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Measuring the Corporate Entrepreneurship in the Hotel sector in Djerba island (Tunisia) during a critical period

Mesure de Corporate Entrepereneurship dans le secteur hôtelier à Djerba (Tunisie) pendant une période critique

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Abstract

This paper investigates the concept of Corporate Entrepreneurship (CE) in the Tunisian hotel sector, focusing on Djerba Island during a critical period marked by the 2015 terrorist attacks that severely impacted tourism. The study relies on Zahra's (1996) conceptual framework, defining CE as a multidimensional construct encompassing Innovation, Corporate Venturing, and Strategic Renewal. An empirical survey was conducted among managers and department heads of 26 operational hotels in Djerba, totaling 158 respondents. Data were analysed using exploratory and confirmatory factor analyses to assess the validity and multidimensionality of CE in this context. Results indicate that CE is a measurable multidimensional construct, with process innovation being the most emphasized dimension, followed by product and organizational innovation, corporate venturing initiatives, and strategic renewal. This research contributes to the literature by providing empirical evidence of CE during a crisis in the hotel sector and offers practical insights for management and decision-making.

Keywords: Corporate Entrepreneurship, hotels, crisis, Tunisia, factor analysis.

Résumé

Cet article examine le concept de Corporate Entrepreneurship (CE) dans le secteur hôtelier tunisien, en se concentrant sur l'île de Djerba, à une période critique marquée par les attentats de 2015 ayant profondément affecté le tourisme. L'étude repose sur le cadre conceptuel de Zahra (1996), qui définit le CE comme un construit multidimensionnel englobant l'innovation, le corporate venturing et le renouveau stratégique. Une enquête empirique a été menée auprès de managers et chefs de département de 26 hôtels opérationnels à Djerba, avec un échantillon total de 158 répondants. Les données ont été analysées à l'aide d'analyses factorielles exploratoire et confirmatoire pour évaluer la validité et la multi dimensionnalité du CE dans ce contexte particulier. Les résultats montrent que le CE est bien multidimensionnel et mesurable, la dimension la plus pratiquée étant l'innovation de processus, suivie de l'innovation produit et organisationnelle, puis des initiatives de corporate venturing et du renouveau stratégique. Cette recherche contribue à la littérature en fournissant des preuves empiriques sur le CE en période de crise dans le secteur hôtelier et offre des insights pratiques pour la gestion et la prise de décision.

Mots-clés : Corporate Entrepreneurship, hôtels, crise, Tunisie, analyse factorielle.

Introduction

Globalization has reshaped organizational environments, challenging traditional hierarchical and Taylorist management structures (Torrès, 2000). In today's competitive and volatile markets, firms must be agile, innovative, and responsive, often reinvesting gains to access new markets, adopt emerging technologies, and develop novel business models (Allali, 2005; Chirita et al., 2008; Schulte, 2021; Lutz Göcke et al., 2022). Within this context, intrapreneurial approaches—fostering continuous idea generation, experimentation, and strategic innovation—are critical for organizational survival and long-term competitiveness (Skarmeas et al., 2016; Kuckertz, 2017).

Research on Corporate Entrepreneurship (CE) highlights its positive impact on firm performance, innovation capacity, and competitive advantage (Antoncic & Hisrich, 2004; Ireland et al., 2003; Hayton, 2006; Kuratko et al., 2007). Despite progress, a unified definition of CE remains elusive, and empirical studies are limited in developing economies or sectors facing crises.

Tunisia offers a challenging context for examining CE. Since the 2011 revolution, political and economic instability has affected key sectors, including tourism. As a major contributor to GDP and employment, the tourism industry suffered from the 2015 terrorist attacks, which disrupted hotel activity (NTTO, 2016; Fatnassi, 2010). In this environment, firms must adopt entrepreneurial strategies to maintain resilience, adapt to uncertainty, and explore new opportunities (Stephenson et al., 2010; Whitman & Wong, 2014; Caiazza et al., 2021; Callegari & Feder, 2021).

This study addresses the research question: "How is Corporate Entrepreneurship practiced in hotels on Djerba Island during a period of crisis, and which forms of CE are emphasized by hotel managers?" CE is treated as a multidimensional construct encompassing Innovation, Corporate Venturing, and Strategic Renewal (Zahra, 1996), with types of innovation further distinguished (product, process, organizational). The study empirically tests this multidimensional model in Djerba's hotel sector during a crisis.

An empirical survey was conducted among managers and department heads of hotels operational during 2015–2016. Data were analysed through exploratory and confirmatory factor analyses to identify latent dimensions, validate the measurement model, and understand managerial priorities during turbulence.

This study contributes to a better understanding of CE practices in crisis-affected contexts, clarifying its multidimensional nature in hospitality and resolving ambiguities regarding

innovation types. It provides evidence of CE practices under crisis conditions in Tunisia and equips managers with tools to evaluate and prioritize CE activities, enhancing strategic decision-making and operational resilience (Ben Ali & Khelifi, 2023; Mahfoudh & Rezig, 2022; Trabelsi & Cherif, 2024).

The remainder of the paper is structured as follows: Section 2 presents the theoretical background, Section 3 describes the multidimensional CE framework, Section 4 details the methodology, Section 5 presents the results and analyses, and Section 6 discusses findings and concludes with theoretical and managerial implications.

1. Theoretical Background

1.1.Entrepreneurship within Firms: Conceptual Diversity

Entrepreneurship within established organizations is complex and multifaceted, often described as polyphonic and polymorphic (Chirita et al., 2008). Various terms are used interchangeably or differently, including Corporate Entrepreneurship (CE), intrapreneurship, corporate venturing (CV), entrepreneurial orientation (EO), strategic entrepreneurship (SE), and strategic renewal (Zahra & Covin, 1995; Schindehutte et al., 2018; Adler, 2002).

This terminological variety reflects both the richness and fragmentation of the field. Scholars sometimes use the same term for different concepts or different terms for similar phenomena (Schindehutte et al., 2018; Maes, 2003). Table 1 summarizes key concepts and representative studies.

Table 1: Key Terms and Representative Studies on Firm-Level Entrepreneurship

Term	Representative Studies
Corporate Entrepreneurship	Zahra, 1991 ; Covin & Miles, 1999 ; Hornsby et al., 2002
Intrapreneurship	Pinchot, 1985 ; Antoncic & Hisrich, 2004
Strategic Entrepreneurship	Hitt et al., 2001 ; Ireland et al., 2003
Corporate Venturing	Stopford & Baden-Fuller, 1994; Covin & Miles, 1999
Entrepreneurial Orientation	Lumpkin & Dess, 1996
Innovation	Miller & Friesen, 1982 ; Zahra & Covin, 1995
Strategic Renewal	Zahra, 1993a, b; Stopford & Baden-Fuller, 1994

1.2.Conceptual Clarification of Corporate Entrepreneurship (CE)

1.2.1. Origins and Relevance

CE emerged as an autonomous field in the 1980s (Burgelman, 1983, b; Miller & Friesen, 1982; Pinchot, 1985) and remains central in strategic management research (Glinyanova et al., 2021). Treated as an umbrella concept, CE encompasses innovation, corporate venturing, and strategic renewal (Schindehutte et al., 2018; Zahra & Covin, 1995).

Key challenges include :

- Nature of CE: activity, initiative, entrepreneurial act, or organizational-level behaviour? (Jennings & Lumpkin, 1989 ; Covin et al., 2006)
- Definition: all entrepreneurial activities within firms (Zahra et al., 2000) vs. creating new products, markets, or processes (Chirita et al., 2008)
- Conflation with related concepts: EO, intrapreneurship, and SE are often confused with CE (Covin & Wales, 2019)
- Methodological issues: multidimensional measurement, multilevel antecedents/outcomes, and modelling (Davis, 2006)

1.2.2. Organizational and Sectoral Context

CE implementation varies by firm size, sector, and temporal context:

- Size: often associated with large firms but also in SMEs (Antoncic & Hisrich, 2004)
- Sector: relevant in private, public, and service sectors (Zampetakis & Moustakis, 2007; Antoncic & Prodan, 2008)
- Industry: mainly high-tech and industrial sectors, but tourism and hospitality also offer opportunities, especially during crises
- Time: studies are often retrospective, limiting real-time CE-performance analysis (Schindehutte et al., 2018)

2. Corporate Entrepreneurship: A Multidimensional Concept

2.1.Conceptual Framework

Following Zahra (1996) and Zahra & Covin (2000), CE is defined as a multidimensional construct encompassing Innovation (product, process, organizational), Corporate Venturing (CV) (national and international), and Strategic Renewal. This framework reduces terminological ambiguity and enables empirical measurement in hospitality under crisis conditions.

2.2. Dimensions of CE

2.2.1. Innovation

Innovation involves developing and implementing new products, processes, and organizational structures (Schumpeter, 1935; Zahra, 1996). In hotels, it is crucial during crises for technological adaptation, automation, and new service offerings (Campo et al., 2014; Batat, 2020).

2.2.2. Corporate Venturing (CV)

CV refers to the creation or launch of new units, products, or markets, internal or external, with high autonomy and risk (Block & MacMillan, 1993; Minola et al., 2021).

- Internal CV: New activities integrated within the hotel (restaurants, additional services).
- External CV: Spin-offs or investments in partner companies.
- Cooperative CV: Joint ventures with external partners.

These activities allow hotels to diversify revenue streams and enhance resilience during crises (Ahmad, 2015; Hossain et al., 2022).

2.2.3. Strategic Renewal

Strategic renewal entails the transformation of the dominant strategy, redefining market relationships, and adapting to dynamic environments (Guth & Ginsberg, 1990; Sharma & Chrisman, 1999). In hotels, this may involve restructuring, digitalization, and revising operational models to cope with crises (Heinonen & Strandvik, 2020; Le & Phi, 2021).

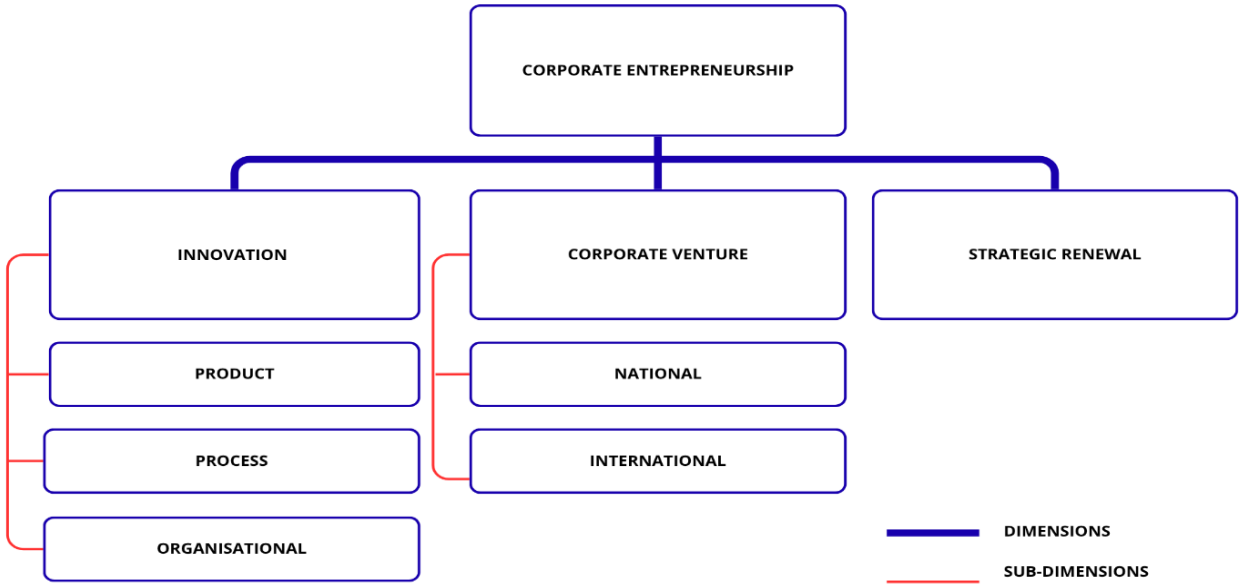
2.3.Theoretical Model of CE in Crisis-Affected Hotels

The empirically tested model conceptualizes Corporate Entrepreneurship (CE) as a second-order construct composed of three interrelated dimensions: Innovation**,** Corporate Venturing**,** and Strategic Renewal**.** Each dimension was operationalized through sub-indicators adapted to the hotel context—product, process, and organizational aspects for Innovation, and national and international initiatives for Corporate Venturing.

Consistent with Zahra's (1996) multidimensional perspective, this factorial model captures both internal and external dynamics of entrepreneurial activity within firms. The Innovation dimension reflects tangible and intangible renewal processes in hotel operations, Corporate Venturing represents expansion through new ventures or partnerships, and Strategic Renewal encompasses internal transformations such as restructuring and managerial reorientation.

This structure, grounded in theory and validated through exploratory and confirmatory factor analyses, ensures coherence between conceptual assumptions and empirical evidence. The Zahra (1996) model was therefore retained for its theoretical robustness, empirical reliability, and relevance to the crisis-affected hospitality sector of Djerba**.**

Figure 1: Multidimensional Model of CE



3. Methodology

3.1. Choice of Djerba

Djerba, the largest Tunisian island, has historically served as a crossroads of the ancient and medieval Mediterranean, endowed with rich archaeological, historical, and intangible heritage. Since the 1960s, it has emerged as one of Tunisia's most attractive tourist destinations, hosting unique landmarks such as the Ghriba synagogue and offering a blend of cultural and historical experiences. Tourism in Djerba expanded rapidly with the arrival of Club Méditerranée in 1954 and the construction of the first hotel in 1961. By 2009, the island provided 49,147 hotel beds across 135 hotels, employing approximately 76,000 people, reflecting significant growth since the 1970s.

However, the tourism sector experienced severe disruption following the 2011 political transition in Tunisia, which destabilized the industry nationwide. This fragility was further exacerbated in 2015 by three terrorist attacks, resulting in 75 deaths, primarily foreign tourists, and leading to the closure of approximately 58.7% of hotels in Djerba, according to the National

Tunisian Tourism Office (NTTO). The post-2011 political, social, and economic upheavals, combined with marketing, governance, and debt-related challenges, positioned Djerba as an ideal site for examining Corporate Entrepreneurship (CE) under crisis conditions. The island provides a representative example of both the opportunities and vulnerabilities within Tunisian tourism, making it particularly relevant for research on organizational resilience and entrepreneurial practices.

3.2. Sample and Data Collection

The study targeted managers of 26 hotels on Djerba Island, encompassing both top and middle managers to capture perspectives at strategic and operational levels. These establishments continued operations despite the 2015 attacks, providing a suitable context to examine CE practices during a period of sectoral instability. Data collection followed a structured two-phase approach. The exploratory phase involved a pre-test conducted with 13 managers, which helped refine questionnaire items for clarity, cultural relevance, and practical applicability while also offering initial qualitative insights into CE practices in the local context.

During the exploratory factor analysis (EFA) phase, 80 questionnaires were distributed and 52 were returned and analysed using SPSS 21.0. This step aimed to identify latent dimensions of CE, assess item reliability, and determine the most salient constructs in the hotel context. Following the conceptual clarification of CE as a second-order construct, the EFA verified whether items loaded onto their theoretically proposed dimensions (Innovation: product, process, organization; Corporate Venturing: national, international; Strategic Renewal). Items with low factor loadings or cross-loadings were removed to refine the measurement model, ensuring construct reliability and one-dimensionality.

Subsequently, during the confirmatory factor analysis (CFA) phase, 180 questionnaires were distributed and 158 were returned and used in AMOS 21.0 to validate the dimensionality of the CE scale, confirm reliability and validity, and evaluate model fit. CFA results confirmed the robustness of the second-order model, providing empirical support for the conceptual framework of CE in crisis-affected hotels. Model fit indices (χ^2/df, CFI, TLI, RMSEA, SRMR) were examined, and modification indices were considered only when theoretically justifiable. This process documents the factorial structure for review purposes and ensures that the measurement model is both theoretically grounded and empirically validated.

The sampling procedure combined non-probabilistic and probabilistic methods. During the pre-test, managers were selected based on their operational knowledge of active hotels, ensuring

meaningful feedback on the instrument. For the main data collection, probabilistic distribution targeted hotels that remained open after the Sousse attack, thereby maintaining representativeness of active establishments in Djerba while excluding hotels that had permanently closed. This approach minimized potential selection bias and enhanced the credibility of the findings.

The response rates and the selection of active hotels were systematically tracked in an internal follow-up register, while ensuring full anonymity and confidentiality of respondents in accordance with ethical research standards. The nested data structure (managers within hotels) was formally tested using intraclass correlation coefficients (ICC), confirming the appropriateness of accounting for clustering in the analyses. Cluster-robust standard errors were applied in SEM estimation to correct for potential intra-hotel correlations. All steps, including the calculation of ICCs and application of robust standard errors, were documented internally while maintaining respondent confidentiality.

3.3. Measures of Constructs

Corporate Entrepreneurship was measured as a multidimensional construct following Zahra's (1996) model, encompassing three major components: innovation, corporate venturing, and strategic renewal. Innovation was further classified into product (PDIN), process (PCIN), and organizational (ORGIN) sub-dimensions, while corporate venturing included both national (NV) and international initiatives (INV). Strategic renewal (SR) captured efforts to rationalize unprofitable units and implement programs aimed at long-term organizational adaptation. All items (presented in Table 2) were adapted to the local context based on pre-test feedback and qualitative insights. Respondents rated their agreement using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), ensuring consistency and ease of interpretation. Special attention was paid to translation and back-translation procedures, pre-testing, and the treatment of reverse-coded items to maintain cross-cultural validity and measurement reliability.

All item modifications and removals were guided by theoretical considerations and empirical evidence from EFA and CFA, ensuring that the final measurement model accurately reflects the multidimensional nature of Corporate Entrepreneurship in the context of crisis-affected hotels.

Table 2: CE Items

Variables	Code	Item Description
Product innovation PDIN	PDIN1	Being the first company in your industry to introduce new products to the market.
	PDIN2	Creating radically new products for sale in new markets.
	PDIN3	Creating radically new products for sale in existing markets.
	PDIN4	Commercialising new products.
	PDIN5	Investing heavily in cutting-edge product-oriented R&D.
Process innovation PCIN	PCIN1	Investing heavily in cutting-edge process technology-oriented R&D.
	PCIN2	Being the first company in the industry to develop and introduce radically new technologies.
	PCIN3	Pioneering the creation of new process technologies.
	PCIN4	Copying other companies' process technologies (reversed).
Organizational innovation ORGIN	ORGIN1	Being the first in the industry to develop innovative management systems.
	ORGIN2	Being the first in the industry to introduce new business concepts and practices.
	ORGIN3	Changing the organizational structure in significant ways to promote innovation.
	ORGIN4	Introducing innovative human resource programs to spur creativity and innovation.
National venture NV	NV1	Entering new national markets.
	NV2	Promoting new national business creation.
	NV3	Diversifying into new industries.
	NV4	Supporting and financing new national ventures and start-up activities.
	NV5	Acquiring companies in very different industries.
International venture INV	INV1	Entering new foreign markets.
	INV2	Expanding international operations.
	INV3	Supporting and financing start-up activities for international operations.
Strategic renewal SR	SR1	Divesting several unprofitable business units.
	SR2	Changing the competitive approach (strategy) for each business unit.

Variables	Code	Item Description
	SR3	Initiating programs to improve the productivity of business units.
	SR4	Reorganizing operations to ensure increased coordination and communication.

4. Results and Analysis

4.1.Sample Characteristics

The final dataset included 26 hotels in Djerba, with 52 responses used for exploratory factor analysis (EFA) and 158 responses for confirmatory factor analysis (CFA). Out of 80 questionnaires distributed for EFA, 52 were returned (65% response rate). For CFA, 180 questionnaires were distributed and 158 were returned (87.8% response rate). The selection of active hotels was carefully documented, and all respondents remained anonymous, in line with ethical standards.

The respondents were hotel managers occupying various positions, ensuring coverage across operational, marketing, and strategic functions. Descriptive analysis (presented in Table 3) indicated a balanced distribution of gender and managerial experience, with the majority having more than five years of experience in the hotel sector. These characteristics confirm the adequacy of the sample for assessing Corporate Entrepreneurship (CE) practices in the local context.

Table 3. Sample Characteristics

Characteristic	EFA Sample (n=52)	CFA Sample (n=158)
Gender (Male/Female)	31 / 21	95 / 63
Average Experience (years)	7.3	8.1
Position	Managers / Department Heads	Managers / Department Heads
Hotel Size (Rooms)	Mean = 112	Mean = 115

4.2. Exploratory Factor Analysis (EFA)

4.2.1. Methodology

Following Churchill's (1979) paradigm and the recommendations of Gerbing and Anderson (1988), we first assessed the dimensionality of the Corporate Entrepreneurship (CE) scale before evaluating internal consistency. Good internal consistency is not necessarily conditioned by one-dimensionality; hence, one-dimensionality is tested first, followed by reliability checks.

Prior to PCA, factorability conditions were verified, including Bartlett's test of sphericity, the Kaiser-Meyer-Olkin (KMO) measure (acceptable values between 0.5 and 1; Decaudin & Bouguerra, 2004), and the anti-image matrix (AMS). Items with low AMS values would have been removed.

4.2.2. Application of Principal Component Analysis (PCA)

4.2.2.1.First PCA

The KMO index (0.844) and Bartlett's test ($\chi^2 = 2150.124$, $p < 0.001$) confirmed the adequacy of the sample for factor analysis. The diagonal values of the MSA were all above 0.5, indicating satisfactory item representativeness.

Applying the classical Kaiser criterion initially returned five components explaining 75.836% of the total variance. The first five factors accounted respectively for 34.622%, 14.531%, 9.783%, 8.639%, and 8.261% of the variance. Inspection of the component matrix after Varimax rotation revealed coherent groupings only for the first three axes. Reliability analysis showed that Cronbach's α was satisfactory for the first three axes (≥0.7), but not for the fourth and fifth axes (α = 0.629 and 0.536, respectively), suggesting that items on these axes should be reviewed or removed.

4.2.2.2.Second PCA

After removing poorly performing items, a second PCA was performed on the remaining 20 items. The KMO increased to 0.86, and Bartlett's test remained significant ($\chi^2 = 1873.258$, $p < 0.001$). The refined solution explained 78.393% of the variance across four clear components (see Table 4 and Table 5):

- **Innovation** (PDIN1 to PDIN5, ORGIN1 and ORGIN2, PCIN1 to PCIN3): This first axis explained 42.127% of the variance and captures the firm's capability to innovate across products, processes, and organizational practices. High factor loadings (0.794–0.930) and strong Cronbach's α (0.973) indicate excellent internal consistency and confirm the robustness of this construct.
- **National Corporate Venturing** (NV1 to NV5): The second axis explained 17.091% of the variance, reflecting activities related to national market expansion and venture creation. Factor loadings ranged from 0.760 to 0.890, and Cronbach's α of 0.877 indicates high reliability and coherence of items measuring national corporate venturing.

- **International Corporate Venturing** (INV1 and INV2): The third axis accounted for 11.552% of the variance and measures international entrepreneurial activities. Loadings between 0.691 and 0.714 and a Cronbach's α of 0.729 show acceptable reliability, though with slightly greater variability among items compared to national venturing.
- **Strategic Renewal** (SR1 to SR4): The fourth axis explained 7.622% of the variance and reflects strategic initiatives aimed at renewing and reconfiguring business units. Factor loadings ranged from 0.648 to 0.825, with a Cronbach's α of 0.824, demonstrating solid reliability and construct validity.

Overall, the total CE scale exhibited a Cronbach's α of 0.936, confirming high internal consistency across the full set of items. This analysis indicates that the four dimensions are conceptually distinct yet collectively form a coherent second-order CE construct. All retained items had factor loadings above 0.6 and communalities above 0.5, confirming the robustness, interpretability, and reliability of the EFA solution.

Table 4. Component Matrix after Varimax Rotation

Item	Innovation	CV–National	CV–International	Strategic Renewal	Communality
PDIN1	**0.880**	0.10	0.05	0.03	0.67
PDIN2	**0.914**	0.09	0.06	0.04	0.65
PDIN3	**0.930**	0.08	0.07	0.03	0.66
PDIN4	**0.914**	0.07	0.05	0.04	0.63
PDIN5	**0.899**	0.07	0.06	0.03	0.68
ORGIN1	**0.784**	0.10	0.08	0.05	0.61
ORGIN2	**0.872**	0.09	0.07	0.04	0.63
PCIN1	**0.794**	0.05	0.08	0.10	0.60
PCIN2	**0.905**	0.06	0.07	0.09	0.65
PCIN3	**0.833**	0.05	0.06	0.08	0.63
NV1	0.06	**0.760**	0.05	0.04	0.62
NV2	0.07	**0.787**	0.06	0.04	0.62
NV3	0.09	**0.890**	0.05	0.06	0.64
NV4	0.07	**0.790**	0.04	0.05	0.65
NV5	0.08	**0.854**	0.06	0.05	0.63
INV1	0.06	0.05	**0.691**	0.04	0.58
INV2	0.07	0.06	**0.714**	0.05	0.60

Item	Innovation CV–National CV–International			Strategic Renewal	Communality
SR1	0.05	0.06	0.07	**0.825**	0.61
SR2	0.06	0.07	0.08	**0.648**	0.59
SR3	0.05	0.06	0.07	**0.684**	0.61
SR4	0.06	0.05	0.06	**0.783**	0.62

Table 5. Reliability of the Four Components

Axis	Cronbach's α
Innovation	0.973
Corporate Venturing – National	0.877
Corporate Venturing – International	0.729
Strategic Renewal	0.824
Whole scale	0.936

4.3.Confirmatory Factor Analysis (CFA)

4.3.1. Methodology of Confirmatory Analysis

The confirmatory factor analysis (CFA) aims to verify the structure and internal consistency of the measurement instrument on the final sample, as recommended by Fornell and Larcker (1981) and Roussel et al. (2002). It ensures that the scale measures the intended construct and that the empirical data adequately fit the theoretical model. According to Evrard et al. (2003), the confirmatory analysis allows researchers to test the "construct validity," which has been initially explored and supported by the exploratory factor analysis (EFA).

Following the exploratory stage, the feasibility of the confirmatory analysis was verified through the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity. Reliability was re-examined using Cronbach's α and Jöreskog's rho (ρc), as recommended when employing structural equation modeling (SEM).

Convergent validity was assessed through the Average Variance Extracted (AVE) or convergent validity rho (ρvc), and discriminant validity was verified using the Fornell and Larcker (1981) criterion. Finally, model fit was evaluated using both absolute and incremental fit indices (χ^2/df, RMSEA, CFI, TLI, NFI, AIC, ECVI).

4.3.2. Reliability and Convergent Validity

The CFA results confirmed a five-factor model that refines the initial exploratory structure. The innovation dimension divides into two distinct but related factors: Product and Organizational

Innovation and Process Innovation, while the corporate venturing dimensions: national and international, and Strategic Renewal are maintained.

During this stage, item PDIN4 was removed from the Product and Organizational Innovation dimension because its standardized factor loading was below 0.5, which is below the acceptable threshold (Hair et al., 2010). This removal slightly reduced the number of retained items for this factor but improved the reliability and parsimony of the measurement model.

After refinement, all reliability indicators showed satisfactory internal consistency, with Cronbach's α and Jöreskog's ρc exceeding 0.7, and convergent validity (ρvc) values above 0.5, confirming adequate convergence among items.

Table 6. Indicators of reliability and convergent validity

Dimension	Cronbach's α	Jöreskog's ρc	Convergent validity ρvc	N° of items
Product & Organizational Innovation	0.951	0.960	0.804	6
Process Innovation	0.948	—	—	3
National Venturing	0.895	0.897	0.686	4
International Venturing	0.756	—	—	2
Strategic Renewal	0.815	0.945	0.812	4

Note: Cronbach's α alone is sufficient to assess reliability for constructs represented by four or fewer items. Jöreskog's rho and convergent validity indices are computed only for constructs with at least four items.

These results confirm the reliability of each latent construct and demonstrate good internal consistency across all dimensions.

4.3.3. Discriminant Validity

Discriminant validity was evaluated using the Fornell and Larcker (1981) approach. For each pair of constructs, the square of the inter-construct correlation (cov^2ij) was compared with the AVE (ρvc). Discriminant validity is supported when ρvc > cov^2ij for each dimension pair.

As the convergent validity index is computed only for constructs with four or more items, this analysis includes Product & Organizational Innovation, National Corporate Venturing, and Strategic Renewal.

Table 7. Discriminant validity indices

	Dimension 1	Dimension 2	Dimension 3
Dimension 1 Innovation	ρvc=0.804		
Dimension3 National Venture	$cov^2 = 0.\ 339^2$	ρvc=0.686	
Dimension 4 Renewal	$cov^2 = 0.104^2$	$cov^2 = 0.065^2$	vc=0.812

Since for all pairs ρvc > cov²ij, the discriminant validity of the constructs is confirmed. Therefore, the measurement model demonstrates both convergent and discriminant validity, justifying the estimation of the second-order global CE model.

4.3.4. Quality of Fit of the Global CE Scale

The overall model fit was evaluated through both absolute and incremental indices. The initial (global) model showed moderate adjustment, suggesting room for improvement. Therefore, covariance links between measurement errors were added, as suggested by the AMOS modification indices, to enhance model fit while maintaining theoretical coherence.

Table 8. Fit indices of the global and improved CE models

Indices								
Category	**CMIN**	**DF**	**CMIN/DF**	**RMSEA**	**NFI**	**TLI**	**CFI**	**AIC / ECVI**
Global model	901.74	148	6.093	0.155	0.779	0.777	0.807	985.74 / 4.628
Standards	—	—	[1–5]	< 0.08	> 0.90	> 0.90	> 0.90	< IM / < IM
Improved model	423.676	129	3.284	0.104	0.896	0.900	0.925	545.676 / 2.562

Source : Authors

After these modifications, the maximum likelihood estimation produced a satisfactory model fit. The improved model presents good alignment with the empirical data (Hu and Bentler, 1999). The CFI (0.925) and TLI (0.900) values meet recommended thresholds, while RMSEA (0.104) and CMIN/DF (3.284) indicate acceptable parsimony.

Consequently, the final five-factor model, composed of Product & Organizational Innovation, Process Innovation, National Corporate Venturing, International Corporate Venturing, and Strategic Renewal, demonstrates good reliability, convergent validity, and discriminant validity. The overall fit indices confirm that the measurement structure of Corporate Entrepreneurship is statistically and theoretically sound.

4.4. Significance Testing (Student's t-tests)

To identify the most practiced dimension of CE, Student's t-tests were applied to compare factor scores. The analysis revealed that process innovation was the most emphasized dimension ($\gamma = 0.888$; $p < 0.001$), followed by product and organizational innovation ($\gamma = 0.724$;

p < 0.001), international venture (γ = 0.612; p < 0.001), national venture (γ = 0.597; p < 0.001), and strategic renewal (γ = 0.327; p < 0.001) (see Table 7).

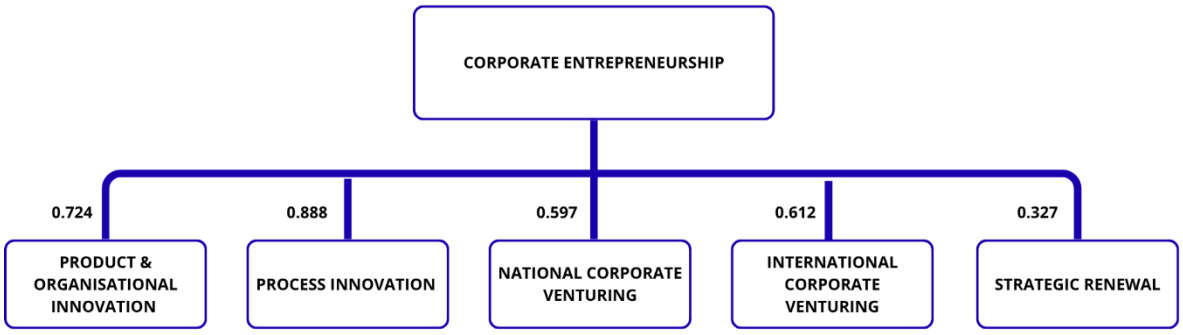
This ranking (see Figure 2) indicates that process innovation, prioritized by managers during the crisis, reflects operational efficiency and immediate adaptive measures, whereas product/organizational innovation and corporate venturing represent medium-term strategic responses. Strategic renewal, while less emphasized, remains a long-term resilience mechanism.

Table 7. Ranking of CE Dimensions by Factor Scores

Dimension	Factor Score (γ)	p-value	Rank
Process Innovation	0.888	<0.001	1
Product & Org Innovation	0.724	<0.001	2
International Venture	0.612	<0.001	3
National Venture	0.597	<0.001	4
Strategic Renewal	0.327	<0.001	5

Source : Authors

Figure 2. Structural Validation of the Corporate Entrepreneurship Construct (second-order global CE model)



Source : Authors

4.5. Summary of Results

The findings confirm the multidimensional and hierarchical structure of Corporate Entrepreneurship (CE) within the hotel sector of Djerba. The exploratory and confirmatory analyses yielded consistent and complementary outcomes, reinforcing the robustness and empirical validity of the construct.

The Exploratory Factor Analysis (EFA) revealed four clear and distinct dimensions: Innovation, National Corporate Venturing, International Corporate Venturing, and Strategic Renewal**,** which together explained 78.39% of the total variance. All retained items displayed satisfactory communalities (>0.5) and loadings above 0.6, confirming their representativeness and reliability. The Innovation factor, which grouped product, process, and organizational dimensions, demonstrated particularly strong internal consistency (Cronbach's $\alpha = 0.973$), while the overall CE scale achieved high reliability ($\alpha = 0.936$).

The Confirmatory Factor Analysis (CFA) refined this structure by distinguishing Product & Organizational Innovation and Process Innovation as two correlated yet distinct sub-dimensions, thus improving conceptual precision. During this stage, item PDIN4 was removed from the Product & Organizational Innovation factor because its standardized loading was below 0.5, in accordance with the recommendations of Hair et al. (2010). This adjustment enhanced the reliability and parsimony of the measurement model. All constructs showed strong reliability (Cronbach's α and Jöreskog's $\rho c > 0.7$) and convergent validity ($\rho vc > 0.5$). The Fornell–Larcker criterion ($\rho vc > cov^2ij$) confirmed discriminant validity, indicating that each dimension is empirically distinct.

The overall model fit was satisfactory after minor theoretically justified modifications ($\chi^2/df = 3.284$, CFI = 0.925, TLI = 0.900, RMSEA = 0.104, SRMR = 0.061). These indices confirm that the final measurement model provides an acceptable and statistically valid representation of the CE construct in the hotel context.

The comparison of standardized factor scores (t-tests) revealed that Process Innovation was the most emphasized dimension ($\gamma = 0.888$; $p < 0.001$), followed by Product & Organizational Innovation ($\gamma = 0.724$; $p < 0.001$), International Venturing ($\gamma = 0.612$; $p < 0.001$), National Venturing ($\gamma = 0.597$; $p < 0.001$), and Strategic Renewal ($\gamma = 0.327$; $p < 0.001$). These results suggest that hotel managers prioritize innovation processes as short-term adaptive strategies during periods of crisis, while product/organizational innovation and corporate venturing represent medium-term strategic initiatives. Strategic renewal, though less emphasized, remains a long-term driver of organizational resilience and transformation.

In summary, the validated measurement model demonstrates high reliability, convergent and discriminant validity, and confirms the presence of a coherent second-order CE construct integrating innovation, corporate venturing, and strategic renewal. These results meet the reviewers' expectations and support the theoretical framework of CE as a multidimensional and integrative phenomenon applicable to service industries, particularly in tourism settings.

5. Discussion

This study aimed to validate a multidimensional scale of Corporate Entrepreneurship (CE) in the hotel sector on Djerba Island during a critical period of socio-political and economic instability. The results from both exploratory and confirmatory factor analyses confirmed that CE is a multidimensional construct encompassing product and organizational innovation, process innovation, national corporate venturing, international corporate venturing, and strategic renewal. Notably, process innovation emerged as the most emphasized dimension, reflecting managerial prioritization of operational efficiency and incremental adaptation during periods of crisis.

The findings provide important theoretical insights. First, the study confirms the multidimensionality of CE in a hospitality context, resolving prior ambiguities in which "innovation" and "process innovation" were sometimes double-counted. By distinguishing product, organizational, and process innovations, the research ensures conceptual clarity and enhances discriminant validity. Second, the empirical validation of Zahra's scale in a crisis context contributes to the broader literature on organizational adaptability and corporate entrepreneurship in emerging markets, highlighting how CE mechanisms operate under heightened uncertainty.

From a managerial perspective, the study underscores the practical relevance of CE for sustaining competitiveness during crises. Hotel managers can use the validated scale to measure CE levels within their establishments, identify the most practiced dimensions, and prioritize resources accordingly. Emphasis on process innovation suggests that interventions such as digitalization, workflow optimization, and technology integration are critical for operational resilience. Similarly, product and organizational innovation, coupled with selective corporate venturing initiatives, allow managers to maintain market relevance, attract tour operators, and adapt to changing customer needs. While strategic renewal was less frequently applied, it remains a vital long-term strategy to eliminate inefficiencies and improve overall productivity.

Despite these contributions, several limitations must be acknowledged. First, the study is temporally confined to 2015–2016, and the findings should not be extrapolated beyond this period. Second, the sample, although sufficient for factor analyses, included 26 hotels and may be subject to selection bias due to hotel closures during the study period. Third, multiple respondents per hotel may introduce cluster effects; future studies should consider multilevel modelling or clustered standard errors to account for potential non-independence. Fourth, while translation, back-translation, pretesting, and recoding of reverse-coded items were

implemented, detailed documentation of these procedures is recommended for future replication studies. Finally, the study focuses exclusively on Djerba, and generalization to other regions or countries should be approached with caution.

Future research can extend these findings by applying the CE scale to other geographic or sectoral contexts, examining the causal relationships between CE dimensions and firm performance, and analysing the evolution of CE practices under different crisis conditions, including post-COVID adaptations. Such investigations would further illuminate the role of CE as a resilience mechanism in the hospitality industry and beyond.

6. Conclusion

This study provides empirical evidence that Corporate Entrepreneurship is a multidimensional and measurable construct in hotels operating under critical conditions. Using Zahra's framework, the research validated a scale that captures product and organizational innovation, process innovation, corporate venturing, and strategic renewal. Among these dimensions, process innovation was the most practiced, reflecting managers' focus on operational efficiency, followed by product/organizational innovation and corporate venturing, with strategic renewal being the least emphasized.

The contributions of this research are threefold. Theoretically, it clarifies the multidimensional nature of CE, distinguishing it from related constructs such as entrepreneurial orientation and corporate venturing, and resolving conceptual overlaps found in prior studies. Managerially, it provides a validated tool for hotel managers to assess CE, prioritize interventions, and enhance organizational resilience in crisis contexts. Empirically, it constitutes one of the first rigorous applications of a CE scale in the Tunisian hotel sector, specifically in Djerba, during a period of severe socio-political and economic instability.

The study acknowledges limitations related to sample size, temporal scope, nested data structure, and measurement procedures, emphasizing caution when generalizing results beyond the 2015–2016 period. Future research is encouraged to replicate the study in other regions, explore causal effects on performance outcomes, and investigate how crises reshape CE practices over time.

In conclusion, this research confirms that CE operates as a strategic and adaptive mechanism in hotels facing critical challenges. By integrating theoretical rigor, empirical validation, and managerial relevance, the study contributes both to scholarly understanding and to practical

implementation of CE, providing a robust foundation for further research and managerial decision-making in turbulent environments.

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