

Entrepreneurial orientation toward starting camel-based entrepreneurial ventures in Saudi Arabia: role of entrepreneurial culture, circular economy and government support

Mohammad Alshallaqi

College of Business, Alfaisal University, Riyadh, Saudi Arabia, and

Hussam Al Halbusi

College of Commerce and Business, Lusail University, Lusail, Qatar

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Abstract

Purpose – Camel-centered entrepreneurial ventures in Saudi Arabia represent a culturally significant and economically viable sector, aligning with the objectives of Vision 2030 to diversify the economy by transforming traditional camel-related industries, such as tourism, dairy, cosmetics and sports, into innovative and sustainable business models. Therefore, this study aims to examine the impact of entrepreneurial orientation (EO) on establishing camel-based entrepreneurial ventures in Saudi Arabia, with entrepreneurial culture (EC) being assessed as a mediating factor. To capture the contextual dynamics, this study introduced two boundary conditions: Circular Economy (CE) and Government Support (GS), both evaluated for their moderating effects on the relationships between EO and EC, as well as between EC and the initiation of camel-based ventures.

Design/methodology/approach – A quantitative research design was used, using a purposive sampling strategy to collect data from 147 Saudi entrepreneurs engaged in camel-related activities.

Findings – Structural equation modeling using partial least squares revealed that EO significantly influenced the creation of camel-based ventures, with EC serving a critical mediating role. Furthermore, the findings indicate that these relationships were stronger with high engagement in CE and substantial GS.

Originality/value – The findings offer novel insights into EO by elucidating the interaction of cultural, environmental and institutional factors in shaping sustainable entrepreneurship within niche sectors – an area frequently overlooked in EO studies. By concentrating on the Saudi context, this study extends EO theory to encompass emerging economies. It outlines the boundary conditions that enhance our understanding of entrepreneurial outcomes contingent upon socio-institutional facilitators. This approach provides theoretical advancement and practical guidance for policymakers and practitioners seeking to align entrepreneurial ecosystems with national transformation objectives, such as Vision 2030.

Keywords Sustainable entrepreneurship, Entrepreneurial orientation, Entrepreneurship, Enterprising communities, Circular economy

Paper type Research paper



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1. Introduction

Entrepreneurial ventures are widely recognized as crucial catalysts of economic growth, innovation and societal transformation (Abdelfattah *et al.*, 2025a). They generate employment, enhance competition and increase productivity, making them indispensable in developed and developing economies (Audretsch *et al.*, 2025). In contrast to traditional businesses that operate within established paradigms, entrepreneurial ventures introduce disruptive models, advanced technologies and innovative solutions to address evolving consumer demands and systemic challenges (Stephens and Miller, 2024; Al Halbusi *et al.*, 2025b). This disruptive capacity is particularly significant in addressing global issues, such as climate change, digital transformation and resource scarcity.

In addition to their economic contributions, entrepreneurial ventures also advance social and environmental objectives. Social enterprises provide essential services to underserved communities, whereas green entrepreneurship fosters sustainable practices, supports circular economies (CE) and mitigates environmental damage (Di Vaio *et al.*, 2022; Al Halbusi *et al.*, 2023). Governments, universities and investors increasingly establish supportive ecosystems that offer regulatory incentives, funding and education to integrate entrepreneurial activities into broader development strategies (Kara *et al.*, 2024; Audretsch and Fiedler, 2024). These collective efforts underscore the pivotal role of entrepreneurship in cultivating inclusive, resilient and sustainable economies worldwide.

Despite notable advancements, research has predominantly focused on Western or developed countries, resulting in a paucity of studies on entrepreneurship in emerging regions. This gap is particularly evident in the Middle East, with Saudi Arabia as a prime example. Through its Vision 2030 initiative, Saudi Arabia underscores entrepreneurship as a pivotal strategy for reducing its dependency on oil, diversifying its economy and fostering socioeconomic transformation (e.g. Corrêa *et al.*, 2022). However, there is a dearth of empirical evidence regarding the interaction of entrepreneurial orientation (EO) with cultural, institutional and sustainability factors during this transition (Cherif, 2025). Addressing this research gap is essential for understanding how entrepreneurship can enhance systemic resilience and facilitate sustainable development in underexplored areas.

EO is a vital strategic posture encompassing proactiveness, innovativeness, risk-taking, autonomy and competitive aggressiveness (Shan *et al.*, 2016; Han *et al.*, 2024a, 2024b). Organizations exhibiting strong EO cultivate an environment that prioritizes opportunity recognition, experimentation and adaptability, enabling them to anticipate market trends and rapidly respond to technological advancements and shifts in consumer preferences (Ishaq *et al.*, 2024). Empirical research consistently indicates a correlation between EO and enhanced innovation capabilities, competitive advantage and sustainable growth. Furthermore, EO is linked to broader economic effects, such as industrial diversification and knowledge dissemination, underscoring its significance in shaping organizational strategies and broader economic dynamics (Acciarini *et al.*, 2023).

Despite extensive research on EO, two significant gaps remain. First, there is a scarcity of studies that systematically explore the interaction between EO and entrepreneurial culture, which encompasses the values, norms and behaviors that foster creativity, collaboration and resilience within organizations (Al Halbusi *et al.*, 2024b; Girma Aragaw *et al.*, 2025). While EO represents strategic intent, *entrepreneurial culture embodies* the underlying mindset that supports innovation and proactive problem-solving. Understanding this interaction is essential for understanding how strategic approaches lead to entrepreneurial outcomes. Second, there is a lack of research incorporating *sustainability-oriented frameworks*, such as the CE and institutional enablers, such as government support (GS), into EO studies. These elements are particularly relevant in emerging economies, where environmental challenges

and institutional interventions significantly influence entrepreneurial ecosystems (Guerrero *et al.*, 2024). Without considering these factors, the current EO literature risks missing the boundary conditions that affect entrepreneurial performance in various contexts.

The identified omissions underscore a dual gap: the lack of empirical research from developing economies undergoing structural transformations and theoretical ambiguity concerning the interplay among EO, culture, sustainability and institutional support. Given its policy-driven emphasis on entrepreneurship and commitment to environmental sustainability and institutional reform, Saudi Arabia presents a compelling empirical context to address this gap. Investigating EO within this setting facilitates theoretical advancement and the derivation of practical insights applicable to other transitioning economies.

This study addresses the following question:

- Q1. How do EO and entrepreneurial culture interact to influence entrepreneurial ventures in emerging economies and how are these relationships shaped by the moderating effects of the CE and GS?

This study makes three significant *contributions to the field of entrepreneurship*. First, it advances the EO literature by critically examining its interaction with *entrepreneurial culture*. Rather than considering EO as an isolated concept, this study illustrates how cultural norms and values influence the transformation of EO into venture outcomes. This adds depth to EO theory by linking the strategic posture with organizational behavior and mindset. Second, this study introduces *the CE and GS* as dual moderators. This approach enriches EO research by identifying the conditions under which EO–culture interactions yield sustainable and resilient entrepreneurial outcomes. This emphasizes aligning entrepreneurial strategies with sustainability goals and institutional frameworks, which are often neglected in previous EO studies. Third, this study provides *context-specific insights from Saudi Arabia*, addressing the empirical gap in emerging economies. By situating the analysis within the framework of Vision 2030, this study offers practical guidance for policymakers and practitioners while avoiding the error of treating policy agendas as theoretical innovations. Instead, Vision 2030 is a practical backdrop for testing and validating new theoretical contributions to the literature. Thus, collectively, these contributions bridge theoretical and empirical gaps, expand the EO scholarship and offer actionable insights for promoting sustainable and inclusive entrepreneurship ecosystems in emerging contexts (Bläse *et al.*, 2025).

1.1 Research contextualization

Camel-centered entrepreneurial initiatives in Saudi Arabia represent a unique integration of cultural heritage, economic potential and environmental sustainability, thereby establishing themselves as a crucial element of the Kingdom's Vision 2030 objectives (Basaffar *et al.*, 2018). Historically, camels have signified the Saudi identity, deeply embedded in the nation's history, customs and lifestyle (see Figure 1). In contemporary times, they offer a promising avenue for economic diversification, particularly in the agriculture, tourism and biotechnology sectors. By leveraging the cultural significance of camels, entrepreneurs can create ventures that preserve Saudi heritage and foster innovation and sustainable development. However, the success of these enterprises depends on their ability to integrate modern entrepreneurial strategies with traditional knowledge while addressing challenges such as resource scarcity, environmental degradation and market accessibility. This study explores how the principles of the CE and GS can significantly strengthen the relationship between EO, entrepreneurial culture and the success of camel-based ventures in Saudi Arabia (Alrubaisi *et al.*, 2021).

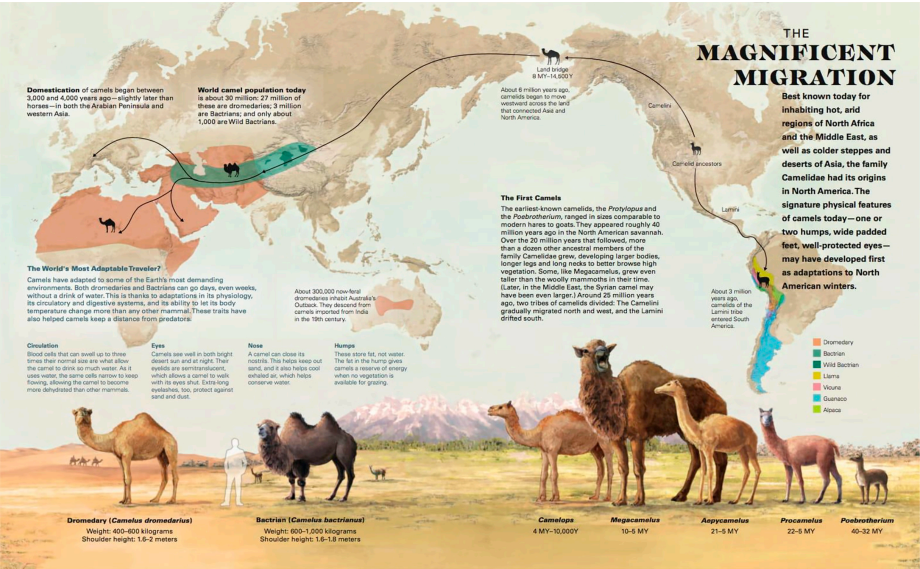


Figure 1. Camels are a symbol of Saudi identity, deeply embedded in the nation’s history

In the context of camel-based enterprises, the concept of a CE is of considerable significance, particularly in light of the environmental challenges faced by the Kingdom, such as desertification and water scarcity. By adopting CE strategies, including recycling, upcycling and waste reduction, enterprises can mitigate their environmental impact while enhancing resource efficiency (Abdelwahed *et al.*, 2023). For instance, camel-derived products such as milk, wool, leather and dung can be innovatively transformed into value-added products, such as organic fertilizers, sustainable textiles and health supplements. This approach aligns with global sustainability objectives and fosters an entrepreneurial ethos emphasizing innovation, resilience and ethical responsibility. This is supported by systems theory, which underscores the interconnections between economic, environmental and social systems. By integrating CE practices into their operations, camel-based businesses can contribute to ecological conservation while creating new revenue and market opportunities (Shatila *et al.*, 2025).

From the perspective of GS, another crucial factor for the development and sustainability of entrepreneurial ventures in Saudi Arabia is apparent. The Kingdom’s Vision 2030 initiative highlights the importance of entrepreneurship as a driver of economic diversification and job creation, particularly in sectors beyond oil. Institutional theory provides a coherent framework for understanding the role of government in shaping entrepreneurial ecosystems (Alwakid *et al.*, 2021a). Policies such as financial incentives, regulatory reforms and infrastructure development can significantly reduce entry barriers for camel-based ventures, enabling entrepreneurs to transform the cultural values of innovation and tradition into successful business models. For example, government-supported funding programs, research initiatives and public-private partnerships can facilitate the expansion of entrepreneurial ventures and simplified regulations can ease market entry and export opportunities (Alharbi *et al.*, 2022). Empirical evidence from other regions with strong GS for entrepreneurship

demonstrates a positive correlation between such interventions and increased venture creation, economic growth and social development (e.g. [Alwakid et al., 2021b](#)).

In Saudi Arabia, integrating a CE with GS creates a cooperative effect that enhances the entrepreneurial landscape of camel-related enterprises. The CE ensures the sustainability of these businesses and aligns them with international environmental goals, while GS provides the necessary infrastructure and stability for success. Consequently, this dual moderating influence strengthens the relationship between EO. It is characterized by proactivity, risk-taking, innovation and an entrepreneurial culture, thereby creating a dynamic environment which ere traditional knowledge and contemporary practices converge ([Zaki et al., 2025](#)). Furthermore, this culture results in significant entrepreneurial ventures that contribute to economic diversification, job creation and the preservation of cultural heritage. This dual moderating effect fortifies the connection between EO, marked by proactiveness, risk-taking, innovation and entrepreneurial culture ([Ayasrah et al., 2019](#)), fostering a vibrant setting where traditional knowledge and modern practices intersect. Moreover, it guarantees that this culture leads to impactful entrepreneurial ventures that aid economic diversification, job creation and cultural preservation ([AlMulhim et al., 2025](#)).

From a broader perspective, this study highlights the importance of camel-centric entrepreneurial initiatives in achieving the objectives of Saudi Arabia's Vision 2030. By leveraging the CE and securing GS, these initiatives can address critical issues such as food security, environmental sustainability and rural development. For example, camel milk and meat production can enhance food security, while eco-tourism projects focused on camel heritage can invigorate local economies and promote cultural tourism. Furthermore, the integration of advanced technologies, including artificial intelligence, blockchain and the Internet of Things, into camel-based enterprises can optimize resource utilization, improve supply chain transparency and enhance product quality, thereby fostering innovation and competitiveness ([Ahmad et al., 2023](#); [Al Halbusi et al., 2025a](#)).

This study delineates a comprehensive framework that bridges theoretical insights with practical applications, providing actionable guidance for policymakers, entrepreneurs and stakeholders in Saudi Arabia. By integrating entrepreneurial initiatives with environmental sustainability and institutional support, camel-based enterprises can exemplify sustainable development in this region. Ultimately, this study underscores the transformative potential of entrepreneurial ventures in shaping the future of Saudi Arabia's economy, society and environment, demonstrating how the interaction between the CE and GS can promote economic growth, societal advancement and environmental conservation in a scientifically validated and logically coherent way.

2. Theoretical background

This study uses institutional and leadership theories, emphasizing entrepreneurial and transformational *leadership perspectives*, to develop a cohesive and contextually relevant model that integrates EO and entrepreneurial culture (EC) ([Chaudhary et al., 2024](#)). Institutional theory elucidates how entrepreneurs in developing countries navigate systemic voids, regulatory deficiencies and sociocultural pressures ([Urbano et al., 2025](#)). It underscores the impact of coercive, normative and cognitive forces on entrepreneurial behavior and the legitimacy of new ventures, particularly in environments characterized by weak or fragmented formal institutions ([Aeeni et al., 2025](#)). In the Middle East and North Africa region, these institutional dynamics influence the alignment of innovation and entrepreneurial ambition with traditional norms and values ([Hassani and Mosconi, 2021, 2022](#)). This is consistent with research linking entrepreneurial ecosystems to local cultural

traditions (Vicentin *et al.*, 2024) and community-based norms that either facilitate or impede entrepreneurship (Dauletova and Al-Busaidi, 2024).

Concurrently, leadership perspective, informed by entrepreneurial and transformational leadership models, provides a micro-level perspective on how entrepreneurial leaders mobilize resources, influence organizational behavior and convert vision into collective action that aligns with institutional and community expectations (Al Halbusi *et al.*, 2025e). Entrepreneurial leaders act as intermediaries between global market demands and local traditions, enhancing legitimacy and resilience in fragile institutional settings. Their relational and value-driven leadership styles foster trust, reputation and long-term sustainability, particularly in culturally embedded ventures such as family-based or heritage-linked businesses (Saeedikiya and Aeeni, 2020). Furthermore, leadership perspectives illuminate how gendered leadership practices intersect with institutional logics, as women entrepreneurs in conservative environments often adopt adaptive and inclusive leadership strategies to navigate the structural and cultural challenges they face (Ravet-Brown *et al.*, 2024).

By integrating institutional and leadership perspectives, this study presents a multidimensional framework in which institutional theory situates EO and EC within macro-level systemic and cultural forces, while the leadership perspective – especially entrepreneurial and transformational leadership – demonstrates how vision, agency and influence transform institutional pressures into effective entrepreneurial strategies. These frameworks comprehensively understand EO and EC as socially embedded, leadership-driven processes shaped by contextual constraints and individual entrepreneurial agency.

2.1 Entrepreneurial orientation and camel-based entrepreneurial ventures

Research has demonstrated that EO is commonly conceptualized as a multidimensional construct that encompasses innovativeness, proactiveness and risk-taking (Lumpkin and Dess, 1996). While EO is frequently associated with improved performance outcomes across diverse industries (Gómez-Jorge *et al.*, 2025), the results are not consistent, as some studies indicate that its efficacy is significantly moderated by factors such as institutional quality, sociocultural norms and market dynamism (Wales *et al.*, 2021; Al Halbusi *et al.*, 2024b). These considerations are particularly pertinent in less developed economies, where entrepreneurs face constraints such as limited resources, fragmented institutions and heightened environmental uncertainty. In such contexts, EO is often perceived as enabling businesses to overcome structural challenges, identify opportunities and mobilize resources for sustainable growth. Nevertheless, the extent to which EO contributes to the success of firms in culturally significant and heritage-embedded sectors remains inadequately understood, highlighting a notable gap in the extant literature (Al Halbusi *et al.*, 2025a, 2025b, 2025c, 2025d, 2025e).

Entrepreneurship centered around camels in Saudi Arabia and the broader Gulf region reveals a significant research gap. These enterprises, steeped in heritage, are situated at the intersection of cultural tradition and the imperative of economic diversification. While the existing literature on EO underscores its significance in promoting innovation and adaptability, there is a paucity of research examining how EO can be translated into sustainable models within industries that are deeply intertwined with cultural identity and community values (Al Halbusi *et al.*, 2025a). Studies on camel-based enterprises illustrate their transformative potential through innovations in dairy, pharmaceuticals and cosmetics (Maitra *et al.*, 2025) and their expansion into global tourism markets. However, a critical analysis suggests that such innovations do not inherently result from EO; instead, they are shaped by institutional frameworks, consumer preferences and global discourses on heritage entrepreneurship, which stress the necessity of balancing authenticity with modernization

(Amsidder *et al.*, 2024). This highlights a gap in understanding how EO influences camel ventures' ability to leverage heritage as a competitive advantage.

In this context, innovation is a pivotal catalyst for generating value in camel-based enterprises by facilitating the development of novel products and processes that align with evolving consumer preferences and sustainability requirements. The advent of camel milk derivatives and health-oriented products exemplifies how innovation empowers entrepreneurs to access high-value market segments (Maitra *et al.*, 2025). Equally important is proactiveness, which enables entrepreneurs to anticipate and capitalize on global trends such as the rising demand for organic and wellness products (Muthukumar *et al.*, 2023). Through proactive branding and export strategies, camel entrepreneurs enhance their competitiveness in local and international markets. Moreover, risk-taking is crucial in an industry characterized by environmental unpredictability, climate challenges and volatile markets. Entrepreneurs who embrace risk invest in research, genetics and sustainable breeding practices despite uncertainties, fostering resilience and long-term competitiveness (Kishore *et al.*, 2024).

Moreover, the broader institutional and economic landscapes present opportunities and constraints for camel-focused ventures. Saudi Arabia's Vision 2030 emphasizes diversification through agribusiness, eco-tourism and heritage-based industries, with government incentives, incubators and research networks fostering supportive ecosystems (Alrubaihi *et al.*, 2021). Despite this promising environment, significant gaps persist in understanding how EO interacts with institutional frameworks to influence entrepreneurial outcomes. Recent studies advocate a deeper investigation into how digitalization, sustainable practices and interfirm collaboration bolster EO-driven enterprises (Abdelwahed *et al.*, 2023). Similarly, comparative studies across regions are necessary to capture cultural and institutional differences in heritage-based entrepreneurship, while research on consumer behavior and technology adoption can illuminate demand-side dynamics. Overall, the literature suggests that EO is a critical factor in the success of camel-based ventures in Saudi Arabia; however, its impact remains insufficiently theorized and examined in heritage-embedded contexts (Van de Wetering *et al.*, 2023). This study addresses unresolved debates and contributes to the ongoing discourse on heritage entrepreneurship by critically synthesizing these perspectives. Consequently, we propose the following hypothesis:

- H1. Entrepreneurial Orientation will be significantly related to starting camel-based entrepreneurial ventures.

2.2 The mediating role of entrepreneurial culture on the relationship of entrepreneurial orientation and starting camel-based entrepreneurial ventures

EO has long been recognized as crucial to venture initiation and business success (Ferreira *et al.*, 2024). EO comprises five principal dimensions – innovativeness, proactiveness, risk-taking, competitive aggressiveness and autonomy – that collectively augment entrepreneurs' ability to identify opportunities, navigate uncertainties and generate value in dynamic markets (Lumpkin and Dess, 1996). However, while EO provides a strong theoretical foundation, researchers increasingly emphasize that its efficacy is contingent on contextual factors, with entrepreneurial culture (EC) being particularly significant. EC represents the collective values, norms and behaviors that promote innovation, experimentation and proactive risk-taking. In the absence of such cultural support, EO may remain a theoretical construct with limited practical applicability (Al Halbusi *et al.*, 2025b).

The relationship between EO and entrepreneurial culture (EC) demonstrates significant variability across various industries and regions. Research on heritage-driven and industry-

specific entrepreneurship indicates that the manifestation of EO is influenced by the integration of tradition with innovation (Arabeche *et al.*, 2022). Camel-based enterprises in the Gulf region exemplify this dynamic, as they must reconcile the preservation of cultural significance with the exigencies of contemporary market demands (Al Kanhal, 2010). For example, the element of innovativeness within EO thrives in camel-related ventures only when there is cultural support for research and product diversification, such as the development of cosmetics from camel milk or textiles from camel wool. This highlights that EO, in isolation, is inadequate without a cultural framework that endorses experimentation and aligns innovation with heritage-based practice (Naveed *et al.*, 2022).

Proactiveness, a fundamental component of EO, is particularly emphasized in cultures prioritizing opportunity identification and market exploration. In the camel industry, this is exemplified by entrepreneurs' endeavors to penetrate international markets and promote camel-derived products that align with global wellness and sustainability trends in the camel industry (Abdelfattah *et al.*, 2022). However, unlike general EO research, camel-based enterprises demonstrate how proactiveness can be constrained if the culture discourages risk-taking or undervalues international expansion (Arabeche *et al.*, 2022). The propensity to assume risks in these ventures further highlights the cultural influences. While cultures that tolerate failure foster innovation, the camel industry faces challenges such as climate variability and high production costs, making risk-taking essential rather than optional. Only in robust entrepreneurial cultures, where failures are perceived as learning opportunities, can these risks culminate in sustainable success. While competitive aggressiveness and autonomy are frequently emphasized in EO research, their manifestations differ across heritage-related sectors. Camel industry entrepreneurs derive greater benefits from collaborating with institutions and networks that promote sustainability and knowledge exchange than from engaging in adversarial competition (Almutairi and Quttainah, 2020). Similarly, autonomy in camel-based enterprises thrives in cultural contexts that foster decision-making while honoring traditions and collective identities (Al-Swidi and Mahmood, 2012). These examples demonstrate how EO–EC interactions occur in heritage-based industries, transcending generic models that often overlook cultural nuances.

Entrepreneurial culture (EC) is a conduit that transforms EO into concrete outcomes for camel enterprises. A strong EC promotes innovation through novel business models, such as eco-tourism or digital platforms for camel products, while ensuring that these innovations achieve cultural acceptance. This perspective is consistent with Basso *et al.*'s assertion that EC amplifies the impact of EO. However, camel-based entrepreneurship underscores EC's dual role of EC: facilitating modern business practices while preserving cultural heritage. In the absence of such a culture, entrepreneurial endeavors in the heritage industry may fail or lead to superficial commercialization. The intersection of EO and EC also reflects broader theoretical discussions on heritage-based entrepreneurship. Global studies underscore cultural heritage industries' challenges in balancing tradition with market innovation, from European wine to indigenous crafts in Latin America (Wadhvani and Lubinski, 2025). Although camel ventures are less studied, they exemplify a similar scenario in which heritage serves as both an asset and a constraint. For example, producing camel milk health products requires technical expertise and a culture that supports their commercialization while respecting traditions. Consequently, camel-based ventures address a research gap in EO–EC studies by illustrating how cultural legitimacy influences the success of innovation in heritage-rich sectors.

Saudi Arabia's Vision 2030 strategically integrates camel enterprises into a comprehensive national economic diversification and sustainability framework. Both governmental initiatives and educational institutions play pivotal roles in fostering EC, ensuring that camel-related

businesses contribute to non-oil economic expansion (Almutairi and Quttainah, 2020). This strategy elevates camel-based entrepreneurship from a niche activity to a significant element of the national innovation agenda. Nonetheless, there is ongoing discourse regarding aligning these top-down reforms with grassroots entrepreneurial practices, particularly in sectors associated with cultural heritage. By addressing this misalignment, camel-based businesses can contribute to the global discourse by illustrating how EO and EC collectively support cultural preservation and economic modernization (Sultan *et al.*, 2024).

While there is a considerable body of research on EO and entrepreneurial culture (EC), industries rooted in heritage within the Middle East have been largely neglected. Predominantly, research has concentrated on general EO models, often overlooking the cultural factors influencing their implementation. This study addresses a significant empirical gap by investigating camel-based enterprises in Saudi Arabia, contributing to the global discussion on heritage entrepreneurship. This demonstrates that EO yields sustainable outcomes only when supported by an entrepreneurial culture legitimizing innovation and preserving cultural heritage (e.g., Al Halbusi *et al.*, 2024a). This study positions camel-based enterprises as a unique and underexplored domain that challenges the prevailing assumptions in EO–EC research. Consequently, this study posits that a supportive entrepreneurial culture enhances the relationship between EO and camel-based business success:

- H2. Entrepreneurial culture mediates the relationship between entrepreneurial orientation and starting camel-based entrepreneurial ventures.

2.3 Critical moderator of circular economy

The CE has emerged as a vital framework for advancing sustainable development, emphasizing the efficient utilization of resources, waste reduction and the implementation of closed-loop systems, in contrast to the traditional linear “take-make-dispose” model (Hossain *et al.*, 2024). Within the context of entrepreneurial ventures, CE principles align operational practices with long-term sustainability objectives across various sectors, including agriculture, manufacturing and tourism. Camel-based enterprises in Saudi Arabia, which are deeply embedded in cultural traditions yet encounter environmental challenges, present a compelling context for examining how CE influences the relationship between EO, entrepreneurial culture (EC), and venture sustainability (Al Halbusi *et al.*, 2024a).

EO, defined by attributes such as innovation, proactivity, risk-taking, competitive drive and independence (Lumpkin and Dess, 1996), catalyzes entrepreneurs to create and capture value. Nevertheless, the effectiveness of the EO is significantly shaped by cultural and institutional contexts. The CE is a boundary condition that channels EO toward sustainable innovation and resource management. For instance, camel enterprises can adopt CE principles by repurposing by-products such as dung and wool to produce organic fertilizers and eco-friendly textiles, transforming waste into new revenue streams (Al Kanhal, 2010). These practices enhance the sustainability of ventures and foster an entrepreneurial culture (EC) that prioritizes innovation, environmental stewardship and ethical responsibility.

Entrepreneurial culture (EC) is pivotal in transforming EO into sustainable practice. A supportive culture fosters teamwork, knowledge exchange and continuous learning, all essential for adopting CE principles. For example, camel industry entrepreneurs can collaborate with research organizations and government agencies to develop innovative water conservation techniques or waste-to-value initiatives (Mabkhot *et al.*, 2024). This approach aligns with the findings of Basso *et al.*, who emphasized EC as a catalyst for entrepreneurial success by creating environments conducive to innovation and risk-taking. By integrating CE principles, camel-based enterprises can merge traditional practices with

contemporary sustainability objectives, contributing to cultural preservation and ecological balance. The interplay between EO and EC reveals distinct pathways to sustainability in camel-based industries. Cultures promoting creative problem-solving and efficient resource utilization enhance innovation, leading to products such as camel milk cosmetics and wool-based textiles (Ferreira *et al.*, 2024). Proactiveness is heightened when cultures prioritize sustainability-driven market exploration, aligning camel products with global wellness and ethical-consumption trends. In resource-limited contexts, risk-taking becomes more feasible under CE frameworks, which alleviate environmental uncertainties and encourage experimentation with renewable energy and precision agriculture. Competitive aggressiveness also acquires a collaborative dimension, as camel entrepreneurs gain a competitive advantage by incorporating CE practices that safeguard the environment and attract eco-conscious consumers (Almutairi and Quttainah, 2020).

The significance of the CE in Saudi Arabia is substantial and growing. Environmental challenges, such as desertification, water scarcity and climate change, pose considerable threats to the sustainability of traditional industries. Camel-based enterprises, which have historically been integral to Saudi culture, now serve as conduits between heritage and contemporary sustainability practices. Producing camel milk products and wool textiles necessitates technical expertise and a cultural commitment to sustainability. Through financial assistance and regulatory reforms, GS and educational institutions incorporating CE principles into their curricula fortify the institutional framework essential for these transitions (Almutairi and Quttainah, 2020). These initiatives align with Vision 2030, which seeks to diversify the economy and integrate ecological sustainability into national development strategies.

Despite the growing body of research on the CE, EO and entrepreneurial culture (EC), debates and inconsistencies in empirical findings persist. Numerous studies investigating the EO–EC relationship have presumed sustainability as an implicit outcome without explicitly theorizing how frameworks such as the CE influence entrepreneurial action (Alcalde-Calonge *et al.*, 2024). Furthermore, while global heritage-based sectors, such as the European wine industry or indigenous crafts in Latin America, have been analyzed to balance tradition and innovation, camel-based businesses in the Middle East have not been thoroughly investigated (Al Halbusi *et al.*, 2025c). This gap limits our understanding of how culturally rooted industries adapt to sustainability demands in the face of environmental challenges. Camel enterprises exemplify how CE principles can connect heritage preservation with modern entrepreneurial needs, providing new insights into the EO–EC–sustainability connections.

Although EO and EC have been extensively studied, there is limited empirical focus on heritage-based entrepreneurship in resource-constrained environments such as Saudi Arabia. The integration of CE into camel-based ventures addresses this gap by illustrating how sustainability frameworks transform entrepreneurial practices in culturally significant sectors. Compared to European wine or Latin American indigenous crafts, camel-based enterprises face the additional challenges of operating under climate stress, water scarcity and desertification. This makes them a unique case where heritage, environmental vulnerability and modern entrepreneurial innovation intersect. By examining CE as a moderating mechanism, this study extends the EO–EC literature beyond descriptive accounts and addresses unresolved debates on how tradition and sustainability interact in entrepreneurial ecosystems. Based on this premise, the following hypothesis is proposed:

- H3a.* The circular economy will moderate the relationship between entrepreneurial orientation and entrepreneurial culture; thus, this relationship will be stronger when the circular economy is higher than lower.
- H3b.* The circular economy will moderate the relationship between entrepreneurial culture and starting camel-based entrepreneurial ventures; thus, this relationship will be stronger when the circular economy is higher than lower.

2.4 Critical moderator of government support

GS is pivotal in developing entrepreneurial ecosystems by providing essential infrastructure, resources and regulatory frameworks that foster innovation (Zaidi *et al.*, 2023). In Saudi Arabia, GS is particularly significant for camel-based entrepreneurial ventures because of its cultural importance and alignment with the objectives of Vision 2030, which emphasizes diversification and sustainability. Despite the growing body of literature on EO and entrepreneurial culture (EC), there remains an ongoing debate regarding the impact of government interventions on entrepreneurial outcomes within heritage-based industries. This study aims to address this gap by examining the moderating effect of GS on the EO–EC–Camel Venture relationship in the Saudi context (Alshebami, 2024).

EO, characterized by attributes such as innovation, proactivity, risk-taking, competitive aggressiveness and autonomy (Lumpkin and Dess, 1996), enables entrepreneurs to discern opportunities and generate value. However, empirical findings are inconclusive regarding whether EO ensures venture success (Hassan *et al.*, 2023a). GS can augment the effects of EO by mitigating structural and financial barriers to entrepreneurship. For instance, grants, subsidies and regulatory support enable camel-based entrepreneurs to implement innovative business strategies and diversify their offerings (Abdelfattah *et al.*, 2025b). In this context, GS complements EO and legitimizes entrepreneurial risk-taking and innovation in sectors deeply embedded in cultural traditions. Similarly, entrepreneurial culture (EC) – the collective norms and values that foster innovation, collaboration and proactive problem-solving – requires supportive policies to actualize its potential fully. Although the EC literature underscores the significance of culture in shaping entrepreneurial actions, it frequently neglects the institutional framework necessary to sustain these practices. In the camel industry, government-backed research initiatives, funding programs and public–private partnerships facilitate knowledge sharing and enhance the sustainability of value-added products, such as camel milk-based health items and eco-textiles (Al Halbusi *et al.*, 2024a). Consequently, GS amplifies the impact of EC by ensuring that cultural readiness is supported through tangible resources and institutional legitimacy.

The interactions among GS, EO and EC elucidate distinct pathways for achieving sustainability. Innovativeness, a vital component of EO, is augmented by GS through investments in research and development and the implementation of advanced technologies, thereby enabling camel entrepreneurs to market products such as camel milk cosmetics and camel wool textiles (Sayed and Abdelrahim, 2024). Proactiveness is bolstered when GS provides market access and export incentives, facilitating camel-based enterprises to meet the global demand for heritage and eco-friendly products (Abdelfattah *et al.*, 2025b). The feasibility of risk-taking is enhanced when GS mitigates uncertainty through financial incentives and supportive regulations, particularly in the adoption of capital-intensive technologies, such as renewable energy and precision farming (Van de Wetering *et al.*, 2023). Furthermore, competitive aggressiveness is redefined by GS to emphasize collaborative competition, wherein entrepreneurs gain a competitive advantage through collective sustainability efforts and shared innovation networks (Al Halbusi *et al.*, 2024c).

Under the Vision 2030 framework, GS integrates camel-related enterprises into the national diversification strategy by harmonizing traditional practices with contemporary sustainability principles. Producing camel milk products and textiles necessitates technical expertise and policy-driven support in infrastructure, funding and regulation. From the institutional theory perspective, entrepreneurs’ success is contingent on the broader environment shaped by governmental entities (Chew *et al.*, 2024). Saudi initiatives have enhanced the competitiveness of camel-based enterprises by providing legitimacy and market incentives (Almutairi and Quttainah, 2020). Educational institutions contribute to this ecosystem by cultivating entrepreneurial mindsets aligned with sustainability and innovation.

Despite recent advancements, significant gaps remain in this field. Research on the Entrepreneurial Orientation–Entrepreneurial Context (EO–EC) relationship often regards GS as a passive element rather than an active determinant of entrepreneurial outcomes. Similarly, investigations into global heritage-based industries, such as European wine clusters or indigenous crafts in Latin America, have examined the interplay between tradition and innovation but rarely considered the institutional role of government in moderating this interaction (e.g., Jalali, 2025). Camel-based ventures provide a unique perspective, as they operate in resource-limited and climate-challenged environments where GS is not merely supportive but essential for survival. This study contributes to the literature by conceptualizing GS as a moderating factor that enhances the EO–EC relationship in heritage-based entrepreneurship. Focusing on camel-based ventures expands the discourse on global heritage entrepreneurship beyond the dichotomy of tradition and innovation. It includes the role of institutional support in the context of environmental scarcity. This positions camel enterprises as a comparative example, highlighting how government assistance influences the capacity of culturally rooted industries to adapt to sustainability requirements and global market trends. This study posits that GS moderates the relationship between EO, entrepreneurial culture and camel-based enterprises’ performance (see Figure 2):

H4a. Government support will moderate the relationship between entrepreneurial orientation and entrepreneurial culture; thus, this relationship will be stronger when government support is higher than when it is lower.

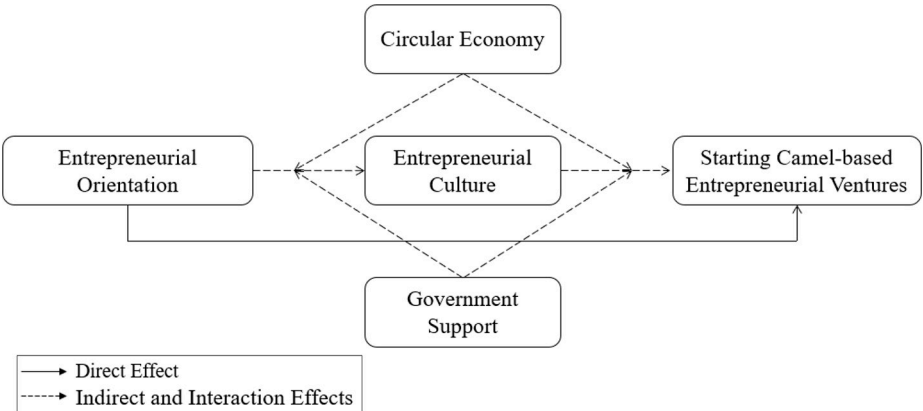


Figure 2. Research model

H4b. Government support will moderate the relationship between entrepreneurial culture and starting camel-based entrepreneurial ventures; thus, this relationship will be stronger when government support is higher than when it is lower.

3. Research method

This study used a quantitative methodology to examine the interconnections among the key components of camel-based entrepreneurial activities in Saudi Arabia. The quantitative approach facilitated statistical analyses to discern patterns and relationships among variables. A purposive sampling technique was used to ensure that the sample accurately represented the entrepreneurs and stakeholders in camel-based enterprises (Al Halbusi *et al.*, 2024b). This study adopted a cross-sectional design to assess the direct and moderating effects among the variables. Data were collected through structured questionnaires from participants who met specific inclusion criteria, thereby enhancing the validity of the findings.

3.1 Sampling and process

This study focused on entrepreneurs, business proprietors and stakeholders involved in camel-related enterprises in Saudi Arabia. Owing to this business sector's specialized and culturally embedded nature, purposive sampling was used to ensure the inclusion of individuals with relevant expertise and practical experience. This nonprobability sampling technique involves deliberately selecting participants based on specific criteria that align with the research objectives. The inclusion criteria encompassed individuals who owned or managed camel-based businesses, had a minimum of two years of experience in the camel industry, or possessed direct involvement or strategic insights into camel-related entrepreneurial activities.

This study was conducted in a unique and challenging environment. Camel-based entrepreneurship in Saudi Arabia represents a niche market closely associated with heritage, traditional practices and local knowledge, rendering it both culturally sensitive and logistically challenging to access relevant participants. Unlike more conventional industries, camel-related businesses are often informally organized, dispersed across various locations and embedded within close-knit communities, which poses significant obstacles for data collection. Despite these challenges, the research team successfully distributed 200 structured questionnaires and received 150 responses, of which 147 were validated following data screening, resulting in an effective response rate of 73.5%. This rate underscores both the difficulty of engaging a hard-to-reach entrepreneurial group and the dedication of the study participants. It also highlights the reliability and representativeness of the data collected in capturing insights from a significant economic and cultural segment of Saudi Arabia's entrepreneurs.

3.2 Measurements

The principal constructs of this study were evaluated using a structured questionnaire, with items sourced from prior research. Participants' responses were captured using Likert scales, typically ranging from 1 (strongly disagree) to 5 (strongly agree), facilitating quantifying attitudes, perceptions and behaviors related to the constructs under investigation.

EO was evaluated using a nine-item scale from Falahat *et al.* (2021), which measures innovativeness, proactiveness and risk-taking among camel-based enterprises in Saudi Arabia. Entrepreneurial culture (EC) was assessed using a 22-item scale adapted from Breazeale *et al.* (2017), focusing on societal support, failure acceptance and entrepreneurial activities within Saudi Arabia. The CE was measured using a ten-item scale (Zeng *et al.*, 2017; Al Halbusi *et al.*, 2024b) that evaluates resource efficiency, waste reduction and

sustainable practices. GS was gauged using a four-item scale adapted from studies such as [Falahat et al. \(2021\)](#), assessing financial aid, regulatory frameworks and institutional support for entrepreneurial activities. Entrepreneurial ventures within the camel industry were evaluated using a 13-item scale modified from [Cardon et al. \(2013\)](#), which measures opportunity recognition, resource mobilization, capability and readiness and cultural alignment in the camel sector.

4. Data analysis techniques

To analyze the research model, Structural Equation Modeling (SEM) with Partial Least Squares (PLS) was employed using Smart PLS 4.0 software. This method ([Hair et al., 2017](#)) is advantageous because it does not require stringent assumptions regarding variable distribution. It is particularly suitable for complex causal analyses involving first- and second-order constructs ([Hair et al., 2019](#)). Per established guidelines ([Hair et al., 2017, 2019](#)), the PLS analysis used 5,000 subsamples to generate bootstrap *t*-statistics with *n* – 1 degree of freedom (where *n* represents the subsample size) to evaluate the significance of the path coefficients. The analysis assessed the measurement model for scale validity and reliability, then examined the structural model to test the study’s hypotheses.

4.1 Common method bias

Common method bias (CMB) pertains to the potential for measurement errors that may arise when data for independent and dependent variables are collected from the same source, often concurrently. This approach ensured that shared measurement methods did not artificially influence the observed relationships among the variables, enhancing the study’s validity and reliability (e.g., [Podsakoff et al., 2024](#)). Furthermore, we conducted a two-step analysis to evaluate the impact of the CMB.

Given the significance of common method variances (CMV’s) inability to artificially amplify interaction effects in our research ([Podsakoff et al., 2012; Podsakoff et al., 2024](#)), we examined whether this factor influenced our findings. Harman’s (1976) single-factor test, which used exploratory factor analysis, revealed no issues. Seven factors with eigenvalues greater than 1 accounted for 68% of the total variance, with the first factor explaining only 23%, indicating no significant concern regarding CMB in this study. Subsequently, we assessed both vertical and lateral collinearity using a comprehensive collinearity test with variance inflation factors (VIFs), as recommended by Kock. According to Kock and Lynn, a VIF exceeding 3.3 suggests a problematic level of collinearity that could imply CMV contamination. However, as shown in [Table 1](#), our study did not exhibit any CMV-related issues.

Table 1. Common method variance assessment via full collinearity estimate criteria

Variables	VIF
Entrepreneurial orientation	1.78
Entrepreneurial culture	1.42
Circular economy	1.17
Government support	1.28
Starting camel-based entrepreneurial ventures	2.18

Note(s): VIF = variance inflation factor

4.2 Measurement model

As shown in Table 2, the components of EO, entrepreneurial culture, CE, GS and the initiation of camel-based entrepreneurial ventures exhibit reliability, with most items surpassing the preferred threshold of 0.70 (Hair et al., 2017). Moreover, both Cronbach's alpha coefficient and Dillon–Goldstein composite reliability (ρ_c), which relate to aggregated scores, demonstrated strong reliability and internal consistency for the reflective constructs (Table 2), with values exceeding the 0.70 benchmark necessary for advanced research (Henseler et al., 2009). This finding was further supported by Dijkstra and Henseler's (2015) composite reliability measure (ρ_A), an enhanced, unique, consistent reliability metric for PLS construct scores, which also showed values above the recommended 0.70 limit. The average variance extracted (AVE) for each construct exceeded 0.50 (Table 1), confirming convergent validity for our reflective constructs (Henseler et al., 2009). Furthermore, multicollinearity tests indicated minimal collinearity (Table 2), which remained well below the stringent threshold of 3.3.

Discriminant validity was assessed using the method proposed by Fornell and Lacker, in conjunction with the heterotrait–monotrait ratio (HTMT). According to Fornell and Lacker's methodology, the AVE surpassed the shared variance with other latent variables, as illustrated in Table 3 (Hair et al., 2017). Henseler et al. (2015) recommended using the HTMT of correlations, a more dependable technique grounded in a multitrait–multimethod matrix, to substantiate this evaluation further. As shown in Table 4, all HTMT values were below 0.90, providing compelling evidence of the discriminant validity of each pair of variables. Moreover, all HTMT values significantly differed from 1 and the 95% confidence intervals (CI) did not encompass 1, further affirming the robust discriminant validity of each variable pair (Henseler et al., 2015).

4.3 Hypothesis testing

Structural equation modeling with partial least squares (SEM-PLS) was used to examine the hypothesized relationships within the research framework. This approach is particularly suitable for exploratory studies involving complex models, small-to-medium sample sizes and data that do not adhere to a normal distribution (Hair et al., 2019). The SEM-PLS analysis was conducted using a bootstrapping technique with 5,000 resamples to evaluate the significance of both direct and indirect effects, providing robust estimates through the bias-corrected confidence intervals.

Table 4 presents the findings of the structural path analysis, which encompasses both direct and indirect effects. Regarding the direct relationship ($H1$), the path from EO to the initiation of camel-based entrepreneurial ventures exhibited a statistically significant effect ($\beta = 0.362$, $t = 3.132$, $p < 0.000$), with a 95% bias-corrected confidence interval ranging from 0.221 to 0.543. This outcome corroborates $H1$, indicating that a heightened level of EO significantly enhances the likelihood of initiating camel-based ventures in the study area.

Regarding the indirect effect ($H2$), EO positively influences the initiation of camel-based entrepreneurial ventures, mediated by entrepreneurial culture. The indirect pathway ($\beta = 0.274$, $t = 2.831$, $p < 0.000$) lies within a significant confidence interval [95% biased corrected interval (BCI): 0.027–0.163], thereby supporting $H2$. This finding suggests that fostering an entrepreneurial culture is a crucial mechanism through which EO is translated into tangible actions within camel-based ventures. These results highlight the importance of direct and mediated pathways in understanding entrepreneurial engagement in this unique industry.

Table 5 explains the structural path analysis results assessing the proposed model's moderating effects. This analysis was executed using SEM-PLS, with bootstrapping (5,000

Table 2. Measurement model, i.e. item loadings and weights, construct reliability and convergent validity

Construct	Item	VIF	Loading	Cronbach's alpha	Construct reliability Dillon-Goldstein (ρ_c)	Dijkstra–Henseler (ρ_A)	AVE
Entrepreneurial orientation	EO1	1.58	0.811	0.781	0.87	0.789	.641
	EO2	1.75	0.864				
	EO3	1.59	0.844				
	EO4	1.22	0.794				
	EO5	1.51	0.884				
	EO6	1.27	0.864				
	EO7	1.11	0.847				
	EO8	1.95	0.795				
	EO9	1.33	0.831				
Entrepreneurial culture	EC1	1.26	0.793	0.788	0.81	0.897	0.527
	EC2	1.43	0.831				
	EC3	1.26	0.788				
	EC4	1.27	0.785				
	EC5	1.71	0.831				
	EC6	0.133	0.812				
	EC7	1.84	0.791				
	EC8	1.64	0.787				
	EC9	1.55	0.829				
	EC10	1.17	0.790				
	EC11	1.97	0.787				
	EC12	1.44	0.814				
	EC13	1.811	0.783				
	EC14	1.44	0.861				
	EC15	1.16	0.833				
	EC16	1.80	0.828				
	EC17	1.18	0.814				
	EC18	1.46	0.789				
	EC19	1.96	0.790				
	EC20	1.45	0.815				
	EC21	1.99	0.832				
	EC22	1.42	0.834				
Circular economy	CE1	1.14	0.821	0.821	0.811	0.851	0.641
	CE2	1.22	0.871				
	CE3	1.66	0.781				
	CE4	1.16	0.801				
	CE5	1.87	0.788				
	CE6	1.10	0.855				
	CE7	2.06	0.778				
	CE8	2.41	0.814				
	CE9	2.21	0.795				
	CE10	1.17	0.829				
Government support	GS1	1.21	0.877	0.828	0.841	0.866	0.688
	GS2	2.33	0.868				
	GS3	1.15	0.891				
	GS4	1.61	0.852				
Starting camel-based entrepreneurial ventures	SCEV1	1.31	0.784	0.817	0.801	0.846	0.549
	SCEV2	2.48	0.821				
	SCEV3	1.12	0.788				
	SCEV4	1.03	0.769				
	SCEV5	1.29	0.802				

(continued)

Table 2. Continued

Construct	Item	VIF	Loading	Cronbach's alpha	Construct reliability Dillon-Goldstein (ρ_c)	Dijkstra-Henseler (ρ_A)	AVE
	SCEV6	1.57	0.814				
	SCEV7	2.21	0.781				
	SCEV8	1.33	0.799				
	SCEV9	1.18	0.785				
	SCEV10	1.41	0.808				
	SCEV11	1.25	0.792				
	SCEV12	1.08	0.773				
	SCEV13	1.49	0.816				

Note(s): VIF = variance inflation factor; AVE = average variance extracted.

resamples) used to ensure robust conclusions. Regarding *H3a*, the interaction between EO and the CE positively affected entrepreneurial culture ($\beta = 0.191$, $t = 2.26$, $p < 0.000$; 95% BCI: 0.012–0.268). This finding indicates that implementing CE practices strengthens the relationship between EO and developing a supportive entrepreneurial culture. Similarly, *H3b* was validated, revealing that entrepreneurial culture positively interacts with the CE to significantly enhance the initiation of camel-based entrepreneurial ventures ($\beta = 0.198$, $t = 4.73$, $p < 0.000$; 95% BCI: 0.047–0.347). This underscores that CE principles augment the efficacy of entrepreneurial culture in promoting venture creation in the long run.

H4a investigated the interaction between EO and GS, revealing a significant positive effect ($\beta = 0.151$, $t = 2.87$, $p = 0.001$; 95% BCI: 0.069–0.259). This finding suggests that GS enhances the impact of EO on cultural development. Furthermore, Hypothesis *H4b* confirmed that GS significantly affects the relationship between entrepreneurial culture and the initiation of camel-based entrepreneurial ventures ($\beta = 0.180$, $t = 3.48$, $p = 0.000$; 95% BCI: 0.118–0.291), indicating that favorable government conditions further strengthen the role of culture in promoting entrepreneurial activities. Collectively, these results highlight the critical moderating role of both CE initiatives and GS in reinforcing the connections between orientation, culture and entrepreneurial activities within the specific context of camel-based ventures in Saudi Arabia.

Understanding the subtle differences in how moderation analysis varies between high and low interaction levels can be complex, as the exact magnitude and nature of this effect may not be immediately evident from examining the coefficients. Dawson (2014) suggested addressing this challenge by incorporating an interaction plot into the analysis. Consequently, this study included interaction plots for all interactions to evaluate slope gradients.

Figure 3 demonstrates the interactions between EO, the CE and entrepreneurial culture. The figure shows that high CE engagement enhances the positive relationship between EO and culture, suggesting the key role of EO in fostering culture. When CE engagement is low, this relationship weakens and becomes slightly negative, indicating a constrained influence. These findings confirm that CE practices amplify the cultural impact of EO, highlighting the importance of sustainability strategies. Figure 4 depicts the interaction between entrepreneurial culture and the CE in camel-based entrepreneurial ventures. Strong engagement with the CE enhances the influence of entrepreneurial culture on venture establishment, whereas limited engagement diminishes this impact. Figure 4 shows the moderating effect of the CE on the relationship between entrepreneurial culture and camel-based businesses. These findings

Table 3. Descriptive statistics, correlation matrix and discriminant validity

Constructs	Mean	SD	1	2	3	4	5
1. Entrepreneurial orientation	0.460	0.474	<i>0.578</i>	0.744 [0.662;0.749]	0.392 [0.323;0.468]	0.678 [0.620;0.731]	0.197 [0.157;0.254]
2. Entrepreneurial culture	0.441	0.456	0.329	<i>0.861</i>	0.543 [0.490;0.607]	0.794 [0.758;0.827]	0.175 [0.156;0.239]
3. Circular economy	0.309	0.325	0.351	0.372	<i>0.559</i>	0.570 [0.510;0.631]	0.127 [0.103;0.203]
4. Government support	0.421	0.435	0.541	0.281	0.339	<i>0.662</i>	0.180 [0.152;0.247]
5. Starting camel-based entrepreneurial ventures	0.367	0.449	0.356	0.368	0.361	0.369	<i>0.642</i>

Note(s): SD = standard deviation; n.a = not applicable. Italic values on the diagonal are the square roots of the average variance extracted, shared between the constructs and their respective measures. Off-diagonal elements above the diagonal are the heterotrait–monotrait ratios of correlations (HTMT) and their respective confidence intervals at the 95% confidence level

highlight the need to align cultural and environmental sustainability factors with niche economic sectors.

Figure 5 illustrates the interaction between EO and GS in shaping the entrepreneurial culture. When GS is substantial, the relationship between EO and culture is significantly enhanced, suggesting that entrepreneurs are more successful in fostering a culture with GS. When support is limited, this relationship weakens, indicating difficulties in effecting cultural change without institutional backing. Figure 5 emphasizes the moderating role of GS in augmenting cultural outcomes of entrepreneurial intent. Figure 6 illustrates the interaction between entrepreneurial culture and GS for camel-based ventures. The graph shows that high GS positively correlates with entrepreneurial culture and venture initiation. In environments with a robust entrepreneurial culture, individuals are more likely to establish ventures when they receive GS. When support is minimal, the relationship between culture and venture creation becomes negligible, suggesting that cultural factors alone cannot stimulate ventures without institutional support. Figure 6 demonstrates the moderating role of GS in transforming cultural orientation into entrepreneurial endeavors.

5. Discussion and implications

In Saudi Arabia, enterprises centered around camels represent a unique intersection of cultural traditions and the nation’s economic progression. This study underscores the pivotal role of EO as a fundamental component in establishing and expanding camel-related businesses. Entrepreneurs who embrace innovation, proactivity and risk-taking can commercialize traditional sectors such as tourism, dairy, cosmetics and sports and transform them into catalysts for modern economic development in the region. This is significant as it illustrates that EO is a bridge between cultural heritage and market-driven innovation, directly aligning with Saudi Arabia’s Vision 2030 objective of diversifying the economy beyond the oil sector.

The primary finding of this study is the affirmation of the essential mediating role of entrepreneurial culture (EC). EO alone is insufficient in sectors deeply rooted in heritage unless supported by a culture that promotes entrepreneurial activities. The significance of this finding lies in demonstrating that cultural capital is not merely supplementary but integral to entrepreneurial success. EC fosters the norms, values and shared trust necessary for innovative ideas to be accepted, risks to be undertaken and collaborative efforts to flourish. This discovery addresses a longstanding gap in the EO–EC literature by illustrating that culture is not merely supportive but transformative in culturally entrenched industries,

Table 4. Structural path analysis: direct and indirect effects

Hypothesis	Direct effect	Std beta	Std error	t-value	p-value	BCI 95% LL	BCI 95% UL	Decision
H1	Entrepreneurial orientation → Starting camel-based entrepreneurial ventures	0.362	0.083	3.132	0.000	0.221	0.543	Supported
H2	Entrepreneurial orientation → Starting camel-based entrepreneurial ventures	0.274	0.091	2.831	0.000	0.027	0.163	Supported
Note(s): <i>n</i> = 147. Bootstrap sample size = 5,000. SE = standard error; LL = lower limit; CI = confidence interval; UL = upper limit 95% bias-correlated CI								

Table 5. Structural path analysis: interaction effects

Hypothesis	Structural path analysis: Interaction effect	Std beta	Std error	t-value	p-value	Bias and corrected bootstrap 95% CI		Decision
						BCI 95% LL	BCI 95% UL	
H3a	Entrepreneurial orientation X Circular economy → Entrepreneurial culture	0.191	0.079	2.26	0.000	0.012	0.268	Supported
H3b	Entrepreneurial culture X Circular economy → Starting camel-based entrepreneurial ventures	0.198	0.078	4.73	0.000	0.047	0.347	Supported
H4a	Entrepreneurial orientation X government support → Entrepreneurial culture	0.151	0.054	2.87	0.001	0.069	0.259	Supported
H4b	Entrepreneurial culture X government support → Starting camel-based entrepreneurial ventures	0.180	0.070	3.48	0.000	0.118	0.291	Supported

Note(s): $n = 147$. Bootstrap sample size = 5,000. SE = standard error; LL = lower limit; CI = confidence interval; UL = upper limit 95% bias-correlated CI

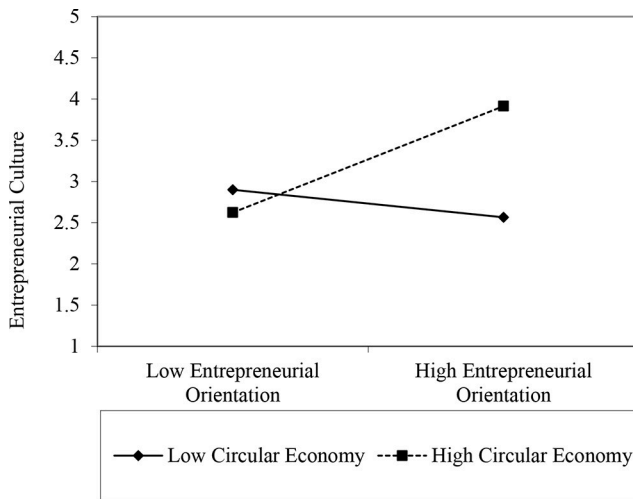


Figure 3. Interaction plot of entrepreneurial orientation and circular economy on the entrepreneurial culture

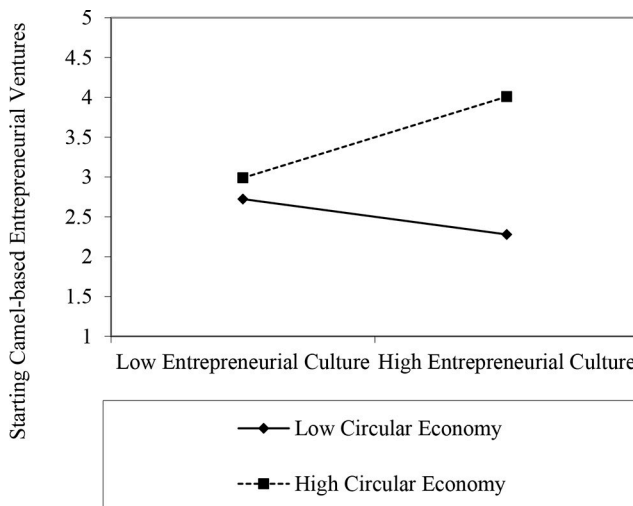


Figure 4. Interaction plot of entrepreneurial culture and circular economy on the starting camel-based entrepreneurial ventures

such as those centered around camels, transforming entrepreneurial potential into actualized ventures.

The CE and GS roles are equally important and are critical boundary conditions. The influence of CE highlights that sustainability is a fundamental driver of entrepreneurial legitimacy and long-term competitiveness rather than a secondary consideration. This is

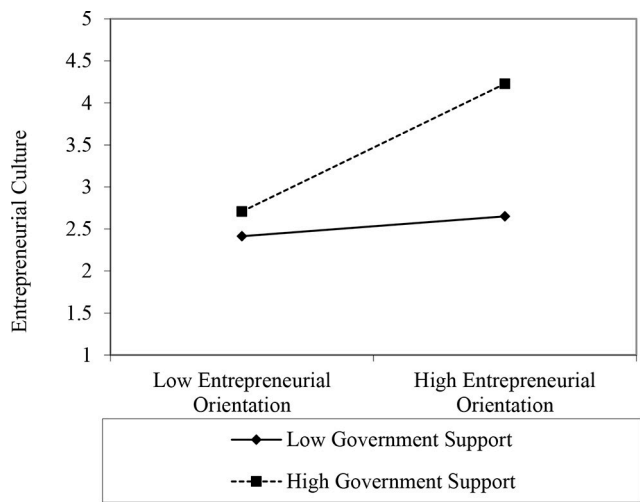


Figure 5. Interaction plot of entrepreneurial orientation and government support on the entrepreneurial culture

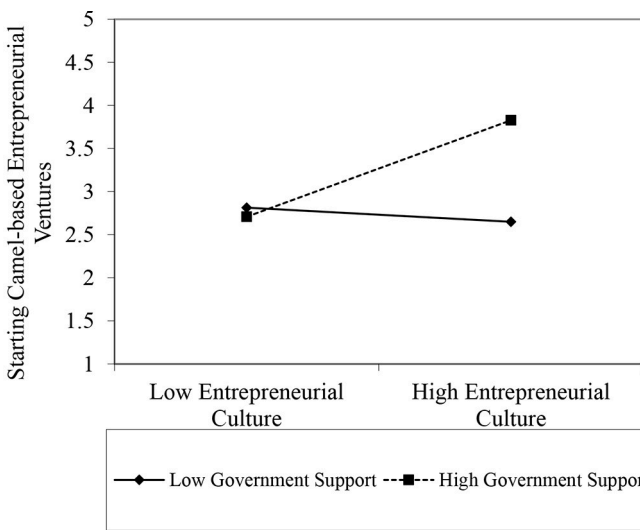


Figure 6. Interaction plot of entrepreneurial culture and government support on the starting camel-based entrepreneurial ventures

significant because it demonstrates that entrepreneurs who integrate CE practices – such as resource recycling, waste-to-value solutions and eco-friendly product design – establish ventures that are not only profitable but also resilient. These concepts have practical applications in the camel industry, such as converting waste into bioenergy, developing

recyclable packaging for milk products and using camel wool in eco-textiles. The significance of these practices lies in their capacity to transform camel-focused enterprises from being merely traditional to becoming globally relevant, thereby meeting the growing demand for sustainable and ethically produced products.

GS is pivotal in fostering entrepreneurial success. It is essential for legitimizing innovative business models, reducing uncertainty and equipping entrepreneurs with the necessary resources for their growth. Regulatory reforms, financial incentives, training programs and infrastructure investments mitigate barriers and shape the institutional framework determining whether entrepreneurship thrives or declines. In industries with deep-rooted heritage, where cultural significance is high but financial risk is considerable, GS ensures the strengthening of the entrepreneurial culture and alignment of ventures with national priorities. This insight is significant because it highlights the crucial role of institutional support in transforming entrepreneurial aspirations into sustainable achievements. Thus, these insights have theoretical, practical and contextual significance. Theoretically, they contribute to EO–EC research by demonstrating that entrepreneurial success is contingent on cultural and institutional factors, addressing a gap in existing studies that often consider these aspects in isolation. Practically, camel-based businesses exemplify how heritage sectors can be revitalized through innovation, sustainability and policy support. Contextually, camel entrepreneurship is not merely a cultural endeavor but a viable contributor to economic diversification and sustainable development. This supports the broader narrative that heritage-based sectors, when strategically supported, can serve as platforms for preserving traditions and generating modern economic value.

5.1 Theoretical and practical implications

This study substantially contributes to entrepreneurship theory by enhancing the understanding of EO in heritage-rich and non-Western contexts. While EO has been extensively examined in Western and technology-focused industries, its dynamics in culturally rooted and resource-constrained environments remain unexplored. By investigating EO in the context of camel-based enterprises in Saudi Arabia, this study demonstrates that EO is not an isolated concept but gains significance and momentum through the mediating influence of entrepreneurial culture (EC). EC, which comprises shared values, norms and cognitive frameworks, emerges as a pivotal mechanism that translates EO into tangible entrepreneurial actions. This finding underscores the importance of integrating entrepreneurship theories with sociocultural dimensions, expanding the EO literature beyond firm-centric or individualistic perspectives.

Incorporating the CE and GS as boundary conditions expands the theoretical framework of both dynamic capability and institutional theory. From the dynamic capability perspective, CE underscores how companies adapt their resources and practices to achieve sustainability, illustrating that innovation driven by EO can be augmented through environmentally adaptive strategies. From an institutional perspective, GS demonstrates that entrepreneurial outcomes are influenced not only by internal orientations but also by policy frameworks, legitimacy structures and government interventions. Thus, CE and GS exemplify the complexity of entrepreneurial ecosystems, wherein individual agency, cultural integration, sustainability demands and institutional support influence venture outcomes.

This study theoretically challenges the prevalent approach in EO research, which often regards context as a secondary consideration, by highlighting its essential role in EO implementation. By elucidating the interaction between EO and factors such as culture, sustainability and policy, this study expands the scope of EO theory from a primary focus on internal firm dynamics and market influences to a more comprehensive, ecosystem-based perspective. This novel viewpoint encourages future research to explore heritage-driven entrepreneurship across diverse cultural and industrial landscapes, fostering interdisciplinary

dialogue among fields such as entrepreneurship, sustainability studies, cultural economics and public policy. Ultimately, the findings enhance global EO scholarship by demonstrating that EO is not merely a strategic stance but a process deeply embedded in cultural and institutional contexts, influencing and being influenced by broader societal changes. Thus, this study contributes to a more diverse theorization of EO that considers various cultural and institutional contexts rather than presuming a universal Western or technology-driven model.

From a practical standpoint, this study provides timely and valuable insights for policymakers, entrepreneurs and support organizations that align with Saudi Arabia's Vision 2030. The findings suggest that achieving entrepreneurial success in traditional industries such as camel tourism, dairy, cosmetics and sports is not solely attributable to individual efforts but requires deliberate cultivation of supportive cultural norms, sustainability-oriented practices and institutional frameworks.

These findings highlight the imperative for policymakers to transition from focusing solely on financial incentives to promoting a comprehensive cultural transformation. This involves integrating entrepreneurship education across all educational levels, establishing mentorship networks connecting heritage entrepreneurs with inspirational figures and initiating media campaigns that elevate entrepreneurship to a respected career path. Investment in rural and regional infrastructure, such as transportation, digital platforms and market access centers, can significantly reduce barriers to expanding camel-based enterprises. Furthermore, policymakers can incorporate heritage-driven entrepreneurship into tourism strategies, positioning camel-focused businesses as integral components of cultural diplomacy and promoting national identity (Uzir *et al.*, 2020).

These findings underscore the necessity for governmental agencies and support organizations to incorporate CE principles into policy frameworks and support systems. Establishing sector-specific incubators for camel industries, facilitating access to eco-friendly and digital technologies and offering training in waste-to-value innovation could create new value chains (Salah *et al.*, 2023). Regulatory flexibility is also essential; adaptable licensing processes and supportive intellectual property frameworks can legitimize unconventional but sustainable business models. Government institutions can foster entrepreneurship and advance sustainability objectives by aligning incentives with CE practices.

This research underscores the strategic advantage for business owners in establishing ventures on three interconnected foundations: cultural authenticity, environmental responsibility and institutional alignment. Camel-based product-centered enterprises that leverage heritage narratives can distinguish themselves in the increasingly competitive global marketplace. Integrating sustainability practices, such as zero-waste processing, eco-friendly packaging and product life-cycle management, bolsters environmental credibility and prepares businesses for export (Hassan *et al.*, 2023b). By engaging in government initiatives and incubator programs, entrepreneurs can position themselves as key contributors to Saudi Arabia's economic diversification while attracting socially conscious investors and international partners. These insights demonstrate that camel-focused entrepreneurship can evolve into a globally competitive and sustainable industry when cultural capital, environmental innovation and institutional support are strategically aligned (Al Halbusi *et al.*, 2024a). Consequently, this study provides a roadmap for policymakers to create more inclusive ecosystems, support organizations to offer targeted interventions and support entrepreneurs in establishing resilient ventures that preserve tradition and foster modern economic growth.

5.2 Limitations and future research directions

While this study elucidates the interactions among EO, entrepreneurial culture (EC), CE and GS within the context of camel-based enterprises in Saudi Arabia, it is crucial to

acknowledge certain limitations. First, the model emphasizes internal and institutional factors influencing entrepreneurial activities, excluding other significant variables that could broaden the explanatory scope of future research. Subsequent studies should incorporate entrepreneurial self-efficacy, market orientation and perceived value creation to comprehensively understand venture creation's cognitive, strategic and customer-focused dimensions. In addition, social capital, access to finance and technological readiness could offer deeper insights into the ecosystemic facilitators and barriers camel-based entrepreneurs face (Abdelfattah *et al.*, 2023).

From a contextual perspective, this study is situated within the distinctive cultural and institutional frameworks of Saudi Arabia. Although this context is highly relevant, it may limit the generalizability of the findings to other settings. Future research should consider comparative studies across different regions or countries that integrate traditional industries into their national innovation agendas, such as the camel wool sector in Mongolia or specific regions in North Africa. Furthermore, incorporating demographic and psychosocial factors, such as gender, generational perspectives, tribal affiliations and entrepreneurial motivations (e.g. necessity versus opportunity-driven entrepreneurship), would provide a more comprehensive understanding of entrepreneurial activities in heritage-based contexts. In addition, future research could explore how digital transformation and AI adoption can enhance productivity, expand market access and improve sustainability in camel-focused enterprises. Using longitudinal designs and mixed-methods approaches would also strengthen causal inferences and offer deeper contextual insights into the development of these enterprises over time in a rapidly changing policy and economic environment.

Ethics statement

All procedures performed in studies involving human participants were by the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed consent

Informed consent was obtained from all individual participants included in the study.

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Corresponding author

Hussam Al Halbusi can be contacted at: Hussam.mba@gmail.com