FINDING THE MICRO-FOUNDATIONS OF ORGANIZATIONAL AMBIDEXTERITY - DEMYSTIFYING THE ROLE OF TOP MANAGEMENT BEHAVIOURAL INTEGRATION

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ABSTRACT

Organizational ambidexterity in a firm is significantly influenced by the behavioural integration of the Top Management Team (TMT). Researchers observe that ambidextrous firms are associated with two dimensions of dexterity, namely, balanced and combined dimensions. However, studies do not explain the varied effects of behaviourally integrated TMTs on the different dimensions of ambidexterity. A clear understanding of this relationship will help firms choose the specific TMT processes needed to facilitate specific dimensions of ambidexterity. We address this research gap and test our research model with structural equation analyses on data collected from 78 SMEs. We observe that behavioural integration processes mostly enhance a firm's combined ambidexterity. Further, we find that combined ambidexterity completely mediates the relationship between behavioural integration and firm performance. Our study adds to the literature on ambidexterity, micro-foundations, and the theory of behavioural integration, and guides small firms in their choices of behavioural and innovation practices.

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1. Introduction

Ambidextrous firms are able to meet changing market demands by exercising a dynamic capability to combine and/or balance innovations that are simultaneously explorative and exploitative (Duncan, 1976; March, 1991; Tushman and O'Reilly, 1996). Research on ambidextrous firms is dominated by studies that explore either the genesis of ambidexterity or its effect on firm performance (Limaj and Bernroider, 2019; Turner, Swart, and Maylor, 2013). Most of these studies treat organizational ambidexterity as a single conceptualization. However, recent studies have conceptualized ambidexterity into two dimensions, namely, combined and balanced (Cao, Gedajlovic, and Zhang, 2009; He and Wong, 2004). Balanced ambidexterity is the pursuit of exploration and exploitation in an equitable manner. Combined ambidexterity, in contrast, is the ability of the organization to pursue exploration and exploitation to a greater combined degree. While it appears self-evident that balancing and combining explorative and exploitative innovations will have varying effects on an organization's performance measures (Gualandris, Legenvre, and Kalchschmidt, 2018; Roldán Bravo, Ruiz-Moreno, and Lloréns Montes, 2018), the conditions under which firms might benefit from one or both dimensions of ambidexterity are poorly understood. It is therefore important for academic researchers to examine the effects that similar antecedents and outcomes might have on the different dimensions of ambidexterity.

In the past, researchers have examined the influence of senior management on organizational ambidexterity. For instance, Cao, Simsek, and Zhang (2010), Kauppila (2010),

Raisch, Birkinshaw, Probst and Tushman (2009), and Tushman and O'Reilly (1996) all acknowledge the significance of top management processes in enabling the combination of exploration and exploitation. Most of these studies were conducted from the perspective viewpoint of the upper echelons. Through this perspective, Hambrick and Mason (1984) suggest that organizational outcomes rely on the background, experience, decision-making, and skills of top management. Further, in an extension of the upper echelons perspective, Hambrick (1994) proposes that behaviourally integrated Top Management Teams (TMTs) are better able to manage contradictory innovation choices. Hambrick (1994, p. 188-189) defines TMT behavioural integration as "the degree to which the senior management group engages in mutual and collective interaction". A behaviourally integrated TMT exhibits a variety of mutually interactive and reinforcing processes that include collaborative behaviour, information exchange, and joint decision-making (Hambrick, 1994; Lubatkin, Simsek, Ling, and Veiga, 2006). Ambidexterity researchers (Lubatkin et al., 2006; Venugopal, Krishnan, Kumar, and Upadhyayula, 2017; Yitzhack Halevi, Carmeli, and Brueller, 2015) have, in the past, observed positive associations between behaviourally integrated TMTs and ambidextrous firms. However, none of these studies have explored whether behaviourally integrated TMTs have different influences on the combined and balanced dimensions of ambidexterity. In our study, which is anchored in the new micro-foundations research, we aim to examine the distinct causal mechanisms and varied effects of the combined and balanced dimensions of ambidexterity. The new micro-foundational movement emphasizes the need to examine the varied influences of senior team behaviours and behavioural strategies on dynamic capabilities such as organizational ambidexterity (Foss and Lindenberg, 2013; Stokes et al., 2015; Tabesh, Vera, and Keller, 2019;

Teece, 2007). Barney and Felin (2013) suggest that the traditional perspectives seen in the literature on the upper echelons and top management are key pillars of the new research on micro-foundations.

In the past, the predominant research views on ambidexterity have conceptualized and measured it as a combined dimension and observed its positive association with the financial performance of firms (Raisch et al, 2009; Uotila, Maula, Keil, and Zahra, 2009). Other studies find a positive association between the balanced dimension of organizational ambidexterity and firm performance (Cao et al., 2009; Güttel, Konlechner, and Trede, 2015; He and Wong, 2004; Sok and O'Cass, 2015). Some studies (Cao et al., 2009; Enke and Bausch, 2013; Güttel et al., 2015; Kim and Rhee, 2009; Uotila, 2017) have observed that the dynamism of the environment might change the nature of the relationship between the dimensions of ambidexterity and financial performance. However, few studies have ventured to explore the conditions that might impinge the impact of the ambidexterity dimensions on firm financial performance.

We submit that an analysis of secondary data would be insufficient for an understanding of the causal mechanisms and effects of these two closely associated organizational capabilities. Hence, we choose to test our conceptual model with primary data collected via survey instruments from 78 Small and Medium Enterprises (SME) across the industries of Information Technology (IT), Biotechnology, and Electronics in India. Our findings shed light on the previously unknown varied effects of TMT behavioural integration and its sub-processes on the different dimensions of ambidexterity and firm performance. Thus, our study adds to the literature on ambidexterity, the micro-foundations of organizational capabilities, and behavioural integration. The remaining sections of the study are organized as follows. We describe the theoretical background and the

development of our hypothesis in the first section. In the second section, we explain the research methods employed, the data analysis techniques used, and the results. Finally, we explain the findings of the study, its implications for practice and research, and delineate the limitations and future areas of research.

2. Theoretical Background and Hypothesis Development

In the recent past, there has been an increased focus on the micro-foundations of firm strategies and organizational capabilities (Felin and Foss, 2005; Helfat and Peteraf, 2015). Felin and Foss (2005) define micro-foundations as including all the individual-level actors responsible for organizational outcomes, including their nature, choices, abilities, and motivations, together with their emergent collective interactions. Of the various research streams associated with the discipline of micro-foundations, the theory of behavioural integration, being an extension of the upper echelon perspective, is one of the most widely used theoretical underpinnings to an understanding of the aggregate influences of top management processes on ambidexterity. While the upper echelon perspective proposes that organizations are manifestations of their managerial characteristics (Hambrick and Mason, 1984), the theory of TMT behavioural integration underscores the claims of the micro-foundation theory of organizational capabilities, proposing that a behaviourally integrated TMT better manages contradictory innovation choices (Hambrick, 1994). A behaviourally integrated TMT is better equipped, through the sub-processes of collaboration (Lin, McDonough, Lin, and Lin, 2013), joint decision-making (Smith, 2014), and information exchange (Smith and Tushman, 2005), to achieve common platforms of

understanding and managing the contradictory demands of exploration and exploitation (Lubatkin et al., 2006).

Studies posit that ambidextrous firms are able to simultaneously balance and pursue the conflicting demands of exploration and exploitation (Duncan, 1976). Ambidextrous firms therefore have two dimensions wherein they reflect their ambidexterity: first, by the degree of balance they maintain between their exploration and exploitation activities; second, by the combined magnitude of their exploration and exploitation. These two dimensions are named the balanced and combined dimensions of ambidexterity, respectively (He and Wong, 2004). In the recent past, studies have explored the effects on the dimensions of ambidexterity of various organizational capabilities, such as desorptive capacity (Roldán Bravo et al., 2018) and combined and balanced management controls (Wang, Yang, and Zhang, 2018). However, despite significant academic research (Jansen, George, Van den Bosch, and Volberda, 2008; O'Reilly and Tushman, 2011) suggesting that TMT actions are one of the most significant factors necessary for ambidextrous firms, no study to date has examined how the micro-foundations of top management processes have differing effects on the two dimensions of ambidexterity. This research gap is the focus of our study.

2.1. TMT Behavioural Integration and Ambidexterity

A behaviourally integrated TMT manages contradictory innovation choices through mutual and collective interactions, exhibited via the sub-processes of collaborative behaviour, information exchange, and joint decision-making (Hambrick, 1994). Hambrick (1994) defines a

collaborative TMT as one that shares tasks and resources seamlessly and exhibits a high degree of task and social collaboration.

When TMT engages in enhanced informal and formal networking and achieves a perceptible degree of cohesiveness, it is better enabled to negotiate the distribution of resources between a firm's existing exploitative and its new explorative pursuits (Lax and Sebenius, 1987). The social dimension of a collaborative TMT facilitates distributive decision-making in a realm of contradictory innovation demands. Past studies have postulated similar relationships between shared top management team decisions and the paradoxical innovation outcomes of firms (Smith and Tushman, 2005). With enhanced information exchange, a TMT can combine diverse opinions on common mental platforms and distribute the paradoxical strategic demands of resource, time, and personnel allocation to achieve a balanced dimension of ambidexterity (Martin, Keller and Fortwengel, 2017; Raisch et al., 2009; Smith and Tushman, 2005).

In the same vein, when TMTs make collective decisions by taking into account each member's opinion, they are striving towards a common mental platform that balances the varied vested functional interests. With joint decisions, TMT members discuss and evaluate all ideas before reaching a united decision. When TMT members are aware of all the strategic decisions and choices available to the firm, it becomes easier for them to develop the paradoxical cognitive processes necessary for the optimal distribution of resources (Smith and Tushman, 2005). Therefore, building on past literature, we hypothesize that TMT behavioural integration is positively associated with the balanced dimension of ambidexterity.

H1: TMT behavioural integration is positively associated with the balanced dimension of ambidexterity of the firm.

When a TMT shares tasks and resources, their degree of awareness of and involvement in the varied end-objectives of these tasks and resource allocations increases. This enables them to recognize the opportunities, synergies, and linkages that can be employed in the integration of existing resources and tasks (Smith and Tushman, 2005). In other words, enhanced TMT collaboration enables a firm to make integrative decisions that take advantage of the inter-operable nature of tasks and resources. The task dimension of a collaborative TMT enhances the firm's ability to integrate and combine paradoxical innovative pursuits (Smith and Tushman, 2005).

Similarly, when a TMT exchanges information extensively, the members have more opportunities to disseminate knowledge within the organization, including information about the knowledge expertise available within the organization (Carmeli and Yitzhack Halevi, 2009; Carmeli and Schaubroeck, 2007). Such improved information enables the TMT to address complex issues from a variety of perspectives, thereby making better-informed decisions (Evans and Butler, 2011). Thus, a behaviourally integrated TMT benefits from an enhanced information exchange that renders it more capable than a less integrated TMT of assimilating exploration and exploitation activities. Further, through joint decision-making, all TMT members are able to voice their opinions, unhindered by any apparent display of power differences within the team (Lubatkin et al., 2006). When a TMT makes joint decisions in this manner, the firm has the advantage of being able to scrutinize each alternative course of action and its consequence, and decision-making is fuelled by inputs from all the functional areas. Therefore, it is logical to argue that firms that do have TMTs that engage in such high degrees of collaboration, information exchange, and joint decision-making will be able to make decisions that display a high degree of

enhanced integrative innovation, thereby reducing resource slack and task redundancies. Thus, we propose that a behaviourally integrated TMT enhances the combined dimension of ambidexterity.

H2: TMT behavioural integration is positively associated with the combined dimension of ambidexterity of the firm.

2.2. Dimensions of Ambidexterity and Firm Financial Performance

In March (1991), and more recently, Miller and Martignoni (2016) suggested that firms trade-off investments in the exploration versus the exploitation of knowledge. Following this argument, O'Reilly and Tushman (2004) revised the concept of ambidextrous firms (Duncan, 1976) to propose that ambidextrous firms enhance performance by balancing exploration and exploitation simultaneously. Today, the conception of ambidexterity has two main tenets. First, ambidextrous firms pursue exploration and exploitation simultaneously. Second, ambidextrous firms balance exploration and exploitation. Although empirical research has examined the claims of simultaneity in detail and has offered alternative explanations in the form of the temporal partitioning of exploration and exploitation (Siggelkow and Levinthal, 2003), there is a dearth of research scrutinizing the balanced and combined effects of exploration and exploitation on firm performance. Balancing paradoxical innovations requires not only an unbiased resource and task distribution but also a degree of distributive senior management negotiation (Smith and Tushman, 2005). Similarly, the organizational capabilities that are necessary to integrate paradoxical innovations include the ability to leverage the effects of paradoxical innovation tasks

and resources (Cao et al., 2009; Smith and Tushman, 2005). However, ambidexterity researchers have predominantly chosen to measure the combined effect of exploration and exploitation on firm financial performance. To date, only Cao et al. (2009) and He and Wong (2004) have examined the comparative effects of the balanced and combined dimensions of ambidexterity on the financial performance of a firm. Both studies found empirical support for the effect of combined ambidexterity on firm financial performance. Regarding the effects of balanced ambidexterity on firm financial performance, Cao et al. (2009) observed these to be positive, while He and Wong (2004) found the reverse to be true. More recently, Enke and Bausch (2013) suggested that the different dimensions of ambidexterity might have opposing effects on firm financial performance, contingent on their conceptualizations and the national cultures and ages of the firms. Ambidexterity, conceptualized as a combined dimension, has a greater effect on firm performance for mature firms and in collectivist nationalist cultures (Enke and Bausch, 2013). However, these studies overlook the need to balance exploration and exploitation. Exploitation helps firms to overcome the risks of failure, while exploration helps them to avoid the risk of obsolescence (Cao et al., 2009). To survive in the long run, firms need to be able to balance their exploration and exploitation activities (Tushman and O'Reilly, 1996). Therefore, we hypothesize that balancing exploration and exploitation is positively associated with the firm's financial performance.

H3: A balanced dimension of ambidexterity is positively associated with firm financial performance.

Past studies examining the combined effect of exploration and exploitation on firm performance suggest that paradoxical innovative pursuits build on each other (Gilsing and

Nooteboom, 2006). When the variety of content in the existing knowledge domains of a firm starts to decline, the firm finds itself repetitively exploiting the same dominant codified knowledge. To meet the challenges of their environments, firms must explore a variety of content from different contexts while maintaining the content in their knowledge domains. Combining new and extant knowledge leads to differentiation and the birth of new knowledge that is incorporated into the established knowledge base for future exploitation. Thus, exploitation and exploration enhance each another in cycles of knowledge discovery (Gilsing and Nooteboom, 2006), thereby increasing the overall innovation level of the firm and leading to improved firm financial performance. In a similar vein to other such studies (Lubatkin et al., 2006), we hypothesize that the combined dimension of ambidexterity (combined exploration and exploitation) positively affects firm financial performance.

H4: The combined dimension of ambidexterity is positively associated with firm financial performance.

2.3. TMT Behavioural Integration, Dimensions Of Ambidexterity and Firm Financial Performance

Studies (Carmeli, 2008; Simsek, Veiga, Lubatkin, and Dino, 2005) have shown that behaviourally integrated TMTs enhance the financial performance of firms. Li and Hambrick (2005) established that a behaviourally disintegrated TMT is negatively associated with firm performance. Carmeli (2008) postulates that a behaviourally integrated TMT exchanges diverse opinions and views without any perceived power difference within it, thereby avoiding groupthink and enhancing the overall performance of the firm.

Studies (Pertusa-Ortega, and Molina-Azorín, 2018; Roldán Bravo et al., 2018) have also observed positive relationships between the integration of exploration and exploitation with firm financial performance. However, most of these studies have measured only the combined dimension of ambidexterity to test the ambidexterity hypothesis (Junni, Sarala, Taras, and Tarba, 2013). In the recent past, a few studies have compared the effects of the balanced and combined dimensions of ambidexterity on varied measures of organizational performance, including firm financial performance (Cao et al., 2009; He and Wong, 2004), supplier product innovation (Gualandris et al., 2018), supply chain competence (Roldán Bravo et al., 2018), cooperative innovation (Wang et al., 2018), and a firm's ability to take advantage of favourable environments (Crescenzi and Gagliardi, 2018). Some of these studies observed that a firm might gain more benefit from the combined dimension of ambidexterity than from the balanced dimension (Gualandris et al., 2018; Roldán Bravo et al., 2018). Surprisingly, some studies, while comparing the effects of the balanced and combined dimensions of ambidexterity, have revealed negative associations between combined ambidexterity and cooperative innovation (e.g., Wang et al., 2018). Researchers suggest that the effect of an organization's ambidextrous dimensions on performance is largely contingent on environmental dynamics (Gualandris et al., 2018; Wang et al., 2018) and the indicators chosen to measure ambidexterity (Kerry and DeSimone, 2019). For instance, in environments with rapidly changing policies, technologies, and market demands, a small firm might fare better with enhanced exploration rather than balanced exploration and exploitation (Gualandris et al., 2018). Similarly, researchers have observed that measures of ambidexterity that omit indicators of the joint variances of exploration and exploitation with their reciprocal reinforcements would fail to uncover significant influences on financial performances

(Kerry and DeSimone, 2019). In our study, to better understand how and why environmental agents affect the genesis and effects of the different dimensions of ambidexterity, we propose to compare the mediating role of ambidexterity in the relationship between TMT behavioural integration and firm financial performance.

Since it is suggested that behaviourally integrated TMTs enhance not just a firm's financial performance but also impacts several other organizational performance measures such as human resource performance (Carmeli, 2008; Chen, Tang, Lee Cooke, and Jin, 2016) and the organization's productive energy (Raes, Bruch, and De Jong, 2013), it is logical to reason that the dimensions of ambidexterity would only partially mediate the effect of a behaviourally integrated TMT on a firm's financial performance.

H5: A balanced dimension of ambidexterity mediates the effect of TMT behavioural integration on firm financial performance.

H6: The combined dimension of ambidexterity mediates the effect of TMT behavioural integration on firm financial performance.

We demonstrate the proposed research model in Figure 1.

Insert Figure 1 Here

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3. Methods

3.1. Sample and Procedure

We examined our hypotheses in the research context of Small and Medium Enterprises (SMEs) between 10 and 300 employees. In 2007, the National Knowledge Commission in India identified Information Technology, Biotechnology, and Electronics as the industries with the highest innovation intensities. We therefore explored the research questions in the context of SMEs across the industries of Information Technology, Biotechnology, and Electronics in India. The following logical arguments prompted us to set our research in an SME context. First, TMTs in SMEs have a more significant position than their counterparts in large firms. They take on duties that are strategic as well as managerial in nature (Cao et al., 2009; Lubatkin et al., 2006). Second, TMTs in SMEs differ from those in large firms in that they are not a loosely aggregated group of people and tend to be highly behaviourally integrated (Hambrick, 1994). Third, past studies have observed positive associations between TMT behavioural integration and organizational ambidexterity in SMEs of similar employee size. Finally, in our study, we aim to examine the micro-foundational antecedents of the different dimensions of ambidexterity, and past studies have emphasized the role of resource constraints in determining the ability of the firm's leadership to balance the dimensions of ambidexterity. Thus, SMEs, being more resource constrained than larger firms (Barney, 1986), provide us with a wider scope for unravelling the nuanced and varied effects of TMT behavioural integration on the different dimensions of ambidexterity.

3.2. Data Collection

We collected quantitative data with survey instruments on the dependent variables (firm financial performance, and the balanced and combined dimensions of ambidexterity) and the independent variable (TMT behavioural integration) from managerial and TMT members, respectively, between November 2014 and June 2015. We collected data from firms located in the states of Kerala and Karnataka to obtain a representative sample of the Indian IT, Biotechnology, and Electronics SMEs. The Ministry of Micro, Small and Medium Enterprises (MSME) ranked the States of Kerala and Karnataka at the 6th and 8th positions, respectively, in a classification of the Indian States based on the quantum of MSME enterprise and employment presence in the States. We obtained the list of SMEs in these states from D and B India's Emerging SME database (D and B India, 2008). Of the invited firms, 83 responded to the survey. We removed 5 firms that recorded less than 80% of the data (Hair, Hult, Ringle, and Sarstedt, 2013). Thus, with a response rate of 19.5% and 473 usable surveys, we had 240 responses from TMT members and 233 responses from managerial executives. This response rate is better than the average response rate for organizational level studies in the Indian context (Krishnan & Poulose, 2016). We collected data from at least 3 TMT members and 3 managerial executives for each firm.

We met with the Managing Directors (MD) and Chief Executive Officers (CEO) and invited them to participate in the study and to allow their firms to do so also. Without revealing the details of the study, we provided a memo on our definitions of TMT and exploration and exploitation innovation. Like similar studies in the literature (Lubatkin et al., 2006; Mihalache, Jansen, Van den Bosch, and Volberda, 2014), we asked the MDs and CEOs to identify their TMT members and requested them to be a part of our study. TMT members were defined as all

managerial executives and higher ups, including CEOs, who have the capacity as TMT to make decisions on exploration and exploitation in the firm. Of the final sample of 78, 43 TMTs had multiple founders.

3.3. Measures

3.3.1. Dependent Variables: Firm Financial Performance

We asked the CEOs and managerial executives to assess their firm's financial performance over the prior three years by comparing aspects of it with those of their major competitors. We used Auh and Menguc's (2005) Likert scale of firm financial performance, where the scale is anchored between 1 (much worse) and 5 (much better). The items were (1) return on sales, (2) return on assets, (3) return on investment, (4) profit growth, and (5) sales growth.

3.3.2. Balanced and Combined Dimensions of Ambidexterity

We adapted the scale of Lubatkin et al. (2006) to measure the organization's exploration and exploitation orientation during the previous three years. We asked the managerial executives and the CEOs of the firms to each assess 6 statements on the exploration and exploitation activities of their firm on a scale from 1 (strongly disagree) to 5 (strongly agree). We measured exploration through reflective items, such as (1) Your organization looks for novel technological ideas by thinking 'outside the box', and (2) Your organization bases its success on its ability to explore new technologies. We measured exploitation through reflective items, such as (1) Your organization commits to improve quality and lower cost, and (2) Your organization continuously improves the reliability of its products. Like Cao et al., (2009), we measure the balanced

dimension of ambidexterity by subtracting the absolute difference between exploration and exploitation from 5 (since exploration and exploitation were measured on scales from 1-5). Similarly, similar to Mihalache et al. (2014), we measured the combined dimension of ambidexterity as the product of the exploration and exploitation scales. We added the prefix 'Your organization' to Lubatkin et al.'s (2006) items to facilitate the understanding of the participant.

3.3.3. Independent Variable: TMT Behavioural Integration

We adapted Simsek et al.'s (2005) scale to measure TMT behavioural integration. We measured it as a meta-construct comprising TMT collaborative behaviour, information exchange, and joint decision-making. We measured each of the sub-processes with 3 items. Collaborative behaviour was measured on a scale from 1 (strongly disagree) to 5 (strongly agree) using items such as 'When a team member is busy other team members often volunteer to help manage the workload'. Similarly, we measured joint decision-making on a scale from 1 (strongly disagree) to 5 (strongly agree) using items such as 'Team members usually let each other know when their actions affect another team member's work'. We measured information exchange on a scale from 1 (low effectiveness) to 5 (high effectiveness) using items that examined the quantity of ideas, quality of solutions, and levels of creativity. The meta-construct had a Cronbach's alpha value of 0.880 and a composite reliability value of 0.905.

3.3.4. Control Variables: TMT Size, Firm Size, Firm Performance until Date, Industry

Similar to prior studies on the topic (Heavey, Simsek, and Fox, 2015; Kostopoulos, Bozionelos, and Syrigos, 2015; Yitzhack Halevi et al., 2015), we controlled for firm size by measuring it in terms of employee strength. We asked the TMT, including the CEO, to report

employee strength in the survey. As in previous studies (Mihalache et al., 2014), we controlled the industry effects by ranking the IT, Electronics, and Biotechnology industries in that order and controlling for their effects in the SEM analysis. Our ordinal ranking was inspired by MSME observations on industry revenue generation.

Like other studies (Cao et al., 2010; Lubatkin et al., 2006), we controlled for firms' financial performance to date. We measured firms' financial performance to date on a scale from 1 (much worse) to 5 (much better). We asked TMT members to assess their firm's performance compared with that of industry competitors for the three years leading up to the study via five items. The scale displayed a Cronbach's alpha value of 0.908 and a composite reliability of 0.931.

Following the suggestions of Podsakoff and Organ (1986) and Reynolds (1982), appropriate measures were taken to rule out straight lining, outliers, and selection and social desirability biases.

4. Data Analyses and Results

We measured the organization level variables by taking the responses from individuals and aggregating them at the firm level. Before aggregating the individual responses in each firm, we checked whether the variance within the firm was significantly lower than that seen across

the firms with an F-test and the value of the intra-class correlation coefficient. We observed that in a one-way random test on each item, the F-statistic was insignificant, and the intra-class correlation coefficient was greater than 0.7. As with past studies (Mihalache et al., 2014), since the measures of TMT size and firm size were not normally distributed, we employed the natural log of these measures in our data analysis. We examined the hypothesized relationships with the Partial Least Square Structural Equation Model (PLS-SEM), which we found to be suitable for our research for the following reasons. First, TMT behavioural integration was found to have a non-normal distribution. Second, we achieved a rather small sample. Finally, the research was primarily exploratory in nature because we were examining the varied effects of behaviourally integrated TMTs on two dimensions of the same dependent variable, namely, ambidexterity. Researchers have found PLS-SEM to be superior in performance to covariance-based SEM in modelling complex research models with higher order constructs, and in exploring the effect of multiple independent variables on a dependent variable (Futterer, Schmidt, and Heidenreich, 2018). Since our study examines the effects of two different dimensions of ambidexterity on firm financial performance, PLS-SEM facilitates the exploratory nature of our quest. Table 1 demonstrates the descriptive statistics for the variables.

Insert Table 1 Here

We followed Hair et al.'s (2013) criteria and checked the required threshold limits for the Cronbach's alpha value of reliability and composite reliability of all scales, the indicator outer

loadings, the average variance extracted from each variable, and the tolerance value of indicators. The reliability and validity of the constructs are shown in Table 2.

Insert Table 2 Here

4.1. Structural Model

Figure 2 demonstrates all the hypothesized relationships with the standardized PLS-SEM path coefficients. In addition, we assessed R^2 and Q^2 (measured using the cross-validated redundancy approach) values for each relationship. Table 3 shows the model quality fit indices, the degree of variance explained by independent variables with R^2 values, and the predictive strength of the model with Q^2 values. The R^2 and adjusted R^2 show that the independent variables of the study could explain approximately 40% of the variance in the combined dimension of ambidexterity (R^2=0.405, t= 5.498, p=0.000; adj R^2= 0.389 t= 5.149, p= 0.000) and 58% of the variance in firm financial performance (R^2 = 0.580, t=9.022, p= 0.000; adj R^2= 0.551, t= 8.024, p= 0.000). Although not significant, the independent variables explained approximately 8% of the variance in the balanced dimension of ambidexterity (R^2= 0.0.087, t= 1.502, p= 0.133; adj R^2= 0.063, t= 1.0598, p= 0.290). Hair et al. (2013) have suggested that the predictive indices Q^2 of 0.02, 0.15, and 0.35 correspond to small, medium, and large effects. At a predictive index Q^2 = 0.007, the predictive relevance of balanced ambidexterity was <0.02, suggesting that the variables of the study had little effect in predicting the balanced dimension of ambidexterity. However, with Q^2= 0.374, the predictive relevance of the combined ambidexterity was > 0.35, suggesting that the variables of the study had a large effect in predicting the

combined dimension of ambidexterity. Similarly, with $Q^2 = 0.347$, the predictive relevance of firm financial performance was close to 0.35, suggesting that the variables of the study had a large effect in predicting the financial performance of the firm.

Insert Figure 2 Here

Insert Table 3 Here

4.2. Main Effects

We obtained support for Hypothesis 1 postulating a positive association between TMT behavioural integration and the balanced dimension of ambidexterity (β= 0.279**, p= 0.007, t=2.679). Similarly, we observed support for Hypothesis 2 that postulates a positive association between TMT behavioural integration and the combined dimension of ambidexterity (β= 0.623***, p= 0.000, t=9.853). Further, we obtained support for Hypothesis 4 that postulates a positive association between the combined dimension of ambidexterity and firm financial performance (β= 0.693***, p= 0.000, t=9.329). However, we did not find supporting evidence for Hypothesis 3 that postulates a positive association between the balanced dimension of ambidexterity and firm financial performance (β= 0.072, p= 0.370, t=0.897). The standardized path coefficients are shown in Table 4. Further, upon closer inspection of the effect of TMT

behavioural integration on the dimensions of ambidexterity, we observed that only the TMT sub-process of collaborative behaviour has significant effects on both the balanced (β= 0.397**, p= 0.004, t=2.883) and combined dimensions of ambidexterity (β= 0.254*, p= 0.031, t=2.155). The results showed that TMT information exchange (β= -0.177, p= 0.205, t=1.268) and joint decision-making (β= 0.097, p= 0.525, t=0.636) did not have significant effects on the balanced dimension of ambidexterity. Furthermore, the findings also showed that while TMT information exchange (β= 0.287, p= 0.033, t=2.134) had significant effects on the combined dimension of ambidexterity, joint decision-making (β= 0.191, p= 0.148, t=1.446) had non-significant effects. Thus, TMT joint decision-making did not have significant effects on either the balanced or the combined dimensions of ambidexterity in our study. Based on these findings, our study sheds light on the exact nature of the micro-foundational TMT processes that build the balanced and combined dimensions of ambidexterity.

Insert Table 4 here

4.3. Mediation Effects

Smart PLS 3.2.1 directly provides the indirect and total effects of all variables, along with the p values, t statistics, standard deviations, and confidence interval limits. We show the mediating effects of Hypotheses 5 and 6 in Table 5. Although Hypothesis 1 and 2 were supported and TMT behavioural integration has positive associations with the balanced and combined

dimensions of ambidexterity, it was only the combined dimension of ambidexterity that had a significant positive association with firm financial performance (β= 0.693***, t= 9.329, p=0.000). The balanced dimension of ambidexterity had no significant positive association with firm financial performance (β= 0.072, t= 0.897, p=0.370). Therefore, the total and indirect effects of TMT behavioural integration on firm financial performance were equal in magnitude. Thus, TMT behavioural integration had only one significant path to influence firm financial performance, which was through combined rather than balanced ambidexterity. Therefore, Hypothesis 6, which postulates that combined ambidexterity mediates the effect of TMT behavioural integration on firm financial performance, was supported (β=0.452***, t=6.696, p=0.000). Upon observing the indirect effects, we also noted that the combined dimension of ambidexterity fully mediated the effect of TMT collaboration on firm financial performance (β=0.204*, t=2.327, p=0.020). However, Hypothesis 5, which postulates a mediating effect of balanced ambidexterity in the link between TMT behavioural integration and firm financial performance, was not supported. Following Baron and Kenny's (1986) logic, our results suggested that the combined dimension of ambidexterity completely mediated the effect of TMT behavioural integration on firm financial performance. As the direct effect of TMT behavioural integration on firm financial performance was completely absorbed by the combined dimension of ambidexterity, we observed that combined ambidexterity accounted for almost the entire variance brought in firm financial performance by a behaviourally integrated TMT. Following Shrout and Bolger (2002), we observed that combined ambidexterity fully mediated the effect of TMT behavioural integration on firm financial performance.

Insert Table 5 Here
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5. Discussion

In this study, we explore the relationship between behaviourally integrated TMTs and the dimensions of ambidexterity. Additionally, we examine the effect of the dimensions of ambidexterity on firm financial performance and its mediating role in the association between TMT behavioural integration and firm financial performance. Our findings suggest that the meta-construct of TMT behavioural integration, with the sub-processes of TMT collaboration, information exchange, and joint decision-making, enhances both the combined and balanced dimensions of ambidexterity. These observations are in keeping with past studies that have observed similar positive associations between TMT behavioural integration and the combined dimensions of ambidexterity (Lubatkin et al., 2006; Yitzhack Halevi et al., 2015). However, even though we observe positive significant associations between a behaviourally integrated TMT and the balanced dimension of ambidexterity, we notice that the size of this effect is considerably less than that demonstrated by the combined dimension of ambidexterity.

Upon closer inspection of the sub-processes of TMT behavioural integration, only TMT collaboration enhances both the balanced and combined dimensions of ambidexterity. At high degrees of task collaboration and interdependence, TMT members are not only aware of the potential resource requirements of each other's innovation pursuits, but they also engage fully in compromising vested functional interests and managing trade-offs. This further enhances the firm's ability to either distribute resources (in pursuit of balanced ambidexterity) or integrate

them (achieving combined ambidexterity). These results are in line with previous academic explorations (Jansen et al., 2008).

Similarly, we observe that the inclusion of TMT members in the decision-making process does little to balance or combine exploration and exploitation. Joint decisions at the TMT level require the participation of all members in the decision-making process. However, this does not guarantee that the firm will develop the ability to make exploration and exploitation trade-offs, much less that it will be able to pursue both. Our results are in keeping with past research (Jansen, Van den Bosch and Volberda, 2005) that has observed that participation in decision-making only helps firms to acquire knowledge and has little impact on the transformative assimilation or exploitation of new knowledge. Therefore, based on our findings, we suggest that while the joint decision-making sub-process of a behaviourally integrated TMT might breed consensus and positively influence the other sub-processes of TMT collaboration and TMT information exchange, it will have little effect on the balanced and combined dimensions of ambidexterity.

Further, our results show that TMT information exchange has significant positive associations with only the combined dimension of ambidexterity and not with the balanced dimension of ambidexterity. Thus, our study suggests that TMT information exchange only helps in combining exploration and exploitation, rather than in the trading of resources to balance exploration and exploitation. Although rich, timely, and accurate information exchanges among TMT members raises them to a common level of awareness regarding the potential and resource needs of each other's innovation pursuits, it does little to generate a willingness to act upon the information they have received (Hambrick, 1994). TMT information exchange enhances the

social integration of the members (Hambrick, 1994), but without its integration with the other sub-processes of TMT collaboration and decision-making has little effect in influencing the balance of exploration and exploitation in firms. Thus, our study adds to the claims of research on the micro-foundations of organizational capabilities that it is not the individual actors or processes that will significantly impact the development of organizational capabilities in a firm, but it is rather their successful integrations with each other that generate results (Barney and Felin, 2013). By displaying the varied effects of TMT behavioural integration and its sub-processes on the two dimensions of ambidexterity, our study lends support to the claim that micro-foundational actors can integrate to develop varied organizational capabilities (Felin and Foss, 2005). Most importantly, our study contributes to the theory of behavioural integration and literature on ambidexterity by explicitly portraying the varied effects of TMT behavioural integration and its sub-processes on the two dimensions of ambidexterity.

In keeping with earlier work, our study suggests that the combined dimension of ambidexterity enhances firm financial performance (Tushman and O'Reilly, 1996). However, our study nuances this suggestion by demonstrating that merely balancing exploration and exploitation will not produce enhanced firm financial performance. The findings of this study therefore contribute to the debate concerning the contexts in which balanced exploration and exploitation is beneficial for firms, and the extent of the benefits to be gained. The results of this study suggest that, in the specific research context of small firms, organizations benefit more from an interaction of exploration and exploitation than from a balance *per se*. Our results support few earlier works in this research area. For instance, He and Wong (2004), in a similar research context of small hi-tech firms, observe that small firms (i.e., internally resource-

constrained firms) benefit more from concentrating on either exploration or exploitation than from balancing both. In contrast, in the research context of larger firms, Uotila et al. (2009) observe that organizations benefit from a balance of exploration and exploitation rather than from combining the two. Based on our study and past literature, we observe that the positive association between balanced ambidexterity and firm performance is dependent on the research context. In comparison to smaller firms, larger firms have fewer resource constraints, whether these be physical, financial, or human (Barney, 1986). Large firms have the resources to facilitate explorative and exploitative innovation strategies simultaneously and to balance them. Small firms, with barely sufficient resources to innovate, prosper by integrating and reinforcing their explorative and exploitative innovation strategies one against the other, rather than by attempting to balance them. Thus, our study provides a novel contribution to the literature on ambidexterity by identifying the boundary conditions of the ambidexterity hypothesis. Our study suggests that a firm's physical, financial, and human resource munificence determines the nature of the association between the balanced dimension of ambidexterity and the firm's financial performance.

In addition to underscoring, the importance noted in the literature of senior team actions and TMT processes in facilitating ambidexterity, our study observes that the combined dimension of ambidexterity fully mediates the effect of TMT behavioural integration on firm financial performance. These results suggest that the TMT sub-processes of collaboration, information exchange, and joint decision-making impact firm financial performance primarily through their effects on the combination of explorative and exploitative innovation. Thus, our study makes a significant contribution to the literature on ambidexterity by unveiling the ways

through which key TMT processes determine innovation pursuits and influence firm financial performance in small firms.

6. Managerial Implications

Our findings will help SME managers to identify optimal ways of managing their innovation pursuits so they align with their firm's objectives. The results suggest that resource-constrained small firms would benefit from a combined pursuit of exploration and exploitation rather than by attempting to achieve an equitable balance of paradoxical innovation strategies. Further, our research guides SME board members and TMT members on the appropriate mix of TMT behavioural strategies, based on their firm's innovation choices. Our findings suggest that SMEs should focus on enhancing their collaborative behaviours to better combine their explorative and exploitative innovation pursuits. Furthermore, our study also suggests that SME board members and TMT members should implement senior team practices to enhance TMT collaboration, information exchange, and joint decision-making in a manner that promotes the reciprocal reinforcement of exploration and exploitation.

Our results suggest that if SME TMT members consider their TMTs to be behaviourally integrated, they should concentrate on combining paradoxical innovation pursuits to enhance the financial performance of the firm. We would suggest that the TMT members of small and young technology-based firms nurture processes that build the behavioural integration of their senior teams. Thus, the apparently disparate innovation pursuits of the firm can be metamorphically combined. The specific sub-processes that lead to the birth of a behaviourally integrated TMT, such as collaboration, joint decision-making, and information exchange, have a pivotal role to

play in bridging the causal loop between the activities of sensing and seizing, and vice versa. Therefore, our results also suggest that where firms choose to pursue exploration and exploitation separately in different temporally or geographically distributed spatial domains and with independent teams, placing undue emphasis on the behavioural integration of the senior teams would appear unnecessary. Under such conditions, resource-constrained firms might benefit from focusing solely on enhancing the collaborative actions of their senior team members.

The study findings would suggest that innovation and technology officers and knowledge managers in SMEs should encourage the formal and informal mechanisms of TMT collaboration, which are particularly aimed at integrating exploration and exploitation. Similarly, policy makers and technology park directors should advise SMEs to cease striving for an optimal balance of exploration and exploitation, contenting themselves instead with enhancing either exploration or exploitation, or even - and this is to be preferred - attempting to achieve an overall high magnitude of exploration and exploitation.

7. Limitations and Future Research

We collected the data for this study from a sample of technology-based, product innovating, resource-endowed SMEs, situated on hi-tech parks in India. We suggest that future researchers on this topic design their research by collecting data from firms located in different areas and with more varied degrees of government support and private resources, as well as controlling for the effects of resource abundance. In addition, most of the firms in our sample were not publicly listed; hence, it was not possible to collect objective measures of their financial

performance or innovation. We used perceptual self-report measures to measure firm financial performance. Although this procedure has been suggested by prior researchers (Lubatkin et al., 2006), the use of perceptual financial measures nevertheless limits our study. We were unable to examine the longitudinal effects of exploration and exploitation on firm financial performance since the data were cross-sectional in nature. Gupta, Smith and Shalley (2006) suggests that balanced ambidexterity might enhance firm financial performance over long time intervals. Our study covered firm financial performance over the relatively short period of three years, so we are unable to pinpoint any significant long-term effects of balanced ambidexterity. It is logical to presume that whereas a spike in combined innovation might cause immediate decipherable effects, the effects of balancing exploration and exploitation might take longer to manifest. Therefore, we urge future researchers to examine the longitudinal effects of the different dimensions of ambidexterity on objective measures of firm financial performance.

In this study, we used composite scores to measure the different dimensions of ambidexterity. Although past studies (Tisak and Smith, 1994) support the use of composite scores, their use might have led to a loss of information (Edwards, 1994); therefore, we suggest that future researchers design measures to directly capture the different dimensions of ambidexterity.

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Table 1

Descriptive statistics.

	Mean	Std. Dev	TMT behavioural integration	Firm financial performance	Combined dimension of ambidexterity	Balanced dimension of ambidexterity	Firm financial performance till date	Industry	Firm size	TMT size
TMT behavioural integration	3.68	0.69	1							
Firm financial performance	3.45	0.95	0.59***	1						
Combined dimension of ambidexterity	20.94	4.00	0.62***	0.72***	1					
Balanced dimension of ambidexterity	2.61	1.41	0.27*	0.21	0.20	1				
Firm financial performance till date	3.66	0.69	0.35***	0.20	0.23**	0.12	1			
Industry	2.46	0.84	0.11	-0.19	-0.03	0.10	0.06	1		
Firm size^{nl}	4.19	0.65	0.14	0.14	0.02	0.07	0.09	-0.06	1	
TMT size^{nl}	1.43	0.35	0.10	0.13	0.14	0.09	0.10	0.04	-0.10	1

Table 2
Reliability and validity of the constructs.

Criteria	TMT Behavioural integration	Firm financial performance	Exploration	Exploitation	Firm financial performance till date
Composite reliability (>0.708)	0.905	0.899	0.902	0.888	0.902
Cronbach's alpha(>0.7)	0.880	0.858	0.869	0.847	0.908
Average variance extracted(>0.5)	0.516	0.640	0.606	0.571	0.733

Table 3
Model quality indices.

Model Quality Indices	R^2	Adjusted R^2	Q^2
Balanced Ambidexterity	0.08 (p= 0.133, t=1.50, SD=0.05)	0.06 (p=0.290, t=1.05, SD=0.05)	0.00
Combined Ambidexterity	0.40 (p=0.000, t=5.49, SD=0.07)	0.38 (p= 0.000, t=5.14, SD=0.07)	0.37
Firm Financial Performance	0.58 (p= 000, t=9.02, SD= 0.06)	0.55 (p=0.000, t= 8.02, SD= 0.06)	0.34

Table 4

Structural model path coefficients

Dependent Variables	Independent Variables																				
	TMT Behavioural Integration			Balanced Dimension of Ambidexterity			Combined Dimension of Ambidexterity			TMT Size			Firm Size			Firm Financial Performance Until Date			Industry		
Balanced Dimension of Ambidexterity	Path coefficient	SD	Effect Size							Path coefficient	SD	Effect Size									
	β = 0.27**, t = 2.67, p=0.007	0.10	0.08							β = 0.06, t = 0.68, p=0.491	0.10	0.01									
Combined Dimension of Ambidexterity	β = 0.62***, t = 9.85, p=0.000	0.06	0.64							β = 0.07, t = 0.81, p=0.416	0.09	0.01									
Firm Financial Performance				β= 0.07, t = 0.89, p= 0.370	0.08	0.01	β = 0.69***, t = 9.32, p=0.000	0.07	1.03				β = 0.10 t = 1.36, p=0.172	0.08	0.03	β = 0.04 t = 0.50, p=0.616	0.09	0.01	β = -0.17 t = 1.89, p = 0.059	0.09	0.07

Table 5
Indirect effects.

		TMT Behavioural Integration		
	Dependent Variable	Path Coefficient	Standard Deviation	Boundary Limits
Indirect Effect	Firm Financial Performance	β = 0.45***, t=6.69, p=0.000	SD= 0.06	LBL (2.5%)= 0.34, UBL (97.5%)=0.60
Total Effect	Firm Financial Performance	β = 0.45***, t=6.69, p=0.000	SD= 0.06	LBL (2.5%)= 0.34, UBL (97.5%)=0.60