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Balancing exploration and exploitation to sustainability: Propositional perspectives on collaborative innovation and performance amid technological uncertainty

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Abstract

Innovation management plays a crucial role in fostering competitive advantage, and businesses have made significant strides in this domain. However, enterprises in emerging economies continue to lag behind their counterparts in developed markets regarding innovation capabilities and overall innovation performance. Prior research has underscored the importance of investigating collaborative innovation mechanisms while also highlighting the limitations within the domains of organizational ambidexterity and innovation performance. Drawing upon an integrated literature review on ambidexterity and collaboration in the context of innovation and foundational theoretical frameworks, this study presents a conceptual framework that explores the contribution of ambidextrous behavior to innovation performance within emerging markets. From the perspective of resource-based view and dynamic capability theory, it is posited that ambidextrous behavior influences innovation performance through the mediating role of collaborative innovation. Furthermore, within the framework of situational theory, this research asserts that the impact of collaborative innovation on innovation performance is significantly buffered in environments characterized by high technological uncertainty. Consequently, this study has put forth four key propositions that require further empirical validation. These propositions serve as a foundation for future research, particularly in the context of emerging markets, where empirical evidence remains scarce. In conclusion, this study offers both theoretical and practical contributions by delineating the impact of ambidextrous behaviors on innovation performance through the lens of collaborative innovation, thereby advancing scholarly discourse and informing strategic decision-making. This study seeks to provide valuable insights for managers and policymakers by identifying a spectrum of opportunities, including resource acquisition and time-lagged adjustment and balancing of exploratory and exploitative activities.

Keywords: Collaboration, Innovative behaviors, Networking, Organizational ambidexterity, Resource-constraints market, Uncertainty.

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1. Introduction

Innovation is a crucial driver of competitive advantage in today's rapidly evolving business landscape. In the innovation-driven market, businesses come across substantial challenges that hinder their innovation performance [1, 2]. The contribution, in the form of patent applications and high-tech exports Chin, et al. [3] of businesses in the developing countries lag behind those in the developed market [4, 5]. These businesses struggle against lower financial support, lack of skilled expertise and imported advanced equipment [5-8]. Organizational behavior concerning resource allocation is critical to innovation related activities [9]. These evolving circumstances demand organizational flexibility [10]. Accordingly, it is mandated for such businesses to establish innovative behaviors such as ambidextrous behavior [11, 12]. Which fosters their ability to utilize limited resources in order to transform diverse ideas into concrete innovation [13, 14]. In such an environment, ambidextrous behaviors become particularly important due to their positive impact on both short- and long-term performance [11, 12]. Ambidexterity involves balancing exploitative and explorative behaviors [15]. Although research has documented the relationship between organizational ambidexterity and innovation, further exploration of its underlying mechanisms is needed [16, 17]. By strategically allocating resources, ambidextrous behaviors facilitate a balance between optimization and innovation, making them integral to routine processes [18]. Through the concurrent focus on exploitative and exploratory activities, ambidexterity fosters the application of existing knowledge alongside the generation of new ideas, thus supporting collaborative innovation [19].

Collaborative innovation, which facilitates knowledge sharing and co-creation among internal and external stakeholders, plays a crucial role in enhancing innovation performance. It allows businesses to leverage external expertise, integrate diverse knowledge bases, and co-develop novel solutions. Given the complexities of modern business environments, collaborative innovation serves as a critical link between internal organizational strategies and external market dynamics. Given the challenges arising from resource constraints and a dynamic market [20, 21]. There is a significant research gap in examining how these factors interact to shape organizational innovative performance. From a theoretical perspective, understanding the effects of these constructs on SME innovation could provide insights into how resource-based views (RBV)—encompassing ambidextrous behaviors, and dynamic capabilities, represented by collaborative innovation, can be leveraged to link resources and processes for positive outcomes. Furthermore, collaborative innovation creates a bridge between the internal dynamics such as ambidextrous behavior, and the external environment, facilitating innovation performance. By focusing on collaboration as a mediating factor, organizations can improve the integration of both internal resources, leading to more effective innovation outcomes. This integrated approach enhances the innovation process, ensuring that firms can adapt to and capitalize on changing market demands and technological advancements.

The effective innovation management is highly associated with external business environment. With any changes in external market, innovation management activities may expose businesses towards heightened uncertainty [22, 23]. So, it is obvious that businesses decision related to innovation is also reliant on their understanding of future market and expected returns [24, 25]. With advances in the technological arena, it has apparently become highly risky to innovate in current era [26, 27]. Accordingly, the effectiveness of collaborative innovation in driving innovation performance is contingent on external factors, particularly technological uncertainty. The contingency theory underscores the need to assess technological uncertainty to mitigate its adverse impacts and to design relevant strategies. Technological uncertainty, defined as the unpredictability of changes in production or service technologies, can either hinder or enhance the success of collaborative efforts in innovation [28, 29]. High levels of technological uncertainty may increase the risks associated with R&D investments, while also creating new opportunities for businesses that can effectively adapt to evolving technologies. Therefore, this study posits the moderating role of technological uncertainty on the relationship between collaborative innovation and innovative performance.

This study aims to explore the role of ambidextrous behavior in fostering innovation performance, with collaborative innovation acting as a mediator in this relationship. Furthermore, the study posits the moderating role of technological uncertainty on the relationship between collaborative innovation and innovation performance. By integrating insights from the resource-based view (RBV) and dynamic capabilities theory, this research provides a comprehensive understanding of how firms can leverage internal capabilities and external collaboration to navigate technological uncertainties and drive innovation success. Through empirical analysis, this study seeks to contribute to the existing literature by offering insights into the mechanisms that enhance innovation performance in uncertain technological environments, providing valuable implications for both academic researchers and industry practitioners.

1.1. Ambidextrous Behavior

Ambidexterity emerges from a dynamic process that requires both the simultaneous and sequential integration of exploitative and explorative activities within a given timeframe. This phenomenon manifests at both the individual and organizational levels [30, 31]. Exploitation prioritizes efficiency and reliability, while exploration emphasizes flexibility and adaptability [32]. Despite its significance, research on individual ambidexterity remains limited [33]. However, some studies suggest that individual ambidexterity can enhance employee performance [34, 35]. Define ambidextrous behavior as the ability of employees to perform seemingly conflicting tasks, driven by the motivation to simultaneously or sequentially manage diverse job demands, balancing efficiency with adaptability in pursuit of multiple objectives.

At the organizational level, previous studies highlight a positive relationship between ambidexterity and firm performance [15, 36]. On an individual scale, Groysberg and Lee [37] observe that employees hired for exploratory roles

(initiating new activities) experience both short- and long-term performance declines, whereas those recruited for exploitative roles (reinforcing existing processes) face only temporary setbacks. Jasmand, et al. [35] further validate the ambidexterity-performance relationship at the employee level, showing that individual ambidexterity positively influences work performance. Their findings reveal that ambidextrous employees contribute to higher customer satisfaction and improved sales performance while reducing the time spent per customer. Recent research reinforces this positive link between individual ambidexterity and job performance [38, 39]. Additionally, Yu, et al. [40] extend the concept to service-sales ambidexterity at the branch level, demonstrating its beneficial impact on frontline employees' financial performance.

1.2. Collaborative Innovation

A new business model, known as collaborative innovation, has gained prominence in recent years [41]. According to Chesbrough [42]; Li, et al. [41] and Najafi-Tavani, et al. [43] collaborative innovation refers to a company's engagement with various external partners to enhance internal innovation. This can encompass product, service, process, and managerial innovation. From a management perspective, collaborative innovation involves inter-firm relationships where organizations exchange and share resources, including knowledge, technology, expertise, and opportunities, to drive innovation [44]. Given the early stage of research in this domain, a broad definition of external collaborative innovation is adopted—encompassing all forms of inter-organizational collaboration aimed at achieving innovation [45]. Many businesses now rely on collaborative innovation as a strategic tool to access new knowledge, resources, and technologies, as well as to facilitate knowledge-sharing with external stakeholders [41]. Consequently, firms increasingly view joint innovation initiatives as a key approach to strengthening their competitive market position [46].

Collaborative innovation can take multiple forms, including partnerships, alliances, joint ventures, technology exchanges, and licensing agreements. It also involves collaboration with various external stakeholders such as suppliers, competitors, research institutions, and universities. While independent innovation provides advantages like greater control over intellectual property, reduced coordination complexities, and lower risks of knowledge leakage, a steady inflow of external knowledge is essential for fostering an innovation-friendly environment [47]. Although collaborative innovation can help reduce costs and shorten innovation cycles, it also presents challenges, including coordination difficulties, potential conflicts, and relationship strains.

Research on collaborative innovation has examined firms' willingness to engage in such partnerships, particularly their inclination to enter into formal collaboration agreements Pittino and Visintin [45]. De Massis, et al. [48] highlight the need to explore how dominant partners within a coalition influence firms' decisions to participate in collaborative innovation. Similarly, Classen [49] and Alberti [50] emphasize the early stage of research in this field, calling for further investigation into firms' motivations and inclinations to engage in collaborative innovation. The absorptive capacity framework is commonly used to assess firms' ability to manage collaborative innovation. Cohen and Levinthal [51] define absorptive capacity as an organization's ability to acquire, assimilate, transform, and apply external knowledge. Other important factors influencing the management of collaborative innovation include organizational flexibility (the ability to adapt internal structures and external networks to drive innovation) and resource orchestration (the strategic allocation and coordination of a firm's resources) [52]. A firm's willingness to participate in collaborative innovation depends on multiple factors such as risk tolerance, trust, and managerial competencies [45]. Key drivers include the need for complementary resources, the resolution of knowledge gaps, and the expansion of social networks.

Scholars have extensively examined the impact of collaborative innovation on firms' innovation performance, particularly in relation to product, process, and managerial innovation [53, 54]. However, the literature presents contradictory findings on this relationship [55, 56]. Several studies suggest a positive linear relationship between collaborative innovation and innovation performance [41, 43, 57]. For example, Zhou, et al. [58] argue that collaborative innovation enhances knowledge acquisition and technological development, while Wang, et al. [27] find that higher collaboration levels lead to better new product development outcomes.

Conversely, some researchers propose that collaborative innovation can negatively impact firms' innovation performance [59, 60]. This negative correlation is attributed to increased R&D expenses Liu, et al. [61] over-reliance on external partners Kim [55] loss of control over proprietary knowledge, and greater organizational complexity Rauter, et al. [46]. Liao, et al. [59] further suggest that collaborative innovation within supply chains (SC) may hinder product innovation. Daugherty, et al. [62] argue that cross-organizational collaboration often fails to deliver expected innovation benefits, while Daugherty, et al. [62] find that supplier-firm integration has no significant impact on process innovation.

These inconsistent findings raise important research questions: To what extent does collaborative innovation influence firms' innovation performance? Additionally, past studies have focused on industry–university–research (IUR) collaborations and supply chain (SC) partnerships as key collaborative innovation strategies [26, 63, 64]. While some research suggests that both SC and IUR collaborations positively impact innovation success [65, 66].The degree of influence varies significantly across studies [57, 61].

1.3. Innovation Performance

In recent decades, as the focus on sustainable economic development has intensified, innovation has become a central topic of interest [40]. The concept of enterprise performance has long been acknowledged as multifaceted, with definitions varying widely. It is often evaluated through periodic assessments as well as comprehensive examinations of daily business operations [67]. A review of existing literature on organizational innovation highlights diverse methods for assessing innovation performance, which can generally be classified into two key dimensions: product development and process improvement [68].

From a conceptual standpoint, product innovation refers to the creation of new ideas or entirely new products and services, often manifested through modifications to the final offering of an organization. In contrast, process innovation involves changes in production methods, either through internally developed new practices or by adopting externally sourced innovations [69]. The measurement of these two types of innovation differs. Product innovation performance is typically assessed using five key indicators: Chen, et al. [1] the uniqueness of new products, Hu, et al. [2] the incorporation of advanced technologies, Hu, et al. [2] the speed of new product development, Chen, et al. [4] the volume of new product launches, and Zhang, et al. [5] the number of early market entrants. Process innovation performance, on the other hand, is evaluated based on four primary criteria: Chen, et al. [1] technological competitiveness, Hu, et al. [2] the novelty or advancement of the technology used, Chin, et al. [3] the rate of process innovation adoption, and Chen, et al. [4] the speed of technological and procedural changes [69].

Empirical research by Lotfi, et al. [70] found that product innovation performance, measured through patents, was influenced by seven out of fourteen variables related to the product innovation process. Interestingly, factors such as firm size, age, industry sector, and product life cycle had no significant effect on product innovation outcomes. This study, which focused on medium-sized Swedish technology-based industrial firms, emphasized the role of investment decisions in three key areas: innovation process portfolio management, formalization of innovation processes, and organizational structure for innovation. These elements collectively contribute to the transformation of innovation processes into measurable performance outcomes, which in turn impact a firm's overall business performance.

Innovation performance plays a crucial role in determining both firm competitiveness and national economic growth. Bate [71] identify several factors that drive innovation performance, including human capital, research and development (R&D), infrastructure, and business sophistication. Additionally, an in-depth analysis of innovation predictors highlights elements such as innovation linkages, knowledge acquisition, business complexity, and physical/digital infrastructure as the most significant contributors to innovation success [71].

For small and medium-sized enterprises (SMEs), innovation is fundamental for long-term survival and growth. Internal characteristics of SMEs significantly influence innovation performance. Pullen, et al. [72] conducted a study involving 187 SMEs from Europe and Australia and 236 SMEs from the United States, using Structural Equation Modeling (SEM) to analyze new product development (NPD) data. Their findings suggest that SMEs focusing on incremental innovation tend to achieve higher innovation performance overall. Furthermore, the internal organizational structure of these firms plays a key role in fostering innovation success.

Innovation performance can be understood as a firm’s ability to transform innovation inputs into tangible results, ultimately leading to the successful commercialization of innovations Zizlavsky [73]. Alegre, et al. [74] developed a two-dimensional framework to measure innovation performance, distinguishing between effectiveness and efficiency. Effectiveness relates to the economic impact of an innovation, including its success and tangible outcomes, while efficiency refers to the process through which these results are achieved. Given the broad scope of innovation research, spanning multiple fields and levels of analysis, achieving a universally accepted definition remains challenging. However, scholars generally agree that innovation involves originality and novelty, whereas imitation refers to the act of replicating existing ideas Yu, et al. [40]. Pease and Rowe [75] further clarify that, within a regional context, innovation should not be equated with invention; rather, it is defined as "introducing something new within a specific industry or technological domain."

1.4. Ambidextrous Behaviors and Collaborative Innovation

Drawing on the resource-based view theory, the current study posited the influence of ambidextrous behavior on the collaborative innovation. Ambidextrous behavior, which emphasizes on the balancing of both exploitative and explorative innovation, is viewed as the critical driver of innovation [76, 77]. Such balancing of two different innovation behaviors assures the effective contribution of partners within collaborative innovation in a network in the form of improved creativity level, effective problem-solving and viable application of ideas in the market [30, 57].

The positive relationships and cohesion among employees positively influences their motivation, develop a learning environment and drive the innovation activities [30, 78]. In the context of small businesses, ambidextrous behaviors play their crucial role by increasing trust level, lowering anxiety, and establishing workplace environment which is effective to collaborative innovation [79]. In addition, research studies have also offered sufficient evidence in support of positive impact of the ambidextrous behaviors on the employees’ creativity and firm performance [31, 80]. Such claims posit that employees who balances exploitative and explorative behaviors have high orientation towards innovative outcomes Liu and Wang [81] which possess substantial significance under the collaborative innovation umbrella (39,40). Hence, it is concluded that.

Proposition 1: Ambidextrous behavior influences collaborative innovation.

1.5. Collaborative Innovation and Innovation Performance

According to dynamic capability theory, firms gain competitive advantage by adapting, integrating and reconfiguring their resources [82]. Being a process, collaborative innovation enriches firms’ capabilities by having access to the external knowledge, which is highly critical to generate new ideas and reduce knowledge boundaries[66, 83]. In results, drive innovation performance [84]. Integration of external knowledge with internal knowledge base ignites creativity of innovative products and efficiency of services at the firm level [85]. In the presence of high technological disruptions and market volatility, innovation evolves around high uncertainty and risk. In a highly dynamic and competitive market, collaborative innovation enables firms to harness their complementary capabilities, sustain knowledge exchange and resource sharing, adapt to technological disruptions and drive their innovation activities [86]. By promoting knowledge sharing, lowering uncertainty, and better adapting to market fluctuations, collaborative innovation enables firms to mitigate

the risks related with innovative practices [83, 87, 88]. In results, there is enhanced innovation performance in the shape of efficient development cycles and effective innovation efforts. While buffering the uncertainties and risks of innovation, firms deliver innovation solutions and secure their market share through collaborative innovation.

By engaging in collaborative innovation, firms also contribute to their reputation in the market and expand customer trust, which, in turn, ignite their sales performance [84]. Because of collaboration with external partners in a network, the improved innovation performance may also indicate an enhanced level of market-relevant products and services offerings. Accordingly, following proposition is developed.

Proposition 2: Collaborative innovation influences innovation performance.

1.6. The Mediating Role of Collaborative Innovation

Collaborative innovation follows both divergent and convergent processes in order to see beyond out of the box, generate new ideas, and offer a viable solution in compliance with certain boundaries [89]. Collaborative innovation emphasizes knowledge acquisition, generation, and integration within firms [61]. On this line, ambidextrous behavior emerges as a resource to deal with this paradox [90]. Ambidextrous behavior is defined as an organizational ability to balance exploitation (refining existing capabilities) and exploration (searching for new opportunities) simultaneously. Ambidextrous behavior focuses on the balancing of both explorative and exploitative practices among partners in a network of stakeholders [76]. Ambidextrous behavior enables firms to effectively employ resources at hand by offering best practices, which results in improved innovation activity [33]. Such behaviors also encourage positive relationships among network members (Helmy, et al. [91]), which ultimately improves employees' and partners' motivation for knowledge generation and creativity [92]. Such associations among employees drive their desire for learning new knowledge, gaining new resources, and exploiting the resources' effectiveness. Such strong relationships among employees in the workplace context also ignite their trust levels and lower anxiety in the highly dynamic and uncertain market, which is quite useful to increase partners' engagement in innovation practices [93]. The absence of such associations among partners boosts perceived risk levels and innovation costs [91]. However, ambidexterity improves employees' work performance [80]. Ambidextrous behavior also works as a trigger to ignite creativity (Yang and Yang [57]), and consequently improves innovation performance [77]. For a decade, past studies have always rated ambidexterity as an essential factor of firm performance (Luger, et al. [31] and Raisch, et al. [94]). Yang and Yang [57] also confirmed the positive association between employee ambidexterity and their performance [57].

Accordingly, collaborative innovation emerges as a potential mechanism because of its critical role in the integration of exploitative and explorative activities in a synergistic manner. Collaboration with external partners (such as customers, suppliers, universities, or other organizations) offers firms a diversity of knowledge and technologies, which improves their ability to generate new ideas and employ resources effectively. Collaboration also facilitates firms with a structured and dynamic environment, where both explorative and exploitative behaviors could be utilized and nurtured. Collaborative innovation facilitates a firm breaking through the knowledge boundaries of external partners in a network, increasing their own knowledge base [83]. The knowledge acquisition through collaboration helps firms to cope with numerous manufacturing, design, and managerial challenges [95, 96]. Such collaboration ultimately offers unique and updated knowledge related to technologies, products, and processes, which are useful to deliver innovative outputs [58]. Therefore, firms produce new products or services, employ process and management innovation activities efficiently and frugally [97, 98]. As firms often have limited information and resources to adjust to uncertain conditions, innovation is a highly risky task. However, collaborative innovation also lowers the risk involved in the innovation process [83]. Through collaborative innovation, firms seek knowledge about customer needs, access to advanced technologies, and managerial experience from network partners [99]. Accordingly, it is quite obvious that ambidextrous behavior enables firms to innovate collaboratively, which lowers the risks of introducing innovative products, processes, and management practices, which, in turn, can lead to improved innovation performance. Hence, the following proposition is developed:

Proposition 3: Ambidextrous behavior indirectly influences innovative performance through collaborative innovation.

1.7. The Moderating Role of Technological Uncertainty

In the knowledge economies, technological uncertainty signifies a substantial importance of the fluctuation in the dynamic business environment. In the presence of high technological uncertainty, firms find it hard to anticipate industry trends and understand the opportunities for innovation, which hinders their continuous engagement with technological advances in the market. In order to cope with such uncertainties, firms are mandated to leverage their knowledge management capabilities to gain tacit and explicit external knowledge and in result reprocess and refine their knowledge through integration. With increasing level of technological uncertainty, knowledge reserves of any firm diminishes, there is growing need to gain external knowledge in order to foster innovation activities. At this point, firms, having robust knowledge management practices, possess high capability to innovate and maintain the equilibrium of innovation process [100].

Along with these lines, there are numerous reasons such as adjustment of policy cycle, and time-lagged effect for the weakening relationship of collaborative innovation with innovation performance at the higher level of technological uncertainty. Technological uncertainty obstructs the application of innovation policy frameworks established by collaboration. In the presence of turbulence in the technological field, firms experience technological shifts at a higher number and wider level, which requires flexible adjustments to innovation strategies and technology standards [101]. On

one side, collaborative innovation spurs dialogue between stakeholders such as policymakers and business leaders, aiding in the development of policies to foster innovative activities, the swiftness of technological uncertainty can overtake the system's ability to adjust. The current policy frameworks in relation to innovation management also strain to align with the dynamic requirements of collaborative innovation owing to time constraints in policy adjustment cycle [102, 103]. In result, the collaborative innovation's effectiveness in relation to innovation performance lessens in the face of intensified technological uncertainty.

Technological uncertainty aggravates the time-lag effects associated with resources acquisition and makes it hard to acquire the regulatory resources essential for innovative activities. Firms are highly reliant on the external resource acquisition to conduct their innovation practices [104, 105]. Through collaborative innovation, firms engage with policy makers and other stakeholders to ensure the acquisition of resources on time, thus supporting the innovation efforts. Nevertheless, owing to the hierarchical decision-making and bureaucratic processes involved, firms find it hard to receive the government supports on time in the presence of technological uncertainty at high level [106]. Contrary to this, there is minimum time-lag effect of collaborative innovation on resource acquisition in the presence of low technological uncertainty, such effect amplifies with higher level of uncertainty where availability of resources on time becomes critical [107]. In result, collaborative innovation is not able to offer resource acquisition on time, hinders the firm's ability to adjust along with technological changes and gain a first-mover advantage. Under such conditions, the role of collaborative innovation in driving innovation activities diminishes because of technological uncertainty. In conclusion, the relationships between collaborative innovation and innovation performance weakens with increasing level of technological uncertainty, lowering the collaborative efforts impact in igniting innovation output. Accordingly, following proposition is established.

Proposition 4: The relationship between collaborative innovation and innovation performance buffers with increasing level of technological uncertainty.

2. Conclusion

This study has deepened our understanding of the intricate relationship between ambidextrous behavior and innovation performance. Furthermore, it has elucidated the mediating role of collaborative innovation within this relationship, while also exploring the moderating influence of technological uncertainty on the interplay between collaborative innovation and innovation performance. As a result, this research has formulated four key propositions concerning the role of collaborative innovation in the contemporary economy and its potential contribution to innovative organizational performance. Innovation performance serves as both a foundational reference and a critical framework for guiding future empirical investigations. In essence, organizational performance represents a significant theoretical contribution to this conceptual study, necessitating empirical validation through quantitative research to assess the robustness and reliability of these propositions. The conceptual framework underpinning this study is illustrated in Figure 1.

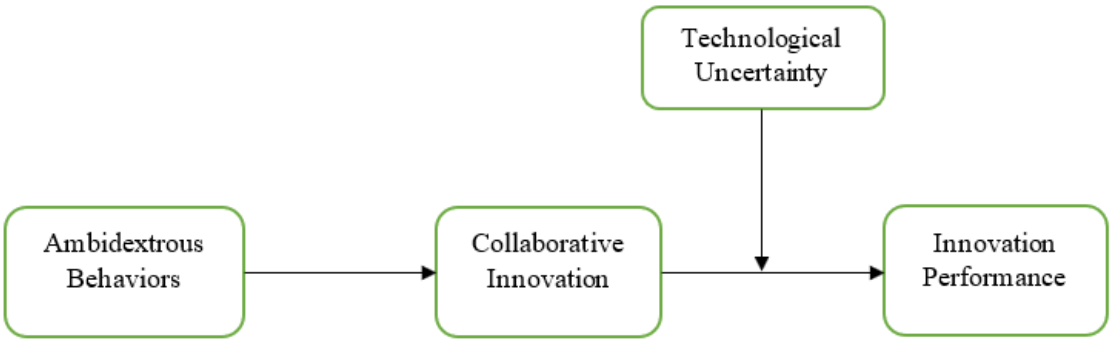

Figure 1.
Conceptual framework.

Extensive literature underscores a positive correlation between ambidextrous behavior and innovation performance; however, a crucial missing link between these two constructs has been identified [108]. To address this gap, the present study posits that collaborative innovation functions as the essential intervening variable bridging ambidextrous behavior and innovation performance. While prior research has largely focused on the theoretical underpinnings of collaborative innovation, empirical validation remains limited [109]. Although inherently aligned with creativity and innovation management principles, collaboration innovation alone does not directly lead to innovation performance. This study extends corporate innovation management literature by establishing a conceptual linkage between collaborative innovation and the two dimensions of innovation performance—partnership networks and relational collaboration. This linkage provides a strong foundation for future empirical research based on the proposed conceptual framework.

From an resource-based view and dynamic capability theory, this research enriches the academic discourse by positioning collaborative innovation as a mediating construct between ambidextrous behavior and innovation performance, thereby addressing the research gap highlighted by Rosing and Zacher [108] and Stojčić [109]. Moreover, within the context of resource-constrained environments [70, 110, 111]. This study identifies technological uncertainty as a key moderating factor that enhances the effectiveness of collaborative innovation. By doing so, it advances the situational theory by

validating the moderating impact of technological uncertainty on the relationship between ambidextrous behavior and collaborative innovation.

Ultimately, this research identifies critical gaps within the existing literature that warrant further scholarly attention. Additionally, it lays a robust foundation for future research endeavors through a comprehensive conceptual framework and well-defined research propositions, thereby providing significant theoretical and practical contributions to the field.

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