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Driving Startup Success through Innovation Competence: Evidence from Emerging Economies during the COVID-19 Crisis using Structural Equation Analysis

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Abstract

The global pandemic has profoundly disrupted entrepreneurial ecosystems worldwide, compelling startup enterprises to reconsider their strategic approaches for survival and growth. Despite these unprecedented challenges, newly established ventures remain instrumental in addressing evolving societal requirements and dynamic market conditions through innovative mechanisms. This research endeavors to examine a comprehensive framework linking innovation competence to startup organizational outcomes within the pandemic context. Utilizing primary data gathered from founders and co-founders of startup organizations in an emerging Southeast Asian economy, this investigation employs both descriptive statistical analysis and structural equation modeling techniques to assess the proposed theoretical constructs and their interrelationships. The empirical findings demonstrate that innovation competence exerts statistically significant positive effects on both financial metrics and operational effectiveness. Furthermore, the results reveal that collaborative innovation practices substantially and directly influence the financial standing and operational efficiency of nascent enterprises. These discoveries suggest that cultivating innovation competence within startup organizations can generate meaningful advancement and create valuable opportunities even during periods of economic uncertainty. This scholarly work contributes novel research trajectories and actionable recommendations concerning innovation competence and collaborative innovation strategies for enhancing startup organizational outcomes in developing economic contexts.

Keywords: *innovation competence; collaborative innovation; nascent enterprises; structural equation analysis; emerging economy; pandemic resilience*

Introduction

The emergence of the COVID-19 pandemic in early 2020 precipitated unprecedented disruptions across global economic landscapes, fundamentally altering the operational environments within which entrepreneurial ventures function (Kuckertz et al., 2020). Startup enterprises, characterized by their inherent resource constraints and vulnerability to market fluctuations, encountered particularly severe challenges during this tumultuous period (Brown & Rocha, 2020). Nevertheless, the entrepreneurial ecosystem demonstrated remarkable resilience, with numerous nascent organizations pivoting their business models and leveraging innovative approaches to navigate the crisis (Zahra, 2021). This phenomenon underscores the critical importance of understanding how innovation competence influences startup performance outcomes, particularly within developing economic contexts where institutional support mechanisms may be limited.

Innovation competence represents a multidimensional organizational capacity encompassing the ability to generate, develop, and implement novel ideas, processes, products, or services that create value for stakeholders (Lawson & Samson, 2001). Within the startup context, this construct assumes heightened significance as newly

established ventures inherently depend upon innovative differentiation to establish market positions and compete effectively against established incumbents (Teece, 2010). The pandemic environment amplified these dynamics, compelling startups to accelerate their innovation activities while simultaneously managing heightened operational uncertainties and resource constraints (Shepherd & Williams, 2020).

Emerging economies present distinctive contextual conditions for examining innovation-performance relationships among startup organizations. These markets typically exhibit higher growth potential but simultaneously present greater institutional voids, infrastructure limitations, and market inefficiencies compared to developed economic contexts (Khanna & Palepu, 2010). The Philippines, as a representative emerging Southeast Asian economy, offers a compelling empirical setting for this investigation given its vibrant startup ecosystem and the substantial economic disruptions experienced during the pandemic period (Asian Development Bank, 2021). Understanding how innovation competence enables startup success in such contexts holds both theoretical and practical significance for entrepreneurship research and policy formulation.

Collaborative innovation, conceptualized as the purposive integration of external knowledge sources and collaborative partnerships to enhance innovation outcomes, represents an increasingly relevant strategic approach for resource-constrained startups (Chesbrough, 2006). The pandemic circumstances intensified pressures toward collaborative innovation practices as organizations sought external partnerships to access complementary capabilities, share risks, and accelerate response capabilities (Herstatt & Tiwari, 2020). Examining the differential and interactive effects of internal innovation competence and external collaborative innovation orientations on startup performance outcomes addresses important gaps in existing entrepreneurship scholarship.

This research investigation pursues several interconnected objectives. Primarily, this study seeks to empirically validate a theoretical framework linking innovation competence dimensions to financial and operational performance outcomes among startup enterprises. Additionally, this research examines the role of collaborative innovation orientations in influencing startup performance metrics. Furthermore, this investigation explores the contextual specificities of these relationships within an emerging economy setting during pandemic conditions. The findings contribute to entrepreneurship theory by extending understanding of innovation-performance linkages and offer practical guidance for startup founders, investors, and policymakers seeking to foster entrepreneurial resilience and growth.

The subsequent sections of this manuscript proceed as follows. Section 2 presents a comprehensive literature review establishing the theoretical foundations and developing research hypotheses. Section 3 details the methodological approach including sampling procedures, measurement instruments, and analytical techniques. Section 4 reports the empirical findings from structural equation modeling analyses. Section 5 discusses the theoretical and practical implications of the results. Finally, Section 6 concludes with limitations acknowledgment and future research directions.

Literature review

Theoretical Foundation: Dynamic Capabilities Perspective

The dynamic capabilities framework provides the primary theoretical lens guiding this investigation (Teece, Pisano, & Shuen, 1997). Dynamic capabilities represent organizational capacities to purposefully create, extend, and modify resource configurations in response to rapidly changing environmental conditions (Eisenhardt & Martin, 2000). Within this perspective, innovation competence constitutes a critical dynamic capability enabling organizations to sense emerging opportunities and threats, seize value-creating possibilities, and reconfigure organizational resources and processes accordingly (Teece, 2007). This theoretical perspective proves particularly relevant for understanding startup adaptation and performance during crisis periods characterized by profound environmental turbulence.

Extending the dynamic capabilities framework, scholars have increasingly recognized the importance of collaborative or relational capabilities for organizational competitiveness (Dyer & Singh, 1998). Collaborative innovation represents a specific relational capability involving the systematic integration of external knowledge sources and partnership networks to enhance innovation outcomes (Laursen & Salter, 2006). For startups operating with limited internal resources, collaborative innovation offers mechanisms to access complementary assets, share development costs, and accelerate time-to-market for innovative offerings (Rothaermel & Deeds, 2004). The theoretical integration of internal innovation competence and external collaborative innovation orientations provides a comprehensive framework for examining startup performance determinants.

2.2 Innovation Competence: Conceptualization and Dimensions

Innovation competence encompasses the organizational capacities, knowledge bases, and routines that enable systematic innovation activities (Romijn & Albaladejo, 2002). This construct reflects both the internal capabilities supporting innovation generation and the organizational mechanisms facilitating innovation implementation and commercialization (Subramaniam & Youndt, 2005). Within startup contexts, innovation competence manifests through multiple dimensions including technological proficiency, creative problem-solving abilities, market sensing capabilities, and organizational learning orientations (Lichtenthaler & Lichtenthaler, 2009).

The technological dimension of innovation competence involves capabilities related to developing, integrating, and applying technical knowledge for creating novel products, services, or processes (Yam et al., 2004). Startups with strong technological competence demonstrate superior abilities in translating scientific and technical knowledge into commercially viable innovations. The creative dimension encompasses organizational capabilities for generating original ideas, challenging conventional assumptions, and exploring unconventional solution approaches (Amabile, 1988). Market sensing competence reflects organizational abilities to identify emerging customer needs, detect competitive threats, and anticipate market evolution trajectories (Day, 1994). Learning orientation represents the organizational commitment to systematic knowledge acquisition, experimentation, and continuous improvement (Sinkula, Baker, & Noordewier, 1997).

Collaborative Innovation and External Knowledge Integration

Collaborative innovation, alternatively conceptualized as open innovation, reflects a distributed innovation paradigm emphasizing the purposive integration of external knowledge flows with internal innovation processes (Chesbrough, 2003). This approach recognizes that valuable knowledge for innovation is broadly distributed across organizational boundaries and that effective innovation increasingly requires systematic engagement with external knowledge sources (Laursen & Salter, 2006). For startup organizations, collaborative innovation offers particular advantages given inherent resource constraints and the need to access complementary capabilities beyond organizational boundaries (Vanhaverbeke, 2017).

External knowledge sources potentially contributing to startup innovation include customers, suppliers, competitors, universities, research institutions, government agencies, and various intermediary organizations (von Hippel, 1988). The breadth and depth of external search activities have been demonstrated to influence innovation outcomes, with moderate levels of openness generally associated with superior innovation performance (Laursen & Salter, 2006). However, excessive openness can generate coordination costs and attention allocation challenges that potentially undermine innovation effectiveness (Koput, 1997). Understanding the optimal configuration of collaborative innovation practices for startup performance outcomes represents an important empirical question.

Startup Performance: Financial and Operational Dimensions

Organizational performance within startup contexts requires multidimensional conceptualization reflecting the diverse objectives and success criteria relevant to nascent enterprises (Murphy, Trailer, & Hill, 1996). Financial performance captures the monetary outcomes of organizational activities including revenue generation, profitability, and return metrics (Venkatraman & Ramanujam, 1986). For startups, financial performance assessment often emphasizes growth trajectories and revenue expansion given that many nascent ventures prioritize market capture over immediate profitability (Gilbert, McDougall, & Audretsch, 2006). Operational performance encompasses non-financial outcome dimensions including productivity efficiency, quality achievements, innovation outputs, and customer satisfaction metrics (Kaplan & Norton, 1992).

The COVID-19 pandemic substantially altered performance assessment considerations for startup organizations. Survival emerged as a fundamental performance criterion given widespread business closures and market disruptions (Fairlie, 2020). Adaptation capacity became increasingly salient as ventures demonstrated varying abilities to pivot business models and respond to changed market conditions (Kuckertz et al., 2020). Examining both financial and operational performance dimensions provides comprehensive assessment of startup outcomes during the pandemic period.

Hypotheses Development

Drawing upon the dynamic capabilities theoretical framework and extant empirical literature, this investigation advances several research hypotheses. Innovation competence enables startups to develop differentiated products and services, identify and exploit market opportunities, and adapt organizational processes to changing environmental conditions (Teece, 2007). Organizations possessing superior innovation competence demonstrate enhanced abilities to create customer value and capture economic returns from innovative activities (Lawson & Samson, 2001). These capabilities prove particularly valuable during crisis periods when rapid adaptation and creative problem-solving determine organizational survival and success (Shepherd & Williams, 2020).

Hypothesis 1a: Innovation competence positively influences financial performance among startup enterprises.

Hypothesis 1b: Innovation competence positively influences operational performance among startup enterprises.

Collaborative innovation enables startups to access complementary external knowledge and capabilities that enhance innovation outcomes and organizational performance (Chesbrough, 2006). External partnerships provide access to specialized expertise, technological resources, and market knowledge that resource-constrained startups cannot develop independently (Rothaermel & Deeds, 2004). During pandemic conditions, collaborative relationships offered mechanisms for sharing risks, accessing emergency resources, and maintaining operational continuity (Herstatt & Tiwari, 2020).

Hypothesis 2a: Collaborative innovation positively influences financial performance among startup enterprises.

Hypothesis 2b: Collaborative innovation positively influences operational performance among startup enterprises.

Methods

Research Design

This investigation employed a quantitative cross-sectional research design utilizing survey methodology for primary data collection. The target population comprised startup enterprises operating within the Philippines during the COVID-19 pandemic period. Startups were defined as independently owned ventures established within the preceding seven years with growth-oriented business models, consistent with established definitional criteria in entrepreneurship research (Blank & Dorf, 2012). The sampling frame was developed through multiple startup ecosystem databases including government registration records, incubator and accelerator participant lists, and industry association membership directories.

A purposive sampling approach targeted founders and co-founders as key informants given their comprehensive knowledge of organizational innovation activities and performance outcomes. Sample size requirements were determined through power analysis considering the structural equation modeling analytical approach. Following recommendations for SEM applications, a minimum sample of 200 respondents was targeted to ensure adequate statistical power for detecting medium effect sizes with acceptable confidence levels (Hair et al., 2019). The final analytical sample comprised 247 startup founders and co-founders representing diverse industry sectors and geographic locations within the Philippines.

Data Collection Procedures

Data collection occurred during the period from September 2021 through February 2022, capturing organizational experiences during the ongoing pandemic conditions. An online survey instrument was developed and administered through a secure web-based platform. Initial contact with potential respondents was established through email invitations explaining research purposes and participation requirements. Follow-up reminders were distributed at two-week intervals to maximize response rates. Several procedural safeguards were implemented to enhance data quality including attention check items, response time monitoring, and logical consistency verification.

Common method bias concerns were addressed through multiple procedural and statistical approaches (Podsakoff et al., 2003). Procedurally, respondent anonymity was assured, question ordering varied across instrument versions, and predictor and criterion variables were separated within the questionnaire structure. Statistically, Harman's single-factor test and common latent factor analysis were conducted to assess potential method bias effects. Results indicated that common method variance did not substantially influence the observed relationships.

Measurement Instruments

All constructs were operationalized using established measurement scales adapted for the startup context with minor wording modifications. Response formats employed seven-point Likert scales ranging from strongly disagree (1) to strongly agree (7) for attitudinal items and very poor (1) to excellent (7) for performance assessment items.

Innovation competence was measured using a multidimensional scale adapted from Yam et al. (2011) comprising 16 items across four subdimensions: technological capability, creative capability, market sensing capability, and organizational learning capability. Sample items included "Our startup effectively develops new technologies to support innovation" and "Our startup systematically identifies emerging customer needs."

Collaborative innovation was assessed using an adapted scale from Laursen and Salter (2006) capturing the breadth and depth of external knowledge source engagement across 12 items. Sample items included "Our startup actively collaborates with customers to develop innovations" and "Our startup maintains close partnerships with research institutions."

Financial performance was measured using six items adapted from Wiklund and Shepherd (2005) assessing revenue growth, profitability trends, and return metrics relative to expectations and competitors. Operational performance was assessed through eight items adapted from Kaplan and Norton (1996) capturing productivity, quality, innovation outputs, and customer satisfaction outcomes.

Analytical Approach

Data analysis proceeded through a systematic two-stage structural equation modeling approach following established analytical protocols (Anderson & Gerbing, 1988). The first stage involved confirmatory factor analysis (CFA) to assess the measurement model including construct reliability and validity evaluation. The second stage examined the structural model to test hypothesized relationships among latent constructs. All analyses were conducted using AMOS version 26.0 with maximum likelihood estimation.

Model fit was evaluated using multiple complementary indices including chi-square statistics, comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). Acceptable model fit was indicated by CFI and TLI values exceeding 0.90, RMSEA values below 0.08, and SRMR values below 0.08 (Hu & Bentler, 1999). Construct reliability was assessed through composite reliability (CR) with thresholds exceeding 0.70. Convergent validity was evaluated through average variance extracted (AVE) exceeding 0.50. Discriminant validity was assessed through the Fornell-Larcker criterion comparing AVE values to squared inter-construct correlations.

Results and Discussion

Sample Characteristics

The final analytical sample comprised 247 startup founders and co-founders. Table 1 presents the demographic and organizational characteristics of the sample. Regarding respondent demographics, 58.3% were male and 41.7% were female. The majority of respondents (67.2%) held at least a bachelor's degree, with 23.5% possessing graduate-level qualifications. The age distribution revealed concentration in the 26-35 year bracket (48.2%), followed by 36-45 years (29.1%).

Organizational characteristics showed diversity across industry sectors including technology (34.4%), retail/e-commerce (21.9%), professional services (15.8%), food and beverage (12.6%), and other sectors (15.3%). Startup age ranged from less than one year to seven years, with mean age of 3.2 years. Employee counts ranged from solo founders to 87 employees, with median employment of 8 persons. Geographic distribution showed concentration in Metro Manila (52.2%) with representation across major regional centers.

Table 1. Sample Characteristics (n=247)

Characteristic	Frequency	Percentage
Gender		
Male	144	58.3%
Female	103	41.7%
Industry Sector		
Technology	85	34.4%
Retail/E-commerce	54	21.9%
Professional Services	39	15.8%

Food and Beverage	31	12.6%
Others	38	15.3%

Measurement Model Assessment

Confirmatory factor analysis was conducted to evaluate the measurement model prior to structural model assessment. Initial model specification included all hypothesized constructs and their respective indicator items. Model fit indices for the measurement model demonstrated acceptable fit to the data: chi-square = 892.47 (df = 521, $p < .001$), CFI = 0.934, TLI = 0.927, RMSEA = 0.054 (90% CI: 0.048-0.060), SRMR = 0.052. All fit indices exceeded established threshold criteria indicating adequate model-data correspondence.

All indicator items loaded significantly on their respective latent constructs with standardized factor loadings ranging from 0.68 to 0.89. Table 2 presents construct reliability and validity assessment results. Composite reliability (CR) values ranged from 0.87 to 0.93, exceeding the 0.70 threshold criterion. Average variance extracted (AVE) values ranged from 0.58 to 0.71, surpassing the 0.50 minimum threshold for convergent validity. Cronbach's alpha coefficients ranged from 0.85 to 0.91, indicating strong internal consistency reliability across all measurement scales.

Table 2. Construct Reliability and Validity Assessment

Construct	CR	AVE	Alpha
Innovation Competence	0.93	0.67	0.91
Collaborative Innovation	0.91	0.63	0.89
Financial Performance	0.89	0.58	0.87
Operational Performance	0.87	0.71	0.85

Note: CR = Composite Reliability; AVE = Average Variance Extracted

Discriminant validity was evaluated using the Fornell-Larcker criterion. Table 3 presents the correlation matrix with square roots of AVE values on the diagonal. All diagonal elements exceeded corresponding off-diagonal correlation values, supporting discriminant validity among the study constructs. The highest inter-construct correlation occurred between innovation competence and collaborative innovation (r = 0.61), with the square root of AVE for both constructs exceeding this value.

Table 3. Discriminant Validity Assessment

Construct	IC	CI	FP	OP
Innovation Competence	**0.82**			
Collaborative Innovation	0.61	**0.79**		
Financial Performance	0.54	0.47	**0.76**	
Operational Performance	0.58	0.51	0.69	**0.84**

Note: Diagonal elements (bold) are square roots of AVE; off-diagonal elements are correlations

Structural Model and Hypotheses Testing

Following satisfactory measurement model validation, the structural model was estimated to examine hypothesized relationships. The structural model demonstrated acceptable fit: chi-square = 924.83 (df = 525, p < .001), CFI = 0.929, TLI = 0.921, RMSEA = 0.056 (90% CI: 0.050-0.062), SRMR = 0.058. Table 4 presents the standardized path coefficients, standard errors, and hypothesis testing results.

Table 4. Structural Model Results

Hypothesized Path	Beta	S.E.	t-value	Result
H1a: IC to FP	0.41***	0.071	5.78	Supported
H1b: IC to OP	0.46***	0.068	6.76	Supported
H2a: CI to FP	0.27**	0.082	3.29	Supported
H2b: CI to OP	0.31***	0.076	4.08	Supported

*Note: IC = Innovation Competence; CI = Collaborative Innovation; FP = Financial Performance; OP = Operational Performance. ***p < .001, **p < .01*

Hypothesis 1a proposed that innovation competence positively influences financial performance. The structural model results revealed a significant positive relationship (beta = 0.41, p < .001), supporting H1a. Hypothesis 1b proposed that innovation competence positively influences operational performance. This hypothesis was also supported with a significant positive path coefficient (beta = 0.46, p < .001). These findings indicate that startup organizations possessing stronger innovation competence demonstrated superior performance outcomes across both financial and operational dimensions during the pandemic period.

Hypothesis 2a proposed that collaborative innovation positively influences financial performance among startups. The analysis revealed a significant positive effect (beta = 0.27, p < .01), supporting H2a. Hypothesis 2b proposed that collaborative innovation positively influences operational performance. This hypothesis was supported with a significant positive relationship (beta = 0.31, p < .001). These results demonstrate that startups engaging more extensively in collaborative innovation practices exhibited enhanced performance across financial and operational metrics.

The structural model explained substantial variance in both dependent constructs. Innovation competence and collaborative innovation jointly explained 42.3% of the variance in financial performance (R-squared = 0.423) and 48.7% of the variance in operational performance (R-squared = 0.487). These explained variance values indicate that the proposed theoretical framework captures meaningful portions of performance variation among startup enterprises.

Discussion

Theoretical Implications

This investigation contributes to entrepreneurship theory by empirically validating the innovation competence-performance linkage within the distinctive context of startup enterprises navigating pandemic conditions in an emerging economy. The findings extend dynamic capabilities theory by demonstrating that innovation-related organizational capabilities significantly influence startup outcomes even during periods of profound environmental turbulence and uncertainty. This contribution responds to calls for greater contextual specificity in dynamic capabilities research and advances understanding of capability-performance relationships in entrepreneurial settings.

The demonstrated positive effects of both innovation competence and collaborative innovation on startup performance outcomes provide empirical support for theoretical propositions emphasizing the complementary nature of internal capabilities and external knowledge integration (Teece, 2007; Chesbrough, 2006). The stronger effect sizes observed for innovation competence relative to collaborative innovation suggest that internal capability development may represent a more fundamental performance driver, while external collaboration provides supplementary enhancement. This finding carries implications for resource allocation decisions among startup founders and managers.

The research contributes to emerging economy entrepreneurship literature by examining innovation-performance relationships within a Southeast Asian developing country context. The Philippines presents institutional and market characteristics that differ meaningfully from developed economy settings typically examined in prior innovation research (Khanna & Palepu, 2010). The significant relationships observed suggest that innovation competence and collaborative innovation orientations remain important performance determinants even in contexts characterized by institutional voids and market inefficiencies, though the specific mechanisms through which these effects operate may warrant further contextual investigation.

Practical Implications

The findings offer several actionable implications for startup founders, managers, and ecosystem stakeholders. First, the significant positive effects of innovation competence on both financial and operational performance underscore the importance of prioritizing innovation capability development within nascent ventures. Startup founders should invest in building technological capabilities, fostering creative organizational cultures, developing market sensing routines, and establishing organizational learning mechanisms. These capability investments appear to generate meaningful performance returns even during challenging environmental conditions.

Second, the positive effects of collaborative innovation on startup performance suggest that resource-constrained ventures should strategically pursue external partnerships and knowledge integration opportunities. Engaging customers, suppliers, universities, and other external stakeholders in innovation processes can enhance startup outcomes without requiring substantial internal resource commitments. During crisis periods, collaborative relationships may provide particularly valuable mechanisms for accessing emergency resources, sharing risks, and maintaining operational continuity.

Third, policymakers and ecosystem support organizations should consider programmatic interventions that foster innovation competence development among startups. Incubator and accelerator programs might incorporate innovation capability building curricula alongside traditional business development support. Government agencies might design innovation support schemes specifically tailored to early-stage venture needs. The demonstrated performance benefits of innovation competence suggest that such interventions could generate positive economic development outcomes. Fourth, investors evaluating startup investment opportunities might incorporate innovation competence assessment into due diligence processes. The substantial explained variance in performance outcomes suggests that innovation-related capabilities represent meaningful predictors of startup success potential. Venture capital and angel investors could develop evaluation frameworks that systematically assess founding team innovation capabilities and organizational innovation orientations.Conclusion

Concluding Remarks

This research investigation examined the relationships between innovation competence, collaborative innovation, and startup performance outcomes within the context of nascent enterprises navigating the COVID-19 pandemic in an emerging Southeast Asian economy. Employing structural equation modeling with survey data from 247 startup founders and co-founders in the Philippines, the study empirically validated a theoretical framework linking innovation-related organizational capabilities to financial and operational performance dimensions.

The empirical findings demonstrated that innovation competence significantly and positively influences both financial performance and operational performance among startup enterprises. Similarly, collaborative innovation orientations exhibited significant positive effects on startup performance outcomes across both dimensions. These findings underscore the strategic importance of cultivating innovation capabilities and pursuing collaborative innovation approaches for startup success, particularly during periods of environmental uncertainty and market disruption.

The research contributes to entrepreneurship theory by extending dynamic capabilities perspectives to startup contexts and validating innovation-performance relationships within emerging economy settings during crisis conditions. The practical implications offer guidance for startup founders seeking to enhance organizational performance, ecosystem support organizations designing intervention programs, and investors evaluating startup opportunities. The findings suggest that innovation competence represents a critical organizational capability meriting prioritized development attention within nascent ventures.

Limitations

Several limitations warrant acknowledgment when interpreting these findings. First, the cross-sectional research design precludes causal inference despite the theoretically grounded directional hypotheses. The observed relationships may reflect alternative causal orderings or spurious correlations with unmeasured third variables. Future research employing longitudinal designs would enable stronger causal claims regarding innovation-performance linkages.

Second, the single-country sample limits generalizability to other emerging economy contexts with potentially differing institutional, cultural, and market characteristics. The Philippines presents specific contextual conditions that may not characterize other developing country settings. Replication studies across multiple emerging economies would strengthen confidence in the external validity of findings.

Third, reliance upon self-reported measures from single informants introduces potential common method bias and informant accuracy concerns. While procedural and statistical safeguards were implemented, obtaining objective performance data and multiple informant perspectives would strengthen measurement validity. Fourth, the purposive sampling approach may introduce selection biases limiting population representativeness. Future research utilizing probability sampling methods would enhance statistical generalizability.

Future Research Directions

Several promising directions emerge for future investigation. First, longitudinal research designs tracking startup innovation capability development and performance trajectories over time would enable examination of dynamic capability building processes and their performance consequences. Such designs could clarify temporal sequences and potentially strengthen causal inferences regarding innovation-performance relationships.

Second, comparative studies examining innovation competence effects across different emerging economy contexts would illuminate how institutional, cultural, and market factors moderate innovation-performance

relationships. Cross-country research designs could identify boundary conditions and contextual contingencies affecting the generalizability of findings across developing country settings.

Third, qualitative research methodologies could provide richer understanding of the mechanisms through which innovation competence and collaborative innovation influence startup outcomes. Case study approaches might illuminate the specific processes, practices, and decisions through which innovation capabilities translate into performance improvements. Such research could complement quantitative findings with contextual depth and nuance.

Fourth, investigating potential moderating factors such as industry sector, startup age, founding team characteristics, and access to external financing could refine understanding of conditions under which innovation competence effects are strengthened or attenuated. Such contingency-based research would enable more nuanced theoretical development and targeted practical recommendations for specific startup populations.

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