



OPEN INNOVATION ORIENTATION AND SUSTAINABILITY OF SMEs: DO ENTREPRENEURIAL ORIENTATION AND RESOURCE BRICOLAGE MATTER?

Orientação para a inovação aberta e sustentabilidade das SMEs: a orientação empresarial e os recursos da bricolagem importam?

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ABSTRACT

The burgeoning literature postulates that a firm's degree of openness for external parties in building its knowledge base undoubtedly enables it gaining competitive advantage though a little attention has been devoted to investigating the phenomena from small and medium enterprise (SME) perspective. Accordingly, this study investigates how open innovation orientation leads nurturing greater innovation and acquiring greater sustainable goals and specifically, how entrepreneurial orientation and resource bricolage facilitate the whole process. Drawing upon a sample of 442 SMEs, the study followed a quantitative approach to investigate the focal research question. The results reveal that open innovation orientation of SMEs significantly influences on nurturing greater innovation and attaining sustainable goals in long-run while the entrepreneurial orientation drives the whole process. The study also finds that the resource bricolage plays a significant role in converting SMEs more open innovation oriented and fostering greater innovation. By doing so, this study provides noteworthy theoretical and managerial insights.

Keywords: SMEs, Open innovation orientation, Innovations, Entrepreneurial orientation, Sustainable goals, Resource bricolage.

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ORIENTAÇÃO PARA A INOVAÇÃO ABERTA E SUSTENTABILIDADE DAS SMES: A ORIENTAÇÃO EMPRESARIAL E OS RECURSOS DA BRICOLAGEM IMPORTAM?

Open innovation orientation and sustainability of SMEs: do entrepreneurial orientation and resource bricolage matter?

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RESUMO

A crescente literatura postula que o grau de abertura de uma empresa para partes externas na construção de sua base de conhecimento, sem dúvida, permite que ela ganhe vantagem competitiva, embora um pouco de atenção tenha sido dedicada à investigação dos fenômenos da perspectiva de pequenas e médias empresas (SMEs). Consequentemente, este estudo investiga como a orientação à inovação aberta leva a fomentar uma maior inovação e adquirir maiores objetivos sustentáveis e, especificamente, como a orientação empreendedora e a bricolagem de recursos facilitam todo o processo. Com base em uma amostra de 442 SMEs, o estudo seguiu uma abordagem quantitativa para investigar a questão de pesquisa focal. Os resultados revelam que a orientação para a inovação aberta das SMEs influencia significativamente no incentivo a uma maior inovação e na obtenção de objetivos sustentáveis a longo prazo, enquanto a orientação empreendedora conduz todo o processo. O estudo também conclui que a bricolagem de recursos desempenha um papel significativo na conversão das SME mais orientadas para a inovação aberta e no fomento de uma maior inovação. Ao fazer isso, este estudo fornece percepções teóricas e gerenciais notáveis.

Palavras-chave: SMEs, Orientação para a inovação aberta, Inovações, Orientação empreendedora, Objetivos sustentáveis, Bricolagem de recursos.

INTRODUCTION

Opening organizational boundaries for external knowledge sources as a primary strategy in fostering innovation is at the core of 'open innovation' phenomena (Chesbrough, 2003; Christensen et al., 2005; Piller and Walcher, 2006). Thus, the paradigm strongly accentuates that 'not all the smart people work for us. We need to work with smart people inside and outside our company' (Chesbrough, 2003, p.3). Scholarly investigations on 'open innovation phenomena' are amply evident in business and management literature (Bianchi et al., 2010; Fleming and Waguespack, 2007; Lichtenthaler, 2011; Van De Vrande et al., 2009). So far, however, there has been a little discussion on how such an orientation leads for increased innovations and to gain overall sustainable goals from SMEs perspective which warrants further research on multiple grounds. First, the extant literature on open innovation phenomena has predominantly emerged from the experiences of large corporate conglomerates (e.g. Chesbrough, 2003; Dodgson et al., 2006; Laursen and Salter, 2006; Motzek, 2007) while far too little attention has been paid to validate the findings from SME perspective (exceptions are Brunwicker and Vanhaverbeke, 2015; Parida et al., 2012). Second, though the power of innovation as a strategy for growth and survival is getting increasingly investigated in SME research agenda (e.g. Bianchi et al., 2010; Lee et al., 2010; Lichtenthaler, 2011), lack of critical attention can be seen on how 'being open' to external knowledge sources enhance their innovation capabilities and finally paves the way for SMEs to reach greater sustainable goals. Third, 'size' being a staple determinant of resource ownership and capabilities (Garmestani et al., 2006; Gibb Dyer, 2006), compared with large corporates, SMEs' access to new knowledge is certainly constrained due to the limited investments on new knowledge generation and exposure for quality network partners (Gruenberg-Bochard and Kreis-Hoyer, 2009; McGrath and O'Toole, 2010; Torkkeli et al., 2012). However, this doesn't necessarily mean that SMEs are 'one-man-islands' though the research to date has generated little understanding on SMEs practise open innovation orientation as a strategic approach to generating new knowledge. Fourth, research to date has tended to use more on mere financial indicators to appraise a firm's success which is increasingly questioned (Hubbard, 2004; Goyal et al., 2013). The increasing popularity of the frameworks such as 'triple-bottom-line' emphasizes the significance of appraising a firm's overall sustainable performances via broader dimensions such as financial, social and environment (Peloza, 2009). Aligned with broad business and management literature, a considerable amount of SME research has been on mere financial indicators in assessing SME performances, (Artiach et al., 2010; Morioka and Carvalho, 2016; Wood, 2010) and thus, how SMEs attempt on achieving overall sustainable goals is still unexplored and needs considerable academic scrutiny. Finally, compared with large corporates, it is clear that SMEs are vastly constrained with resources, which implies that they should be extra attentive in expending their resources. Thus, finding new resolutions for issues they face, trying novel alternatives with the existing resources which is known as 'resource bricolage' (Baker and Nelson, 2005; Senyard et al., 2009) is a concept highly applicable in SME sector though the scientific evidences are lacking.

Addressing the aforementioned important knowledge gaps, this paper investigates how entrepreneurial orientation fuels SMEs' open innovation orientation which prompts nurturing innovation and attaining broad sustainable goals. By doing so, the paper contributes to the extant body of knowledge on four fronts: First, to accomplish the overarching research objective, the proposing model of the study incorporates diverse constructs such as entrepreneurial orientation, open innovation orientation, innovation, resource bricolage and triple bottom line goals. Thus, the paper contributes by combining diverse constructs to solve the main identified puzzle. Second, the study contributes to open innovation literature with its SME context specific investigations on the phenomena since open innovation orientation is a key identified antecedent of nurturing greater innovation and attaining increased sustainable goals. Third, contributing to the argument of the inadequacy of using mere financial indicators to measure overall performances of firms, the study uses 'triple bottom line' framework to assess the overall sustainable performances of SMEs and further, the study's contribution is evident on the front of exploring the antecedents of greater 'triple bottom line'. Finally, the study contributes to bricolage literature by scrutinizing its role on open innovation orientation and innovation outcomes from SMEs perspective.

The remainder of this paper is organized as follows. First, the theoretical underpinnings and hypotheses development along with the conceptual model are presented. Second, research methods are presented followed up by the results and discussion. Finally, the contribution to the theory, practice and limitations are discussed.

1 THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

1.1 Entrepreneurial orientation

Entrepreneurial orientation (EO) has received an ample theoretical and empirical attention in the field of entrepreneurship literature (e.g. Habbershon and Pistrui, 2002; Lumpkin and Dess, 1996; Rosenbusch et al., 2013; Wiklund and Shepherd, 2002; Zahra, 2005). EO emphasizes the salient characteristics that a firm should show namely, innovativeness, risk-taking, pro-activeness (Miller and Shamsie, 1996), competitive aggressiveness and autonomy Lumpkin and Dess (1996) to stand out from their competitive firms (Atuahene-Gima and Ko, 2001; Lumpkin and Dess, 1996; Wiklund and Shepherd, 2002). Thus, the literature largely contends that firms who take an entrepreneurial posture tend to nurture innovations as a strategic response of staying ahead of their competitors in their markets (Anderson et al., 2004; Basl and Gala, 2009; Dhanaraj and Parkhe, 2006; Weerawardena et al., 2015). In line with past research, this study defines EO as SME's propensity of being innovative, proactive and willingness to take the risk as a salient strategy to stay ahead of their competitors. Investing on this significant knowledge gaps in the extant literature, this paper expands the traditional EO – performance link by theorizing EO as the driving force for SMEs to maintain an open orientation in building fresh know-how which results in nurturing commercially viable solutions. The hypotheses are as follows.

1.2 Open innovation orientation

An increased number of researchers posit that the essence of open innovation orientation is to being open for external parties in the process of creating organizational knowledge base (Birkinshaw, 2017; Chesbrough, 2003; Eisenmann et al., 2011; Elmquist et al., 2009; Gawer and Henderson, 2007; Tee and Woodard, 2013; Tellis et al., 2009). Prior researchers specifically those have been grounded on large corporates have found that EO essentially leads firms to leverage the knowledge from external parties those cannot build in-house (Huang et al., 2010; Moensted, 2010). Since the entrepreneurial orientation upsurges the degree of proactiveness and willingness to take risks within firms, such firms incline to pursue the resources beyond what they have within organizations in sustaining the competitive advantage (Elmquist et al., 2009; Tellis et al., 2009). The resource-based view also supports this argument by emphasizing that entrepreneurial firms tend to have more faith in 'connect and develop' where the emphasis is on effective networking and building partnerships as a strategic approach to nurture innovations (Chaston, 2009; Chen et al., 2006; Niehaves, 2010; Moensted, 2010). Based on the discussion, this paper argues that being highly resourced wise constrained, there is a fervent need for SMEs to have faith in 'connect and develop' approach as a strategic rejoinder to leverage the knowledge and skills they cannot build in-house. Consequently, this paper postulates the link between EO and open innovation orientation of SMEs as follows:

Hypothesis 1a: SMEs' Entrepreneurial orientation positively affects their open innovation orientation

1.3 Innovation

As far back as 1934, Schumpeter viewed innovation as a process whereby organizations convert the ideas and conceptions into products, services or process those can bring greater financial benefits for nations. The broad entrepreneurship and innovation literature has excessively viewed the power of innovation as a strategic approach to attain greater organizational performances and market leadership (e.g. Hult et al., 2004; Nieto and Quevedo, 2005; Olson and Sallis, 2006; Tajeddini et al., 2006; Utsch and Rauch, 2000). Aligned with this, a number of prior researchers indicate innovation as a premeditated approach that drives the managerial decision-making process, which leads attaining overall firm performances (Green et al., 2008; Zollo and Winter, 2002).

The essence of these arguments is that firms have to engage in continuous innovations in this turbulent environment to gain competitive advantage (Baregheh et al., 2009; Lumpkin and Katz, 2011; Wiklund and Shepherrd, 2002).

The broad entrepreneurship literature where the entrepreneurial orientation has been evolved as a distinct research domain has mostly detailed the significance of nurturing organizational innovations (Brockman and Morgan, 2003; Brown and Eisenhardt, 1995; Hamel, 2000; Li et al., 2009; Lumpkin and Dess, 1996; McGrath, 2001; Wiklund and Shepherd, 2002; Zahra and Covin, 1995). Aligned with the extant literature, this paper argues that SMEs with high entrepreneurial orientation incline to foster more innovations to sustain competitive advantages. This is, SMEs who embrace an entrepreneurial posture may endeavour to use innovations as a primary strategic tool for market survival and growth. Consequently, since EO guides SMEs to increase their degree of proactiveness, innovativeness, willingness to take risks and competitive aggressiveness (Ireland and Webb, 2007; Madhoushi et al., 2011), this study links the dimensions EO and innovation performance and hence, the study hypothesizes:

Hypothesis 1b: SMEs' entrepreneurial orientation positively affects innovation within SMEs

1.4 Open innovation orientation and innovation

As stated above, a large number of researchers have stressed the significance being open to external networks as a core strategy of creating knowledge that firms cannot afford generating in-house (Chen and Huang, 2009; Niehaves, 2010; Wang and Rafic, 2009; Wiklund and Shepherd, 2002.). The research further argues that the need of being open for external parties is further intensified for the firms who operate in highly volatile and dynamic environments whose primary strategy is innovation for growth and survival (Boudreau, 2010; Chaston, 2009; Parker and Van Alstyne, 2009). Surprisingly, though an overwhelming number of researches emphasize the significance of the approach in nurturing organizational innovations, researchers are lacking from SME context. Considering of SMEs sector, the need of staying connected with external parties in creating knowledge and fresh know-how is further strengthened due to the sector's highly resource-wise constrained nature (Camagni and Capello, 2017; Gronum et al., 2012; Love and Roper, 2015). These internal limitations of generating fresh knowledge further intensify the need of thinking alternative paradigms in accessing new knowledge results in nurturing innovations. Thus, this paper argues that having a greater degree of openness for external networks certainly helps SMEs to reach the fresh know-how that they cannot afford generating in-house which assist them to build their internal knowledge bases. The discussion provides the basis for the following hypothesis, namely:

Hypothesis 2a: SMEs' open innovation orientation positively affects innovation

1.5 Sustainable goals - Triple-bottom-line framework

The core of triple-bottom-line is that firm should take a broad perspective in assessing their firm performances and questions the assessing the performances only from the perspective of financial bottom-line (Hubbard, 2004; Jones et al., 2005; Van Marrewick and Hardjono, 2003). Extending the argument, the scholars argue that the firms have to take a broad perspective in assessing their overall sustainable performances incorporating social/ethical and environmental aspects into consideration (Elkington, 1997). However, as the earlier discussed reflects, current SME research has largely assessed the performances of SMEs in terms of mere financial outcomes (e.g. Watson and Robinson, 2003). Making a clear departure from this well-developed body of knowledge, this study takes a clear standard that SMEs have to take a broader perspective in assessing their overall sustainable performances where the application of the approaches such as 'triple-bottom-line' is significant since the framework guides for assessing the performances from diverse perspectives (Van Marrewick and Hardjono, 2003). Investing on this important gap, this paper attempts to bring-about the triple-bottom-line framework to understand the performances of SMEs.

1.6 Open innovation orientation and triple-bottom-line

Research based on large corporates principally argues that the more the firms engage in networking with external parties, the more they tend to enhance their capability of creating greater value (Chaston and Scott, 2012; Moensted, 2010). This is since being open for external networks enriches firms' sensitivity of the market paving the way for them to gain the market leadership (Gumusluoglu and Ilsev, 2009; Tang and Zhou, 2012). However, to which extent 'being open for external knowledge sources' could help to attain sustainable goals/ triple bottom line goals from SME context is still unknown and needs further academic scrutiny. These various observations provide the basis for the hypothesis:

H2b - Open innovation orientation positively affects attaining triple-bottom-line goals for SMEs.

1.7 Innovation and triple-bottom-line

The extant literature largely stresses the significance of innovation as a core strategy of creating greater value (e.g., Damanpour, 1991; Hurley et al., 2005; McDonald and Srinivasan, 2004). The main argument is that the firms those innovate can stand out from their competitors since those innovations pave the way for the competitive advantage (Chaston, 2009; Ireland and Webb, 2007; Weerawardena and Mavondo, 2011). However, in investigating innovation-performance link, the large majority of these researchs has been based on how competent those firms are in achieving in terms of financial goals. Thus, how innovation leads to attaining broad sustainable performances as specified in triple bottom line needs further academic scrutiny. These various observations provide the basis for the hypothesis;

H3: Innovation positively affects attaining triple-bottom-line goals for SMEs.

1.8 Resource bricolage

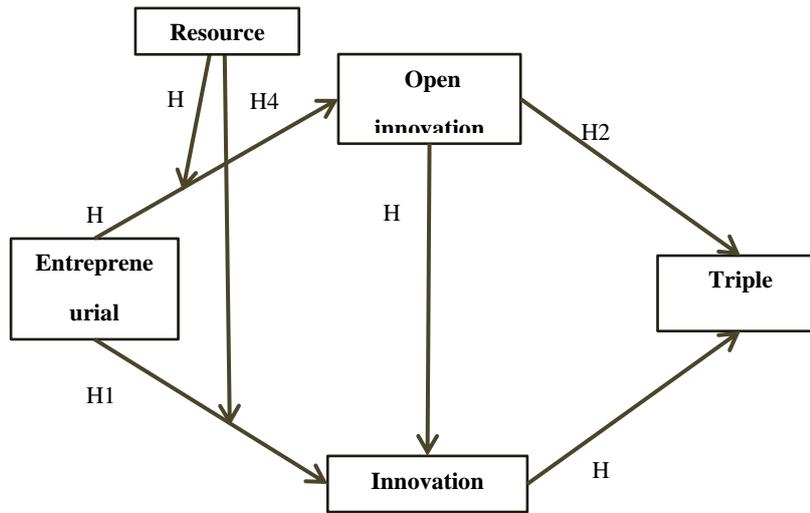
Bricolage is making do by applying a combination of resources already at hand (Baker and Nelson, 2005; Banerjee and Campbell, 2009). Thus, the essence of this concept is optimizing the mobilization of existing or discarded organizational resources to address the issues (Baker, 2007; Desa, 2012; Desa and Basu, 2013; Tracey and Phillips, 2007) and grab new opportunities (Ferney and Bell, 2006; Salunke et al., 2013). Research on resource bricolage increasingly gets popular from the perspective of large corporates. However, compared with large corporates, SMEs are more resource-wise constrained which implies that they should be extra attentive on how they handle existing resources to overcome issues and grab new opportunities. Accordingly, based on the discussion, this study hypothesizes;

H4a: Resource bricolage positively moderates the relationship between entrepreneurial orientation and open innovation orientation

H4b: Resource bricolage positively moderates the relationship between entrepreneurial orientation and innovation

Based on the above discussion, this paper takes the standard that taking an entrepreneurial posture is central in eliciting the firms' degree of openness in reaching the knowledge sources external to the organizations (see Figure 1- Conceptual model). Further, the paper theorizes that SMEs those believe to be open their organizational boundaries for external parties as a core strategy of building their inter-organizational knowledge bases are capable of nurturing more innovations which finally leads to gain broad sustainable performances as triple-bottom-line framework emphasizes. Extending the said central arguments in this paper, the conceptual model proposes that taking an entrepreneurial posture prompts SMEs to go beyond their organizational boundaries in search of the knowledge and skills they cannot build in-house in nurturing innovations. Further, the paper theorizes that such an approach would enhance SMEs' capabilities in reaping increased triple bottom line goals: financial, social and environmental. Moreover, the paper views that resource bricolage positively moderates the proposing relationships between SE – open innovation orientation and SE – innovation.

Figure 1: Research model and hypotheses



2 RESEARCH DESIGN AND PROCESS

2.1 Sampling and key informants

In selecting the sample SMEs, this paper followed the World Bank’s criterion in defining SMEs where SMEs are defined as enterprises with below 99 people. Applying this criterion to define SMEs, the proposing conceptual model was tested with 442 Sri Lankan SMEs. Thus, the study adopted a random sampling method in the selection of the sample for the survey. Data were analyzed by using Structural Equation Modeling (SEM) by using AMOS software. Table 1 summarizes the diverse nature of respondent SMEs to this survey.

Table 1: Key descriptive statistics of the study sample

| | Frequency | Percentage |
|---|-----------|------------|
| Operating sector | | |
| Manufacturing Sector (Categories: textile and apparel, leather and footwear, gem and jewellery, edible products including milk/fish-based products, other) | 199 | 45% |
| Service Sector (Categories: health services, passenger transport, freight transport, banking and insurance, tourism, telecommunications, construction, business process outsourcing, beauty care industry, other) | 243 | 55% |
| Number of employees | | |
| >10 | 145 | 33% |
| 10-50 | 161 | 36% |
| 51-99 | 136 | 31% |
| Market scope | | |
| Global market only | 21 | 5% |
| Local market only | 201 | 45% |

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| | | |
|-----------------------------------|------------|------------|
| Both global and national markets | 29 | 7% |
| Regional market only | 191 | 43% |
| | Min | Max |
| Age (years since founding) | 1 | 46 |

As Table 1 illustrates, multiple aspects were evaluated to gain an in-depth understanding of the central study phenomena: the sector they operate, number of employees, their market scope and age. First, the majority of respondent SMEs were from the service sector (55%) while the response rate of SMEs in the manufacturing sector is also significant (45%). Second, in terms of the number of employees, most of respondent SMEs had the employees between 10-50 (36%) followed by >10 (33%) and 51-99 (31%). Third, in terms of market scope of respondent SMEs, the majority of respondents served the local market only followed by SMEs serving only for regional markets (43%), SMEs serving both global and local markets (7%) and SMEs serving only for the global market (5%). Finally, the sample captured SMEs' diversity based on the age of the SME operations and the years of operations of the sample ranged from 1 to 46.

2.2 Data collection

Top managers, owner-managers and CEOs of the selected SMEs were the key informants since they are aware of the overall strategic directions of the firms (Snow and Hrebick, 1980).

2.3 Measures

Measures of all the constructs used in this paper have been grounded on well-established and tested measures in the extant body of literature as follows:

Entrepreneurial orientation: The measurements used in this study were based on the Covin and Slevin's (1989) nine-item scale and revised based on the suggestion of Lumpkin and Dess (2001) those are widely used in the entrepreneurship literature. Overall, the used scale captures the dimensions of proactiveness, innovativeness, competitive aggressiveness and risk-taking propensity of SMEs. Later, factor-analysis was done where it was found all of the factors loaded above 0.60 on a single factor with an eigenvalue of 4.43 which allowed combining all nine items into a single scale.

Open innovation orientation: The measurements for the construct were based on the 10 item scale based on the works of Brunnschwicker and Vanhaverbeke (2014). Hence, to evaluate the overall perspective, this paper evaluated the knowledge sourcing activities of SMEs based on six types of innovation partners, namely; direct customers, indirect customers, suppliers, research organizations, IPR experts and network partners.

Innovation: The measurements for innovation performance were based on the works of Laursen and Slater (2006), Atuahene-Gima and Ko (2005), and Parida, Westerberg and Frishammar (2012). Thus, to evaluate SMEs' innovation, two dimensions were evaluated, namely the frequency of radical innovations (new to the world) and incremental innovations (new to the firm).

Triple-bottom-line: An 8 item scale was used to measure this construct and was based on the works of Hubbard (2009). Overall, the used scale captures the dimensions of economic performances, social performances and environmental performances of SMEs. The factor-analysis was done where it was found all of the factors loaded above 0.60 on a single factor with an eigenvalue of 5.54 which allowed combining all nine items into a single scale.

Resource bricolage: Based on the works of Desa and Basu (2013), an 9 item scale was used to measure this construct. Since the study's focus was on resource bricolage, the items were used to measure three different resource dimensions, namely, material, labor and skills.

2.4 Measurement models

This paper tested five measurement models for the five respective constructs specified in the proposed conceptual model to investigate the focal study phenomena. Diverse criteria were taken into consideration while re-specifying the respective measurement models. To sum up, the overall strategy was threefold. First, critical ratios or t-values for the items were evaluated to assess the statistical significance where items were retained when they met the criteria of ± 1.96 at $p = 0.05$ (e.g. Mort and Weerawardena, 2006). Second, the standardised residuals of the items were evaluated (Joreskog and Sorbom, 1984) where values higher than 1.96 and lower than -1.96 were identified and removed. Third, based on AMOS output, model misspecifications were identified based on modification indices (Joreskog and Sorbom, 1996) where model re-specifications were continued till the models reach the accepted degree of fitness (Byrne, 2001; Gallagher et al., 2008; Shook et al., 2004). The summaries of measurement models are presented in Table 2.

Table 2: Summary of fit statistics – Measurement models

| | Constructs | Multiple Fit Statistics | | | | | |
|---|--------------------|-------------------------|-------|-------|-------|-------|-------|
| | | X ² | p* | GFI | CFI | TLI | RMSEA |
| 1 | Entrepreneurial | 9.045 | 0.208 | 0.986 | 0.991 | 0.989 | 0.029 |
| 2 | Open innovation | 4.328 | 0.108 | 0.982 | 0.988 | 0.966 | 0.063 |
| 3 | Innovation | 4.241 | 0.097 | 0.976 | 0.989 | 0.966 | 0.067 |
| 4 | Triple bottom-line | 5.416 | 0.163 | 0.981 | 0.982 | 0.981 | 0.043 |
| 5 | Resource bricolage | 6.876 | 0.155 | 0.985 | 0.992 | 0.964 | 0.054 |

2.5 Validity and reliability of measurement models

Numerous tests were conducted to evaluate the validity and reliability of the measures. First, the convergent validity was evaluated with AVE values (Table 3). As Table 3 presents, AVE values for all the constructs exceed the generally accepted cut-off value of .50 which provides a strong indication for convergent validity of the constructs. Second, Fornel and Larket Test was conducted to (Fornel and Larker, 1981) evaluate the distinctiveness of the respective constructs. Here, AVE values were compared with the squared correlation values of the respective constructs. The analysis showed that (Table 3) the squared correlation values for all the constructs in this paper do not exceed the respective AVE values which are a clear indication of the non-existence of multicollinearity issues among the constructs. Third, confirmatory factor analysis (CFA) was employed since it is well accepted as an inferential statistical approach that allows a more objective interpretation of validity (Gerbing and Anderson, 1988). Fourth, the reliability of the measures was evaluated with the Cronbach's alpha values (Cronbach & Furby, 1970) and as presented in Table 3, all the Cronbach's alpha Coefficient values were above the commonly required minimum of .70 (Cronbach and Furby, 1970; Nunnally, 1978; Nunnally, 1994). To sum up, all these tests confirm that the measures used in this study are valid and reliable.

Table 3: Summary statistics - Validity and reliability of the measures

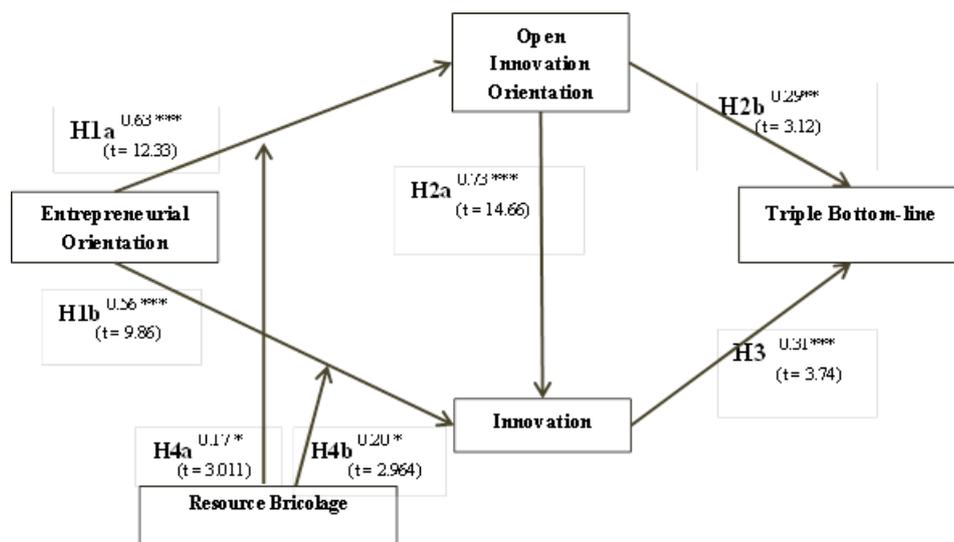
| | | AVE | CA/CR | (a) | (b) | (c) | (d) | (e) |
|-----------------------------|-----|------|-----------|------|------|------|------|------|
| Entrepreneurial orientation | (a) | 0.71 | 0.84/0.92 | 0.71 | | | | |
| Degree of openness | (b) | 0.68 | 0.72/0.83 | 0.45 | 0.68 | | | |
| Innovation | (c) | 0.67 | 0.70/0.81 | 0.46 | 0.46 | 0.67 | | |
| Triple bottom-line goal | (d) | 0.70 | 0.83/0.91 | 0.35 | 0.23 | 0.24 | 0.70 | |
| Resource bricolage | (e) | 0.72 | 0.79/0.84 | 0.46 | 0.22 | 0.51 | 0.13 | 0.72 |

N = 442 CA – Cronbach’s alpha, CR – Composite reliability

3 RESULTS AND DISCUSSION

This section presents the results of the empirical investigation of this paper. In sum, the overall fitness of the structural model was evaluated by using multiple fit indices provided by AMOS (Baumgartner and Homburg, 1996; Hair et al., 2014; West et al., 2012). Figure 2 presents the emergent structural model from quantitative data analysis. All fit indices provide evidence of a favourable model fit; GFI (.954), CFI (.942), TLI (.971). Overall, the fit indices such as RMSEA (.048) further confirms that the final structural model offers an adequate fit in predicting how the degree of openness of SMEs trigger innovations and performances within SMEs and how entrepreneurial orientation drives the overall process.

Figure 2: Structural model



The key focus of this paper was to investigate whether entrepreneurial orientation drives the overall process open innovativeness and innovations which in the long run fuels SMEs to conquer increased triple bottom line goals. Consequently, two hypotheses were introduced to the model (see Figure 1) by making the entrepreneurial orientation as the exogenous variable. Subsequently, entrepreneurial orientation was found significantly

influence; a) degree of openness to the knowledge sources external to the firms ($\beta = 0.63$: CR = 12.33: $p < 0.001$), and b) SME innovation ($\beta = 0.56$: CR = 9.86: $p < 0.001$). Significantly, a greater degree of variation of the two respective constructs; open innovation orientation (61%) and innovation (41%) are well explained by the model. Therefore, H1a and H1b were supported.

As Figure 2 demonstrates, the open innovation orientation was found significantly influence innovation of SMEs ($\beta = 0.731$: CR = 14.66: $p < 0.001$). Out of all the sources to assess the degree of openness, SMEs openness to direct customers and network partners was prominent while others were not much popular among SMEs. Therefore, H2a was supported. Extending this argument further, this paper hypothesized that open innovation orientation positively supports SME to gain increased triple bottom line goals which was supported by the data analysis ($\beta = 0.29$: CR = 3.12: $p < 0.01$) which further extend the extant arguments on why firms have to maintain an open innovation orientation to gain competitive advantage. Thus, H2b was supported.

As hypothesized, results confirm that innovations positively influence attaining triple-bottom-line goals of SMEs ($\beta = 0.31$: CR = 3.74: $p < 0.01$) and thus, H3 was supported. Interestingly, incremental innovations were the popular type of innovation while radical innovations were very limited within the respondent SMEs. Investigating further, the study found two reasons for this. First, SMEs act on market signals since their heavy focus on the existing customer base and the network parties which has boxed them into acting on mere market signals based on the changes in the current customer base. Second, their marginal focus on the parties such as Universities/ research organizations and IPR experts further confine from nurturing radical innovations.

The results of hypothesized moderating effects of resource bricolage were positive. Resource bricolage was found positively moderates the relationship between entrepreneurial orientation and open innovation orientation (interaction coefficient (β) = 0.17: $p < 0.01$) and thus, H4a was supported. Further, supporting H4b, resource bricolage was found positively moderates the relationship between entrepreneurial orientation and innovation (interaction coefficient $\beta = 0.20$: $p < 0.01$).

Extending the focal research question further, this study focused on investigating whether the structural model (presented by Figure 2) shows significant differences based on the size of the respondent SMEs; small and medium categories. Here, to evaluate whether the difference is significant, the study conducted a Chi-square difference test. The results confirm that the chi-square difference is significant (Chi-Square 14.675 with $p < .05$) which confirms that the model is different between two identified groups (among small and medium groups). Table 4 summarizes the results of two models and the respective conclusions based on the data analysis. In summary, overall results show that the specified relationships significantly different between the firms of two groups- small and medium. Further, except for bricolage related relationships, results demonstrate that the relationships are stronger in medium-size firms compared to small firms. This makes sense since small firms are generally more constrained with resources compared to medium firms where the situation forces small firms to combine existing resources for developing novel resolutions for the issues they face and grab new opportunities.

Table 4: Summary statistics for two structural models: Small size firms and medium-sized firms

| Hypothesis | *Path value | **Path value | Critical ratio - t value | p-value | Conclusion |
|------------|-------------|--------------|--------------------------|---------|--|
| H1a | .51 | .66 | 9.664 | .000 | The relationship is stronger for medium firms than for small firms |
| H1b | .50 | .62 | 7.985 | .000 | The relationship is stronger for medium firms than for small firms |
| H2a | .66 | .78 | 12.921 | .000 | The relationship is stronger for medium firms than for small firms |
| H2b | .19 | .31 | 3.395 | .001 | The relationship is stronger for medium firms than for small firms |
| H3 | .26 | .34 | 4.011 | .001 | The relationship is stronger for medium firms than for small firms |
| H4a | .16 | .17 | 3.264 | .01 | The relationship is stronger for small firms than for medium firms |
| H4b | .19 | .20 | 3.338 | .01 | The relationship is stronger for small firms than for medium firms |

*Path values of the structural model – small size firms ** Path values of the structural model –medium size firms

CONCLUSION

Theoretical implications

The study enriches the extant knowledge on several fronts. First, following the investigations on the significance of being entrepreneurial in realizing increased overall performances (e.g. Rosenbusch, et al., 2013; Zahra,2005), this study was intended to shed light on the said macro view of entrepreneurial orientation and performances of SMEs. The first theoretical contribution is evident on the ground of study's attempt on building a single model incorporating entrepreneurial orientation, open innovation orientation, innovation, resource bricolage and triple bottom line goals to evaluate how entrepreneurial orientation drives SMEs to gain overall performances. The study results confirm that social entrepreneurship drives attaining the overall process of innovation-based triple bottom line goals.

Second, there is a limited number of research can be seen on open innovation from the SME perspective. However, rather than hypothesizing the direct relationship between open innovation and performances, this paper contributes to the literature by extending the perspective by theorizing two relationships; a) open innovation – innovation and, b) open innovation – triple bottom line goals. Thus, this is an expansion of the whole paradigm of innovation-performance link.

Third, this study aligns with several arguments posits the inadequacy of weighing the firm performances merely based on financial indicators (Hubbard, 2004; Jones et al., 2005). Extending this core argument, this paper adds theoretical nuance to the 'triple-bottom-line' framework on multiple grounds. In one hand, this paper brought together the 'triple bottom line' approach to evaluate overall performances of SMEs stressing the significance of taking a broader posture in evaluating performances which has largely been omitted in preceding research. On the other hand, the contribution is further vibrant since the paper tested antecedents of the triple bottom line, namely, open innovation orientation and innovation. Significantly, the triple-bottom-line variable is largely explained by the model ($R^2 = 59\%$).

Forth, 'bricolage' which is about the effective mobilization of available resources within firms, is a least researched dimension in entrepreneurship research domain (Desa, 2012) specifically in SMEs context. The original contribution is obvious since the paper investigated the moderating effect of resource bricolage on the

links: a) entrepreneurial orientation and open innovation orientation and, b) entrepreneurial orientation and innovation. This paper does an authentic contribution to extant literature with its findings that resource bricolage positively moderates the aforesaid relationships.

Managerial implications

This study offers preliminary guidance for SMEs to take an entrepreneurial posture. The proposed model in this study is a roadmap for SMEs managers, which clearly shows what criteria to be focused when achieving increased performances. As discussed, the model has incorporated entrepreneurial orientation, open innovation orientation, innovation, resource bricolage and triple bottom line goals to evaluate how entrepreneurial orientation drives SMEs to gain overall performances. Thus, the study stresses the significance of taking an entrepreneurial posture and being open innovation-oriented in nurturing greater innovations and performances.

The study also sheds the light on the significance of being open for external parties to source the knowledge that they cannot build in-house. Extending this further, the study suggests six multiple parties that SMEs managers to work with when sourcing such knowledge sources (direct customers, indirect customers, suppliers, research organizations, IPR experts and network partners).

Limitations and future research

Besides the aforesaid important theoretical and managerial implications, the study is with few limitations. First, though the study successfully captures a greater degree of variety of SMEs in Sri Lanka, our results emerge from a sample of SMEs and this could be problematic when generalizing the findings. Therefore, future

researchers can test the model in diverse segments such as large corporations and social enterprises, in different countries and cultures which would increase the degree of generalizability of the proposed research model. Second, it is evident that only 59% of the 'triple bottom line' variable is explained by the model which implies that 41% of the variation of the construct is not explained by the proposed model in this study. Hence, future researchers can expand on this dimension. Future research may also test different sets of antecedents and moderators to improve the predictability of the model.

Third, the key puzzle that this paper wanted to solve is whether the entrepreneurial orientation enhances SMEs' openness innovation orientation which in return enhances their innovations and performances. For accomplish this, this study followed a quantitative approach and hence, future researchers can follow mixed research design method and modify the proposed research model with qualitative data which will certainly increase the validity and the credibility of the model.

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