



Evaluation and Analysis of the Cultural and Social Environment of the Entrepreneurial Ecosystem Using the PFB Approach

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Abstract

This study empirically analyzes the cultural and social environment as a pillar of the entrepreneurial ecosystem and its impact on business performance and entrepreneurship development in Iran. Using data from the Global Entrepreneurship Monitor (GEM) for 2019–2020, the research applies the Penalty for Bottleneck (PFB) methodology, grounded in the weakest-link theory and the theory of constraints. The cultural and social environment is operationalized through two sub-indices: Perceived Entrepreneurship (PE) and Social Values of Entrepreneurship (SE), comprising ten pillars. The main objective is to identify bottlenecks, measure penalties imposed on stronger pillars, and prioritize policy interventions. The findings reveal that the “ease of starting a business” pillar (normalized value = 0.35) acts as the bottleneck. It imposes the largest penalties on “high social status of entrepreneurs” (−0.15), “media attention to entrepreneurship” (−0.08), and “perception of entrepreneurial capabilities” (−0.08). The PE sub-index decreases from 53% to 50%, the SE sub-index from 71% to 65%, and the overall Cultural Environment Index (BEI) from 62% to 58% after applying PFB. However, ecosystem efficiency (ABE) improves from 56.24% to 61.96% after penalty application, indicating that addressing the bottleneck enhances balance. The study concludes that entrepreneurship policies should target the weakest pillars rather than reinforcing stronger ones. The findings offer a systemic framework for improving Iran’s entrepreneurial cultural ecosystem and reducing policy intervention costs.

Keywords: Entrepreneurial Cultural Wnvironment; Cultural Environment Cottlenecks; Ecosystem efficiency; Global Entrepreneurship Monitor (GEM); Penalty for Bottleneck (PFB).

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Introduction

Problem statement. In contemporary economic literature, the transition from a managed economy to an entrepreneurial economy is a central theme, emphasizing the role of innovative small and medium-sized enterprises in economic growth and development (Drucker, 1985; Audretsch & Thurik, 2001). Entrepreneurship does not occur in a vacuum; it is embedded in an entrepreneurial ecosystem in which cultural and social factors play a decisive role. Despite growing interest in entrepreneurial ecosystems, the interaction among their pillars—particularly the cultural and social environment—has received insufficient empirical attention (Isenberg, 2011; Stam, 2015). In Iran, although entrepreneurship is recognized as a driver of development, the cultural environment remains imbalanced, and the weakest pillars impose penalties on stronger ones. This imbalance reduces the efficiency of the entire ecosystem and increases the cost of policy interventions.

Purpose. This study aims to empirically analyze the cultural and social environment of the entrepreneurial ecosystem in Iran, identify its bottlenecks, measure the penalties imposed on other pillars, and prioritize policy measures. It further seeks to assess how removing the bottleneck can improve ecosystem efficiency and balance.

Questions / Hypothesis. The study addresses three main questions: (1) Which pillar of the cultural and social environment acts as the bottleneck? (2) How does the bottleneck penalize stronger pillars? (3) How does improving the bottleneck affect the overall efficiency of the cultural entrepreneurial ecosystem? No formal hypothesis is tested; the study is exploratory and analytical.

Background. The theoretical framework draws on the Global Entrepreneurship Monitor (GEM) model, which conceptualizes the cultural and social environment through two sub-indices: Perceived Entrepreneurship (PE) and Social Values of Entrepreneurship (SE). These sub-indices consist of ten pillars. The PFB methodology, developed by Acs, Autio, and Szerb (2014) and extended by Szerb et al. (2016), is based on the weakest-link theory and the theory of constraints. It assumes that the weakest pillar acts as a bottleneck, imposing penalties on stronger pillars and reducing overall ecosystem efficiency. The cultural context is further informed by Baumol's (1990) distinction between productive and unproductive entrepreneurship, Hofstede's (2011) cultural dimensions, and the socio-cultural factors affecting entrepreneurial activity (Thornton et al., 2011; Cacciotti & Hayton, 2017).

Methodology

This research is applied in purpose and analytical-descriptive in method, employing the Penalty for Bottleneck (PFB) technique. Data were collected from the Global Entrepreneurship Monitor (GEM) database for the years 2019–2020. The GEM survey in Iran was conducted with 36 entrepreneurship experts and experienced entrepreneurs using a 7-point Likert scale. The cultural and social environment was measured through ten pillars grouped into two sub-indices: Perceived Entrepreneurship (PE) with six pillars, and Social Values of Entrepreneurship (SE) with four pillars.

The analysis followed five steps. First, the values of the ten pillars were normalized using the Mini-Max method to fit the [0,1] interval. Second, the penalty imposed on each pillar by the bottleneck was calculated using the PFB formula: $h_j = \min y_j + \left(1 - e^{-(y_j - \min y_j)}\right)$, where y_j is the normalized value of pillar j , and $\min y_j$ is the lowest normalized value. Third, the values of the two sub-indices were

computed as $PE_i = 100 \sum_{j=1}^6 h_j$ and $SE_i = 100 \sum_{j=1}^4 h_j$. Fourth, the overall Cultural Environment

Index was calculated as $BEI_i = \frac{1}{2}(PE_i + SE_i)$. Fifth, the Average Bottleneck Gap (ABG) and Average Bottleneck Efficiency (ABE) were calculated to assess ecosystem efficiency: $ABG_i = \frac{100 \sum (\max y_{i,j} - y_{i,j})}{(j-1) \max y_{i,j}}$ and $ABE_i = 100 - ABG_i$. A decision rule was applied to identify the bottleneck: the pillar with the lowest normalized value, provided that the gap with the second lowest pillar is at least 0.05.

Findings

The findings indicate that the “ease of starting a business” pillar, with a normalized value of 0.35, acts as the bottleneck of the cultural environment in Iran. It imposes the largest penalties on the pillars of “high social status of entrepreneurs” (−0.15), “media attention to entrepreneurship” (−0.08), and “perception of entrepreneurial capabilities” (−0.08). The second weakest pillars are “fear of failure” (0.42) and “entrepreneurial intention” (0.44), which are relatively close to each other and also impose penalties on stronger pillars.

The values of the sub-indices before and after applying PFB reveal a significant penalty effect. The Perceived Entrepreneurship (PE) sub-index decreases from 53% to 50%, the Social Values of Entrepreneurship (SE) sub-index from 71% to 65%, and the overall Cultural Environment Index (BEI) from 62% to 58%. This indicates that the bottleneck imposes substantial losses on the cultural ecosystem. However, the efficiency of the ecosystem improves after applying the penalty. The Average Bottleneck Gap (ABG) decreases from 76.43 to 38.04, and the Average Bottleneck Efficiency (ABE) increases from 56.24% to 61.96%. This suggests that addressing the bottleneck through policy intervention can enhance the balance and efficiency of the cultural entrepreneurial ecosystem.

The results also show that there is no direct relationship between the level of development of the cultural environment and the efficiency of the entrepreneurial ecosystem. Instead, homogeneity and balance among pillars are the key drivers of efficiency. A sensitivity analysis indicates that improving the bottleneck from 0.35 to 0.55 reduces the penalty imposed on the “high social status of entrepreneurs” pillar by approximately 67%, demonstrating the high return on investing in the weakest pillar.

Conclusion

The study concludes that the cultural and social environment of Iran’s entrepreneurial ecosystem is imbalanced, with the “ease of starting a business” acting as the critical bottleneck. This bottleneck imposes significant penalties on stronger pillars, particularly the social status of entrepreneurs, media attention, and perceived capabilities, leading to wasted potential and reduced ecosystem efficiency. The findings confirm that optimal entrepreneurship policies should focus on improving the weakest pillars rather than reinforcing stronger ones. Facilitating business start-ups can reduce penalties, preserve the high social status of entrepreneurs, and ultimately enhance the entrepreneurial culture. A systemic approach to ecosystem optimization is recommended, with policy priorities aligned with bottleneck removal. Future research should examine cultural convergence and social cohesion across Iranian provinces and measure their impact on the cultural entrepreneurial ecosystem, using Hofstede’s dimensions and informal institutions.

References

1. Acs, Z. J., Autio, E., & Szerb, L. (2014). National systems of entrepreneurship: Measurement issues and policy implications. *Research Policy*, 43(3), 476–494. <https://doi.org/10.1016/j.respol.2013.08.016>
2. Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
3. Audretsch, D. B., & Thurik, A. R. (2001). What’s new about the new economy? Sources of growth in the managed and entrepreneurial economies. *Industrial and Corporate Change*, 10(1), 267–315. <https://doi.org/10.1093/icc/10.1.267>
4. Baumol, W. J. (1990). Entrepreneurship: Productive, unproductive, and destructive. *Journal of Business Venturing*, 11(1), 3–22. [https://doi.org/10.1016/0883-9026\(90\)90014-8](https://doi.org/10.1016/0883-9026(90)90014-8)
5. Cacciotti, G., & Hayton, J. C. (2017). National culture and entrepreneurship. In A. C. Corbett, J. A. Katz, & P. H. Phan (Eds.), *The Wiley handbook of entrepreneurship* (pp. 401–422). Wiley.
6. Drucker, P. F. (1985). *Innovation and entrepreneurship: Practice and principles*. Harper & Row.
7. Global Entrepreneurship Monitor. (2020). *Global Entrepreneurship Monitor 2019/2020 global report*. Global Entrepreneurship Research Association.



8. Hofstede, G. (2011). Dimensionalizing cultures: The Hofstede model in context. *Online Readings in Psychology and Culture*, 2(1). <https://doi.org/10.9707/2307-0919.1014>
9. Isenberg, D. (2011). *The entrepreneurship ecosystem strategy as a new paradigm for economic policy: Principles for cultivating entrepreneurship*. Institute of International and European Affairs.
10. Nezhad Taheri, A., Karshenasan, A., & Mohammadi Khiyareh, M. (2020). Evaluation and analysis of entrepreneurial ecosystem and business environment of provinces with new PFB approach. *Quarterly Journal of Economic and Regional Development*, 27(20), 101–127. (In Persian)
11. Riahi, P. (2016). *Monitoring and improving Iran's entrepreneurship system: First report*. Ministry of Cooperatives, Labour, and Social Welfare. (In Persian)
- Shane, S. (2003). *A general theory of entrepreneurship: The individual-opportunity nexus*. Edward Elgar.
12. Spigel, B. (2015). The organization of entrepreneurial ecosystems. *Entrepreneurship Theory and Practice*, 39(1), 49–72. <https://doi.org/10.1111/etap.12167>
13. Stam, E. (2015). Entrepreneurial ecosystems and regional policy: A sympathetic critique. *European Planning Studies*, 23(9), 1759–1769. <https://doi.org/10.1080/09654313.2015.1073179>
14. Szerb, L., Acs, Z. J., Autio, E., & Komlósi, É. (2016). The entrepreneurial ecosystem in the United States: A regional perspective. *Journal of Entrepreneurship and Public Policy*, 5(3), 316–342. <https://doi.org/10.1108/JEPP-03-2016-0013>
15. Thornton, P. H., Ribeiro-Soriano, D., & Urbano, D. (2011). Socio-cultural factors and entrepreneurial activity: An overview. *International Small Business Journal*, 29(2), 105–118. <https://doi.org/10.1177/0266242610391930>

