Effects of Innovation on Performance of Manufacturing SMEs in Nigeria: An empirical study

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Abstract

This paper investigates how innovation affect the performance of manufacturing Small and Medium enterprises (SMEs) in a developing Nation. The subject of innovation and how it influences SMEs performances in developing nations is yet to be comprehensively explored. Besides, only little emphasis has been placed on the possible impact of various dimensions of innovation on SMEs performances. In order to enrich the literature, this paper evaluates the effects of various innovation dimensions on the performance of manufacturing SMEs in Nigeria. A total of 305 samples was obtained from SMEs in the textile/leather/apparel and footwear subsector; wood/furniture and woodworks subsector; and domestic/industrial plastic and rubber subsector in Southwestern Nigeria. Data collected was analyzed using correlation analysis and hierarchical regression analysis. The correlation result shows that all dimensions of innovation (product, process, market, and organizational) had significant positive relationship with firm performance including the control variable ‘firm size’. However, the regression result confirmed that process innovation and organizational innovation influences SMEs performance significantly. Additionally, product innovation had significant impact on innovation with the exclusion of other innovation dimensions from the model and marketing innovation had significant impact on the performance of SMEs with the exclusion of organizational innovation from the model. Overall, innovation accounts for about 55.7% of variation in the performance of the manufacturing SMEs. The study concludes that all dimensions of innovation, and specifically process and organizational innovation are critical elements for the enhancing the performance of SMEs in Nigeria. Therefore, owners and managers of SMEs should pay critical attention to implementation of innovation activities in their firms as it positively impact performance.

Keywords: Innovation, Firms Performance, Manufacturing SMEs, Innovation dimensions

Introduction

Innovation remains the major strategy and driving force for firms’ growth and survival in any competitive business environment. The introduction of novel products and services has remained the thrust behind the spring-up of new SMEs and the expansion of the existing ones. The growth and development of developing nations lies in the innovative ability of its citizens and SMEs within the nation. The essential role of SMEs in the growth and the development of nations’ economy cannot be gainsaid. SMEs have remained the catalysts for economic development both for the developed and developing nations in terms of employment generation, development of indigenous entrepreneurship, forward integration with large-scale enterprises and added value to gross domestic product (GDP) (Ussahawanitchaki, 2012). Globally, SMEs are responsible for about 75% of employment in any country (Olughor, 2015). Consequently, an essential issue dominating policy debates globally and particularly Africa, has been how to drive economic growth through improving the performance of SMEs (Obeng, 2009; Audrey and Jaraji, 2016). The OECD, in its research, found that SMEs contribute over 55% of GDP and 65% of total employment in high-income countries while it contributes about 95% and of total...
employment and about 70% of GDP in middle income countries (OECD, 2004). Conversely, in low-income countries, particularly in the least developed economies, the contribution of SMEs to employment and GDP is less than that of the informal sector, where the great majority of the poorest of the poor make a subsistence level of living. Therefore, an important policy priority in developing countries should be geared towards the reformation of policies that divide the informal and formal sectors, so as to enable the poor to participate in markets and to engage in higher value added business activities.

The establishment of SMEs is highly essential for developing countries as these businesses employ unskilled workers who are excessively dominate these countries (Bhhatia-Panthaki, 2007). Nigeria, like several developing countries, recognizes the importance of SMEs for economic growth and development. SMEs due to their flexibility and ability to promptly and effectively integrate inventions are more innovative than large firms (Li, 2003; Verhees, 2004). Studies have shown that SMEs engages in innovation activities has enhanced performances (Freel, 2000; Westerberg, 2008; Gracia, 2014). Also, the study of SMEs increases stakeholders’ awareness of the needs of these enterprises in respect to growth and development. Such awareness allows scientists, owners of enterprises, entrepreneurs and policy-makers to provide the needed support and formulate effective polices for SMEs (Norman, 2008). Nigerian SMEs, though essential to the nation’s economy, are faced with numerous challenges such as inadequate and non functional infrastructural facilities, bureaucratic bottlenecks and inefficiency in the administration of incentives and support facilities, lack of easy access to funds/credits, uneven competition arising from import tariffs, lack of access to appropriate technology, absence of R&D, high dependence on imported raw materials, lack of scientific and technological knowledge and know-how, lack of appropriate managerial and entrepreneurial skills and lack of suitable training and development, fluctuating value of the Naira, government policies; political consideration etc. One essential element to overcoming most of the challenges faced by SMEs is innovation.

As opined by D'Cruz and Rugman (1992), a firm is likely to build a competitive edge given its ability to design, develop and market products or services that are novel and of better quality to that of its competitors. Thus for firms survival and growth, innovation has become a necessity for all firms including SMEs (Kaplan and Waren, 2007). Given the importance of innovation in firms, several studies (Lin and Chen, 2007; Trienekens et al., 2008; Bakar and Ahmad, 2010; Chong et al., 2011; Mohd and Syamsuriana, 2013; Njogu, 2014; Olughor, 2015; Gu and Shao, 2015; Audrey and Jaraji, 2016) have assessed the impact of innovation on firm performance. But most of the previous studies focused on either one or two dimensions of innovation (Johne, 1999; Georgellis et al., 2000; Medina and Rufin, 2009; Espallardo and Ballester, 2009; Zhang and Duan, 2010; Bakar and Ahmad, 2010; Ar and Baki, 2011). However, this study assesses the effect of various dimensions of innovation on the performance of manufacturing SMEs in Nigeria.
Literature Review

Innovation

Innovation is an increasingly important element of globalization and competitiveness (Gorodnichenko, et al., 2010). As globalization and international competition intensifies, technology becomes more central to firms’ performance within the domestic and international market. This study measures AC as an explanatory variable for innovation in firms. The innovativeness of firms may be affected by both internal and external factors. External factors are basically associated with a firm’s interaction with its external environment such as other firms, suppliers or buyers (Jorna and Waalkens, 2006). Internal factors include, for instance, a firm’s inherited capacities, such as skills, accumulated experience and prior related knowledge of its workforce (Webster, 2004), organizational structure, communication network, R&D efforts, as well as the ability to respond appropriately to the intrinsic motivation of its employees (Jorna and Waalkens, 2006). It has been asserted that innovation plays an essential role in the survival of firms in the business environment. Innovations can in this context be viewed as a multidimensional concept (Neely et al., 2001). Schumpeter, for instance, defines innovation as the introduction of a new good, the introduction of a new production method, opening of a new market, or opening of a new source of supply (Schumpeter, 1934). Similarly, Lundvall (1992), describes innovation as an ongoing process of exclusion, search, and exploration resulting in new products, new techniques, new organizational forms, and new markets. Malerba (2002) refers to innovation as a tradable application of an invention, as a result of invention integration into economic and social Practice. Kuratko and Hodgetts (2004) defined innovation as the creation of new wealth or the alteration and enhancement of existing resources to create new wealth. Oslo Manual (2005) defines innovation to be an activity that produces new or significantly improved goods (products or services), processes, marketing methods or business organization OECD, 2005). Innovation also refers to the process of creating ideas, developing an invention and also introducing a new product, process or service to the market (Thornhill, 2006).

The relationship between innovation and firm performance has been confirmed in both empirical and theoretical studies. For instance, Calantone et al. (2002) examined the relationship between learning orientation, firm innovation and firm performance in US firms. Carol and Marvis (2007), examined the relationship between innovation and organizational performance of Taiwanese SMEs in the manufacturing and service sectors. They measured performance in terms of firm sales. Van Auken et al. (2008) assessed the relationship between the degree of innovation and performance among a sample of 1,901 Spanish manufacturing SMEs and their study reveal evidence of a positive relationship between three types of innovation (product, process and managerial/systems) and performance. Similarly, Garrido and Camarero (2010) investigated the relationship between learning orientation, innovativeness and performance and finding of the study reveals that learning orientation significantly influences both innovativeness and performance. Also, Terziovski (2010) studied the innovation practice and its effects on performance of Australian SMEs. Their study revealed that innovation strategy is a key driver to performance of SMEs. Quite a number of studies (Carl and Marvis, 2007; Van et al., 2008; Terziovski, 2010; Mensah and Achuah, 2015) have focused on assessment of the relationship between innovation and performance within the SMEs.
Furthermore, business literature offers various classifications of innovations that have been developed and applied (Schumpeter, 1934; Johannessen et al., 2001; Avermaete et al., 2003). Some authors (Avermaete et al., 2003; Johannessen et al., 2001) discuss innovation from the perspective of output (product, process, organizational, marketing), while others (Damanpour, 1996; Jansen et al., 2006; Abernathy and Clark, 1985) describe the concept in terms of the degree of change (i.e., radical and incremental). Yet another perspective used in capturing the dynamic process of innovation is that of the various stages of innovation (i.e., invention initiative and realized innovation). Innovation is the output of initiatives within a firm. Porter (1990) argues that a firm is a collection of activities that are performed to design, produce, market, deliver, and support its product. However, we classify innovation into four types: product, process, organizational, and marketing innovation (Avermaete et al., 2003; OECD 2005).

**Product Innovation**

This can be considered as any good or service that is perceived by an individual or a firm as new (Kotler, 1991). Also, it refers to the introduction of new products or services in order to create new markets or customers, or satisfy existing market or customers (Wang and Ahmed, 2004; Wan et al., 2005). Product innovation entails diverse organizational strategies as well as unique inputs which results in novel outputs (Martinez-Ros and Labeaga, 2009). Production innovation has been investigated in accordance with a wide range of managerial phenomena, including entrepreneurial firms in the emerging countries (Li and Atuahena-Gima, 2001), continuous innovation in mature firms (Dougherty and Hardy, 1996), collaborative networks (Nieto & Santamaria, 2007), R&D spillovers (Audretsch and Feldman, 1996), human resource systems and organizational culture (Lau and Ngo, 2004), and leadership (Gruber, 1992). Product innovation is usually the result of producing and commercialization of new goods (products or services) or with improved performance characteristics. Product innovations assist SMEs to distinguish themselves from their competitors, through proffering solutions to individual or national challenges.

Product innovation remains one of the major roots of competitive advantage to firms (Mohd and Syamsuriana, 2013). This is because when firms engage in innovation, the quality of their goods and services is improved upon and this enhances the performance as well as the competitive advantage of the firm. (Forker et al., 1996). As noted by Hult et al. (2004), product innovation shields a firm from threats and competitors creates opportunity for the innovating firm to enjoy the ‘first mover’ advantage. Bayus et al. (2003) proved that product innovation had positive and significant link with organizational performance. Alegre et al. (2006) opined that product innovation dimension was strongly and positively associated with firm performance. Also, Espallardo and Ballester (2009) in their study affirmed that product innovation positively impacts firm performance. Likewise, Varis and Littunen (2010) noted that introduction of product innovation is positively associated with firm performance was also confirmed by. Therefore, this study argues that:

**Hypothesis 1**: Product innovation is positively related to firm performance

**Process innovation**

This can be defined as changes in the ways of producing or developing products, including new logistics, new raw material, new production lines, new production processes/methods, and new
technology. This type of innovation does not stand on its own. In many cases, process innovation may be the consequence of product innovation or/and organizational innovation. New processes basically rest on the use of new technologies to increase the efficiency and quality of production. This view on innovation was reflected by the first and second edition of the “Oslo Manual” the OECD’s handbook for innovation surveys (OECD, 1997; OECD and Eurostat, 1997). Process innovation entails the implementation of new or improved production process or adoption of new tools, technology, or knowledge in producing a product (Langley et al., 2005; Oke et al., 2007).

Process Innovation is very essential in the manufacturing process of a firm as it gives a firm an advantage over its competitors. Interestingly, studies have revealed that process innovation is positively related to performance of firms (Vivero, 2002; Mohd and Syamsuriana, 2013; Nham et al., 2016). Also, Anderson (2009) in his study noted that there is a relationship between new technology (used as a proxy for process innovation) and performance of a firm. Recent evidence by Gunday et al. (2011) reaffirmed that process innovation is significantly correlated to innovative performance. Hence, this study proposes that:

**Hypothesis 2:** Process innovation is positively related to firm performance

*Marketing innovation:*

This is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.” (OECD and Eurostat, 2005). Marketing innovation has to do with the market mix and market selection in a bid to meet consumers’ expectations (Mohd and Syamsuriana, 2013). Marketing innovation plays a crucial role in fulfilling market needs and responding to market opportunities (Rodriguez-Cano et al., 2004). Marketing innovation entails devising a better way of meeting the needs of customer, entering a new market, or strategically positioning a firm’s product on the market with the intention of increasing firm’s sales (Gunday et al., 2011).

Marketing innovation is carried out through marketing activities such as; pricing strategies, product package design properties, product placement and promotion activities, etc (Kotler, 1991). Studies have shown that marketing innovation positively impact sales growth of firms through the increased demand for products, which as a result, yields additional profit to innovative firms (Johne and Davies, 2000; Sandvik, 2003). Also, Otero-Neira et al. (2009) in their study opined that market innovation positively impacts the performance of firms. Likewise, Varis and Littunen (2010) in their study using an estimated model reaffirmed the existence of significant correlation between a marketing innovation and firm performance. Thus, this study argues that:

**Hypothesis 3:** Marketing innovation is positively related to firm performance

*Organizational innovation:*

Organization innovation involves changes in the ways of organizing and managing a firm, including human resource management and the improvement of the firm’s access to the market
(i.e., expanding new markets) (Avermaete et al., 2003). “It entails the implementation of a new organizational method in the firm’s business practices, workplace organization or external relations.” (OECD and Eurostat, 2005). Organizational innovations has the propensity to enhance firms’ performances by reducing administrative and transaction costs, improving workplace satisfaction (and thus labor productivity), gaining access to non-tradable assets (such as non-codified external knowledge) or reducing costs of supplies (OECD Oslo Manual, 2005). Organizational innovation can increase the performance of firm through decreasing transaction cost and administrative cost thereby improving workplace satisfaction. Also, organizational innovation can be implemented in business practice through the application of new techniques for arranging routines and procedures for carrying out activities. It includes the introduction of new methods for the allocation of responsibilities and decision making among employees.

Nham et al. (2016) in their study revealed that organizational innovation positively affects the performance of firms. Their findings showed that the higher the innovation activities of firms, the higher their innovative performance. Also, Della and Solari (2008) in their study of medium-sized Milanese firms found that organizational innovation is related to business performance. Their work revealed firms which achieved high productivity increases were those that combined investments in the new organization of work with advanced technologies. Hence, this study proposes that:

**Hypothesis 4:** Organizational innovation is positively related to firm performance

**Small and Medium Enterprises (SMEs) in Nigeria**
Conceptually, the definition of SME is nebulous as it varies from country one country to another and even within the same country, it may vary from sector to sector depending on the purpose for which the definition is sort. The National Council of Industry (NCI) in 2003, defined SMEs as firms having between 10 and 100 employees and a total cost of working capital that is between N1million and less than N200million. SMEs act as bedrock for innovations, inventions and problem solving. This usually comes to be in the process of solving the daily problems that confront the owners as entrepreneurs. In Nigeria, the sector has been seen to contribute significantly to entrepreneurship, technology change and growth in productivity. SMEs in Nigeria constitute about 96% of Nigerian businesses (Oyelaran-Oyeyinka, 2007) and accounts for 75% employment rate (Umar et al., 2014) and 50% of industrial output (Nwankwo et al., 2012). More so, SMEs represents about 90% of the manufacturing sector (Oyelaran-Oyeyinka, 2007), and contributes 56.43% to manufacturing GDP (NBS, 2003).

**Firm Performance:**
Performance measurement and performance management practices have become common place in all businesses. The knowledge of the association between innovation and firm performance offers practical insights for proper management of firms. With this knowledge, managers of SMEs would be capable of optimizing their decision-making processes as it relates to various performance output. This knowledge will also assist them in the maximal allocation of the resources. As noted by Murphy et al. (1996), firm performance is a multi-faceted concept, which include indicator such as; production, finance or marketing (Sohn et al., 2007), or consequential such as relating to growth and profit (Wolff & Pett, 2006). Studies have described firm performance in terms, how organizational objectives are well achieved (Jarvis et al., 2000; Wood, 2006). Firm performance can be assessed by examining how successful an organization is in achieving its goals (Gerba and Viswanadham, 2016). Scholars have argued that performance of firms can be described as the firms’ ability to produce suitable outcome and actions (Wood, 2006; Chittithaworn et al., 2011). Gerba and Viswanadham (2016) opined that performance can be in terms of financial and non-financial performance. This includes; return on investment (ROI), sales volume, sales value, profitability, total assets, employment size, capital employed, market share, customer satisfaction, productivity, turnover, delivery time, employees turnover, etc. In this study, performance is measured as total sales value (Carter and Jones-Evan, 2000; Gebreeyesus, 2007).

Methodology

Data Source

Primary data used in this study was collected from manufacturing SMEs in textile/leather/apparel and footwear subsector; wood/furniture and woodworks subsector; and domestic/industrial plastic and rubber subsectors in Southwestern Nigeria. Specifically, data was collected from manufacturing SMEs that are located along the Lagos-Ota-Agbara-Ibadan industrial axis where about 26.44% of manufacturing SMEs in Nigeria are domiciled. SMEs employing between 10 persons and 200 persons were sampled for this study. The survey was carried out on 305 SMEs using a self-administered questionnaire.

Measures

Independent Variable

Innovation as an independent variable in this study was divided into product innovation, process innovation and organizational innovation and market innovation. Product innovation included five items: introduction of new or significantly improved product, introduction of new machines
and equipment, introduction of additional refurbished or second hand equipment, introduction of goods that is new to the market, and introduction of goods that is new to the firm. Process innovation included four items: introduction of new or significantly improved method of manufacturing, purchased/lease of machines/equipments, introduction of supporting activities for manufacturing processes, and engagement in research aimed at producing specific inventions or modifying existing techniques. Organization innovation included six items: introduction of new or improved organizational knowledge management system, made significant changed with firm’s relations with other firms or public institutions through alliances, partnership, subcontracting etc, engagement in research with no specific application, development pilot projects and subsequent full-scale production facilities and possession of on-going or abandoned innovation activities. Marketing innovation includes two items: made significant changes product design or packaging, and made significant changes in sales or distribution methods of firms. The respondents were asked, “in the last five years, if their firms have engaged in the above listed innovation activities”. Their responses were based on ‘yes’ = 1 and ‘no’ = 0.

**Dependent Variables**

The dependent variable firm performance was assessed using self-assessment of firm performance by the respondents as objective performance measures were not available (Love *et al.*, 2002). The performance indicator for this study was sales revenue (Kellermanns *et al.*, 2010).

**Control Variables**

Several control variables which are visible in the business performance literature were also introduced to the model. These variable include; highest level of educational qualification (Fairlie and Robb, 2007; Nichterand Goldmark, 2009), work experience (Mengistae, 2006; Alowaihan, 2004), and firm size (Ozgulbas *et al.*, 2006); Orser, *et al.*, 2000).

**Reliability Test**

Cronbach's alpha was used to determine the internal consistency of the innovation constructs. Internal consistency illustrates the degree to which all the items in scale measure the same or construct and thus it is related to the inner-relatedness of the items within the test (Tavakol and Dennick, 2011). As opined by George and Mallery (2003,) a good Cronbach alpha should be 0.7 or greater. However, According to Kline (2000) a Cronbach alpha of 0.6 is acceptable. In this study, scales which have Cronbach's alpha coefficient that is 0.6 and above will be accepted.

**Results and Discussion:**

**Sample Characteristics:**
As shown in Table 1, majority of the respondents were males as compared to the females. This indicates that the SME subsector surveyed are dominated more by males. The wood/furniture/woodworks subsector has about 98.7% males. The domestic/industrial plastic and rubber had 66.1% of males. However, the textile/leather/apparel & footwear subsector had a fair gender distribution as 50.5% were males and 49.5% were females. Also, about 90.9% of the firms surveyed were sole proprietorship. In terms of educational qualification, majority of the respondent had senior school certificate (SSCE) and ordinary national diploma (OND) as their highest educational qualification. However, about 21% of the respondents had higher national diploma (HND) as their highest qualification, about 7.0% had B.Sc/B.Tech as highest qualification, about 2.8% had MBA/M.Sc/M.A as their highest qualification, and only one of the respondent had PhD as highest qualification. Majority (60.6%) of the respondents had between 6 and 10 years of work experience and about 22.9% of the respondents had 11 to 15 years of work experience. Interestingly, about 10% of the respondents had over 15 years of work experience. About 90.6% of the respondents surveyed were within the ranks of chief executive officer, director and manager.

Table 2 shows firms’ investment is innovation activities such as in-house R&D, external R&D, machinery/equipment acquisition, and training. In terms of average amount invested, firms’ highest investment was in machinery/equipment acquisition (₦ 2,071,133.97) followed by external R&D (₦ 1,700,000.00). However, firms’ investments in in-house R&D and training seems to be low.

Furthermore, table 3 shows the percentage of firms that had introduced each innovation type as well as the maximum and minimum number the innovation type introduced by the firms. Results shows that about 90.2% of the firms had introduced product innovation and about 87.9% of them had introduced process innovation. About 86.2% had introduced organizational innovation and 87.2% of the firm had introduced marketing innovation. Maximum number of product innovation introduced was 20. The maximum number of process innovation and marketing innovation stood at 5 while the highest number of organizational innovation introduced by firms was 9. However, the least number of each type of innovation introduced by the firms was 1. More so, about 83% of the firms had introduced only 1 process innovation. About 57% of the firms had introduced only 1 product innovation and about 43% had introduced at least 2 product innovations. About 79% of the firms had introduce only 1 marketing innovation and about 84% of the firm introduced only 1 organizational innovation type.

Table 1: Sample Characteristics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>199</td>
<td>65.9</td>
</tr>
<tr>
<td>Female</td>
<td>102</td>
<td>34.1</td>
</tr>
<tr>
<td>Form of Ownership</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activities</td>
<td>N</td>
<td>Minimum Amount invested (in Naira)</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>----</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>In-house R&amp;D</td>
<td>86</td>
<td>11,000</td>
</tr>
<tr>
<td>External R&amp;D (or outsourced R&amp;D)</td>
<td>13</td>
<td>200,000</td>
</tr>
<tr>
<td>Machinery/equipment Acquisition</td>
<td>209</td>
<td>30,000</td>
</tr>
<tr>
<td>Training</td>
<td>38</td>
<td>10,000</td>
</tr>
</tbody>
</table>

Table 2: Investment in Innovation Activities of Manufacturing SMEs in Nigeria

Source: Author
Table 3: Innovations Introduced by Manufacturing SMEs

<table>
<thead>
<tr>
<th>Innovation Types</th>
<th>Percentage of Innovators</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product innovation introduced within the last 5 years</td>
<td>90.2</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Process innovation introduced within the last 5 years</td>
<td>87.9</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Marketing innovation introduced in the last 5 years</td>
<td>87.2</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Organizational innovation introduced in the last 5 years</td>
<td>86.2</td>
<td>1</td>
<td>9</td>
</tr>
</tbody>
</table>

Source: Author

A reliability test was carried out on the variables to determine the reliability of the variables. The result revealed a Cronbach Alpha of 0.778 for product innovation (5 items), 0.715 for process innovation (4 items), 0.608 for organizational innovation (6 items) and 0.952 for marketing innovation (2 items) which in theory is considered good (Nunally, 1978; George and Mallery 2003; Kline; 2003; Devellis, 2012). This indicates the degree to which the variables measures a unidimensional latent construct which suggests that the variables used for the study have relatively high internal consistency.

The correlation statistics in Table 4 shows that a significant positive relationship exists between the innovation dimensions and firm performance. Innovation dimension such as; process innovation ($r = 0.384$), process innovation ($r = 0.476$), marketing innovation ($r = 0.388$), and organizational innovation ($r = 0.361$). This implies that the SMEs must continually engage in innovation to boost their performances. More so, process innovation was the innovation dimension with the highest correlation value. Also, Control variables such as; firm size ($r = 0.688$) and highest educational qualification ($r = 0.217$) had significant positive association with firm performance. However, the control variable ‘work experience’ ($r = 0.159$) was found to be positively associated with firm performance though the relationship was not significant.

Table 4: Mean, Standard Deviation and Correlation of Innovation and Performance Variables

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm Performance</td>
<td>3.56</td>
<td>3.28</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product innovation</td>
<td>1.66</td>
<td>0.781</td>
<td>.384**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process innovation</td>
<td>1.31</td>
<td>0.710</td>
<td>.476**</td>
<td>.394**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marketing innovation</td>
<td>1.41</td>
<td>0.793</td>
<td>.388**</td>
<td>.358**</td>
<td>.482**</td>
<td>1</td>
<td></td>
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</tbody>
</table>
Furthermore, the study assessed the impact of innovation on firm performance using hierarchical regression analysis. Results show that in model 1, firm size ($\beta = 0.493$, $p < 0.01$) and product innovation ($\beta = 0.155$, $p < 0.10$) had significant positive impact on firm performance and the explanatory power ($R^2$) of the model was 38.8% with a significant F-value of 20.637. In model 2, with the introduction of process innovation into the model, firm size ($\beta = 0.416$, $p < 0.01$) and process innovation ($\beta = 0.338$) had significant positive impact on firm performance. However, product innovation, higher educational qualification and work experience had insignificant positive impact on firm performance. The explanatory power ($R^2$) of the model was also increased to 48.1% with increase in F-value to 22.988. In model 3, marketing innovation was introduced into the model. Results show that process innovation ($\beta = 0.294$), marketing innovation ($\beta = 0.165$), and firm size ($\beta = 0.375$, $p < 0.01$) had significant positive impact on firm performance. Also, product innovation and higher educational qualification increased from $\beta = 0.069$ to $\beta = 0.091$ and from $\beta = 0.051$ to $\beta = 0.055$ respectively. Besides, the explanatory power ($R^2$) of the model increased to 53.1% with a significant F-value of 21.510. In model 4, with the introduction of organizational innovation into the model, process innovation ($\beta = 0.282$), organizational innovation ($\beta = 0.171$) and firm size ($\beta = 0.353$, $p < 0.01$) had significant positive impact on firm performance. This result is consistent with Ar and Baki (2011) as their study revealed that process innovation had significant positive impact on firm performance. Interestingly, product innovation and market innovation did not have significant impact on firm performance. This is consistent with Mohd and Syamsuriana (2013) as their study revealed that marketing innovation had insignificant positive impact on performance. Moreover, the explanatory power ($R^2$) of the model increased to 55.7% with a significant F-value of 19.725. These results therefore imply that innovation accounts for about 55.7% of the variation in the performance of the manufacturing SMEs. Therefore, manufacturing SMEs in Nigeria should engage more in process innovation and organizational innovation in order to boost their performances.

Table 5: Results of Hierarchical Regression Analysis

<table>
<thead>
<tr>
<th></th>
<th>1.26</th>
<th>0.896</th>
<th>.361**</th>
<th>.094</th>
<th>.186*</th>
<th>.410**</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm size</td>
<td>13.33</td>
<td>6.673</td>
<td>.688**</td>
<td>.373**</td>
<td>.303**</td>
<td>.231**</td>
<td>.212*</td>
</tr>
<tr>
<td>Highest educational qualifications</td>
<td>4.02</td>
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<td>.230**</td>
<td>.112</td>
<td>.206*</td>
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<tr>
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<td>.159</td>
<td>.208*</td>
<td>.255**</td>
<td>.260**</td>
<td>.091</td>
</tr>
</tbody>
</table>

*Correlation significant at the 0.1 level (2 tailed), ** Correlation significant at the 0.05 level (2 tailed), **P ≤ 0.01 (2 tailed), N=305.
Source: Authors
<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
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<td>Work experience</td>
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<td>Product innovation</td>
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<td>Marketing innovation</td>
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<td>Organizational innovation</td>
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<td>Adjusted R²</td>
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<td>.460</td>
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</table>

* p<0.05, ** p<0.01, and *** p<0.001 are significant at the 0.05, 0.01 and 0.001 level respectively.

Source: Authors

Conclusion

This study assessed the effect of innovation on firm performance in manufacturing SMEs in Nigeria. The study sampled a total of 305 SMEs in textile/leather/apparel and footwear subsector; wood/furniture and woodworks subsector; and domestic/industrial plastic and rubber subsector in Southwestern Nigeria. The data was analyzed with the use of hierarchical regression analysis. Results revealed that process innovation and organizational innovation positively impacts firm performance significantly. Also, the size of the firm was seen to be very critical as it relates the impact of innovation on firm performance. Hence, manufacturing SMEs and policy makers must note that innovation remains an essential element in small and medium sized firms. Although this paper assessed investment in various innovation activities, the paper did not assess the impact of investment on innovation activities on firms performance. Further studies should examine the impact of investment on innovation activities on firms performance. This is very important as investment in innovation activities could also boost performance of SMEs.
References


