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Analyzing the Mediating Effect of Strategic Agility on the Relationship between Entrepreneurial Orientation and Sustainability of Ghana Club 100: The Role of Market Orientation

Stanislaus Ganyo Yaw Amegashie[1], Ofori Issah[2], Richard Kofi Asravor[3]

[1]School of research and graduate study, African University of Communications and Business

[2]Lecturer Accra Technical University ORCID: 0009-0000-9766-5233

[3]Head of Economics Department, Ghana Communication Technology University

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Corresponding Author:
Ofori Issah

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ABSTRACT

Purpose: In the dynamic and competitive business environment of today, firms must not only focus on profitability but also on long-term sustainability. This is especially crucial for elite and influential companies like those in the Ghana Club 100, which serve as benchmarks for business excellence in Ghana. Despite increasing emphasis on sustainable development, many firms in emerging economies continue to struggle with embedding sustainability into their core strategic practices. A significant area that remains underexplored in this context is how firms' entrepreneurial orientation (EO)—their tendency to innovate, take risks, and be proactive—translates into sustainability outcomes and what internal strategic capabilities mediate or moderate this relationship.

Methodology: A quantitative research approach is employed for this study to gather measurable data from a large number of respondents and subject the findings to statistical analysis. The study utilizes a primary data collection method through structured survey questionnaires administered to selected respondents within target firms. The target population includes managers, executives, and decision-makers of firms listed under the Ghana Club 100 ranking and other formally registered private firms across key industries. The sample size of 380 respondents was used.

Findings: The results indicate a significant positive relationship between Entrepreneurial Orientation (EO) and Strategic Agility. The results also demonstrate a significant and positive direct effect of Strategic Agility (SA) on Firm Sustainability. The direct relationship between Entrepreneurial Orientation (EO) and Firm Sustainability (FS) was found to be statistically non-significant. There is a significant positive moderating effect of Market Orientation on the Strategic Agility–Firms Sustainability relationship. Strategic Agility (SA) was found to mediate the relationship between Entrepreneurial Orientation (EO) and Firm Sustainability.

Unique Contribution to Theory, Practice, and Policy: From a theoretical perspective, the results validate a moderated model within the dynamic capabilities framework. While strategic agility alone contributes to sustainability, its impact is significantly amplified in firms that are highly market-oriented. Theoretically, this mediation model aligns with the Dynamic Capabilities View (DCV), which posits that entrepreneurial orientation must be complemented by adaptive capabilities—such as agility—to translate into long-term sustainable outcomes. Practically, managers should foster both strategic

agility and market orientation simultaneously. Firms that are agile but not customer- or market-focused may struggle to translate agility into tangible, sustainable value.

1. BACKGROUND OF THE STUDY

In the dynamic and competitive business environment of today, firms must not only focus on profitability but also on long-term sustainability. This is especially crucial for elite and influential companies like those in the Ghana Club 100, which serve as benchmarks for business excellence in Ghana. Despite increasing emphasis on sustainable development, many firms in emerging economies continue to struggle with embedding sustainability into their core strategic practices (Asamoah & Opoku, 2020). A significant area that remains underexplored in this context is how firms' entrepreneurial orientation (EO)—their tendency to innovate, take risks, and be proactive—translates into sustainability outcomes and what internal strategic capabilities mediate or moderate this relationship.

Entrepreneurial orientation (EO) is well-established in literature as a driver of firm performance and competitiveness (Rauch et al., 2009; Roscoe et al., 2019). EO reflects a firm's strategic posture and readiness to engage in opportunity-seeking behavior, risk-taking, and innovation. These attributes are crucial in shaping strategic directions and creating value, particularly in uncertain and resource-constrained markets such as Ghana (Asiedu & Amoako, 2022). However, while EO is believed to enhance sustainability by fostering adaptive and innovative capabilities, the mechanisms through which this influence unfolds are less understood. One such mechanism is strategic agility, which represents a firm's ability to swiftly sense changes in the environment and respond with appropriate strategic actions (Doz & Kosonen, 2010; Shams et al., 2021).

Strategic agility has emerged as a pivotal capability in rapidly changing business environments, acting as a bridge between entrepreneurial initiatives and sustainable outcomes (Mousavi et al., 2021). In contexts where firms are exposed to technological changes, regulatory shifts, and environmental pressures, the ability to act with agility becomes central to long-term success (Ismail et al., 2022). Yet, despite the relevance of strategic agility, its mediating role in the relationship between EO and firm sustainability remains under-examined, particularly in Sub-Saharan Africa. There is limited empirical evidence from Ghanaian firms to clarify whether entrepreneurial postures automatically lead to sustainability, or whether agility is needed to translate entrepreneurial tendencies into sustainable strategies and practices.

Adding to the complexity is the potential moderating role of market orientation (MO)—a firm's strategic focus on understanding and satisfying customer needs (Narver & Slater, 1990). Market-oriented firms are more likely to detect customer and societal demands for sustainable products, services, and ethical practices. When firms are both entrepreneurially oriented and market-oriented, they may be better positioned to align agility-driven initiatives with market expectations, thereby achieving sustainability (Ali et al., 2020; Chouaibi et al., 2023). However, the interactive effect of MO in enhancing or diminishing the influence of EO and strategic agility on sustainability is largely unexplored in the Ghanaian context.

The Ghana Club 100 provides a unique empirical setting to explore these dynamics. These firms are considered the leading business entities in the country, expected to set the pace for innovation, competitiveness, and sustainability. Yet, despite their visibility, there is a paucity of academic inquiry into how their strategic orientations contribute to sustainability, particularly from a mediating and moderating perspective. Prior studies in Ghana have predominantly treated EO and sustainability as a direct relationship (Amoako et al., 2021), without unpacking the complex internal capabilities and external market considerations that shape this linkage.

Therefore, this study seeks to analyze the mediating effect of strategic agility on the relationship between entrepreneurial orientation and firm sustainability, while exploring the moderating effect of market orientation within the context of Ghana Club 100 firms. The findings from this study will offer theoretical contributions to the strategic management and entrepreneurship literature by unpacking the black box between EO and sustainability. Practically, the study will provide insights for Ghanaian firms seeking to build resilient and sustainable businesses in volatile markets through the deployment of dynamic capabilities and market-driven strategies.

2. LITERATURE REVIEW

2.1 Strategic Agility

Strategic agility refers to an organization's ability to swiftly sense, respond, and adapt to dynamic environmental changes with speed and flexibility while maintaining strategic coherence (Doz & Kosonen, 2010). It enables firms to reposition themselves in response to emerging opportunities or threats, ensuring sustained competitiveness in uncertain and turbulent markets. Strategic agility encompasses three key dimensions: strategic sensitivity, which involves the ability to detect weak signals in the environment; resource fluidity, which reflects the capacity to reallocate resources rapidly; and leadership unity, which emphasizes collaborative and decisive leadership (Mousavi, Bossink, & van Vliet, 2021). In today's fast-paced business landscape, strategic agility has become essential for achieving innovation, resilience, and sustainability, particularly in emerging markets like Ghana where external volatility is prevalent (Ismail et al., 2022). It serves as a dynamic capability that bridges entrepreneurial orientation with desired outcomes such as firm sustainability by enhancing organizational responsiveness and decision-making effectiveness (Teece, 2018).

Thus, strategic agility is not only a response mechanism but a proactive strategic posture that enables long-term value creation in complex environments.

2.2 Entrepreneurial Orientation

Entrepreneurial Orientation (EO) refers to a firm's strategic posture characterized by innovativeness, proactiveness, and risk-taking in pursuing new opportunities and driving competitive advantage (Lumpkin & Dess, 1996). EO is considered a key determinant of firm performance and adaptability, especially in dynamic and uncertain environments. Innovativeness reflects the tendency to support creativity and experimentation in developing new products or processes; proactiveness indicates the firm's forward-looking perspective in anticipating market needs; and risk-taking involves the willingness to commit resources to uncertain ventures (Wales, 2016). In emerging markets such as Ghana, EO enables firms to cope with volatility, exploit market gaps, and pursue sustainable strategies (Asiedu & Amoako, 2022). Moreover, EO contributes to sustainability by fostering a culture of continuous improvement, strategic renewal, and opportunity recognition (Roscoe et al., 2019). As such, EO is increasingly viewed not only as a growth-oriented capability but also as a foundation for building strategic agility and long-term resilience.

2.3 Sustainability of Ghana Club 100

The sustainability of Ghana Club 100 firms refers to their ability to maintain long-term economic viability while addressing social and environmental responsibilities. These firms, recognized annually by the Ghana Investment Promotion Centre (GIPC), are considered leaders in corporate performance and are expected to set benchmarks for sustainable business practices in Ghana's private sector (GIPC, 2022). Sustainability in this context encompasses economic growth, environmental stewardship, and social inclusion, aligning with the triple bottom line approach (Elkington, 1997). However, despite their elite status, many Ghana Club 100 firms face challenges such as fluctuating market conditions, regulatory inconsistencies, and weak environmental reporting frameworks, which affect their ability to sustain performance across all dimensions (Asamoah & Opoku, 2020). Integrating sustainability into their strategic priorities requires not only financial investment but also a shift toward innovation, agility, and stakeholder engagement. Consequently, understanding the strategic orientations—such as entrepreneurial and market orientation—that drive sustainability in these firms is critical for enhancing their resilience and long-term impact (Amoako et al., 2021).

2.4 Market Orientation

Market orientation (MO) refers to an organizational culture and strategy that prioritizes identifying, understanding, and responding to the needs and preferences of customers to create superior value (Narver & Slater, 1990). It involves three core components: customer orientation, competitor orientation, and inter-functional coordination, all aimed at aligning firm activities with market demands (Kohli & Jaworski, 1990). In today's competitive and dynamic business environment, especially within emerging markets like Ghana, MO enables firms to adapt swiftly to changing customer preferences, technological shifts, and competitive pressures (Ali et al., 2020). It enhances organizational learning and strategic responsiveness, fostering capabilities such as agility, innovation, and sustainability. For firms in the Ghana Club 100, MO is crucial for maintaining market leadership and social relevance, as it strengthens the relationship between entrepreneurial orientation and sustainable performance (Chouaibi, Rejeb, & Rejeb, 2023). Ultimately, MO supports firms in balancing short-term profitability with long-term stakeholder engagement and environmental responsibility.

2.5 Dynamic Capabilities Theory (DCT)

The Dynamic Capabilities Theory (DCT), introduced by Teece et al. (1997), posits that a firm's ability to integrate, build, and reconfigure internal and external competencies in response to rapidly changing environments is essential for sustained competitive advantage. DCT is particularly relevant in explaining how entrepreneurial orientation (EO)—characterized by proactiveness, risk-taking, and innovativeness—translates into sustainable outcomes through the mediating role of strategic agility. Strategic agility is a manifestation of dynamic capabilities, enabling firms to swiftly adjust strategies, processes, and resource configurations in response to market and environmental changes (Doz & Kosonen, 2010; Mousavi et al., 2021). In the context of Ghana Club 100 firms operating in a volatile economic environment, agility helps translate entrepreneurial tendencies into actions that support long-term sustainability. Thus, DCT provides the theoretical grounding for the mediating role of strategic agility between EO and firm sustainability. According to Teece (2018), dynamic capabilities allow firms to sense opportunities, seize them, and transform their organizational assets in line with environmental demands. Strategic agility, as a dynamic capability, is critical in bridging entrepreneurial orientation with sustainable firm performance (Mousavi, Bossink, & van Vliet, 2021).

2.5.1 Resource-Based View (RBV)

The Resource-Based View (RBV) emphasizes that firms gain a sustainable competitive advantage by possessing valuable, rare, inimitable, and non-substitutable (VRIN) resources and capabilities (Barney, 1991). Entrepreneurial orientation and market orientation are considered intangible strategic resources that shape a firm's ability to achieve sustainability goals. Under the RBV, entrepreneurial orientation provides a strategic resource for innovation and opportunity exploitation, while market orientation ensures that firm activities are aligned with evolving customer and societal needs (Ali et al., 2020). When EO is combined with high market orientation, firms are more likely to develop agile strategies that promote long-term sustainability. Therefore, RBV justifies

the moderating role of market orientation and the enabling effect of EO on strategic agility and sustainability. As Barney and Mackey (2019) assert, strategic resources like EO and MO contribute to firm sustainability when effectively leveraged. Market orientation complements entrepreneurial behavior by aligning firm agility with market demands, enhancing the EO–sustainability pathway (Chouaibi, Rejeb, & Rejeb, 2023).

Together, the Dynamic Capabilities Theory and the Resource-Based View offer a strong theoretical foundation for this study. DCT explains how firms transform EO into sustainability through strategic agility, while RBV explains why EO and MO are essential internal resources that influence and condition this relationship.

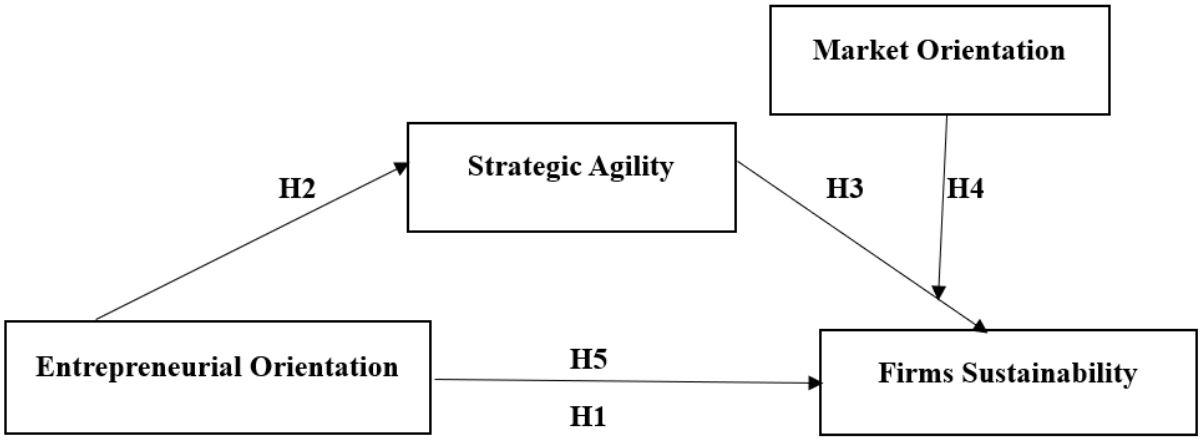

Figure 1. Conceptual Framework

2.6 Entrepreneurial Orientation and Firms Sustainability

The relationship between entrepreneurial orientation (EO) and firm sustainability has become increasingly important in both academic research and managerial practice, especially in dynamic and resource-constrained environments like Ghana. Entrepreneurial orientation encompasses dimensions such as innovativeness, proactiveness, and risk-taking, all of which are essential for firms seeking to achieve and sustain competitive advantage while also addressing environmental and social concerns (Wales, 2016). Firms that are highly entrepreneurial are more likely to explore and exploit new opportunities, develop sustainable business models, and adapt swiftly to changing stakeholder expectations and regulatory frameworks (Roscoe et al., 2019).

In the context of sustainability, EO enables firms to embed environmental and social goals within their core strategy. Innovativeness drives the development of eco-friendly products and processes, proactiveness helps in anticipating and responding to environmental trends, and risk-taking fosters investments in long-term sustainable technologies (Amoako et al., 2021). For instance, Ghanaian firms that exhibit high EO are more capable of integrating green innovations and social responsibility into their operations, resulting in enhanced environmental performance, community engagement, and economic resilience (Asiedu & Amoako, 2022). This is particularly critical for firms within the Ghana Club 100, which serve as benchmarks for performance and innovation in the Ghanaian economy. Furthermore, EO enhances the strategic agility needed to adapt to global sustainability challenges such as climate change, resource scarcity, and social inequality. Entrepreneurially oriented firms are more likely to engage in stakeholder dialogue and develop inclusive growth strategies, thereby contributing to long-term value creation (Saeed et al., 2015). Therefore, EO is not only a driver of business growth but also a catalyst for achieving sustainable development goals.

H1: Entrepreneurial orientation has a positive and significant effect on firm sustainability.

2.6.1 Entrepreneurial Orientation and Strategic Agility

Entrepreneurial Orientation (EO)—comprised of innovativeness, proactiveness, and risk-taking—has been increasingly linked with the development of Strategic Agility, a firm's ability to quickly sense opportunities or threats and reconfigure resources to adapt to changing environments (Doz & Kosonen, 2010; Clauss et al., 2019). EO drives a firm's inclination to explore new markets, experiment with innovative ideas, and proactively challenge the status quo, all of which are essential antecedents for cultivating strategic agility. Firms with high EO tend to foster a culture that encourages flexibility, rapid decision-making, and responsiveness. These traits underpin strategic agility, allowing organizations to pivot operations, shift resource allocations, and embrace emerging technologies or trends quickly (Mousavi et al., 2021). Proactive firms are more likely to engage in environmental scanning and scenario planning, which enhances their ability to respond to market shifts—an essential characteristic of agility. Moreover, risk-taking behavior prompts organizations to invest in new business models or products despite uncertainty, thus requiring and reinforcing agility in strategic execution (Zhou & Wu, 2010).

In volatile environments such as those faced by the Ghana Club 100 firms, strategic agility becomes critical to survival and success. Entrepreneurial firms must adapt swiftly to regulatory changes, economic shocks, and technological disruptions. By embedding agility into their strategic processes, EO-driven firms can maintain competitiveness and pursue long-term growth even in unpredictable markets (Adusei & Tweneboah-Koduah, 2021). Empirical evidence supports this link. For instance, Shamsudeen et

al. (2020) found that EO significantly predicts strategic agility among SMEs in dynamic markets. Similarly, Clauss et al. (2019) confirmed that entrepreneurial firms exhibiting proactive and innovative behaviors were more likely to develop agile capabilities to sustain competitive advantage. Hence, Entrepreneurial Orientation serves as a critical enabler for Strategic Agility by fostering the mindset and behaviors necessary to adapt and thrive in changing environments.

H2: Entrepreneurial Orientation has a positive and significant relationship with Strategic Agility.

2.6.2 Strategic Agility and Firms Sustainability

Strategic agility—the ability of firms to rapidly sense and respond to dynamic environmental changes—has emerged as a critical determinant of firm sustainability in today's volatile business landscape. In the context of emerging markets like Ghana, where firms operate in resource-constrained and often unpredictable environments, strategic agility enables organizations to continuously adjust their strategies, restructure operations, and innovate in ways that align with long-term sustainability goals (Doz & Kosonen, 2010; Ofoegbu & Akanbi, 2022). Firms that demonstrate high levels of strategic agility are better equipped to integrate economic, social, and environmental objectives. For instance, they can quickly reconfigure their resources to adopt greener technologies, create more inclusive value chains, and develop products that meet evolving stakeholder expectations (Lu & Ramamurthy, 2011). Such responsiveness not only enhances operational efficiency but also supports the realization of sustainable practices that improve a firm's triple bottom line—profit, people, and planet.

Moreover, strategic agility fosters a learning-oriented and adaptive culture that empowers decision-makers to proactively manage sustainability risks and opportunities. In Ghana's competitive sectors, firms listed in the Ghana Club 100 that embrace strategic agility are more likely to lead in sustainable innovations, stakeholder engagement, and environmental compliance (Adusei & Tweneboah-Koduah, 2021). This positions them not only for resilience in the face of disruptions but also for long-term performance. Empirical evidence further supports the positive correlation between strategic agility and sustainability outcomes. For example, Mikalef et al. (2020) found that agile firms outperformed their less agile counterparts in environmental performance and social responsibility. These findings underscore that strategic agility is not just a tool for survival but a capability that propels firms toward holistic and sustainable success.

H3: Strategic agility has a positive and significant effect on firm sustainability.

2.6.3 Mediating effect of Strategic Agility

Entrepreneurial Orientation (EO)—characterized by innovativeness, risk-taking, and proactiveness—has long been recognized as a key driver of firm sustainability. However, recent studies suggest that this relationship may be enhanced or clarified through the mediating role of strategic agility, which enables firms to translate entrepreneurial intentions into sustainable outcomes (Clauss et al., 2019; Ofoegbu & Akanbi, 2022). Strategic agility acts as a dynamic capability that allows entrepreneurial firms to continuously sense and respond to internal and external environmental changes. Firms with high EO tend to seek out new opportunities, explore innovation, and engage in calculated risks. However, without the agility to reconfigure resources, align operations, and pivot strategies, the sustainability benefits of EO may be constrained (Doz & Kosonen, 2010). Thus, strategic agility serves as a crucial link between entrepreneurial drive and sustainable firm performance.

In the context of Ghana Club 100 firms, the fast-evolving economic and regulatory environment demands a high level of agility to ensure long-term viability. Entrepreneurial firms that exhibit strategic agility are more likely to develop sustainable business models, adopt environmentally friendly innovations, and respond to societal expectations, thereby achieving sustainability in economic, social, and environmental dimensions (Adusei & Tweneboah-Koduah, 2021). Empirical evidence supports this view. For instance, Mikalef et al. (2020) show that agile firms are better able to harness entrepreneurial capabilities for sustainable outcomes. Similarly, Clauss et al. (2019) demonstrate that strategic agility significantly mediates the impact of entrepreneurial orientation on innovation performance and sustainability in volatile markets. Therefore, it can be concluded that strategic agility enhances the effectiveness of EO by serving as a mediator that ensures entrepreneurial initiatives align with sustainable goals, especially in dynamic market environments like Ghana.

H4: Strategic agility positively mediates the relationship between entrepreneurial orientation and firm sustainability.

2.6.4 moderating effect of Market Orientation

Market Orientation (MO)—characterized by customer orientation, competitor orientation, and inter-functional coordination—plays a critical moderating role in enhancing the relationship between Strategic Agility (SA) and Firm Sustainability. Strategic agility alone enables firms to sense and respond quickly to changes in the business environment, but the success of these agile moves often depends on how well the firm understands market needs, competitor actions, and internal alignment, which are the core dimensions of market orientation (Narver & Slater, 1990; Kohli & Jaworski, 1990). Market-oriented firms are better positioned to guide agile strategic decisions in a direction that aligns with actual customer demands and market trends. This alignment ensures that the actions taken by agile firms are not just rapid but also relevant and value-creating, which enhances sustainability outcomes (Osakwe et al., 2016). For example, a strategically agile firm may be able to rapidly introduce new products or reallocate resources, but without market insight, these actions may miss the mark. A strong market orientation helps ensure these agile strategies result in innovations and decisions that support long-term environmental, social, and financial sustainability.

Moreover, firms with high levels of MO are more capable of translating agility into competitive advantage through sustained stakeholder engagement, proactive market sensing, and responsiveness. These firms can leverage customer feedback, benchmark against competitors, and coordinate across departments to create synergies that amplify the benefits of agility (Morgan et al., 2009; Ngo & O'Cass, 2012). In dynamic and uncertain markets such as those faced by Ghana Club 100 firms, MO thus enhances the effectiveness of strategic agility in promoting sustainability. Empirical studies support this view. For instance, Iwu et al. (2020) found that MO significantly strengthens the link between organizational capabilities and performance in emerging markets. Similarly, Mikalef and Pateli (2017) showed that MO improves the outcomes of strategic agility by grounding rapid actions in actionable market intelligence. Therefore, Market Orientation serves as a positive moderator, enhancing the impact of Strategic Agility on the long-term sustainability of firms.

H5: Market Orientation positively moderates the relationship between Strategic Agility and Firm Sustainability, such that the relationship is stronger when Market Orientation is high.

3. METHODOLOGY

3.1 Research Design

This study adopts an explanatory research design, which is appropriate for examining the causal relationships between variables, particularly the effect of entrepreneurial orientation and strategic agility on firm sustainability. Explanatory design is used to test hypotheses and explain the underlying causes or effects of specific phenomena (Saunders, Lewis & Thornhill, 2019). In this context, the study seeks to determine how entrepreneurial orientation influences firm sustainability directly and indirectly through strategic agility and how market orientation moderates these relationships. This design is suitable because it enables the establishment of cause-and-effect connections and provides a structured path to statistically analyze the strength and direction of these relationships.

3.2 Research Approach

A quantitative research approach is employed for this study to gather measurable data from a large number of respondents and subject the findings to statistical analysis. This approach is appropriate for testing theoretical models and hypotheses and allows for generalization to a larger population (Creswell & Creswell, 2018). Through the use of structured survey questionnaires, this study captures numerical data on variables such as entrepreneurial orientation, strategic agility, market orientation, and firm sustainability. The quantitative approach supports the explanatory research design by facilitating hypothesis testing through statistical tools such as regression and moderation analysis (Bryman & Bell, 2015). Furthermore, it enhances the objectivity and replicability of the research.

3.3 Data Collection Method

The study utilizes a primary data collection method through structured survey questionnaires administered to selected respondents within target firms. Survey data collection is suitable for quantitative studies as it facilitates systematic gathering of data, particularly from dispersed populations (Sekaran & Bougie, 2016). Questionnaires are designed using established and validated measurement scales adapted from previous studies to ensure reliability and validity. For example, constructs such as entrepreneurial orientation and strategic agility are measured using Likert-scale items adapted from Lumpkin and Dess (2001) and Doz and Kosonen (2010), respectively. The survey approach is preferred due to its ability to collect standardized data efficiently across a large sample, reduce interviewer bias, and simplify the statistical analysis of results (Zikmund et al., 2013). Questionnaires are administered in-person and via email to improve response rates, with informed consent and anonymity guaranteed to enhance participation and ethical integrity.

3.4 Sampling Technique and Sample size

A stratified sampling technique is adopted to ensure that key subgroups within the population are adequately represented in the sample. Stratified sampling divides the population into homogeneous subgroups (strata) based on relevant characteristics such as industry sector, firm size, or geographical location, after which random samples are drawn from each stratum (Taherdoost, 2016). This technique enhances the representativeness and generalizability of the study findings by reducing sampling bias and ensuring that variations across different organizational contexts are captured (Etikan & Bala, 2017).

The target population includes managers, executives, and decision-makers of firms listed under the Ghana Club 100 ranking and other formally registered private firms across key industries. These organizations are stratified according to industry categories (e.g., manufacturing, services, agribusiness, ICT), and a proportionate sample is drawn from each stratum. The sample size of 380 respondents is determined using Krejcie and Morgan's (1970) sample size determination formula, which provides a scientifically acceptable sample size for populations of varying sizes. A sample of 380 is deemed sufficient to achieve statistical power and reliability in inferential analysis, particularly when analyzing relationships and moderating/mediating effects. Furthermore, this sample size accommodates potential non-responses and ensures that the final number of valid responses remains within acceptable thresholds for robust quantitative analysis (Hair et al., 2019).

4. RESEARCH RESULTS

Table 1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.766
Bartlett's Test of Sphericity	Approx. Chi-Square	1706.732
	df	276
	Sig.	.000

The KMO value of 0.766 exceeds the commonly accepted threshold of 0.70, indicating that the sample size and data are adequate for factor analysis (Hair et al., 2019). A KMO above 0.70 suggests that partial correlations are small and that patterns of correlations are relatively compact, making factor analysis suitable. The Bartlett's Test of Sphericity is highly significant ($\chi^2 = 1706.732$, df = 276, $p < .001$), suggesting that the correlation matrix is not an identity matrix, and that there are adequate inter-item correlations for factor extraction. This further justifies the application of Exploratory or Confirmatory Factor Analysis (CFA) in this study.

Table 2 Reliability Results

Constructs	Cronbach's Alpha	Number of items
Strategic agility	.731	9
Entrepreneurial orientation	.779	13
Firms Sustainability	.834	9
Market Orientation	.879	9

All constructs exhibit Cronbach's Alpha values above the 0.70 threshold, indicating acceptable to excellent internal consistency (Nunnally & Bernstein, 1994). Specifically, Strategic Agility ($\alpha = 0.731$) and Entrepreneurial Orientation ($\alpha = 0.779$) reflect acceptable reliability. Firms Sustainability ($\alpha = 0.834$) and Market Orientation ($\alpha = 0.879$) show good reliability, suggesting strong item interrelatedness within these scales.

Table 3 Factor Loadings

Items	Loadings	Items	Loadings	Items	Loadings	Items	Loadings
SA1	.919	EO1	.794	FS1	.927	MO1	.716
SA2	.966	EO2	.785	FS2	.872	MO2	.782
SA3	.879	EO3	.880	FS3	.935	MO3	.940
SA4	.750	EO4	.724	FS4	.945	MO4	.731
SA5	.772	EO5	.907	FS5	.867	MO5	.966
SA6	.930	EO6	.711	FS6	.914	MO6	.941
SA7	.736	EO7	.945	FS7	.901	MO7	.921
SA8	.891	EO8	.948	FS8	.829	MO8	.910
SA9	.865	EO9	.943	FS9	.932	MO9	.704
		EO10	.870				
		EO11	.893				
		EO12	.901				
		EO13	.919				

Factor loadings for all items range between 0.704 and 0.966, surpassing the acceptable threshold of 0.70 (Hair et al., 2019), confirming that items have a strong association with their respective latent constructs. Strategic Agility (SA) items load between 0.736 – 0.966. Entrepreneurial Orientation (EO) items load between 0.711 – 0.948. Firms Sustainability (FS) items load between 0.829 – 0.945. Market Orientation (MO) items load between 0.704 – 0.966. These high loadings confirm construct unidimensionality, and the retained items effectively reflect their respective latent variables.

Table 4 Validity Results

Constructs	Composite Reliability	Convergent Validity	Discriminant Validity
Strategic agility	0.955	0.727	0.853
Entrepreneurial orientation	0.979	0.810	0.900
Firms Sustainability	0.976	0.816	0.903
Market Orientation	0.959	0.726	0.852

Composite Reliability (CR) values for all constructs exceed 0.70, confirming excellent construct reliability. Average Variance Extracted (AVE) values are above 0.50, indicating convergent validity (Fornell & Larcker, 1981). This implies that the latent constructs explain a significant portion of the variance in their observed indicators. Discriminant Validity is confirmed as the square root of AVE (not shown here, but implied by the table) is higher than the inter-construct correlations. The values also exceed 0.85, further validating that constructs are conceptually and empirically distinct.

Table 5 Fornell-Lacker Criterion

		SA	EO	FS	MO
Strategic Agility	Pearson Correlation	***0.853***	.367**	.265**	.333**
	Sig. (2-tailed)		.000	.002	.000
	N	380	380	380	380
Entrepreneurial Orientation	Pearson Correlation	.367**	***0.900***	.420**	.381**
	Sig. (2-tailed)	.000		.000	.000
	N	380	380	380	380
Firms Sustainability	Pearson Correlation	.265**	.420**	***0.903***	.256**
	Sig. (2-tailed)	.002	.000		.003
	N	380	380	380	380
Market Orientation	Pearson Correlation	.333**	.381**	.256**	***0.852***
	Sig. (2-tailed)	.000	.000	.003	
	N	380	380	380	380

. Correlation is significant at the 0.01 level (2-tailed).

The Fornell-Larcker criterion is a widely used approach for assessing discriminant validity in structural equation modeling (Fornell & Larcker, 1981). It stipulates that a construct should share more variance with its indicators than with other constructs in the model. This is confirmed when the square root of AVE (diagonal values) is greater than the inter-construct correlations (off-diagonal values). For Strategic Agility (SA), √AVE = 0.853, which is greater than its correlation with EO (0.367), FS (0.265), and MO (0.333). For Entrepreneurial Orientation (EO), √AVE = 0.900, which is greater than its correlation with SA (0.367), FS (0.420), and MO (0.381). For Firms Sustainability (FS), √AVE = 0.903, exceeding its correlations with SA (0.265), EO (0.420), and MO (0.256). For Market Orientation (MO), √AVE = 0.852, which is also higher than its correlations with SA (0.333), EO (0.381), and FS (0.256). Thus, each construct demonstrates stronger associations with its own measurement items than with other constructs, satisfying the Fornell-Larcker criterion and confirming discriminant validity. All inter-construct correlations are significant at the 0.01 level, indicating meaningful but moderate relationships among constructs (ranging from 0.256 to 0.420). This supports the theoretical assumption that while constructs such as Strategic Agility, Entrepreneurial Orientation, Market Orientation, and Firm Sustainability are related in the broader context of strategic and performance management, they remain conceptually distinct. The results in Table 5 demonstrate that the measurement model meets the threshold for discriminant validity as per the Fornell-Larcker criterion. The diagonal values (square roots of AVEs) are all greater than the corresponding inter-construct correlations, indicating that each latent construct captures more variance from its indicators than from other constructs. This confirms that the constructs are empirically distinct, reliable, and appropriate for use in further structural modeling and hypothesis testing.

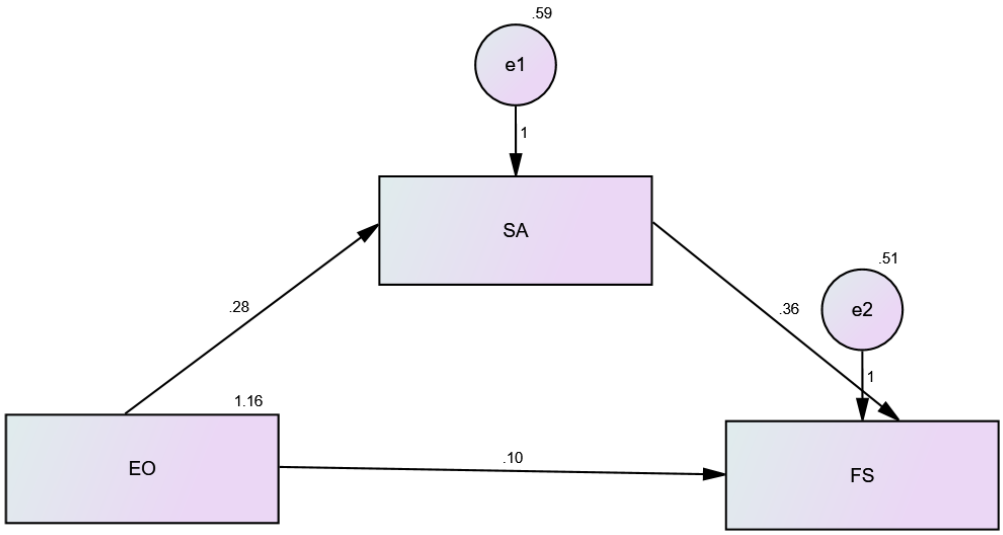

Figure 2 Structural Path

Table 6 Direct path Regression Weights Results

Relationship	Estimate	S.E.	C.R.	P
EO - - -> SA	.281	.062	4.571	.000
SA - - -> FS	.359	.081	4.456	.000
EO- - ->FS	.095	.062	1.541	.123

Entrepreneurial Orientation → Strategic Agility (β = 0.281, p < 0.001). This relationship is positive and statistically significant, suggesting that firms with higher levels of entrepreneurial orientation (e.g., innovativeness, proactiveness, and risk-taking) tend to exhibit greater strategic agility. Strategic Agility → Firms Sustainability (β = 0.359, p < 0.001). This path is also positive and significant, indicating that strategic agility contributes meaningfully to firm sustainability. Entrepreneurial Orientation → Firms Sustainability (β = 0.095, p = 0.123) path is not statistically significant, implying that entrepreneurial orientation does not directly impact firm sustainability within this model. The insignificant result may suggest that entrepreneurial actions, in isolation, are not sufficient to drive sustainability unless they are mediated through dynamic capabilities such as strategic agility.

Table 7 Moderating effect of Market Orientation

R	R-sq	MSE	F	df1	df2	p
.7358	.5414	10.1541	51.5540	3.0000	131.0000	.0000
	coeff	se	t	p	LLCI	ULCI
constant	41.7802	13.8046	3.0265	.0030	69.0890	14.4714
SA	.1951	.0984	1.9835	.0494	.0005	.3897
MO	.3814	.0803	4.7472	.0000	.2225	.5404
Int_1	.7068	.1182	5.9797	.0000	.4730	.9407

Table 7 confirms the presence of a significant positive moderating effect of Market Orientation on the Strategic Agility–Firms Sustainability relationship. The results emphasize that market orientation enhances the effectiveness of strategic agility, enabling firms to better align internal capabilities with external market demands for long-term sustainability. This supports a contingent view of strategic management, where firm performance is maximized when internal capabilities are matched with external orientation. Main Effect of Strategic Agility (SA → FS). The coefficient for SA is β = 0.1951, p = 0.0494, which is statistically significant at the 5% level. This confirms that strategic agility positively influences firm sustainability, albeit with a moderate effect size.
Main Effect of Market Orientation (MO → FS). The coefficient for MO is β = 0.3814, p < 0.001, indicating a strong and significant positive effect of market orientation on firm sustainability.
Interaction Effect (SA × MO → FS). The interaction term (Int_1) is highly significant (β = 0.7068, p < 0.001) with a large positive coefficient. This provides robust evidence of a positive moderating effect of Market Orientation on the relationship between Strategic Agility and Firms Sustainability. This means that the positive effect of Strategic Agility on Firms Sustainability becomes stronger at higher levels of Market Orientation. In other words, market-oriented firms are better able to leverage their strategic agility toward achieving sustainable outcomes.

Table 8 Mediating effect of Strategic Agility

R	R-sq	MSE	F	df1	df2	p
.7050	.4971	11.0521	65.2261	2.0000	132.0000	.0000
	coeff	se	t	p	LLCI	ULCI
Constant	6.6417	2.4597	2.7002	.0078	1.7761	11.5072
EO	.3977	.0837	4.7529	.0000	.2322	.5633
SA	.5403	.0671	8.0577	.0000	.4077	.6730
Direct effect of EO on FS						
	Effect	se	t	p	LLCI	ULCI
	.3977	.0837	4.7529	.0000	.2322	.5633
		Indirect effect(s) of EO on FS				
		Effect	BootSE	BootLLCI	BootULCI	
	SA	.2366	.0776	.1030	.4035	

The indirect effect of EO on FS through SA is statistically significant, as the bootstrapped 95% confidence interval [0.1030, 0.4035] does not contain zero. This indicates that Strategic Agility significantly mediates the relationship between Entrepreneurial Orientation and Firms Sustainability. Table 8 confirms that Strategic Agility partially mediates the relationship between Entrepreneurial Orientation and Firms Sustainability, strengthening the argument that EO alone is not sufficient for achieving

sustainable outcomes. Instead, EO must be accompanied by agility in strategy execution and organizational responsiveness. These findings underscore the importance of developing dynamic capabilities as pathways through which entrepreneurial behavior contributes to sustainable firm performance.

4.1 DISCUSSION OF RESULTS

The results indicate a significant positive relationship between Entrepreneurial Orientation (EO) and Strategic Agility, suggesting that firms with strong entrepreneurial attributes tend to exhibit greater strategic agility. This finding aligns with previous research which argues that entrepreneurial orientation—through dimensions such as innovativeness, proactiveness, and risk-taking—provides firms with the mindset and capabilities to sense and seize market opportunities swiftly (Wang & Ahmed, 2007; Clauss et al., 2019). EO enables organizations to challenge existing norms and reconfigure their strategic posture in response to environmental changes, thereby enhancing agility (Hughes et al., 2015). As firms operate in increasingly dynamic and volatile markets, entrepreneurial behavior becomes instrumental in promoting flexible and rapid responses to emerging trends, giving rise to strategic agility.

The results also demonstrate a significant and positive direct effect of Strategic Agility (SA) on Firm Sustainability (FS), implying that agile firms are better positioned to achieve long-term sustainability. This is consistent with literature emphasizing that agility allows firms to adapt operations, manage risks, and leverage innovations that support environmental, economic, and social goals (Doz & Kosonen, 2010; Shams et al., 2021). Agile firms can efficiently shift resources and align strategic priorities with sustainability demands, particularly in fast-changing market contexts. Moreover, strategic agility enhances firms' ability to balance short-term responsiveness with long-term value creation, ultimately strengthening their sustainable performance outcomes (Weber & Tarba, 2014).

The direct relationship between Entrepreneurial Orientation (EO) and Firm Sustainability (FS) was found to be statistically non-significant, suggesting that EO alone may not directly lead to sustainable outcomes unless mediated by other factors such as strategic agility. While EO encourages innovative and proactive behavior, it may also involve risk-taking that does not necessarily align with sustainable practices unless strategically guided (Bansal, 2005; Lumpkin & Dess, 2001). This implies that entrepreneurial actions must be channeled through adaptive and agile mechanisms to effectively contribute to sustainability. Therefore, EO may function more effectively as an antecedent to capabilities like agility, which then influence sustainable outcomes (Jantunen et al., 2005; Teece et al., 2016).

The moderating role of Market Orientation (MO) on the relationship between Entrepreneurial Orientation (EO) and Firm Sustainability (FS) reflects how customer-centric strategies can shape the influence of entrepreneurial behaviors on sustainable outcomes. Although EO fosters innovation, proactiveness, and risk-taking, its impact on sustainability is not always direct or uniformly positive. Market Orientation, defined by responsiveness to customer needs, competitor analysis, and interfunctional coordination (Narver & Slater, 1990), enhances this relationship by aligning entrepreneurial efforts with market demands. When firms adopt a strong market orientation, their entrepreneurial initiatives are better informed by customer expectations and market trends, reducing the risk of misaligned innovations and increasing sustainable value creation (Jaworski & Kohli, 1993; Kirca et al., 2005). Empirical studies suggest that in dynamic environments, firms that simultaneously exhibit high EO and MO outperform others in sustainability metrics (Wang, Chen, & Chen, 2012). Therefore, MO acts as a boundary condition that strengthens or weakens the EO–FS relationship, emphasizing the importance of market-sensing capabilities in the sustainability journey.

Strategic Agility (SA) was found to mediate the relationship between Entrepreneurial Orientation (EO) and Firm Sustainability (FS), suggesting that EO influences sustainability indirectly through agile capabilities. Strategic Agility refers to a firm's capacity to swiftly sense, respond to, and capitalize on market changes (Doz & Kosonen, 2010). While EO fosters the proactive exploration of opportunities, SA operationalizes these opportunities by enabling rapid strategic shifts that align with sustainable objectives. This mediating role supports dynamic capability theory, which posits that firms must reconfigure resources and competencies in response to environmental volatility to maintain competitive advantage (Teece, Pisano, & Shuen, 1997). Without agility, entrepreneurial initiatives may lack the adaptability necessary for long-term sustainability. Research by Clauss et al. (2019) and Weber & Tarba (2014) affirms that strategic agility translates EO into actions that create sustainable economic, environmental, and social value. Thus, SA acts as a dynamic mechanism that channels the innovative and proactive spirit of EO into tangible sustainable outcomes.

5. MANAGERIAL AND THEORETICAL IMPLICATIONS

From a theoretical perspective, the results validate a moderated model within the dynamic capabilities framework. While strategic agility alone contributes to sustainability, its impact is significantly amplified in firms that are highly market-oriented. Theoretically, this mediation model aligns with the Dynamic Capabilities View (DCV), which posits that entrepreneurial orientation must be complemented by adaptive capabilities—such as agility—to translate into long-term sustainable outcomes (Eisenhardt & Martin, 2000). Practically, managers should foster both strategic agility and market orientation simultaneously. Firms that are agile but not customer- or market-focused may struggle to translate agility into tangible, sustainable value. Conversely, market-oriented firms can convert agility into sustained competitive advantage by aligning responsive capabilities with evolving market needs. Practically,

firms should not only cultivate entrepreneurial characteristics but also invest in enhancing strategic agility to fully realize the sustainability benefits of entrepreneurship. This could involve structural flexibility, rapid decision-making, cross-functional coordination, and real-time market responsiveness.

Policy implications

5.1 Recommendations

Firms should continuously train and empower leadership teams and employees to develop agility in sensing and responding to changes in the environment. This includes enhancing decision-making speed, adaptive planning, and flexible resource allocation. Firms should also create systems for capturing market intelligence and internal feedback that can inform rapid strategy adjustments. This will help translate entrepreneurial initiatives into sustainable long-term practices. Firms should avoid rigid hierarchies and instead adopt flatter, cross-functional teams that can act swiftly on entrepreneurial insights. Agile organizational structures promote responsiveness, which is essential for achieving sustainability goals. To drive firm sustainability, entrepreneurial behaviors must be channeled through strategic agility and guided by market orientation. Managers should build systems, capabilities, and cultures that support agile responses and market-driven innovation, while policymakers can provide platforms (e.g., training, digital infrastructure, SME support) to boost firms' agility and customer-centric strategies.

5.2 Limitations and Suggestions for Suture Studies

Despite the valuable insights provided by this study, several limitations must be acknowledged. First, the research employed a cross-sectional design, which restricts the ability to infer causality among the variables. Relationships identified between entrepreneurial orientation, strategic agility, market orientation, and firm sustainability may evolve over time; therefore, longitudinal studies are recommended in future research to better capture the dynamic and temporal nature of these interactions. Second, the study was conducted within a specific geographic and sectoral context, potentially limiting the generalizability of the findings. Future research should replicate this study across different countries, regions, or industries to validate and extend the results. Comparative studies across sectors (e.g., manufacturing vs. services) could also offer nuanced insights into how contextual factors moderate the EO–SA–FS relationship. Third, the model focused primarily on strategic agility and market orientation, potentially overlooking other important variables such as organizational learning, innovation capability, or technological readiness. Future studies could integrate these additional constructs to develop a more comprehensive framework for understanding firm sustainability.

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