Innovation and Performance of SMEs in Nigeria Manufacturing Firm

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Abstract: *Performance of small and medium enterprises (SMEs) in the manufacturing industries all around the world is considered as a major driver of the economic development, specifically; in the areas of industrialization, modernization, and urbanization. However, SMEs in Nigeria manufacturing sector are encountering difficulties that lean their performance. The urge to remain buoyant, feasible, and innovative is often being obstructed by the slow rate of growth of the firm. It is conceived, perhaps, that risk-taking and proactive ability could make a substantial difference in ameliorating the challenges in the sector. Thus, this study examined the individual and combined moderating effect of risk-taking and pro-activeness on the relationship between innovation and performance of SMEs in Nigeria manufacturing firm. The study adopted survey research design of 504 population of owners and managers of 126 SMEs, food and beverages, agro-allied and animal feeds, plastic and rubber, and wood furnishing and fitting companies in five Local Government Areas in Ogun State, Nigeria. Total enumeration method was adopted for the study as data were collected through structured adapted and validated questionnaire. Cronbach's Alpha reliability coefficientsfor the dependent variable, the independent variable and the moderators ranged from 0.88 to 0.95. This indicated that the instrument employed had a high level of consistency above the recommended criterion of 0.7. The response rate was 87%. Data were analysed using descriptive and inferential (hierarchical regression) statistics. The findings revealed that pro-activeness had a negative and significant moderating effect on the relationship between innovation and performance of SMEs in the Nigeria manufacturing firm ($\Delta F=10.8990, \Delta R^2 = 0.002$, $p<0.05$), while Risk-taking had a negative and significant moderating effect on the relationship between innovation and performance of SMEs in the Nigeria manufacturing firm ($\Delta F=37.9739$, $\Delta R^2 = 0.009$, $p<0.05$). Meanwhile, the combined effect of pro-activeness and risk-taking had significant moderating effect on the relationship between innovation and performance in the Nigeria manufacturing firm ($\Delta F= 99.210$, $\Delta R^2 = 0.015$, $p<0.05$). This implies that the higher the level of pro-activeness and risk taking of the selected SMEs, the higher the firm performance of the Nigeria manufacturing SMEs. The study recommended that owners and managers in manufacturing SMEs in Nigeria should be more proactive and take unflinching steps in their businesses given the competitive environmental context within which they exist.*

Keywords: *Performance, Innovation, Pro-activeness, Risk-taking, Small and Medium Enterprises (SMEs)*

1. INTRODUCTION

The depth of research works on SMEs' performance indicates lack of consensus on the factors that drive SME's performance (Ndeye, Abdul, & Nagayevb, 2018). Estimation from international organizations show that SMEs account for between 80% to 99% of firms in any given country as well as between 60% to 70% of global employment (World Trade Organisation,2016), and approximately 50% of GDP (SME Competitiveness Outlook, 2015) in both formal and informal sectors. SMEs in the manufacturing sector continue to encounter difficult situations, trimming performance, causing inability to remain buoyant, feasible and innovative, thus, choking the sustainability and growth of the firm (Bushe, 2019). These challenges are exacerbated by several inhibiting factors (Mohammed et al., 2017), some of which are attributed to lack of innovation and increasing cost of production which negatively impact on the SMEs performance (Abdisa, 2019).

In Nigeria, Akinwale et al. (2017) noted that SMEs dominate the larger proportions of firms in the manufacturing sector. Critical in the development, it remained uncompetitive, characterized by

production of less diversified products, stagnated growth, low productivity, and weak innovation. SMEs have recorded unsatisfactory performance as regards contribution to GDP at 5% (National Bureau of Statistics [NBS], 2017) associated with inability to develop new business, product innovation, new market and new process innovation. In addition, Jeptoo and Nyiva (2017) align with the position of NBS (2017) while expressinglack of innovationas a major challenge limiting SMEs in achieving increased sales volume and other higher performance indices in Nigeria. Researchers such as Bolarinwa and Okolocha (2016) as well as Jeptoo and Nyiva (2017) have attributed the poor performance of SMEs to the lack of financial capital, human resources, and negligence of innovation adoption which are central to their improved performance.   SMEsInnovation has become an important factor such that business enterprises now consider it as an important element that gives numerous advantages of increase to profit and market shares (Erjona, 2015; Garcia, 2014; Mohd & Syamsuriana, 2013). Although innovation is considered the lifeblood of many organisations, firms are often challenged to derive the anticipated performance benefits of innovation (Rousseau et al., 2016). Research on the performance outcomes of innovation is similarly characterised with mixed results and ambiguity due to lack of moderations (Garcia-Castro & Aguilera, 2015), and thus, the study attempts to fill the void by providing an insight into these moderating variables. Lomberg et al. (2017) argue and investigate innovation, pro-activeness and risk-taking and found that they have their unique and direct effect on performance. Linton (2019) asserts that innovativeness, risk-taking, and pro-activeness can be meaningfully divided between the attributes of process and outcome and are also argued to vary independently of each other.

Consequently, proactive firms have the ability to create first-movers advantage, target premium market segments, charge high prices, and reach the market ahead of competitors (Adegbuyi, et al.,2018). Hsiu-Fen and Chin-Jung (2016) assume that firms' risk-taking behaviour moderate the relationship between past performances of firm. Proactive firms, on the other hand, usually have a forward-looking perspective, being able to anticipate and being prepared for the future (Dada & Fogg, 2014). Dai, et al. (2014) submit that both high and low degrees of innovativeness and pro-activeness increase firm international scope and performance. These results are also complementary to those found by Kreiser et al. (2013), which found that in small firms, innovativeness and pro-activeness showed positive relationships with SMEs sales growth, while risk-taking assumed a predominantly negative relationship. Prior literatures in Nigeria on innovation and performance focused on linear effect of product innovation on firm performance. No identified study investigated the individual and combined moderating effect of pro-activeness and risk-taking on SMEs innovation and firm performance (Barasa et al., 2019;Afriyieet. al., 2019). In the light of the identified assumption and problems, and an attempt to bridge the gap in the body of existing literature, this study intends to investigate the individual and combined moderating effect of pro-activeness and risk-taking on innovation and performance of SMEs in selected Nigeria manufacturing firm in Ogun State, Nigeria.

2. LITERATURE REVIEW

2.1. Pro-activeness, SMEs Innovation and Firm Performance

Pro-activeness has received the least attention of the three dimensions from entrepreneurship scholars. It is defined (Brownhilder & Johan, 2017) as an opportunity-seeking, forward-looking perspective, involving the introduction of new products or services ahead of the competition and acting in anticipation of future demand to create change and shape the environment. Eggers, Kraus, Hughes, Laraway and Snycerski (2013) aver that pro-activeness refers to operating a firm in expectation of future problems, needs, and changes, thus involves efforts to seize the initiative, expecting and enacting new opportunities, and creating or contribute in emerging markets. According to Eggers et al (2013), a proactive firm is one that is first to come up with proactive innovations. Pro-activeness thereby comprises the predisposition to be the first to market with new products or services. According to Franket al. (2010),pro-activeness is a firm's strategic orientation that captures specific entrepreneurial aspects of decision-making styles, methods and practices. Linton (2019) opines that pro-activeness enables introduction of new products and brands ahead of competition at a speed which enables firms to implement new ideas. Dada and Fogg (2014) in their view points out that pro-activeness is often associated with advantageous market position, since it is associated with initiating actions before competitors(Simmons, 2010).

Pro-activeness is the tendency for enterprises to take the positive marketing strategy and action leading to the introduction of new products, new processes, new technologies, and new services in order to transcend competitors. To gain competitive advantage, proactive enterprises tend to take advantage of the market opportunities ahead of competitors, and take the lead in introducing new products and services. Jia, et al., (2013) are of the opinion that in the competitive industry and market, pro-activeness plays a vital role in obtaining and maintaining the competitive advantage of the enterprise. Thus, Yu-Ming et al. (2018) submits that enterprises with pro-activeness tend to find new market opportunities more easily, and take quick action on these opportunities, and then bring innovative performance to enterprises. Filser and Eggers (2014) observe that pro-activeness is highlighted by initiatives that are taken in order to exploit unforeseen opportunities, and subsequently introducing new products and services ahead of competitors. Alternatively, a proactive enterprise can also be the initiator of activities, which competitors then need to react to, thus proactive firm opens new tracks in terms of products or services (Grande et al., 2011). Indeed, pro-activeness mirrors the significance of initiatives in the entrepreneurial process through which competitive advantages can be generated clearly, indicating firms can influence and create their environment by actively observing environmental pressures (Grande et al., 2011).

Kreiser and Davis (2010) ascribe high levels of pro-activeness to superior business performance in munificent and dynamic environments. Acting proactively is far less risky because pro-activeness primarily facilitates firms to competing in a more agile manner, and in general won't result in as much up-front investment as do innovativeness and risk-taking (Tachia et al., 2016). Nevertheless, time and resources are required for firms to be proactive in acquiring new market insights (Dai et al., 2014). Also, potential up-front costs may be necessary for firms to develop the requisite capabilities for new market entry (Kreiser, et al., 2013).In this study, pro-activeness is acting in advance of a future situation, rather than just reacting. It means taking control and making things happen rather than just amending to a condition or waiting for something to occur.

Furthermore, Shuangfa (2018) posits that pro-activeness is one of the robust predictors in explaining the variance in SME performance than individual-level CEO characteristic concerning promotion and prevention focus, an idea previously opined by Justin and Patrick (2014) who argue that top managers who favour innovative activities and those who display a high degree of pro-activeness will positively impact firm performance. In the work of Farja et al. (2016),pro-activeness was found to strongly affect SME growth as well as firm expansion to international markets. In the same vein Hao and song (2016) had pointed out asserting that pro-activeness allows firms to be well-informed with changes in technology and regularly striving to create and integrate resources to match technology advancement. Benneth (2018) asserts that pro-activeness enhances manufacturing firms' non-financial performance (market share and employees' satisfaction). This is consistent with the study by Adele (2015), who studied the effect of pro-activeness on manufacturing firms' performance in Nigeria and found that it significantly affects manufacturing firms' performance. But Adele (2015) focused majorly on financial performance measures. It is also consistent with the study by Abosede et al. (2018) that studied the effect of corporate entrepreneurship (pro-activeness) on the international performance of banks in Nigeria and found that pro-activeness significantly affects banks international performance.

2.2. Risk-taking, SME's Innovation, and Firm Performance

Soininen (2012) considers innovativeness, risk-taking and proactivity as the essential characteristics of entrepreneurial orientation. SMEs are exposed to many risks. According to Belasv et al. (2014), risk represents uncertainty where it is possible to quantify the probability of different outcomes. Risk represents a danger where achieved company's results are different from the anticipated ones. Risk-taking is defined as the capacity of the entrepreneur to perceive risk at its inception and to find avenues to mitigate transfer or share the risk (Ogunsiji & Kayode, 2010). Risk-taking is further defined by Jafar and Roland (2018) as the degree to which managers are willing to make large and risky resource commitments. Risk-taking has also been described as the ability and willingness of a firm to pursue calculated and planned business opportunities in the marketplace, even though outcomes of these opportunities are uncertain (Neneh and Johan, 2017). It explains the tendency to take bold actions such as venturing into unknown new markets and committing a large portion of resources to ventures with uncertain outcomes (Kitigin, 2017). Ngoze and Bwisa (2014) established that risk taking has positive impact on financial performance. Hence, it is expected that risk taking

will have a positive relationship with SMEs performance. It could be said that for SMEs particularly the manufacturing sector to have a healthy performance and viability, they should have the propensity to engage in high-risk projects and managerial preferences for bold versus cautious actions in order to achieve firm objectives. Kitigin (2017) reiterates this view further by asserting that risk-taking involves the willingness to commit significant resources to opportunities with a reasonable chance of costly failure as well as success.

The firm's tendency to engage in high-risk projects and managerial preferences to achieve firm objectives comprise willingness to commit significant resources to opportunities with a reasonable chance of failure as well as success (Ashraf et al., 2017).At high levels of risk-taking, firms could face significant chances of failure. In other words, it is possible that the investments may fail to generate desirable outcomes. Pointedly, since firms are resource constrained (Muller et al. 2017), the potential failure in their risk-taking activities may result in considerable investment disruptions and threatened firms' survival in a competitive market place. Accordingly, high levels of risk-taking may negatively impact firm performance. In the same vein, firms with high levels of risk-taking tendencies might become over optimistic with the opportunity available, which could lead to over-committing resources to projects that are unpromising (Dai et al., 2014). Risk can be managed by engaging in experiments, testing the markets, acquiring knowledge, and the use of networks. Interestingly, studies have shown that entrepreneurs perceive a business situation to be less risky than non-entrepreneurs. Muhammad et al. (2014) confirmed that risk-taking has positive and significant relationship with financial performance. Lawan et al. (2015) opined that there is positive and significant relationship between risk-taking and performance in Nigerian SMEs. The results of (Olawoye et al, 2016) panel analysis of the relationship between risk-taking, and performance of firms listed on Nigerian Stock Exchange, with returns on assets and returns on equity showed a negative relationship between risk-taking and returns on assets and risk-taking and returns on equity.

Furthermore, the study carried out by Danso and Adomako (2016) finds support for the notion that in a less developed market economy the level of entrepreneurs' risk-taking is positively related to firm performance. This finding differs from Willebrands et al. (2012) that found a significant negative relationship between entrepreneurs risk taking and firm performance. According to Wambugu et al. (2015), risk taking is a dominant attribute of entrepreneurship. The higher the risk-taking orientation, the higher a firm's profitability and growth. Subsequent to this, the findings of their study show that risk taking has a great impact on firm performance of agro processing SMEs in Kenya. Specifically, they assert that risk taking has a significant positive effect on firm performance of agro processing SMEs in terms of growth and profitability. The results are consistent with the finding from other study that establish that risk-taking influences the firm performance of small firms (Rao, 2013). The findings demonstrate that the ability of SMEs to stay competitive is directly related to the intensity of taking risks. Results from the study done by Li (2016) on corporate risk-taking in relation to advisory directors using a sample of listed companies in China from 2008 to 2015, show that the percentage of advisory directors is positively associated with the level of corporate risk-taking, and the interaction of the percentage of advisory directors and risk-taking is positively correlated with the future firm performance. However, these effects are not significant at all in the state-owned enterprises due to government's interference.

2.3. Combined Effect of Pro-activeness and Risk-Taking on the Relationship Between SMEs Innovation and Firm Performance

Eugene (2014) investigated the effects of entrepreneurial orientations components; risk- taking, and pro-activeness on organizational learning of a manufacturing firm in Nigeria. Result of data analysis showed that entrepreneurial orientation measured by risk-taking behaviour and pro-activeness has positive and significant impact on organizational learning. In the same view, Jafar and Roland (2018) established that risk-taking and pro-activeness have positive effect on knowledge creation processes, which in turn positively influence firm performance and may play different roles in these relationships. Expatiating on this relationship, Filser and Eggers (2014) maintain that an organization should seek to find the most effective configuration of its innovative, proactive and risk-taking behaviours. While each of these should be present in some form, their configurationally relationship is likely to differ in varying settings.

3. METHODOLOGY

The researchers adopted survey research design in this study. It captured perception, perspectives and position of the respondents at a categorical timeframe. The population comprised of one owner and three managers of the selected manufacturing SMEs totalling 504 owners and managers (see table 1.1) from 126 selected registered SMEs in Ogun State Nigeria (SMEDAN, 2018). The study gave attention to Ogun State because the State is one among those with the largest concentration of SMEs as well as notable investment hub in the country (Manufacturers Association of Nigeria *president* (MAN), Ahmed, 2019; Small and Medium Association of Nigeria (SMEDAN), 2017).

These categories of SMEs were chosen because they play important roles in the development of the economy of the country, boosting the GDP and accelerating employment of labour. The study population is presented in detail in Table 1.

Table1. *List of Selected Manufacturing Firms in Four LGA, Ogun State*

S/N	Selected Manufacturing Sub-Sector	Selected SMEs	Owners	Managers	Total Owner	Total Managers	Target Population
1	Food and Beverages	16	1	3	16	48	**64**
2	Agro, Allied and Animal feeds	20	1	3	20	60	**80**
3	Plastic and Rubber	40	1	3	40	120	**160**
4	Wood Furnishing and Fitting	50	1	3	50	150	**200**
		126			126	378	504

Source: *Field work (2022)*

The sampling units for the study are owners and managers of registered manufacturing SMEs in Ogun State. They are responsible for decision making in the selected sector. The sampling frame consists of owners and managers in each target unit within the respective registered manufacturing SMEs (SMEs, 2019). Table 2 below reflects the sampling frame for the study.

Table2. *List of Owners and Managers in the Manufacturing SMEs*

S/N	Sectors Name	No of Owners	No of Managers
1	Foods and Beverages	16	48
2	Agro, Allied and Animal feeds	20	60
3	Plastics and Rubber	40	120
4	Wood Furniture and Fitting	50	150
	TOTAL	126	478
	TOTAL (Owners &Managers)	504	

Source: *Researcher's compilation, 2022*

To ensure maximum accuracy, the study adopted total enumeration sampling technique and employed primary method of data collection through structured questionnaire to elicit data(Syed, 2016). The questionnaire was adapted from available literatures on the topic base on its ability to give objective response and feedback from the respondents (Jayani, 2018; Olomu et al., 2016; Maduagwu et al., 2017; Emmanuel, 2017; Olabanji et al., 2019; Muthoga, 2019). The study instrument utilized a six (6) point Likert-type scale with four sections. A pretest was conducted on the questionnaire to assess the clarity and suitability to the participants before sending to the major respondents. 10% of the sample size representing the population of the study was administered on owners and managers of manufacturing SMEs in Oyo State. The researcher employed content and construct validity to assess the instrument's ability to measure the extent to which statements in the questionnaire intends to measure as indicated by Adeoye et al. (2019) and Muthoga (2018).Content validity was done to establish Co-variance of the main constructs and the items. The study made use of exploratory factor analysis (EFA) in determining the construct validity of the measuring instrument. Average Variance Extracted (AVE)>0.5 was employed in testing the construct and convergent validity of the research instrument. The AVE for each variable was computed by dividing the sum of the squares of each

factor loading by the number of indicators. The values of AVE for the variables ranged from 0.600 to 0.953. These values are above the minimum threshold of 0.500 and therefore imply that each variable on average is able to explain more than half of the variance of its indicators. The overall Cronbach's Alpha for the instrument is 0.951.The result also showed a good reliability result with Cronbach's Alpha for the dependent variable (firm performance), the independent variable (SME innovation) and the moderators are 0.949, 0.913 and 0.883. The result indicated that the questionnaire has high level of consistency as Cronbach's values are above the recommended criterion of 0.7.This indicates that all results are reliable. Hence, the instrument was administered.

Retrieved copies of the instrument were checked for comprehensiveness and consistency to confirm that respondents have fully responded to question items as required. Thereafter, data gathered was coded and imputed into data sheet, then transferred into the Statistical Package and Service Solutions (SPSS) version 24.0 for analysis. The descriptive statistics was done using percentages, mean and standard deviation score values for the demographic question items, dependent, independent and moderating variables question items respectively. This enables the researcher to describe the characteristics of the variables under study. Hierarchical regression was used to analyze the effect of the moderators on the relationship between manufacturing SMEs innovations and their performances. The justification for adopting hierarchical regression analysis is because of its ability to evaluate the contributions of predictors beyond previously entered predictors, as a means of statistical control, and for examining incremental validity. This approach was adopted by (Agbawodikeizu & Egwakhe, 2019; Nwank were, 2017). All hypotheses were tested at 0.05 level of significance.

The operationalization of the variables for each of the hypothesis was summarized in these models:

Hypothesis One

$Y = f(X_i*z_1)$

$$Y = \beta_0 + \beta_1 Xi + \beta_z z_1 + \beta_{iz} Xi*zi + e_i \tag{1}$$

Hypothesis Two

$Y = f(Xi*z_2)$

$$Y = \beta_0 + \beta_1 Xi + \beta_z z_2 + \beta_{iz} Xi*z_2 + e_i \tag{2}$$

Hypothesis Three

$Y = f(X_i*z_1*z_2)$

$$Y = \beta_0 + \beta_1 Xi + \beta_z z_i + \beta_z z_2 + \beta_{iz} (X_i*z_1*z_2) + e_i \tag{3}$$

Where:

β_0 = Constant term

β_z = Coefficients of the moderating variables

β_{iz} = Coefficients of the interaction terms

e_i = Error term.

4. FINDINGS

4.1. Restatement of Hypothesis One

H_{01}: Pro-activeness has no significant moderating effect on the relationship between innovation and firm performance.

The hierarchical regression was applied using process analysis. The test was carried out in the order of hierarchy. The responses for each research variable were combined to generate composite scores used in the regression analysis. The hypothesis is to be supported if the effect of the interaction between innovation and Pro-activeness (Xz_1) on firm performance of selected manufacturing SMEs in Ogun State, Nigeria, is statistically significant. The result of the analysis is presented step by step in Tables 1a-c.

Table1a. *Summary of hierarchicalregressionsfor moderating effect of pro-activeness on the relationship between innovation and firm performance*

	R	R-sq	MSE	F	df1	df2	P
	0.9505	0.9035	0.1675	1314.8146	3	430	0.000
Outcome variable: Firm Performance							

Source: *Researcher's Field Computation 2022*

Table1b. *Model of Regression analysis*

Model	*Beta*	Se	T	P	LLCI	ULCI
Constant	4.0383.	0.0324	124.7989	0.0000	3.9747	4.1019
Innovation	0.5052	0.0300	16.8323	0.0000	0.4462	0.5642
Pro-activeness	0.4212	0.0278	15.1696	0.0000	0.3668	0.4760
Interaction (si*RT)	-0.0549	0.0166	-3.3014	0.0010	-0.0875	-0.0222
Outcome Variable: Firm Performance						

Source: *Researcher's Field Computation 2022*

Table1c. *Indirect effect(s) of X on Y*

	R^2 change	F	df1	df2	P
X*W	0.0024	10.8990	1	430	0.000

Source: *Researcher's Field Computation 2022*

Figure 1 Process Analysis (model 1)

In tables 1a, b and c, the result of the hierarchical regression model of hypothesis one which states that pro-activeness has no significant moderating effect on the relationship between innovation and firm performance in Ogun State, Nigeria. Process analysis model 1 was used to achieve this. From the result gathered, it can be seen that when pro-activeness was introduced as the moderator, the relationship between innovations and firm performance of selected manufacturing SMEs showed a high level of statistical significance. The value of $R^2 = 0.9505$, $p<0.05$ explained 95.05% of variation in firm performance of the selected manufacturing SMEs in Ogun State, while (F $(3, 434) = 1314.8146$, $p=0.000$) which revealed that the independent variable and moderator were significant.

Table 1b, revealed a statistically significant coefficients for innovation ($\beta= 0.5052$, $t= 16.8323$, $p<0.05$) indicating that there is a linear dependence as firm performance depends on innovations of selected manufacturing SMEs in Ogun State Nigeria. A unit increase in innovation leads to an increase in firm performance of the selected manufacturing industries by 0.5052. Pro-activeness ($\beta = 0.4212$, $t = 15.1696$, $p<0.05$) is statistically significant. The result shows that pro-activeness has a positive and significant effect on Firm Performance.

When an interaction term (innovation *pro-activeness) was introduced, the result showed a negative and significant effect ($\beta = -0.0549$, $t= -3.3014$, $p=0.010$ ($p<0.05$). This implies that a unit change in the interaction terms will lead to firm performance to reduce by 0.0549 units in the selected manufacturing SMEs in Ogun State, Nigeria. Table 1b revealed that there is no zero (0) between the lower-level confidence interval (LLCI) and upper-level confidence interval (ULCI) which indicated that pro-activeness moderates the relationship between innovations and firm performance of the selected manufacturing SMEs. The result thus disclosed that pro-activeness has a negative but significant moderating effect on the relationship between innovation and firm performance in selected manufacturing SMEs in Ogun State, Nigeria.

It can also be observed that there was a change in the value of *R square* in Table 1c when an interaction term was introduced of 0.002 at $p = 0.000$ ($p<0.05$). This indicates that the interaction term (innovation dimensions*pro-activeness) accounts for 0.2% variation in firm performance which is statistically significant. The established regression equation from the results is stated as follows:

$FP = 4.038+ 0.5052IN_i + 0.4212PA – 0.0549IN_i*PA+ e_i$ (1)

Where: FP = Firm Performance

        IN = Innovations

        PA = Pro-activeness

        IN*PA = Interaction of Innovation and Pro-activeness

From the result above, the null hypothesis which states that pro-activeness has no significant moderating effect on the relationship between innovation and firm performance was rejected.

4.2. Restatement of Hypothesis Two

H_{02}:   Risk-taking has no significant moderating effect on the relationship between innovation and firm performance.

Hypothesis two was tested using hierarchical regression in process analysis. The test was carried out in the order of hierarchy. The responses for each research variable were combined to generate the composite scores that were used in the regression analysis. The hypothesis would be supported if the effect of the interaction between innovation and Risk-taking (Xz_2) on firm performance of selected manufacturing SMEs in Ogun State, Nigeria, is statistically significant. The results of the analysis step by step are presented in Tables2a–c below.

Table2a. *Summary of hierarchical regressions for moderating effect of risk taking on the relationship between innovation and Firm Performance in Ogun State, Nigeria.*

	R	R-sq	MSE	F	df1	df2	P
	0.9508	0.9041	0.1661	1350.6509	3	430	0.000
Outcome variable: Firm Performance							

Source: *Researcher's Field Computation 2022*

Table2b. *Model of Regression analysis*

Model	*Beta*	Se	T	P	LLCI	ULCI
Constant	4.0925	0.0299	136.5516	0.0000	4.0308	4.1512
SMEs Innovation dimensions	0.5678	0.0267	21.2754	0.0000	0.5154	0.6203
Risk Taking	0.3350	0.0214	15.4741	0.0000	0.2885	0.3725
Interaction (NI*RT)	-0.0893	0.0145	-6.1623	0.0000	-0.1177	-0.0608
Outcome Variable: Firm Performance						

Source: *Researcher's Field Computation 2022*

Table2c. *Indirect effect(s) of X on Y*

	R^2 change	F	df1	df2	P
X*W	0.0085	37.9739	1	430	0.000

Source: *Researcher's Field Computation 2022*

In tables 2a, b and c, the result of the hierarchical regression model of hypothesis two which states that risk taking has no significant moderating effect on the relationship between innovation and firm performance in Ogun State, Nigeria, was presented. Result of the findings showed that when risk taking is introduced as the moderator, there is a significant increase in the relationship between innovations and firm performance of selected manufacturing SMEs. The value of R^2=0.9508, $p<0.05$ divulged that there is a 95.08% of variation in firm performance of the selected manufacturing SMEs in Ogun State, Nigeria, while ($F_{(3, 434)}$ = 1350.6509, p=0.000). This further showed that the independent variable and moderator were significant as seen in table2a.

Similarly, Table 2b, conveys a significant coefficient for innovation dimensions (β= 0.5678, t= 21.2754, $p<0.05$), indicating that there was a linear dependence as firm performance depends on innovations of selected manufacturing SMEs in Ogun State Nigeria. A unit increase in innovation dimensions variables by 0.5678 and vice versa. Risk taking was seen to be significant at β = 0.3350, t = 15.4741, $p<0.05$),which showed that risk taking had a positive and significant effect on the firm performance of selected manufacturing SMEs in Ogun State Nigeria.

When the interaction term (innovation dimensions*risk taking) was introduced, the result shows a negative and significant effect (β = -0.0893, t= -6.1623, ($p<0.05$). This is an indication that a unit change in the interaction terms will lead to a reduction in the firm performance by 0.0145 units in the selected manufacturing SMEs in Ogun State Nigeria. Table b revealed that there is no zero (*0*) between the lower-level confidence interval (LLCI) and upper-level confidence interval (ULCI) which is an indication that risk taking moderates the relationship between innovations dimensions and firm performance of the selected manufacturing SMEs in Ogun State. The result of Hypothesis two

shows that risk taking has a negative but significant moderating effect on the relationship between innovation and firm performance in selected manufacturing SMEs in Ogun State.

From Table 2c, when an interaction term was introduced of 0.009 at $p = 0.000$ ($p<0.05$), the value of *R square* changed which indicates that the interaction term (innovation*risk taking) accounts for 0.09% variation in firm performance which is statistically significant. Hence, the regression equation from the results is presented as follows:

$$FP = 4.0925+ 0.5678IN_i + 0.3350RT - 0.0893IN_i*RT+ e_i \qquad (2)$$

Where: FP = Firm Performance

IN = Innovations

RT = Risk Taking

IN*RT = Interaction of Innovation and Risk Taking

From the result above, the null hypothesis which states that risk taking has no significant moderating effect on the relationship between innovation and firm performance was rejected.

4.3. Restatement of Hypothesis Three

H₀₃: Pro-activeness and Risk-taking have no significant moderating effect on the relationship between innovation and firm performance.

Hypothesis three was tested using hierarchical regression in Process analysis. The test was carried out in the order of hierarchy. The responses for each research variable were combined to generate composite scores which were used in the regression analysis. The hypothesis would be supported if the effect of the interaction between innovation and risk-taking(Xz_2) on firm performance of selected manufacturing SMEs in Ogun State, Nigeria, is statistically significant. The results of the analysis step by step are obtainable in tables three (3).

Table3. *Summary of hierarchical regression for moderating effect of pro-activeness and risk-taking on the relationship between innovation and firm performance in Ogun State, Nigeria*

Variables	B	T	Sig.	R^2	Adj. R^2	ΔR^2	ΔF	Sig. F Change
(Constant)	0.165	1.979	0.048	0.841	0.840	0.841	2281.002	0.001
Small and Medium Enterprises Innovation	0.937	47.760	0.000					
$F (1, 432) = 2281.002$, p = 0.001								
(Constant)	0.099	1.502	0.134	0.901	0.901	0.060	262.526	0.001
Small and Medium Enterprises Innovation	0.519	17.293	0.000					
Pro-activeness	0.443	16.203	0.000					
$F (2, 431) = 1962.205$, p = 0.001								
(Constant)	0.102	1.715	0.087	0.920	0.919	0.019	99.774	0.001
Small and Medium Enterprises Innovation	0.431	15.125	0.000					
Pro-activeness	0.315	11.357	0.000					
Risk Taking	0.220	9.989	0.000					
$F (2, 493) = 1641.185$, p = 0.001								
(Constant)	.901	9.339	0.000	0.935	0.934	0.015	99.210	0.001
Small and Medium Enterprises Innovation	0.375	14.255	0.000					

Pro-activeness	0.156	5.243	0.000					
Risk Taking	0.027	0.962	0.337					
FP_PR_RT	0.010	9.960	0.000					
F (4, 429) = 1536.822, p = 0.001								
a. Dependent Variable: Firm Performance								
b. Predictors: (Constant), Small and Medium Enterprises Innovation								
c. Predictors: (Constant), Small and Medium Enterprises Innovation, Pro-activeness								
d. Predictors: (Constant), Small and Medium Enterprises Innovation, Pro-activeness, Risk Taking								
e. Predictors: (Constant), Small and Medium Enterprises Innovation, Pro-activeness, Risk Taking, FP_PR_RT								

Source: *Researcher's Field Computation 2022*

Table three (3) illustrates the hierarchical regression summary of the combined risk-taking and pro-activeness on the relationship between manufacturing innovation and firm performance of selected manufacturing SME's in Ogun state, Nigeria. In step one: innovation was regressed on firm performance of selected manufacturing SME's in Ogun state, Nigeria. The findings in table three(3) showed the result of hierarchical regression analysis for Model one (1) when only innovation and firm performance of selected manufacturing SME's are in the equation model ($R = 0.917$, $R^2 = 0.841$, Adjusted $R^2 = 0.840$, $p = 0.000 < 0.05$, $\Delta R^2 = 0.841$). These indicate that innovation accounts for 84.0% of the variability in firm performance of selected manufacturing SMEs in Ogun State, Nigeria. Further, table three(3) showed beta coefficient, β is 0.937, $p < 0.05$ when innovation is in the model. These results indicate that for every unit increase in SME innovation, firm performance of selected enterprises increased by 0.937. The overall model is also significant ($F(1,432) = 2281.432$, $p < 0.05$) as evidenced from Table 3.

The introduction of the first moderators (pro-activeness) in Model 2 significantly improves the effect of pro-activeness on the relationship between innovation and firm performance of selected manufacturing SME's in Ogun State, Nigeria ($R = 0.949$, $R^2 = 0.901$, Adjusted $R^2 = 0.901$, $p = 0.000 < 0.05$, $\Delta R^2 = 0.060$). Innovation and pro-activeness explain 90.1% of the variation (as against the 84% recorded when only innovation was in the model) in the firm performance of the selected manufacturing SME'S in Ogun state, Nigeria. The *F* value is statistically significant ($F(2,431) = 1962.205$, $p < 0.05$) that the influence of the independent variable and the moderator (pro-activeness) were significant in the model as seen from Table 3. Further, Table 3 showed the beta coefficients of innovation ($\beta = 0.519$, $p < 0.05$) and pro-activeness ($\beta = 0.443$, $p < 0.05$); that is for every unit increase in innovation and pro-activeness, firm performance of selected manufacturing SME's increases by 0.519 and increases by 0.443 respectively.

The introduction of the second moderator (risk taking), model three(3) significantly improves the effect of pro-activeness and risk taking on the relationship between innovation and firm performance of selected manufacturing SME's in Ogun state, Nigeria ($R = 0.959$, $R^2 = 0.920$, Adjusted $R^2 = 0.919$, $p = 0.000 < 0.05$, $\Delta R^2 = 0.019$). Innovation, pro-activeness and risk taking explain 91.9% of the variation as against the 90.1% recorded when only innovation and pro-activeness was in the model in the firm performance of the selected manufacturing SME'S in Ogun state, Nigeria. The *F* value is statistically significant ($F(3,430) = 1641.185$, $p < 0.05$) that the influence of the independent variable and the moderators (pro-activeness and risk taking) were significant in the model, as seen from table three (3). Further, table 3 showed the beta coefficients of innovation dimension ($\beta = 0.431$, $p < 0.05$), pro-activeness ($\beta = 0.315$, $p < 0.05$); and risk taking ($\beta = 0.220$, $p < 0.05$); that is, for every unit increase in innovation dimension, pro-activeness and risk taking, firm performance of selected manufacturing SME's increases by 0.431, 0.315 and 0.220, respectively.

In model four (4), the interaction term was introduced. All the variables of innovation, pro-activeness, risk taking, and the interaction term were entered in the regression model. The results under change statistics, reveal that the R^2 change increased by 0.015 from 0.919 to 0.934 ($\Delta R^2 = 0.015$) when the interaction variable (Innovation*Pro-activeness*Risk taking) was added. The change was statistically significant at $p = 0.0001$ (p-value < 0.05). The results show statistically significant relationship between innovation, pro-activeness, risk taking and the interaction term ($F(4, 429) = 1536.822$, $p < .05$). Table three (3) further reveals the F statistics changed from 1641.185 to 1536.822 ($\Delta F = 104.363$), showing

a decrease when interaction term was added. The *F* ratio shows that the regression of innovation, pro-activeness, risk taking on firm performance of selected manufacturing SME's is statistically significant. The interaction term showed a positive beta effect that was statistically significant (β = 0.010, $p<0.05$); that is for every unit change in interaction term, firm performance of selected manufacturing SME's in Ogun State will improve by 0.010

Summarily, the introduction of the moderators and the interaction effect all showed a positive significant effect as discussed above. The results suggest that innovation, pro-activeness and risk taking all have statistically significant moderating effect on the relationship between innovation and firm performance of selected manufacturing SME's in Ogun State, Nigeria. The confirmed regression equation from the results is stated as follows:

FP = 0.901 + 0.375SI + 0.156PR + 0.027RT + 0.010SI*(PR*RT)   (3)

Where:

   FP = Firm Performance   SI = Innovation

   PR = Pro-activeness   *RT* = Risk Taking

   SI**PRRT* = The interaction of Innovation, Pro-activeness and Risk Taking

The results indicate that pro-activeness and risk taking have combined, positive and significant effect on the relationship between innovation and firm performance (β = 0.010, *t* = 9.960, $p<0.05$). This implies that the higher the level of pro-activeness and risk taking of the selected SMEs, the higher their firm performance, other things being equal. Based on these results, the null hypothesis three (H$_{03}$) which states that pro-activeness and risk-taking have no significant moderating effect on the relationship between innovation and firm performance is hereby rejected.

5. DISCUSSION OF FINDINGS

The results of hierarchical regression analysis (Process Analysis) for the moderating effect of pro-activeness on the relationship between innovation and firm performance of selected Manufacturing SMEs in Ogun State, Nigeria, reveals significant moderating effect (β = -0.0549, *t*= -3.3014, ΔR^2 = 0.002, $p<0.05$). The result showed that pro-activeness has a negative but significant moderating effect on the relationship between innovation and firm performance. The empirical position of scholars on pro-activeness with reference to moderating effect on the relationship between innovation and firm performance of manufacturing SMEs varies. Similar to the current empirical findings, Shuangfa (2018) conveyed that pro-activeness is one of the robust predictors in explaining the variance in SMEs performance - an idea that is consistent with Justin and Patrick (2014) who demonstrate that top managers who favour innovative activities and display a high degree of pro-activeness will positively impact firm performance. Farja et al. (2016) identified that pro-activeness will strongly affect SMEs growth as well as firm expansion to international markets. In the same vein, Hao and song (2016) indicated that pro-activeness facilitate firms to be well-informed with changes in technology and regularly striving to create and integrate resources to match advancement. This establishes that the ability of SMEs to stay competitive is directly related to the concentration of pro-activeness.

Moreover, the hierarchical regression analysis for the moderating effect of risk taking on the relationship between innovation and firm performance of selected Manufacturing SMEs in Ogun State, Nigeria, indicates negative but significant moderating effect (β = -0.0893, *t*= -6.1623, ΔR^2 = 0.009, p<0.05). Conceptually, Soininen et al. (2012) assert the risk-taking effect as essential characteristic of entrepreneurial orientation. This suggests that SMEs are exposed to many risks. Belasv, et al. (2014) opined that risk represents a kind of uncertainty where it is possible to quantify the probability of different outcomes. Risk represents a danger where achieved company's results are different from the anticipated ones (it is called the measurable deviation). Risk-taking is described as the capacity of the entrepreneur to perceive risk at its inception and to find avenues to mitigate transfer or share the risk (Ogunsiji & Kayode, 2010). The result of the current study, however, revealed that risk-taking has a negative significant moderating effect on the relationship between innovation and firm performance. This is consistent with the study of Kreiser et al. (2013) who found that risk-taking and performance are negatively related. The results of panel analysis conducted by

Olawoye et al. (2016) as well showed a negative relationship between risk-taking and returns on assets as well as risk-taking and returns on equity. This demonstrates that the ability of SMEs to stay competitive is directly related to the intensity of taking risks.

Furthermore, the hierarchical regression analysis (Process Analysis) for the moderating effect of pro-activeness and risk taking on the relationship between innovation and firm performance of selected manufacturing SMEs in Ogun State, Nigeria reveal positive significant moderating effect ($\beta = 0.010$, $t = 9.960$, $\Delta R^2 = 0.015$, $p<0.05$). The result of the moderating effect revealed that pro-activeness and risk-taking have a joint significant moderating effect on the relationship between innovation and firm performance of SMEs in Ogun State. The current study relates to the empirically investigation of Eugene (2014) on the effects of entrepreneurial orientations components (risk-taking and pro-activeness on organizational learning in a manufacturing firm in Nigeria).The result of data analysis showed that entrepreneurial orientation components (risk-taking and pro-activeness) have positive and significant impact on organizational learning. This is congruent to the work of Jafar and Roland (2018) who found that risk-taking and pro-activeness have a positive effect on knowledge creation processes. This, however, positively affects firm performance and play significant roles in these relationships. Invariably, organizations need to seek the most effective formation of its innovative, proactive, and risk-taking behaviours. As each of these is present in certain form, their conformational relationship differs in different situations.

6. CONCLUSION AND RECOMMENDATION

The study generally concludes that more improvement in pro-activeness and risk-taking will enhance SMEs innovation and firm performance. The diffusion of innovation theory explains pro-activeness and risk-taking as relevant functions that have the capacity to convince most people to embrace new product, service or idea across various markets even when it negates their normal judgment. Since results thus disclosed that pro-activeness and risk-taking had individual negative significant moderating effects and positive significant combined moderating effect on the relationship between innovation and firm performance of SMEs in Ogun State, Nigeria. It is recommended that the owners and managers in manufacturing SMEs be more proactive in taking leading moves of business opportunities and also practice innovation in their operations. The study further recommends that the owners and managers of manufacturing SMEs should not be petrified in taking calculated risk, though, the requirements given to the manufacturing SMEs by the government may be rather too high interms of registration, taxes and loans obtainment. The government, on its own part, is advised to revisit and adjust its policies towards sustainability of the manufacturers, while proactive steps need to be taken towards administering desired businesses irrespective of the competing environmental context in which they exist.

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