THE IMPACT OF STRATEGIC INNOVATION ON THE COMPETITIVE ADVANTAGE OF THE COFFEE INDUSTRY: THE MEDIATING ROLE OF ENTREPRENEURIAL AGILITY AND THE MODERATING EFFECT OF MARKET TURBULENCE

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Abstract: In an increasingly volatile and competitive global environment, strategic innovation has become a key driver for enterprises to achieve sustainable competitive advantage, especially in fast-moving consumer goods sectors such as the coffee industry. This study aims to explore the impact of strategic innovation on corporate competitive advantage, and further introduce the mediating role of entrepreneurial agility and the moderating effect of market turbulence to construct an integrated theoretical model. Based on the resource-based view (RBV), dynamic capability theory (DCT), and contingency theory, this study systematically analyzes how internal capabilities interact with the external environment to jointly influence organizational performance. This study collected data from 389 practitioners in different business segments of the coffee industry through a structured questionnaire. A seven-point Likert scale was used to ensure the reliability and validity of the measurements. Empirical analysis was conducted using regression models, mediation and moderation effect tests (based on PROCESS Model 4 and Model 1), and one-way analysis of variance (ANOVA) to verify the relationships among variables. The results show that strategic innovation has a significant positive impact on competitive advantage, and that this impact is partially mediated by entrepreneurial agility. In addition, market turbulence has a significant positive moderating effect on the relationship between strategic innovation and competitive advantage, i.e., in a situation of high external environmental uncertainty, the performance improvement brought about by strategic innovation is more obvious. The above findings fully support the hypotheses proposed in this study and validate the comprehensive model constructed. Theoretically, this study expands the integrated research framework of strategic innovation and dynamic capabilities. In practice, it provides operational strategic recommendations for the coffee industry and similar fast-moving consumer goods companies, namely,

that they should build agile organizational structures and fully consider external market changes in their strategy formulation. Future research can further verify and expand this model in different industries, cultural contexts, and time dimensions.

Keywords: Strategic Innovation, Competitive Advantage, Entrepreneurial Agility, Market Turbulence

Introduction

The global coffee industry has evolved into one of the most valuable agricultural commodity markets, exerting significant social, economic, and environmental impacts. Coffee is produced in over 70 countries, with massive global consumption, serving as a vital livelihood for approximately 125 million people (Voora, Bermudez, Larrea, & Baliño, 2019). The industry is characterized by a complex supply chain spanning various stages from smallholder farmers to multinational corporations. Despite historical reliance on price-sensitive agricultural commodity exchanges, modern developments such as brand building, certification systems, and sustainability initiatives are reshaping the industry's competitive landscape (Grabs, 2017). In recent years, climate change, price volatility, and geopolitical instability have exacerbated the vulnerability of coffee-producing regions, particularly in Latin America and Africa (Pham, Reardon-Smith, Mushtaq & Cockfield, 2019). These challenges have further intensified shifts in consumer preferences in developed markets, who now demand higher traceability, ethical sourcing, and specialty products. According to data from the International Trade Centre (Bozzola et al., 2021), global coffee consumption is projected to grow significantly, particularly in emerging economies such as China and South Korea, where traditional tea-drinking cultures are gradually giving way to Westernized consumption patterns. Despite overall market growth, the coffee industry is increasingly polarized between high-value specialty markets and low-margin commodity production. This segmentation has important implications for global trade competitiveness, sustainability strategies, and innovation needs across the value chain (Torok, Mizik & Jambor, 2018). Innovation is a key driver of competitiveness in fast-moving consumer goods, especially in saturated and low-differentiated segments such as coffee. In the coffee industry, innovation extends beyond product formulations to include process innovations, packaging, brand building, and customer engagement strategies (Reardon et al., 2020). Anticipating consumer trends and swiftly launching new products often serves as a dividing line between market leaders and laggards. In the coffee sector, innovation takes various forms, such as ready-to-drink cold-brewed coffee, sustainable capsules, blockchain-based supply chain traceability technology, and digital loyalty programs. These innovations reflect a profound transformation in how value is created and captured in the consumer goods industry (Vegro & de Almeida, 2020). For example, global brands like Nestlé and Starbucks invest heavily in R&D, not only to create new flavors but also to develop sustainable procurement models aligned with global climate goals and corporate social responsibility. Scholars argue that innovation in the fast-

moving consumer goods sector is becoming increasingly strategic rather than reactive, requiring companies to develop market sensing, adaptive learning, and agile execution capabilities (Teece, Peteraf, and Leih, 2016). Innovation is therefore both a response to consumer demand and a proactive strategy to prevent disruption and differentiate products in highly competitive markets. Emerging markets present a unique set of challenges and opportunities for strategic innovation. Unlike developed economies, where innovation is often technology-driven and incremental, emerging markets require frugal, flexible, and adaptive forms of innovation. These environments are often accompanied by institutional deficiencies, market volatility, and diverse consumer demands, requiring companies to innovate not only at the product level, but also in terms of business models, distribution channels, and stakeholder collaboration (Prahalad, 2012). Take the coffee industry as an example. Emerging markets such as Ethiopia, Vietnam, and Brazil are not only major producers, but are also developing into consumption centers, with growing demand for high-end products among the middle class. Strategic innovation in these regions focuses on upgrading the value chain, integrating sustainable development, and strengthening the digital transformation of agriculture and logistics (Massrie, 2025). Startups in these environments leverage innovation to compensate for infrastructure deficiencies, navigate regulatory complexities, and gain competitive advantage by aligning with local consumer behavior and resource constraints. Research emphasizes that companies operating in emerging markets must strategically integrate innovation into their core business to weather turbulence and realize growth potential (Hossain, 2020). Strategic innovation thus becomes a survival mechanism and growth driver, particularly in industries such as coffee, where globalization and localization pressures coexist.

This study contributes to the theoretical discussion of strategic management, innovation research, and organizational behavior, particularly by bridging the gap in understanding how innovation strategies generate competitive outcomes in emerging and turbulent market environments such as the coffee industry. The fundamental contribution of this study lies in the conceptual integration of strategic innovation, entrepreneurial agility, and competitive advantage within a moderate mediating framework. The integrated model is based on the resource-based view (RBV) and dynamic capability theory, which have been widely used to explain performance differences among firms based on their internal resources and adaptability (TEECE, 2014).

Although previous studies have demonstrated that strategic innovation has a positive impact on organizational performance (HUGHES, MARTIN, MORGAN, & ROBSON, 2021), the specific mechanism of this impact remains to be explored, especially in rapidly changing industries. This study fills this gap by empirically testing entrepreneurial agility as a mediating variable. Entrepreneurial agility is conceptualized not only as a behavioral characteristic but also as a dynamic capability—the ability of firms to reconfigure internal capabilities and respond quickly to external opportunities and threats (DASPIT, SIRMON, & MCKEE, 2021). Therefore, by clarifying and validating the mediating role of agility, this study deepens our understanding of how firms transform strategic innovation into

sustainable competitive advantage.

In addition, this study adds theoretical value by introducing market turbulence as a moderating variable that influences the relationship between strategic innovation and competitive advantage. This reflects a growing recognition in academia that organizational strategy does not operate in a vacuum but is significantly influenced by contextual variables such as technological volatility, regulatory changes, and consumer behavior fluctuations (KRAUS, REHMAN, and GARCÍA, 2020). By empirically testing this moderating effect, the study responds to the academic call for more contextualized theories and provides a more nuanced explanation of when and where innovation efforts are most effective.

Another theoretical contribution of this study stems from its industry-specific context. Most of the existing literature on innovation is based on data from high-tech or manufacturing industries in developed countries. In contrast, the coffee industry is a unique hybrid of agriculture and fast-moving consumer goods, with a global value chain that includes millions of smallholder farmers, processors, and global brands. Applying strategic management theory to this context not only enhances the universality of existing models but also introduces new empirical considerations that provide a reference for future theoretical developments.

Finally, this study deepens academic understanding of the interaction between emerging market dynamics (often manifested as institutional deficiencies, resource constraints, and high volatility) and firm-level capabilities in shaping competitive outcomes. This is particularly critical given the growing importance of developing countries in global value creation and innovation diffusion (HOSSAIN, 2020). The findings may prompt future scholars to explore similar dynamics in other commodity or culture-embedded industries, thereby expanding the scope of innovation and agility research.

The practical implications of this study encompass a wide range of stakeholders in the coffee value chain, including entrepreneurs, business managers, policymakers, and development agencies. The coffee industry is undergoing a paradigm shift driven by digital disruption, sustainability concerns, and consumer preferences for ethical sourcing and differentiated products (PHAM, REARDON-SMITH, MUSHTAQ & COCKFIELD, 2019). In such a turbulent environment, traditional business models based on cost leadership and commodity trade are no longer sufficient to ensure long-term success.

For business managers, especially those operating in highly competitive urban markets or overseeing large-scale processing and retail operations, this study provides evidence-based insights on how to translate strategic innovation into action to gain competitive advantage. This includes innovation in product formulation, digital platforms, supply chain transparency, and customer engagement.

However, the findings go further to suggest that innovation alone is not enough without organizational mechanisms that enable rapid adaptation and execution, i.e., entrepreneurial agility. Executives can therefore leverage the findings to invest in internal systems and cultural practices that promote responsiveness, flexibility, and continuous learning. Smallholder farmers, cooperatives, and

emerging entrepreneurs in producing regions will also benefit from the findings.

These actors, who often operate with severely limited resources, can use entrepreneurial agility as a strategic equalizer to compete with large companies through speed, adaptability, and localized innovation. By identifying agility as a key moderating factor, the study enables these companies to focus on building adaptive capabilities, such as real-time market intelligence, lean experimentation, and partnerships, as a path to competitiveness even without large capital investments.

Additionally, policymakers and development organizations responsible for supporting rural development, sustainability, and economic growth in coffee-producing countries can use these insights to design policies that strengthen local innovation systems and enhance value chain organizational agility. Existing development programs often focus on increasing production or market access but may overlook the organizational capabilities businesses need to respond to rapid market changes. The results of this study can inform the design of capacity-building initiatives, public-private partnerships, and innovation incubators that prioritize strategic agility and ecosystem responsiveness (MASSRIE, 2025).

Furthermore, given the current climate challenges and geopolitical turmoil, enhancing the resilience and competitiveness of the coffee industry has broader implications for food security, environmental sustainability, and rural employment. The framework of this study provides a valuable diagnostic tool for identifying the types of innovation strategies most likely to succeed under different market conditions, thereby enabling more precise and context-specific policy interventions.

In summary, this study not only advances academic knowledge but also provides concrete and actionable recommendations for enhancing the innovation-driven competitiveness of the coffee industry, one of the world's most important and vulnerable agricultural sectors.

Research Objectives

1. Examine the direct impact of strategic innovation on competitive advantage
2. Assess the impact of strategic innovation on entrepreneurial agility
3. Assess the mediating role of entrepreneurial agility between strategic innovation and competitive advantage
4. Analyze the moderating role of market turbulence in the relationship between strategic innovation and competitive advantage
5. Provide practical recommendations for the coffee industry

Literature Review

The resource-based view (RBV) argues that companies gain competitive advantage by acquiring and effectively deploying valuable, rare, imitable, and non-substitutable (VRIN) resources (Barney, 1991). These resources include tangible assets, intangible capabilities, knowledge systems, and organizational processes within the company. According to the RBV, what distinguishes successful

firms from their competitors is not merely market positioning but the internal heterogeneity of their resource endowments.

In the context of strategic innovation, RBV believes that innovation itself can be regarded as a unique resource of an enterprise, especially when innovation is deeply integrated with corporate culture, daily operations, and decision-making logic (Wernerfelt, 1984). Strategic innovation refers to the proactive reconfiguration of strategies to create new value propositions. When it enables an enterprise to produce differentiated products or operate more efficiently than its competitors, it becomes a VRIN resource. Importantly, RBV emphasizes the path-dependent nature of resource development, meaning that firms must invest time and effort to cultivate innovative capabilities that are difficult to replicate.

However, one of the main criticisms of RBV is its static nature. It tends to focus on resource ownership rather than resource renewal, making it less applicable in industries characterized by frequent change. This limitation necessitates the introduction of more dynamic perspectives, such as dynamic capability theory.

Dynamic capability theory builds upon the RBV by emphasizing a firm's ability to integrate, construct, and reorganize internal and external capabilities to respond to rapidly changing environments (Teece, Pisano, & Shuen, 1997). Unlike the RBV, dynamic capability theory does not focus on resource ownership but rather on how firms evolve and update these resources over time. These capabilities enable firms not only to innovate but also to continuously adapt and reorganize innovation processes to address technological, competitive, and regulatory disruptions.

Teece (2007) further divides dynamic capabilities into three main dimensions: 1) sensing opportunities and threats; 2) seizing opportunities through strategic investment; and 3) transforming the organization to maintain consistency and competitiveness. The concept of entrepreneurial agility in this study is closely related to these dimensions, especially in terms of how companies respond to environmental uncertainty and leverage strategic innovation.

In the context of the coffee industry, dynamic capabilities are manifested in the ability of companies to anticipate changes in consumer preferences, adopt new technologies, and reorganize their supply chains. For example, companies that quickly integrate blockchain technology to achieve supply chain traceability or launch sustainable product lines are typical examples of dynamic capability practices (Daspit, Sirmon, & McKee, 2021). Therefore, dynamic capabilities bridge the theoretical gap between strategic intent and organizational adaptability, offering a more process-oriented perspective compared to the resource-based view (RBV).

Situational theory argues that there is no single best way to organize or lead a company; rather, the optimal course of action depends on the specific environment in which the company operates (Donaldson, 2001). This theory emphasizes the fit between organizational strategy and environmental conditions, which is particularly important in dynamic and turbulent markets. When applied to innovation, situational theory suggests that the effectiveness of innovation strategies is not static but

depends on factors such as market volatility, technological turbulence, and consumer unpredictability.

In this study, market turbulence is conceptualized as a key contingent factor that moderates the relationship between strategic innovation and competitive advantage. Companies operating in highly unstable markets may derive more value from innovation due to the urgent need for differentiation and adaptation, while companies in stable markets may not reap the same rewards. This is consistent with the findings of Kraus, Rehman, and García (2020), who argue that the strategic value of innovation is amplified in unpredictable environments.

The definition of strategic innovation varies across the literature, but all emphasize its transformative and systemic nature. It is not merely the result of random creation or incremental change, but rather a deliberate strategic action that reshapes competitive boundaries and creates new market space. Markides (1997) was one of the first scholars to define strategic innovation as the creation of new business models in existing industries, which is often achieved by challenging traditional assumptions about product offerings, customer segmentation, or value delivery mechanisms. In this sense, strategic innovation refers to "competing differently, rather than competing better." Govindarajan and Trimble (2005) expanded this concept to describe strategic innovation as the pursuit of non-incremental breakthroughs to create entirely new growth platforms. These innovations often deviate from the existing capabilities of the enterprise and require significant organizational learning and cultural adaptation. A key development in the discussion of strategic innovation is the "blue ocean strategy" proposed by Kim and Mauborgne (2005), which defines strategic innovation as creating uncontested market space through value innovation—with a focus on both differentiation and cost reduction. According to their model, companies should not fight with competitors in the highly competitive "red ocean," but should seek to redefine the industry, eliminate outdated assumptions, and construct new strategic logic. What all these views have in common is an emphasis on novelty, proactivity, customer focus, and impact on the entire system. Therefore, strategic innovation is not limited to a single function (such as R&D), but cuts across marketing, operations, leadership, and organizational structure. Common characteristics: involves proactive rather than reactive change; focuses on value reconstruction rather than mere product improvement; requires senior management involvement and risk acceptance; often involves entering unknown or undefined markets.

Corporate strategic innovation can be viewed as a complex adaptive system. Members of a complex adaptive system are called adaptive agents, which include enterprises, suppliers, competitors, governments, intermediary organizations, universities, and scientific research institutions. Members of a corporate strategic innovation system can be described by stimulus-response rules, whose behaviors are adaptive and can interact with each other. Adaptive agents in the corporate strategic innovation system can be specifically divided into agents and component agents. Through continuous, active, and repeated interactions, agents and component agents accumulate experience and continuously change their stimulus-response rules, adapting their own structures and behaviors.

The corporate strategic innovation process is a process of joint participation by corporate employees, a process of collaboration among members of the strategic innovation system, a process of strategic resource integration, and a process of strategic information generation, evaluation, selection, and implementation. In this series of processes, enterprises, suppliers, competitors, governments, intermediary organizations, universities, and scientific research institutions constitute the network nodes of the strategic innovation system. According to the American scholar John Holland, agent behavior can be seen as determined by a set of stimulus-response rules: IF (if) stimulus s occurs, THEN (then) a response is made. Enterprises are the main actors in the strategic innovation process. IF they have the ability to integrate internal and external resources, THEN they can successfully implement strategic innovation. Suppliers, competitors, government, universities, and scientific research institutions are secondary actors in the strategic innovation process. IF secondary actors can communicate with each other, share resources, and collaborate, THEN enterprises can successfully implement strategic innovation.

Enterprises are the behavioral agents in the strategic innovation system. Here, enterprises refer to enterprises that can lead or follow strategic innovation in the strategic innovation system, excluding suppliers and competitors. If enterprises want to carry out continuous strategic innovation, they need to continuously discover, acquire, utilize, and integrate various internal and external resources to truly transform innovation resources into innovation achievements. While relying on the cooperation of external actors, enterprises also need to continuously improve their own innovation capabilities. The "global automotive architecture" strategic system of General Motors is a good example. As competition in the automotive market became increasingly fierce, General Motors' high costs became more and more prominent, greatly affecting the company's competitiveness. Faced with changes in the environment, General Motors carried out strategic innovation at the right time and built a "global automotive architecture" strategic system, striving to find the right balance between scale and diversification. The "global automotive architecture" strategic system refers to the standardization of automotive products and processes, the use of a central chassis, the adoption of the same manufacturing methods and common raw materials, and the use of a series of flexible modules and different parts to transform the company's scale potential into a competitive advantage for global expansion through extensive production capacity and various resources to meet the diverse needs of global markets.

The research results of Rumelt et al. (1991) and Foss and Knudsen (2003) show that competitive advantage is a core issue in strategic management theory. Which factors can enable enterprises to have superior profitability, and how to win and maintain long-term competitive advantages to achieve sustainable development of enterprises, have always been important issues of great concern to the academic and industrial circles at home and abroad. The concept of competitive advantage was first introduced by Chamberlin (1935), who explored the concept of enterprise competition in his book Monopoly and Monopolistic Competition. In early studies, Bain (1956) discussed the characteristics of

barriers to competition in the manufacturing industry, and Alderson (1965) proposed the concept of "differentiation competition," gradually establishing the importance of competitive advantage for corporate strategy formulation (Nayaketal., 2022). In the 1980s, Porter (1985) systematically analyzed corporate competitive advantage, opening a new chapter in management research. Scholars have engaged in a long and rich discussion on "what is corporate competitive advantage" and "how to create and maintain corporate competitive advantage." Through systematic sorting and summarizing of the literature, we found that although scholars have conducted in-depth research on competitive advantage, there are still differences in the definition of competitive advantage, resulting in different conceptual connotations.

In summary, despite different perspectives on competitive advantage, the understanding of its conceptual connotation can be roughly divided into two types: the outcome perspective and the source perspective (Wang, 2019). Scholars who hold the outcome perspective focus on emphasizing the results brought about by competitive advantage, namely, superior profitability, profit levels, advantageous position, and development space compared to competitors. Scholars who hold the source perspective focus on emphasizing the source of competitive advantage, namely, the value created by the unique resources, capabilities, and conditions possessed by enterprises. The connotation of competitive advantage is that in a turbulent environment, enterprises can well coordinate and utilize various internal and external resources to form organizational capabilities that match environmental conditions, provide higher quality and cheaper products and services than their competitors, and thus win performance levels and leading positions that surpass their competitors within a certain period of time.

Competitive advantage refers to the ability of an enterprise to create more economic value than its competitors by providing higher quality products or services, more efficient operations, or utilizing unique capabilities (Barney, 1991). It enables enterprises to maintain excellent performance in the long term and is essential to long-term strategic success. Michael Porter (1985) provided one of the earliest and most enduring frameworks for competitive advantage, proposing two basic types: cost leadership (providing lower prices through increased efficiency) and differentiation (providing unique attributes that customers value). Companies can also adopt a focus strategy to provide customized products for niche markets. The resource-based view (RBV) (Wernerfelt, 1984; Barney, 1991) later redefined competitive advantage as the result of a company's unique, valuable, scarce, difficult to imitate, and irreplaceable resources (VRIN). These resources may include brand reputation, proprietary technology, management capabilities, or organizational culture. In recent years, scholars have emphasized the dynamic and capability-driven nature of competitive advantage. Teece, Pisano, and Shuen (1997) proposed the concept of dynamic capabilities—the ability of firms to reconfigure resources in response to environmental changes—as a prerequisite for maintaining advantage in turbulent markets. Thus, competitive advantage is no longer viewed as static, but rather as a continuous process of strategic adjustment, innovation, and organizational learning.

Competitive advantage explains how companies acquire and maintain sustainable advantages over their competitors. This research has wide applications in the field of business management, and understanding the evolution of competitive advantage research is of great significance for corporate strategy formulation, organizational structure, and business process optimization. Currently, the mainstream view on the sources of competitive advantage is gradually shifting from the exogenous theory of competitive advantage to the endogenous theory of competitive advantage.

The exogenous theory of competitive advantage argues that competitive advantage is mainly influenced by external environmental factors and emphasizes that enterprises need to study and respond to changes in the external environment to obtain and maintain competitive advantage. This view originates from the perfect competition market hypothesis of neoclassical economics, in which enterprises are considered homogeneous. The flaw in this theory is that it ignores factors such as the competitive relationship between enterprises in the actual market environment, market structure imbalances, and incomplete information transparency. Subsequently, Bain (1968) from Harvard University proposed the Structure-Behavior-Performance (SCP) theoretical framework to address these shortcomings. In the SCP theory, firms are no longer passive acceptors of prices but can alter market structures through strategic behavior. The SCP theory believes that organizations need to analyze the environment to identify the sources of their competitive advantages. This framework became the focus of research for many scholars from the 1960s to the 1980s. In the early 1980s, Michael E. Porter proposed the strategic positioning theory and the “five forces model,” pointing out that the competitive situation of an industry is determined by the following five forces: the bargaining power of suppliers, the bargaining power of buyers, the threat of new entrants, the threat of substitutes, and the degree of competition within the industry. At the same time, Porter proposed three competitive strategies for companies to gain and maintain competitive advantages, namely: cost leadership strategy, which refers to reducing costs through economies of scale and technological innovation to win market competition with low prices; differentiation strategy, which refers to companies satisfying the differentiated needs of customers with products or services that are different from their competitors; and focus strategy, which refers to companies focusing on specific market segments and gaining competitive advantages by concentrating resources. Although Porter's analytical framework provides a valuable perspective for understanding competitive advantage, the exogenous theory of competitive advantage also has its own shortcomings. First, it overemphasizes the influence of the market and industry, with a clear “black box” tendency, neglecting the role of internal resources and capabilities of enterprises, and failing to address the issue of performance differences between two enterprises under the same conditions. Second, it overemphasizes the choice of strategy and ignores the challenges and difficulties in the implementation process. Finally, the theory assumes that all companies have the same understanding of and response to the market and industry, ignoring the heterogeneity between companies.

Due to the limitations of the exogenous theory of competitive advantage, scholars began to shift

their perspective on the source of competitive advantage to within companies. The endogenous theory of competitive advantage originated in E. Penrose's 1959 book "The Theory of Business Growth," in which he proposed that companies are a collection of production resources. In 1973, Rubin also conceptualized organizations as "resource bundles." Based on this, scholars developed the resource-based view and dynamic capability theory around issues such as the nature of enterprises and the sources of their long-term competitive advantages. The resource-based view (RBV) theory was proposed by Wermerfelt (1984) and developed through the research results of many scholars. It explains how enterprises obtain competitive advantages and economic benefits through the ownership and management of internal resources such as assets, capabilities, and knowledge. This view tends to be static in its analysis, with the implicit assumption that the speed of technological change is constant, and it fails to clearly define the relationship between the various factors that drive enterprise innovation. If companies want to achieve long-term competitive advantage, it is not enough to simply use isolation mechanisms to prevent competitors from imitating them. They also need to cultivate the ability to innovate continuously and focus on dynamic changes in capabilities. Therefore, the analytical framework for competitive advantage has gradually shifted from a static analytical framework based on RBV theory to a dynamic analytical framework based on dynamic capability theory.

As an extension of RBV theory, dynamic capability theory can help companies improve their adaptability in highly uncertain and volatile competitive markets and is also regarded as an important factor for organizations to gain competitive advantage. Dynamic capability has the meaning of change and dynamism, referring to an organization's ability to adapt to and lead change. This ability enables organizations to adapt to and lead environmental changes by continuously adjusting and improving their conventional capabilities. Although resources are the focus of RBV theory, in dynamic capability theory, changing and innovating resources to adapt to market turbulence has become the key point of the theory. This also means that dynamic capabilities are not only about owning resources, but more importantly, how to effectively manage and utilize these resources to gain competitive advantages in a changing market environment.

A company's competitive advantage is the advantage it has over its competitors, involving hard advantages that can be clearly measured and compared, as well as soft advantages that reflect the uniqueness of the company. Manufacturing companies are economic organizations engaged in industrial production and operation activities or providing industrial services. They have characteristics such as production scale effects, production process complexity, market environment dependence, environmental pollution, and high product added value, which should be taken as a prerequisite when defining the concept of their competitive advantage.

The concept of market turbulence originates from contingency theory, which argues that environmental fluctuations affect the success of organizational strategies (Donaldson, 2001). Jaworski and Kohli (1993) define market turbulence as "the rate of change in the composition of customers and

their preferences," emphasizing that it reflects the extent to which the market evolves due to external forces rather than internal actions of the enterprise.

The main characteristics of market turbulence include:

Rapid changes in consumer preferences and demand

Frequent entry or exit of competitors

Technological disruptions that change industry standards

Regulatory and economic shocks that affect market access

Empirical research has developed reliable measures of market turbulence. The most widely used measure is the five-item scale developed by Jaworski and Kohli (1993), which includes the following statements

"In our industry, customer preferences for products change significantly over time."

"We are seeing demand from customers who have never purchased our products or services."

Respondents typically rate these items on a 5-point or 7-point Likert scale. Researchers such as Slater and Narver (1994) have validated and expanded this construct, often using perceptual measurement methods, with data sources including market or strategic managers.

Recent studies have also used moderate regression and structural equation modeling (SEM) to capture the interactive effects of market turbulence on other strategic concepts (Teece, 2007; Kraus et al., 2020).

Market turbulence is the most influential, complex, and difficult to predict component of the external network of a company's digital transformation capabilities. Digital transformation capabilities and dynamic capabilities affect a company's business model innovation activities. Many scholars have conducted research on the relationship between market turbulence, market orientation, marketing agility, and dynamic capabilities in the context of digital transformation capabilities.

Houston (1986) pointed out that market turbulence affects the role of market orientation in enterprise performance. Based on the impact of market turbulence, when enterprises are in market environments with different degrees of turbulence, the value achieved by applying digital transformation capabilities may also differ. Some scholars have studied this and pointed out that when enterprises are in a highly turbulent market environment, the value created by their digital transformation capabilities is higher. When faced with a highly turbulent external environment, enterprises need to adjust their business strategies in a timely manner in order to adapt to changing market demands. Some scholars believe that relying on digital transformation capabilities, enterprises can quickly deploy new software businesses while effectively expanding their existing businesses. Some scholars believe that enterprises use digital transformation capabilities to improve their market responsiveness, and when market turbulence is more obvious, the learning ability of enterprises will also improve accordingly. Digital transformation capabilities can promote integration among various departments within an enterprise, as well as software module integration between enterprises and their

partners, thereby facilitating in-depth collaboration. Conversely, when enterprises face an external environment with low market turbulence, market demand is relatively stable, customer demand changes are relatively small, and cooperation mechanisms are relatively stable. Such enterprises are less affected by digital transformation capabilities. In addition, Houston (1986) proposed that market orientation may have a strong or weak impact on enterprise performance, depending on environmental conditions such as market turbulence and the intensity of competition. Lin Ping (2009) concluded through empirical analysis that the higher the market turbulence, the greater the role of dynamic capabilities in organizational performance. In a turbulent market, the marketing agility of enterprises is particularly important. Lee et al. (2016) pointed out that the marketing agility of enterprises is not only reflected in the prediction and active grasp of market opportunities, but also includes the ability to modify positioning and strategies under changing conditions and seek new business models to gain early competitive advantages. Chakravarty et al. (2013) further noted that a firm's marketing agility also manifests as defensive agility, which refers to a firm's ability to observe and respond to market dynamics in a defensive manner, such as maintaining resilience in chaotic market conditions and focusing on how to recover from them rather than fundamentally altering internal structures to respond to changes. Therefore, a firm's marketing agility requires not only the ability to predict and seize market opportunities in an offensive manner but also the ability to observe and respond to market dynamics in a defensive manner.

Methodology

The main purpose of this study is to examine the impact of strategic innovation on competitive advantage in the coffee industry, focusing on the mediating role of entrepreneurial agility and the moderating role of market turbulence. To this end, this study adopts a quantitative research design, employs a theory-based deductive approach, and conducts empirical testing through structured surveys and statistical modeling.

This study is grounded in the positivist paradigm, which posits that social phenomena can be explained through objective measurement and the application of generalizable laws (Saunders, Lewis, & Thornhill, 2019). Positivism aligns with hypothesis-driven research, which seeks to examine the relationships between variables through systematic measurement and statistical testing.

By employing the hypothesis-deductive approach, the study constructs a conceptual model based on established theories such as the resource-based view (RBV), dynamic capability theory, and situational theory, and conducts empirical tests using structural equation modeling (SEM).

This study adopts a descriptive and explanatory research design:

Descriptive: Describes the current practices, innovation levels, and perceptions of agility and competitiveness among coffee industry firms.

Explanatory: Tests the relationships and causal links between the variables in the hypotheses.

A cross-sectional survey method was employed to collect data from a sample of coffee companies at a single point in time. This method is suitable for identifying patterns and general relationships between strategic constructs across different firms within an industry (Creswell, 2014).

Given the objectivity of the research constructs and the need to generalize the findings to a broader population, this study adopts a quantitative research method. This method offers the following advantages:

Potential constructs can be measured using validated scales

Hypothesis testing can be conducted using multivariate statistical techniques

It enhances the repeatability and objectivity of relationship assessments.

Key variables such as strategic innovation, entrepreneurial agility, competitive advantage, and market turbulence are operationalized using measurement items adapted from previous validated studies to ensure the reliability and validity of the constructs.

The research design follows a structured step-by-step process

Literature review and hypothesis formulation: Identify relevant theories and constructs; propose testable hypotheses.

Tool design and pre-testing: Develop a structured questionnaire based on prior research, followed by expert validation and pre-testing.

Data collection: Distribute the final survey questionnaire to selected respondents in the coffee industry via online and offline channels.

Data analysis: Apply statistical techniques, including descriptive statistics, confirmatory factor analysis (CFA), and structural equation modeling (SEM).

Interpretation and reporting: Present survey results, evaluate hypotheses, and discuss theoretical and managerial implications.

This study adopts a quantitative, cross-sectional, explanatory research design guided by a positivist philosophy and based on established theory. This design is well suited to exploring the complex interactions between strategic innovation, entrepreneurial agility, market turbulence, and competitive advantage in the dynamic and globally relevant coffee industry.

The sampling strategy of this study is consistent with the research objectives and quantitative design. This section outlines the target population, sampling method, and sample size determination. The overall objective is to ensure that the sample is representative of a broader group of companies engaged in relevant activities within the coffee industry, thereby enhancing the generalizability of the research findings.

The target population of this study includes decision-makers and senior managers of companies engaged in production, processing, retail, export, and specialty coffee services within the coffee industry. The inclusion of participants from all stages of the coffee value chain ensures that the study captures a diverse range of strategic practices and performance outcomes.

Specifically, this includes:

Managers of coffee production enterprises (cooperatives, plantations, family-owned businesses)

Owners and executives of roasting and packaging companies

Senior staff of retail chains and independent coffee shops

Export managers, logistics coordinators, and sustainability officers

Geographically, the study focuses on companies in emerging and transition markets, where strategic innovation plays a key role in overcoming volatility and structural constraints. These countries include Ethiopia, Vietnam, Colombia, Indonesia, and Kenya, as well as growing consumer markets such as China and Brazil.

The focus on management respondents is justified by their access to strategic information and their ability to assess the agility, innovation, and competitiveness of their organizations.

Given the heterogeneity and geographical dispersion of the study population, this research employs a non-probability purposive sampling method, specifically judgment sampling. This method is particularly suitable when target respondents possess specific expertise or roles, such as those involved in strategic planning or innovation management (Etikan, Musa, and Alkassim, 2016).

To enhance external validity and capture differences between firms of varying sizes and functions, the sampling also incorporated snowball sampling, where initial respondents recommended other qualified participants within the coffee value chain. This hybrid technique helps to reach specialized respondents while ensuring diversity in firm characteristics.

Inclusion criteria:

At least 2 years of operational history

Actively involved in innovation, marketing, or strategic decision-making

Willing to provide organizational-level insights

Recruitment channels:

Online professional networks (e.g., LinkedIn, industry groups)

Chambers of commerce and coffee associations

Recommendations from academic and trade contacts in the coffee industry

The sample size estimate is based on recommendations from the structural equation modeling (SEM) literature. Following Kline (2016), at least 10 respondents are required per parameter estimate, while Hair et al. (2014) recommend a minimum of 200 cases in SEM models of moderate complexity.

Therefore, to ensure statistical power, generalizability, and the reliability of model testing, a conservative estimate of 350–450 usable responses is targeted.

The actual sample size will be continuously monitored during the data collection phase and oversampled to offset potential non-responses or incomplete submissions. Data quality will be checked to screen for missing data, linearization, and response bias.

The survey instrument was developed based on a comprehensive review of the literature to

ensure theoretical validity, structural reliability, and relevance to the coffee industry context. The four core constructs—strategic innovation, entrepreneurial agility, competitive advantage, and market turbulence—are measured using multiple scales borrowed from established research (Jaworski & Kohli, 1993; Barney, 1991; Teece et al., 1997).

Each item uses a 7-point Likert scale ranging from 1 = Strongly Disagree to 7 = Strongly Agree, which is suitable for measuring agreement with subjective statements in behavioral and strategic research (Likert, 1932).

The questionnaire is divided into two main sections:

Section A: Demographic and Firm Characteristics, including firm size, type, age, geographic location, and respondent position.

Section B: Perception-based questions related to strategic innovation, entrepreneurial agility, competitive advantage, and market turbulence.

To reduce common methodological biases, the following procedural remedies were adopted

The order of items in each construct block was randomized.

Positive and neutral items were mixed together to reduce patterned responses.

Participants were assured of anonymity and confidentiality.

A pilot study was conducted with 30 respondents selected from coffee industry companies similar to the target population prior to full-scale deployment. The pilot aimed to assess:

Item clarity and understandability

Scale reliability (via Cronbach's alpha coefficient)

Survey length and user experience

Feedback from the pilot study was used to revise ambiguous statements, remove redundant items, and adjust the structure of some questions. Reliability coefficients (all constructs $\alpha > 0.80$) indicated adequate internal consistency, and no major technical issues were reported during the pilot deployment.

Additionally, minor language localization was implemented for non-English market participants to ensure semantic equivalence of measurement items.

Following the pilot, the final questionnaire was distributed through a combination of online and offline channels:

Online distribution: Survey links were shared via email, LinkedIn, industry forums, and professional coffee associations.

Offline distribution: Paper versions were distributed at industry events, training sessions, and field visits with smallholder producers and local cooperatives.

To ensure data integrity:

Duplicate submissions were identified and removed using IP addresses.

Questionnaires with a missing rate exceeding 30% were excluded from analysis.

Attention check questions were included in the survey to screen out careless respondents.

A total of 412 complete responses were received, of which 389 were retained for analysis after screening, resulting in an effective response rate of approximately 94%. This sample size exceeds the minimum sample size requirement for structural equation modeling (SEM), enhancing the robustness of the statistical analysis.

Results

Table 1: Model Summary

Model	R	R-square	Adjusted R-square	Errors in Standard Estimates
1	.626a	.392	.390	5.64518

a. Predictor variable: (constant), strategic innovation

Table 2: ANOVA

	Model	Sum of Squares	Degrees of Freedom	Mean Square	F	Significance
1	Regression	7948.923	1	7948.923	249.432	.000b
	Residuals	12332.943	387	31.868		
	Total	20281.866	388			

a. Dependent variable: competitive advantage

b. Predictor variable: (constant), strategic innovation

Table 3: Coefficients[a]

	Model	B	Standard Error	Beta	t	Sig.
1	(Constant)	14.152	1.534		9.229	.000
	Strategic Innovation	.691	.691 .044	.044 .626	15.793	.000

a. Dependent variable: competitive advantage

The results of the regression analysis provide strong empirical support for hypothesis H1, which argues that strategic innovation has a significant positive impact on competitive advantage. The model shows that strategic innovation is a significant predictor of competitive advantage, with a standardized coefficient of $\beta = .626$ ($p < .001$). The model is statistically robust, explaining 39.0% of the variance in competitive advantage (adjusted $R^2 = 0.390$), and the regression is highly significant ($F(1, 387) = 249.432$, $p < 0.001$).

This strong positive correlation confirms that companies engaged in higher levels of strategic innovation are more likely to gain greater competitive advantage. The unstandardized coefficient (B =

0.691) further indicates that for every unit increase in strategic innovation capability, the competitive advantage score increases by an average of 0.691 units. Therefore, hypothesis H1 is supported.

Table 4: Intermediary Analysis

Effect Type	Effect Type	95% CI Lower	95% CI Upper
Total Effect	0.937	0.937	0.8761
Direct Effect	0.4061	0.3056	0.5065
Indirect Effect	0.5309	0.5309 0.4399	0.6218

The results show that strategic innovation has a positive and significant direct and indirect effect on competitive advantage.

The total effect of strategic innovation on competitive advantage is 0.937 (95% CI [0.876, 0.998]), indicating a strong overall effect.

After controlling for mediating variables, the direct effect of strategic innovation on competitive advantage was 0.406 (95% CI [0.306, 0.507]), indicating that strategic innovation significantly enhances competitive advantage independently of mediating variables.

The indirect effect through entrepreneurial agility was 0.531 (95% CI [0.440, 0.622]), confirming a significant mediating role.

Since the 95% confidence intervals for both the direct and indirect effects did not include zero, this supports partial mediation. In other words, entrepreneurial agility partially mediates the effect of strategic innovation on competitive advantage, while strategic innovation also retains a direct effect.

These results provide strong support for Hypothesis H2, confirming that entrepreneurial agility plays an important mediating role. This finding is consistent with theoretical foundations such as the dynamic capability's perspective, which argues that agile, opportunity-oriented capabilities enhance the strategic impact of innovation on sustained competitive advantage.

Table 5: Moderate Analysis

Predictor	Coefficient	Std. Error	Error	P>|t|	P>|t| [0.025	0.975]
Strategic Innovation (X)	0.202261	0.096545	2.094989	0.036825	0.036825 0.012439	0.012439 0.392083
Market Turbulence (W)	0.062949	0.062949 0.119912	0.119912 0.524958	0.599915	-0.17282	0.298713
Interaction (X × W)	0.295928	0.295928 0.023517	12.58339	1.18E-30	0.24969	0.342167

To examine whether market turbulence moderates the relationship between strategic innovation

and competitive advantage, we conducted a hierarchical regression analysis.

The results are as follows:

The main effect of strategic innovation on competitive advantage is significant ($\beta = 0.202$, $p = .037$), indicating a positive benchmark relationship between the two.

The main effect of market turbulence itself is not significant ($\beta = 0.063$, $p = .600$), indicating that market turbulence itself may not directly predict competitive advantage.

Crucially, the interaction term ($X \times W$) is highly significant ($\beta = 0.296$, $p < .001$), with a 95% confidence interval [0.250, 0.342] that does not include zero. This indicates that market turbulence significantly enhances the positive effect of strategic innovation on competitive advantage.

These results strongly support Hypothesis H5, confirming that market turbulence plays a positive moderating role. In dynamic or unpredictable market environments, a firm's strategic innovation capabilities are more likely to translate into concrete competitive advantages. This finding is consistent with contingency theory, which argues that external environmental factors determine the effectiveness of internal strategic initiatives.

Discussion

This study aims to explore the impact of strategic innovation on competitive advantage in the global coffee industry, incorporating the mediating role of entrepreneurial agility and the moderating role of market turbulence. Through a robust empirical framework, the findings not only theoretically reinforce the view that innovation, agility, and environmental conditions interact to shape firm performance, but also provide a detailed practical explanation of this view.

Strengthening the link between innovation and performance

There is a statistically significant direct relationship between strategic innovation and competitive advantage, confirming a long-standing view in the strategic management and innovation literature. This result reaffirms that companies that actively invest in new strategies, innovative business models, and customer-centric solutions are better able to differentiate themselves from their competitors and achieve superior performance.

What sets this study apart is its broader and more comprehensive approach to defining strategic innovation. While much empirical research tends to limit innovation to technological breakthroughs or R&D intensity, this study adopts a multidimensional perspective. Strategic innovation includes deliberate repositioning, value chain restructuring, the use of digital tools, and the alignment of internal processes with long-term market opportunities. This broader definition better reflects the actual practices of coffee companies, many of which have found creative ways to innovate despite limited resources. This allows the findings of this study to be applied not only to high-tech industries but also to more traditional commodity-related industries such as coffee.

Entrepreneurial agility as a key link

A major contribution of this study is that it identifies entrepreneurial agility as an important mediating mechanism. The finding that strategic innovation has a positive impact on entrepreneurial agility, which in turn enhances competitive advantage, suggests that innovation is not a static resource but a dynamic process that requires active implementation and adaptive behavior. In this context, agility refers not only to speed or flexibility, but also to opportunity recognition, strategic responsiveness, iterative learning, and rapid decision-making.

Partial mediation results further indicate that while strategic innovation can directly influence performance, its value can only be fully realized when embedded in agile systems and entrepreneurial cultures. In the coffee industry, where companies face challenges such as commodity price volatility, changing consumer preferences (e.g., a shift toward sustainable or specialty products), and technological disruption (e.g., automation and AI-driven logistics), agility becomes an essential interface between strategic intent and market success.

This reinforces and validates the concept of dynamic capabilities, providing empirical support for Teece's argument that, in rapidly changing environments, sustained competitiveness is not driven by the mere possession of resources but by the coordination of resources through agile practices and entrepreneurial momentum.

Understanding the context through market turbulence

Equally noteworthy is the moderating role of market turbulence. Findings consistent with discovery-contingency theory and strategic fit models suggest that the positive impact of strategic innovation on competitive advantage is amplified under turbulent conditions. In stable environments, strategic innovation may lead to incremental improvements, but in turbulent environments—characterized by demand shocks, regulatory changes, or supply chain fragility—innovation becomes a survival mechanism.

This observation is highly relevant to the current context of the global coffee industry. Increasing climate variability, adjustments to international trade policies, and global health and economic shocks have made the external environment highly unpredictable. Companies that fail to perceive or respond to turbulence may struggle to cope, while those that combine innovation with environmental awareness and flexibility are more likely to turn uncertainty into opportunity.

Furthermore, the importance of these interaction effects suggests that the effectiveness of innovation strategies is not universal but varies over time. This places the study among an emerging body of literature calling for more realistic and conditional models of innovation effectiveness, particularly in emerging markets and traditional industries.

The value of a comprehensive model

By examining direct, mediating, and moderating effects simultaneously, this study offers a more comprehensive view of how strategic innovation drives performance. The comprehensive model goes beyond linear relationships and reflects the multi-layered reality of organizational life, in which

strategic initiatives are filtered through organizational behaviors (such as agility) and shaped by environmental contingencies (such as market turbulence).

This framework provides a template for complex causal pathways, better capturing how firms adapt, execute, and thrive in real-time environments, offering guidance for future empirical research. From a methodological perspective, it also contributes to theoretical testing in applied management research by demonstrating the power of mediation-moderation models in capturing interdependencies between concepts.

Industry Relevance and Strategic Implications

While the theoretical contributions are evident, the industry focus on the coffee industry further enriches the discussion. Coffee is both a traditional commodity and a modern lifestyle product, providing a unique context for exploring innovation under the dual pressures of stability and change. The study clarifies that even in mature industries, firms can achieve strategic innovation through strategic deployment capabilities, lean innovation, brand positioning, and value chain integration, rather than through radical invention.

For managers in the industry, these findings suggest that innovation must be embedded in agile processes and responsive cultures to achieve performance. Furthermore, volatility should not be viewed solely as a threat, but rather as a context amplifier that increases the returns to innovation.

This discussion shows that the relationship between strategic innovation and competitive advantage is multidimensional, behaviorally mediated, and contextually constrained. The study successfully integrates key insights from resource-based views, dynamic capabilities theory, and contingency theory to provide a coherent, empirically validated model that bridges the gap between theoretical rigor and managerial relevance.

Conclusion

This study aims to explore the impact of strategic innovation on competitive advantage in the coffee industry, focusing on the mediating role of entrepreneurial agility and the moderating role of market turbulence. By establishing and testing a conceptual model based on the resource-based view (RBV), dynamic capability theory (DCT), and contingency theory, this study makes several contributions in terms of theory, empirical evidence, and practice.

The first major contribution is to validate that strategic innovation is a key determinant of competitive advantage. The results confirm that strategic innovation directly improves firm performance and reinforce the argument that innovation is a critical firm-specific resource in highly competitive industries such as coffee.

Second, this study identifies entrepreneurial agility as an important partial mediator, deepening the understanding of how innovation works within organizations. This highlights the importance of agility as a dynamic capability that bridges the gap between strategic intent and effective execution.

Third, empirical evidence shows that market turbulence significantly moderates the relationship between innovation and performance, suggesting that the external environment can amplify or diminish the benefits of innovation. This highlights the importance of adopting a contingency approach to strategy formulation, whereby firms must align their internal capabilities with external realities.

Fourth, the study contributes methodologically by enhancing the explanatory power of traditional linear models and capturing the complex interactions between internal and external strategic factors through the implementation of a comprehensive mediating-moderation model.

Finally, the focus on the coffee industry adds industry depth to the strategic management literature, extending the innovation and agility frameworks to a commodity industry that is traditionally understudied but of global importance.

In a rapidly changing global environment characterized by economic uncertainty, technological disruption, and environmental turmoil, the ability of companies to engage in strategic innovation, entrepreneurial action, and dynamic adaptation is more important than ever. This study shows that competitive advantage is not a static state, but a fluid outcome shaped by internal capabilities and external contingencies.

For coffee companies and similar companies in the fast-moving consumer goods (FMCG) industry, the findings suggest that long-term success depends not only on innovation itself, but also on the alignment of execution agility with strategy and the market environment. Innovation must be embedded in the daily operations of the organization, the culture must encourage agile responses, and market signals must be integrated into the decision-making framework.

While this study provides solid empirical evidence and rich theoretical insights, it also opens up new directions for future research. As the global coffee industry continues to transform—driven by sustainability, digitalization, and shifting consumer values—further exploration of strategic adaptation mechanisms will be critical to understanding how companies maintain their competitive advantage.

In summary, this study reaffirms that strategic innovation is not just an option, but a necessity, and when combined with entrepreneurial agility and market responsiveness, it becomes a powerful driver of lasting competitive advantage.

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