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Chapter: Technological and Innovation-Driven Dimensions of Sustainable Development

UNVEILING THE DRIVERS OF COLLABORATIVE ENTREPRENEURSHIP AND ITS ROLE IN VALUE CO-CREATION

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Annotation. This study explores the environment of collaborative entrepreneurship in terms of its determinants and outcomes. Data were collected from 204 managers and specialists in renewable energy companies, and was analysed with Smart PLS. The results revealed that market dynamism and collaborative orientations significantly impact the perpetration of collaborative entrepreneurship. The study also found that relationship quality plays a vital mediating role in the impact of collaborative orientation on collaborative entrepreneurship. In addition, collaborative entrepreneurship was found to have a significant impact on value co-creation. The findings of this study enhance our understanding of the collaborative entrepreneurship environment, the mechanisms of its implementation, and how to measure its performance. It also enriches the knowledge of companies and experts interested in achieving collaborative entrepreneurship to deal with challenges and the accompanying opportunities that arise with market dynamism that are difficult to exploit individually.

Keywords: collaborative entrepreneurship, market dynamism, collaborative orientations, relationship quality, value co-creation, renewable energy companies.

JEL classification: L26, M14, O31.

Introduction

The considerable challenges facing organisations in highly unstable business environments necessitate collaboration at both regional and global levels to provide joint solutions to these contemporary challenges. Conventional models of individual or autocratic entrepreneurship based on internal organisational resources are facing profound transformations and revisions, where entrepreneurship is evolving into a more collaborative paradigm and shared value creation (Adomako, Nguyen, 2024). In light of this trend, smart organisations are moving towards collaborative entrepreneurship as a strategic choice that ensures their survival and prosperity, as well as their partners (Kusa, 2023; Liu *et al.*, 2023). In recent years, the concept and practices of collaborative entrepreneurship have gained a luster that attracts numerous companies, practitioners, and researchers,

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inspiring the collaborative orientation of innovation, risk-taking, proactivity, and working on joint projects to achieve shared benefits and advantages (Costa, Franco, 2024).

The journey towards collaborative entrepreneurship is not without its challenges. Because resource constraints are so prevalent, businesses have a challenge in maximising resources' accessibility and mobilisation while reducing their vulnerabilities (Letaifa, Goglio-Primard, 2016). Entrepreneurs imbued with this mindset recognise the inherent power of collaboration in driving innovation, fostering resilience, and unlocking untapped opportunities. Collaborative technologies offer unprecedented opportunities for enhanced connectivity, transcending geographical barriers, facilitating real-time communication, and streamlining collaborative processes (Alsmadi, Alzoubi, 2022; D'Angelo *et al.*, 2024). Traditional notions of resources ownership and control yield a more adaptable framework, wherein collaboration and alliances become fundamental to acquiring resources (Schaltegger *et al.*, 2018). The ability to forge symbiotic relationships characterised by trust, reciprocity, and mutual benefit becomes instrumental in overcoming today's business challenges. As such, nurturing high-quality relationships emerges as a strategic imperative, fostering resilience amidst uncertainty and volatility, where the strength of these relationships determines the extent to which value can be co-created and sustained (Kovanen, 2021).

Despite growing interest and enthusiasm surrounding collaborative entrepreneurship, there exists a critical gap in the literature that necessitates empirical investigation. The existing literature offers fragmented insights into the factors influencing the perpetration of collaborative entrepreneurship (Costa, Franco, 2024; Adomako, Nguyen, 2024). While individual studies have examined the roles of market dynamism, resource dependencies, and collaborative orientation in isolation, a comprehensive understanding of their combined impact remains elusive. Market dynamism is widely acknowledged as a key determinant of entrepreneurial behaviour (Buccieri, Park, 2022). Similarly, organisational learning has a central function in shaping viability and sustainability of entrepreneurial ventures (Brandi, Thomassen, 2021). Collaborative orientation is increasingly recognised as a critical driver of entrepreneurship (Etemad, 2022; Kusa, 2023). However, the interplay between these factors and their collective influence on the perpetration of collaborative entrepreneurship remains underexplored.

The literature lacks empirical exploration of the nuanced role of relationship quality and collaborative technology adoption in shaping the impact of collaborative orientation on collaborative entrepreneurship. Relationships are fundamental to successful collaboration, influencing trust, communication, and coordination among partners (Ratten, 2014; Perez-Encinas *et al.*, 2021). In addition, the adoption of collaborative technologies can facilitate and enhance collaborative endeavours by enabling seamless information sharing, coordination, and knowledge exchange (Etemad, 2022; D'Angelo *et al.*, 2024). While entrepreneurship is often touted as a vehicle for value creation, the extent to which collaborative entrepreneurship contributes to value co-creation and the mechanisms underlying this relationship require empirical validation. Without empirical insights, it is challenging to ascertain the efficacy of collaborative entrepreneurship as a means of value creation and its implications for various stakeholders.

These gaps in the literature necessitate empirical research answering the following questions:

Q1: Do market dynamism, resource dependencies, and collaborative orientation impact the perpetration of collaborative entrepreneurship?

Q2: Does collaborative entrepreneurship contribute to value co-creation?

Q3: To what extent relationship quality and collaborative technology adoption are important in the impact of collaborative orientation on collaborative entrepreneurship?

Answering these questions enhances the understanding of the collaborative entrepreneurship environment, develops mechanisms for its implementation, and measures its outcomes. It also enriches the knowledge of companies and experts interested in achieving entrepreneurship through collaborative strategies to deal with challenges and opportunities that are difficult to exploit individually.

1. Literature Review

Collaboration and entrepreneurship research have a long shared historical background. Collaborative entrepreneurship refers to a mode of entrepreneurial activity characterised by the joint efforts of multiple individuals, organisations, or entities to identify and pursue opportunities, innovate, and create value through cooperative endeavors (Ribeiro-Soriano, Urbano, 2009; Patrício *et al.*, 2024). Unlike traditional forms of entrepreneurship that often focus on individual or single-entity initiatives, collaborative entrepreneurship involves collaboration among diverse stakeholders, including entrepreneurs, start-ups, established companies, investors, government agencies, non-profit organisations, and communities (Adomako, Nguyen, 2024). This collaborative approach allows participants to leverage complementary resources, expertise, and networks, leading to synergistic outcomes that may not be achievable independently (Franco, Haase, 2013; Ojiaku *et al.*, 2020). Collaborative entrepreneurship encompasses various forms of collaboration, such as strategic alliances, joint ventures, co-creation partnerships, ecosystem collaborations, and open innovation initiatives, all aimed at fostering innovation, scalability, and sustainability while addressing complex societal challenges and market needs (Rezazadeh, 2017; Costa, Franco, 2024).

The term collaborative entrepreneurship did not emerge from a specific point in time or from a model that was applied in a specific study. This entrepreneurial concept emerged gradually with the development of economic and administrative thought in certain contexts over recent decades, with its roots in broader frameworks, such as social entrepreneurship and the collaborative economy (Campbell *et al.*, 1995; Ribeiro-Soriano, Urbano, 2009). This may explain the scarcity of studies devoted to exploring the nuance, environment, and performance of collaborative entrepreneurship, compared to its increasing importance and its handling in scattered pieces in the literature. However, most of the previous studies on collaborative entrepreneurship were conducted in the context of education. In fact, the first study to directly use the term “collaborative entrepreneurship” in its title was in the field of education (Campbell *et al.*, 1995).

Early studies were concerned with defining collaborative entrepreneurship and how to distinguish it from other types of entrepreneurship, such as individual entrepreneurship or institutional entrepreneurship (Miles *et al.*, 2006; Kenney, Mujtaba, 2007; Ribeiro-Soriano, Urbano, 2009). Studies discussing the opportunities and challenges facing this type of entrepreneurship emerged (Rocha, Miles, 2009; Ratten, 2014). The literature shows that some scholars have been interested in exploring the performance of collaborative entrepreneurship (Ojiaku *et al.*, 2020; Adomako, Nguyen, 2024). Although the literature indicates that the objective of this entrepreneurship is to achieve co-creation partnerships and collaborative value (Franco, Haase, 2013; Patrício *et al.*, 2024), no prior research sought to explore its role in value co-creation as an outcome and a performance indicator of its success. Value co-creation expresses the process of cooperation between independent entities with common interests to generate joint benefits, rather than each party having only individual efforts and benefits (Re, Magnani, 2022; Walidayni *et al.*, 2023). This type of cooperation is achieved when the maximum benefits are gained from the resources, knowledge, skills, and capabilities of the participants seeking to achieve the outcomes that exceed what could be achieved if each party worked individually (Siaw, Sarpong, 2021).

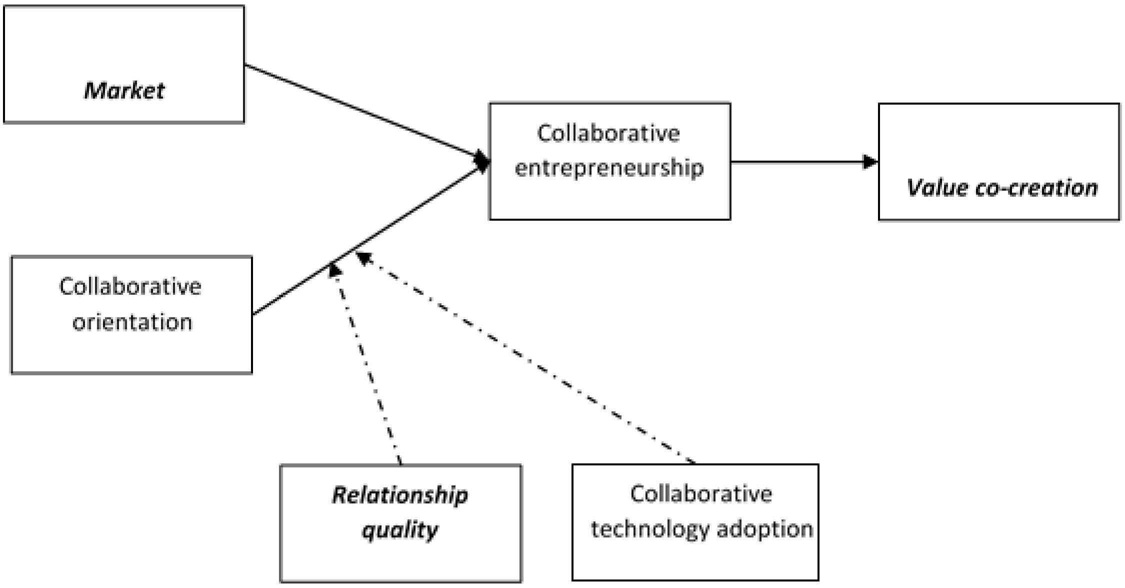
Understanding the collaborative entrepreneurship environment is a challenging area that has lacked research and attention in previous studies. There are few previous studies on the determinants of adopting collaborative entrepreneurship, with a lack of focus in their research. For example, Rezazadeh (2017) investigated how business model innovation determines collaborative entrepreneurship attitudes. Franco and Haase (2013) examined the impact of firm resources and entrepreneurial orientation. Minhas and Sindakis (2022) studied the role of social cohesion. Rezazadeh and Nobari (2018) found that entrepreneurial attitudes, compatibility, complementarity, and interpersonal attraction significantly contribute to cooperative entrepreneurship. Costa and Franco (2024) focused on the investigation of the importance of cooperation networks in enabling collaborative entrepreneurship. In addition, Elert and Henrekson (2021) chose to focus on the impact of institutional pressures on adopting this collaborative paradigm of entrepreneurship.

The challenges imposed by accelerating decreases in resources, changing customer needs and preferences, and evolutionary leaps in technology and digital transformations have created a dynamic environment that requires collaboration for entrepreneurship. Market dynamism is the main driver of business strategies that reflect their ability to adapt to the turbulent changing business environments and competitive challenges through innovation and proactivity (Westman *et al.*, 2023; Parra Requena *et al.*, 2023). Organisations with a collaborative orientation recognise the benefits of leveraging diverse perspectives, resources, and capabilities through collaborative efforts (Vásquez, Rivas, 2021; Minhas, Sindakis, 2022). This orientation fosters deeper and more strategic partnerships aimed at achieving common goals, addressing complex challenges, and maintaining long-term relationships to enhance competitiveness, adaptability, and sustainability in today's interconnected business landscape (Chou *et al.*, 2017; Elert, Henrekson, 2021). In this context, relationship quality can decisively impact the dynamics and outcomes of interactions and collaborations, influencing factors such as satisfaction, loyalty, cooperation, and performance. It encompasses various dimensions, including trust, mutual respect, communication effectiveness, cooperation, commitment, and shared goals and values.

A review of prior research reveals a lack of studies exploring any roles of market dynamism, collaborative orientation, and relationship quality in shaping collaborative entrepreneurship. Although scholars emphasise the role of innovative digital solutions in enhancing collaboration between companies (Lin, Maruping, 2022; Holopainen *et al.*, 2024) and leveraging entrepreneurial efforts (Lin, Maruping, 2022; Xiong *et al.*, 2024), there is an observable lack of research on the potential power of these collaborative digital technologies in enabling entrepreneurship. These gaps need to be addressed to enhance the understanding of the collaborative entrepreneurship environment, develop mechanisms for its implementation, and measure its outcomes.

2. Research Model and Hypotheses

The research model (see *Figure 1*) was designed to represent the relationships examined in the study to bridge the gaps in the literature. It posits that market dynamism and collaborative orientation play a significant role in harnessing collaborative entrepreneurship. It also proposes a significant moderating role of relationship quality and collaborative technology adoption in the potential impact of collaborative orientation on collaborative entrepreneurship. Besides, this study posits a significant contribution of collaborative entrepreneurship to value co-creation.



Source: created by the authors.

Figure 1. **Research Model**

2.1 The Impact of Market Dynamism

Market dynamism is the main driver for launching entrepreneurial strategies and projects in order to respond to the uncertainty and continuous, regular, or unpredictable changes in the market (Siaw, Sarpong, 2021; Westman *et al.*, 2023). The challenges and the accompanying opportunities arising with market dynamism often need to be confronted by forming partnerships and alliances with other actors to develop innovative solutions and achieve common goals (Parra Requena *et al.*, 2023; Karpacz, Wojcik-Karpacz, 2024). These companies can collaborate to develop products and services that better respond to market requirements and needs. Scholars confirm that traditional business models and strategies are not sufficient to deal with the high-speed market dynamics, which requires the adoption of entrepreneurial collaborative strategies (Buccieri, Park, 2022; Crick *et al.*, 2024). Market dynamism resulting from easy entry into competition requires business partners to collaborate to build innovative value chains that support their competitiveness and superiority and make it challenging for new competitors to enter (Parra Requena *et al.*, 2023). The continuous changes in customers' lifestyles, needs, and preferences and their implications for supply and demand can open up new business opportunities or lead to the extinction of old business models (Rezazadeh, 2017). These market shifts push companies to adopt proactive strategies based on collaboration and alliances with business partners to ensure rapid response (Adomako, Nguyen, 2024). Market fluctuations force companies to build collaborative strategies to take entrepreneurial initiatives in which partners share in taking the risks associated with these initiatives (Patterson, 2020; Lin, Maruping, 2022). Therefore, the following hypothesis is proposed:

H1: Market dynamism significantly contributes to adopting collaborative entrepreneurship.

2.2 The Impact of Collaborative Orientation

Collaborative orientation represents the intention, desire, and ability of companies to partner, coordinate, and share resources, knowledge, and competencies with others to achieve common goals (Franco, Haase, 2013). It is considered a fundamental pillar in teamwork, integration, and building collaborative strategies (Kusa, 2023; Costa, Franco, 2024). This orientation manifests in fostering open communication and actively seeking opportunities for collaboration, partnership, and entrepreneurship (Franco, Haase, 2013; Khan *et al.*, 2022). It promotes the transparent and regular exchange of information about goals, challenges, potential risks, best practices, and problem-solving. Collaborative orientations include a set of values and practices that provide a viable basis for interaction among collaborators, such as sharing goals and challenges, joint planning, joint initiatives and ventures, financing, sharing resources and capabilities, research and development, collaboration in training, and sharing costs and risks (Rocha, Miles, 2009; Ceesay *et al.*, 2024). Applying these collaborative values and practices is essential to expand business, enhance innovation capacity, and develop new products or services, enabling collaborators to achieve outcomes that surpass what could be accomplished individually. These principles and values represent the essence of collaborative entrepreneurship, which transforms the collaborative orientation into strategic entrepreneurship that achieves the goals of the participants fairly (Kusa, 2023; Xiong *et al.*, 2024). According to existing studies, collaborative orientation between companies fosters an environment conducive to the exchange of innovative ideas, the development of new business processes, the improvement of supply chains, and the creation of entrepreneurial solutions that distinguish them in the market (Elert, Henrekson, 2021; Adomako, Nguyen, 2024). Consequently, the following hypothesis is proposed:

H2: Collaborative orientation significantly contributes to the adoption of collaborative entrepreneurship.

2.3 The Mediating Impact of Relationship Quality

The quality of the relationship has always been considered the basis for launching and sustaining collaboration (Dai, 2022; Hani *et al.*, 2022). Scholars have described the quality of relationships as a main determinant of collaboration success (Kovanen, 2021; Masitenyane *et al.*, 2023). Relationship quality includes dimensions such as trust, effective communication, mutual respect, and commitment as indispensable requirements for its achievement (Dai, 2022; Masitenyane *et al.*, 2023). Collaboratively oriented entities need to develop high-quality relationships to build their collaborative strategies and achieve their goals. Building these strong relationships is a sign of endorsement of this orientation and an actionable indicator of transforming it into effective collaboration. Focusing a collaborative orientation on achieving common goals enhances collaborators' sense of collective commitment to achieving success and motivates parties to work harder to realising these goals (Patterson, 2020). The success and sustainability of collaborative entrepreneurship depend on the strength and resilience of collaborative relationships and partnerships (Anwar, 2023; Giraldi *et al.*, 2024). Open communication is a cornerstone of entrepreneurship (Letaifa, Goglio-Primard, 2016). Studies confirm that fostering a culture of trust, mutual respect, and reciprocity among partners lays the foundation for collaborative entrepreneurship (Gottfredson *et al.*, 2022; Re, Magnani, 2022). Relationships built on trust, commitment, and open communication support agility and accelerate shared decision-making, which supports the implementation of proactive strategies to adapt to new challenges and capitalise on emerging opportunities. Accordingly, the following hypothesis is proposed:

H3: Relationship quality significantly moderates the impact of collaborative orientation on collaborative entrepreneurship.

2.4 The Mediating Impact of Collaborative Technology Adoption

Companies with a strong collaborative orientation are more inclined to adopt and leverage collaborative technologies as enablers of their collaborative activities and interactions (Steininger, 2019; Xiong *et al.*, 2024). Collaborative orientation is the basis for the integration and utilisation of collaborative technologies within entrepreneurial ventures (Zoppelletto, Orlandi, 2022; Zhang, Hao, 2024). As ventures embrace a collaborative mindset and seek to leverage diverse resources and capabilities through partnerships, the adoption of collaborative technologies becomes essential for facilitating communication, coordination, and knowledge sharing among partners (Zabaikin *et al.*, 2020; Zaghdoud, 2025). The impact of collaboration-enabled technology on collaborative entrepreneurship is well documented. Digital transformations have effectively contributed to shaping collaborative leadership by enhancing effective communication and knowledge sharing, reducing coordination costs, fostering innovation through virtual collaboration, and accelerating joint processes to access information (Satalkina, Steiner, 2020; Xiong *et al.*, 2024). By harnessing digital platforms and communication tools, entrepreneurial companies can enhance collaboration transparency, facilitate real-time information exchange, and foster collaboration across dispersed teams and networks (Alsmadi *et al.*, 2023). Collaborative technology adoption enables businesses to overcome geographical barriers, streamline processes, and enhance collaboration effectiveness, thereby amplifying the impact of their collaborative orientation on the execution and success of collaborative entrepreneurship initiatives (Satalkina, Steiner, 2020; Arya *et al.*, 2024). Thus, the following hypothesis is proposed:

H4: The adoption of collaborative technology significantly moderates the impact of collaborative orientation on collaborative entrepreneurship.

2.5 Collaborative Entrepreneurship and Value Co-Creation

Collaboration provides a platform for stakeholders to engage in co-creation activities, where they contribute their unique insights, resources, and expertise towards common objectives (Karami, Read, 2021; Chandna, Salimath, 2022). Collaborative entrepreneurship fosters partnerships and alliances that leverage diverse perspectives, resources, and capabilities to generate innovative solutions and experiences (Re, Magnani, 2022; Liao, Li, 2023). Unlike traditional forms of entrepreneurship that may prioritise individual initiatives and transactions, collaborative entrepreneurship emphasises collaboration and collective action among stakeholders, including entrepreneurs, customers, suppliers, and communities (Zabaikin *et al.*, 2020; Wei *et al.*, 2024). Collaborative entrepreneurship adopts meaningful and mutually beneficial relationships among stakeholders (Bonamigo, Frech, 2021; Chandna, Salimath, 2022). By engaging in collaborative ventures, entrepreneurs can tap into the collective intelligence, creativity, and networks of their partners, enabling them to co-create value that transcends what could be achieved independently (Inada, 2024). Collaborative entrepreneurship encourages an ecosystem approach to value creation, wherein stakeholders collaborate across sectors, industries, and disciplines to address complex challenges and seize market opportunities (Siaw, Sarpong, 2021). This collaborative mindset promotes openness, transparency, and mutual trust among participants, fostering a culture of collaboration and innovation that underpins value co-creation efforts. Through collaborative entrepreneurship, entrepreneurs can engage customers as active participants in soliciting feedback, co-designing solutions, and tailoring offerings to meet evolving needs and preferences (Chandna, Salimath, 2022; Solaz *et al.*, 2024). Consequently, the following hypothesis is proposed:

H5: Collaborative entrepreneurship has a significant impact on value co-creation.

3. Research Methodology

3.1 Instrument Development

This empirical study seeks to assess its research model and test the hypotheses by collecting data by utilising a questionnaire. The items of the instrument were derived from prior research on collaborative entrepreneurship, collaborative orientation, market dynamism, relationship quality, collaborative technology adoption, collaborative technology adoption, and value co-creation. The mentioned sources are provided in *Table 1.*

Table 1. Measurement Sources

Variables	References
Market dynamism	Buccieri, Park, 2022; Parra Requena *et al.*, 2023.
Collaborative orientation	Kusa, 2023; Kusa, 2025.
Collaborative entrepreneurship	Rocha, Miles, 2009; Costa, Franco, 2024.
Relationship quality	Dai, 2022; Masitenyane *et al.*, 2023.
Collaborative technology adoption	Zoppelletto, Orlandi, 2022; Zhang, Hao, 2024.
Value co-creation	Al-Omoush *et al.*, 2023; Knobel *et al.*, 2024.

Source: created by the authors.

The questionnaire was reviewed by three experts in entrepreneurship, collaborative information technology, and collaboration management. The experts revised the measurements for their relevance, clarity, and consistency. The questionnaire included 24 items, as presented in *Table 2*.

Participants responded to the questionnaire by indicating the extent of their agreement with each item using a 5-Likert scale. However, the common method bias (CMB) analysis of Kock (2015) revealed that VIFs for all items are less than the threshold of 3.0, concluding that CMB is not an issue in this study.

Table 2. The Questionnaire

Variables	Codes	Questionnaire items
Market dynamism	MD1	My company operates in an industry marked by swift shifts in consumer preferences and market trends.
	MD2	Competitors frequently enter and exit the market, leading to fluctuations in market share
	MD3	Customer demands and expectations change frequently, influencing our product/service development and delivery strategies.
	MD4	Economic conditions, such as inflation and recession, have a notable effect on our business performance.
Collaborative orientation	CO1	Collaboration is ingrained in our organisational culture and values.
	CO2	Our leadership actively promotes a collaborative mindset among employees.
	CO3	Our firm invests in resources and initiatives to facilitate collaboration with business partners.
	CO4	Collaboration with stakeholders is seen as essential for adapting to changes in the business environment.
Collaborative entrepreneurship	CE1	Our firm actively seeks opportunities for collaborative ventures and partnerships.
	CE2	Our firm fosters an entrepreneurial culture that encourages risk-taking and innovation through collaboration.

Table 2 *(continuation)*. The Questionnaire

	CE3	Our organisational structure facilitates proactiveness in collaborative ventures.
	CE4	Our firm encourages employees to think creatively and entrepreneurially in collaborative settings.
Relationship quality	RQ1	Our firm prioritises building and maintaining strong relationships with stakeholders.
	RQ2	We have established processes for resolving conflicts and addressing concerns in relationships with stakeholders.
	RQ3	Our firm values open and honest communication in all relationships.
	RQ4	Our leadership leads by example in demonstrating a commitment to relationship-building.
Collaborative technology adoption	CTI1	Our firm embraces technology as a means to enhance collaboration and productivity.
	CTI2	We measure the impact of technology adoption on collaboration effectiveness and efficiency.
	CTI3	Collaborative technologies are integrated into our workflow and business processes.
	CTI4	Our leadership champions the importance of collaborative technology adoption as a competitive advantage for our firm.
Value co-creation	VC-C1	Our organisation believes in creating value through collaboration with suppliers and partners.
	VC-C2	We actively seek feedback from customers to co-create better solutions.
	VC-C3	Our firm involves external stakeholders in the product or service development process.
	VC-C4	Our firm has mechanisms in place to ensure mutual value creation in partnerships.

Source: created by the authors.

3.2 Data Collection and Sampling

The renewable energy sector is an opportune population for an empirical study on collaborative entrepreneurship. The renewable energy sector is undergoing a major transformation worldwide due to the increasing focus on sustainability and environmental protection. Challenges facing the renewable energy sector, such as financing, advanced technologies, and large-scale transformations, require strategic collaboration between various stakeholders (Alsmadi *et al.*, 2023). This introduces a significant scope for collaborative entrepreneurship, where collaborative projects and initiatives can achieve greater impact in the transition to clean and sustainable energy sources. Renewable energy technologies are evolving rapidly, requiring continuous innovation. Collaboration between start-ups, business partners, governments, and local communities can effectively contribute to the development and scaling up of collaborative entrepreneurship. Therefore, renewable energy companies in Jordan were targeted as a population for data collection.

More than 600 companies are operating in the renewable energy sector in Jordan. There is insufficient information on the renewable energy sector in Jordan. Therefore, various websites interested in this sector were consulted for the top companies in this sector. Twenty companies were selected from different lists of top renewable energy companies and start-ups. After contacting these companies, 11 of them agreed to participate in the study. It was agreed with the companies to send a cover letter explaining the purpose of the study and ensuring the privacy of the information collected and the anonymity of the participants. The letter included a copy of the questionnaire and a link to an electronic version the questionnaire. The sample included managers and specialists in these companies. The data collection extended from 6 January to 15 February 2025. Two-hundred and four valid completed surveys were collected for analysis. The profile of participants is presented in *Table 3*.

Table 3. The Participating Companies and Respondents

Companies	**No**	**%**	Respondents	**No**	**%**
Renewable energy type			***Functional unit***		
Solar energy	6	55	***Executive management***	**34**	**17**
Wind energy	**3**	27	**Production and supply**	**32**	**16**
Bioenergy	**2**	18	**Design and engineering**	**28**	**14**
Firm size			**Installation and maintenance**	**25**	**12**
>250 employees	**02**	18	**Marketing and sales**	**21**	**10**
250-500 employees	**06**	55	**Finance**	**18**	**09**
<500 employees	**03**	27	**Research and development**	**14**	**07**
Firm age			**Sustainability and environmental affairs**	**10**	**05**
<5	***04***	36	**Public relations and partnerships**	**9**	**04**
5-10	***05***	45	***Others***	**13**	**06**
>10	***02***	18	***Experience***		
Total	***11***	***100***	**>10 years**	043	21
			10-20 years	**113**	**49**
			<20 years	051	25
			Gender		
			Male	131	64
			Female	073	36
			Total	***204***	***100***

Source: created by the authors.

4. Data Analysis

4.1 Research Model Assessment

Table 4 includes the outcomes of testing the reliability and validity of the measurement scale. The factor loading for the vast majority of items has exceeded 0.6, the acceptable level, except for one item from market dynamism (MD3) and collaborative technology adoption (CTI2), which have been excluded from the analysis (Gefenb*et al.*, 2000). All variables demonstrated acceptable reliabilities, where Composite Reliability (CR) is > 0.7. Similarly, the Average Variance Extracted (AVE) confirmed the validity of convergence, exceeding 0.7 for all constructs (Fornell, Larcker, 1981). Also, all variables showed adequate constant internal consistency, where Cronbach's alpha value exceeded 0.7 for all variables.

Table 4. Measurement Model

Variables	**Cronbach's alpha**	**CR**	**AVE**
Collaborative entrepreneurship	0.784	0.817	0.613
Collaborative technology adoption	0.754	0.759	0.664
Collaborative orientation	0.853	0.870	0.691
Market dynamism	0.720	0.735	0.630
Relationship quality	0.833	0.890	0.653
Value co-creation	0.769	0.779	0.596
Collaborative entrepreneurship	0.784	0.817	0.613

Source: created by the authors.

To ensure that the variables in the research model are different and not overly correlated with each other, the Fornell-Larcker (1984) test was used. The results revealed that the AVEs square roots are above the correlation coefficient between the variables, which confirms the discriminant validity criterion of the measurement scale.

Table 5. Discriminant Validity

N.	**Variables**	***1***	***2***	***3***	***4***	***5***	***6***
1	Collaborative entrepreneurship	0.783					
2	Collaborative technology adoption	0.358	0.815				
3	Collaborative orientation	0.663	0.469	0.831			
4	Market dynamism	0.576	0.449	0.659	0.794		
5	Relationship quality	0.487	0.547	0.528	0.395	0.808	
6	Value co-creation	0.496	0.361	0.502	0.589	0.407	0.772

Source: created by the authors.

4.2 Hypotheses Testing

Smart PLS analysis is shown in *Figure 2*. The output demonstrates that the direct impact of market dynamism, collaborative orientation, and the moderating role of relationship quality explain 54.5% of the variances in collaborative entrepreneurship. It also shows that collaborative entrepreneurship explains 23.6% of the variances in value co-creation.

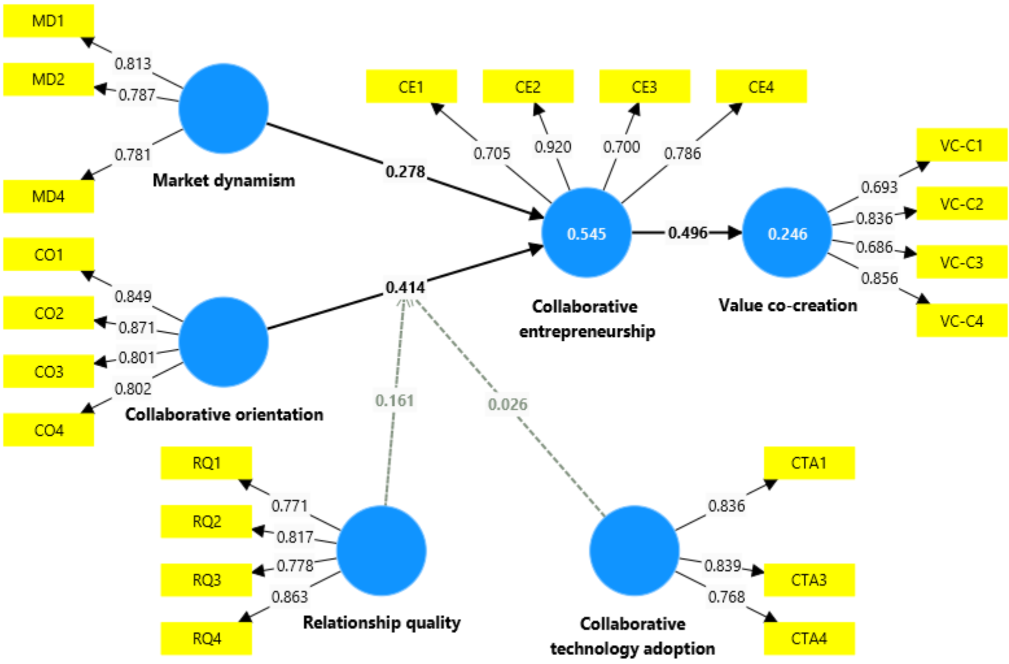


Figure 2. **Path Analysis**

Table 6 provides more details, showing that market dynamism (H1) and collaborative orientation (H2) significantly contribute to the adoption of collaborative entrepreneurship.

Table 6. Hypotheses Testing

H	Paths	β	T value	Sig.	The result
1	Market dynamism -> Collaborative entrepreneurship	0.278	4.370	0.000	**Accepted**
2	Collaborative orientation -> Collaborative entrepreneurship	0.414	5.601	0.000	**Accepted**
3	Relationship quality x Collaborative orientation -> Collaborative entrepreneurship	0.161	3.019	0.003	**Accepted**
4	Collaborative technology adoption x Collaborative orientation -> Collaborative entrepreneurship	0.026	0.433	0.665	**Rejected**
5	Collaborative entrepreneurship -> Value co-creation	0.496	8.237	0.000	**Accepted**

Source: created by the authors.

The results confirm that relationship quality significantly moderates the impact of collaborative orientation on collaborative entrepreneurship (H3). Simultaneously, the results do not support the moderating impact of adopting collaborative technology (H4) on the relationship between collaborative orientation and collaborative entrepreneurship. In addition, this study found that collaborative entrepreneurship significantly impacts value co-creation (H5).

5. Discussion

This study found that market dynamics significantly contribute to collaborative entrepreneurship. This is consistent with studies confirming that entrepreneurial strategies are a response to uncertainty and continuous fluctuations in markets (Siaw, Sarpong, 2021; Westman *et al.*, 2023). The scholars' perspective on the role of market dynamism in forming partnerships and alliances to develop innovative solutions in responding to dynamic market requirements and needs is also supported (Karpacz, Wojcik-Karpacz, 2024; Nobanee *et al.*, 2024). Moreover, scholars have confirmed that the challenges arising from the continuous change in the lifestyle of societies and the changing needs and expectations of customers lead companies to collaborate with other actors in building proactive strategies and taking entrepreneurial initiatives to ensure agile responses (Patterson, 2020; Lin, Maruping, 2022).

The findings of the study indicate that collaborative orientations are a significant factor in collaborative entrepreneurship. This finding aligns with studies that have described collaborative orientation as a fundamental pillar of building collaborative strategies (Kusa, 2023; Costa, Franco, 2024). The present study corroborates earlier research (Rocha, Miles, 2009; Ceesay *et al.*, 2024) which demonstrated that the issue under investigation is consistent with its role in empowering interaction among collaborators, collaborative problem-solving, sharing goals and challenges, joint initiatives and ventures, sharing resources and capabilities, and sharing risks. Studies confirm that collaborative orientation fosters exchanging innovative ideas and creating entrepreneurial solutions that distinguish collaborators in the market (Elert, Henrekson, 2021; Adomako, Nguyen, 2024).

The results showed that the quality of relationships has a significant moderating impact on the association of collaborative orientations with collaborative leadership. This finding agrees with the importance of relationship quality in launching and sustaining collaboration between companies and achieving their shared goals (Dai, 2022; Raman *et al.*, 2025). It is also in line with the importance of strength and long-term resilience of collaborative relationships in the success and sustainability of collaborative entrepreneurship as explained by Anwar (2023) and Giraldi *et al.* (2024). The literature has described open communication, the culture of trust, mutual respect, and reciprocity as a foundation for collaborative entrepreneurship (Gottfredson *et al.*, 2022; Re, Magnani, 2022).

The results did not find a significant moderating role of collaborative technology adoption in the transformation of collaborative orientation into collaborative entrepreneurship. Although further analysis confirms that the adoption of collaborative technology has a significant direct impact on collaborative entrepreneurship, this result can be justified in multiple ways. Although collaborative technology is important in collaborative entrepreneurship, there are other more important variables, such as organisational or cultural factors, in transforming collaborative desires and intentions into collective entrepreneurial action. The moderating effect of relationship quality implies that collaborative orientation depends more on human-based factors such as trust, commitment, and communication among the leadership of companies, the factors that cannot be directly influenced by technology. While orientations represent a mindset, attitudes, or tendencies that direct the behaviour of companies toward common entrepreneurship goals, it seems that collaborative technology is an orientation-independent technical tool for planning and implementing collaborative entrepreneurship requirements.

It was found that collaborative leadership has a decisive impact on value co-creation. Scholars confirm that productive collaboration enables collaborators to engage in collaborative activities that contribute to achieving common goals (Karami, Read, 2021; Chandna, Salimath, 2022). This also aligns with studies that have confirmed the importance of adopting meaningful and mutually beneficial relationships among stakeholders as critical success factors of collaborative entrepreneurship (Bonamigo, Frech, 2021; Chandna, Salimath, 2022). The literature has discussed the urgent requirement of collaborative entrepreneurship to engage customers in co-creation activities and tailoring offerings to meet their evolving needs and preferences, which achieves benefits for both parties (Chandna, Salimath, 2022; Walidayni *et al.*, 2023).

6. Implications

6.1 Theoretical Implications

This empirical study aimed to address the gaps in collaborative entrepreneurship research, contributing significantly to the related literature and theory. By examining the interplay between market dynamism and collaborative orientation, the study enriches researchers' understanding of the contextual determinants of collaborative entrepreneurship. By empirically assessing the impact of these variables on collaborative entrepreneurship, valuable insights into how external market conditions and organisational orientation towards collaboration shape entrepreneurial behaviours and outcomes are provided. This contribution enhances theoretical frameworks by elucidating the complex interactions between environmental factors and organisational characteristics in shaping collaborative entrepreneurial activities.

The study also investigated the role of collaborative entrepreneurship in value co-creation, addressing a significant literature gap in exploring the evaluation of its performance. This study succeeded in enhancing the integration between entrepreneurship and value creation theories by linking them to the collaboration theory. By empirically assessing the role of collaborative entrepreneurship in value co-creation, this study offers empirical evidence to support theoretical propositions regarding the importance of collaboration in generating innovative and proactive solutions and experiences. This contribution extends the understanding of value creation beyond traditional firm-centric models to encompass broader collaborative ecosystems involving multiple stakeholders.

The exploration of the moderating impacts of relationship quality and collaborative technology adoption on the association between collaborative orientation and collaborative entrepreneurship provides many theoretical insights that serve the theories of these variables. By empirically assessing the importance of relationship quality and collaborative technology adoption in facilitating collaboration and enhancing entrepreneurial outcomes, the study advances theoretical understanding of the mechanisms underlying effective collaborative entrepreneurship. This contribution enhances scholarly discourse by elucidating the processes through which collaborative orientation translates into successful collaborative entrepreneurship, highlighting the critical role of relational dynamics. Moreover, by examining the extent to which relationship quality and collaborative technology adoption mediate the relationship between collaborative orientation and collaborative entrepreneurship, the study provides nuanced insights into the conditions under which collaboration is most effective in driving entrepreneurial success. The lack of a statistically significant moderating role of collaborative technology in the relationship between collaborative orientations and collaborative entrepreneurship provides important insights that serve the development of theories of collaborative orientations and a deeper theoretical understanding of the role of collaborative technology in the framework of entrepreneurship.

6.2 Practical Implications

This study offers significant practical contributions to organisations, leaders, and policymakers alike. Actionable insights into the determinants supporting or undermining the success of collaborative entrepreneurship initiatives are provided for organisations and managers. By understanding how market dynamism and collaborative orientation impact the perpetration of collaborative entrepreneurship, organisations can tailor their strategies and allocate resources more effectively. For instance, firms operating in highly dynamic markets may need to prioritise building collaborative partnerships to enhance adaptability and innovation capabilities.

Similarly, insights into the role of relationship quality can guide organisations in fostering strong partnerships and leveraging digital tools to enhance collaboration effectiveness.

The study introduces the contribution of collaborative entrepreneurship to value co-creation, offering real-world implications for businesses striving for innovation and creating value through collaboration. By demonstrating the relationship of collaborative entrepreneurship with value co-creation, this study underscores the importance of fostering collaborative ecosystems and partnerships for companies working towards enhancing their competitiveness and relevance in today's interconnected business environments. Managers can use these findings to justify investments in collaborative ventures, emphasising the potential for generating innovative solutions and experiences that resonate with customers and stakeholders.

The study clarifies the importance of relationship quality in the impact of collaborative orientation on collaborative entrepreneurship. This insight is particularly valuable for policymakers and organisations seeking to foster a conducive environment for collaborative entrepreneurship. Understanding the determinants and outcomes of collaborative entrepreneurship enables policymakers to design more innovative policies and practical initiatives that promote collaboration, nurture high-quality relationships, and support the adoption of collaborative technologies that have a direct impact on this kind of entrepreneurship. Similarly, organisations can implement measures to enhance relationship-building capabilities and invest in technologies that facilitate collaboration and communication among partners.

Conclusions

The emergence of collaborative entrepreneurship as a strategic approach in current dynamic business landscape has sparked considerable interest among scholars and practitioners. This study strived to address significant literature gaps by examining the determinants, including the impact of market dynamism, resource dependencies, collaborative orientation, relationship quality, and collaborative technology adoption on collaborative entrepreneurship in the context of renewable energy companies. It also aimed to explore the extent to which relationship quality and collaborative technology adoption mediate the association between collaborative orientation and collaborative entrepreneurship. In addition, it sought to assess the contribution of collaborative entrepreneurship to co-creating value.

The results revealed that market dynamism and collaborative orientation have a significant impact on the perpetration of collaborative entrepreneurship among renewable energy companies. Specifically, firms operating in dynamic markets with high resource dependencies and a strong collaborative orientation are more likely to engage in collaborative entrepreneurship initiatives. It was also found that relationship quality plays a pivotal mediating role in the impact of collaborative orientation on collaborative entrepreneurship. A firm with strong collaborative orientations is more likely to achieve collaborative entrepreneurship if it has high-quality relationships with partners. Collaborative entrepreneurship was found to have a pivotal power in value co-creation, highlighting its role in generating innovative solutions and experiences that resonate with customers and stakeholders.

The findings of the study provide important contributions to organisations, managers, and policymakers. Organisations can leverage collaborative entrepreneurship as a strategic approach to navigate dynamic market conditions, enhance value co-creation, and build sustainable competitive advantage. Managers should prioritise building strong relationships with partners and investing in collaborative technologies to facilitate effective collaboration and innovation. Policymakers can support collaborative entrepreneurship by fostering a conducive ecosystem that encourages collaboration, knowledge exchange, and technology adoption

Although this empirical study presents valuable insights into the dynamics of collaborative entrepreneurship, some limitations can be acknowledged. The sample size of 204 managers and specialists from renewable energy companies in Jordan may limit the generalisability of the findings, as renewable energy companies vary widely in terms of size, industry, geographic location, and organisational culture. Furthermore, the economic, cultural, collaborative orientations, relationship quality, and entrepreneurship environment in Jordan may differ from that of other countries or regions, which may have substantial impact on results. Therefore, future research could expand the sample size and include more diverse sectors to ensure the robustness and applicability of the findings across different contexts, providing a more comprehensive and generalisable understanding of the collaborative entrepreneurship environment and its outcomes.

While the study examines the impact of collaborative entrepreneurship on value co-creation, it does not explicitly address the outcomes or performance implications of collaborative ventures. Future research could explore the relationship between collaborative entrepreneurship and key performance indicators such as innovation outcomes, financial performance, and market competitiveness. Understanding how collaborative entrepreneurship contributes to firm-level outcomes can provide further insights into its strategic importance and value proposition for organisations.

Moreover, the study investigates the mediating role of relationship quality and collaborative technology adoption in the relationship between collaborative orientation and collaborative entrepreneurship. Although the present study did not find a significant moderating role for collaborative technology in this relationship, the results call for further research to determine the link between collaborative orientations, collaborative technologies, and collaborative entrepreneurship. Also, the study does not explore other potential mediators or moderators that may influence this relationship. Future research could examine additional factors such as organisational culture, leadership style, and institutional context to provide a more nuanced understanding of the mechanisms underlying collaborative entrepreneurship.

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BENDRADARBIAVIMU GRINDŽIAMO VERSLUMO VEIKSNIAI IR JO VAIDMUO KURIANT VERTĘ

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Santrauka. Šiame tyrime nagrinėjama bendradarbiavimu grindžiamo verslumo aplinka atsižvelgiant į jį lemiančius veiksnius ir rezultatus. Duomenys tyrimui surinkti iš 204 atsinaujinančiosios energijos įmonių vadovų ir specialistų, analizuoti pasitelkus programą „Smart PLS“. Rezultatai atskleidė, kad rinkos dinamiškumas ir bendradarbiavimo orientacija reikšmingai veikia bendradarbiavimu grindžiamo verslumo plėtrą. Taip pat nustatyta, kad santykių kokybė yra svarbus tarpinis veiksnys, lemiantis bendradarbiavimo orientacijos įtaką minėtam verslumui. Be to, paaiškėjo, kad analizuojamas verslumas yra itin svarbus bendrai vertei kurti. Šio tyrimo rezultatai padeda geriau suprasti bendradarbiavimu grindžiamo verslumo aplinką, jo įgyvendinimo mechanizmus ir veiklos vertinimo būdus. Jie taip pat praturtina įmonių ir ekspertų, siekiančių bendradarbiavimu grindžiamo verslumo, žinias, kad būtų galima spręsti iššūkius ir pasinaudoti galimybėmis, kylančiomis dėl rinkos dinamiškumo, kurias sunku išnaudoti individualiai.

Reikšminiai žodžiai: bendradarbiavimu grindžiamas verslumas; rinkos dinamiškumas; bendradarbiavimo orientacija; santykių kokybė; bendras vertės kūrimas; atsinaujinančios energijos įmonės.