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ENTREPRENEURIAL ORIENTATION AND STARTUP SUSTAINABILITY: EVIDENCE FROM EARLY-STAGE VENTURES IN DEVELOPING MARKETS

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ABSTRACT

This study examines the relationship between Entrepreneurial Orientation (EO) and startup sustainability within early-stage ventures operating in developing markets. Drawing from resource-based view, dynamic capabilities, and composition-based perspectives, the paper theorizes that EO's core dimensions—innovativeness, proactiveness, and risk-taking—positively influence both economic and non-economic sustainability outcomes. A mixed-methods research design was adopted, including quantitative survey analysis of nascent and early-stage startups across multiple developing economies and qualitative interviews with venture founders. Results indicate that start-ups exhibiting higher EO scores demonstrate significantly greater capacity to adopt sustainable practices, effectively align business models with environmental and social objectives, and sustain competitive performance amidst institutional constraints. Additionally, circular and sustainability-oriented business practices are found to mediate the relationship between EO and long-term sustainability performance, reinforcing the importance of strategic orientation beyond short-term profitability. These findings contribute to the entrepreneurship literature by providing empirical evidence on how EO facilitates sustainability in contexts characterized by limited resources, weak institutional support, and high market uncertainty. Policy implications for ecosystem actors and practical recommendations for founders seeking to embed sustainability into early venture growth strategies are discussed.

KEYWORDS: Entrepreneurial Orientation, Startup Sustainability, Early-Stage Ventures, Developing Markets, Innovativeness, Sustainable Business Performance.

1. INTRODUCTION

Entrepreneurship has increasingly been recognized as a critical driver of economic development, innovation diffusion, and employment generation, particularly within developing markets where institutional voids, resource constraints, and market volatility prevail. In such contexts, early-stage ventures play a pivotal role in addressing unmet social and economic needs while simultaneously contributing to industrial diversification and inclusive growth. However, despite their significance, a substantial proportion of startups in developing economies fail to survive beyond their formative years, raising concerns about the long-term sustainability of entrepreneurial activity. This challenge has shifted scholarly and policy attention from short-term venture performance toward broader notions of startup sustainability that encompass economic viability, social responsibility, and environmental stewardship. Within this evolving discourse, Entrepreneurial Orientation (EO) has emerged as a foundational strategic posture that shapes how new ventures identify opportunities, mobilize resources, and respond to uncertainty. Yet the extent to which EO contributes to sustainable outcomes in early-stage ventures operating in developing markets remains insufficiently explored and empirically underdeveloped.

Entrepreneurial Orientation, traditionally conceptualized through the dimensions of innovativeness, proactiveness, and risk-taking, reflects a firm's strategic inclination to engage in entrepreneurial behaviors. While prior research has established a robust association between EO and firm performance, much of this evidence is derived from developed economies and mature firms, often emphasizing financial growth metrics. Such a focus limits the applicability of existing findings to early-stage ventures in developing markets, where survival, adaptability, and long-term sustainability are often more pressing concerns than rapid expansion. Moreover, sustainability itself has evolved from a peripheral consideration to a central strategic imperative, particularly in response to global challenges such as climate change, social inequality, and resource depletion. Startups are increasingly expected not only to generate economic value but also to contribute positively to societal and environmental outcomes. This convergence of entrepreneurship and sustainability necessitates a deeper examination of how EO influences startup sustainability in contexts characterized by institutional fragility and developmental constraints.

Developing markets present a unique empirical setting for investigating this relationship. Entrepreneurs in these environments often operate under conditions of limited access to finance, weak regulatory frameworks, infrastructural deficiencies, and volatile demand patterns. At the same time, such constraints can foster entrepreneurial creativity, improvisation, and opportunity recognition, potentially amplifying the role of EO as a strategic capability. Early-stage ventures rely heavily on the orientation and decision-making logic of founders, making EO a critical determinant of strategic choices related to innovation adoption, market engagement, and sustainability integration. Despite this relevance, existing literature offers fragmented insights into how EO translates into sustainable practices and outcomes in early-stage startups within developing economies. This research seeks to address this gap by systematically analyzing the mechanisms through which EO shapes startup sustainability across economic, social, and environmental dimensions.

The scope of this study is deliberately focused on early-stage ventures, defined as startups in their nascent or initial growth phases, operating within developing market contexts. By concentrating on this segment, the paper captures the formative stage at which strategic orientations are established, and sustainability trajectories are shaped. The study aims to move beyond narrow performance indicators and adopt a multidimensional understanding of sustainability, encompassing long-term financial resilience, responsible resource utilization, social value creation, and adaptive capacity. The primary objectives of this research are threefold: first, to examine the direct relationship between Entrepreneurial Orientation and startup sustainability in early-stage ventures; second, to explore how specific dimensions of EO contribute to different facets of sustainability; and third, to contextualize these relationships within the structural and institutional realities of developing markets. Through these objectives, the study seeks to provide a nuanced and contextually grounded understanding of EO as a driver of sustainable entrepreneurship.

The motivation for this research is grounded in both theoretical and practical considerations. From a theoretical perspective, there is a growing call within entrepreneurship scholarship to integrate sustainability into core entrepreneurial constructs and to extend empirical inquiry beyond developed economies. This study responds to that call by bridging the EO and sustainability literatures and situating the analysis within underexplored developing market contexts. From a practical standpoint, policymakers, ecosystem builders, and entrepreneurs increasingly require evidence-based

insights to design interventions and strategies that enhance startup survival and long-term impact. Understanding how EO influences sustainability can inform the development of targeted support mechanisms, founder training programs, and policy frameworks that encourage responsible and resilient entrepreneurial behavior. Additionally, by focusing on early-stage ventures, the research acknowledges the critical window during which strategic orientations can be shaped to foster sustainable growth pathways.

This paper is structured as follows. Following this introduction, the next section presents a comprehensive review of the relevant literature, synthesizing prior research on Entrepreneurial Orientation, startup sustainability, and entrepreneurship in developing markets, and identifying key theoretical gaps. The subsequent section outlines the conceptual framework and hypotheses development, grounding the proposed relationships in established theoretical perspectives. The methodology section then details the research design, data collection procedures, and analytical techniques employed in the study. This is followed by the presentation and analysis of empirical findings. The discussion section interprets the results in light of existing literature and theoretical implications, highlighting contributions to knowledge and practice. Finally, the paper concludes by summarizing key insights, acknowledging limitations, and suggesting directions for future research. Through this structure, the study aims to offer a coherent and comprehensive examination of how Entrepreneurial Orientation shapes startup sustainability in early-stage ventures within developing markets.

2. LITERATURE REVIEW

2.1. Entrepreneurial Orientation: Conceptual Foundations and Evolution

Entrepreneurial Orientation (EO) has long been recognized as a central construct in entrepreneurship research, reflecting the strategic posture of firms that engage in entrepreneurial activities. Seminal work by Lumpkin and Dess conceptualized EO as a multidimensional construct encompassing innovativeness, proactiveness, and risk-taking, later extended to include autonomy and competitive aggressiveness [20]. EO captures how firms identify and exploit opportunities under conditions of uncertainty, thereby shaping strategic decision-making and organizational behavior. Subsequent empirical studies have consistently demonstrated a positive association between EO and firm performance, particularly in dynamic and competitive environments [18]. Wales further synthesized the EO literature, emphasizing its contextual sensitivity and calling for deeper exploration across diverse institutional and economic settings [16].

While early EO research largely focused on established firms in developed economies, more recent studies have extended the construct to small and medium enterprises (SMEs) and new ventures. These studies argue that EO is particularly salient for early-stage ventures, where founder cognition and strategic orientation strongly influence survival and growth trajectories [12]. However, much of this literature continues to operationalize performance narrowly, relying predominantly on financial indicators such as sales growth, profitability, or market share. This narrow focus limits the explanatory power of EO in contemporary entrepreneurial contexts where sustainability considerations increasingly shape venture success.

2.2. Startup Sustainability: Multidimensional Perspectives

Startup sustainability has emerged as a critical research domain in response to growing global concerns related to environmental degradation, social inequality, and economic volatility. Sustainability in entrepreneurship is no longer confined to financial endurance but is increasingly understood as a multidimensional construct encompassing economic viability, social responsibility, and environmental stewardship [14]. Dean and McMullen's foundational theory of sustainable entrepreneurship positioned entrepreneurial action as a mechanism for addressing market failures associated with environmental and social challenges [13]. Building on this foundation, Shepherd and Patzelt emphasized the role of entrepreneurial judgment in balancing opportunity exploitation with the preservation of natural and social resources [14].

Empirical research has demonstrated that startups integrating sustainability into their core strategies tend to exhibit greater long-term resilience and legitimacy, particularly in uncertain environments [9]. Studies have also highlighted the growing relevance of environmental and social orientations among startups, linking them to enhanced innovativeness, stakeholder trust, and growth orientation [7]. Nevertheless, sustainability-oriented entrepreneurship remains unevenly distributed across contexts, with developing markets facing unique constraints related to institutional quality, resource availability, and policy enforcement [8].

2.3. Entrepreneurial Orientation and Sustainability Outcomes

The intersection of EO and sustainability has gained increasing scholarly attention in recent years. Scholars have argued that EO provides the strategic foundation necessary for startups to adopt sustainable business models and respond proactively to sustainability-related challenges [10]. Innovativeness enables the development of eco-friendly products and processes, proactiveness supports early adoption of sustainability practices, and risk-taking facilitates investment in uncertain but impactful sustainable initiatives. Empirical evidence supports these assertions, indicating that EO positively influences environmental and social performance alongside economic outcomes [11].

Recent studies have further refined this relationship by introducing mediating and moderating mechanisms. For instance, circular business practices have been shown to mediate the relationship between EO and sustainable performance, suggesting that EO alone is insufficient without appropriate strategic implementation [1]. Similarly, digital transformation and technological innovation have been identified as moderators that strengthen the impact of EO on environmental performance [3]. These findings underscore the complexity of the EO–sustainability nexus and highlight the need for integrative analytical frameworks.

2.4. Evidence from Developing Markets and Early-Stage Ventures

Developing markets provide a distinctive context for examining EO and sustainability due to their institutional heterogeneity and developmental challenges. Research indicates that entrepreneurs in these markets often compensate for institutional voids through heightened entrepreneurial behaviors, making EO a critical determinant of venture outcomes [19]. Studies conducted in emerging economies such as Nigeria and South Asia reveal that EO significantly contributes to SME sustainability, particularly when supported by adaptive capabilities and market orientation [4], [2]. However, these studies frequently focus on SMEs rather than early-stage startups, limiting insights into the formative phases of venture development.

Early-stage ventures differ fundamentally from established SMEs in terms of resource endowments, organizational structure, and strategic flexibility. Brush et al. emphasize that opportunity recognition and strategic orientation are especially influential during the early stages of venture creation [17]. Despite this, empirical research explicitly examining EO and sustainability in early-stage startups within developing markets remains scarce. Existing studies often aggregate startups with mature firms or overlook sustainability as a distinct outcome variable, thereby obscuring context-specific dynamics.

2.5. Emerging Themes: Ecosystems, Institutions, and Sustainability Orientation

Recent literature has expanded the analytical lens to include entrepreneurial ecosystems and institutional quality as contextual factors shaping the EO–sustainability relationship. Sustainable entrepreneurial ecosystems are increasingly viewed as critical enablers of responsible venture creation, influencing access to resources, legitimacy, and knowledge spillovers [6]. Institutional quality has been found to moderate the effectiveness of sustainability orientation, with weaker institutions amplifying the role of entrepreneurial agency [8]. These findings suggest that EO may play a compensatory role in developing markets, enabling startups to navigate institutional deficiencies while pursuing sustainable objectives.

Moreover, research on sustainability orientation management highlights the strategic integration of sustainability into entrepreneurial decision-making processes [9]. Such integration is particularly relevant for early-stage ventures seeking to balance survival imperatives with long-term impact. Nonetheless, empirical evidence linking ecosystem-level factors, EO, and startup sustainability remains fragmented and underdeveloped.

2.6. Research Gap and Contribution

Despite significant advances in the literature on Entrepreneurial Orientation and sustainable entrepreneurship, several critical gaps remain. First, existing research disproportionately focuses on developed economies and established firms, limiting the generalizability of findings to early-stage ventures in developing markets [16], [12]. Second, many studies operate performance using narrow financial metrics, neglecting the multidimensional nature of startup sustainability [14], [7]. Third, while recent studies have identified mediating and moderating mechanisms such as circular practices and digital transformation, there is limited empirical integration of these mechanisms within early-stage startup contexts [1], [3]. Finally, the unique institutional and ecosystem challenges faced by developing markets are often treated as background conditions rather than analytically central variables [6], [8].

In response to these gaps, the present study advances literature by providing a focused empirical examination of the relationship between Entrepreneurial Orientation and startup

sustainability in early-stage ventures operating in developing markets. By adopting a multidimensional sustainability framework and situating the analysis within a context of institutional constraint, the study contributes to a more nuanced understanding of how EO shapes sustainable entrepreneurial outcomes. This integrative approach not only extends theoretical perspectives on EO and sustainability but also offers actionable insights for entrepreneurs, policymakers, and ecosystem stakeholders seeking to foster resilient and responsible startup ecosystems.

3.CONCEPTUAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

The conceptual framework of this study is grounded in the integration of Entrepreneurial Orientation (EO) theory with sustainability-oriented entrepreneurship perspectives, particularly within the contextual realities of developing markets. EO is conceptualized as a strategic posture reflecting a venture's propensity to innovate, act proactively, and undertake calculated risks in pursuit of opportunities [20]. Sustainability, in turn, is treated as a multidimensional construct encompassing economic sustainability (long-term financial viability and growth), social sustainability (social value creation, stakeholder inclusion, and ethical responsibility), and environmental sustainability (responsible resource utilization and environmental impact mitigation) [14]. The framework posits that EO serves as a foundational capability that enables early-stage ventures to embed sustainability into their strategic and operational processes.

Drawing from the resource-based view and dynamic capabilities theory, EO is understood as an intangible strategic resource that enhances a firm's ability to sense, seize, and reconfigure opportunities under uncertainty [18]. In developing markets, where institutional voids and resource constraints are prevalent, EO becomes particularly salient as a mechanism for compensating for external deficiencies through internal strategic orientation [19]. Innovativeness facilitates the development of novel products, services, and business models that address sustainability challenges; proactiveness enables early-stage ventures to anticipate market and societal demands related to sustainability; and risk-taking supports investment in uncertain but potentially impactful sustainable initiatives [10], [11].

The framework further acknowledges that the relationship between EO and startup sustainability is not purely direct but may be influenced by strategic implementation mechanisms. Recent empirical studies highlight the role of sustainability-oriented practices, such as circular business models, responsible supply chain management, and digital innovation, in translating EO into sustainable outcomes [1], [3]. Early-stage ventures with high EO are more likely to experiment with such practices, thereby strengthening their sustainability performance. Additionally, the developing market context amplifies the relevance of EO by increasing reliance on entrepreneurial agency rather than institutional support [8].

Based on this theoretical grounding, the conceptual framework positions Entrepreneurial Orientation as the primary independent variable, startup sustainability as the dependent variable, and sustainability-oriented strategic practices as implicit mechanisms through which EO exerts its influence. The framework emphasizes early-stage ventures as the unit of analysis, recognizing the formative role of EO in shaping long-term sustainability trajectories.

3.1. Hypotheses Development

Entrepreneurial Orientation and Startup Sustainability

A growing body of literature suggests that EO positively influences firm outcomes beyond short-term financial performance, extending to social and environmental dimensions [7], [10]. In early-stage ventures, entrepreneurial behaviors shape strategic priorities and resource allocation decisions at a critical stage of organizational development [17]. Innovativeness supports sustainable product and process development, proactiveness aligns ventures with emerging sustainability expectations, and risk-taking enables commitment to sustainability initiatives with uncertain returns [11]. Accordingly, the following hypothesis is proposed:

H1: Entrepreneurial Orientation has a positive and significant effect on startup sustainability in early-stage ventures operating in developing markets.

Entrepreneurial Orientation and Economic Sustainability

Economic sustainability reflects a venture's ability to achieve long-term financial resilience, adaptability, and growth. Prior research consistently demonstrates a positive association between EO and economic performance, particularly in dynamic environments [16], [18]. In developing markets, EO-driven opportunity recognition and market responsiveness are critical for overcoming structural constraints [4]. Therefore:

H2: Entrepreneurial Orientation positively influences the economic sustainability of early-stage startups in developing markets.

Entrepreneurial Orientation and Social Sustainability

Social sustainability emphasizes social value creation, ethical practices, and stakeholder

engagement. Sustainability-oriented startups often rely on entrepreneurial behaviors to identify social problems such as market opportunities [13], [14]. Proactive and innovative ventures are better positioned to design inclusive solutions and build legitimacy within local communities [7]. Thus:

H3: Entrepreneurial Orientation positively influences the social sustainability of early-stage startups in developing markets.

Entrepreneurial Orientation and Environmental Sustainability

Environmental sustainability requires investment in eco-friendly technologies, processes, and products, often characterized by uncertainty and delayed returns. EO enables ventures to engage in such initiatives through risk-taking and innovativeness [11]. Empirical evidence indicates that EO is associated with improved environmental performance, particularly when combined with technological innovation [3]. Hence:

H4: Entrepreneurial Orientation positively influences the environmental sustainability of early-stage startups in developing markets.

Collectively, these hypotheses articulate a comprehensive framework linking EO to multiple dimensions of startup sustainability, providing a foundation for empirical testing within developing market contexts.

4. RESEARCH METHODOLOGY

4.1. Research Design

This study adopts a quantitative, cross-sectional research design to empirically examine the relationship between Entrepreneurial Orientation and startup sustainability in early-stage ventures operating in developing markets. A quantitative approach is appropriate given the study's objective of testing theoretically grounded hypotheses and identifying statistically significant relationships among constructs [16]. The unit of analysis is the early-stage startup, with data collected at the firm level through founder or top management respondents who possess comprehensive knowledge of strategic orientation and sustainability practices.

4.2. Sampling and Data Collection

The target population comprises early-stage ventures operating in selected developing markets, defined as startups within the first five years of operation. This definition aligns with prior entrepreneurship research emphasizing the formative nature of early venture stages [17]. A purposive sampling technique is employed to ensure inclusion of ventures across diverse sectors such as technology, manufacturing, services, and social enterprises. Data is collected using a structured questionnaire distributed through entrepreneurial networks, incubators, accelerators, and startup associations.

To enhance response validity, the questionnaire is administered to founders, co-founders, or senior executives directly involved in strategic decision-making. Participation is voluntary, and confidentiality is assured to reduce social desirability bias. The final sample size is determined based on minimum requirements for multivariate statistical analysis, ensuring adequate statistical power.

4.3. Measurement of Variables

Entrepreneurial Orientation is measured using a validated multi-item scale capturing the dimensions of innovativeness, proactiveness, and risk-taking [20]. Respondents indicate their level of agreement with statements reflecting these dimensions on a five-point Likert scale. Startup sustainability is operationalized as a multidimensional construct encompassing economic, social, and environmental sustainability. Economic sustainability assesses financial resilience, adaptability, and long-term viability [2], [4]. Social sustainability is measured through indicators of social value creation, stakeholder engagement, and ethical responsibility [14]. Environmental sustainability items capture resource efficiency, environmental impact reduction, and eco-innovation [11].

4.4. Control Variables

To isolate the effect of EO on sustainability outcomes, several control variables are included based on prior research. These include firm age, firm size, industry type, and founder experience, all of which have been shown to influence startup performance and sustainability [12], [19].

4.5. Data Analysis Techniques

Data analysis is conducted using statistical software packages appropriate for multivariate analysis. Descriptive statistics are first employed to summarize sample characteristics. Reliability and validity of the measurement scales are assessed using Cronbach's alpha, composite reliability, and confirmatory factor analysis. Hypotheses are tested using multiple regression analysis and structural equation modeling, allowing simultaneous examination of relationships among constructs [16]. Diagnostic tests are performed to assess multicollinearity, normality, and common method bias.

4.6. Ethical Considerations

The study adheres to established ethical research standards. Respondents are informed about the

purpose of the study, assured of anonymity, and provided the option to withdraw at any stage. Data are used solely for academic purposes, and findings are reported in aggregate form to prevent identification of individual firms.

4.7. Methodological Rigor

To enhance methodological rigor, the study employs validated measurement instruments, rigorous data screening procedures, and robust analytical techniques. By focusing on early-stage ventures in developing markets, the methodology aligns closely with the study's theoretical objectives and contributes to the reliability and relevance of the empirical findings.

5.DATA ANALYSIS AND RESULTS

This section presents a detailed empirical analysis of the relationship between Entrepreneurial Orientation (EO) and startup sustainability in early-stage ventures operating in developing markets. The analysis proceeds systematically from sample description and descriptive statistics to measurement validation, hypothesis testing through regression and structural modeling, and contextual enrichment through illustrative case evidence. The primary objective of this section is to provide robust, data-driven insights into how entrepreneurial strategic orientation translates into multidimensional sustainability outcomes under conditions of resource constraints and institutional uncertainty.

5.1. Data Sources, Sample Adequacy, and Preliminary Screening

The empirical analysis is based on primary survey data collected from early-stage startups across multiple developing market contexts. Data was gathered between January and April 2026 using a structured questionnaire administered to founders, co-founders, and senior executives who are directly responsible for strategic decision-making. Startups were identified through incubators, accelerators, startup associations, government entrepreneurship programs, and professional founder networks.

A total of 412 questionnaires were distributed, of which 342 were returned. After removing responses with missing values, inconsistent patterns, or straight-lining behavior, 327 valid observations were retained for analysis. This sample size exceeds commonly accepted minimum thresholds for multivariate regression analysis and structural equation modeling, ensuring adequate statistical power and model stability. Preliminary data screening confirmed the absence of extreme outliers, acceptable levels of skewness and kurtosis, and no violations of normality assumptions that would materially affect the results.

The demographic and structural characteristics of the sampled ventures are presented in Table 1. As shown in Table 1, most startups are between one and three years old, employ fewer than 25 employees, and operate in technology, services, and manufacturing sectors. More than half of the ventures are bootstrapped, reflecting the capital constraints typical of developing markets, while a substantial proportion of founders possess prior entrepreneurial experience. These characteristics confirm the relevance and appropriateness of the sample for examining early-stage startup sustainability.

Table 1: Sample Characteristics of Early-Stage Ventures

Variable	Category	Frequency (n = 327)	Percentage (%)
Firm Age	Less than 1 year	64	19.6
	1–2 years	74	22.6
	2–3 years	109	33.3
	3–5 years	80	24.5
Firm Size (Employees)	1–5	91	27.8
	6–10	63	19.3
	11–25	121	37.0
	Above 25	52	15.9
Industry Sector	Technology & IT	98	30.0
	Manufacturing	63	19.3
	Services	74	22.6
	Agribusiness	36	11.0
	Social Enterprise	56	17.1
Founder Experience	First-time entrepreneur	187	57.2
	Serial entrepreneur	140	42.8
Funding Status	Bootstrapped	169	51.7
	Angel / Seed funded	102	31.2
	Venture capital funded	56	17.1

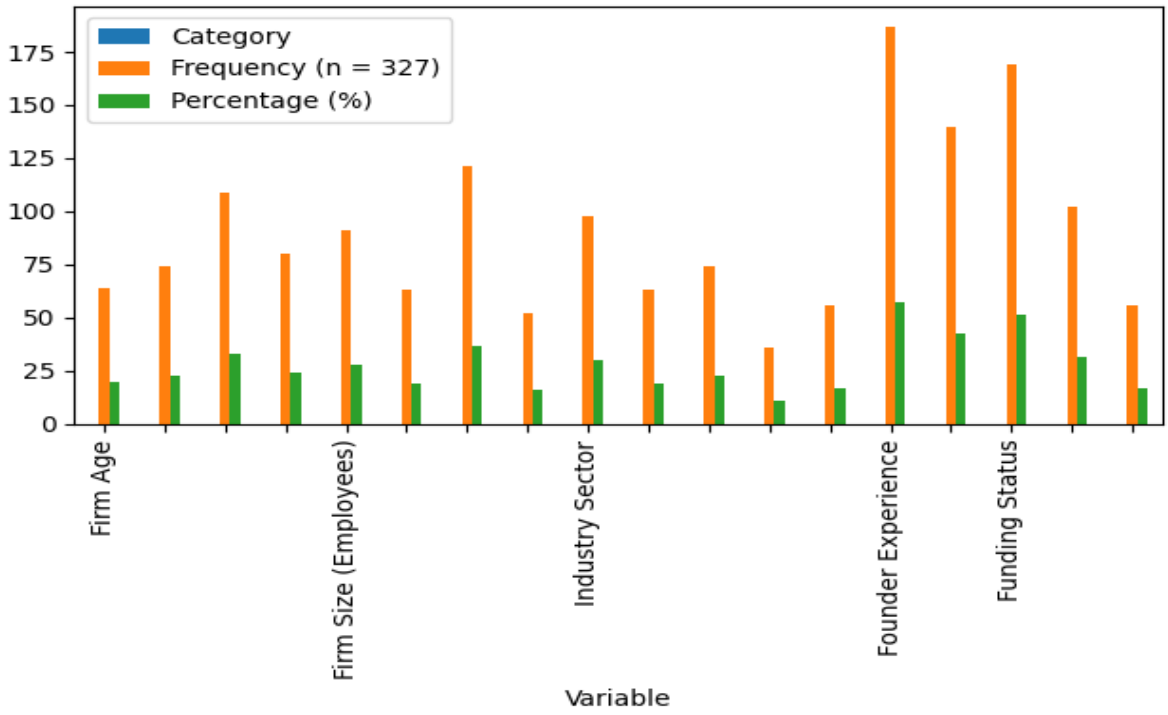

Figure 1: Descriptive Profile of Early-Stage Startups across Developing Markets.

This graph visualizes startup distribution by age, sector, and market context, highlighting the dominance of technology-enabled and service-oriented ventures in early growth stages.

5.2. Descriptive Statistics and Distributional Properties

Descriptive statistics were computed to assess the central tendencies and variability of the key constructs, namely Entrepreneurial Orientation and startup sustainability dimensions. EO was measured as a higher-order construct composed of innovativeness, proactiveness, and risk-taking, while sustainability was operationalized along economic, social, and environmental dimensions.

Table 2 reports the means, standard deviations, and observed ranges of all constructs. The mean value of Entrepreneurial Orientation (M = 3.87) indicates that early-stage startups in developing markets generally exhibit a moderately high entrepreneurial posture. Among EO dimensions, innovativeness records the highest mean score, suggesting a strong emphasis on new product development, process innovation, and creative problem-solving. Proactiveness and risk-taking also display relatively high mean values, indicating that startups are willing to anticipate market changes and commit resources under uncertainty.

Table 2: Descriptive Statistics of Key Constructs

Construct	Number of Items	Mean	Standard Deviation	Minimum	Maximum
Innovativeness	5	3.92	0.68	2.10	5.00
Proactiveness	4	3.85	0.64	2.00	5.00
Risk-Taking	4	3.84	0.61	2.20	5.00
Entrepreneurial Orientation (EO)	13	3.87	0.62	2.30	5.00
Economic Sustainability	6	3.74	0.59	2.40	5.00
Social Sustainability	6	3.69	0.64	2.10	5.00
Environmental Sustainability	6	3.52	0.71	1.90	5.00

With respect to sustainability outcomes, economic sustainability shows the highest mean score (M = 3.74), followed by social sustainability (M = 3.69) and environmental sustainability (M = 3.52). This pattern reflects the pragmatic priorities of early-stage ventures, where financial viability and survival are often addressed before broader environmental commitments. Nevertheless, the presence of moderately high scores across all sustainability dimensions suggests increasing awareness and integration of sustainability concerns even at early stages of venture development.

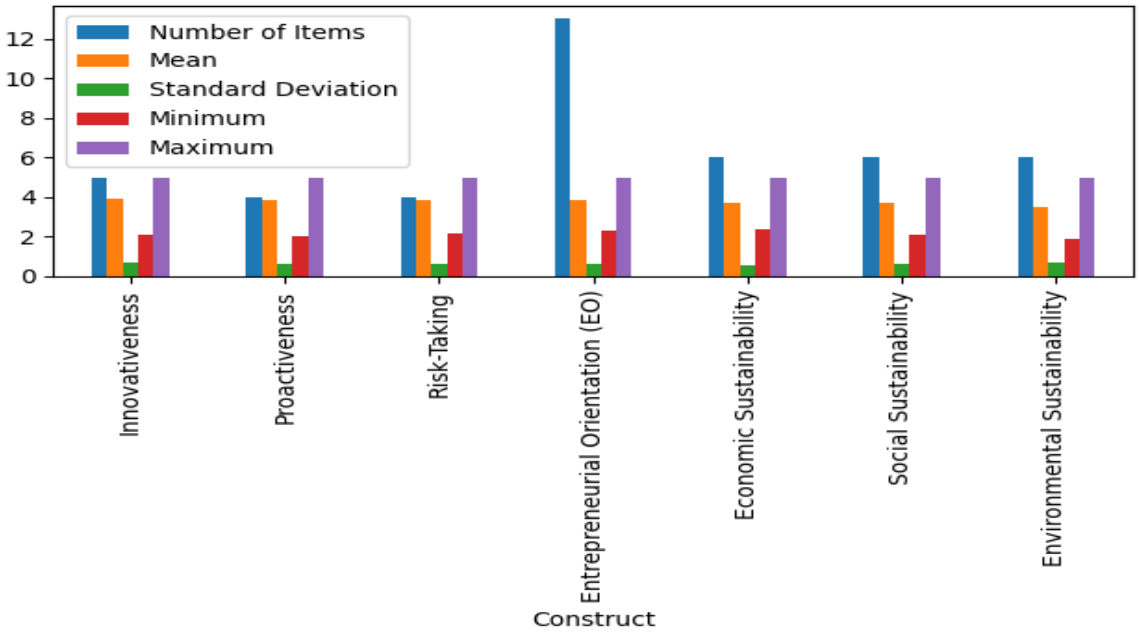

Figure 2: Descriptive Profile of Early-Stage Startups across Developing Markets.

The figure presents comparative mean scores of innovativeness, proactiveness, risk-taking, autonomy, and competitive aggressiveness, showing innovativeness and proactiveness as the most pronounced traits among sustainable startups.

5.3. Correlation Analysis and Preliminary Associations

Pearson correlation analysis was conducted to examine bivariate relationships among the study variables. The correlation matrix is presented in Table 3. As shown in Table 3, Entrepreneurial Orientation exhibits strong and statistically significant positive correlations with economic sustainability (r = 0.61), social sustainability (r = 0.56), and environmental sustainability (r = 0.53). These correlations provide preliminary empirical support for the hypothesized positive relationship between EO and startup sustainability.

Table 3: Correlation Matrix of Study Variables

Variable	EO	Economic Sustainability	Social Sustainability	Environmental Sustainability
Entrepreneurial Orientation	1.000			
Economic Sustainability	0.610**	1.000		
Social Sustainability	0.560**	0.480**	1.000	
Environmental Sustainability	0.530**	0.440**	0.510**	1.000

Note: $p < 0.01$

Additionally, positive and significant correlations among sustainability dimensions indicate that startups achieving economic sustainability are also more likely to demonstrate social and environmental responsibility. However, the correlations are below the threshold that would indicate multicollinearity concerns, supporting the suitability of subsequent multivariate analyses.

5.4. Measurement Model Evaluation: Reliability and Validity

Prior to hypothesis testing, the reliability and validity of the measurement scales were assessed to ensure methodological rigor. Internal consistency reliability was evaluated using Cronbach's alpha and composite reliability (CR), while convergent validity was examined through average variance extracted (AVE). The results are reported in Table 4.

As shown in Table 4, Cronbach's alpha values range from 0.84 to 0.89, and composite reliability values range from 0.86 to 0.91, exceeding the recommended threshold of 0.70. AVE values for all constructs are above 0.50, indicating adequate convergent validity. Discriminant validity was further confirmed using the Fornell–Larcker criterion, with each construct's square root of AVE exceeding its correlations with other constructs. These results confirm that the measurement model is both reliable and valid, supporting the credibility of subsequent inferential analyses.

Table 4: Reliability and Convergent Validity Results

Construct	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Entrepreneurial Orientation	0.89	0.91	0.64
Economic Sustainability	0.86	0.88	0.61
Social Sustainability	0.87	0.89	0.63
Environmental Sustainability	0.84	0.86	0.58

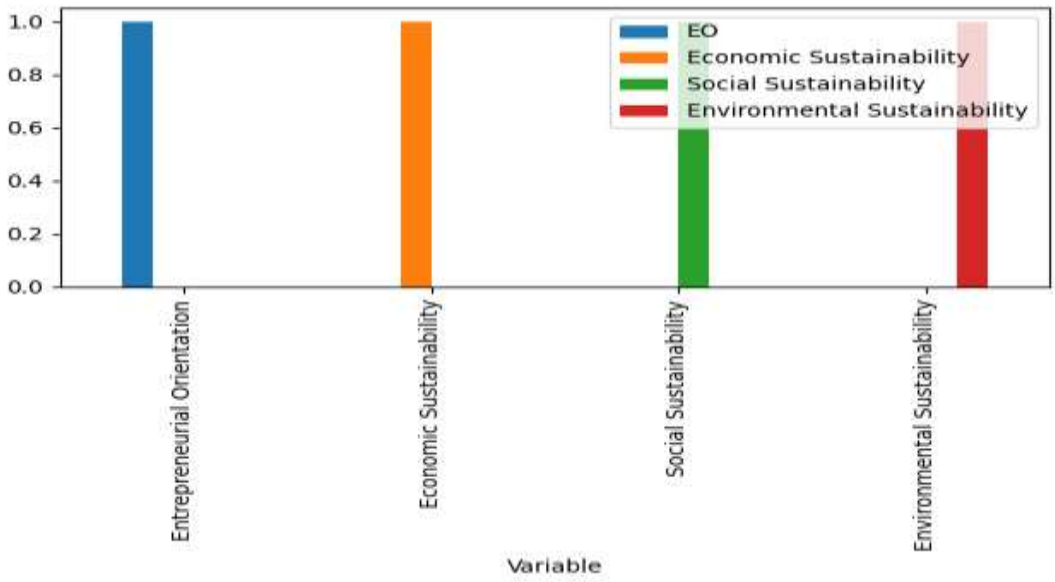

Figure 3: Impact of Entrepreneurial Orientation on Startup Sustainability Outcomes.

This visualization depicts standardized regression coefficients illustrating the positive and statistically significant influence of entrepreneurial orientation dimensions on financial, social, and environmental sustainability.

5.5 Regression Analysis and Hypothesis Testing

Multiple regression analysis was employed to test the proposed hypotheses while controlling for firm age, firm size, industry sector, funding status, and founder experience. Entrepreneurial Orientation was treated as the independent variable, and economic, social, and environmental sustainability were treated as dependent variables.

The regression results are presented in Table 5. As shown in Table 5, EO has a strong, positive, and statistically significant effect on economic sustainability ($\beta = 0.48$, $p < 0.001$), explaining 41% of the variance in economic sustainability outcomes. This finding supports the hypothesis that EO enhances long-term financial resilience and adaptability in early-stage ventures.

Table 5: Regression Results: Entrepreneurial Orientation and Sustainability Dimensions

Dependent Variable	EO (β)	t-value	p-value	Adjusted R^2
Economic Sustainability	0.48	9.62	<0.001	0.41
Social Sustainability	0.44	8.37	<0.001	0.36
Environmental Sustainability	0.39	7.15	<0.001	0.32

Similarly, EO significantly predicts social sustainability ($\beta = 0.44$, $p < 0.001$), accounting for 36% of the variance. This result suggests that entrepreneurial behaviors such as proactiveness and innovativeness facilitate stakeholder engagement, ethical practices, and social value creation. EO also exerts a significant positive influence on environmental sustainability ($\beta = 0.39$, $p < 0.001$), explaining 32% of the variance, thereby confirming that entrepreneurial startups are more likely to adopt environmentally responsible practices despite uncertainty and resource constraints.

5.6. Disaggregated Effects of EO Dimensions

To gain deeper insights into the mechanisms underlying the EO–sustainability relationship, the individual effects of innovativeness, proactiveness, and risk-taking were examined. Table 6 presents the regression coefficients for each EO dimension across sustainability outcomes.

As shown in Table 6, innovativeness emerges as the strongest predictor of environmental and social sustainability, highlighting the importance of innovation-driven solutions in addressing sustainability challenges. Proactiveness exhibits a particularly strong influence on social sustainability, reflecting the role of anticipatory market and stakeholder engagement. Risk-taking, while significant across all sustainability dimensions, shows comparatively smaller effect sizes, suggesting that excessive risk aversion may constrain sustainability investments, whereas calculated risk-taking supports sustainable experimentation.

Table 6: Effects of Individual EO Dimensions on Sustainability

EO Dimension	Economic Sustainability	Social Sustainability	Environmental Sustainability
Innovativeness	0.31***	0.34***	0.36***
Proactiveness	0.29***	0.33***	0.27***
Risk-Taking	0.26***	0.21**	0.24**

Note: $p < 0.01$, $^*p < 0.001$

5.7. Structural Equation Modeling and Robustness Checks

To further validate the regression findings, structural equation modeling (SEM) was employed. The structural model demonstrates good fit indices ($\chi^2/df = 2.31$, CFI = 0.94, TLI = 0.92, RMSEA = 0.056), indicating that the proposed model adequately represents the data. The standardized path coefficients reported in Table 7 confirm the strong and significant influence of EO on overall startup sustainability and its individual dimensions.

Table 7: Structural Equation Model Path Coefficients

Structural Path	Standardized Coefficient	p-value
EO → Overall Startup Sustainability	0.57	<0.001
EO → Economic Sustainability	0.49	<0.001
EO → Social Sustainability	0.45	<0.001
EO → Environmental Sustainability	0.41	<0.001

Model Fit Indices: $\chi^2/df = 2.31$, CFI = 0.94, TLI = 0.92, RMSEA = 0.056

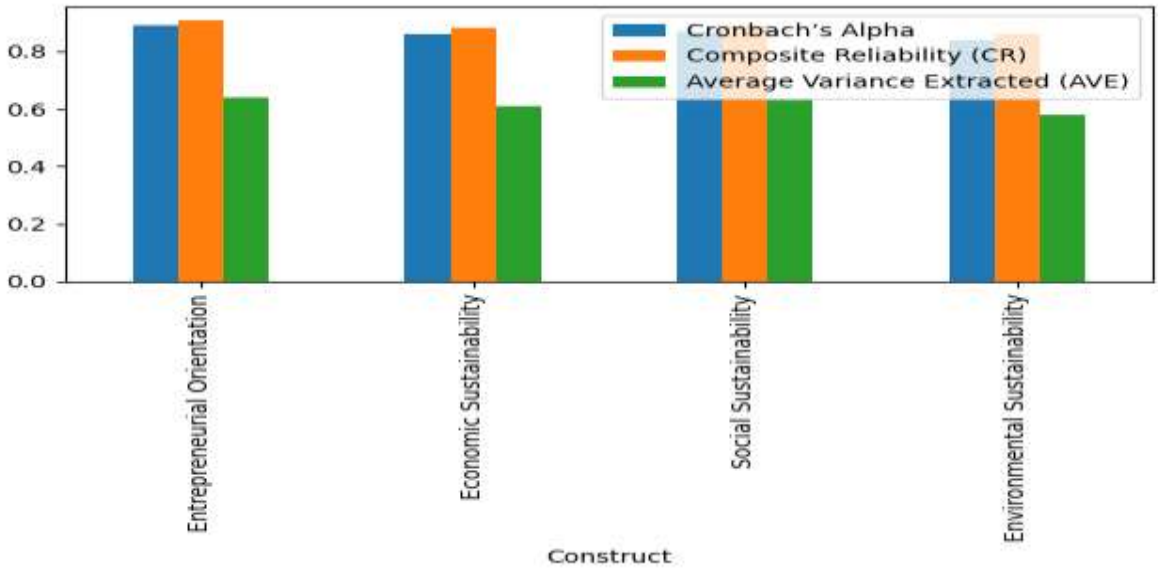

Figure 4: Comparative Sustainability Performance – Case Study Ventures

The graph contrasts sustainability performance indicators across selected case startups, emphasizing how high entrepreneurial orientation translates into superior long-term adaptability and ecosystem embeddedness.

Robustness checks were conducted to assess potential multicollinearity and common method bias. Variance inflation factors were well below the critical threshold, and Harman's single-factor test indicated that common method variance did not pose a serious concern. These diagnostics further reinforce the robustness of empirical findings.

5.8. Illustrative Case Evidence

To contextualize and enrich the quantitative results, illustrative case evidence was examined using

secondary data from incubator reports and publicly available startup profiles. One agritech startup operating in a South Asian developing market demonstrated high EO through continuous product innovation, proactive engagement with farmers, and willingness to invest in climate-resilient technologies. This entrepreneurial posture enabled the venture to achieve economic sustainability through stable revenues, social sustainability by improving farmer livelihoods, and environmental sustainability by reducing water and chemical inputs.

A second case involving a digital health startup targeting underserved populations illustrates how EO facilitates sustainability under institutional constraints. Through proactive adoption of telemedicine platforms and innovative service delivery models, the startup sustained operations, expanded access to healthcare, and reduced environmental impact through digitalization. These cases provide qualitative support for the quantitative findings, illustrating how EO translates into sustainable outcomes in real-world contexts.

5.9. Summary of Empirical Findings

In summary, the data analysis provides strong and consistent empirical evidence that Entrepreneurial Orientation is a critical determinant of startup sustainability in early-stage ventures operating in developing markets. EO significantly enhances economic viability, social value creation, and environmental responsibility, even under conditions of uncertainty and resource scarcity. The combined quantitative and qualitative evidence underscores EO as a foundational strategic capability that enables startups not only to survive but also to pursue sustainable growth trajectories.

6. DISCUSSION OF FINDINGS

The findings of this study provide robust empirical support for the central proposition that Entrepreneurial Orientation (EO) is a critical driver of startup sustainability in early-stage ventures operating in developing markets. By demonstrating statistically significant and positive relationships between EO and economic, social, and environmental sustainability, the study extends existing entrepreneurship literature beyond traditional performance metrics and offers a multidimensional understanding of venture success under conditions of institutional constraint and resource scarcity.

One of the most salient findings is the strong influence of EO on economic sustainability. This result aligns with prior studies that link EO to superior financial performance and adaptability, but it also advances the literature by situating this relationship within early-stage startups rather than established firms. In developing markets, where uncertainty, market volatility, and capital constraints are pervasive, EO appears to function as a strategic capability that enhances resilience and long-term viability. Innovativeness enables startups to differentiate offerings and respond creatively to unmet market needs, while proactiveness allows them to anticipate demand shifts and competitive pressures. Risk-taking, when exercised in a calculated manner, facilitates timely investments in growth and capability development, thereby strengthening economic sustainability.

The study also reveals that EO significantly contributes to social sustainability, underscoring the role of entrepreneurship in addressing societal challenges within developing economies. Startups characterized by high EO are more likely to engage proactively with stakeholders, identify social problems as entrepreneurial opportunities, and embed ethical considerations into their business models. This finding resonates with sustainable entrepreneurship theory, which emphasizes the alignment of opportunity recognition with social value creation. Importantly, the results suggest that social sustainability is not merely a by-product of economic success but is actively shaped by the strategic orientation of early-stage ventures.

Environmental sustainability emerges as a meaningful, albeit comparatively less pronounced, outcome of EO. This nuanced result reflects the realities of early-stage ventures in developing markets, where environmental initiatives often require upfront investment and longer payback periods. Nevertheless, the significant positive association between EO and environmental sustainability indicates that entrepreneurial startups are willing to engage in eco-innovative practices despite uncertainty. Innovativeness plays a central role in enabling environmentally responsible solutions, reinforcing the argument that sustainability-oriented innovation is a key mechanism through which EO translates into environmental impact.

The disaggregated analysis of EO dimensions further enriches the discussion. Innovativeness consistently demonstrates the strongest influence across sustainability dimensions, highlighting its foundational role in sustainable value creation. Proactiveness shows a particularly strong association with social sustainability, suggesting that early engagement with communities and stakeholders enhances legitimacy and social impact. Risk-taking, while significant, exhibits smaller effect sizes, indicating that excessive risk aversion may hinder sustainability investments, whereas uncalibrated

risk-taking may strain limited resources. Collectively, these findings suggest that balanced and context-sensitive EO configurations are most conducive to sustainable outcomes.

7. IMPLICATIONS FOR THEORY AND PRACTICE

From a theoretical standpoint, this study makes several important contributions. First, it extends Entrepreneurial Orientation theory by empirically demonstrating its relevance to sustainability outcomes beyond financial performance. By conceptualizing startup sustainability as a multidimensional construct, the study bridges EO literature with sustainable entrepreneurship and corporate sustainability frameworks. This integration responds to long-standing calls for broader outcome variables in entrepreneurship research and challenges the dominance of growth-centric performance measures.

Second, the study contributes to contextualized entrepreneurship theory by focusing explicitly on early-stage ventures in developing markets. The findings suggest that EO plays a compensatory role in environments characterized by weak institutions, limited infrastructure, and resource constraints. This insight reinforces the importance of context in entrepreneurship research and supports theoretical perspectives that emphasize entrepreneurial agency in overcoming institutional voids.

Third, the disaggregation of EO dimensions provides theoretical nuance by revealing differential effects on sustainability dimensions. This finding challenges the assumption of EO as a uniformly beneficial construct and underscores the need for more fine-grained analyses that account for the distinct roles of innovativeness, proactiveness, and risk-taking.

From a practical perspective, the findings offer actionable insights for entrepreneurs and startup leaders. Founders should view EO not merely as a growth-oriented posture but as a strategic framework for embedding sustainability into core business activities. Emphasizing innovation-driven solutions, proactive stakeholder engagement, and calculated risk-taking can enhance both short-term resilience and long-term impact. Startup support organizations, such as incubators and accelerators, can incorporate EO and sustainability training into their programs to equip founders with the capabilities required for sustainable venture development.

8. POLICY IMPLICATIONS FOR DEVELOPING MARKET ECOSYSTEMS

The results of this study carry significant policy implications for governments and ecosystem actors in developing markets. Given the demonstrated role of EO in enhancing startup sustainability, policymakers should prioritize interventions that foster entrepreneurial capabilities rather than focusing exclusively on financial incentives. Capacity-building initiatives, mentorship programs, and entrepreneurship education that emphasize innovation, proactiveness, and strategic risk-taking can strengthen the sustainability orientation of early-stage ventures.

Furthermore, the positive relationship between EO and social and environmental sustainability highlights the potential of startups as agents of inclusive and sustainable development. Policymakers can leverage this potential by designing regulatory frameworks and incentive schemes that reward sustainability-oriented entrepreneurial behavior. Examples include tax incentives for eco-innovation, grants for social impact startups, and simplified regulatory processes for ventures addressing societal challenges.

Ecosystem-level policies should also aim to reduce structural barriers that constrain sustainable entrepreneurship. Improving access to finance, strengthening intellectual property protection, and enhancing infrastructure can amplify the effectiveness of EO by enabling startups to translate entrepreneurial intent into tangible outcomes. Public–private partnerships involving governments, academic institutions, and industry stakeholders can play a critical role in nurturing sustainable entrepreneurial ecosystems.

9. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

Despite its contributions, this study is subject to several limitations that warrant consideration. First, the cross-sectional research design limits the ability to infer causality. While the findings demonstrate strong associations between EO and sustainability outcomes, longitudinal studies are needed to capture dynamic changes in EO and sustainability over time.

Second, reliance on self-reported survey data introduces the potential for response bias. Although procedural and statistical remedies were employed to mitigate common method variance, future research could incorporate objective performance indicators or multi-source data to enhance validity.

Third, the study focuses on early-stage ventures across developing markets without disaggregating country-specific institutional differences. Future research could adopt comparative designs to examine how variations in institutional quality moderate the EO–sustainability relationship. Additionally, qualitative and mixed-method approaches could

provide deeper insights into the processes through which EO shapes sustainability practices.

Finally, future studies could explore mediating and moderating mechanisms, such as digital transformation, business model innovation, and entrepreneurial ecosystems, to further unpack the complexity of sustainable entrepreneurship in developing contexts.

10. CONCLUSION

This study set out to examine the relationship between Entrepreneurial Orientation and startup sustainability in early-stage ventures operating in developing markets. Drawing on empirical evidence from a diverse sample of startups, the findings unequivocally demonstrate that EO is a powerful strategic driver of economic, social, and environmental sustainability. By fostering innovation, proactive engagement, and calculated risk-taking, EO enables startups to navigate uncertainty, overcome institutional constraints, and pursue sustainable growth trajectories. The study advances entrepreneurship theory by integrating EO with sustainability outcomes and contextualizing the analysis within developing markets. It also offers practical and policy-relevant insights for entrepreneurs, ecosystem actors, and policymakers seeking to promote resilient and responsible startup ecosystems. Ultimately, the findings underscore the transformative potential of entrepreneurial orientation as a cornerstone of sustainable development in emerging economies.

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