

TRACK - ENTREPRENEURSHIP

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Entrepreneurial ecosystems: a qualitative comparative analysis (QCA) of their similarities and differences around the world

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Objective of the paper. *The usage of the term “entrepreneurial ecosystem” is quite new in management research. Daniel Isenberg’s (2010) work in the Harvard Business Review and Brad Feld’s (2012) book on Startup Communities have driven its recent popularity within practitioner and policy communities. Economic organizations and communities, such as the World Economic Forum (2013), the Kauffman Foundation (Motoyama et al., 2014), and the OECD (Mason and Brown, 2014) have enfolded this approach as a new economic development strategy. This has been followed by several academic studies focused on establishing the attributes of successful ecosystems and exploring how they support high-growth entrepreneurship (e.g., Acs et al., 2017; Ács, Autio, and Szerb, 2014; Audretsch and Belitski, 2017; Stam, 2015). The lack of coherent theoretical underpinnings is reflected in definitional diversity (Autio and Levie, 2017). As Stam underlines (2015: 1761) “there is not yet a widely shared definitions” nor probably shared meanings. In part, this is because such ecosystems are defined in very different ways, at different scales, and with different research designs and data (Malecki, 2018).*

Received definitions mostly focus on the various elements that constitute an entrepreneurial ecosystem. For instance, Stam (2015: 1765) defined the entrepreneurial ecosystem as “an interdependent set of actors that is governed in such a way that it enables entrepreneurial action”. Mason and Brown (2014, p. 5) suggested a rather more comprehensive definition as: “a set of interconnected entrepreneurial actors (both potential and existing), organizations (e.g. firms, venture capitalists, business angels and banks), institutions (universities, public sector agencies and financial bodies), and processes (business birth rate, rate of high-growth firms, number of serial entrepreneurs and block-buster entrepreneurs, and levels of entrepreneurial ambition and sell-out mentality in the society). Although over time entrepreneurial ecosystems conceptualization has led to more accurate definitions and conceptualizations - moving to themes such as governance (Colombo et al., 2017) or digitalization (Sussan and Acs, 2017) - the notion of entrepreneurial ecosystems is still suffering from the following shortcomings. First, as it essentially neglects outcome measures (Autio and Levie, 2017), entrepreneurial ecosystems concept has been criticized for bordering on tautological (Ács, et al., 2014; Roundy, 2017). Specifically, the concept is tautological in that entrepreneurial ecosystems are defined as those that demonstrate successful entrepreneurship, and where successful entrepreneurship is apparent, there must be a strong entrepreneurial ecosystem. Additionally, most of the provided definitions present a laundry list of factors and characteristics with no reasoning about cause and effect nor of how they cohere (Alvedalen and Boschma, 2017; Spigel and Harrison, 2017).

This paper aims at looking at entrepreneurial ecosystems from a configurational perspective to empirically analyze how the elements that constitute an entrepreneurial ecosystem function in conjunction to each other. To take a holistic view to look at entrepreneurial ecosystems, and to analyze not only their entrepreneurial component, is perfectly in line with the recommendations from the received (manly theoretical) literature. For instance, according to Feld (2012) successful entrepreneurial ecosystems have nine attributes. Entrepreneurs should lead the development of the ecosystem as mentors or advisors whereas the interaction between the other players in the ecosystem (with high network density, many connecting events and large companies collaborating with local start-ups), the access to all kinds of relevant resources (talent, services and capital), the enabling role of government at the background are the keys of the success. Isenberg (2010) suggest to policy makers and practitioners to respect the nine following rules when building an entrepreneurial ecosystem: 1) Stop emulating Silicon Valley; 2) Shape the ecosystem around the local conditions; 3) Engage the private sector from the start; 4) Stress the roots of new ventures; 5) Do not over-engineer clusters; help them grow organically; 6) Favour the high potentials; 7) Get a big win on the board; 8) Tackle cultural change head-on; 9) Reform legal, bureaucratic and regulatory frame-works. Isenberg and Onyemah (2016) list six distinct domains of the ecosystem, i.e., policy, finance, culture, support, human capital and markets. They list as well the key actors of the entrepreneurial ecosystems, i.e., policy makers and public leaders, financial actors, culture impacters, support organization and event organizers, educators and developers of human capital, and corporations.

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These frameworks are perfectly consistent with the key elements, output and outcomes of entrepreneurial ecosystems identified by Stam (2015), as well as with the key actors and interrelationships within entrepreneurial ecosystems discussed by Brown and Mason (2017).

Methodology. To address the paper's purposes and scope, we relied on the principles and methodologies of qualitative comparative analysis (QCA) (Ragin, 1987, 2000) that is uniquely suitable to compare entrepreneurial ecosystems and verify whether, even in the presence of contextual specific configurations, there are patterns of associations among their components. Its focus on phenomenon explanation (i.e., how a certain outcome is produced) is in contrast with the goal of most regression type analyses, which ask what influence a given causal factor has on some variable net other causal factors.

Specifically, we performed a fuzzy set QCA using a sample composed of the entrepreneurial ecosystems qualitatively analyzed by the World Economic Forum Report (2014). They are eight ecosystems representing six continents (North America, Europe, Asia, South/Central America with Mexico, Australia/New Zealand and Africa/Middle East) and two subsets of the US responses: (i) Silicon Valley/Bay Area (defined as the broader San Francisco Bay Area); and (ii) US - Other Cities. A separate analysis of Silicon Valley/Bay Area helps to compare its ecosystem with those of US - Other Cities and the other five continent groups presented. Silicon Valley is regarded by many observers as having the deepest and certainly most publicly recognized and successful entrepreneurial ecosystem.

On the ground of available theoretical or substantive knowledge of the cases and settings examined, we first identified the conditions. Particularly, for each ecosystem, eight conditions are considered taking the point of view of 1,000 interviewed entrepreneurs coming from different part of the globe¹. Early-stage companies seeking to scale in a sustained way face the challenge of attracting cash inflows, either from revenues or financing, to build and deliver the products and services that their customers will value and pay for. This makes accessible markets and funding & finance as two central ecosystem pillars. Human capital/workforce is a third key pillar, as scaling typically requires the mobilization of people to produce and deliver those products and services to customers. The five remaining pillars are mentors, government & regulatory framework, education & training, universities, and cultural support. We consider the pillars of the entrepreneurial ecosystems as the variables of entrepreneurial ecosystems configurations (see Table 1).

Tab. 1: Readily available pillars of entrepreneurial ecosystems worldwide

| Ecosystems | AM | HC | F&F | MEN | GRF | E&T | UN | CS | Average |
|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|---------|
| US – Silicon Valley/Bay Area | 92% | 93% | 91% | 91% | 67% | 80% | 88% | 90% | 86% |
| US – Other Cities | 83% | 87% | 76% | 72% | 57% | 62% | 67% | 64% | 71% |
| North America | 85% | 90% | 82% | 78% | 62% | 70% | 75% | 75% | 77% |
| Europe | 72% | 81% | 57% | 52% | 54% | 60% | 52% | 33% | 58% |
| Australia/New Zealand | 69% | 81% | 69% | 58% | 54% | 38% | 42% | 35% | 56% |
| Asia | 68% | 73% | 44% | 38% | 39% | 34% | 30% | 26% | 44% |
| Africa/Middle East | 68% | 50% | 55% | 36% | 55% | 32% | 23% | 45% | 45% |
| South/Central America with Mexico | 62% | 71% | 45% | 35% | 42% | 27% | 27% | 16% | 41% |

AM: accessible market; HC: human capital; F&F: funding & finance; MEN: mentors; GRF: government & regulatory framework; E&T: education & training; UN: universities; CS: cultural support

Source: World Economic Forum Report (2014)

Findings. We calibrated measures and constructed the truth table with 2k rows, where k is the number of causal conditions used in the analysis. We then reduced the number of the truth table rows based on minimum acceptable solution frequency and minimum acceptable consistency to generate the simplified combinations. In an effort to do that, we benefitted from the adoption of the fsQCA 2.5 software package that automatically calibrated cases into sets and revealed the possible configuration associated with the outcome of interest. A set of eight variables yields 256 configurations. The analyzed entrepreneurial ecosystems felled in four of them. At this point, according to the standard recommended thresholds for small size sample, we applied a frequency threshold of 1 and eliminated configurations that do not have observations. Then, we selected a consistency threshold of 0.7 and place 1 in the value proposition column for con-figuration with 0.7 consistency or greater and a 0 for cases with lower consistency.

In presenting the final results, we followed current conventions of reporting intermediate and parsimonious solutions introduced by Ragin and Fiss (2008). FsQCA presents three solutions to each truth table analysis: (1) a “complex” solution that avoids using any counterfactual cases (rows with-out cases “remainders”); (2) a “parsimonious” solution, which permits the use of any remainder that will yield simpler (or fewer) recipes; and (3) an “intermediate” solution, which uses only the remainders that survive counterfactual analysis based on theoretical and

¹ The Stanford Graduate School of Business' alumni database was used to seek responses from entrepreneurs with experience in early-stage compa-nies. Entrepreneurs show this geographical affiliation: 669 from North America, 160 from Europe, 28 from Australia/New Zealand, 117 from Asia, 20 from Africa and Middle East, 53 from South/central America with Mexico.

substantive knowledge (which is input by the user). Following this approach, attribute configurations that are part of both intermediary and parsimonious solutions are referred to as core conditions, whereas those present in intermediate but not in parsimonious solutions are referred to as complementary conditions. Measure of consistency and coverage are reported for the intermediate solutions. Eventually, the presence of a condition is indicated by a black circle - “●” - whereas its absence is indicated by an open circle with a cross - “⊗”. Furthermore, large circles indicate core conditions, and small circles refer to complementary conditions. Only one configuration is constantly linked to a high performing entrepreneurial ecosystem. Table 2 that follows visualizes the solution for high performing entrepreneurial ecosystems.

Tab. 2: Configurations of high performing entrepreneurial ecosystems

| | Solution # 1 |
|-----------------------------------|--------------|
| Accessible Markets | ● |
| Human Capital | ● |
| Funding & Finance | ● |
| Mentors | ● |
| Governments and Regulat. Policies | ● |
| Education and Training | ● |
| Universities | ● |
| Cultural Support | ● |
| Raw coverage | 0.508000 |
| Unique coverage | 0.508000 |
| Consistency | 0.796238 |

Source: own elaboration

The Boolean expression of the above solution is “am*hc*f&f*men*grf*e&t*un*cs” to be read as follows: Accessible market with human capital, funding & finance, mentors, governments and regulatory framework, education & training, universities and cultural support are sufficient to generate a high performing entrepreneurial ecosystem.

Table 3 shows the results of the fuzzy set analysis of low performing entrepreneurial ecosystems. The results indicate the existence of three distinct configurations that actually are not consistently linked to low performing ecosystems. The consistency scores for all solutions remained in fact below the imputed threshold of 0.7.

Tab. 3: Configurations of low performing entrepreneurial ecosystems

| | Solution # 1 | Solution # 2 | Solution # 3 |
|-------------------------|--------------|--------------|--------------|
| Accessible Markets | ● | ● | ● |
| Human Capital | ● | ● | ● |
| Funding & Finance | ⊗ | ● | ● |
| Mentors | ⊗ | ● | ● |
| Govern. & Reg. Policies | ⊗ | ● | ● |
| Education and Training | ⊗ | ● | ⊗ |
| Universities | ⊗ | ● | ⊗ |
| Cultural Support | ⊗ | ⊗ | ⊗ |
| Consistency | 0.438889 | 0.66805 | 0.597786 |

Source: own elaboration

Findings reveal that for allowing an entrepreneurial ecosystem to emerge and grow, the presence of multiple elements, i.e., what we called the pillars of entrepreneurial ecosystems, need to coexist. What this analysis adds to the received literature and empirical research is to suggest that the key role in the dynamics of entrepreneurial ecosystems is not played by entrepreneurs nor by accessible markets nor by financial resources. They result to be complementary conditions; in other words, their presence is necessary but not sufficient to generate an entrepreneurial ecosystem. Only when these factors combine with cultural support, which is made of tolerance of risk and failure, preference for self-employment, success stories, research culture, positive image of entrepreneurship and celebration of innovation, the emergence of a successful entrepreneurial ecosystem occurs.

Limitations of the research. The generalization of our findings may be affected by some limitations. First, in collecting data and measuring ecosystems’ pillars, we relied on entrepreneurs’ perception of the ecosystems at hand. Second, configurations are drawn only from eight global cases. Therefore, further large-scale studies and more objective ecosystems’ measures are needed to overcome these limitations.

Practical implications. Public policies have long recognized that entrepreneurial innovation is profoundly affected by its context. We suggest that to (re)create a more hospitable cultural environment is essential for entrepreneurial ecosystems. Particularly, findings emphasize that only an environment that tolerates risk and failure,

prefers self-employment, narrates success stories, is provided with a research culture, gives a positive image of entrepreneurship and celebrates innovation, allows entrepreneurship to grow and flow. Despite received studies, our analysis suggest that the real core elements of an entrepreneurial ecosystem are not human capital nor accessible markets nor financial resources. The element that makes the difference in building and sustaining entrepreneurship is the cultural support.

Originality of the paper. Our paper provides original findings thus contributing to the advancement of the state-of-the-art of the literature on entrepreneurial ecosystems. It is original from the methodological side as well. Despite most of the received literature has looked at entrepreneurial ecosystems by using single case studies, we used a configurational approach and compared eight different global cases. This approach has allowed us to overcome the concern related to the “laundry list” of the elements that constitute an entrepreneurial ecosystem as well as to detect the factors that produce a given phenomenon only in conjunction.

Key words: entrepreneurial ecosystems; pillars of entrepreneurial ecosystems; qualitative comparative analysis (QCA)

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