THE MODERATING ROLE OF ENVIRONMENTAL TURBULENCE ON THE RELATIONSHIP BETWEEN ORGANIZATIONAL LEARNING AND FIRM INNOVATIVENESS

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ABSTRACT

It is generally agreed that innovation is critical to firm competitive advantage. This study evaluates the moderating role of environmental turbulence on the relationship between organizational learning and SMEs innovativeness in Kano Nigeria. Accordingly, a sample of 320 SMEs aged between 5 to 20 years from four different sectors participated in the study. Moreover, Structural Equation Modelling (using Smart PLS) approach was applied to assess the measurement model and the relationships between the constructs. Consequently, the findings show that both organizational learning and environmental turbulence have positive effect on SMEs ability to innovate. Similarly, the result demonstrates that during turbulent environment, organizational learning predicts SMEs innovativeness. The research expands the innovation literature by confirming the influence of organizational learning on SMEs innovativeness in a developing nation (Nigeria). Moreover, this finding will help managers of SMEs on how to improve their firms’ ability to innovate by considering learning culture in their respective organizations.

Keywords: Organizational Learning, Environmental Turbulence firm innovativeness, SMEs

1. INTRODUCTION

As today’s business environment becomes highly uncertain and competitive, innovation becomes a critical to firm success. Hult et al., (2004) argued that with the unpredictable managerial environment, innovativeness is one of the essential elements influencing business performance. Moreover, firm’s ability to innovate is essential to firm for achieving innovative performance (Hurley & Hult, 1998) which in turn lead to competitive advantage (Prajogo & Ahmed, 2006). Similarly, several studies proves that organizational learning inspire innovation activities (e.g. Narver & Slater, 1995). Therefore, firms should emphasize on organizational learning in their management practice. Equally important, firms innovate through continuous learning procedure which creates new technological knowledge (Nonaka
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& Takeuchi, 1995). This shows that organizational learning is critical to organizational innovativeness and success.

To date numerous body of literature within the innovation field have tried to recognise the environmental factors that influence innovative ideas and activities (Jansen et al., 2006). However, the effect of various dimensions of environmental turbulence on firm innovativeness lacks similar attention (Jahanshahi, Zhang, & Brem, 2014). Furthermore, several empirical studies conducted on the association between organizational learning and firm innovativeness however, studies regarding this relationship under different environmental situations are limited. Thus, little empirical studies have been conducted on the moderating role of environmental turbulence on the relationship between organizational learning and SMEs innovativeness.

Similarly, most of the studies of innovation focuses on large scale firms rather than SMEs. Besides, small and medium enterprises are considered a powerful engine for nation’s economic development. Consequently, in most developed and developing nations, SMEs becomes essential source of employment generation (Rahnama, Mousavian & Eshghi, 2011; Mahmood & Hanafi, 2013), and innovation (Uwalomwa & Ranti, 2009) which in turn stimulates capacity building and diffusion of skills. For example, in Nigeria over the years, SMEs offers employment opportunities to a greater percentage of above 70 percent, thus making the citizens very productive, which the result helps in capital formation (Dauda & Akingbade, 2010). Accordingly, it has been highlighted that, one of the significant ways through which SMEs are anticipated to execute these task is by involving as well as commercializing innovation (Radas & Bozic, 2009). This is because innovation might be more important for SMEs than for large firms. As Fritz (1989) argues, regarding the use of product innovation as a way of becoming competitive, SMEs outperformed their large scale counterparts. This is because “smaller firms are thought to be more innovative than larger firms for many reasons (e.g. respond faster to market shifts and needs, accept and implement change easier)” (Salavou & Avlonitis, 2008). Moreover, many large firms depend upon the creativity of SMEs. To fill the aforementioned gaps, the present study seeks to answer the following three questions: (1) does organizational learning positively related to SMEs innovativeness? (2) Does environmental turbulence positively related to SMEs innovativeness (3) does environmental Turbulence moderate the relationship between organizational learning and SMEs innovativeness?

2. CONCEPTUAL BACKGROUND AND HYPOTHESES DEVELOPMENT

2.1 Firm Innovativeness

Firm’s innovativeness manifest its competence in creating, developing and implementing novel ideas, product or process that would assist them in achieving and sustaining competitive advantage over its rivals. The essential role innovation plays in achieving competitive advantage has led firm, organizations and researchers shown more interest in the area of innovation and innovativeness (Porter, 1980). Accordingly, the research on innovativeness has led to the evolution of two different constructs. These are consumer or individual innovativeness and firm or organizational innovativeness (Kamaruddeen, Yusof & Said, 2009). The term consumer innovativeness was developed from the disciplines such as
marketing, sociology, and psychology (Clark & Goldsmith, 2006), which focus on behaviour of consumers towards adoption and purchasing new product presented into the market. While the second construct which is firm innovativeness was developed from the marketing, management and economic disciplines (Hult, et al., 2004), and tend to measure firm’s capability to innovate. Thus, the focus of this study is innovativeness at organizational level. Therefore, firm innovativeness has been defined in many ways by different authors. For example, the term according to Thomson (1965) refers to as “the generation, acceptance and implementation of innovations”. Furthermore, Lumpkin and Dess (1996) defined innovativeness as a firm’s tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological process.

2.2 Organizational Learning

In the present dynamic business environment as well as economic uncertainty, several organizations are determined to survive and remained competitive. Thus, organizational learning has been considered as one of the strategic weapons for attaining organizational success (Santos-VijandeSanchez, & Trespalacios, 2012). Despite the aforementioned vague and multidisciplinary views of organizational learning, there are some unique definitions regarding the concept. For example, most famous definition came from Fiol and Lyyles (1985), who viewed organizational learning as a “process of improving actions through better knowledge and understanding. In the same view earlier on by Daft and Weick (1984), relate the construct with the environment. According to them, “organizational learning is a process by which knowledge about action outcome relationship between the organization and the environment is developed”. According to Di Bella et al., (1996) organizational learning is the “capacity (or process) within an organization to maintain or improve performance based on experience”. To cab it up, after reviewing about seventy eight (78) definitions regarding organizational learning, Templeton et al., (2002:189) argued that organizational learning “is a set of action (knowledge acquisition, information distribution, information interpretation and organizational memory) within the organization that intentionally and unintentionally influence positive organizational change”.

2.3 Environmental Turbulence

Researchers and practitioners generally agreed that for organizations to be successful and sustain competitive advantage must assess its external environmental forces as well as making a proper response to such environment (Galbraith, 2002). However, the current environment is characterized as dynamic, uncertain and turbulence that affect organizational activities. A turbulent environment is an “environment with high degree of inter-period change that causes dynamism and uncertainty” (Samson, & Mahmood, 2015).Consequently, there are several views regarding the meaning of environmental turbulence. For example, as stated by Boyne and Meier (2009: 801), turbulence is one factor of general models of the task environment that constrains organizational behavior and performance. Khandwalla (1977) defined environmental turbulence as a “dynamic, unpredictable, expanding, fluctuating environment”; it is an environment in which the components are marked by change. Emery and Trist (1965) characterized the turbulent environment as one that has a high rate of
“interconnectedness with the organization together with a high degree of change in the environment itself”. In the same way, Baburoglu (1988) attribute environmental turbulence “as an environment with increased complexity, relevant uncertainty, and dynamic and unexpected directionality of occurrences in a transitional state”.

However, some authors view environmental turbulence from three different dimensions which include: “technological turbulence, competitive intensity and market turbulence” (Ottesen & Grønhaug, 2004). Technological turbulence refers to the “rapid pace and the amount of unpredictability of change in technology within an industry” (Slater and Narver, 1994, p. 51); competitive intensity refers to the strength of competition a firm face up within a given industry it operate (Paladino, 2007); and market turbulence “refers to the extent and volatility of changes in the composition, behavior and preferences of customers” (Kohli and Jaworski, 1990; Slater and Narver, 1994).

2.4 Organizational Learning and Firm Innovativeness

Current digital economics and business necessitate the creation, sharing and application of knowledge and expertise (Brockman, Beverly and Morgan, Robert, 2003). Lemon and Sahota (2004) also confirmed that mastery of knowledge can increase the ability for innovation and is gradually accepted as a key resource for innovation. Organizational learning (OL) is an increasingly significant field of study that determine how organizations learn and therefore improve their levels of “competitive advantage”, “innovativeness”, as well as effectiveness. Thus, firms must ensure the employee to continue absorbing new knowledge, and sustaining an internal eminent knowledge management system, because knowledge is the key that combines organizational learning and innovative activities. It is clear that when one view both learning as well innovativeness in an organization, the working environment is an extremely essential determining factor in terms of organizer or “inhibitor of learning and creative behaviour on the job” (Van der Sluis, 2004).

To date several studies explained organizational learning and its influence on firm innovativeness. For example, according to the study conducted by Liao et al. (2008) after they collected data from “government organizations, as well as state-run and private firms in Taiwan Province”, their result show the positive impact of organizational learning on innovation. Furthermore, Jiménez-Jiménez and Sanz-Valle (2011) simultaneously examined the relationship between organizational learning, innovation and performance and they found that firm innovativeness was predicted by organizational learning. In the same token using the sample of 150 SMEs in Banyumas Regency in Indonesia, Rahab and Sudjono (2012) depicts a positive result between “market orientation and organizational learning” on SMEs “innovativeness”.

Based on the aforementioned discussions, the present study propose the following hypothesis:

**H1**: There is a positive relationship between organizational learning and SMEs innovativeness

2.5 Environmental Turbulence and Firm Innovativeness

The relationship between environmental turbulence and organizational learning has been found in several studies. Some of these include; Uzkurt et al., (2012) who conducted a study
among 156 SMEs in Turkey. Environment turbulence were used as independent variable predicting firm innovativeness. The result of their study discloses that “market or demand turbulence and technological turbulence have a positive consequence on the innovativeness of SMEs”. However, regarding the product innovativeness it is believes to be high during turbulent situation. This was proved by Calantone, Garcia and Droge (2003) who studied four different industries. Their finding shows that during technological turbulence the route form innovativeness to “strategic planning and from risk-taking to new product development is very speed. Thus, turbulence environment predict innovativeness as well as new product development. Similarly this result was later confirmed by Denneels (2011) who used the sample of 145 U.S firms. The finding of the study reveal that the “relationship of willingness to cannibalize with explorative products is stronger under customer turbulence”. While in In contrast, the relationship of “future-oriented market scanning with explorative products” appeared to is weak during customer as well as competitive turbulence and stronger under technological turbulence. Therefore environmental turbulence helps organization regarding explorative product. Consequently, this study proposes the following hypothesis:

H2: Environmental turbulence is positively related to firm innovativeness

2.6 Environmental Turbulence as a Moderator

Environmental turbulence organizational learning relationship, researchers conducted several studies. For instances, Srivastava and Frankwick (2011) conducted a conceptual paper regarding this relationship. The authors proposed that, “for organizational learning to take place, both top management attitude toward learning and environmental turbulence will affect the way organizational learning takes place”. Furthermore, it has been expected that under market turbulence, the value of learning orientation rise. This is due to the fact that it can deliver variety of ideas that widen the number of possible, valuable as well as profitable actions in organizational settings (Moorman & Miner, 1997). Thus, under high rate of market turbulence, orientation towards learning facilitates firms to increase organizational innovativeness and performance.

Accordingly, empirical evidence proved that. For example, using a sample of 200 supply management professionals Hanvanich, Sivakumar and Hult (2006) revealed that, under turbulence situation, organizational learning orientation is related to firm innovation and performance. In the same way, Lichtenthaler (2009) confirm that dynamic capabilities are essential during high rate of technological and market turbulence. Thus, environmental Turbulence improve learning process. Moreover, Ko and Tan (2012) survey of 66 technology-based entrepreneurs in China and their findings revealed that under environmental turbulence that knowledge transfer was positively related to firm innovation. Based on the above discussions the present study propose the following hypothesis:

H3: Environmental turbulence moderates the relationship between organizational learning and firm innovativeness.

Research Framework
3. METHODOLOGY

3.1 Measures
Firm innovativeness is operationalized as the firms’ openness mind and willingness to accept new idea that becomes part of firm’s culture to conduct business. Accordingly, firm innovativeness was measured using five items adopted from Lee and Tsai (2005) which were initially developed by Hurley and Hult, (1998). Organizational learning scale was adopted from Lee and Tsai (2005 and lastly the scale of environmental turbulence was adopted from Lichtenthaler (2009).

3.2 Sample and Data Collection
The data collection process took place within Small and Medium Enterprises (SMEs) located in Kano state Northwest Nigeria. Accordingly, 320 owner/manager of SMEs participated in the study. Respondents were given self- administered questionnaires to assess the level of human capital and innovativeness in their respective organizations. Personal visits and telephone contacts help researchers retrieve 253 (79%) questionnaires which filled up by owner/ manager of SMEs. These SMEs comprises of 190 from manufacturing, 23 from agricultural sector, and 40 from service industries. Moreover, these sectors were represented by several areas.

4. RESULT

4.1 Measurement Model
We used composite reliability to assess internal consistency reliability of the constructs (Hair et al., 2011). Following Hair et al., (2011)’s rule of thumb of threshold of 0.7 and above, we retained 3 items each for organizational learning and environmental turbulence while 4 items were retained for firm innovativeness (Figure 1). In addition, the result of indicator reliability of each latent construct was greater than the minimum of 0.7 (Hair et al., 2011).

Fig. 1: Measurement Mode
Similarly, convergent validity was test using average Varience Extracted (AVE). Accordingly, the result demonstrate sufficient convergent validity as the AVE of each construct exceed 0.5 (Hair et al., 2011). (Figure 1). Lastly discriminant validity was assessing using “Heterotrait-Monotrait (HTMT) ratio (Henseler, Ringle and Sartedt, 2015).
Consequently, the result (Table 1) demonstrates that the discriminant validity has been established as the values of the correlations among the constructs are less than 0.85 (Henseler et al., 2015).

**Table I: Heterotrait-Monotrait(HTMT) Ratio Criterion of Discriminant Validity**

<table>
<thead>
<tr>
<th></th>
<th>FIN</th>
<th>OGL</th>
<th>EVT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm Innovativeness</td>
<td>.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational Learning</td>
<td></td>
<td>.83</td>
<td>.75</td>
</tr>
<tr>
<td>Environmental Turbulence</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

**4.1 Structural Model**

In previous section the measurement model has been discussed, therefore, this section evaluates the structural model of this study. The main assessing criteria for structural model are R-square (R²) measure, predictive relevance (Q²) effect size (f²), and the level of significance of the path coefficient (Hair et al., 2011). Therefore, this study used a standard bootstrapping process whereby creating a huge samples i.e. 5,000 (Hair et al., 2011; Hair et al., 2014), and 253 cases to evaluate significance of the path coefficients. In Table II, below the R² value of endogenous latent variable is presented.

**Table II: Variance Explained in the Endogenous Latent Variables**

<table>
<thead>
<tr>
<th>Latent Variable</th>
<th>Variance Explained (R²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm Innovativeness</td>
<td>44%</td>
</tr>
</tbody>
</table>

The result shows that the present research model explain about 44% of the total variance in firm innovativeness. This advocates that organizational learning and environmental turbulence jointly explained 44% of the variance in firm innovativeness. Thus, this result demonstrates an acceptable R² value which considered as moderate (Hair et al., 2011). Moreover, f-square (f²) can be assess to see whether the influence of a particular independent latent variable on dependent latent variable is essential. Therefore, Table III presents the assessment of effect size (f²) of this model.

**Table III: Effect Sizes (f-Square) of the Latent Variables Based on Cohen’s (1988) Recommendation**

<table>
<thead>
<tr>
<th>Latent Variable</th>
<th>f-square (f²)</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational Learning-&gt; Firm Innovativeness</td>
<td>.11</td>
<td>Small</td>
</tr>
<tr>
<td>Environmental Turbulence-&gt; Firm Innovativeness</td>
<td>.33</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

As presented in Table III above, the effect size of organizational learning and environmental turbulence on firm innovativeness are .11 and .33 respectively. Thus, consisted with the rule of thumb Cohen’s (1988), the effect size of these exogenous latent variables on firm innovativeness can be regarded as small and moderate individually. Similarly, the assessment of predictive relevance is presented in Table IV and the result shown that endogenous latent construct’s Q² is greater than zero, thus indicating predictive relevance of the model has been achieved (Chin, 1998; Henseler et al., 2009).

**Table IV: Cross Validated Redundancy**

<table>
<thead>
<tr>
<th>Latent Variable</th>
<th>SSO</th>
<th>SSE</th>
<th>Q² (=1-SSE/SSO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm Innovativeness</td>
<td>968.00</td>
<td>735.814</td>
<td>.24</td>
</tr>
</tbody>
</table>
Lastly, the following causal paths stated in the hypothesized model were found to be statistically significant (Table V): from organizational learning to firm innovativeness ($\beta=0.24 \ t=3.22 \ P<.001$), environmental turbulence to firm innovativeness ($\beta=0.43 \ t=6.45 \ P<.001$); environmental turbulence as a moderator ($\beta=0.31 \ t=1.54 \ P<.06$).

**Table V: Structural Model assessment**

<table>
<thead>
<tr>
<th>Path</th>
<th>Original Sample</th>
<th>Std. Deviation</th>
<th>T-Statistics</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational Learning-&gt;firm innovativeness</td>
<td>0.24</td>
<td>0.07</td>
<td>3.22</td>
<td>0.00*</td>
</tr>
<tr>
<td>Environmental turbulence-&gt;firm innovativeness</td>
<td>0.43</td>
<td>0.06</td>
<td>6.45</td>
<td>0.00*</td>
</tr>
<tr>
<td>Organizational Learning-&gt;Environmental Turbulence-&gt;Firm Innovativeness</td>
<td>0.31</td>
<td>0.20</td>
<td>1.54</td>
<td>0.06**</td>
</tr>
</tbody>
</table>

Note:* significant at 1% level ** significant at 10% level

5. DISCUSSION

The aim of this paper was to design, present, and tests the model examining the relationship between organizational learning and SMEs innovativeness: moderated by environmental turbulence. Our findings demonstrates that organizational learning positively affect firm innovativeness. This means that the higher the organizational learning employed by SMEs, the better for firm to be innovative. Moreover SMEs that have sustainable firm’s orientation towards “organizational learning” will increase firms’ innovative activities both effectively and efficiently. Thus, to achieve innovative capability and innovative performance firms need to adopt learning culture. This result is consistent with previous findings (Rahab, 2012; Tohidi et al., 2011).

Furthermore, regarding environmental turbulence innovativeness relationship, our result found a positive link between the constructs. This indicates that during turbulent environment innovativeness believe to be high. In other word, the more the rate of environmental changes and difficulties the better for the firms to be responsive regarding these changes (Gaur, Vasudevan & Gaur, 2011). This result is consistent with previous findings (e.g. Subramaniam & Gopalakrishna, 2001; Jahanshahi, Zhang and Brem 2014). Lastly, our finding revealed that environmental turbulence moderate the relationship between organizational learning and SMEs innovativeness. Specifically the result shows that for organizational learning to take place, both top management attitude toward learning and environmental turbulence will affect the way organizational learning takes place”. Furthermore, it has been expected that under market turbulence, the value of learning orientation rise. This is due to the fact that it can deliver variety of ideas that widen the number of possible, valuable as well as profitable actions in organizational settings (Moorman & Miner, 1997). Thus, under high rate of market turbulence, orientation towards learning facilitates firms to increase organizational innovativeness and performance. Thus, under turbulence situation, organizational learning orientation is related to firm innovation and performance. This findings confirm the results of earlier studies (e.g. Hanvanich, Sivakumar and Hult 2006; Lichtenthaler (2009).

6. CONCLUSION AND IMPLICATION

It is generally agreed that innovation is a critical factor in firms’ performance and survival as a result of the growth of the competitive and uncertain environment (Wheelwright and Clark, 1992). Therefore it is vital to understand organizational condition that lead to firm innovative
capabilities. Accordingly, researchers consider organizational learning as one of the factors that influence firm innovativeness. However, empirical studies regarding this link are limited. In addition, studies regarding this relationship under different environmental situations are also limited. Consequently, the relationship between the constructs was analysed. Accordingly, the finding revealed a positive influence of organizational learning and environmental turbulence on SMEs innovativeness. Similarly, the result shows that during turbulent organizational learning predict innovativeness. Thus this study contributes to the innovation literature by confirming that OL and ET influence SMEs innovativeness. The findings of this research provide valuable information that could be used to make enhancements in organizational practices. Thus, when seeking to increase firm innovative capabilities, practitioners should take into account the improvement of learning orientation in the organizations.

REFERENCES


