Theme 8: Building an Enterprise State

Assessment of Technology Innovation of Small Scale Firms in Nigeria Industrial Estate

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1. Introduction

The role of innovation as a critical factor influencing firm's commercial creativity and competitiveness has been explained in literatures. Innovation is central to the growth of output and productivity; it is a continuous process that brings about new ideas, new product development, and pioneering of new technologies/processes in various industries as well as promotion of entrepreneurship in the industrial sector. Innovation efforts embarked upon by most firms have led to their growth and sustainable competitiveness (Hitt *et al.,* 1997; Tidd, 2001; Souitaris, 2003).

This suggests that firms need innovations to open up new markets, gain competitive advantage and successfully increase market share. The rate of rapid changes experienced by industries as well as stiff challenges posed by competition and globalization means firms have to innovate or die. Yet innovation activities by various firms in developing countries are characterized by erratic investment patterns, while several firms also display apathy to research and development (R&D). In most firms, investments in innovation follow a boom-bust cycle. Most firms make investment in innovation a priority when making brisk returns, but firms tend to exhibit low interest in innovations when returns are low (Wolpert, 2002).

Firms are required to deliberately invest and engage in the dynamic process of innovations. These innovations could either be radical or incremental. Unsystematic investments on innovation activities by firms may sometimes lead to successful innovation but cannot guarantee consistent productivity and returns. Innovation processes generate new products and new routines of an innovating firm (Nelson and Winter, 1982). Information and knowledge are inputs to this process. Given that innovation is the transformation of new knowledge into products and processes, there is a need for a corporate culture of consistent innovation activities

generated through an integrated innovation system that can lead to diffusion and creation of new knowledge and technology.

Economic growth is driven by innovation. Therefore, the ability to create knowledge and innovation is essential for increased productivity and global competitiveness. The study finds its significance in its holistic approach to understand, unravel and proffer solutions to the many challenges facing the small-scale industries as well as the entrepreneurs. This is appropriate and worthwhile as newly industrialized economies of South Korea, Singapore, Taiwan etc. have demonstrated that research and development (R&D) investments do not reward only countries that are already technologically advanced, but can successfully affect the development of less advanced economies such as Nigeria (Bas *et al.*, 2008). The study also generated baseline data on innovations serving as exemplars where none exists. It will also create a database of indicators and reference material for the assessment of technological oriented SSIs in Nigeria.

A national system of innovation (NSI) of this nature brings about sustainable industrial growth and economic gains. Knowledge in terms of basic principles, technical solutions and entrepreneurial knowledge of technological and non-technological variables can lead to successful innovations among firms. Innovation has been defined as the process by which firms' master implement the design and production of goods and services that are new to them irrespective of whether they are new to their competitors, customers or the world (Mytelka, 2000). Innovation is simply a dynamic process of creating new goods and services and all factors associated with such a dynamic process.

In spite of the importance of innovation as the bedrock of a market-driven economy, little is known about innovation activities of small scale industries (SSIs) located within industrial estates in Nigeria. This is not unconnected with the attitude of government and relevant agencies in giving appropriate support and attention to small and medium technology industries (SMTIs)

located within estates for industrial growth. Though these industrial estates were originally established to accommodate and provide economic ambience to small scale industries, however, there is no follow-up on performance output and productivity in addition with other innovations carried out in the estates. This is clearly responsible for the dearth of data on technology innovation activities in the industrial estates. Similarly, the paucity of research work and information on innovation activities of firms located within industrial estates in developing countries has been noted in literature (Bala-Subrahmanya, 2005).

3. State-of-the-art

In Nigeria, industrial estates have many challenges in stimulating technological development and innovation activities. Some of these challenges include lack of infrastructural facilities, unstable nature of electric power from the national grid, lack of linkages between research institutions and firms, lack of collaboration among firms within the industrial estates, as well as poor funding. Despite these challenges, studies on innovation activities carried out by firms in the industrial estates are scanty as most researchers concentrate more on micro-level studies of different industrial sectors.

In a globalised economy, no company is isolated. Different firms play significant roles in one another's progress and the economy as a whole through partnerships, alliances, acquisitions, mergers and linkages. That notwithstanding, an attempt to generate such positive inter-dependence among firms as well as create clusters of competencies by bringing several companies together in a particular location is the industrial estate phenomenon. Therefore, efforts at boosting technology, process, or product profile of firms in such estates could be an important indicator of industrial and economic growth.

However, as a result of the scarcity of studies on innovation activities of firms located in these industrial estates, there is a need for more research work and data generation on the technological innovation efforts of firms located in these estates. Industrial estates, as collections of SSIs and other firms are sources of industrial and economic growth. Innovation assessment revealed the level of competitiveness and factors required to maintain competitiveness of the industrial firms within their immediate environment and the globalised economy. It also established a relationship between research and activities of the firms existing in industrial estates in a developing country like Nigeria.

Similarly, innovation surveys are measurement of outputs from firms that commercialize new products and new processes. Hence, this study has generated data on performance of firms in these small scale industrial estates as well as conditions favorable to their success. The study further revealed information on innovation activities like innovation processes, innovation behavior and innovative performance that are all relevant to generating policies necessary to improve the National Innovation System (NIS) and the industrial sector.

Industrial estates are dense sectoral and geographical concentrations, comprising of inter-linked firms (Albu, 1997) which have intrinsic economic values and innovative potentials. It is also a planned clustering of industrial enterprises with standard factory buildings erected in advance of demand, and a variety of services and facilities to the tenants (UNIDO, 1967). Nigerian authorities during the pre-independence era realized the importance of industrialization to the economy and in 1958 established the first industrial estate at Yaba area of Lagos. The establishment of industrial estates in Nigeria was as a result of government policy intervention programme to boost industrial development in the country. The motivation was borne out of the perception that small and medium scale enterprises (SMEs) would have a critical role to play in the industrial development of Nigeria after independence.

Although, the original aim was for the industries to serve as mere processing offshore arms of their parent companies based in Britain and other Western European countries, it was envisaged that such industries developed in Nigeria should have feeder arms in form of cottage firms. The cottage firms were the beginning of small and medium scale enterprises in Nigeria. After independence, many other industrial estates, layouts and incubators were established across the major cities of Nigeria. In southwestern Nigeria for instance, majority of these estates such as Ilupeju, Matori, Ikeja, and Apapa industrial estates are located within Lagos State environment. This has contributed to the high rate of commercial and industrial activities witnessed in Lagos State. In fact, the State is regarded to be the commercial hub of West Africa.

Furthermore, industrial estates are also a platform for job and wealth creation and poverty eradication. It is globally known that industrial development is easily achieved through the encouragement and active promotion of small scale industries based on availability of space, manageable finance and skills, which industrial estates provide. They can positively influence the socio-economic development and industrialization of a nation by attracting investments and generating employment. They also add to and improve social infrastructure in terms of healthcare and educational facilities and leveraging on raw material sources, skilled manpower resources, proximity to end-users' markets, and so on. Goods that are new to the locality are produced in industrial estates at competitive costs; thus reducing the import rate and promoting exportation to foreign markets.

The initial concept behind the establishment of industrial estates was to develop entrepreneurial skills of the indigenous business people. The purpose was that after some years, the entrepreneur would look for a site to build his factory/plant and vacate the estate. It was also meant to create an opportunity for entrepreneurs to manufacture spare parts needed by different industries leading to growth of small scale businesses. This is what obtains in China and other

developing countries that are producing spare parts used by large scale industries in their industrial production chain; thus enabling them to sufficiently and internally develop industrially through the establishment of industrial estates. However, cases of near neglect, gross dilapidation and some closures are recorded in some of the industrial estates located in Lagos State. Some entrepreneurs and industrial experts have also opined that some industrial estates have failed to achieve their set purpose. This is because some of the businesses had shut down due to loss of goodwill and competencies required for profitable operation. The existing micro-economic environment in the industrial estates does not favour the growth of firms in the estates. Few tenants in the estates have also defeated the objectives of the estates by abusing spaces allotted to them for other non-economic uses. In conclusion, industrial estates are also expected to generate processes of technological learning; which has been suggested to be a pre-requisite for innovation capability (Jerez-Gomez *et al.,*2005; Ogbimi, 2007; Alegre and Chiva, 2008)

3. Methodology

The study area is Lagos State located in southwestern Nigeria. Four Small Scale Industrial (SSI) Estates within the study area were sampled. The estates covered include Matori I (MIE 1), Matori II (MIE 2), Yaba (YIE) and Isolo (IIE). The estates and firms were selected using purposive sampling method. Industries covered in the survey are rubber/polymer/plastic, printing/publishing, drinks/beverages, leather/shoe-making, wood/furniture, electronics, machinery/spare parts, metal/wire products, agriculture/food products, chemicals/gas, and cosmetics/sanitary products.

Forty-six questionnaires were administered to the forty-six firms. Information on firms' innovation activities and the industrial estates' background were acquired through questionnaire survey and interview of employers and employees. The questionnaires were designed to collect data on year of establishment of the firms, firm size, ownership structure, type of business and

technology, number of personnel involved with R&D, educational level, experience and skill, use of ICT, R&D activities and expenditures, types and intensity of innovation, product, process, organization and marketing innovations, factors influencing innovation activities, licenses and patents, sales turnover, and market orientation.

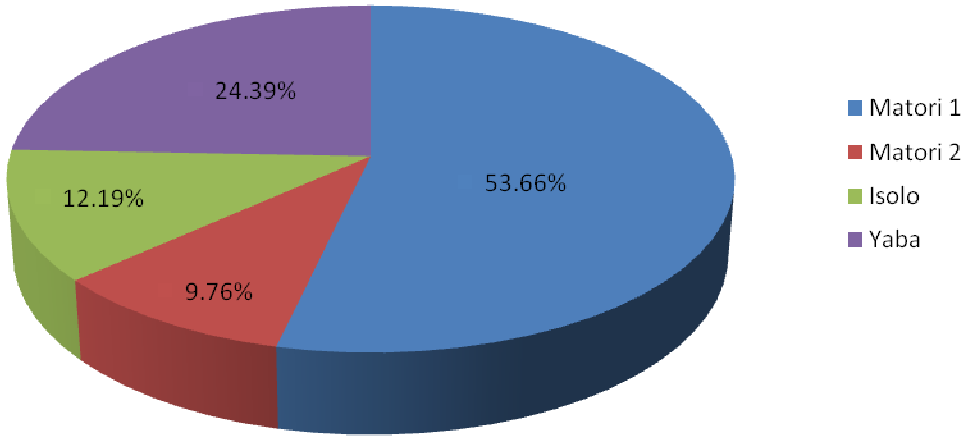
The questionnaires were codified while the data were analyzed using statistical software for social sciences (SSSS). Inferential and descriptive statistics (IDS) were also employed in analyzing the data. Pearson product moment correlation (PPMC) were employed to show the relationship between factors influencing innovation activities and firms' innovation. Regression analysis was carried out to determine the contribution of innovation activities to the sales turnover of the firms.

4. Findings and Interpretation

4.1 Distribution of Firms

The distribution of firms located in the estates is shown in Figure 4.1. The study administered forty six (46) questionnaires among the four industrial estates with a response rate of 89.1%. The response shows that Matori I has 53.66%; Matori II (9.76%); Isolo (12.19%) and Yaba (24.39%). This shows that Matori I have the highest number of firms evaluated in the study.

Figure 4.1: Distribution of firms by estate



Field survey, 2013**.**

4.2 Nature of Industries and Industrial Activities

Table 4.1 below shows the distribution of firms in the four sampled industrial estates according to their economic activities. The firms were categorized under various manufacturing industries using the international standard industrial classification (ISIC) code (Oslo, 2005). The observed industrial activities among the estates include food products and beverages; tanning and leather dressing; wood work and processes; paper and paper products; printing and publishing; chemical and chemical products; rubber and plastic products; metal fabrication, machinery and equipment.

The result reveals that food/beverages, metal fabrication, chemical/chemical products, and rubber/plastic products are the predominant industrial sectors at the estates.

Furthermore, the study shows that Matori I has the highest level of industrial activity and spread of twenty two (22) firms in different manufacturing sectors (Figure 4.1). The main industrial activities were manufacturing of food products/beverages, printing/publishing, and metal fabrication. Matori II had the least spread of only three (3) firms engaged in manufacturing of food/beverages, chemicals, and rubber/plastic products. Isolo industrial estate has four (4) firms manufacturing food/beverage, chemicals, metal fabrication, and electrical machinery.

However, majority of other industrial spaces in the estate were locked up and also not in production. Yaba industrial estate has six (6) firms that are predominantly engaged in the manufacturing of foods and beverages. The spatial distribution shows that most of the industries surveyed are involved in food processing industry. This outcome supports the view by The World Bank (1995) that the food processing industries contribute significantly to satisfying the basic needs in most African countries. It is therefore not surprising that majority of the responding firms are engaged in food processing industries.

Table 4.1: International Standard Industrial Classification (ISIC) of Firms in the Estates

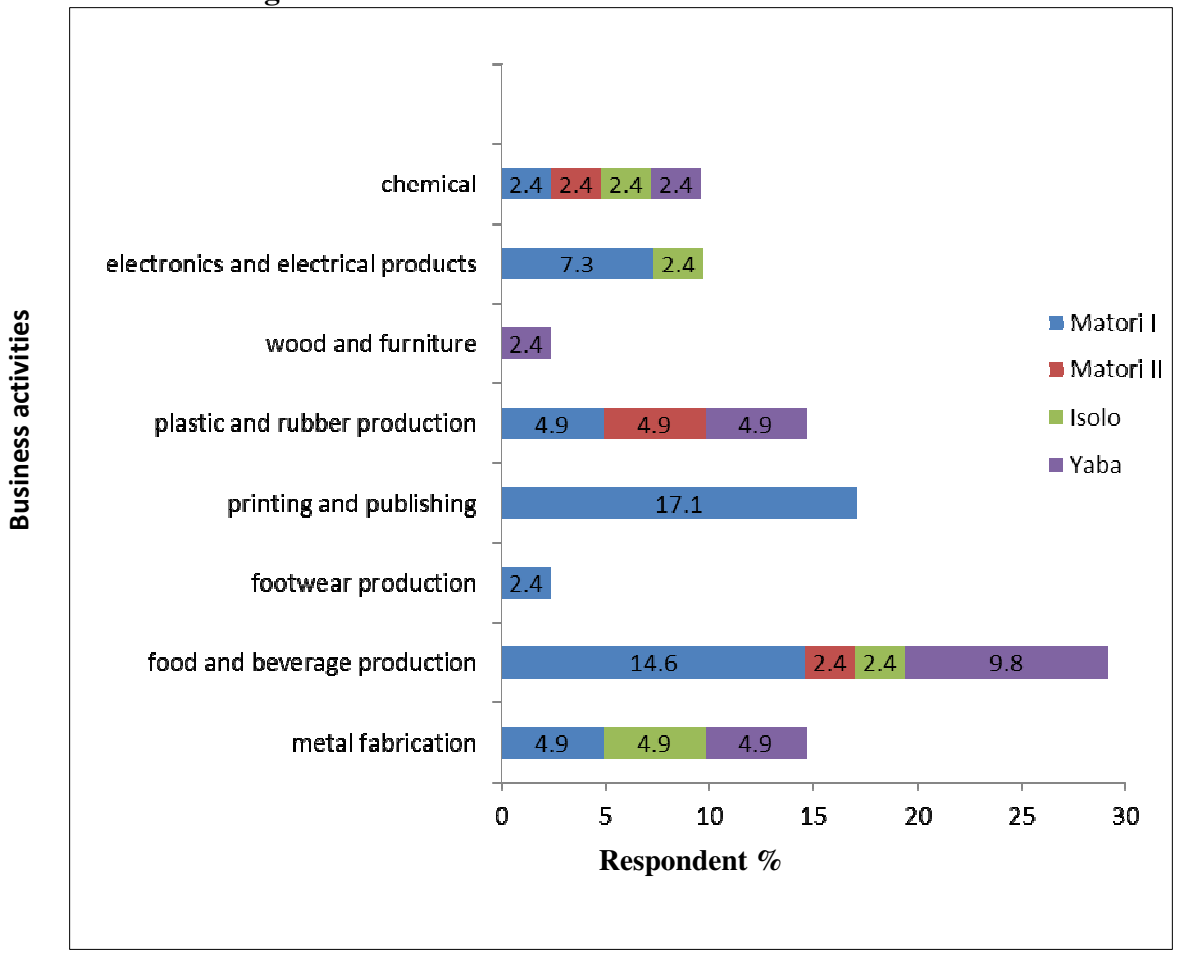
ISIC Code	Description of Manufacturing Sector	Location				
		Matori I	Matori II	Isolo	Yaba	Total
15	Manufacture of food products and beverages.	6(14.6)	1(2.4)	1(2.4)	4(9.8)	12(29.3)
19	Manufacture of tanning and leather dressing.	1(2.4)	-	-	-	1(2.4)
20	Manufacture of wood work and processes.	-	-	-	1(2.4)	1(2.4)
21	Manufacture of paper and paper products.	2(4.9)	-	-	-	2(4.9)
22	Manufacture of printing and publishing.	4(9.8)	-	-	-	4(9.8)
24	Manufacture of chemicals and chemical products.	2(4.9)	1(2.4)	1(2.4)	1(2.4)	5(12.2)
25	Manufacture of rubber and plastic products.	1(2.4)	2(4.9)	-	2(4.9)	5(12.2)
28	Manufacture of metal fabrication.	4(9.8)	-	2(4.9)	1(2.4)	7(17.1)
29	Machinery and equipment.	1(2.4)	-	-	1(2.4)	2(4.9)
30	Manufacture of office, accounting and computing machinery.	1(2.4)	-	-	-	1(2.4)
31	Manufacture of electrical machinery and apparatus.	-	-	1(2.4)	-	1(2.4)
		22(53.7)	**4(9.8)**	**5(12.2)**	**10(24.4)**	**41(100)**

NOTE: *Figures in parenthesis are row percentages, Field survey,* 2013.

Figure 4.2 further shows the general classes of business activities carried out by firms at the estates. These include food/beverages production, and printing/publishing. Others include chemicals/gas ventures, electronics/electrical, plastic/rubber production, metal fabrication, wood/furniture and footwear production. The pattern of prevalence of business activities at the

estates might be connected with availability of skilled human resources and technological capability.

Figure 4.2: Business Activities of Firms

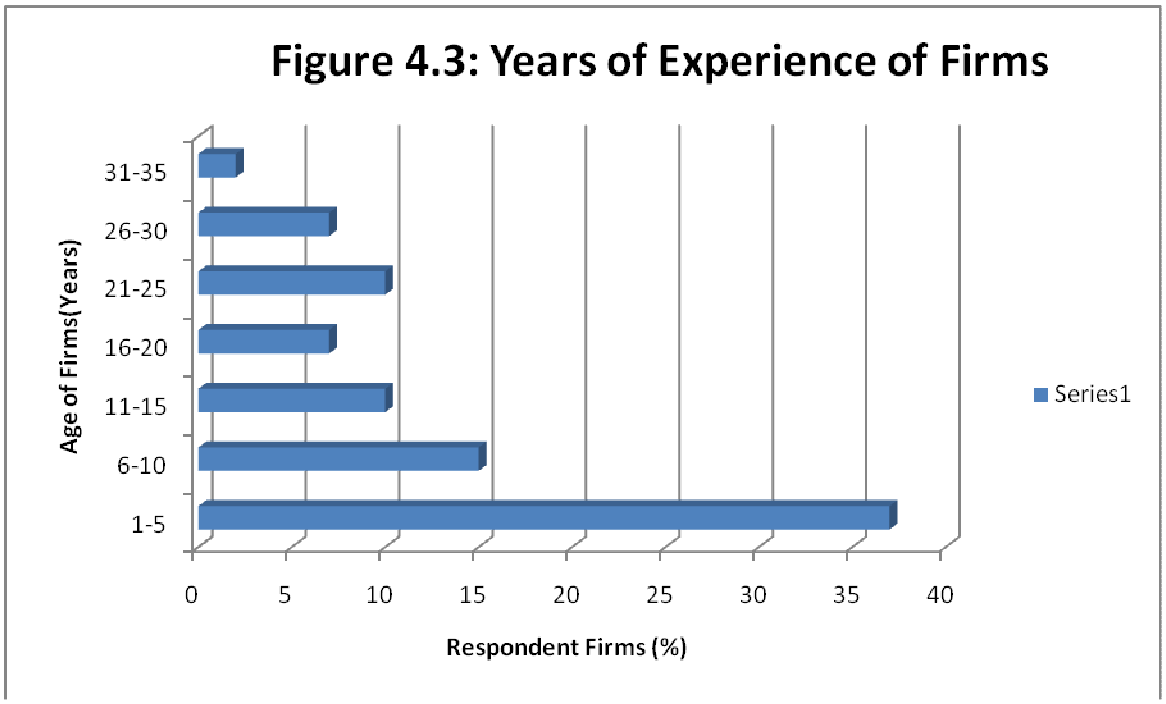


Field survey, 2013

4.3 Years of firms in the estates

The years of experience of firms is presented in figure 4.3. The figure reveals that two (2) out of the total number of firms have the highest level of experience between 31-35 years, followed by a group of seven (7) firms having 26-30 years of experience. However, majority of the firms (37%) have between 1-5 years of experience in business, indicating their entrance into

business is very recent. It is also observed that a few, (19%) of the firms, have spent more than 20 years in the estate. Research studies by Sorensen and Stuart (2000), and Wignaraja (2001), found a positive relationship between firms' age and its level of innovation. However, the age of the majority of firms in the study suggest that their recent entrance in business may not translate higher level of innovation. The outcome further supports similar findings by Feldman (1994) that experience is very crucial to enterprise survival. Similarly, past experience from previous job as well as on the job experience are also major key factors in enterprise duration, growth and survival (Omisakin, 1999). However, the outcome of this study does not support the findings.



Field survey, 2013

4.5 Ownership structure of firms

The ownership structure of the firms is presented in Table 4.2. It shows that 92.7% of responding firms are fully owned by Nigerians; 4.9% are owned by foreigners, and 2.4% are joint ventures by Nigerians and foreigners. Wignaraja (2001), and Michie and Sheehan (2003) in

their research observed that firms with foreign partners are often better placed to acquire technological capabilities because they have easy access to technology, human capital as well as R&D results from their foreign partners.

Table 4.2: Ownership Structure of Firms

Ownership structure	**Frequency (%)**
Fully owned by Nigerians	38(92.7)
Fully owned by foreign individuals	2(4.9)
Joint venture (Nigerians and Foreigners)	1(2.4)
Total	**41(100)**

Field survey, 2013.

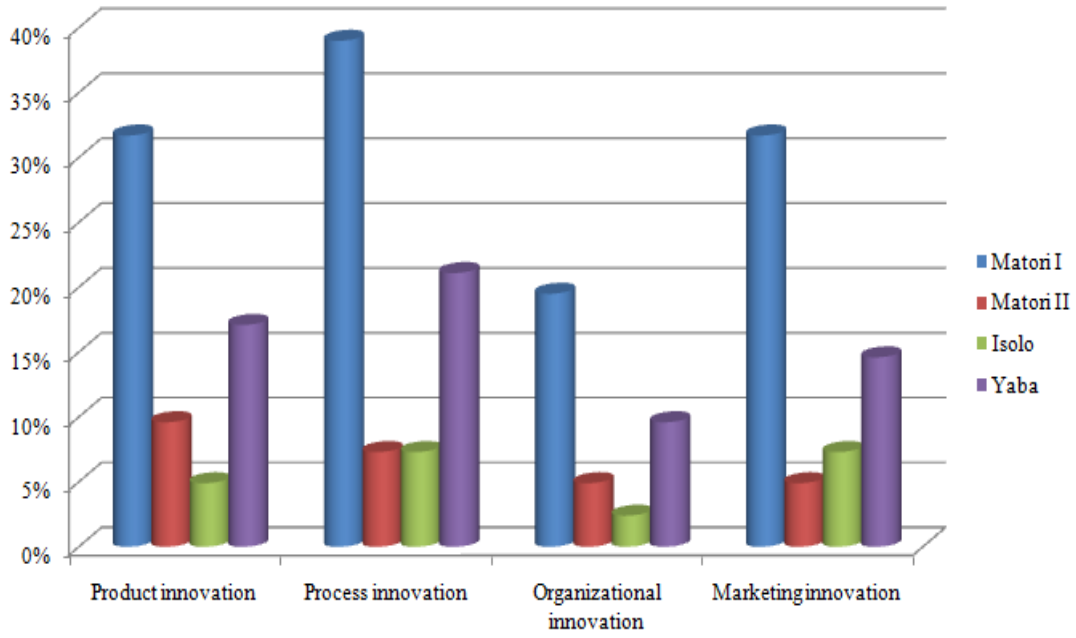
This is further corroborated by the findings of Chibber and Majumder (1999), and Sarkar and Sarkar (2000) which showed that firms with joint ownership and high foreign partnership structure have access to technical and financial resources and are also endowed with superior managerial capital which translates to higher performance than firms with low foreign partnership or fully owned by indigenous entrepreneurs. The result is further supported by the research of Central Bank of Nigeria (CBN) (2003) which indicate that majority of small-scale firms in Nigeria are sole proprietorship form of business owned by Nigerians. The low level of foreign partnership and joint ventures between Nigerian firms and their foreigner counterparts may be an explanation for the low level of innovation capabilities at the estates. This is because such foreign partnerships and ventures would have provided a strong absorptive capacity for

innovation. This has critical implication on firm's innovation, productivity and performance in the industrial estates.

4.4 Innovation Activities

Firms engaged in innovation to sustain market competitiveness. The types of innovations carried out by firms in the four industrial estates are presented in Figure 4.4. These include product, process, organizational and marketing innovations. The figure reveals that innovation activities among the responding firms is less than fifty percent (50%). Firms in Matori I however performed better in product innovations (31.7%); process (39.0%); and marketing (31.7%). Firms in Yaba industrial estate has innovations outcome of product (17.1%); process (21.1%); and marketing (14.6%). The least innovative firms were found in Isolo industrial estate.

Figure 4.4: Innovation Activities



Field Survey, 2013

Furthermore, firms generally seems to understand the processes of implementing process, product and marketing innovations which were highly prevalent in the estates while organizational innovation recorded low implementation. The quantities of innovation in the four estates were more predominant in the introduction of new goods or services (26.87%) to the market. This was followed by new or improved methods (13.43%) and development of new design and product packaging (11.94%). The findings shows that the level of innovation activities were not substantial in the estates.

However, the noticeable difference between introductions of new products to the market and the other two activities indicates an inherent weakness in the firms' technological capabilities; the lower the level of internal factors such as technically skillful human resource and adoption of new processes and methods, the lower the level of innovation outcome. This

supports the findings of Becheikh *et al.* (2006); Romijn and Albaladejo (2002); Sternberg and Arndt (2001); Keizer *et al*. (2002); OECD (2005); and Landry *et al.* (2002).

According to Mark (2005), when it becomes clear that firm's innovation outcomes are being threatened by limitations in internal resources, the firm is expected to bridge this gap through participating in innovation networks which provides access to sophisticated technology and technical expertise. More pro-active policy intervention from government is therefore needed to improve firm relationship with other firms and institutions, as well as re-training of manufacturing firms on new or improved methods of production, organizational management, and marketing in order to enhance the level of technological innovation locally.

4.5 Summary of innovation activities

Table 4.3 shows the summary of innovation activities by responding firms. Thirty-two (32) firms, representing 78.0%, carried out innovation activities (IAs) while 73.2% of these firms reported successful innovations. A much lower figure of 4.9% firms actually started but abandoned their innovation efforts due to internal and external constraints. Most, (41.5%) of the innovation, were based on internal efforts while external factors accounted for (7.3%). This low level of innovation by diffusion indicates a poor absorptive capacity of the firms and a more favorable inclination towards in-house efforts.

Table 4.3: Summary of Innovation Activities

Description	Frequency (%)
(A) Innovation activities	
Firms that carried out innovation activities	32(78.0)
Firms with successful innovation	30(73.2)

Firms with abandoned innovation	2(4.9)
Innovation activities based on internal efforts	17(41.5)
Innovation activities based on external influence	3(7.3)
(B) Technology Innovation strategy	
Continuous innovation	8(19.5)
Occasional innovation	11(26.8)

Field Survey, 2013

Continuous innovation strategy is a central theme in the literature of strategic knowledge management and organizational learning. It can be understood as continuous improvement or as a proactive attitude towards the external world (Lal and Dunnewijk, 2008). Once the capability to improve continuously is established, it can easily contribute to continuous innovation (Bessant, et al. 2001). Continuous innovation is also connected to the firms' knowledge management systems and processes (Chapman and Hyland, 2004). The response to the question on technology innovation strategy adopted by individual firms is shown in Table 4.3 where majority (26.8%) of responding firms engaged in occasional innovation while a few (19.5%) adopted a continuous innovation strategy. The overall result showed a negative attitude towards continuous innovation in their businesses. However, continuous innovation and learning is very significant for the performance of an enterprise as well as for the strategic orientation and perception of the environment (Lal and Dunnewijk, 2008). This result also suggests grave implication for firms in the estates as Albu (1997) observed that sustainable innovation created by consistent innovation activities are important for the small manufacturing firms if they want to remain in business and be competitive especially in a market-driven economy.

4.6 Obstacles to Innovation

Obstacles to innovation activities of firms are presented in table 4.4. The highest level of obstacles for the sampled firms are lack of infrastructures (Rank score 104); lack of finance from outside the enterprise (91); lack of funds within the enterprise (84); and unwillingness of consumers to pay higher price for better quality (73). Others are high cost of innovation (67); inadequate facilities (57); domination of market by established competitors (55); domination of market by foreign substitutes (52); lack of information on markets (42); lack of information on technology (41); lack of qualified personnel (40); and uncertainty of demand for innovation (40). Other factors such as difficulty in finding partners for innovation; no demand for innovation; and prior innovations serving as disincentive for new ones; were of lesser significance to innovation activities of these firms.

The significance of infrastructure (such as electricity) and funding as obstacles to innovation activities calls for urgent attention. According to Oyelaran-Oyeyinka *et al.* (1996), resources for innovation capability are important for the firm to continuously translate generated ideas into marketable new products, processes and services. Hence, any deficient resource becomes a stiff obstacle to innovation capabilities and effective performance of industrial firms in creating new products and processes.

Table 4.4: Obstacles to Innovation

Factors	High	Medium	Low	None	Rank score
Lack of infrastructures e.g. electricity.	34(82.9)	-	2(4.9)	4(9.8)	104
Lack of finance from sources outside your enterprise.	26(63.4)	4(9.8)	5(12.2)	5(12.2)	91
Lack of funds within your enterprise or group.	24(58.5)	3(7.3)	6(14.6)	7(17.1)	84
Consumers' unwillingness to pay higher price for better quality.	19(46.3)	5(12.2)	6(14.6)	10(24.4)	73
Innovation costs too high.	16(39.0)	7(17.1)	3(7.3)	14(34.1)	65
Inadequate facilities e.g. laboratory.	14(34.1)	5(12.2)	6(14.6)	15(36.6)	58
Market dominated by established enterprises.	13(31.7)	7(17.1)	7(17.1)	13(31.7)	60
Market dominated by foreign substitutes.	14(34.1)	3(7.3)	4(9.8)	19(46.3)	52
Lack of information on markets.	5(12.2)	8(19.5)	10(24.5)	17(41.5)	41
Lack of information on technology.	5(12.2)	10(24.4)	8(19.5)	17(41.5)	43
Lack of qualified personnel.	5(12.2)	7(17.1)	10(24.4)	18(43.9)	39
Uncertain demand for innovation goods or services.	6(14.6)	9(22.0)	6(14.6)	19(46.3)	42
Difficulty in finding cooperation partners for innovation.	7(17.1)	3(7.3)	10(24.4)	20(48.8)	37
No demand for innovation.	6(14.6)	3(7.3)	10(24.4)	20(48.8)	34
Prior innovations as a disincentive.	4(9.8)	2(4.9)	12(29.3)	21(51.2)	28

NOTE: *Figures in parenthesis are row percentages,* Field Survey, 2013.

3 - High **2** - Medium
1 - Low **0** - None

4.7 Effect of Firms' Innovation on Business Performance

Using average sales turnover as a proxy variable for business performance, the study assessed the effect of firms' innovativeness on firms' average sales turnover by running both the correlation and regression analyses. The correlation analysis shows the relationship between the dependent variable (average sales turnover) and the independent variables (product, process, organizational and marketing innovations). The correlation matrix in the Table 4.5 revealed that there is a significant positive relationship between the average sales turnover of firms and process innovation ($r = 0.518$; $p<0.05$). On the other side, independent variables such as product innovations ($r = -0.046$; $p>0.05$), organizational innovation ($r = -0.213$; $p>0.05$), and marketing innovation ($r = -0.069$; $p>0.05$) have no significant relationship with the firms' average sales turnover.

The regression analysis further confirmed the result of the correlation analysis, and also showed the contributions of each of these independent variables to the dependent variable (average sales turnover). The regression model has R^2 value of 0.320. This implies that the independent variable account for about 32% variation observed in the dependent variable. The regression result showed that only process innovation ($t = 2.097$; $p<0.05$) of the firms is statistically significant. Furthermore, in assessing the contribution of each of the independent variable using the standardized beta coefficient value, process innovation has the highest contribution (Beta value = 0.526) to the average sales turnover, and this was followed by organizational innovation (Beta value = 0.378), and marketing innovation (Beta value = 0.150) while product innovation (Beta value = 0.091) has the least contribution.

Table 4.5: Correlation Matrix of Average Sales Turnover and Innovation

	Sales	Product innovation	Process innovation	Organizational innovation	Marketing innovation
Sales	1				
Product innovation	-.046	1			
Process innovation	.518**	.314	1		
Organizational innovation	-.213	.224	.271	1	
Marketing innovation	-.069	.112	.512**	.300	1

***. Correlation is significant at the 0.01 level (2-tailed).*

Table 4.6: Regression Summary of Average Sales Turnover (dependent variable) and Innovation

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.000	.850		1.177	.252
Product innovation	-.271	.629	-.091	-.430	.671
Process innovation	1.943	.927	.526	2.097	.048
Organizational innovation	-.999	.513	-.378	-1.948	.064
Marketing innovation	-.428	.611	-.150	-.701	.491
total innovation	.485	1.427	.097	.340	.737

Dependent Variable: *Average Sales Turnover*

$Y = \beta_0 + \beta_1\chi_1 + \beta_2\chi_2 + \beta_3\chi_3 + \beta_4\chi_4$

Average Sales Turnover $= \beta_0 + \beta_1$ PDT $+ \beta_2$ PCS $+ \beta_3$ ORG $+ \beta_4$ MKT

Average Sales Turnover $= 1.000 - 0.271\chi_1 + \mathbf{1.943\chi_2} - 0.999\chi_3 - 0.428\chi_4$

5. Conclusions, Policy Implications and Directions for further Research

The study conclude that majority of the firms in the industrial estate experienced successful innovation and most of the innovation activities (IAs) were based on internal efforts. The nature of IAs is mainly occasional as opposed to continuous, and incremental rather than radical. The goods and services of the firms are restricted, in large part, to their immediate environment as only few of them, mostly the older ones, established their influence in the markets of other regions. The firms were not well protected from fierce foreign competition through governmental policies and this situation was worsened by the preference of the public sector for foreign goods and services.

The nature of IA carried out by the firms were mainly targeted at the short term goals of increasing operational efficiency and producing more with less as opposed to long term strategic activities. However, despite abundance of trained human resources, the success of IA was minimal and the major R&D activities engaged in are technically less intensive. This might be connected to poor linkages with R&D institutions and foreign enterprises. On few occasion, some of the firms preferred to import products of their foreign counterparts rather than enter into joint ventures or combined R & D efforts with them.

Factors that mainly influenced IA of the firms were obstacles such as lack of infrastructure and funds. The significant reasons for IA of the firms were to improve working conditions and deliberate in-house efforts. The firms mainly interact and derive information for IA from suppliers, customers, and competitors. Several firms at the estates collapsed and were locked up. This occurred on most occasions, after the demise of the proprietor. Others were driven from the market by foreign competition or failure to innovate within a dynamic industry. The later reason was important, not only in the collapse of the defunct firms but also in the weak performance of the surviving ones.

The study further revealed that government's role and policies were important to the IA and optimal performance of firms located in the industrial estates. Enough steps have not been taken by government to protect the local firms from undue foreign competition. There was little support for developing linkages and enhancing capabilities for innovation. Rather, government concentrated its efforts within the activities of several, mostly regulatory, agencies. This was counter-productive as these agencies laid various demands on the firms. In this regard, the key to enhancing the innovation and performance of firms in the industrial estates lies with government pro-active economic policies.

In conclusion, it is instructive to aver that innovations in small scale manufacturing industries are essentially critical to the revolution of the industrial sector in Nigeria. The assessment of technology innovations in small scale industries in Matori Industrial Estate I and II, Isolo Industrial Estate, and Yaba Industrial Estate is significant in evaluating the innovation dynamics associated with small scale manufacturing firms in terms of output efficiency, total productivity and technology capability and most importantly, their contributions to the local economy and global value chain (GVC).

However, because the scope of this study is limited to small scale industrial estates, there is need for further research that will focus on technology innovation in the government sponsored small scale business incubators located in most of the States in Nigeria.

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