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Entrepreneurial behavior and firm performance: the mediating role of business model novelty

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ENTREPRENEURIAL BEHAVIOR AND FIRM PERFORMANCE: THE MEDIATING ROLE OF BUSINESS MODEL NOVELTY

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KEYWORDS: Entrepreneurial Behavior, Effectuation, Bricolage, Business Model Novelty, Firm Performance, Emerging Markets, SMEs

Entrepreneurial Behavior and Firm Performance: The Mediating Role of Business Model Novelty

Abstract

Bricolage and effectuation have emerged as new theoretical perspectives describing entrepreneurial behavior (EB). Bricolage emphasizes the creative use of available resources, while effectuation uses available means as a starting point and encourages firms to engage in affordable loss, pre-commitment, flexibility, and experimentation as independent dimensions for entrepreneurial actions. This study examines the influence of each dimension of EB, namely bricolage, affordable loss, pre-commitment, flexibility, and experimentation on business model novelty (BMN). It further assesses the EB – firm performance relationship and examines the mediating effect of BMN on the relationship between each dimension of EB and firm performance. We surveyed 238 small and medium enterprises in India. Our results indicate that bricolage, pre-commitment, flexibility, and experimentation positively influence BMN. However, affordable loss behavior had a negative impact on BMN. Moreover, our findings indicate that BMN mediates the EB-firm performance relationship. Our study enriches the extant literature by demonstrating the impact of each dimension of EB on BMN – an aspect not covered by the extant literature. Furthermore, our study adds to the literature by highlighting BMN as an important mediator explaining EB's impact on firm performance.

Keywords

Entrepreneurial Behavior, Effectuation, Bricolage, Business Model Novelty, Firm Performance, Emerging Markets, SMEs

1. Introduction

Entrepreneurial behavior (EB) involves an enactment of tasks required to explore and exploit new opportunities (Bird and Schjoedt, 2009, p. 328). In recent years, bricolage and effectuation have emerged as new complementary theoretical perspectives describing EB (Berends et al., 2014; Fisher, 2012; Welter et al., 2016). Bricolage entails creatively combining resources at hand to solve problems and create new opportunities (Baker and Nelson, 2005). On the other hand, effectuation is concerned with using the available means as a starting point and use affordable loss, pre-commitment, flexibility, and experimentation as independent dimensions to create and capture new opportunities in an uncertain environment (Arend et al., 2015; Dew et al., 2008; Sarasvathy, 2001). Scholars suggest that EB (i.e., bricolage and effectuation) better serves new ventures and small and medium-sized enterprises' (SMEs) pursuit of novel opportunities than the traditional rational economic approaches (Baker and Nelson, 2005; Fisher, 2012; Sarasvathy, 2009; Welter et al., 2016). However, research exploring the influence of EB – based on bricolage and effectuation – on SMEs is at a nascent stage. Our study adds to this stream of literature by exploring the relationship between EB, business model novelty (BMN), and the performance of SMEs.

Prior studies have highlighted that the independent dimensions of effectuation and bricolage (i.e., EB) drive product and process innovation (Fisher, 2012; Reuber et al., 2016; Roach et al., 2016; Senyard et al., 2014). Nevertheless, extant literature has paid scant attention to the potential impact of EB on BMN and its implications (Futterer et al., 2018; Guo et al., 2016; Reymen et al., 2017). BMN is defined as the degree of novelty in content, structure, and governance of the firm's business model (BM), creating new ways of conducting economic exchanges among various participants (Zott and Amit, 2007; Zott and Amit, 2008). These represent critical outward facing firm activities and, unlike other types of innovation (i.e., product, service, or internal process), have received little attention (Zott and Amit, 2010). BMN

helps firms survive, explore new opportunities, create and capture value, gain competitive advantage, and improve their performance (Baden-Fuller and Mangematin, 2013; Guo et al., 2017; Pati et al., 2018; Zott and Amit, 2007). Unsurprisingly, many scholars have called for further research to identify potential antecedents of BMN (Amit and Zott, 2015; Foss and Saebi, 2017; Guo et al., 2016; Pati et al., 2018; Snihur and Zott, 2020). EB drives creativity and innovation in products and processes (Fisher, 2012), but does it also drive BMN? This question remains unanswered, and hence, this paper explores the relationship between EB and BMN.

Prior empirical studies point to the direct influence of EB – that is, effectuation and bricolage – on firm performance (Brettel et al., 2012; Chandler et al., 2011; Yu et al., 2019). However, the mechanism by which EB influences firm performance is primarily assumed rather than empirically examined (Cai et al., 2017). EB and its dimensions highlight actions that enable SMEs to explore new opportunities (Shane and Venkataraman, 2000). For SMEs, the path to exploiting new opportunities lies in improving their BMN by adding new stakeholders, novel activities, or different transaction mechanisms (throughout this manuscript, "improving BMN" refers to altering all or any of these dimensions). Improving BMN is likely to boost a firm's performance by enhancing the value proposition for existing and new customers (Aspara et al., 2010; Pati et al., 2018; Zott and Amit, 2007). Therefore, BMN might be one of the missing link between EB and firm performance. However, few studies have explored the mediating effect of BMN on the EB–performance relationship. Hence, in this study, we examine: (1) the impact of EB on BMN; and (2) whether BMN mediates the EB–performance relationship.

Using the data from 238 Indian SMEs, our findings indicate that different dimensions of EB influence BMN differently, and that BMN mediates the EB–performance relationship. Our research contributes to the EB literature by affirming that each dimension is independent

and influences BMN differently. Additionally, we identify a mechanism by which EB influences firm performance. Our study also adds to the BM literature by highlighting EB as an important antecedent of firms' BMN and by demonstrating the importance of BMN as an essential firm-level construct linking EB and firm performance. Finally, our findings also encourage entrepreneurs and owner-managers to selectively focus on specific dimensions of EB useful for improving their BM design and firm performance.

The following section develops the theoretical framework that leads to our hypotheses linking EB, BMN, and firm performance. We then present our method section, followed by the analysis and results sections. Finally, we discuss the implications of our findings, highlighting our contribution to theory and practice.

2. Literature Review

2.1. Entrepreneurial Behavior

Entrepreneurial behavior describes how an entrepreneur or entrepreneurial firm acts to explore and exploit opportunities (Shane and Venkataraman, 2000). The traditional EB perspective draws on the demand and supply lens (Casson, 1982). However, in recent years, bricolage (Baker and Nelson, 2005) and effectuation (Sarasvathy, 2001) have emerged as alternative and complementary theoretical perspectives describing EB (Fisher, 2012; Welter et al., 2016). Both effectuation and bricolage enable SMEs to explore unspecified new opportunities better, using limited resources (Welter et al., 2016). However, effectual behavior is beneficial in uncertain contexts, whereas bricolage is most effective in the context of resource scarcity (Welter et al., 2016). Using both bricolage and effectuation to understand EB is especially relevant for SMEs from emerging economies that operate in both uncertain and resource-constrained environments (Pati and Garud, 2020; Xu and Meyer, 2013). Therefore, scholars suggest that

modeling EB using both bricolage and effectuation perspectives offers a more effective way forward (Fisher, 2012). Drawing on Fisher (2012), we use both bricolage and effectuation to portray EB.

Entrepreneurial bricolage focuses on the creative use of available resources when faced with resource constraints in addressing a new problem or exploring new opportunities (Baker and Nelson, 2005). In comparison, effectual behavior uses available means as a starting point and proposes affordable loss, pre-commitment, flexibility, and experimentation as independent dimensions for entrepreneurial actions (Chandler et al., 2011; Sarasvathy, 2001). Affordable loss deals with selecting the potential investments and opportunities centered on the threshold of loss rather than on long-term returns (Chandler et al., 2011; Roach et al., 2016; Sarasvathy, 2009). The affordable loss approach encourages the firm to invest in opportunities to survive the worst possible outcome (Dew et al., 2009). The pre-commitment behavior is built on the notion that, as part of a collaborative endeavor, each stakeholder commits to their contribution in developing the opportunities before the actual exploitation of the opportunity (Sarasvathy, 2001; Sarasvathy, 2009). The flexible behavior approach assesses a firm's agility while exploring and exploiting opportunities in an uncertain and continuously changing environment (Baker and Nelson, 2005; Chandler et al., 2011). Finally, experimentation is concerned with a firm's use of a trial-and-error approach to pursue their goals (Alvarez and Barney, 2007; Chandler et al., 2011).

These dimensions of EB are independent of each other and represent unique behavioral aspects that are conceptually different (Fisher, 2012; Sarasvathy, 2001). For example, a firm might rely more on one dimension, paying less attention to one or more of the other dimensions. Hence, the dimensions need not be correlated with each other and might have a different influence on outcomes (Chandler et al., 2011). Moreover, empirical evidence suggests that the dimensions of EB may have a different impact on other firm-level variables (Brettel et al.,

2012; Chandler et al., 2011). Therefore, we use each dimension as an independent sub-construct.

2.2. Business Model Novelty

Amit and Zott (2001 page 495) define a BM as a unifying unit of analysis describing "*the content, structure, and governance of transactions designed to create value through the exploitation of business opportunities*." Here, "content" refers to the selection of activities that are required to be performed; "structure" describes how the activities are linked or the sequence of activities; and "governance" highlights who conducts the activity (Zott and Amit, 2007; Zott and Amit, 2010).

Amit and Zott (2001) identify four archetypal BM designs – novelty, efficiency, lock-in, and complementarity. Lock-in and complementarity designs are germane to e-commerce ventures and capital-intensive industries (Zott and Amit, 2007; Zott and Amit, 2010). Novelty and efficiency cover a broader range of businesses and are more appropriate for SMEs and entrepreneurial ventures (Pati et al., 2018; Zott and Amit, 2007). Prior studies suggest that novelty is a more appropriate BM for entrepreneurial firms as it maps closely on to opportunity exploration, helping to create new opportunities (Amit and Zott, 2001; Zott et al., 2011). Scholars also found BMN to benefits all firms irrespective of operating environments, whereas BM efficiency is predominately beneficial for mature firms operating in hostile environments (Pati et al., 2018; Zott and Amit, 2007). Earlier studies have also highlighted the importance of EB for firm-level innovation (Fisher, 2012; Reuber et al., 2016; Senyard et al., 2014). Hence, EB is likely to influence BM novelty rather than efficiency. Therefore, our study focuses on novelty as a characteristic of a firm's BM design. BMN is defined as the degree of novelty in content, structure, and governance of the firm's BM (Zott and Amit, 2007; Zott and Amit, 2008). BMN is embedded in Schumpeterian economics, emphasizing innovation in conducting economic exchange (structure); commencing activities (content); and bringing stakeholders to

the existing BM (governance) (Zott and Amit, 2007; Zott and Amit, 2008; Zott and Amit, 2010).

Previous studies indicate that BMN drives firm performance (Aspara et al., 2010; Morris et al., 2013; Pati et al., 2018; Zott and Amit, 2007) and helps the firm gain a competitive advantage in the long run (Afuah and Tucci, 2001; Casadesus-Masanell and Ricart, 2011). Therefore, firms can strengthen their competitive advantage and performance by emphasizing factors that can improve their BMN. More recently, many scholars have highlighted the importance of exploring the antecedents of BMN (Amit and Zott, 2015; Foss and Saebi, 2017). However, limited quantitative studies have empirically examined the antecedents of this important construct (Foss and Saebi, 2017; Saebi et al., 2017). Prior studies have investigated the impact of some of the EB dimensions such as flexibility (e.g., Bock et al., 2012), experimentation (e.g., Andries et al., 2013; Sosna et al., 2010; Wiklund and Shepherd, 2011), and bricolage (Guo et al., 2016) on BMN. However, none of the studies have explored the impact of each dimension of EB on BMN.

Furthermore, although the relationship between dimensions of EB and firm performance is well established (Brettel et al., 2012; Chandler et al., 2011; Yu et al., 2019), a limited number of studies have explored mechanism that mediate this relationship. Cai et al. (2017) advanced our nascent knowledge by identifying exploratory learning as the link between effectual behavior and performance. However, exploratory learning (in some circumstances) requires significant slack resources, rendering it more appropriate for large organizations (O'Regan and Ghobadian, 2012). On the other hand, the BM is omnipresent regardless of organization size or context, offering a more comprehensive potential mediator between EB and firm performance. Hence, we posit that BMN mediates the relationship between each independent dimension of EB and firm performance.

2.3. Entrepreneurial Behavior and Business Model Novelty

Drawing on bricolage and effectuation, EB can encourage SMEs to explore and exploit new opportunities (Shane and Venkataraman, 2000). SMEs can leverage these opportunities profitably by improving their BMN by, for example, introducing new suppliers and partners, experimenting with new transaction methods, introducing new activities, or exploring new markets. Further, prior studies suggest that the inherent action-oriented approach of EB contributes to improving BMN (Chesbrough, 2010). Futterer et al 2018 concur and go further by saying that EB encourages reaching beyond the dominant logics improving BMN. Hence, we contend that EB positively influences BMN.

SMEs operate in a resource constraint environment limiting their ability to pursue new opportunities (Guo et al., 2018; Pati and Garud, 2020). In such environments, entrepreneurial bricolage enables SMEs to use their available resources creatively to explore new opportunities (Baker and Nelson, 2005; Guo et al., 2018; Sarasvathy, 2009). Entrepreneurial bricolage encourages SMEs to improve their BMN by adding new stakeholders and novel activities or using a different transaction mechanism resulting in the exploitation of new opportunities (Choi et al., 2008). Therefore, entrepreneurial bricolage is likely to improve BMN.

While exploring new opportunities, SMEs also have to minimize their losses (Lee et al., 2012). As new opportunities entail significant uncertainties, affordable loss behavior reduces the risk of potential loss to an affordable level while creating prospective options (Dew et al., 2008; Sarasvathy, 2001; Schneider, 2017). Affordable loss behavior encourages SMEs to pursue new activities, introduce new partners, and explore alternate markets and revenue streams to minimize the potential risks and losses to an affordable level (Goel and Karri, 2006). Therefore, we propose that an affordable loss behavior drives BMN.

In an environment with high uncertainty and resource constraints, entrepreneurial pre-commitment behavior encourages SMEs to explore partnerships with other stakeholders

willing to pre-commit their contribution to the opportunity exploration process (Sarasvathy, 2001; Sarasvathy, 2009). Thus, pre-commitment behavior supports the addition of new stakeholders with pre-committed resources and improves the BMN (Andries et al., 2013; Reymen et al., 2017). Moreover, pre-committed behavior also drives the co-creation of the value proposition and new activities, improving the BMN (Gummesson et al., 2010). Therefore, we propose that pre-commitment behavior helps SMEs to improve their BMN.

Entrepreneurial flexibility emphasizes agility and openness to change while exploring new opportunities (Chandler et al., 2011). Unexpected events and surprises in a business environment, such as new legislation, changes in financial structure and governance, or changes in consumer preference, bring new challenges and opportunities (Short et al., 2010). Flexible behavior helps SMEs adapt and enhance their BM to avoid challenges and exploit new opportunities (Chandler et al., 2011; Reymen et al., 2017). Therefore, SMEs, by pursuing flexible behavior, improve their BMN. For example, SMEs might manage their transactions in new ways, seeking to introduce different stakeholders, and modify the existing activities to exploit untapped opportunities (Bock et al., 2012). Hence, flexible behavior is likely to improve BMN.

Another way to manage uncertainty and reduce the risk of failure during the opportunity exploration process is to adopt an experimental approach (Alvarez and Barney, 2007; Chandler et al., 2011). Entrepreneurial experimentation and learning focus on continuous short-term incremental goals, using a trial-and-error approach towards new opportunities (Reymen et al., 2017; Sarasvathy, 2001). Experimental behavior encourages SMEs to introduce a new activity, stakeholder, or revenue stream using a trial-and-error approach, which improves the novelty of the existing BM (Andries et al., 2013; Zott et al., 2011). Therefore, we expect experimentation to influence BMN positively.

Drawing on the arguments presented above, we propose that EB and its various dimensions (for example, bricolage, affordable loss, pre-commitment, flexibility, experimentation) positively influence the BMN.

H1: EB positively influences BMN

H1a: Bricolage positively influences BMN
H1b: Affordable loss positively influences BMN
H1c: Pre-commitment positively influences BMN
H1d: Flexibility positively influences BMN
H1e: Experimentation positively influences BMN

2.4. Mediating Role of Business Model Novelty

Prior studies have highlighted the impact of EB and some of its dimensions on firm performance (Bojica et al., 2014; Brettel et al., 2012; Chandler et al., 2011; Yu et al., 2019). However, few have explored the mechanisms by which EB affects the performance of SMEs (Cai et al., 2017). Extant literature suggests BMN improves performance by enhancing value proposition, boosting customer satisfaction, and facilitating the exploration of untapped markets (Zott and Amit, 2007; Zott and Amit, 2008). Hence, we expect EB to positively drive the BMN of SMEs and consequently to improve their performance. Therefore, we hypothesize that BMN mediates the relationship between EB and SME performance.

Entrepreneurial bricolage encourages firms to creatively recombine existing resources, enabling them to introduce new activities or new ways to transact, thus improving BMN. These, in turn, enhance the value proposition or make the current value proposition more affordable and accessible (Baker and Nelson, 2005). Enhanced value proposition helps SMEs retain existing customers and attract new ones, leading to enhanced performance (Osterwalder and Pigneur, 2010; Zott et al., 2011). Bricolage might also improve BMN by removing non-value-adding activities of the BM, thus improving firm performance (Baker and Nelson, 2005;

Sarasvathy, 2009). Therefore, we hypothesize that BMN mediates the effect of entrepreneurial bricolage on SME performance.

Survival and minimization of losses are among the main challenges faced by SMEs during opportunity exploration (Delmar and Shane, 2006; Elango, 2009; Lee et al., 2012). Affordable loss behavior encourages SMEs to diversify their risk to an affordable level by introducing new stakeholders who bring resources and capabilities (Dew et al., 2008; Sarasvathy, 2009), enhancing the value proposition. The affordable loss behavior might also encourage SMEs to introduce ways to reach customers or alternate offerings, limiting losses to affordable levels in case of failure. We contend that affordable loss behavior improves BMN, which in turn improves the performance of SMEs. Based on the arguments presented, we hypothesize that BMN mediates the relationship between affordable loss and firm performance.

During the opportunity exploration process, the outcomes are unknown ex-ante. In such situations, pre-commitment behavior improves BMN by encouraging SMEs to develop a partnership with new stakeholders willing to pre-commit their resources and capabilities to opportunity exploration (Sarasvathy, 2001; Sarasvathy, 2009). This process helps the SMEs and their partners leverage strengths and contribute together to co-create new products, services, and value propositions, leading to improved firm performance (Chandler et al., 2011; Galkina and Chetty, 2015; Sarasvathy, 2009). Moreover, a pre-committed partnership might help introduce new technology, transaction mechanisms, or activities that provide access to an untapped market, thereby enhancing firm performance (Zott and Amit, 2013). Therefore, we propose that entrepreneurial pre-commitment positively drives BMN, leading to improved firm performance.

Entrepreneurial flexibility encourages firms to remain agile and nimble. Agility allows SMEs to effectively deal with surprises and assist in developing new revenue streams, market segments, and alternate sources of raw materials, leading to long-term performance benefits

(Pati et al., 2018). During opportunity exploration, flexibility might also encourage SMEs to improve their BMN by proactively linking existing activities and stakeholders in new ways or to explore new means of doing business, leading to improved performance (Dreyer and Grønhaug, 2004; Foss and Saebi, 2017). Therefore, we propose that BMN mediates the impact of entrepreneurial flexibility on firm performance.

Experimentation bolsters BMN by introducing new activities, stakeholders, and transaction links using the trial-and-error method (Andries et al., 2013; Rerup and Feldman, 2011; Zott et al., 2011). Thus, experimentation helps SMEs improve their BMN by testing new activities, partners, and transaction mechanisms and putting them into full operation those with the highest potential to succeed, thus improving performance (Andries et al., 2013). Hence, experimentation improves BMN by enabling SMEs to incrementally explore new markets or ways to heighten customer satisfaction, leading to improved performance (Chesbrough, 2010; Zott et al., 2011). Therefore, we propose that BMN mediates the effect of experimentation on firm performance.

The above arguments lead us to propose that BMN mediates the relationship between the dimensions of entrepreneurial behavior (i.e., bricolage, affordable loss, pre-commitment, flexibility, experimentation) and firm performance. Figure 1 depicts the conceptual model of our study.

H2: BMN mediates the relationship between EB and firm performance

H2a: BMN mediates the relationship between bricolage and firm performance.
H2b: BMN mediates the relationship between affordable loss and firm performance.
H2c: BMN mediates the relationship between pre-commitment and firm performance.
H2d: BMN mediates the relationship between flexibility and firm performance.
H2e: BMN mediates the relationship between experimentation and firm performance.

[Insert Figure 1 about here]

3. Method

3.1. Sample and Data Collection

To test our hypotheses, we collected our data from owner-managers of Indian SMEs attending trade conferences and training programs. To minimize response bias due to social desirability and increase the response rate, we gave respondents an option to anonymize their responses (Podsakoff et al., 2003). India is a high growth economy encouraging EB and BMN among SMEs (George and Bock, 2011). Hence, Indian SMEs are a suitable domain for this study. We received 308 completed questionnaires and excluded a total of 70 responses. The reason for excluded responses was threefold. First, we excluded firms in existence for less than two years because it was likely these had underdeveloped or unstable business models (Kollmann and Stöckmann, 2014). Second, a few firms employed more than 500 people (Javalgi and Todd, 2011). Third, we excluded incomplete responses. We were left with 238 useable responses.

3.2. Measures

All the variables were measured using items from established scales (see Appendix I for all scales). A seven-point disagree–agree scale (1 = strongly disagree to 7 = strongly agree) was used to capture the responses on these items. We conducted face validity of all the scale items in the Indian context by two Indian entrepreneurship scholars and two entrepreneurs. We also pre-tested the scale with 48 managers and 33 entrepreneurs before the final data collection.

Entrepreneurial Behavior (EB)

To measure bricolage, we used the scale proposed by Senyard et al. (2014). Prior studies have also used this scale (An et al., 2018; Wu et al., 2017). Due to low loading, we dropped two scale items. Hence, our final bricolage consists of a six-item scale ($\alpha = 0.861$). We measured affordable loss using three items ($\alpha = 0.813$); experimentation ($\alpha = 0.793$); and flexibility ($\alpha = 0.821$) using four items each, by adopting the scales from Chandler et al. (2011). Chandler et

al. (2011) measured pre-commitment using a two-item scale with low reliability (α = 0.62) and, hence, we added an item, adapted from Sarasvathy (2001) – namely, "*We prefer long-term partnerships and prior commitments from our suppliers and customers*." We face-validated and pre-tested the three-item scale before our final data collection. The final pre-commitment scale contained three items with strong reliability (α = 0.72). Other scholars have also used additional items to Chandler's pre-commitment scale to measure pre-commitment behavior (Cai et al., 2017; Roach et al., 2016).

Business Model Novelty (BMN)

The BMN scale was adopted from Pati et al. (2018), who adapted the original Amit and Zott (2001) scale for the Indian context. The scale measures the degree of novelty by capturing the extent to which entrepreneurs agreed or disagreed on the novelty of their business models. We also face-validated and pre-tested the items before the final data collection. Our final BMN scale had seven items and was found to have strong reliability (α = 0.872) and validity.

Firm Performance

We adopted a seven-item scale (α = 0.910) from Ramanujam and Venkatraman (1987) to measure firm performance. These measures are commonly used (Gupta and Batra, 2016; Nandakumar et al., 2010). We also asked the respondents to provide the actual return on assets (ROA); 64 respondents provided these values. We found a strong correlation (r=0.62, p=0.000) between the objective ROA values and the subjective performance values among the firms providing both sets of measures, thus offering a high degree of confidence in our main performance measures (Gupta and Batra, 2016).

Control Variables

Prior studies have commonly used firm size, firm age, industry sector, international presence, environmental hostility, and dynamism as control variables as these might influence BMN and

firm performance (Futterer et al., 2018; Pati et al., 2018). Therefore, we included these exogenous factors as control variables in our research model. The firm age variable ranges from 1 to 5, where "1" represents firms that are less than three years old, "2" represents 3–5 years old, "3" represents 5–7 years old, "4" represents 7–10 years old, and "5" represents more than 10 years old. We represented firm size using a five-point variable where "1" represented a firm with less than 100 employees; "2" represented a firm with the number of employees between 100 and 200, and so on up to 500 employees. We operationalized the international presence of SMEs using their number of international offices. We coded the industry sector as "0" and "1" for SMEs in the service sector and the manufacturing sector, respectively. We included environmental dynamism ($\alpha = 0.739$) and hostility ($\alpha = 0.737$) as control variables using scales adapted from Miller and Friesen (1982) and Slevin and Covin (1997), respectively, to measure them.

3.3. Common Method Bias

To control for any bias due to the impact of the training programs and conferences on the responses provided by the respondents, we collected our data at the beginning of these events. Additional responses were also collected from owner-managers of SMEs not involved in a conference or training program, and we could not find any difference in demographic and response patterns between additional respondents and our primary sample. The survey questionnaire defined central constructs. Additionally, before starting the survey, a member of the research team explained the nature, purpose, and the main constructs to the responders. A member of the research team was also available for any assistance throughout the survey. These measures helped to clarify any misunderstandings and provided more reliable data. To check the validity of the information provided by a key respondent, we requested a second respondent from the SMEs who had voluntarily provided their contact details to complete a part of the survey. The intra-class correlation coefficient (ICC) between the responses provided by the

original and second respondents was 0.89 ($p < 0.001$), which was much higher than the suggested value of 0.70. This finding confirms the reliability of the responses given by the first respondents (George and Bettenhausen, 1990).

Additional measures included arranging the questions in such a way that possible inference between questions was disrupted. To create psychological separation between independent and dependent variables, we included some filler tasks, as suggested by MacKenzie and Podsakoff (2012). We did the Harman (1976) test and found nine factors that explained 64.57% of the total variance, and the largest factor explained 19.33% of the variance. These results suggest that no major issues exist due to common method bias (CMB). We also used the common latent factor and marker variable techniques to assess CMB. The common latent factor model ($\chi 2/df = 1.307$, IFI = 0.947, TLI = 0.940, CFI = 0.946, RMSEA = 0.036, SRMR = 0.0672) was very close to the one without common latent factor ($\chi 2/df = 1.22$, IFI = 0.962, TLI = 0.957, CFI = 0.962, RMSEA = 0.03, SRMR = 0.0532), and these results indicated that CMB did not distort the results (Podsakoff et al., 2003). We also used the marker variable technique (Lindell and Whitney, 2001) by introducing a variable, namely "social contribution to underprivileged society" in the questionnaire. We found that the marker variable was uncorrelated with the variables, namely BMN and firm performance. After controlling for the marker variable, we also found that the variables in the model were still statistically significant. These results suggested that CMB did not affect our results (Williams et al., 2010).

4. Analyses and Results

We used AMOS, a maximum likelihood covariance-based structural equation modeling (SEM) software, to test our hypotheses. This technique permits the estimation of multiple associations by incorporating both observed and latent constructs simultaneously in these associations (Lubatkin et al., 2006). We used a two-step approach to SEM (presented below), as suggested

by prior studies (Hoyle, 1995; Lubatkin et al., 2006). We used the bootstrapping technique to generate all our models as it is a computationally intensive, nonparametric resampling procedure whereby repeated sampling from the data set is used for testing mediation or indirect effect (Zhao et al., 2010). Therefore, bootstrapping is considered the most effective technique to assess the mediating effect (Zhao et al., 2010). All the models were generated using 5,000 bootstrap samples. We also tested the mediation by using the Baron and Kenny (B&K) approach - causal steps approach - (Baron and Kenny, 1986) along with the Sobel test – a product of coefficients approach - (Sobel, 1986). The Sobel test (Bricolage (0.19, $p<0.001$), affordable loss (0.07, $p<0.05$), pre-commitment (0.12, $p<0.01$), experimentation (0.07, $p<0.05$), flexibility (0.10, $p<0.01$)) further supports our main findings that BMN mediates the relationship between EB and firm performance.

4.1. CFA and Measurement Model (Reliability and Validity of Measures)

All our variables were highly reliable, with composite reliability (CR) over 0.7 for all. The average variance extracted (AVE) for all the variables (except hostility) was more than 0.5; for hostility, the AVE was 0.49. These values suggest good convergent validity. The maximum shared variance (MSV) was less than the AVE, and the square root of the AVE was greater than inter-construct correlations for all our constructs, indicating good discriminant validity (Hair et al., 2010). Additionally, the maximum value of the variance inflation factor (VIF) for all our models was well below the permissible limit of 10 (Hair et al., 2010), and these figures suggested that multicollinearity did not cause any bias to our results. The details relating to the assessment of reliability and validity are shown in Table 1.

[Insert Table 1 about here]

4.2. The Sequence of Nested Structural Models

We have also contrasted the sequence of nested structural models, resulting in a structural model that accounts for the maximum observed covariance among the constructs providing the

best model fit to the observed data (Lubatkin et al., 2006). We contrasted the measurement model and the null model. The null model constrains the relationship between all the latent factors to zero. We noticed a large significant difference in chi-squared values ($\Delta\chi^2 = 279.55$, df = 147, p=0.000) between the measurement model and the null model. This difference suggests sufficient covariance between the latent variables and provides a basis for examining the nested structural models to test our hypothesis (Lubatkin et al., 2006). In addition, we tested four more nested structural models and evaluated them using a three-step procedure (e.g., Lubatkin et al., 2006). During this procedure, we assessed: (a) model fit using multiple fit indices; (b) variance, explained by the endogenous construct, indicating the substantive contribution of practical significance; and (c) significance of completely standardized path estimates to test our hypotheses.

All the nested structural models are summarized in Table 2. Model 5 has a strong model fit and explains the variance in BMN ($R^2 = 0.397$) and firm performance ($R^2 = 0.288$) significantly. We excluded all the non-significant parts from Model 5 and observed a drop in the variance explained for both BMN and firm performance. Therefore, we decided to retain the non-significant paths and considered Model 5 as our final model.

[Insert Table 2 about here]

Figure 2 depicts the findings. The final model indicated that none of the covariates significantly impacted BMN, but firm age ($\beta = 0.208$, $p = 0.043$) and firm size ($\beta = 0.256$, $p = 0.002$) had a positive influence on firm performance. Environmental dynamism ($\beta = -0.138$, $p = 0.058$) had a negative impact and BMN ($\beta=0.366$, $p=0.004$) had a significant positive influence on firm performance. One of the key findings is that four dimensions of entrepreneurial behavior – namely, bricolage ($\beta = 0.183$, $p = 0.028$), pre-commitment ($\beta = 0.275$, $p = 0.008$), experimentation ($\beta = 0.154$, $p = 0.054$), and flexibility ($\beta = 0.231$, $p = 0.004$) – had significant positive impact on BMN, while affordable loss ($\beta = -0.167$, $p = 0.025$)

negatively impacted BMN. Therefore, hypotheses H1a, H1c, H1d, and H1e is supported but hypothesis H1b is rejected. We also found a significant mediating influence of BMN on the positive effects of bricolage ($\beta = 0.067$, $p = 0.017$), pre-commitment ($\beta = 0.101$, $p = 0.004$), experimentation ($\beta = 0.056$, $p = 0.038$), flexibility ($\beta = 0.085$, $p = 0.002$), and negative effects of affordable loss ($\beta = -0.061$, $p = 0.022$) on firm performance, thereby supporting hypotheses H2a–e.

[Insert Figure 2 about here]

Furthermore, we found that the direct effects of affordable loss, pre-commitment, experimentation, and flexibility on performance were non-significant in our final model, while bricolage ($\beta = 0.194$, $p = 0.042$) had a significant positive influence on firm performance. Hence, we conclude that BMN fully mediates the relationship between the four dimensions of EB (i.e., affordable loss, pre-commitment, experimentation, and flexibility) and firm performance. However, bricolage – performance relationship is partially mediated by BMN.

5. Discussion and Conclusion

Our study examines the impact of dimensions of EB on BMN hitherto neglected. Furthermore, we explore the mediating effect of BMN on the relationship between EB and firm performance, throwing light on the mechanism linking the two. In doing so, we contribute to the research stream investigating the impact of EB on a new form of innovation, i.e., BMN (Fisher, 2012; Reuber et al., 2016). Moreover, our study adds to the limited literature exploring the mediating link between EB and firm performance. Additionally, we also contribute to BM literature by addressing calls by scholars for research to identify the antecedents of BM design and attributes (Foss and Saebi, 2017; Zott et al., 2011).

First, our findings indicate that entrepreneurial bricolage, pre-commitment, experimentation, and flexibility positively impact BMN, while the affordable loss approach has a negative effect on BMN. These findings clearly suggest that EB influences BMN. The fine-grained design of the study highlights the impact of each dimension of EB on BMN, providing a detailed picture. Our study adds to the literature by demonstrating that dimensions of EB drive not only product and process innovation (Fisher, 2012; Reuber et al., 2016) but also the BMN of SMEs. However, both the strength and direction of the coefficients suggest that each dimension is independent and influences BMN differently. In contrast to the earlier assertion (Futterer et al., 2018; Reymen et al., 2017), our findings indicate that each dimension of EB influences the BMN independently.

As we hypothesized, bricolage, experimentation, flexibility, and pre-commitment encourage SMEs to introduce new transaction mechanisms, engage with new suppliers and partners, pioneer new activities, and explore new markets, helping SMEs improve their BMN. Some recent studies have discussed the impact of entrepreneurial behavior on innovation and performance of SMEs (Chandler et al., 2011; Fisher, 2012; Senyard et al., 2014; Yu et al., 2019), and our study contributes by adding to this debate. Our study also supports that EB, as an action-oriented approach, encourages SMEs to go beyond their dominant logic driving BMN (Chesbrough, 2010; Futterer et al., 2018). More interestingly, by adopting a granular approach, our study also shows that the direction of the impact of dimensions of EB is not uniform. Contrary to our expectation, we found that affordable loss adversely influenced BMN. The common wisdom, as discussed previously, is that the affordable loss approach encourages some risk-taking. However, our finding lends support to the argument (proffered by some scholars) that the affordable loss approach discourages SME owner-managers from taking risks and making investment commitments in novelty-related activities (Read and Sarasvathy, 2005). Prior studies have also cautioned about the limitations and demerits of affordable loss

behavior (Goel and Karri, 2006; Read et al., 2009). A coarse approach, using either a single or aggregate measure of EB (or of its constituent dimensions of effectuation and bricolage), might show a positive relationship. However, it might mask the impact of individual elements, some of which may be negative.

Second, many studies have explored the relationship between EB and firm performance (e.g., Read et al., 2009). However, recent studies have indicated that the relationship between EB and firm performance may not be direct and might be mediated by other firm-level factors (Cai et al., 2017). Although ample studies have highlighted the impact of some dimensions of EB on BMN (Futterer et al., 2018) and the positive influence of BMN on firm performance (Futterer et al., 2018; Pati et al., 2018; Zott and Amit, 2007), we do not find any studies exploring the mediating effect of BMN on each dimension of the EB–performance relationship. Hence, we add to this stream of literature by empirically demonstrating that BMN mediates the relationship between the dimensions of EB and firm performance.

Additionally, our study contributes to BM literature in two ways. Although ample evidence highlights the importance of BMN, only a few studies have examined its antecedents (Foss and Saebi, 2017; Saebi et al., 2017). As BMs drive value creation and value capture, leading to competitive advantage and superior firm performance (Chesbrough, 2007), it is important to explore the ways by which firms can improve their BM. Prior research suggests that firm-level factors such as firm strategy (Browne et al., 2018) and top management team characteristics (Foss and Saebi, 2018), might influence BMs and their attributes. Our study contributes to this stream of research by identifying dimensions of entrepreneurial behavior as essential antecedents of BM design.

Finally, extant research has highlighted the potential of the BM as an effective mediator linking important firm-level constructs to performance (Foss and Saebi, 2017; Saebi et al.,

2017). Our study augments this literature by highlighting the importance of BMN as a critical mediator between EB and firm performance.

5.1. Managerial Implication

Apart from theoretical contributions, our findings inform practice by demonstrating how SMEs can improve their BMN and performance. Our study informs entrepreneurs and the owner-managers of SMEs that EB (such as bricolage, pre-commitment and partnership, flexibility, and experimentation) can improve their BMN and, eventually, their firm's performance. Finally, this study suggests that owner-managers of SMEs and entrepreneurs should exercise caution when using the affordable loss approach – it might limit their ability to improve their BMN and firm performance.

We discussed these findings with different groups of Indian entrepreneurs and owner-managers attending executive programs. The findings chimed with their experiences, and they articulated examples of how they improved the BM of their firms. For example, financial constraints thwarted expansion plans of one SME manufacturing cosmetic products as traditional distribution channels required investment in physical stores. Using existing resources, they developed relationships with e-commerce platform providers and developed alternate channels of distribution, selling their products online via third-party websites. This novel improvement in BM (driven by bricolage) resulted in significantly higher ROA and ROE. Another SME, marketing a traditional local-flavored beverage in glass bottles, wanted to change the packaging to reduce costs. However, they were unsure about how customers would respond to a new type of packaging. Hence, they tried and tested different packaging options, which were both cost-effective and appealing to the customers before finally changing it. Therefore, the experimental approach helped the SME improve its BMN and reduced costs, thereby improving performance. Similarly, entrepreneurs also acknowledge that pre-commitment and flexibility help them improve their BMN leading to enhanced performance.

Thus, our findings support the theory that EB and action during opportunity exploration drive BMN, which subsequently influences firm performance (Blank, 2013).

5.2. Limitation

Like all empirical research, our study has some limitations. First, although we took adequate care in minimizing response bias, it is difficult to completely rule out all issues due to the cross-sectional nature of the study and any key informant bias. A longitudinal panel design, with the data collected from multiple respondents, might resolve the problem. However, collecting such data presents challenges that are difficult to surmount. Second, we have drawn our sample from among Indian SMEs; further testing in other domains will enhance generalizability. Although we controlled for firm size, our sample does not distinguish between micro and small enterprise. Future studies could explore if the results are different across micro, small, and medium enterprises. Our research indicates that EB acts as an antecedent of BMN. Future studies should focus on exploring the impact of EB on other attributes of the BM, such as scalability and compatibility. Furthermore, future research could examine the influence of EB on other factors, such as diversification and internationalization.

In conclusion, our study suggests that the underlying dimensions of EB significantly influence BMN; and BMN acts as an important mediator between EB and firm performance. In carrying out this research, we have extended the literature in both the EB and BM fields. We hope that our study will encourage researchers to explore the impact of EB on new constructs via bricolage and effectuation. This will help identify further factors that could shape the relationship between EB and firm performance.

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Table 1. Reliability, validity and descriptive statistics

		Mean	SD	CR	AVE	MSV	1	2	3	4	5	6	7	8	9	10	11	12
1	**Bricolage**	4.66	0.91	0.86	0.51	0.17	**0.71**											
2	**Affordable Loss**	4.66	1.07	0.82	0.60	0.09	0.03	**0.77**										
3	**Pre-commitment**	4.67	1.17	0.79	0.56	0.16	0.37**	−0.06	**0.75**									
4	**Experimentation**	4.02	1.16	0.80	0.50	0.10	0.13*	−0.24**	0.01	**0.70**								
5	**Flexibility**	4.53	1.07	0.81	0.52	0.20	0.34**	−0.11	0.21**	0.23**	**0.72**							
6	**Business model novelty**	4.37	0.99	0.87	0.50	0.20	0.30**	−0.23**	0.34**	0.26**	0.37**	**0.70**						
7	**Performance**	4.59	0.95	0.91	0.59	0.13	0.22**	−0.05	0.16*	0.07	0.13*	0.31**	**0.77**					
8	**Dynamism**	3.51	1.11	0.76	0.53	0.02	0.05	−0.09	−0.05	0.05	0.12	0.11	−0.06	**0.73**				
9	**Hostility**	4.41	1.13	0.74	0.49	0.03	0.00	0.01	0.06	−0.13*	−0.14*	−0.07	0.01	−0.08	**0.70**			
10	**Firm age**	4.28	1.17	-	-	-	−0.11	0.08	−0.03	0.00	−0.04	−0.14*	0.11	−0.13*	0.17**	-		
11	**Firm size**	1.34	0.87	-	-	-	0.16*	0.02	0.14*	0.14*	0.12	0.08	0.26**	−0.03	0.04	−0.02	-	
12	**Industry sector**	0.60	0.49	-	-	-	0.14*	−0.04	0.06	0.08	0.10	0.06	−0.01	0.02	0.02	−0.04	0.13*	-
13	**International presence**	0.17	0.37	-	-	-	0.16*	−0.06	0.08	0.00	0.16*	0.06	0.10	−0.05	0.05	0.03	0.17**	0.14*

*p < .05; **p < .01

Note: N =238. Composite Reliability (CR), Average Variance Extracted (AVE), Maximum Shared Variance (MSV); SD = Standard Deviation. Diagonal contains square root of AVE.

Table 2. Summary of fit indices for contrasts based on the hypothesized model

		χ^2/df (< 3)	IFI (> 0.95)	TLI (> 0.95)	CFI (> 0.95)	RMSEA (<0.05)	SRMR (<0.08)	BMN R^2	Per R^2	Compare Models	$\Delta\chi^2$ [Δdf]
Model 1	Null model	1.34	0.931	0.921	0.929	0.36	0.107	0	0		
Model 2	Covariates only	1.31	0.938	0.927	0.936	0.37	0.097	0.055	0.121	2 vs. 1	38.78***[12]
Model 3	Covariates; EB→ Per	1.31	0.937	0.926	0.935	0.36	0.931	0.055	0.207	3 vs. 2	17.14**[5]
Model 4	Covariates; EB→Per; BMN→Per	1.29	0.942	0.931	0.94	0.035	0.085	0.055	0.273	4 vs. 3	21.34***[1]
Model 5	Covariates; EB→BMN→Per; EB→Per (full model)	1.21	0.959	0.951	0.958	0.028	0.051	0.397	0.288	5 vs. 4	77.024***[5]

*p < .05; **p < .01, ***p < .001.

Note: N = 238. Number of bootstrap samples = 5,000

Covariates include: firm size, firm age, industry sector, international presence, environmental dynamism, environmental hostility.

IFI = Incremental Fit Index; TLI = Tucker-Lewis Index; CFI = Comparative Fit Index; RMSEA = root mean square error of approximation; SRMR = standardized root mean residual; EB= Entrepreneurial Behavior; BMN = Business Model Novelty; Per = Performance. The minimum value for a good model fit for each index is provided in parentheses.

Figure 1. Conceptual model

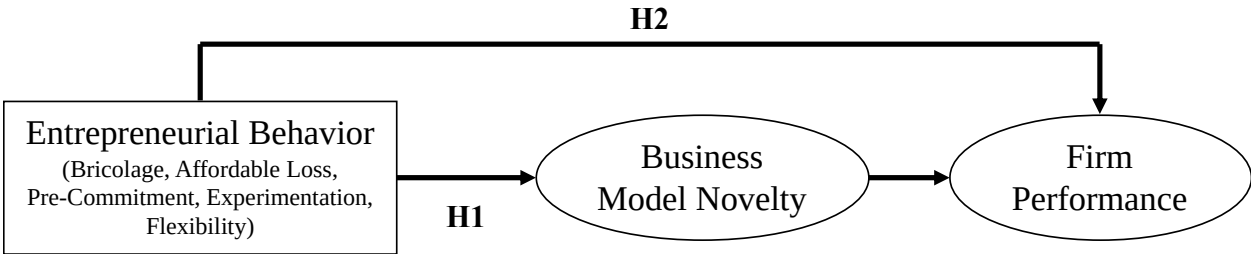
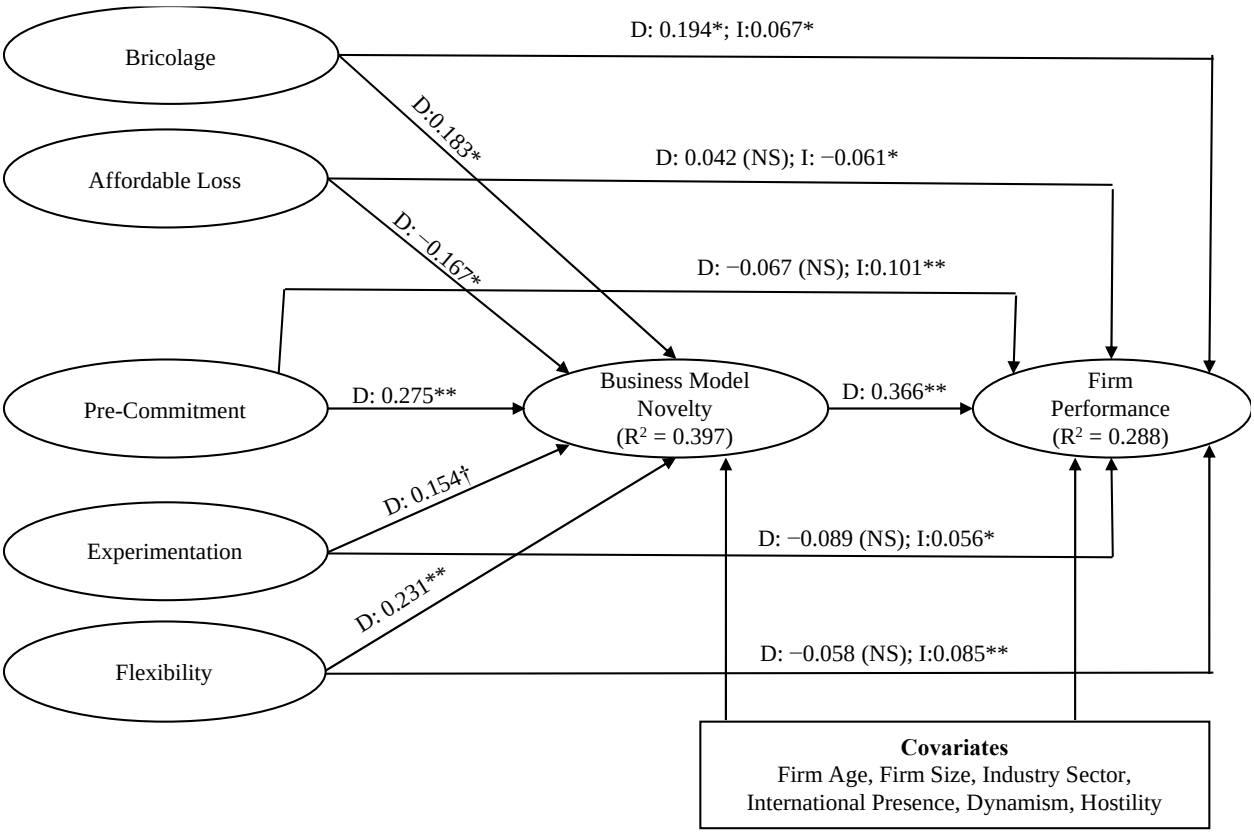


Figure 2. Hypothesized model results



***p < .001, **p < .01, *p < .05, † p < .1, NS=Non-significant

Note: N = 238. Number of bootstrap samples = 5,000

Standardized parameter estimates. D = direct effect; I = Indirect effect

This is a simplified version of the actual model. It does not show indicators, error terms, exogenous factor variances, nor correlations between the independent and control variables; these are included in the model but are not drawn in the figure for the sake of clarity.

Appendix I. Final items of the scales used in the study

Bricolage (Senyard et al., 2014)

- We are confident of our ability to find workable solutions to new challenges by using our existing resources 0.72
- We use any existing resource that seems useful when responding to a new problem or opportunity 0.75
- We deal with new challenges by applying a combination of our existing resources and other resources inexpensively available to us 0.80
- When dealing with new opportunities we take action by assuming that we will find a workable solution 0.74
- By combining our existing resources, we take on a surprising variety of new challenges 0.68
- When we face new challenges, we put together workable solutions from our existing resources 0.78

Affordable loss (Chandler et al., 2011)

- We are careful not to commit more resources than we could afford to lose 0.85
- We are careful not to risk so much money that the company would be in trouble if things didn't work out 0.84
- We are careful not to risk more money than we are willing to lose with our initial idea 0.80

Pre-commitment (Chandler et al., 2011, item 3 adapted from Sarasvathy, 2001)

- We use a substantial number of agreements with our stakeholders to reduce the amount of uncertainty 0.81
- We use pre-commitments from customers and suppliers as often as possible 0.85
- We prefer long-term partnerships and prior commitment from our suppliers and customers 0.73

Flexibility (Chandler et al., 2011)

- We are flexible to allow the business to evolve as opportunities emerge 0.80
- We are flexible to take advantage of opportunities as they arise 0.77
- We adapt our processes to make the best possible use of the resources we have 0.80
- We avoided courses of action that restricted our flexibility and adaptability. 0.68

Experimentation (Chandler et al., 2011)

- We continuously experiment with different products/services that we provide 0.79
- The product/service that we now provide is substantially different than we first imagined 0.85
- We continuously experiment with our business process 0.71
- We tried a number of different approaches until we found a business model that worked. 0.72

Business model (BM) novelty (Pati et al., 2018)

- Our BM offers novel incentives to the stakeholders in the transactions 0.77
- Our BM offers new combinations of products, services, and information 0.74
- Our BM brings together new stakeholders (previously unconnected parties) 0.70
- Our BM links stakeholders to transactions in novel ways 0.75
- Our BM increases the richness (i.e., quality and depth) of some of the links between participants 0.65
- Our BM creates novel value by challenging existing business models 0.73
- Our BM creates and captures value in a way that no other firm does 0.72

Environmental dynamism (Miller and Friesen, 1982)

- Actions of competitors are generally quite easy to predict 0.80
- Product demand is easy to forecast 0.78
- Customer requirements / preferences are easy to forecast 0.81

Environmental hostility (Slevin and Covin, 1997)

- Competitive intensity is high in my industry 0.72
- Severe price wars are characteristic of my industry 0.81
- Low profit margins are characteristic of my industry 0.86

Firm performance (Ramanujam and Venkatraman, 1987)

- Improvement in revenue 0.83
- Improvement in profit 0.84
- Improvement in sales growth 0.79
- Improvement in growth of profit after tax 0.83
- Improvement in market share 0.78
- Improvement in competitive position 0.77
- Improvement in overall performance 0.73

Note: Item loading provided along with the item