

Strategic Configuration of The Entrepreneurial Ecosystem in Border Crisis Contexts: Risks, Opportunities, and Capabilities For Business Sustainability

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Abstract

Border crises impose severe disruptions on local economies, yet entrepreneurship has emerged as a critical mechanism for economic resilience in affected regions. This study examines the strategic configuration of the entrepreneurial ecosystem in Cúcuta, Colombia, a city profoundly affected by the closure of the Colombian-Venezuelan border since 2015, compounded by mass migration and rising unemployment. The research objective was to characterize entrepreneurship during the economic and social crisis in Cúcuta from 2016 to 2018, analyzing entrepreneur profiles, business characteristics, and the risks and opportunities embedded within local business models. A quantitative, analytical, non-experimental field design was employed, surveying 156 newly established enterprises across three key economic sectors: manufacturing, wholesale and retail commerce, and food and accommodation services. Instrument reliability was confirmed through Cronbach's alpha coefficients ($\alpha = 0.784$ for financial variables; $\alpha = 0.852$ for regional impact indicators). Results reveal that wholesale and retail commerce serves as the primary economic dynamizer in the city. Entrepreneurs demonstrated strong initiative, proactivity, self-confidence, practical decision-making, flexibility, openness to learning, and achievement motivation. Financial indicators showed predominantly medium levels of solvency, short-term debt, inventory rotation, and return on investment, with the food and accommodation sector exhibiting the strongest financial performance. A SWOT analysis identified structural risks related to informality, limited strategic planning, and restricted access to financing, alongside opportunities in digital transformation, institutional support, and regional entrepreneurial culture. The study proposes strategic interventions (FO, DO, FA, DA) aimed at strengthening the entrepreneurial ecosystem's sustainability and competitiveness in border crisis contexts.

Keywords Entrepreneurial ecosystem, border crisis, SME sustainability, SWOT analysis, dynamic capabilities, necessity-driven entrepreneurship, developing economies.

1. Introduction

Entrepreneurship has long been recognized as a fundamental driver of economic development, job creation, and innovation (Morris, 1998; Shane, 2005). In times of crisis, entrepreneurial activity acquires heightened significance as individuals and communities seek alternative pathways to generate income and rebuild economic stability (Doern et al., 2018; Maritz et al., 2020). The relationship between crisis and entrepreneurship is complex: while economic disruptions increase uncertainty and risk, they simultaneously generate opportunities for those capable of identifying unmet needs and mobilizing resources under adverse conditions (Timmons, 1989; Santos et al., 2017).

The Colombian-Venezuelan border crisis represents one of the most significant socioeconomic disruptions in contemporary Latin America. The closure of the border in 2015, driven by escalating political tensions, severed longstanding economic interdependencies

between border communities and precipitated a cascade of consequences including soaring unemployment, declining commercial activity, and mass migration (OIM, 2018). Cúcuta, the capital of the Norte de Santander department and a strategic point on the Colombian-Venezuelan border, was disproportionately affected. The city's economy had historically depended on cross-border trade and commercial activities, making it acutely vulnerable to the disruption of these flows. By 2018, approximately 2.3 million Venezuelans had entered Colombia, with Cúcuta serving as a primary point of arrival, adding further complexity to an already strained local economy (DANE, 2020). Unemployment reached 16.9%, positioning the city among the highest in the nation (La Opinión, 2019).

Within this context, entrepreneurship has emerged as a critical coping mechanism and a potential catalyst for economic recovery. However, the nature and viability of entrepreneurial ventures in such crisis-affected border regions remain

insufficiently understood. While the Global Entrepreneurship Monitor (GEM, 2017) reports that Colombia ranks as the third economy globally in entrepreneurial intention—with 53% of individuals aged 18 to 64 expressing intent to start a business within three years—only 16.3% had undertaken any business creation activity. This gap between intention and action is particularly pronounced in regions like Cúcuta, where structural barriers including limited access to financing, high informality, and inadequate institutional support create a challenging environment for nascent enterprises.

The Colombian policy framework has sought to address these challenges through several legislative instruments, including Law 1014 of 2006 (promoting entrepreneurial culture), Law 1780 of 2016 (incentivizing employment and business creation for individuals under 35), and the National Council for Economic and Social Policy (CONPES) Document 3950 of 2018, which specifically addresses labor insertion and entrepreneurship as integration mechanisms for the Venezuelan migrant population. Governmental entities such as INNpulsa Colombia, the SENA's Fondo Emprender, and the Ministry of Commerce, Industry, and Tourism have implemented programs to strengthen entrepreneurial capacity. At the departmental level, the Strategic Plan for Science, Technology, and Innovation (PEDCTI) 2014–2024 and successive development plans have incorporated entrepreneurship and innovation as strategic priorities (Gobernación de Norte de Santander, 2018).

Despite these policy efforts, a critical knowledge gap persists regarding the actual characteristics of entrepreneurial activity in border crisis contexts. Understanding the profile of entrepreneurs, the nature of businesses they create, the financial and technological conditions under which they operate, and the strategic risks and opportunities they face is essential for designing effective support interventions. This understanding becomes particularly urgent when entrepreneurship is driven predominantly by necessity rather than opportunity—a pattern common in developing economies and crisis contexts (Puente et al., 2019; Lecuna et al., 2017). This study addresses this gap by characterizing entrepreneurship during the economic and social crisis in Cúcuta from 2016 to 2018. Specifically, the research pursues four objectives: (1) to analyze the profile of entrepreneurs in Cúcuta, encompassing their personal characteristics, motivations, education, experience, and family environment; (2) to characterize the enterprises created during this period, including their sectoral classification, innovative activity, organizational structure, costs, technological advancement, and geographic impact; (3) to identify the risks and opportunities in the business models being developed; and (4) to propose strategies for

strengthening the development and sustainability of entrepreneurial activity in the city.

The article contributes to the scholarly literature on entrepreneurship in crisis contexts by providing empirical evidence from a border region in a developing economy—a context that remains underrepresented in the international literature (Guerrero et al., 2021; Mendoza et al., 2021). Furthermore, by integrating SWOT analysis with strategic proposal formulation, the study bridges the gap between diagnostic assessment and actionable policy recommendations, offering a framework that may be applicable to other border regions facing similar challenges.

The remainder of this article is organized as follows: Section 2 presents the literature review, grounding the study in entrepreneurial ecosystem theory, dynamic capabilities, and necessity-driven entrepreneurship frameworks. Section 3 describes the methodology. Section 4 reports and discusses the results. Section 5 offers conclusions, implications, and directions for future research.

2. Literature Review

2.1 Entrepreneurship in Crisis Contexts

The intersection of entrepreneurship and crisis has attracted growing scholarly attention over the past decade. Doern et al. (2018) conducted a comprehensive review of research on entrepreneurship and crises, finding that crises create both destructive and generative conditions for entrepreneurial activity. Economic recessions, political instability, and humanitarian emergencies alter the opportunity landscape, compelling entrepreneurs to adapt their strategies, business models, and resource mobilization approaches. González-Pernía et al. (2018) demonstrated that economic recessions in Spain differentially affected necessity-driven and opportunity-driven entrepreneurship, with necessity entrepreneurs exhibiting greater vulnerability but also remarkable persistence.

In the Latin American context, entrepreneurial responses to crisis take distinctive forms. Puente et al. (2019) identified three motivational categories among Latin American entrepreneurs—necessity, opportunity, and transition—arguing that the boundaries between these categories are more fluid than commonly assumed. Maritz et al. (2020) characterized entrepreneurship as an "unsung hero" during the COVID-19 pandemic, highlighting how small enterprises served as economic stabilizers in developing regions. Fernández-Bedoya et al. (2023) examined entrepreneurship research during COVID-19 in South America, revealing patterns of resilience and adaptation that parallel those observed in other crisis contexts.

Migration-related crises add an additional dimension to entrepreneurial dynamics. Guerrero et al. (2021) investigated migrant entrepreneurship in emerging economies, finding that migrant

entrepreneurs contribute to host economies through innovation, job creation, and knowledge transfer, though they face distinct challenges related to legal status, social capital deficits, and market access. Harima (2022) explored transnational migration entrepreneurship during crisis periods, demonstrating how cross-border networks enable entrepreneurial activity even under conditions of severe institutional disruption. Santamaría-Álvarez et al. (2017) specifically examined Colombian transnational entrepreneurs, identifying how diaspora networks and cross-border connections facilitate business creation and sustainability.

2.2 Entrepreneurial Ecosystems

The entrepreneurial ecosystem (EE) framework provides a systemic lens for understanding the conditions that enable or constrain entrepreneurial activity within a given geographic context. Spigel (2017) proposed a relational model of entrepreneurial ecosystems comprising cultural, social, and material attributes that interact to support entrepreneurship. This framework has been further developed by Spigel and Harrison (2018), who advanced a process theory of entrepreneurial ecosystems emphasizing how ecosystem elements are created, maintained, and transformed over time.

Stam and van de Ven (2019) identified key elements of entrepreneurial ecosystems, distinguishing between framework conditions (formal institutions, culture, physical infrastructure, and demand) and systemic conditions (networks, leadership, finance, talent, knowledge, and intermediary services). Their model underscores that productive entrepreneurship depends on the quality and interconnection of these elements rather than on any single factor in isolation.

The application of ecosystem theory to developing economies reveals important contextual specificities. Cao et al. (2020) conducted a systematic review of entrepreneurial ecosystems in both advanced and emerging economies, finding that emerging economy ecosystems face distinctive challenges related to institutional voids, infrastructure gaps, and market inefficiencies. Kantis et al. (2020) examined entrepreneurship policy in emerging countries, arguing that effective ecosystem development requires policies tailored to local institutional realities rather than imported wholesale from developed economy models. Malecki (2018) emphasized the geographic embeddedness of entrepreneurial ecosystems, noting that local conditions—including proximity to borders, migration patterns, and regional economic structures—significantly shape ecosystem dynamics.

Audretsch et al. (2021) and Audretsch and Belitski (2016) developed frameworks for understanding entrepreneurial ecosystems in cities,

demonstrating how urban environments create distinct opportunities and constraints for entrepreneurs. Mack and Mayer (2016) examined the evolutionary dynamics of entrepreneurial ecosystems, providing insight into how ecosystems adapt to external shocks—a particularly relevant perspective for understanding entrepreneurship in crisis-affected border regions like Cúcuta.

2.3 Dynamic Capabilities and Strategic Entrepreneurship

The dynamic capabilities framework, originally proposed by Teece et al. (1997) and subsequently refined by Teece (2018), offers a theoretical foundation for understanding how enterprises in turbulent environments sense opportunities, seize them through strategic action, and transform their resource bases to maintain competitiveness. In crisis contexts, dynamic capabilities become essential for survival, as firms must rapidly reconfigure their strategies and operations in response to environmental shifts.

Dias et al. (2020) examined the role of entrepreneurship in developing dynamic capabilities, finding that entrepreneurial orientation enhances firms' capacity for strategic adaptation. Gölgeci et al. (2017) explored how institutional environments shape the relationship between dynamic capabilities and strategic entrepreneurship, demonstrating that institutional constraints—including those prevalent in developing economies—moderate the effectiveness of dynamic capability deployment. Khoury et al. (2016) investigated entrepreneurship amid concurrent institutional constraints, revealing how entrepreneurs in developing countries navigate multiple institutional pressures simultaneously.

The integration of dynamic capabilities with entrepreneurial ecosystem theory provides a multi-level analytical framework: at the micro level, individual entrepreneurs develop capabilities for opportunity identification and resource mobilization; at the meso level, firms build organizational routines for strategic adaptation; and at the macro level, ecosystem-level dynamics shape the conditions under which these capabilities can be effectively deployed (Guerrero et al., 2020; Urbano et al., 2019).

2.4 Necessity-Driven Entrepreneurship in Developing Economies

The distinction between necessity-driven and opportunity-driven entrepreneurship, central to the GEM framework, takes on particular significance in developing economy contexts. Necessity entrepreneurs start businesses primarily as a response to lack of alternative employment options, rather than to exploit perceived market opportunities (GEM, 2017). Lecuna et al. (2017) examined high-growth entrepreneurs in Latin America, finding that even in contexts dominated

by necessity entrepreneurship, some ventures achieve significant growth trajectories when supported by adequate institutional frameworks. Mas-Tur et al. (2015) identified success factors for entrepreneurs in Latin America, emphasizing the importance of human capital, social networks, and institutional support in enabling entrepreneurial sustainability. Mendoza et al. (2021) studied entrepreneurship in developing countries using Ecuador as a case study, providing evidence that necessity entrepreneurs can transition to opportunity-driven ventures when environmental conditions improve and institutional support mechanisms are available.

Muñoz et al. (2020) examined the reorientation of entrepreneurial support infrastructure during crisis in Chile, arguing that effective crisis response requires adapting support programs to the specific needs of necessity entrepreneurs rather than applying frameworks designed for opportunity-driven ventures. This perspective is particularly relevant for border regions like Cúcuta, where the crisis has intensified necessity-driven entrepreneurial activity.

2.5 SWOT Analysis as a Strategic Assessment Tool

SWOT analysis remains a widely employed strategic assessment methodology in entrepreneurship research, enabling systematic identification of internal strengths and weaknesses alongside external opportunities and threats (Gnyawali & Fogel, 1994). In the context of entrepreneurial ecosystem assessment, SWOT analysis serves as a bridging tool between diagnostic evaluation and strategic formulation, facilitating the development of actionable interventions.

The application of SWOT analysis to entrepreneurship in crisis contexts allows researchers and practitioners to map the interaction between entrepreneurial capabilities and environmental conditions, identifying leverage points for strategic intervention. When combined with categorical risk-opportunity matrices and strategy formulation frameworks (FO, DO, FA, DA strategies), SWOT analysis provides a comprehensive approach to ecosystem-level strategic planning (Santos et al., 2017).

Gnyawali and Fogel (1994) proposed a comprehensive model of entrepreneurial environments encompassing government policies and procedures, socioeconomic conditions, entrepreneurial and business skills, financial support, and non-financial support. This model provides the theoretical scaffolding for the SWOT analysis conducted in the present study, grounding the identification of strategic factors in established entrepreneurship theory.

3. Methodology

3.1 Research Design

This study adopted a quantitative, analytical, non-experimental, cross-sectional field research design. The quantitative approach was selected because the research objectives required numerical measurement and statistical analysis of entrepreneurial characteristics, financial performance indicators, and regional impact variables (Rodríguez, 2010). The analytical orientation aimed to decompose the entrepreneurial phenomenon into its constituent elements—entrepreneur profiles, enterprise characteristics, financial performance, and ecosystem conditions—to identify the interrelationships that shape entrepreneurial activity during crisis (Hurtado, 2008).

The non-experimental design was appropriate because the study observed the entrepreneurial phenomenon in its natural setting without manipulating independent variables (Hernández et al., 2014). The cross-sectional (transeccional) approach collected data at a single point in time, providing a snapshot of entrepreneurial activity during the crisis period (Hurtado, 2010). The field research design involved direct data collection from the entrepreneurs themselves, ensuring that findings reflected the lived realities of enterprise creation and management during the border crisis (Arias, 2006).

3.2 Population and Sample

The study population comprised micro, small, and medium enterprises (SMEs) formally registered with the Cúcuta Chamber of Commerce between 2016 and 2018, with assets ranging from 125 to 5,000 Colombian minimum monthly legal wages (SMMLV). Three economic sectors were selected based on their significance to the local economy: manufacturing industry, wholesale and retail commerce, and food and accommodation services. According to the Compite 360 database of the Cúcuta Chamber of Commerce (2018), 260 new enterprises were registered across these sectors during the study period.

Stratified probabilistic random sampling was employed, with strata defined by economic sector. The sample size was calculated using the standard formula for finite populations:

$$n = (N \times Z^2 \times p \times q) / (e^2 \times (N - 1) + Z^2 \times p \times q)$$

where $N = 260$ (total population), $Z = 1.96$ (95% confidence level), $p = 0.5$ (probability of occurrence), $q = 0.5$ (probability of non-occurrence), and $e = 0.05$ (5% margin of error). The resulting sample comprised 156 enterprises distributed as follows: manufacturing industry ($n = 44$), wholesale and retail commerce ($n = 90$), and food and accommodation services ($n = 22$). Data were collected from the managers or leaders of each enterprise through structured surveys.

3.3 Variables and Dimensions

Two primary variable categories guided the research design. The first, Entrepreneur Characteristics, encompassed two dimensions: (a)

demographic attributes (gender, age, education level, income, prior experience, family background) and (b) psychographic attributes (initiative, persistence, self-confidence, leadership, risk tolerance, creativity, independence, goal-setting, information-seeking, systematic planning, persuasion, and motivation). These attributes were grounded in McClelland's (1961) motivational theory (need for achievement, need for power, need for affiliation) and Timmons et al.'s (1985) entrepreneurial competency framework.

The second variable category, Enterprise Characteristics, comprised four dimensions: (a) demographic (economic sector, activity type, enterprise type), (b) business model (origin of idea, value proposition, employees, R&D&I activities, competitive factors, strategies), (c) financial (funding sources, revenue, R&D&I investment percentage), and (d) environmental factors (entrepreneurial culture, macroeconomic context, financing access, social context, technological context, university support, incubator support).

Additionally, the study assessed regional impact through four capital dimensions—political, human, economic, and social—and evaluated risks and opportunities through SWOT (DOFA) analysis applied to the entrepreneurial business models across the three sectors.

3.4 Data Collection Instrument

A structured questionnaire was designed by the research team based on the theoretical framework, research objectives, and operationalization of variables. The instrument incorporated Likert-scale items, categorical response options, and qualitative ordinal scales. For financial performance indicators (solvency index, short-term debt, inventory rotation, return on investment), a qualitative scale (high, medium, low) was employed to facilitate data collection, as enterprises typically do not disclose precise quantitative financial data.

Content validity was established through expert judgment. Four specialists with demonstrated expertise in management sciences, economics and business, flexible enterprise management systems, and statistics evaluated the instrument. All evaluators confirmed that items were coherent with research objectives, pertinent, clearly worded, and internally valid.

3.5 Reliability Analysis

Instrument reliability was assessed using Cronbach's Alpha coefficient, calculated through SPSS 25. A pilot study was conducted with 15 enterprises across the three sectors to verify comprehension and completeness of responses. The reliability analysis yielded the following results:

For the entrepreneurial competency variables, Cronbach's Alpha coefficients ranged from 0.765

(perception of social environment and entrepreneurial process) to 0.959 (achievement drive), with a mean coefficient of $\alpha = 0.849$, indicating very high internal consistency (Ruiz, 1998). Specific reliability coefficients included: Initiative ($\alpha = 0.943$), Resilience ($\alpha = 0.773$), Risk-taking capacity ($\alpha = 0.843$), Decision-making capacity ($\alpha = 0.896$), Flexibility ($\alpha = 0.844$), Learning capacity ($\alpha = 0.903$), Self-confidence ($\alpha = 0.885$), Achievement drive ($\alpha = 0.959$), and Business vision ($\alpha = 0.781$).

For the financial variables scale (solvency, short-term debt, inventory rotation, return on investment), Cronbach's Alpha was $\alpha = 0.784$, confirming acceptable reliability for the ordinal measurement approach. The regional impact assessment instrument achieved $\alpha = 0.852$ (10 items) for the impact aspects and $\alpha = 0.846$ (5 items) for social capital, both indicating high internal consistency.

3.6 Data Analysis

Data were analyzed using descriptive statistical techniques, including frequency distributions, percentages, and cross-tabulations by economic sector. The SWOT (DOFA) analysis was conducted by systematically identifying internal strengths and weaknesses alongside external opportunities and threats, drawing on both the quantitative survey data and documentary analysis of policy frameworks, institutional reports, and macroeconomic indicators. Strategic proposals were formulated using the FO (Strengths–Opportunities), DO (Weaknesses–Opportunities), FA (Strengths–Threats), and DA (Weaknesses–Threats) strategy matrix approach (Gnyawali & Fogel, 1994). A categorical risk–opportunity matrix was developed to classify findings into five analytical categories: socioeconomic environment, financing, business capabilities, market, and innovation, each supported by theoretical frameworks from the entrepreneurship literature.

4. Results and Discussion

4.1 Entrepreneur Profile in Crisis Contexts

The analysis of 156 new enterprises in Cúcuta revealed a distinctive entrepreneur profile shaped by the border crisis. Entrepreneurs demonstrated high levels of initiative and proactivity, enabling them to act anticipatively in the face of adversity. Self-confidence emerged as a defining trait, facilitating the assumption of challenges with composure and efficacy. Decision-making was characterized by a practical orientation, with entrepreneurs systematically analyzing advantages and disadvantages while seeking expert counsel. Flexibility and adaptability to novel circumstances, combined with openness to continuous learning through both academic and professional experiences, further distinguished the entrepreneurial cohort.

Achievement motivation was particularly pronounced, aligning with McClelland's (1961) theoretical framework: entrepreneurs exhibited a clear projection toward successful outcomes and ambitious goals. Their perception of the social environment enabled the generation of innovative ideas that differentiated their market offerings. Resilience in the face of difficulties manifested as an optimistic attitude that transformed obstacles and failures into growth opportunities. These findings are consistent with Doern et al.'s (2018) observation that crisis contexts can generate distinctive entrepreneurial capabilities, and with Santos et al.'s (2017) identification of resilience as a key predictor of entrepreneurial activity during economic downturns.

The sociodemographic analysis indicated that gender, age, education level, and income significantly conditioned enterprise creation. While male entrepreneurs predominated, female participation had increased notably, consistent with regional trends documented by the OECD/ECLAC/CAF (2016) regarding the growth of female entrepreneurship in Latin America. The most active entrepreneurial age group fell between 25 and 34 years, consistent with GEM (2017) data indicating that in less developed economies, entrepreneurial activity begins at younger ages and with lower educational levels, driven by limited employment alternatives and elevated unemployment rates. This pattern corresponds to what Puente et al. (2019) characterized as necessity-driven entrepreneurship in Latin American contexts.

4.2 Enterprise Characterization and Sectoral Analysis

Wholesale and retail commerce emerged as the primary sector dynamizing Cúcuta's economy, followed by manufacturing and food/accommodation services. This sectoral distribution reflects the city's historical dependence on cross-border trade and its evolution following the frontier closure, confirming the observations of Guerrero et al. (2021) regarding how border economies restructure their entrepreneurial activity in response to migration-induced market changes.

4.2.1 Financial Performance

Financial variable analysis ($\alpha = 0.784$) revealed that most enterprises across all three sectors exhibited medium levels of solvency, short-term debt, inventory rotation, and return on investment. The food and accommodation sector demonstrated the most favorable financial indicators, with enterprises reporting high-to-medium capital investment, favorable inventory rotation, and elevated return on investment, although accompanied by higher-to-medium levels of short-term indebtedness. The manufacturing and commerce sectors displayed predominantly medium-level financial performance, with a

minority of enterprises reporting either high or low values across indicators.

These findings align with Buil and Rocafor's (2015) observation that enterprises surviving during crisis periods tend to maintain moderate but stable financial positions, relying on internal resources rather than aggressive leverage strategies. The relatively conservative financial profiles suggest that Cúcuta's entrepreneurs adopted risk-mitigation approaches consistent with the dynamic capabilities framework's emphasis on strategic adaptation under uncertainty (Teece, 2018).

4.2.2 Innovation Investment and Technological Adoption

Innovation investment patterns varied significantly across sectors. In manufacturing and commerce, 86–88% of enterprises invested between 100 and 150 million COP, while the food/accommodation sector displayed a more diversified investment profile: 40% invested 100–150 million COP, another 40% invested 151–300 million COP, and 20% invested 301–600 million COP. This sectoral variation suggests that food/accommodation enterprises, despite their smaller representation in the sample, demonstrated a greater propensity for innovation-related investment.

Regarding technological adoption, the majority of enterprises across all sectors utilized new technology, with very few relying exclusively on used equipment. Control systems varied by sector: food/accommodation enterprises predominantly used manual and combined mechanical-electronic systems; manufacturing enterprises favored mechanical-electronic and purely mechanical systems; and commerce enterprises employed all types of control systems, with mechanical-electronic being most prevalent. Most enterprises had acquired development or process improvement software within the preceding two years, though a subset of food/accommodation enterprises reported having no software at all.

These patterns are consistent with Lecuna et al.'s (2017) finding that even in necessity-driven entrepreneurial contexts, some ventures achieve meaningful technological advancement when supported by favorable market conditions.

4.3 Regional Impact Assessment

The regional impact assessment ($\alpha = 0.852$ for 10 items; $\alpha = 0.846$ for 5 social capital items) revealed substantial entrepreneurial contributions across four capital dimensions.

Political capital: Over 80% of enterprises across all three sectors reported high impact on leadership, recognition, and prestige achieved through entrepreneurship. This finding indicates that entrepreneurial activity in crisis contexts generates not only economic value but also social legitimacy and community standing, consistent with Audretsch et al.'s (2021) framework for

understanding entrepreneurial contributions to urban development.

Human capital: Entrepreneurship understanding was nearly universal across all sectors, with only 3% of manufacturing and commerce enterprises reporting that their human resources did not comprehend entrepreneurship. Regarding training, the food/accommodation sector demonstrated the highest association between entrepreneurship and personnel training (90%), followed by manufacturing and commerce (over 60%). These results support Mas-Tur et al.'s (2015) emphasis on human capital as a critical success factor for Latin American entrepreneurs.

Economic capital: More than 80% of enterprises across all sectors reported high impact on investments, income, and profitability, with less than 3% failing to detect any such impact. This confirms entrepreneurship's role as an economic stabilizer during crisis periods, corroborating Maritz et al.'s (2020) characterization of entrepreneurship as an "unsung hero" during economic disruption.

Social capital: Connectivity was rated highly (over 80%) across all sectors. However, notable sectoral differences emerged in associativity and social commitment: only 50% or fewer of manufacturing and commerce enterprises considered these variables to have significant impact, whereas the food/accommodation sector rated all social capital variables positively. Environmental protection awareness also diverged, with the food/accommodation sector again leading (approximately 80%) compared to 60% or less in the other sectors. These differential patterns suggest that smaller, service-oriented enterprises may develop stronger community embeddedness, consistent with Spigel's (2017) relational model of entrepreneurial ecosystems.

4.4 Market Orientation

Market orientation analysis revealed distinct geographic strategies across sectors. Food/accommodation enterprises focused primarily on local markets, with secondary regional and international presence but no national market penetration. Manufacturing enterprises oriented primarily toward regional markets, with additional national and local presence and minimal international activity. Commerce enterprises served predominantly local markets with substantial regional and national coverage. International market orientation was most pronounced in the food/accommodation sector, likely reflecting tourism-related activities.

These market patterns illustrate how border crisis conditions reshape commercial geographies, pushing enterprises to seek alternative markets when traditional cross-border trade routes are disrupted (Santamaría-Álvarez et al., 2017).

4.5 SWOT Analysis: Risks and Opportunities in Business Models

The SWOT analysis yielded a comprehensive diagnostic of the entrepreneurial ecosystem, organized through a categorical risk–opportunity matrix encompassing five analytical dimensions: socioeconomic environment, financing, business capabilities, market, and innovation.

4.5.1 Opportunities

Key opportunities identified included: the existing regulatory framework supporting SME development (including FOMIPYME, Law 1429/2010, Law 1607/2012); the contribution of SMEs to national GDP (35%) and employment (80%) according to DANE (2020); the availability of university programs in business formation and entrepreneurship; governmental support through agencies including SENA, INNpursa, Bancoldex, and Colciencias; and the growing culture of female entrepreneurship in the Latin American region. These institutional and policy opportunities align with Kantis et al.'s (2020) emphasis on the importance of tailored entrepreneurship policies in emerging economies and with Stam and van de Ven's (2019) framework conditions for productive entrepreneurial ecosystems.

4.5.2 Threats

Principal threats encompassed: insufficient visibility and accessibility of governmental development programs; high costs and bureaucratic delays in enterprise formalization; elevated rates of early-stage business discontinuation (approximately 5% within 42 months, per GEM 2018/2019); absence of business incubators in the region; institutional distrust toward governmental entities and tax authorities; and limited support for transitioning informal enterprises to formal status. These threats correspond to the institutional voids identified by Cao et al. (2020) as distinctive challenges for entrepreneurial ecosystems in emerging economies.

4.5.3 Strengths

Internal strengths included: institutional support from organizations such as PROEMPRESAS, SENA, the Chamber of Commerce, and university research groups; resilient entrepreneurial culture demonstrated by the capacity to maintain operations during the border closure and subsequent COVID-19 pandemic; practical decision-making capabilities based on systematic analysis of advantages and disadvantages; openness to continuous learning and innovation; high levels of achievement motivation; and the maturity of Cúcuta's commerce sector as a frontier city. These strengths reflect the dynamic capabilities theorized by Teece et al. (1997), particularly the sensing and seizing capacities that enable strategic adaptation under turbulent conditions.

4.5.4 Weaknesses

Critical weaknesses included: the ongoing border crisis impact on economic stability; governmental distrust regarding R&D investment; limited financing access for entrepreneurs; high informality and unemployment (18.1% per DANE, 2020); lack of product/service differentiation; absence of an innovation and development center (I+D); limited articulation between educational institutions, enterprises, and government; and insufficient marketing and market expansion programs for national and international reach. These weaknesses align with Malecki's (2018) observations about the geographic embeddedness of entrepreneurial ecosystem challenges.

4.6 Strategic Proposals for Ecosystem Strengthening

Based on the integrated SWOT analysis, four categories of strategic proposals were formulated following the established FO–DO–FA–DA matrix approach (Gnyawali & Fogel, 1994).

FO Strategies (Strengths–Opportunities): Leverage the resilient entrepreneurial culture and adaptive capacity through digital transformation processes, incorporating technological tools for commercialization and management. Articulate the local entrepreneurial culture with institutional training and mentoring programs to promote continuous organizational learning. Consolidate collaborative networks among entrepreneurs to foster knowledge exchange, strategic alliances, and social capital strengthening.

DO Strategies (Weaknesses–Opportunities): Strengthen financial and administrative education through programs focused on strategic planning and market analysis. Facilitate linkages with institutional SME support programs to enable access to financing, technical advisory services, and enterprise formalization. Promote gradual adoption of digital tools to improve operational efficiency and commercial visibility.

FA Strategies (Strengths–Threats): Utilize entrepreneurial adaptive capacity to diversify markets and commercialization channels, reducing dependence on single market segments. Channel entrepreneurial resilience toward incremental innovation processes responsive to market changes. Strengthen local business networks as mutual support mechanisms against economic fluctuations.

DA Strategies (Weaknesses–Threats): Prioritize enterprise formalization to facilitate access to formal financing and markets. Implement basic strategic planning processes to reduce organizational improvisation and improve decision-making. Develop risk management training programs to enable anticipation of adverse scenarios and strengthen business sustainability.

These strategic proposals align with the entrepreneurial ecosystem strengthening

approaches advocated by Spigel and Harrison (2018), who emphasize that ecosystem development requires coordinated interventions across multiple systemic dimensions. The proposals also reflect Muñoz et al.'s (2020) recommendation for crisis-responsive entrepreneurial support that addresses the specific needs of necessity-driven entrepreneurs rather than applying frameworks designed for opportunity-driven contexts.

5. Conclusions

This study examined the strategic configuration of the entrepreneurial ecosystem in Cúcuta, Colombia, a border city profoundly affected by the closure of the Colombian-Venezuelan frontier since 2015. Through the analysis of 156 new enterprises across three economic sectors—manufacturing, commerce, and food/accommodation—the research yielded several significant conclusions with implications for both theory and policy.

First, the entrepreneur profile in crisis-affected border regions is characterized by a distinctive combination of resilience, practical decision-making, and achievement motivation. These traits, while consistent with McClelland's (1961) motivational theory, are intensified by crisis conditions that demand rapid adaptation. The predominance of necessity-driven entrepreneurship among younger individuals with limited formal education confirms patterns documented in the broader Latin American context (Puente et al., 2019; GEM, 2017), while the growing participation of women reflects evolving regional dynamics.

Second, the entrepreneurial ecosystem in Cúcuta exhibits a structural paradox: strong entrepreneurial culture and institutional support frameworks coexist with significant weaknesses in financing access, formalization processes, and innovation infrastructure. This finding extends the entrepreneurial ecosystem literature (Spigel, 2017; Stam & van de Ven, 2019) by demonstrating how crisis contexts create distinctive ecosystem configurations where certain elements are strengthened (cultural resilience, community solidarity) while others are weakened (financial access, institutional trust). The theoretical implication is that ecosystem models developed in stable economies require substantial adaptation when applied to crisis-affected regions.

Third, financial performance across the three sectors revealed predominantly medium-level indicators, suggesting that enterprises adopt conservative strategies prioritizing survival over growth during crisis periods. The food and accommodation sector demonstrated the strongest financial indicators and the highest propensity for innovation investment, potentially reflecting both its smaller scale and its responsiveness to

emerging market opportunities created by migration-related demand shifts.

Fourth, the regional impact assessment demonstrated that entrepreneurship generates substantial contributions across political, human, economic, and social capital dimensions, even under adverse conditions. The finding that over 80% of enterprises reported high impact on economic capital confirms entrepreneurship's stabilizing role during crises (Maritz et al., 2020). However, the sectoral variation in social capital—particularly the lower associativity and social commitment in manufacturing and commerce compared to food/accommodation—suggests that ecosystem strengthening efforts should be differentiated by sector rather than applied uniformly.

Fifth, the strategic configuration derived from the integrated SWOT analysis and categorical risk-opportunity matrix provides an actionable framework for ecosystem strengthening. The four strategic categories—digital transformation leveraging internal capabilities (FO), institutional support and capacity building (DO), market diversification through resilience (FA), and formalization with strategic planning (DA)—address the specific dynamics of crisis-affected border economies rather than importing strategies designed for stable environments. This approach aligns with Muñoz et al.'s (2020) call for crisis-responsive entrepreneurial support.

The study's limitations include its cross-sectional design, which captures a snapshot rather than the dynamic evolution of the entrepreneurial ecosystem. The geographic specificity of Cúcuta, while providing depth, limits direct generalizability to other border or crisis contexts. Future research should adopt longitudinal designs to track how entrepreneurial ecosystems evolve as crisis conditions change, and comparative studies across multiple border regions would strengthen the external validity of the strategic configuration framework proposed here.

From a policy perspective, these findings suggest that entrepreneurship support in crisis-affected border regions should: (a) recognize and leverage the distinctive capabilities that crisis-forged entrepreneurs possess, rather than treating them as deficient versions of opportunity-driven entrepreneurs; (b) reduce formalization barriers and costs, which currently discourage the transition from informal to formal enterprise; (c) develop sector-specific support programs that address the differentiated needs revealed by the sectoral analysis; and (d) strengthen the articulation between educational institutions, government agencies, and the entrepreneurial community to create more coherent ecosystem support structures.

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