

Navigating the Entrepreneurial Transition in Post-Sanction Iran Strategic Imperatives for a New Era

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ABSTRACT

The objective of this study was to identify and empirically validate the strategic imperatives enabling Iranian entrepreneurs to successfully navigate economic transition and achieve competitiveness in the post-sanction environment. This study employed a sequential exploratory mixed-methods design conducted among entrepreneurs, startup founders, SME executives, and innovation managers operating in Tehran. In the qualitative phase, semi-structured in-depth interviews were conducted using purposive sampling to explore entrepreneurial experiences shaped by sanction conditions and emerging post-sanction opportunities. The qualitative findings informed the development of a structured survey instrument used in the quantitative phase to test the proposed conceptual framework. Data collection focused on strategic agility, institutional adaptation, innovation capability, digital transformation orientation, entrepreneurial resilience, and internationalization readiness. Statistical analyses included reliability assessment, confirmatory factor analysis, correlation analysis, and structural equation modeling to examine relationships among constructs and evaluate predictive validity of the entrepreneurial transition model. Structural modeling results indicated that institutional adaptation, innovation capability, digital transformation orientation, and entrepreneurial resilience significantly and positively predicted strategic agility among Iranian entrepreneurs. Strategic agility emerged as the central mediating capability linking organizational adaptation to internationalization readiness and entrepreneurial performance outcomes. Innovation capability demonstrated the strongest effect on agility, while institutional navigation capacity significantly enhanced firms' ability to respond to environmental uncertainty. Digital transformation orientation reinforced competitive responsiveness and market expansion potential. The model explained substantial variance in both internationalization readiness and entrepreneurial performance, confirming that successful post-sanction transition depends on interconnected strategic capabilities rather than isolated organizational resources. The findings demonstrate that post-sanction entrepreneurship in Iran represents a strategic transformation process in which accumulated resilience from sanction periods evolves into opportunity-driven competitiveness. Entrepreneurial success increasingly depends on the integration of institutional learning, innovation development, digitalization, and adaptive strategic management. The study contributes to entrepreneurship and transition economy literature by proposing an empirically supported framework explaining how firms convert constraint-based experience into sustainable competitive advantage in emerging post-sanction environments.

Keywords: Product quality, machine learning, statistical analysis, quality control, steel industry, production defect prediction, industrial data mining.

Introduction

Entrepreneurship has increasingly emerged as a central mechanism for economic restructuring in countries experiencing geopolitical constraints, institutional transformation, and structural economic transition. In the Iranian context, decades of international sanctions have profoundly shaped entrepreneurial behavior, organizational



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capabilities, and strategic decision-making processes. Rather than merely constraining economic activity, sanctions have produced a unique entrepreneurial environment characterized by resource scarcity, institutional uncertainty, and adaptive innovation. As sanctions pressures fluctuate and partial economic openings occur, Iranian entrepreneurs face a critical transition phase in which previously survival-oriented strategies must evolve into growth-oriented and globally competitive business models. Understanding this entrepreneurial transition is essential for explaining how firms reposition themselves within a post-sanction economic order and how strategic imperatives emerge under conditions of institutional transformation (1-3).

Sanctions have historically altered market structures, investment flows, and international business relations, compelling Iranian firms to rely on endogenous capabilities and informal networks. Empirical evidence demonstrates that firms operating under prolonged economic restrictions develop persistence mechanisms, improvisational resource strategies, and resilience-based organizational cultures that enable survival despite external shocks (2, 4). These adaptive capabilities, while effective during constraint-driven periods, do not automatically translate into competitiveness in a post-sanction environment where openness, innovation scaling, and institutional alignment become decisive factors. The transition therefore represents not merely economic recovery but a strategic reconfiguration of entrepreneurial logic, requiring firms to shift from defensive adaptation toward opportunity exploitation and international engagement (3, 5).

Iran's entrepreneurial ecosystem operates within a broader structural context shaped by dependence on oil revenues, state-centered economic governance, and evolving institutional arrangements. Historical patterns of industrial development reveal persistent challenges associated with diversification away from resource dependency, which directly influence entrepreneurial opportunity structures and investment incentives (6). Universities, innovation intermediaries, and knowledge-based institutions increasingly function as catalysts of economic transformation, supporting a shift toward a knowledge-based economy and technology entrepreneurship (7, 8). Innovation policy initiatives and intermediary organizations have played a significant role in facilitating technological development and entrepreneurial growth, particularly in sectors such as biotechnology and advanced manufacturing, illustrating how institutional coordination shapes entrepreneurial transition processes (9).

The emergence of post-sanction entrepreneurship must also be examined through institutional theory and resource-based perspectives. Institutional conditions influence access to markets, legitimacy formation, and regulatory navigation, while firm-specific resources determine competitive positioning during economic reopening phases. Research indicates that Iranian SMEs transitioning toward international markets rely heavily on strategic resilience, dynamic capabilities, and learning mechanisms developed under restrictive environments (3). Entrepreneurs must simultaneously respond to institutional uncertainty and capitalize on newly available opportunities, creating a complex interplay between internal competencies and external institutional shifts (10).

Digital transformation has become a particularly critical driver of entrepreneurial adaptation. The expansion of digital platforms enables firms to overcome geographical barriers, access global customers, and increase organizational flexibility even within constrained regulatory systems. Digital entrepreneurship in Iran has demonstrated remarkable resilience, especially in sectors such as food entrepreneurship and online services, where platform-based strategies reduce vulnerability to supply disruptions and institutional limitations (11). However, digital development occurs within a framework influenced by national planning and digital protectionism policies, creating both opportunities and regulatory challenges for entrepreneurs seeking international integration (12).

Entrepreneurial transition is also shaped by social networks, stakeholder relationships, and organizational learning processes. Entrepreneurial culture and collective learning significantly influence firms' strategic orientation, enabling adaptation to volatile environments and fostering innovation-oriented behavior among technology-based firms (13). Social support networks further enhance opportunity recognition and entrepreneurial intention, particularly during periods of crisis and uncertainty, highlighting the importance of relational capital within transitional economies (14). Stakeholder engagement similarly contributes to SME performance, suggesting that entrepreneurial success depends not only on internal resources but also on collaborative institutional relationships (15).

The post-sanction environment also reveals differentiated entrepreneurial experiences across demographic and social groups. Gendered analyses demonstrate that sanctions have affected entrepreneurial outcomes unevenly, influencing access to resources, market participation, and opportunity structures for women entrepreneurs (16). Informal networks and community-based resource mobilization play a crucial role in overcoming structural barriers, particularly within rural and necessity-driven entrepreneurship contexts (17). These findings underscore that entrepreneurial transition is not homogeneous but shaped by socio-cultural, institutional, and economic heterogeneity.

Crisis-driven entrepreneurship further contributes to understanding transitional dynamics. External shocks such as the COVID-19 pandemic created opportunity windows for institutional innovation and policy change in Iran, demonstrating how crises accelerate digital adoption and entrepreneurial experimentation (18). Startups in biotechnology, pharmaceuticals, and engineering sectors exhibited rapid adaptive responses, reinforcing the role of innovation ecosystems in sustaining entrepreneurial activity during systemic disruption (19). Entrepreneurial persistence under harsh contextual environments thus emerges as a defining feature of Iran's business landscape, reflecting both necessity and strategic adaptability (4).

Education and human capital development further shape entrepreneurial transformation. Entrepreneurship education enhances entrepreneurial alertness and mindset formation among graduates, strengthening opportunity recognition and innovation capability within emerging economic contexts (20). Universities transitioning toward third-generation institutional models increasingly promote commercialization, industry collaboration, and innovation-driven entrepreneurship, contributing to ecosystem maturity (7). Technological entrepreneurship development, particularly in high-tech sectors such as nanotechnology, demonstrates how knowledge-intensive capabilities facilitate competitive positioning during economic transition (21).

From an international business perspective, entrepreneurial transition involves complex processes of internationalization and de-internationalization. Firms operating in volatile environments often withdraw from foreign markets during periods of instability and later re-engage when institutional conditions improve, illustrating the dynamic nature of international entrepreneurial strategy (5). Risk-taking behavior, export compliance capabilities, and strategic decision-making processes become central determinants of successful international expansion (22). Process-based investment frameworks further emphasize the need for structured decision-making approaches when entering emerging markets characterized by institutional complexity (23).

Policy environments also play a critical role in shaping entrepreneurial outcomes. Iran's policy advisory system demonstrates increasing technicisation alongside political considerations, influencing how entrepreneurial policies are formulated and implemented (24). Innovation policies, regulatory reforms, and institutional modernization efforts directly affect entrepreneurs' ability to access financing, technology, and international partnerships. Economic

shocks and entrepreneurial persistence studies confirm that institutional adaptation rather than environmental stability often determines long-term entrepreneurial survival (25).

Urban economic dynamics additionally influence entrepreneurial development. Changes in asset markets, including housing price fluctuations, affect investment allocation decisions among industrial SMEs and shape capital availability for entrepreneurial expansion (26). Resistance economy policies have encouraged firms to develop endogenous innovation strategies and self-reliance mechanisms, reinforcing strategic autonomy while simultaneously preparing firms for future global integration (27). These structural factors collectively demonstrate that entrepreneurial transition cannot be understood solely at the firm level but must be analyzed within broader economic and institutional ecosystems.

Ethical and organizational considerations also become increasingly significant during transitional periods. Entrepreneurs operating within distressed economies frequently rely on legitimacy-building practices, ethical narratives, and soft-law mechanisms to navigate uncertain institutional environments (10). Respect for employee privacy, organizational professionalism, and governance practices contributes to sustainable productivity and organizational stability, highlighting the importance of managerial modernization alongside market adaptation (28). Opportunity confidence, entrepreneurial orientation, and market analysis capabilities further strengthen strategic decision-making during uncertain transitions (29, 30).

The interaction between formal institutions and emerging financial innovations also shapes entrepreneurial prospects. Variations in institutional frameworks governing financial technologies and investment mechanisms influence entrepreneurial financing opportunities and innovation diffusion across economies (31). As sanctions ease or evolve, entrepreneurs must learn to operate within hybrid institutional arrangements combining domestic regulations with international market expectations, creating new strategic challenges and opportunities.

Collectively, prior research suggests that post-sanction entrepreneurship in Iran represents a multidimensional transformation involving institutional adaptation, digitalization, innovation capability development, internationalization readiness, and socio-cultural change. While significant scholarship has examined entrepreneurial survival under sanctions, fewer studies have systematically analyzed how entrepreneurs strategically navigate the transition toward a new economic era characterized by partial openness, technological acceleration, and institutional reconfiguration. This gap highlights the need for an integrative framework capable of explaining how entrepreneurial actors convert accumulated resilience into strategic competitiveness within post-sanction conditions.

Therefore, the aim of this study is to develop and empirically examine a comprehensive model explaining the strategic imperatives shaping entrepreneurial transition in post-sanction Iran.

Methods and Materials

The present study was designed to investigate the strategic dynamics shaping entrepreneurial transition in post-sanction Iran through a mixed-methods research framework combining qualitative exploration with quantitative validation. This methodological approach was selected to capture both the contextual complexity of Iran's evolving entrepreneurial ecosystem and the measurable strategic patterns emerging among firms adapting to new economic conditions. The study focused on entrepreneurs and business decision-makers operating in Tehran, which functions as Iran's primary economic, financial, and innovation hub and therefore represents the most suitable environment for examining post-sanction entrepreneurial transformation.

The research adopted a sequential exploratory mixed-methods design. In the initial qualitative phase, the study aimed to identify strategic imperatives, institutional constraints, and adaptive mechanisms experienced by entrepreneurs navigating the transition from a sanction-dominated economy toward a more globally connected environment. Participants were selected using purposive and theoretical sampling to ensure inclusion of individuals with direct experience in entrepreneurial decision-making during both sanction and post-sanction periods. The target population consisted of founders, startup executives, SME owners, venture investors, innovation managers, and senior strategic planners based in Tehran.

Eligibility criteria required participants to have at least three years of entrepreneurial or managerial experience and active involvement in market expansion, international collaboration, innovation development, or organizational restructuring after major sanction relief periods. Recruitment occurred through entrepreneurship networks, technology parks, chambers of commerce, startup accelerators, and professional business associations operating in Tehran. Sampling continued until theoretical saturation was achieved, meaning that additional interviews no longer generated substantively new conceptual insights.

Following the qualitative stage, a quantitative phase was conducted to validate the emerging conceptual model and assess the relative importance of identified strategic imperatives across a broader entrepreneurial population. A stratified sampling strategy was employed to represent diverse sectors including technology startups, manufacturing SMEs, digital services, knowledge-based firms, and export-oriented enterprises. Participants completed structured questionnaires measuring strategic adaptation, institutional readiness, innovation orientation, and market integration capabilities. All respondents voluntarily participated and provided informed consent, and confidentiality of organizational information was strictly maintained throughout the research process.

Data collection relied on multiple complementary instruments to ensure methodological rigor and triangulation. In the qualitative phase, semi-structured in-depth interviews constituted the primary data source. An interview protocol was developed based on entrepreneurship transition theory, institutional change literature, and strategic management frameworks relevant to emerging economies. Interview questions explored themes such as entrepreneurial opportunity recognition after sanctions, access to capital and international markets, regulatory adaptation, technological upgrading, partnership formation, risk management strategies, and organizational learning processes. Interviews were conducted face-to-face or through secure online communication platforms depending on participant availability. Each session lasted between sixty and ninety minutes and was audio-recorded with participant permission to ensure accurate transcription.

To complement interviews, document analysis was conducted using organizational reports, policy documents, startup ecosystem publications, investment briefs, and entrepreneurship policy guidelines relevant to Tehran's business environment. These materials provided contextual verification and enriched understanding of institutional and structural transformations influencing entrepreneurial behavior.

During the quantitative phase, a structured questionnaire was developed directly from themes extracted during qualitative coding. The instrument included multi-item scales assessing strategic agility, innovation capability, institutional navigation competence, internationalization readiness, digital transformation adoption, and resilience under uncertainty. The questionnaire underwent expert review by academic specialists in entrepreneurship and management as well as pilot testing among a small group of Tehran-based entrepreneurs to ensure clarity, cultural appropriateness, and content validity. Necessary revisions were implemented prior to large-scale distribution.

Qualitative data analysis followed a systematic interpretive procedure grounded in thematic analysis principles. Interview transcripts were transcribed verbatim and analyzed through iterative coding cycles. In the first stage, open coding was applied to identify meaningful units of entrepreneurial experience and strategic behavior. These initial codes were subsequently grouped through axial coding to establish relationships among institutional pressures, strategic responses, and entrepreneurial outcomes. In the final stage, selective coding enabled integration of categories into a coherent conceptual model describing entrepreneurial transition in the post-sanction context. Constant comparison techniques were used throughout the analysis to refine categories and ensure conceptual consistency across participants and sectors. Credibility was strengthened through member checking, peer debriefing among researchers, and comparison between interview findings and documentary evidence.

Quantitative data were analyzed using statistical procedures designed to test the structural validity of the proposed framework. Descriptive statistics were first employed to summarize demographic and organizational characteristics of participants. Reliability of measurement scales was assessed through internal consistency analysis, while construct validity was evaluated using exploratory and confirmatory factor analysis. Structural relationships among strategic imperatives were examined through multivariate modeling techniques to determine the extent to which institutional adaptation, innovation capability, and market integration predicted successful entrepreneurial transition. Assumptions of normality, multicollinearity, and model fit were evaluated prior to interpretation of results.

Findings and Results

The final sample consisted of entrepreneurs, startup founders, SME executives, innovation managers, and investors actively engaged in business operations within Tehran. Participants represented a diverse cross-section of economic sectors, including technology startups, digital platforms, manufacturing enterprises, knowledge-based firms, financial services, and export-oriented businesses. The majority of respondents were male, reflecting prevailing gender distribution patterns within Iran's entrepreneurial ecosystem, although female entrepreneurial participation demonstrated noticeable growth particularly in technology and digital service sectors. Most participants fell within the age range of 30 to 45 years, indicating that the entrepreneurial transition has largely been driven by mid-career professionals combining managerial experience with innovation-oriented outlooks. Educational backgrounds were predominantly postgraduate, with strong representation from engineering, business management, information technology, and economics disciplines. A significant proportion of respondents had prior experience operating under sanction conditions, providing them with institutional memory and adaptive competencies that influenced post-sanction strategic behavior. Firm size distribution showed dominance of small and medium-sized enterprises, though several scaling startups and internationally oriented firms were also included. Average entrepreneurial experience exceeded seven years, suggesting that participants possessed sufficient exposure to institutional uncertainty and market volatility to meaningfully evaluate strategic imperatives emerging in the post-sanction period.

Table 1. Measurement Model Evaluation: Reliability and Convergent Validity of Strategic Imperatives

Construct	Number of Items	Factor Loadings Range	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Institutional Adaptation	5	0.71–0.86	0.88	0.91	0.66
Innovation Capability	6	0.73–0.89	0.90	0.93	0.69
Market Internationalization Readiness	5	0.70–0.84	0.87	0.90	0.64
Digital Transformation Orientation	5	0.74–0.88	0.89	0.92	0.68
Strategic Agility	6	0.72–0.87	0.91	0.94	0.72
Entrepreneurial Resilience	4	0.69–0.83	0.85	0.89	0.62

The results presented in Table 1 demonstrate strong measurement properties across all latent constructs included in the entrepreneurial transition model. Factor loadings exceeded the recommended threshold, indicating that individual items consistently represented their underlying constructs. Cronbach's alpha values ranged from 0.85 to 0.91, confirming high internal consistency reliability. Composite reliability indices further supported scale stability, while Average Variance Extracted values exceeded acceptable criteria, establishing convergent validity. These findings confirm that institutional adaptation, innovation capability, internationalization readiness, digital transformation orientation, strategic agility, and entrepreneurial resilience operate as empirically distinct yet theoretically coherent dimensions of entrepreneurial transition in post-sanction Iran. The robustness of the measurement model justified proceeding to structural analysis examining relationships among constructs.

Table 2. Correlation Matrix and Discriminant Validity

Construct	IA	IC	MIR	DTO	SA	ER
Institutional Adaptation (IA)	0.81					
Innovation Capability (IC)	0.54	0.83				
Market Internationalization Readiness (MIR)	0.49	0.61	0.80			
Digital Transformation Orientation (DTO)	0.58	0.66	0.63	0.82		
Strategic Agility (SA)	0.64	0.71	0.68	0.70	0.85	
Entrepreneurial Resilience (ER)	0.59	0.62	0.57	0.60	0.73	0.79

Table 2 reports inter-construct correlations alongside square roots of AVE values positioned on the diagonal, allowing assessment of discriminant validity. The results show that each construct shares stronger variance with its own indicators than with other constructs, confirming conceptual distinctiveness within the model. Moderate to strong positive correlations were observed among strategic agility, innovation capability, and digital transformation orientation, suggesting that entrepreneurial adaptation in post-sanction Iran operates through mutually reinforcing strategic capabilities rather than isolated organizational behaviors. Institutional adaptation demonstrated meaningful associations with all other constructs, highlighting the central role of regulatory navigation and institutional learning in shaping entrepreneurial success. Importantly, correlation coefficients remained below critical multicollinearity thresholds, indicating that constructs contribute unique explanatory value without redundancy.

Table 3. Structural Model Results: Path Coefficients and Hypothesis Testing

Hypothesized Relationship	Path Coefficient (β)	t-value	p-value	Result
Institutional Adaptation → Strategic Agility	0.32	5.41	<0.001	Supported
Innovation Capability → Strategic Agility	0.38	6.12	<0.001	Supported
Digital Transformation Orientation → Strategic Agility	0.29	4.87	<0.001	Supported
Strategic Agility → Internationalization Readiness	0.44	7.03	<0.001	Supported
Entrepreneurial Resilience → Strategic Agility	0.26	4.35	<0.001	Supported
Internationalization Readiness → Entrepreneurial Performance	0.47	7.55	<0.001	Supported

The structural model results summarized in Table 3 reveal statistically significant relationships among the strategic dimensions shaping entrepreneurial transition. Institutional adaptation exerted a strong positive effect on strategic agility, indicating that entrepreneurs capable of interpreting regulatory change and navigating institutional uncertainty are better positioned to respond strategically to new market conditions. Innovation capability emerged as the strongest predictor of strategic agility, underscoring the importance of technological upgrading, product development, and knowledge integration during economic reopening phases. Digital transformation orientation also significantly enhanced agility, suggesting that post-sanction entrepreneurship increasingly relies on digital infrastructure to overcome historical constraints such as restricted international connectivity and limited financial integration. Entrepreneurial resilience contributed meaningfully to agility, reflecting the adaptive mindset cultivated during prolonged sanction periods. Strategic agility, in turn, strongly predicted internationalization readiness, which ultimately demonstrated the largest impact on entrepreneurial performance outcomes. These findings collectively validate the proposed transition model and highlight agility as the central mediating mechanism linking institutional change to entrepreneurial success.

Table 4. Model Fit and Predictive Power Indicators

Indicator	Value	Recommended Threshold
R ² Strategic Agility	0.63	>0.25
R ² Internationalization Readiness	0.57	>0.25
R ² Entrepreneurial Performance	0.61	>0.25
SRMR	0.058	<0.08
NFI	0.92	>0.90
Predictive Relevance (Q ²)	0.41	>0

Table 4 presents model fit indices and predictive power statistics demonstrating the explanatory strength of the proposed framework. The R² values indicate that institutional adaptation, innovation capability, digital transformation, and resilience collectively explain a substantial proportion of variance in strategic agility, confirming the multidimensional nature of entrepreneurial adaptation. Similarly high explanatory power was observed for internationalization readiness and entrepreneurial performance, suggesting that the model effectively captures mechanisms through which Iranian entrepreneurs transition toward global competitiveness. The standardized root mean square residual value fell well below recommended thresholds, indicating strong model fit. Normed fit index values confirmed overall structural adequacy, while positive predictive relevance statistics demonstrated the model's capacity to forecast entrepreneurial outcomes beyond sample-specific conditions. Together, these results provide robust empirical evidence that entrepreneurial transition in post-sanction Iran is driven by interconnected strategic capabilities that enable firms to convert institutional change into sustainable competitive advantage.

Discussion and Conclusion

The findings of this study provide empirical evidence that entrepreneurial transition in post-sanction Iran is not merely a recovery phenomenon but a multidimensional strategic transformation shaped by institutional adaptation, innovation capability, digital orientation, resilience, and internationalization readiness. The results revealed that strategic agility emerged as the central mechanism connecting institutional change with entrepreneurial performance. This outcome aligns with institutional theory perspectives suggesting that firms operating in volatile environments develop adaptive capabilities that later become strategic advantages when environmental constraints begin to relax (3). Iranian entrepreneurs appear to have converted long-term exposure to sanctions into

organizational flexibility, allowing them to respond rapidly to emerging opportunities during periods of economic reconfiguration.

The strong relationship identified between institutional adaptation and strategic agility confirms that regulatory navigation remains a defining competence for Iranian entrepreneurs. Under sanctions, firms learned to operate within fragmented institutional environments characterized by uncertainty and restricted global integration. Previous research demonstrates that entrepreneurial persistence under sanctions is closely associated with institutional learning and adaptive governance practices (2). The present findings extend this argument by showing that institutional familiarity does not simply enable survival; rather, it forms the basis for strategic repositioning once market conditions evolve. Studies examining resilience-oriented SME internationalization similarly highlight the importance of institutional competence as a driver of post-crisis expansion strategies (3).

Innovation capability was found to be the strongest predictor of strategic agility, suggesting that technological upgrading and knowledge integration function as primary engines of entrepreneurial transition. This result supports research emphasizing the role of knowledge-based economic development and third-generation universities in fostering innovation-driven entrepreneurship in Iran (7). Innovation policies and intermediary organizations have contributed to building technological competencies that allow firms to shift from necessity-driven entrepreneurship toward opportunity-driven growth (9). Moreover, technological entrepreneurship research indicates that innovation capacity enhances firms' ability to operate competitively in emerging industries, particularly when institutional constraints begin to ease (21). The present study therefore confirms that innovation capability serves as a bridge between survival-oriented entrepreneurship and globally competitive enterprise development.

Digital transformation orientation also demonstrated a significant impact on strategic agility, reinforcing the growing importance of digital platforms in overcoming structural limitations. Iranian entrepreneurs have increasingly relied on digitalization as a mechanism for bypassing geographic and financial restrictions, which corresponds with evidence that digital platforms enhance entrepreneurial resilience and market accessibility (11). At the same time, digital entrepreneurship unfolds within nationally regulated technological environments shaped by planning priorities and digital protectionism policies (12). The findings suggest that entrepreneurs capable of strategically integrating digital technologies while navigating regulatory constraints achieve greater adaptive capacity, enabling participation in hybrid domestic–global markets.

Entrepreneurial resilience significantly contributed to strategic agility, confirming that capabilities developed under hardship conditions continue to influence post-sanction strategic behavior. Research on entrepreneurial persistence in harsh contexts demonstrates that Iranian entrepreneurs cultivate psychological endurance, improvisation skills, and risk tolerance through prolonged exposure to uncertainty (4). These traits appear to function as transferable strategic resources rather than temporary coping mechanisms. The ethical and legitimacy-oriented behaviors adopted by transitional entrepreneurs further strengthen organizational sustainability and stakeholder trust during economic restructuring (10). Thus, resilience operates not only as a survival attribute but also as a foundation for strategic growth.

The study further revealed that strategic agility strongly predicts internationalization readiness, emphasizing the centrality of global engagement in the post-sanction entrepreneurial agenda. Firms capable of rapid strategic adjustment are better prepared to re-enter international markets, establish partnerships, and comply with evolving export regulations. Prior research on SME internationalization confirms that risk-taking orientation and export capability development are critical determinants of successful global expansion from volatile economies (22).

Likewise, studies examining de-internationalization processes highlight how firms withdraw from foreign markets during instability and subsequently re-engage when institutional conditions improve (5). The present findings illustrate that Iranian entrepreneurs are actively transitioning from isolation-driven business models toward outward-looking strategic positioning.

Social and relational factors also help explain the observed results. Entrepreneurial culture and organizational learning significantly influence opportunity recognition and strategic orientation within technology-based firms (13). The importance of social networks identified in prior studies suggests that entrepreneurs leverage relational capital to compensate for institutional deficiencies and access external knowledge resources (14). Stakeholder relationships further enhance SME performance by strengthening legitimacy and collaborative capacity (15). These insights support the interpretation that entrepreneurial transition in Iran is embedded within collective learning processes rather than purely individual strategic decisions.

Gender and social diversity considerations provide additional context for interpreting the findings. Research indicates that sanctions produce differentiated entrepreneurial experiences across demographic groups, influencing opportunity access and resource mobilization patterns (16). Informal network structures, particularly among women entrepreneurs, facilitate resource acquisition and entrepreneurial participation in constrained environments (17). The transition toward a post-sanction economy may therefore generate new inclusion opportunities while simultaneously reproducing structural inequalities unless institutional reforms accompany market liberalization.

Policy transformation also emerges as an important explanatory factor. Institutional technicisation and evolving advisory systems influence how entrepreneurship policies are implemented and how entrepreneurs interact with governance structures (24). Crisis-driven reforms such as digital authentication initiatives demonstrate how external shocks can accelerate policy innovation and create new entrepreneurial opportunity windows (18). Similarly, evidence from startup ecosystems during the COVID-19 crisis shows that innovation-oriented firms adapt rapidly when institutional environments encourage experimentation and technological adoption (19). The findings of this study suggest that post-sanction entrepreneurship benefits from policy environments that prioritize innovation facilitation rather than administrative control.

Macroeconomic and structural conditions further contextualize entrepreneurial transition. Iran's long-standing dependence on oil revenues has historically constrained diversification efforts, shaping entrepreneurial incentives and investment patterns (6). Urban investment dynamics, including fluctuations in real estate markets, influence capital allocation decisions among SMEs and indirectly affect entrepreneurial expansion strategies (26). Resistance economy policies have encouraged firms to develop endogenous capabilities and strategic self-reliance, which may explain the strong resilience orientation observed among entrepreneurs in this study (27). These structural conditions demonstrate that entrepreneurial transition reflects both macroeconomic evolution and firm-level strategic adaptation.

Human capital development and education also contribute to understanding the findings. Entrepreneurship education strengthens entrepreneurial alertness and mindset formation, enabling graduates to recognize emerging opportunities within transitional economies (20). Universities increasingly function as innovation hubs supporting commercialization and knowledge transfer, thereby strengthening entrepreneurial ecosystems (8). Market analysis competencies and opportunity confidence further enhance strategic decision-making during uncertain transitions (29, 30). Collectively, these factors indicate that entrepreneurial transition depends on the interaction between institutional reform, technological capability, and human capital development.

Finally, the broader geopolitical context remains critical for interpreting entrepreneurial transformation. International sanctions reshape trade relationships and global partnerships, influencing both constraints and opportunities for domestic entrepreneurs (1). Variation in formal financial institutions and emerging funding mechanisms further affects access to entrepreneurial finance and innovation investment (31). The results of this study suggest that post-sanction entrepreneurship represents a transitional phase in which accumulated resilience, digitalization, institutional learning, and innovation capability converge to create a new strategic paradigm for Iranian firms.

Despite providing valuable insights, this study has several limitations that should be acknowledged. First, the research focused exclusively on entrepreneurs located in Tehran, which may limit generalizability to other regions of Iran where institutional conditions, resource availability, and entrepreneurial ecosystems differ significantly. Second, the cross-sectional nature of the quantitative data restricts the ability to capture long-term entrepreneurial evolution and dynamic adaptation processes over time. Third, reliance on self-reported data introduces the possibility of response bias, particularly regarding assessments of strategic performance and organizational capabilities. Additionally, rapidly changing geopolitical conditions mean that post-sanction entrepreneurial dynamics remain fluid, and the findings should be interpreted as reflective of a specific transitional moment rather than a permanently stabilized economic environment.

Future studies should adopt longitudinal research designs to examine how entrepreneurial strategies evolve across different phases of sanction relief, economic reopening, and potential re-imposition of external restrictions. Comparative studies between Iranian regions or between Iran and other sanctioned economies could provide deeper insights into contextual determinants of entrepreneurial resilience and transition. Researchers may also explore sector-specific dynamics, particularly within high-technology industries, digital platforms, and creative economies where transformation processes may differ substantially. Integrating qualitative ethnographic approaches could further illuminate micro-level entrepreneurial decision-making processes and identity formation during institutional transition. Finally, future research should examine how artificial intelligence, fintech innovation, and global digital ecosystems reshape entrepreneurial internationalization pathways in emerging economies.

From a practical perspective, policymakers should prioritize institutional stability, transparent regulation, and innovation-supportive governance structures that enable entrepreneurs to convert resilience into sustainable growth. Entrepreneurial support programs should emphasize digital transformation, international market readiness, and strategic management capabilities rather than short-term financial assistance alone. Universities and innovation intermediaries can play a crucial role by strengthening industry collaboration, commercialization pathways, and entrepreneurial education initiatives that prepare entrepreneurs for global competition. Business leaders should invest in organizational learning systems, digital infrastructure, and partnership networks to enhance strategic agility. Finally, strengthening inclusive entrepreneurship policies that support women entrepreneurs, young innovators, and regional startups may help ensure that the benefits of post-sanction economic transition are distributed broadly across society rather than concentrated within limited sectors or metropolitan centers.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adhered in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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