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ASSESMENT OF THE FACTORS INFLUENCING INNOVATIVE CAPACITY OF SMALL AND MEDIUM SCALE ENTERPRISES IN NIGERIA

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ABSTRACT

This study assessed the innovative capacity of SMEs in South Western Nigeria through the analysis of the factors that determine their innovative capacities. Specifically, the following innovative factors were assessed; Size of the firm, Age of the firm, Level of employee training, Collaboration, and Entrepreneurship. One hundred and twenty SMEs were purposively selected from the database of National Association of Small and Medium Scale Industrialist and the directory of Small and Medium Enterprises Development Agency (SMEDAN), from Ogun and Lagos States. The SMEs selected are those into manufacturing, construction and service industries. A total of 120 copies of questionnaires were sent to these firms, and 51 were returned representing 42.5% response rate. Multiple regression was used to empirically validate the research hypothesis of the study. The findings of the study revealed that Entrepreneurship is the most powerful factor that determines innovative capacity of a firm, also level of employees training is the second rated factor, while collaboration with other institutions, size of the firm, and age of the firm are other factors that influence firm innovative capacity in that order.

1.0 INTRODUCTION

Innovation is an important component of a firm's strategy mainly because it constitutes one of the principal means through which it can seek new business opportunities (Covin & Slevin, 1991; Carla & Joao, 2009). Innovation reflects the tendency of a firm to lend its support to new ideas, novelty, experimentation and the creative processes that may result in new products, services or technological processes (Lumpkin & Dess, 1996). A broad categorization of innovation is difficult to achieve, because innovation normally covers a considerable range and combination of products/markets and technological innovation, as in the case of sophisticated, technologically innovative products designed to meet demand in a specific market. So far, research has centred on technological innovation, which mainly consists of the development of products and processes, engineering, research, and has an emphasis on industry-relevant technical expertise and knowledge. Innovation process may take the form of purposeful novelties to improve the quality of products or the efficiency of process, the form of an improved organization of work, the promotion of creating new relations between suppliers and consumers. Innovations are necessary precondition for a knowledge oriented business which promote not only the economic competitiveness of the whole country, but also the welfare of each entrepreneur and the society.

Under current market conditions, characterised by rapidly saturated demand, one firm's competitiveness relative to others tends to be determined more by its innovative capacity than by its productivity (Bercattini, 1999). Porter (1996) proposed a new paradigm of competitiveness based on a process of dynamic innovation of firms and industries, arguing that interrelations between firms, institutions, and industries sustain and develop the competitiveness of a region. With a view to improving the existing theoretical framework, various authors have developed concepts that capture the contextual and relational elements of the innovation process that contribute to regional economic performance (Porter 1990; Zahra *et al*, 1988; Roberts & Amit, 2003).

Few Nigerian enterprises introduce innovations and most of those doing so import rather high technology equipment, instead of performing scientific research themselves or acquire finding from Nigerian or foreign research institutes. Obviously, SMEs will not become centres of well remunerated employment, economic competitiveness and exponential development unless there is a dense communications network of larger rapidly growing local or foreign enterprise (Watkins & Agapitova, 2007). The increasing uncertainty and risky nature of Nigerian business environment call for need for innovation, in order to obtain and sustain competitive advantage and develop strategies directed towards the development of new products, able to compete in a highly

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competitive business environment. Many researchers and scholars considered innovation as a critical tool for firms to compete efficiently in both domestic and global market (Hiltt, 2001). In view of the contemporary challenges faced by firms, innovation is seen as an increasingly key factor in the competitiveness of firms; as a result, the more detailed study of the factors that encourage and limit innovative capacity of firms is crucial (Silva, 2003; Stightz & Heine, 2007).

The goal of this article is to assess the innovative capacity of SMEs in South-western Nigeria and to thereby contribute towards the analysis of the factors that determine firm's innovative capacity, and the subsequent influence on firm performance. In achieving the above stated objectives, this research question was considered; what factors contribute towards the development of innovative behaviour in South-western Nigeria.

2.0 LITERATURE REVIEW

Innovation capacity refers to the ability to make major improvements and modifications to existing technologies, and to create new technologies (Romjin & Albaldejo, 2004). The notion of innovation capacity applies to process and product technology as well as the way in which production is organized and managed. Its importance derives from the fact that it is presumed to contribute to dynamic competitive advantage of companies since it enhances their capacity to keep up with, respond to, and initiates technological change on an ongoing basis (Romjin & Albaldejo, 2004). The vital importance of innovation for industrial growth has been recognised in numerous studies. This is because successful innovation is associated with good performance and related to subsequent growth (Abereijo *et al*, 2007). Empirical studies support the existence of this relationship between innovative behaviour of SMEs and their performance (Gunasekaran et al, 2000; Olomi, 1999). In the industrialised countries there is a consensus that economic growth stems from innovation, particularly in industry (Rothwell & Zegveld, 1982) and that the SMEs provided an important contribution to this growth (Abereijo *et al*, 2007).

Factors influencing innovations in SMEs have been the object of investigation in a large body of national and international studies. Mohnen & Rosa (1999) as well as Baldwin & Gellathy (2004) researched on the factors in Canada. In Germany, the Centre for European Economic Research has conducted several studies in recent years (ZEW&DIW, 2004), Rammer *et al*, (2005) and Rammer *et al* (2006). Comparing the findings of the aforementioned surveys, it would not be an unreasonable assumption that SMEs in these countries or region are often facing similar problems in innovative capacity. Pazos and Lopez (2004), Vaquero (2004) and Silva et al (2004) undertook similar studies on the factors affecting innovative capacities of SMEs in Spain and Portugal. The most important factors discovered are; firm size, firm age, firm external business environment, and the entrepreneur. According to Ussman *et al* (1999), environment, small size, internal culture, lack of information and difficulties in accessing some institution explained the lack of innovation in Portuguese SMEs. The study which made use of 42 SMEs from Beira Interior region of Portugal therefore concluded that innovation should be a major preoccupation in order to achieve a higher competitiveness and a more balanced economy. Marques & Ferreira (2009) observed that innovative entrepreneurial strategy influences firm's competitive advantage and consequently improves performance. They discovered that the factors that contribute most towards the development of innovative behaviour amongst manufacturing firms in Portugal can be grouped into three categories. Those relating to the firm (which involve size, age, labour force training, sector of activity and phase of its life cycle); those relating to the entrepreneur (age and quality of entrepreneurship); and those relating to the external business environment (partnership/cooperation with other firms, openness to external environment). The study which involved 59 SMEs in Portugal concluded that in decreasing order the factor affecting innovative behaviour of SMEs are entrepreneurship, life cycle, establishment of partnership and cooperation agreements with other firms and/or institutions, the age of the firm, and the size of the firm.

Abereijo, *et al* (2007) assessed the capabilities for innovation by SMEs in Nigeria by collecting data from purposively selected 100 SMEs in manufacturing activities from the database and directories of National Association of Small and Medium Scale Industrialist (NASSI) National Association of Small and Medium Scale Enterprises (NASME), and Manufacturing Association of Nigeria (MAN). The study measured the respondents' perception on the capabilities possessed by the innovative manufacturing SMEs in Nigeria for identifying and acquiring innovation from the National Innovation System (NIS). The result of the research revealed that some internal factors which included educational level, working experience in large multinational and specialization in science and engineering, and investment in R&D significantly affect their innovative capabilities. Also an external factor which was exposure to research and development outputs from the universities and research institutes had significant relationship with their innovative ability. Ciemleja & Lace (2008) analysed the factors determining innovation-based attitude of Latvian SMEs. They noted that "innovations are necessary precondition for a knowledge oriented business which promote not only economic competitiveness of the whole

country, but also the welfare of each entrepreneur and the society". The study identified shortage of qualified labour, competence and openness to innovations, technology, and implementation of innovative solutions among others as important preconditions for sustainable innovative strategy in Latvian SMEs. Tiwari & Buse (2007) investigated the barriers to innovation in selected industries in the metropolitan region of Hamburg, Germany. According to the study, the primary barriers faced by SMEs are financial constraints, availability of qualified and suitable human resources, finding suitable cooperation partners with knowledge resources, marketing of innovative products and conceptualization of innovative products. The study therefore concluded that through understanding of internal business process, organizational backing, not only by senior management but also by other employees, especially in R&D department, as well as a profound analysis of business environment conditions of the target offshore country are prerequisites of a successful SMEs innovation.

Vega-Jurado *et al* (2008) studied the effect of external and internal factors on firm's product innovation. The study was based on a sample of 6094 manufacturing firms taken from the Spanish survey of technological innovation 2000. The result indicates that the firm's technological competencies from in-house R&D, are the main determinant of product innovation. They also suggest that in the presence of high levels of such competencies, the technological opportunities deriving from non-industry agents become less important as determinants of innovation. Van Anken, *et al* (2008) analysed the relationship between the degree of innovation (measured as innovation in products, processes, and administration systems) and performance among 1091 Spanish manufacturing SMEs. The results show that innovation positively impacts SMEs performance in low and high technology industries. They stressed that innovation was more important to achieving a competitive advantage to high technology firms than low technology firms. These results support innovation as being important to a firm's sustainable competitive advantage.

Model Specification

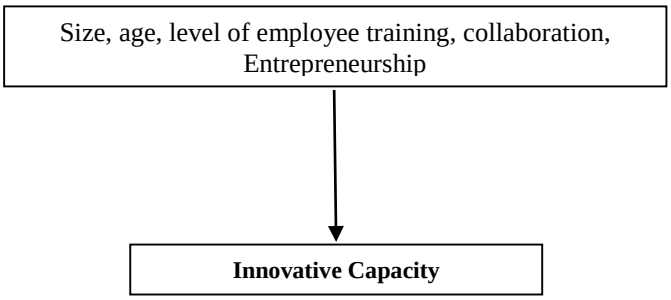

Fig 1: Research model
Source: adapted from Marques & Ferreira (2009) and modified by the author.

Marques and Ferreira (2009) model for SME innovative capacity alongside various studies reviewed on the subject matter were used to construct a research model for this study. The model specified some of the factors that determine the innovative capacity of the firms in the study area. From the model, potential important factors that can affect innovative capacity are firm size, age, level of employee training, collaboration, entrepreneurship, and openness to external environment. Firm's innovative capacity was measured by product innovation, process innovation and investment in R&D.

2.1 RESEARCH HYPOTHESIS

H_1: the age of the firm has a positive influence on its innovative capacity
H_2: the employee's level of training has a positive influence on firm's innovative capacity
H_3: the size of the firm has a positive influence on its innovative capacity
H_4: collaboration with other firm/institution positively influence firm's innovative capacity
H_5: a firm's entrepreneurship practice positively influence its innovative capacity

3.0 RESEARCH METHODOLOGY

The sample used in this study consisted of purposively selected 120 Nigerian Small and Medium Enterprises from two states in south-western Nigeria; Lagos and Ogun. These were obtained from the database of National Association of Small and Medium Scale Industrialist and the directory of Small and Medium Enterprises Development Agency of Nigeria (SMEDAN). The firms used in this study are those in manufacturing, construction and service industries. The data were obtained through the use of questionnaire, which was self-administered on the owners/managers of these firms. A total of 120 copies of questionnaire were sent to these

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firms, of which 51 were returned and found usable for this research, corresponding to a response rate of 42.5%. Multiple linear regression was used to empirically validate the research hypotheses of this study.

South western part of Nigeria has a landmass of about 58,585 square kilometres bounded in the East by Benin (Edo State of Nigeria), in the West it shares a common frontier with the Republic of Benin, in the North it stretches towards Kwara and Kogi States and in the South by the Gulf of Guines (Atlantic Ocean). South western zone of Nigeria covers about one-twelfth of Nigeria landmass and in it are over 30 million people according to 2006 population census. The zone has six states namely, Lagos, Oyo, Ogun, Osun, Ekiti and Ondo States.

4.0 RESULTS AND DISCUSSION

Multiple linear regression method was used to identify the factors influencing innovative capacity of small and medium scale enterprises in the study area. The following variables; size of the firm, age of the firm, level of employees training, collaboration and entrepreneurship were taken as independent variables, while innovative capacity was taken as dependent variables.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.879[a]	.858	.854	.240

Table 2: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	84.271	5	16.854	203.06	.000[a]
	Residual	3.729	45	.083		
	Total	88.000	50			

Table 1: Factors influencing innovative capacity of SMEs in Nigeria

Model	**Non-standardised coefficients**		**Standardised coefficient**	**t**	**Sig**
	β	***Std error***	***Beta***		
Constant	0.359	0.596		0.471	0.441
Size of the firm	0.211	0.128	0.111	2.914	0.201
Age of the firm	0.385	0.138	0.057	1.143	0.001
Collaboration	0.901	0.281	0.264	3.375	0.002
Entrepreneurship	0.712	0.148	0.502	4.831	0.000
Level of employees training	0.534	0.136	0.381	3.811	0.002

Source; Author's Analysis, 2011

Findings from table 1 above revealed that Entrepreneurship is the variable that best explains the firm's innovative capacity, taking into account the standardised beta coefficients of 0.502. Level of employees training is the second most powerful variable that determines the innovative capacity of a firm with coefficients of 0.381. Other factors that influence firm's innovative capacity according to table 1 above is collaboration with other firm/institution (0.264), size of the firm (0.111) and age of the firm (0.057). The correlation between innovative capacity and the factors is 0.879 which shows that these factors are great predictors of innovative capacity of a firm. According to the value of R^2 (0.858), 85.8% of the variability in organization innovative capacity can be explained by these factors. The F value of 203.06 and the t-test indicate the significance of the relationship between these factors and the innovative capacity at 5% level of significance.

Based on the result obtained, the following confirmation and conclusion can be made as far as the hypotheses are concerned;

Hypothesis one which proposed that the age of the firm has a positive influence on its innovative capacity is confirmed. The believe is that the older firms who had been in the business for so long will do everything to remain in business, therefore become more innovative, while the younger firms have lower propensity to

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innovative due to their newness to the business. This is in contrary to the results obtained by Ferreira & Maques (2009) where they confirm that younger firms have greater propensity to innovate than older firms.

The second hypothesis which stated that the employees level of training positively influence innovative capacity is also confirmed. In other words, the workforce that is well trained has a greater innovative capacity because of the exposure to new development in the industry and probably the new knowledge received. Pazos & Lopez (2004) also confirmed that employee's level of training is a significant determinant of firm innovative capacity.

The third hypothesis is accepted base on the result obtained in table 1. This means that as the size of the firm increases, so does their innovative capacity. This is in line with earlier studies conducted by Silva *et al* (2004), Mogolon &Vaquero (2004), and Ferreira & Maques (2009).

Hypothesis four of this study is also confirmed. The implication of this is that firm that establishes collaboration or agreement with other organizations or research institutes have a greater innovative capacity because of the benefits and synergy that will be derived from such collaboration or partnership.

Hypothesis five is also confirmed. This means that if entrepreneurship that is been practiced in an organization is adequate and appropriate, innovative capacity will be greatly enhanced. According to this study, entrepreneurship is the variable that most influences organization's innovative capacity. The studies of Pazos & Lopez (2004) and Marques & Ferreira (2009) also confirm this result.

5.0 CONCLUSION

This research investigated the factors influencing innovative capacity of SMEs in Nigeria. The main finding of the study is that Entrepreneurship is the major factor that enhances innovative capacity of a firm. This indicates that entrepreneurship should be a major preoccupation of firms in order to achieve a higher competitiveness and a more balanced organization innovatively.

The study also revealed that level of employees training is the second most powerful variable that determines the innovative capacity of a firm. This is because; well trained workforce has a greater innovative capacity because of the level of exposure to the new development in the industry. It was also confirmed that size of the firm, collaboration or agreement with other organizations or research institutes, and the age of the firms have significant effect on the innovative capacity of a firm, though at varying degrees or levels.

It is therefore recommended that the above mentioned innovative factors should be taken seriously by firms, so as to improve their level of innovation and subsequently improve their performance. The validity of the above mentioned factors is high, but still subject to improvement. Further empirical study may be carried out to determine how these factors affect organization's performance.

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