of the bias.

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