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Original Article (Mixed)

# Validation of the Knowledge Management Model Based on the Asian Productivity Organization (APO) Model in the Fars Province Water and Wastewater Company

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## Abstract

The aim of the present study was to provide a comprehensive model for international entrepreneurship in ECO member countries. A mixed research method was used: in the qualitative part, data were collected and analyzed using systematic data-based theory and interviews with 15 academic and executive experts (until theoretical saturation). In the quantitative part, 323 managers were selected from 2035 managers of knowledge-based companies in the Export Development and Technology Exchange Corridor by random sampling. The data collection tool included semi-structured interviews and a questionnaire based on qualitative findings. The validity of the tools was confirmed by experts and reliability was confirmed with Cronbach's alpha. Qualitative data were analyzed with MAXQDA software and three-stage coding, which resulted in the extraction of 356 primary codes, 79 open categories, 16 axial categories, and 5 selected categories. In the quantitative part, factor analysis and structural equations were conducted with AMOS. The findings showed that the international entrepreneurship model in ECO is based on multi-level convergence (macro, meso, and micro). Its main components include contextual factors (regional capacity building), causal factors (strategic context building), intervention factors (challenge management), strategies (operational framework), and consequences (sustainable development). This model can help policymakers, economic institutions, knowledge-based companies, and small, medium, and large companies enter global markets and pave the way for creating a sustainable competitive advantage and transforming ECO into an Asian innovation hub.

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## **Extended Abstract**

### **Introduction**

International entrepreneurship, as the process of forming and expanding innovative economic activities across national borders and taking advantage of global opportunities, has become one of the main engines of economic growth in the world in recent decades (Chukwuka et al., 2024). The Economic Cooperation Organization (ECO), as a regional pact consisting of countries with common historical, cultural and geographical ties, has extensive capacities in the fields of trade, investment and knowledge transfer. With a population of over half a billion people and rich natural and human resources, these countries can provide an important platform for the expansion of international entrepreneurship. However, existing studies show that despite the existence of many opportunities, obstacles such as weak institutional coordination, limited access to capital, ineffective support policies, insufficient use of new technologies, and lack of regional entrepreneurial networks have prevented the full realization of the international entrepreneurial potential in the ECO region (khan, 2024). The ECO organization was initially founded in 1985 by Iran, Turkey, and Pakistan, and with the accession of seven other countries in 1992, it became a regional institution with the prospect of economic cooperation, infrastructure development, and facilitation of trade exchanges (abbas, 2024).

Despite such capabilities, the growth of international entrepreneurship in ECO has faced serious obstacles; Complex bureaucracy, financial constraints, difficulty in accessing global markets, and sanctions have prevented the full use of potential (Montiel, 2023). Past research also shows that factors such as a strong business environment, effective support policies, the use of new technologies, and the capabilities of entrepreneurs are essential conditions for success in this direction (Deakins et al., 2024). However, the role of local culture and values, the effect of national policies, and how to integrate new technologies in a regional framework have still received less attention (Nazari et al., 2024).

On the other hand, the geopolitical and economic conditions of these countries are such that entrepreneurial cooperation can not only improve the level of economic interactions in the region, but also play a role in increasing their economic resilience and socio-political convergence. Thus, providing a comprehensive and localized model for the development of international entrepreneurship in ECO member countries is an undeniable necessity; a model that can encompass both structural factors (such as policies, laws, and infrastructure) and behavioral factors (such as entrepreneurial culture, innovation, and risk-taking) and provide practical and efficient solutions by considering common characteristics and differences between member countries. Examining these obstacles and identifying key success factors can pave the way for providing a local and efficient model for the development of international entrepreneurship in the ECO region. Therefore, the research question is: What model can explain the key and effective dimensions of international entrepreneurship in ECO member countries and pave the way for the sustainable development of the region?

### **Theoretical foundations**

#### **Entrepreneurship and economic growth**

Entrepreneurship is recognized in the economic development literature as one of the most important engines of growth and innovation. This phenomenon creates economic and social value by identifying new opportunities, organizing resources, and creating innovative businesses, and provides a platform for the dynamics of economic systems (Callegari, 2024). At the international level, entrepreneurship takes on more complex dimensions, because entrepreneurs are forced to face institutional, political, and cultural diversity in addition to

economic factors. Accordingly, “international entrepreneurship” as an interdisciplinary field in management, economics, and social sciences, focuses on the process of identifying and exploiting cross-border business opportunities (Zahra & George, 2017). In other words, at the international level, this concept becomes important when entrepreneurs operate in diverse political, economic, and cultural environments and are forced to adapt to the institutional and structural differences of different markets (Zahra and George, 2017). Having its roots in internationalization discussions (Tolstoy, 2024), international entrepreneurship, is known as a tool for exploiting cross-border opportunities and creating competitive advantage. Doozandeh Ziabar et al., (2024) studied the presentation of a social entrepreneurship model in rural tourism development in a tourism target village in Guilan province. The statistical population of the study included 10 managers, experts, and university professors in the field of tourism, selected through purposive sampling. The results of the qualitative questionnaire and open interviews with sample members were analyzed after taking notes and transferring them to the system using the data-driven method and through coding and Max Quda software, and the output and final model were reported. The results showed that traditional tourism entrepreneurship follows a capitalist approach.

Shahzad et al. (2024) studied "International Entrepreneurship Antecedents and the Role of Emerging Technologies in Achieving Sustainable Development Goals". This research is applicable in terms of purpose, and quantitative in terms of approach; the data were analyzed using PLS-SEM techniques in SmartPLS 4 software. The findings showed that key antecedents of international entrepreneurship significantly affect sustainable development and emerging technologies play a mediating role between antecedents and sustainable development.

### **Research Methodology**

This research was conducted with a mixed approach (modern hybrid) and in two qualitative and quantitative stages. In the qualitative part, systematic data-based theory was used and the statistical population included academic and non-academic experts in the field of international entrepreneurship. Purposive sampling continued until theoretical saturation was reached, and a total of 15 semi-structured interviews were conducted. Qualitative data were collected through in-depth interviews, observation, and review of scientific documents, and then analyzed. In the quantitative part, the data collection tool was a researcher-made questionnaire with a five-point Likert scale. The reliability of the questionnaire was confirmed by Cronbach's alpha test and its validity was confirmed through content validity and construct validity. Finally, structural equation modeling was used to test the research hypotheses using Amos software.

### **Research findings**

By presenting a local model of "entrepreneurship development based on multi-level convergence", the present study showed that institutional coordination, regional networking, and empowerment of entrepreneurs at three macro, intermediate, and micro levels connect regional capacities in an integrated manner. Contextual factors such as policies, entrepreneurial culture, technological infrastructure and international cooperation provide the foundation for entrepreneurial development, while administrative barriers, legal restrictions and cultural differences pose challenges. Research innovations include the “interactional model of natural resources”, the “dual role of family relationships”, and the “multi-layer model of administrative barriers”. Proposed strategies target the development of infrastructure, cross-border cooperation networks, and the promotion of individual

capabilities. The consequences include increased innovation, economic growth and the creation of job opportunities, and social welfare.

### Conclusion

The present study, with the aim of analyzing the development of international entrepreneurship in the ECO region, has presented an indigenous model called “Entrepreneurship Development Based on Multilevel Convergence”. The findings show that multilevel convergence, including institutional coordination, regional networking and empowerment of entrepreneurs, plays a central role in strengthening international entrepreneurship and connects regional capacities in an integrated manner at three levels: macro (regional policy-making and governance), meso (inter-organizational networks) and micro (individual skills and capabilities). These results are consistent with the findings of Morris (2024) and O’Connor (2023), who have emphasized the importance of institutional frameworks and cooperation networks in the growth of regional entrepreneurship.

The analysis of the research context showed that contextual factors including supportive policies and laws, entrepreneurial culture, technological infrastructure and international cooperation are the foundation for the formation of international entrepreneurship in the ECO region. Cultural and historical commonalities, shared natural resources and economic diversity of countries, especially in the completion of the value chain, play both facilitating and challenging roles. Innovative findings of the research include the “interactive pattern of natural resources” and the “dual role of family relationships” that simultaneously act as an advantage and a constraint in the entrepreneurial process. These results are in line with the studies of Khan et al. (2024) and Zocchla (2024) that have highlighted the importance of contextual capacities in regional entrepreneurship. On the other hand, intervening conditions including administrative and bureaucratic challenges, legal and policy constraints and cultural and social barriers were identified. Lengthy company registration processes, lack of legal transparency, sudden policy changes, language differences, and limited role of women are examples of the main barriers. By introducing the “multi-layered model of administrative barriers” and providing an integrated framework for managing these challenges, this study has provided practical solutions to reduce their negative effects, and is consistent with the findings of Esmaeilpour et al. (2020), Khosravi (2023), and Navi (2025).

Entrepreneurship development strategies in the ECO region focus on three main axes: strengthening legal frameworks and supportive policies, developing common technological and economic infrastructure, and expanding cross-border cooperation networks. Tools such as tax exemptions, joint technology parks, digital platforms, and holding regional conferences facilitate entry into entrepreneurial activities and increase the capacity for synergy among entrepreneurs in member countries. Research innovations include the design of a “regional entrepreneurship policy model at three levels”, a framework for measuring the effectiveness of shared technological infrastructures, and the development of a “smart networking model among regional entrepreneurs”.

The consequences of international entrepreneurship development in the ECO region include two dimensions: economic and social. From an economic perspective; increased innovation, GDP growth, and technological export promotion are observed, and from a social perspective; the creation of job opportunities for youth and women and the improvement of general welfare indicators are significant. These results are in line with the findings of OECD (2023) and Economic Development Bank (2022), which have emphasized that regional entrepreneurship can lead to sustainable economic and social growth.