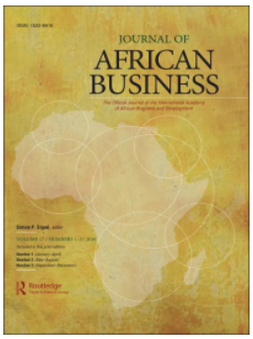

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Symbiotic Resonance, Nexus of Generative Influence, Ecologies of Innovation and Opportunity Exploitation among Small and Medium Enterprises

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ABSTRACT

This paper used a quantitative cross-sectional survey design to collect data from 228 small and medium enterprises (SMEs) in Uganda to test the mediating role ecologies of innovation in the relationship between symbiotic resonance, nexus of generative influence and opportunity exploitation, but also, the moderating role of firm size in the relationship between symbiotic resonance and ecologies of innovation. The mediated – moderated hypotheses were tested through Partial Least Square Structural Equation Modeling (PLS-SEM) using SmartPLS version 3.3.0. The study found that ecologies of innovation positively and significantly mediate the relationship between nexus of generative influence and opportunity exploitation. Additionally, we confirmed that firm size moderates the relationship between symbiotic resonance and ecologies of innovation. Managers of SMEs and policy makers should pay more attention to situations where the owner/manager can act as a leader to influence employees positively, create an enabling environment, provide feedback, allow employee to deviate from norms.

KEYWORDS

Symbiotic resonance; nexus of generative influence; ecologies of innovation; opportunity exploitation; firm size; SMEs

1. Introduction

Globally, entrepreneurial opportunities exist and individuals need to recognize them because they are vital in the success of Small and Medium Enterprises (SMEs). Opportunity exploitation (OE) leads to economic growth of economies (Ge, Sun, Chen, & Gao, 2016). SMEs that thrive in a competitive environment learn to explore and exploit opportunities in an industry (Farsi & Toghraee, 2014). OE is characterized by developing a product or service based on a perceived entrepreneurial opportunity, acquiring appropriate resources, understanding customers and the market, and setting up the organization (Kuckertz, Kollmann, Krell, & Stöckmann, 2017). SMEs in developed and developing economies face a challenge of OE decision when evaluating an opportunity which is normally

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influenced by both the nature of the opportunity and the individual differences. Businesses at times are challenged with opportunity's expected return, costs, length of life as well as demand. While individual challenges are associated with how much risk an entrepreneur is willing to take in the process of exploiting an opportunity (Shane & Venkataraman, 2000).

Entrepreneurship scholars have explored a range of factors that influence opportunity exploration and exploitation, such as, search (Herron & Sapienza, 1992; Kaish & Gilad, 1991), information asymmetry (Hayek, 1945; James, 2015), prior knowledge (Haynie, Shepherd, & McMullen, 2009; Shane, 2000), experiential learning (Corbett, 2005) and social networks (Granovetter, 1973; Singh, Hills, Hybels, & Lumpkin, 1999) showing their importance in increasing the likelihood that opportunities can be explored and exploited by alert entrepreneurs. Prior research assumed that entrepreneurs typically identify and assess a single opportunity at a time (Gruber, MacMillan, & Thompson, 2008). Successive research, however, has found that firms often identify multiple potential opportunities simultaneously, and may compete for resources (Gruber, MacMillan, & Thompson, 2013). Previous researchers have conceptually and empirically studied symbiotic resonance, nexus of generative influence, ecologies of innovation, and opportunity exploitation in big organizations (Lindhult & Hazy, 2016). However, these studies have ignored SMEs and also concentrated on the direct relationships. Although some of the studies report direct effects on opportunity exploration and exploitation, content on the relationships are more complex, with various factors either mediating or moderating linkages. Our contribution to this study is the introduction of ecologies of innovation as mediator between symbiotic resonance and nexus of generative influence in predicting opportunity exploitation. It is further assumed that, firm size moderates between symbiotic resonance and opportunity exploitation among SMEs in Uganda.

Contextually, Uganda is highly endowed with natural resources. The major contributing sectors to Uganda's economy are agriculture 24.2%; industry 25.5%; and services 50.3% (Uganda Investment Authority, 2016). Although Uganda has enormous opportunities, a few have been exploited. In Uganda, over 50% of all SMEs close shop before they celebrate their second birth day (Turyahikayo, 2015). The Ugandan economy need leaders of influence who can create a conducive environment for employees to explore and exploit the colossal opportunities.

Therefore, the main objective of the study is to examine the moderated- mediated relationship between symbiotic resonance, nexus of generative influence, ecologies of innovation and opportunity exploitation among SMEs. The results were achieved through a cross sectional survey of 228 SMEs in Uganda. The findings confirm that ecologies of innovation positively and significantly mediate the relationship between nexus of generative influence and opportunity exploitation. Furthermore, firm size moderates the relationship between symbiotic resonance and ecologies of innovation founded on Complexity System Leadership Theory.

The rest of the paper is structured as follows: it begins with theoretical underpinnings of this study, followed by literature review, methodology, results, discussion, conclusion, limitations, and areas for further research.

2. Theoretical framework and literature review

2.1. Theoretical framework

Complexity System Leadership Theory (CSLT) is used to inform this study. It posits that higher levels of innovation could only be achieved through the emergent eco-systems within ecologies of innovation. This could be made possible through interactions with symbiotic behavior across the business setup (Goldstein, Hazy, & Lichtenstein, 2010; Lindhult & Hazy, 2016). The unfolding-series of event alertness tend to stimulate opportunity-tension, trigger opportunity-recognition, prompt opportunity-evaluation, and consequently opportunity-exploitation [opportunity- 'TREE'] (Kibirango, Munene, Balunywa, Balunywa, & Obbo, 2017). Simultaneously being a facilitator, negotiator, innovator, coordinator or a problem solver, a leader must often play contradictory and paradoxical roles in order to ensure that organization adjusts to the arising circumstances to exploit opportunities as they arise. CSLT as an individual theory can predict multiple possible outcomes. The theory explains symbiotic resonance, nexus of generative influence, ecologies of innovation and opportunity exploitation amidst bureaucratic rules, procedures and culture of employee submissiveness (Heskett, 2011; Lindhult & Hazy, 2016). The study is guided by the conceptual framework below.

2.2. Literature review

2.2.1. Symbiotic resonance, ecologies of innovation and opportunity exploitation

Symbiotic resonance (SR) shapes divergent, unified, fragmented, emergent forms, and creative functions of participants in the opportunity space, resulting in entrepreneurial opportunities for exploitation (Schindehutte & Morris, 2009). SR refers to processes of social interaction whose progression is dynamically shaped in an entanglement of moving and being-moved, affecting and being-affected (Hazy & Uhl-Bien, 2015). This affective interplay is experienced by the involved interactants as a gripping dynamic force, which is highly sensitive to the concrete relational and situational configuration. SR facilitates ecologies of innovation (EoI) which creates quality interaction of the individuals with different backgrounds and different sets of experiences work together for a common goal like exploring, evaluating, and OE (Mühlhoff, 2014).

Acton, Foti, Lord, and Gladfelter (2019) stated that, dissonant leadership styles are often misapplied, but can be useful in particular situations like pace setting and commanding, depending on the situation at hand. However, they emphasize the need for leaders to focus on developing more positive resonant styles to build SR among team members to exploit opportunities. Resonant leaders are able to control not only their own emotions but those of the people they lead, while concurrently building strong and trusting relationships that enhance OE (Mühlhoff, 2014; Rosing & Zacher, 2017).

Tiwari and Lenka (2015) argue that resonant leaders who ensure that employee contributions get acknowledged and valued are likely to contribute to EoI. However, Mayanja, Ntayi, Munene, Kagaari, and Waswa (2019) observed that for resonant leaders to infuse positive emotions among employees to drive their best efforts to accomplish goals, they should be role models. They should invest relational energy to stimulate employees' emotional resilience. The debate is how SR leaders are nurtured to have that

power of influence and how they develop their own resilience. This is in line with CSLT which states that leaders who influence employees in complex environments are likely to adopt to the changing situations and exploit opportunities.

Goldstein et al. (2010) assert that developing a high degree of SR interaction and not competition, require individuals with different backgrounds and different set of experiences connect with others in a very meaningful way to access required resources to exploit opportunities. Employees who are encouraged to talk to each other about new ideas are likely to work together to develop strategies of OE. SR leaders develop mechanisms for evaluating, selecting and pursuing new ideas for innovations that could be useful for OE to achieve competitive advantage (Baltaci & Balcı, 2017). However, Lindhult and Hazy (2016) posits that resonant leaders are more likely to explore and exploit opportunities without necessarily creating EoI. This study therefore extends the discussion by introducing EoI as a mediator between SR and OE among SMEs. In this study, we hypothesize that:

H1a: *Symbiotic resonance significantly relates to opportunity exploitation*

H1b: *Symbiotic resonance significantly relates to ecologies of innovation*

H1c: *Ecologies of innovation significantly relates to opportunity exploitation*

H1d: *Ecologies of innovation mediates the relationship between symbiotic resonance and opportunity exploitation*

2.2.2. Nexus of generative influence, ecologies of innovation and opportunity exploitation

Nexus of generative influence (NGI) is the process of innovation not led by any one individual but emerges through an unfolding series of events at every level of the organization (Hazy & Uhl-Bien, 2015). NGI, is a complexity dynamic process that emerges in the interactive "spaces between" people and ideas. It is dynamic and goes beyond the competencies of individuals alone, it is the product of interaction tension, adaptive tension and restrictive tension that govern changes in perceptions and understanding of opportunities (Mayanja, Ntayi, Munene, Wasswa, & Kagaari, 2020). Goldstein et al. (2010) state that, NGI plays a significant role in facilitating an environment that is conducive for the exploration and experimentation of unfolding series of events emerging at every level in the business to foster the emerging novelty of new routines, methods, processes and ecosystems compliance. Leadership is vital in creating EoI which is likely to drive by all the exchanges, interchanges, interactions, and connectivities existing between its subsystems (de Vasconcelos Gomes et al., 2016; Lindhult & Hazy, 2016).

It is through experimentation and exploitation that innovation grows through interactions and feedback (McMillan, 2008). NGI makes these events to be known, gets selected, and is then reinforced through a series of additional events (Kibirango et al., 2017). Shane and Venkataraman (2000) argue that, although the discovery of an opportunity is a necessary condition for entrepreneurship, it is not sufficient. Subsequent to the discovery of an opportunity, a potential entrepreneur must decide to exploit the

opportunity through EoI. Mayanja et al. (2019) posits that business owner/manager may deliberately disregard creating EoI for employees to interact and exploit opportunities since their businesses sometimes survive without a moderated environment.

Kibirango et al. (2017) assert that leaders play a vital role in creating enabling environment like flexible policies, flat structures, employee interactions, allowing employees to deviate from the norms to come up with new ways of doing things in an organization. It is the enabling environment that helps business owners/ managers to learn from employee interactions to explore and exploit opportunities at a minimal cost (Jarvis, 2016). Shamsudeen, Keat, and Hassan (2017) suggest that if entrepreneurial opportunity is recognized, the exploitation of such opportunity will lead to entrepreneurial success. Individuals who discover an opportunity using employee interactions with enabling environment, identify links, are likely to take economic advantage of the opportunity (Fonfara, Ratajczak-Mrozek, & Leszczyński, 2018). This study contributes to literature gap by examining moderated- mediated effect of EoI in the relationship between NGI and OE among SMEs in developing economies, hence the hypotheses of study:

H2a: *Nexus of generative influence significantly relates to opportunity exploitation*

H2b: *Nexus of generative influence significantly relates to ecologies of innovation*

H2c: *Ecologies of innovation significantly mediates the relationship between nexus of generative influence and opportunity exploitation*

2.2.3. Firm size, symbiotic resonance and ecologies of innovation

The firm size measurement can be carried out in several methods namely through sales, employees, assets or value add features (Dang, Li, & Yang, 2018). Klepper (1996) states firm size as an important factor for big firms to survive through product and process innovations. Firm size influence what kind of SR may occur in any interaction. Large firms are viewed to be more effective with their innovation (Knott & Vieregger, 2015). Zadeh and Eskandari (2012) argue that small firms are more productive with their research and development because they rely on governance advantages. Having fewer employees implies decision makers are closer both to the technology as well as the customer, thus they can better link with market needs. This perspective dramatically expands the potential for creativity, influence, and positive change in an organization (Lichtenstein & Plowman, 2009). We therefore posit that higher levels of innovation and OE could be moderated by firm size.

The innovation ecology partly depends on the presence of elements like talent, capital, but even more so on their identities, meaning, networking capabilities, culture of trust, and pragmatic cooperation. Thus, in this respect, EoI approach is supplementary rather than contradictory to the approach of "systems of innovation" because conventional logic suggests that the elements have to be established before one can talk about their linkages (Smorodinskaya, Russell, Katukov, & Still, 2017).

In modern-day business, SR is touted to be associated with superior innovation. Symbiotic relationships have access to external technical expertise which is crucial and gives the firm access to market information which is useful for opportunity recognition

and exploitation (Hazy & Uhl-Bien, 2015). The current study contributes to the extant literature by exploring the mediating effect of EoI in the relationship between SR and OE. Also, firm size moderates the relationship between firm SR and EOI, leading to the study hypothesis:

H3a: *Firm size significantly relates to ecologies of innovation*

H3b: *Firm size moderates the relationship between symbiotic resonance and ecologies of innovation*

3. Methodology

3.1. Research design, population, sample size and data collection

This study adopted a positivistic paradigm and quantitative cross-sectional survey to obtain valid response from 228 out of a sample of 384 (Krejcie & Morgan, 1970) determined from 93,117 SMEs in categories of trade, services, and manufacturing sector based in Kampala district, Uganda (Uganda Bureau of Statistics, 2013). Based on stratified random sampling and nature of SMEs, the k^{th} business (238) was determined and used to select the sample of 384 SMEs that have been in operations for more than one year, with more than five employees, and capital base above US$10,000 in Kampala because it is a business hub in Uganda with a high business concentration. Conclusions are anchored on SMEs while responses are from owner/managers as they are deemed key in opportunity exploration and exploitation. Out of 800 questionnaires distributed to 400 SMEs, 456 valid questionnaires were received equivalent to 228 SMEs. The distribution of questionnaires to 400 SMEs was to control for non-response bias associated with surveys. We determined the required sample size for this study by performing an *a priori* power analysis using G*Power 3.1 software (Faul, Erdfelder, Lang, & Buchner, 2007). As the response 228 was below the sample of 384. With type-1 error probabilities set to 0.05, a sample size of 111 was required to reach abundant statistical power of 80% for a moderate effect size of 0.309. Therefore, the sample size of this study was deemed adequate for the results of the statistical method to be sufficiently robust (Hair, Sarstedt, Ringle, & Gudergan, 2017). Potential non-response bias was tested by comparing early and late responses for all items using t-test. The results suggested no significant differences between the early respondents and the late respondents ($p < 0.05$). A non-response bias was not problematic.

3.2. Measurement of variables

To operationalize and measure the study variables, references were made to theoretical and empirical works of previous scholars. Each variable was measured as reflective items adapted to fit the study context from previous scholarly works. SR was measured according to Kibirango et al. (2017) and Uhl-Bien et al. (2008); NGI (Hazy & Uhl-Bien, 2015), Kibirango et al. (2017); EoI (de Moura & Adler, 2011; Goldstein et al., 2010); OE (Hazy, 2006; Vissa, 2012), while firm size (Goel & Jones, 2016). All questions were

anchored on six-point Likert scale to avoid a middle point ranging from 1 (never/certainly not) to 6 (always/without fail). We also adapted previously tested item to suit the study context (Podsakoff, MacKenzie, & Podsakoff, 2012).

3.3. Common methods bias

To control for the effect of type I and type II errors, anxiety, social desirability and acquiescence of the study conclusions, some questions were reverse scored, ensure simplicity of the items to the reader (Lamoureux, Pallant, Pesudovs, Hassell, & Keeffe, 2006; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Additionally, respondents were carefully selected (Harrison, McLaughlin, & Coalter, 1996), defined unfamiliar terms, removed vague concepts, kept questions simple, specific, and concise, to avoid multiple meanings (Tourangeau, Rips, & Rasinski, 2000). Finally, responses were obtained from various SMEs; 85 of the respondents were from services, 102 from trade, and 41 from manufacturing. Among the sample respondents, 91.3% were managers. The SMEs that had existed more than 9 years, were 36%, indicating adequate informant knowledge about the attributes of OE in line with Mitchell et al. (2002).

3.4. Data collection and management

We checked for missing values, out of range values, and outliers using descriptive statistical analysis (Hair, Black, Babin, & Anderson, 2010) and Little MCAR test to determine whether data were missing completely at random. The Little MCAR test yielded a Chi-Square = 58.325, DF = 58, Sig. = .463. Since the MCAR test was greater than 0.05, implying that remedial action could be applied (Little & Robin, 2002). Furthermore, descriptive results showed that the missing values were 854 (1.026%), implying the missing values were less than 5% within the replacement region. Consequently, the missing values were replaced using linear interpolation method (Field, 2009). Data were imported from SPSS into Smart PLS software version 3.3.0 to enable the researcher run the reflective measurement models using PLS-A mode to assess reliability and validity of the study variables.

3.5. Measurement model validation

Reliability was assessed in terms Cronbach's alpha coefficient and composite reliability above 0.70. The results indicate that both alpha and composite reliability values were greater than 0.70 as recommended by Hair et al. (2010) (see results in Table 1). While construct validity was assessed in terms of convergent and discriminant validity. Convergent validity was achieved by considering items with a standardized loading above .708 and study variable average variance extracted (AVE) greater than 0.5. Results in Table 1 below indicate that all reflective items have a standardized item loading ranging between 0.720 and 0.782 and all study variables have AVE values ranging from 0.539 to 0.593. Hence, all two conditions for convergent validity were met.

Table 1. Measurement model results for reliability and validity.

Variable	Variable	Measures	Standardized Item Loading	VIF	α	CR	Communality (AVE)
Study construct	OE	Business Plans help in identifying and exploring business opportunities (EOEV1)	0.764	1.843	.815	.870	.573
		Strategic decisions are made in the interest of this organization (EOEV2)	0.776	1.721			
		There is evidence of use of new ideas (processes) (EOEX1)	0.764	1.847			
		There is evidence of ambitiousness, determination, aggressiveness (EOEX2)	0.752	1.730			
		There is evidence of passion (EOEX4)	0.728	1.375			
	NGI	Top leaders develop mechanisms for evaluating, selecting, and pursuing innovations (NGIE10)	0.756	1.409	.763	.849	.585
		Time is set aside to mentor subordinates for quality ideas and new ways of doing things (NGIE7)	0.767	1.499			
		Top leaders ensure time for creativity and innovation (NGIE8)	0.782	1.626			
		Top leaders provide precise explanations of what is expected from employees' interactions for the work outcomes (NGIE9)	0.753	1.397			
	EoI	I have observed new processes in this organization (EIID2)	0.772	1.440	.716	.824	.539
		I have noted new systems in this organization (EIID3)	0.727	1.380			
		There are practices that promote healthy interactions and communication among employees (EINR2)	0.716	1.389			
		There are strategies in place that facilitate entities and systems to promote innovation (EINR3)	0.720	1.453			
	SR	Leaders help employees to attach common or shared understanding of the system's generated specific events (NGSR1).	0.799	1.375			
		Top leaders use art to attach meaning and purpose to whichever event emerges (NGSR2).	0.765	1.404	659	814	.593
		Leaders foster the creation of new shared conceptions in the mind-sets of employees (NGSR4).	0.745	1.182			

Table 2. Discriminant validity of the study variables: Fornell-Larcker Criterion.

Study Variable	1	2	3	4	5	6
NGI (1)	**.765**					
SR (2)	.408	**.770**				
EoIs (3)	.438	.446	**.734**			
Nature of the firm (4)	.105	.076	−0.045	-		
Moderating Effect 1 (5)	.104	.021	−0.075	.019	-	
OE (6)	.263	.446	.505	−0.092	.033	**.757**

Table 3. Discriminant validity of the study variables: Heterotrait-Monotrait Ratio (HTMT).

Study Variable	1	2	3	4	5	6
NGI (1)						
SR (2)	.565					
EoIs (3)	.584	.643				
Nature of the firm (4)	.120	.125	.084			
Moderating Effect 1 (5)	.119	.053	.124	.019		
OE (6)	.323	.464	.643	.108	.079	

3.5.1. Discriminant validity

To know whether we are dealing with distinct variables, three criteria were used (1) Fornell and Larcker (1981) where the square root of average variance extracted (AVE) by each construct should exceed the inter-construct correlation; (2) Heterotrait-monotrait (HTMT) correlation ratio of less than 0.85 was considered as recommended by Hair et al. (2012) and Henseler, Ringle, and Sarstedt (2016). The results show that all the two conditions for discriminant validity were met as square root of the AVE is significantly larger than any correlations involving the construct, indicating that all constructs share greater variance with their own measures than with other constructs. Besides, all the HTMT values were less than 0.85 in Tables 2 and 3.

4. Data analysis, results and discussion

4.1. Demographic characteristics

The results indicate that 44% of businesses were in trade 37.3% in services while 18% in manufacturing. In terms of existence, 36% had existed for more than 9 years. 91.3% and 8.7% respondents were managers and business owners respectively. Additionally, 62.4% of the respondents were male while 37.6% were female. The results also, reveal that 55.7% responses were from owners or managers aged between 30 years and 39 years, 44.8% respondents had worked with the SMEs between 3 years and 6 years while 83.3% of the owners and managers had attained a university degree, implying that business owners/managers were able to give valid responses about opportunity exploration and exploitation.

Table 4. Study variable correlations.

Study Variable	1	2	3	4	5	6
NGI (1)	**1.000**					
SR (2)	.408***	**1.000**				
Eols (3)	.438***	.446***	**1.000**			
Firm size(4)	.105	.076	−0.045	**1.000**		
Moderating Effect 1 (5)	.104	.021	−0.075	.019	**1.000**	
OE (6)	.263***	.353***	.505***	−0.092	.033	**1.000**

***, **, * significance level at 0.001, 0.01, 0.05 (one-tailed).
Moderating effect (SR*firm size).

4.2. Bivariate analyses

The zero-order correlations were done to establish the significance associations among the study variables in Table 4. We established that there were positive and significant associations amongst the study variables SR and OE; SR and EoI; EoI and OE; NGI, OE and EoI enabled us to proceed testing the hypotheses, as is required.

4.3. Direct relationships testing

We tested for the significance of hypothesized theoretical model (Figure 1) through PLS-SEM (Figure 2) and bootstrapping using 5000 sub-samples at 95% confidence interval (Hair et al., 2017). In the sections below, the direct path results of the study variables are presented and discussed (see Table 5).

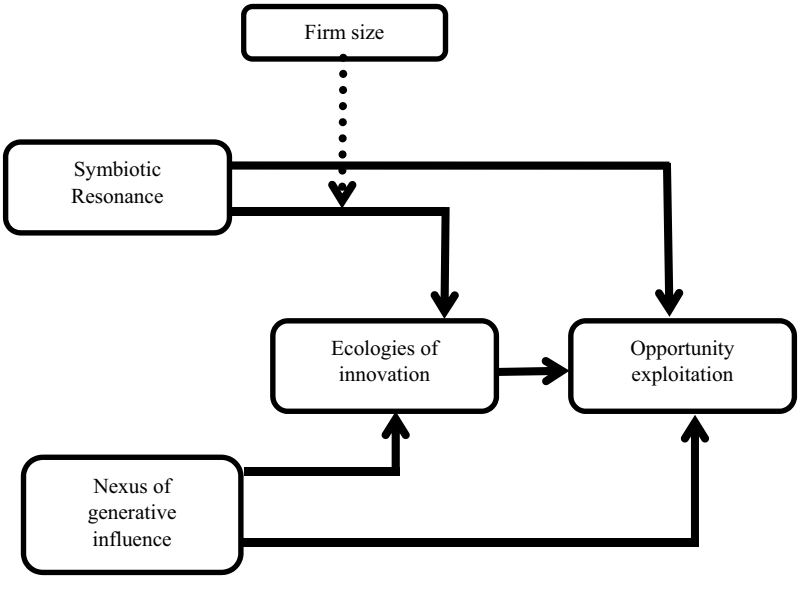

Figure 1. Conceptual framework.

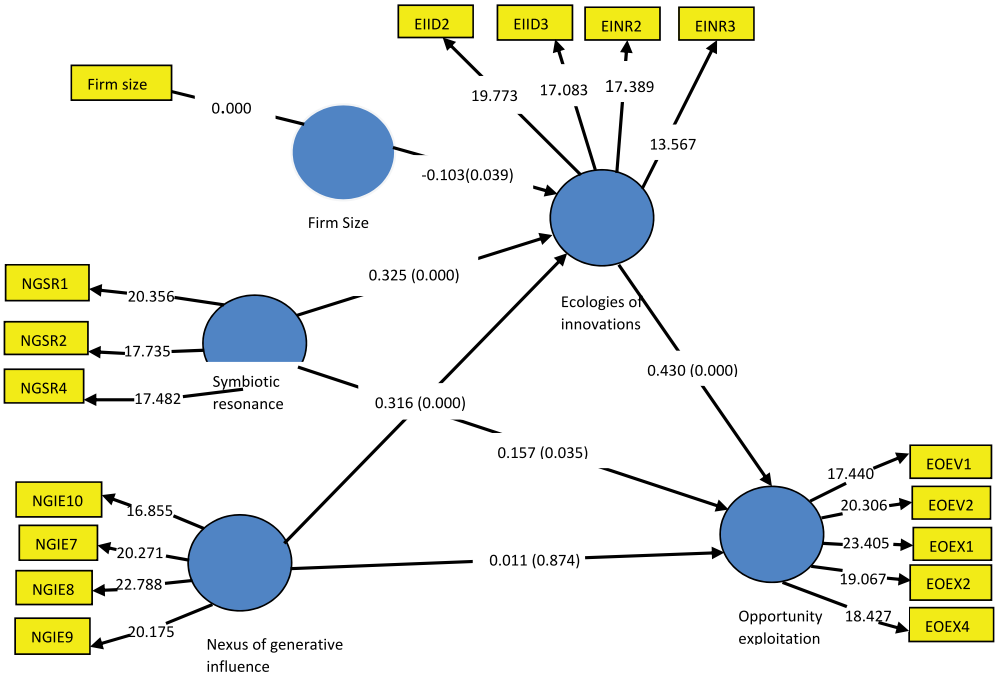

Figure 2. PLS-SEM for opportunity exploitation.

Table 5. Total effects-mediation.

	β	μ	δ	T-Value	P Values	
EoI -> OE	0.430	0.437	0.059	7.288	0.000	
Firm Size -> EoI	−0.103	−0.102	0.061	1.980	0.039	
Moderating Effect 1 -> EoI	−0.112	−0.110	0.055	2.016	0.044	
NGI -> EoI	0.329	0.327	0.057	5.779	0.000	
NGI -> OE	0.011	0.013	0.069	0.158	0.874	
Resonance -> EoI	0.323	0.325	0.069	4.648	0.000	
Resonance -> OE	0.157	0.155	0.076	2.076	0.038	
Specific Indirect Effects	β	μ	δ	T-Value	P Values	
NGI -> Resonance -> EoI	0.131	0.133	0.038	3.470	0.001	Partial
NGI -> EoI -> OE	0.141	0.143	0.031	4.553	0.000	Full Mediation
Resonance -> EoI -> OE	0.139	0.143	0.041	3.372	0.001	Partial
Total Effects	β	μ	δ	T Value	P Values	
EoI -> OE	0.430	0.437	0.059	7.288	0.000	
Firm Size -> EoI	−0.103	−0.102	0.061	1.980	0.039	
Moderating Effect 1 -> EoI	−0.112	−0.110	0.055	2.016	0.044	
NGI -> EoI	0.460	0.460	0.062	7.443	0.000	
NGI -> OE	0.273	0.278	0.065	4.190	0.000	
SR -> EoI	0.323	0.325	0.069	4.648	0.000	
SR -> OE	0.296	0.299	0.071	4.192	0.000	
Coefficient of Determination R^2	Before Moderation				After moderation	
Ecologies of innovation	.288				.301	
Symbiotic resonance	.166				.166	
Opportunity exploitation	.284				.284	

4.3.1. Symbiotic resonance and opportunity exploitation

The findings of hypothesis H1a, indicated that symbiotic resonance (SR) is positively and significantly related to opportunity exploitation (OE) among SMEs in Uganda (β = .157, p = .000). This means that SR leaders create enabling environment within SMEs through formal and informal systems. Formal power is created when positions are visible, flexible, and central to the organization and informal power is created through connections inside and outside the business, such relationships with peers, and coworkers. Formal and informal power among SME employees facilitate access to opportunities to learn and grow, information, support, and resources required to exploit an opportunity. SME owner/manager with SR is likely to create positive work environment that promote employee engagement and result in greater work satisfaction and productivity, which are useful in OE. The findings resonate with the previous research, Bernal, Maicas, and Vargas (2019) and Kibirango et al. (2017), which found that SR amplify opportunity identification and exploitation.

4.3.2. Symbiotic resonance and ecologies of innovation

Further, hypothesis H1b findings reveal that, symbiotic resonance (SR) is positively and significantly related with ecologies of innovation (EoI) among SMEs (β = .323, p = 000). Businesses that operate with uncertainty create emerging events in dynamic systems through interactive behavior patterns to attain innovativeness among SME employees. Interaction SR (practices), trusting association across the business, and not competition, are likely to prevail as a condition for EoI and OE to promote competitiveness. Management that continuously scans the environment for better opportunities is more likely to support employee interactions through EoI to work together to pursue viable business ideas. Behaviors of individuals do not occur in isolation, but rather connect to events through internal working environments and interactions. Goldstein et al. (2010), found that SR can create EoI in the context of the many cooperative, competitive, and symbiotic interactions. The relationships created by top management and employees are the basis of innovation.

4.3.3. Ecologies of innovation and opportunity exploitation

In addition, hypothesis H1c results reveal that ecologies of innovation (EoI) was positively and significantly related to opportunity exploitation (OE) (β = .430, p = .000). Whenever, SME owner/ manager create enabling environment for employees to interact, learn from each through feedback, they are likely to generate new ideas and methods of scanning the environment differently. EoI stimulates employee thinking through which the creativity and innovation is inspired. Consequently, experimentation, interaction, feedback, and developing adaptability through the discernment of emerging patterns is likely to generate new solutions to the prevailing challenges so that opportunities can be fully exploited. Once SMEs appreciate EoI, can foster OE because not only owners/ managers are the driving force behind the generation and development of new ideas, but also customers and employees. Creating an enabling environment that promotes interactions among the employees within the networks encourage exchange new ideas that may be helpful in accessing resources through social interactions for OE. This study is in

line with research by Mayanja et al. (2019) which stated that when entrepreneurs identify opportunities, they should also identify their capabilities for innovation, including the structural support in place to generate and evaluate new ideas.

4.3.4. Nexus of generative influence and opportunity exploitation

Hypothesis H2a findings confirm that nexus of generative influence (NGI) is not significantly related with opportunity exploitation (OE) ($\beta = .011$, $p > .0.05$). SME employees who are not motivated and supported by NGI tend not to share their conceived ideas harmoniously, identify business opportunities, and pursue them. The SME leadership that do not constantly interact with employees to provide the necessary emotional, economic and moral reliance support for collaborative learning, often do not help employees to work as a team to explore and exploit opportunities. The more generative leaders and employees do not encourage rich interactions, the more likely not to amplify actions in the system. Goldstein et al. (2010) and Kibirango et al. (2017) found similar results although the studies were from corporations and academic institutions with formal structures, policies. Similar experiences support SME environment in developing economies like Uganda.

4.3.5. Nexus of generative influence and ecologies of innovation

Furthermore, the findings on hypothesis H2b indicate that nexus of generative influence (NGI) is positively and significantly related with ecologies of innovation (EoI) ($\beta = .329$, $p = .000$). When employees of SMEs are motivated and supported by the owner/manager to share their conceived ideas harmoniously, they are likely to create conducive environment for innovation. Business owner/manager that inspire employees either from bottom-up, horizontally or top-down, are more likely to have conscientious governance that implement policies, structures that nurture mutual interactions among employees for the SMEs to thrive. It should be noted, however, that connections and interactions of different employees within a co-evolution in a non-linear environment arises from divergent views that contribute to EoI. Mayanja et al. (2020), found that in situations where employees of SMEs are motivated and supported by owner/manager to share their conceived ideas harmoniously, they are likely to create conducive environment for innovation.

4.3.6. Firm Size and ecologies of innovation

The regression results reveal that H3a, firm size is negatively and significantly related to ecologies of innovation (EoI) ($\beta = -0.103$, $p < 0.05$). Firm size determines the degree of EoI. Small firms are more focused upon activities providing immediate solutions to critical problems and not those affecting the core areas of the business in the long run. SMEs are likely not to be creative because of the owner- manager relationship with employees tend to be personalized, policies are based on circumstances and decision making is based on employee interactions with customers. In a dynamic environment, when introducing innovations, small firms may not be faster in gaining advantages from incremental innovations in highly competitive markets because of relationships between owner- manager and employees. Huang (2012) found that when the regional ecology moves toward being dominated by small firms, large firms benefit more from the presence of many innovative small firms than SMEs. By contrast, the concentration of

innovative small firms does not add much value for SMEs. The focus of policies should be on understanding the heterogeneous ability of accessing localized knowledge and resources between large and small firms for effective EoI.

4.4. Test of mediation

We followed Cepeda-Carrión et al. (2018) recommendation, to test the mediation role of EoI in the structural model (Figure 2). The results of indirect and direct total effects can are shown in Table 5.

4.4.1. Symbiotic resonance, ecologies of innovation and opportunity exploitation

Hypothesis H1d proposed that ecologies of innovation (EoI) mediates symbiotic resonance (SR) and opportunity exploitation (OE) (β = . 139, p = 001), hypothesis supported. This means that, SR is an indicator of sound interaction that arises from EoI on which the balance of organizational dependency is built. SR interaction creates heterogeneous structures, especially at top levels, that may hinder organizational goal attainment; whereas heterogeneity created at lower levels might foster the development of extraordinary, innovative and different ideas for OE. SR interaction aims to maintain diversity by focusing on tensions between heterogeneous structures but also on lowering organizational tensions. The SR leaders may tolerate different perspectives and organizational oppositions by focusing on new ways of identifying, evaluating and exploiting opportunities from employee interactions with leadership influence. Kibirango et al. (2017) found that, any organization to evolve, it requires employees with a high degree of interaction resonance practices across an institution within organizational dynamic environment. Boylan and Turner (2017) argue that radical changes, which take place in organizations, are not strategically controlled. SMEs sometimes have managers who may not track the whole system out of the combined interactions and relationships of elements.

4.4.2. Nexus of generative influence, ecologies of innovation and opportunity exploitation

Further, hypothesis H2c findings reveal that, ecologies of innovation (EoI) fully mediates the relationship of nexus of generative influence (NGI) with opportunity exploitation (OE) (β = . 141, p = 000) as shown in Table 5. It was found that NGI on its own cannot influence OE without EoI. Therefore, EoI is a true driver and a conduit through which NGI relates with OE. When business owner/manager create enabling environment like flexible policies, flat structures, allowing employees to deviate from the norms to come up with new ways of doing things, the SME is likely to explore and exploit opportunities competitively. NGI offers a view of how individuals at all levels can make a difference in their organizations by creating EoI. When NGI creates EoI in the workplace, it enables experiments in novelty to promote innovative practices, processes and routines.

Fonfara et al. (2018) contend that, when NGI creates an enabling environment, employees are likely to interact with each other to come up with new ways of exploring and exploiting opportunities. NGI enable an organization to become adaptable to the

unprecedented levels of change characterizing today's business environments. Mayanja et al. (2020) posit EoI cannot be created on its own without generative leadership creative abilities. CSLT supports the findings.

4.5. Test of moderation

Hypothesis H3b results also indicate that interaction effect of firm size has relationship between symbiotic resonance (SR) and ecologies of innovation (EoI) as graphically presented in Figure 3. Firm size ($\beta = -0.112$; $t = 2.008$; $p = 0.045$) established significant negative moderation on the relationship between SR and EoI. Moreover, the introduction of interaction effects in the model produces change in the coefficient of determination (R^2). The explained variance in EoI is improved by introducing interaction effect of firm size in the study model. Firm size interaction reflects a change in R^2-value from 0.288 to 0.301 (Table 5, Direct path Table, Figure 3). Even though the change is very small for moderations, still R^2 play a significant role in analyzing the interaction effect (Hair et al., 2017). This means that interaction effect of firm size and SR has a negative significant effect on the relationship between SR and EoI. This means that, when the level of innovation is low, required resources like money, people, and technology may not be adequately available. In addition, business structures, flexible policies that protect individuals in the process of executing their duties may not be in place to influence the level of innovations. The availability of resources and structures encourage employees to come up with innovative ideas. In big organizations, job descriptions are well stated with rewards attached. Big firms can attract talented employees because they have space for innovations and recognition based on new ideas in processes, products, services and strategies unlike SMEs in developing countries.

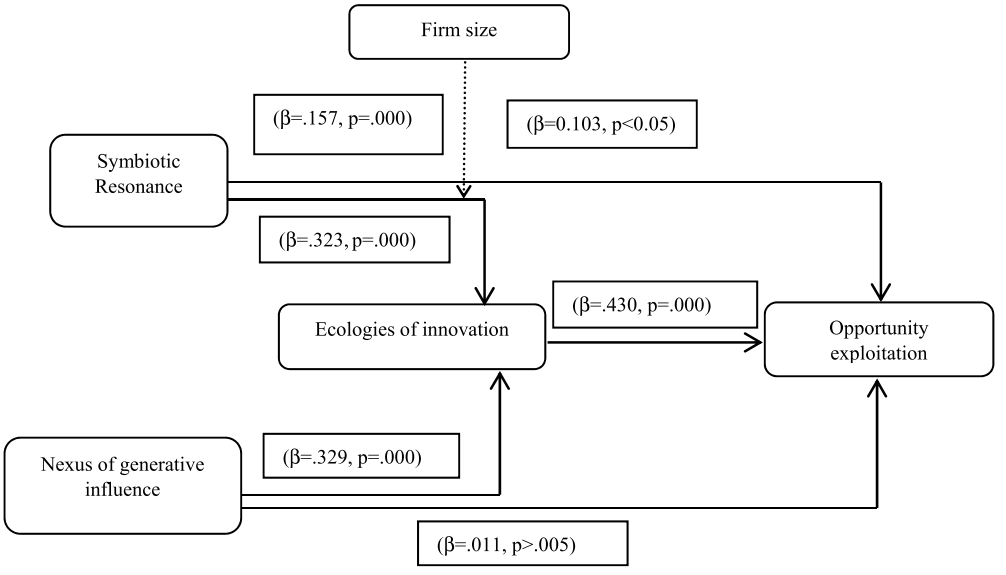

Figure 3. PLS_SEM moderation for opportunity exploitation.

SMEs in developing economies like Uganda may not attract highly skilled and talented employees because of scarce resources. Innovative employees are normally not retained as they tend to have divergent views from the owner/manager. SME owners/managers tend to reward loyalty as opposed to innovation, which negatively affect EOI. Thongsri and Chang (2019) found that SR between business ties, customers, and competitor ties moderate the government support and innovation behavior relationship. This study was among private firms with big SMEs compared to Uganda. As innovation is a key component in the knowledge production function, it would seemingly follow that small firms are burdened by an inherent innovation disadvantage (Audretsch, Hafenstein, Kritikos, & Schiersch, 2018).

5. Implications, conclusion and areas for further research

5.1. Policy implications

The government should put a policy in place to guide the establishment and funding of incubation centers to support start-ups and growth of SMEs. Incubator centers are useful for testing innovations generated by employees, reduce the time required to develop marketable products, assess early stage operational costs and lower initial investment. Businesses located in incubators are more likely to exploit opportunities because ideas are tested in different contexts before rolled out.

The government should establish information hubs for entrepreneurs to access regional and global information using appropriate technology. ICT is vital in promoting innovations, creating interactions among employees in different networks to share new ideas that may be useful for opportunity exploitation. ICT is useful tool for creating and developing entrepreneurial skills for opportunity exploration and exploitation.

SMEs with symbiotic resonant leaders usually influence and motivate their employees to think outside box to come up with new ways of solving societal problems. The government should come up with training centers for offering leadership/managerial and technical courses for SMEs to amplify their leadership skills to survive in a dynamic environment. Equally, there should be business information centers where information is accessed for informed decision-making.

5.2. Managerial

SME owners/managers should aim at encouraging and promoting EoI to amplify perspectives and surprises from events, experiences and experiments which help to drive innovations. Thus, policies that guide employees to focus on facilitating self-organizing process which is conducive for creativity and innovativeness. Employees should continue interacting among themselves and with their networks to access tangible and intangible resources useful for opportunity exploitation.

SME leadership should support employee learning through feedback and interactions as they are source for identifying and developing opportunities through the support, complementary knowledge, experience and contacts held by relationships. Leadership should create a culture of employees learning from mistakes, experiences that promote innovations for opportunity exploration and exploitation.

5.3. Conclusion and areas for further research

The study examined the mediating role of EoI between SR, NGI and OE. The results reveal that EoI positively and significantly mediates the relationship between SR, NGI and OE. This signifies that, the presence of EoI in the model, significantly act as a conduit in the association between NGI, SR, and OE. Last, firm size moderates the relationship between SR and EoI among SMEs in Uganda. Firm size determines the flexibility, interactions and decision making in allocating resources in the process of exploiting opportunities among SMEs. This study used a quantitative research design. A longitudinal study integrating individual opportunity-seeking behavior, developing skills and resources required for creating EoI, opportunity exploration and exploitation; understanding how entrepreneurial opportunities come about, is recommended.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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