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A systematic literature review of entrepreneurial ecosystems in advanced and emerging economies

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Abstract The concept of entrepreneurial ecosystems has been gaining considerable attention during the past decade among practitioners, policymakers, and researchers. However, to date, entrepreneurial ecosystem research has been largely atheoretical and static, and it focused mostly on advanced economies. In this paper, we therefore do two things. We first systematically review entrepreneurial ecosystem literature and propose a conceptual model that explicates three entrepreneurial ecosystem dynamics based on *resource*, *interaction*, and *governance* logics, respectively. We then systematically review empirical studies of emerging economy entrepreneurial ecosystems to build a theoretical framework that highlights their salient features. We reveal three key findings that challenge the direct application of the model vis-à-vis advanced economy entrepreneurial ecosystems to emerging economy entrepreneurial ecosystems: *resource scarcities*, *structural gaps*, and *institutional voids*. Our findings contribute to entrepreneurial ecosystem literature in terms of ecosystem dynamics and contextualizing entrepreneurial ecosystems in emerging economies. We also provide policy implications for emerging countries in fostering new venture creation.

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1 Introduction

The concept of entrepreneurial ecosystems has gained considerable attention from academics, policymakers, and practitioners over the past decade (Acs et al. 2014, 2017; Alvedalen and Boschma 2017; Audretsch and Belitski 2016; Auerswald 2015; Autio et al. 2018; Isenberg 2011; Mack and Mayer 2016; Motoyama and Knowlton 2014; Spigel 2016; Stam 2015). Born with a strong policy flavor, this concept has also been widely used to frame policy conversations (Groth et al. 2015; Isenberg 2010; Mason and Brown 2014; WEF 2014). A broadly agreed notion among researchers refers to an entrepreneurial ecosystem as a community of multiple coevolving stakeholders that provides a supportive environment for new venture creations within a region. Research on some mature entrepreneurial ecosystems, such as Singapore (Wong et al. 2007) and Tel Aviv (Kon et al. 2014), provides insights on other emergent entrepreneurial ecosystems, such as Victoria (Cohen 2006), Estonia (Kshetri 2014), and Waterloo (Spigel 2017).

Despite the extensive scholarly and policy interests, the emerging domain of entrepreneurial ecosystems still remains under-theorized and conceptually fragmented. More importantly, extant entrepreneurial ecosystem

literature has focused mostly on advanced economies such as North America and Europe. However, the emergence of entrepreneurial ecosystems is a global phenomenon (Bruton et al. 2008). As new venture creation has gradually become a critical source of economic growth and essential lubricant for regional development in recent years (Stam and Van de Ven 2018), an ecosystem approach may contribute to reducing the gaps between advanced and emerging economies. Indeed, as Lingelbach et al. (2005, p. 7) pointed out "Entrepreneurship in developing countries is the most understudied important global economic phenomenon today.", understanding entrepreneurial ecosystems in emerging economies is imminent for both entrepreneurship scholars and policymakers.

In the key paper by Hoskisson et al. (2000), emerging economies are defined as "low-income, rapid-growth countries using economic liberalization as their primary engine of growth" (Hoskisson et al. 2000, p. 249). While the list of emerging economies kept changing since it was first used by the World Bank in 1980 consisting of 68 countries, we propose that the three core criteria for qualifying as emerging economies remained stable (Arnold and Quelch 1998). Firstly, the level of economic development is lower, compared to advanced economies, as primarily indicated by GDP per capita. This is important because China, for example, may be considered as a developed economy by some sources without this characteristic. Secondly, a high growth potential exhibits, as primarily indicated by the GDP growth rate. We specifically ignored developing economies which do not exert rapid economic growth. The final criterion is the extent and stability of the free-market system (Manolova et al. 2008). Emerging economies tend to exhibit relatively underdeveloped market-supporting institutions such as capital markets, labor markets, and legal systems (Bruton et al. 2008). Consequently, this variation in the extent of institutional voids may constrain further economic development but also provide opportunities for institutional development (Khanna and Palepu 2000; Mair et al. 2012). Match to the most up-to-date development of the listed countries and consulting the top 5 emerging economies indexes and the 2018 GEM reports, we based our systematic review on a list of 15 countries, namely Brazil, Chile, China, Colombia, Hungary, Indonesia, India, Malaysia, Mexico, Peru, Philippines, Russia, South Africa, Thailand, and Turkey.

Although the development of emerging countries has been phenomenal, along with their entrepreneurial ecosystems, little is known about how an entrepreneurial ecosystem operates in such environments (Schøtt 2008). Perhaps the relative dearth of the emerging economy entrepreneurial ecosystems (E4s) research reflects the difficulty in obtaining credible data due to limited institutional framework. This is a significant gap because complex institutional settings or market-related institutional voids in emerging economies inhibit the direct application of insights derived from advanced economies where sound market economy acts the dominant institutional context (Khanna and Palepu 2000; Mair et al. 2012; Peng 2000; Ramamurti and Hillemann 2018). Also, this gap entails further attention given that emerging economies have been assuming an increasingly dominant position in the world economy during the past two decades when undergoing the transition to a knowledge-based and entrepreneurship/innovation-driven economy.

Recent research on entrepreneurial ecosystems has witnessed a shift of focus from static framework development to process analysis (Spigel and Harrison 2018), and a number of scholars have started to explore entrepreneurial ecosystems in emerging economies such as China, India, and Brazil (Armanios et al. 2017; Goswami et al. 2018; Júnior et al. 2016; Shi and Shi 2017; Shi 2019). However, three major shortcomings remain in received literature. First, there is an absence of research on entrepreneurial ecosystems to systematically explore ecosystem dynamics. Existing research has separately explored specific aspect; however, a full picture of ecosystem dynamics is lacking to unpack not only the resource allocation and interaction processes but also the governance of entrepreneurial ecosystems. Second, beyond descriptive comparisons, research is scarce in terms of exploring theoretical causation underpinning distinctive features of E4s. Third, there is an absence of literature on entrepreneurial ecosystems to identify the salient features among emerging economies as a group when compared with advanced economies. The weak theoretical grounding of the received literature makes it difficult to provide targeted policy guidance for emerging countries.

The purpose of this article is to address the above gaps. We first systematically review the literature on entrepreneurial ecosystems with a focus on advanced economies. This review includes a synthesis of entrepreneurial ecosystems literature in terms of three ecosystem dynamics. Then, we conducted a second systematic literature review on empirical studies of E4s and

demonstrated three findings from this review. These two reviews together provide important insights into the distinctive characteristics of both advanced and emerging economy entrepreneurial ecosystems, thus shedding lights on the corresponding policy implications. Finally, we conclude with contributions and policy implications to foster the effective governance of entrepreneurial ecosystem in emerging countries.

2 Method

We conducted two systematic literature reviews to consolidate and synthesize results from primary research on specific questions (Tranfield et al. 2003). The first review focuses on studies of entrepreneurial ecosystems in general, which, to date, mainly focus on advanced economies, and the second one concentrates on the empirical studies of entrepreneurial ecosystems in emerging economies in order to reveal their distinctive features and shed light on future research avenues. To ensure transparency and replicability of our review, we followed the three-stage systematic review procedure proposed by Tranfield et al. (2003), namely planning, conducting, and reporting. Notably, systematic reviews are different from traditional literature reviews in that they employ more exhaustive, neutral, scientific, and replicable processes (Cook et al. 1997). Specifically, instead of a meta-analysis, we adopted a meta-narrative approach (Greenhalgh et al. 2005) which "places centre-stage the importance of understanding the literature critically and understanding differences between research studies as possibly being due to differences between their underlying research traditions" (Gough et al. 2017, p. 44).

For both systematic literature reviews, we chose the Web of Science ISI Social Sciences Index as our primary search database covering publications from 1970 to 2018. This database is one of the most comprehensive databases for academic research, and it includes a large number of influential and pronounced journals. Although the term entrepreneurial ecosystems emerged only in the 2000s (Malecki 2018), we went back to 1970 because similar concepts such as entrepreneurial systems were used earlier. It was also particularly appropriate and important to include the gray literature in these reviews for two main reasons. First, the topic of entrepreneurial ecosystems is novel and requires contextualization (Rutter et al. 2010). Second, most literature on entrepreneurial ecosystems aims at practitioners and consists of case-based reports. We intended the review to be as inclusive as possible and aimed to prevent omitting any potentially valuable contributions. Accordingly, two more databases were searched to enhance the degree of exhaustiveness: Google Scholar and ProQuest. While Google Scholar is known for its extensive search power, ProQuest provides access to theses. Other sources we included in our search contain personal contacts of influential scholars and practitioners in the field, hand-searching physical archival files, and working papers. We also leverage snowball techniques by examining the references of received papers to identify additional papers. As later illustrated that studies of entrepreneurial ecosystems in emerging economies are fairly limited, we also conducted a focused search of selected key journals to ensure that articles of relevance not using specified keywords are included. We now explain the detailed review procedures, our analytical approach, and the way we organize and present the review results.

We first systematically reviewed studies on entrepreneurial ecosystems. With the suggestions from the review panel that consisted of experts from academia and industry, we focused our review on the following research questions: (a) *How do entrepreneurial ecosystems work?* and (b) *What are the specific dynamics discussed in the entrepreneurial ecosystem literature?* Specifically, while exploring the answers for these two questions, we also paid attention to the uniqueness of entrepreneurial ecosystems relative to existing concepts such as "industrial districts" (Marshall 1920), "regional clusters" (Maskell 2001; Piore and Sabel 1984; Porter 1998; Storper 1995), "innovative milieus" (Crevoisier 2004), and "national and regional system of innovation" (Asheim et al. 2011; Doloreux 2002) although we have not included these in our search terms. We obtained the key list of similar concepts and representative works by reading through received papers on EEs and consulting with scholars and experts in this field. Unpacking theoretical differences between these concepts is essential to justify the indispensable insights provided by the entrepreneurial ecosystem concept above and beyond what has been studied before. We briefly mentioned the uniqueness of entrepreneurial ecosystems discussed in the received studies in the next section while summarizing the three dynamics and more in the discussion section. See Appendix 1 for the detailed review procedure. Our search strings in the Web of Science database is TS=((entrep* OR start-up* OR

startup*) AND (ecosystem* OR eco-system*)). We reviewed both theoretical and empirical papers but geared toward retaining papers making theoretical contributions. In total, we obtained 949 papers from the search process, and the screening process provided us with 68 key papers on EEs presented in Table 6 in Appendix 1. As we only focus on the concept of entrepreneurial ecosystems, we excluded studies in which the primary focus is not on entrepreneurial ecosystems, e.g., studies on firm-level innovation/business ecosystems and the relationship between entrepreneurship and economic growth. Detailed exclusion criteria can also be found in Appendix 1.

We then conducted a systematic literature review of empirical studies on E4s. Specifically, after discussing with the review panel, we focused our review on the following questions: (a) *What are the conditions that affect entrepreneurial activities in emerging economies?* and (b) *How do entrepreneurial ecosystems work in emerging economies?* After a preliminary search of keywords "entrepreneurial ecosystems" and "start-up ecosystem," we found very few empirical studies with emerging economies as the research context. This also confirms the fact that the notion of entrepreneurial ecosystems is in its infancy in emerging economies (Roundy 2017). We, therefore, apply a broader review coverage that involves studies even if not explicitly addressing the topic under the entrepreneurial ecosystem rubric. As detailed in Appendix 1, we initiated with the establishment of a protocol for the systematic literature search, selection, and exclusion. We used combinations of three groups of keywords to ensure comprehensive coverage and understanding: (1) entrepreneurship-related concepts, (2) list of emerging economies, and (3) ecosystem-related concepts. First, since entrepreneurship is a highly heterogeneous term, the definition has been constantly evolving with different emphases by different policymakers. To ensure the comprehensive coverage of our review, we carefully selected a list of entrepreneurship-related concepts according to various policy reports (e.g., European Commission, OECD and Startup Europe) (Autio 2016) and academic papers (Autio and Rannikko 2016; Birch 1979; Czarnitzki and Delanote 2012; Mason and Brown 2013). Second, based on the definition of emerging economies, we discussed in Section 1, the list of emerging economies kept evolving since it was first used in 1980 as the countries advanced in their development in the past several decades. The 65 emerging markets used by Hoskisson et al. (2000) have developed significantly since then. The top 5 emerging economies indexes do not agree entirely on which countries are emerging markets as of 2018 (IMF—23, MSCI—24, S&P—23, Russel—19, and Dow Jones—22).[1] To ensure an up-to-date list and consistency among different indexes, we chose to use a list that is the result of the intersection of the five indexes as of 2018. The final list of countries that all five institutions classify as emerging markets in 2018 includes Brazil, Chile, China, Colombia, Hungary, Indonesia, India, Malaysia, Mexico, Peru, Philippines, Russia, South Africa, Thailand, and Turkey. This final list is also mostly in line with the classification (factor-driven, efficiency-driven, and innovation-driven) used by the Global Entrepreneurship Monitor 2017/2018 which is widely used in the entrepreneurship research community. Third, we curated a list of ecosystem-related concepts specific to emerging economies through reading papers on emerging economies and consulting academic experts in this field. The final list includes (1) unique ecosystem elements such as incubators and accelerators and (2) unique institutional settings such as institutional voids, family businesses, and returnee entrepreneurs. To be consistent with the first review, we also consulted experts in the field of emerging economy clusters and other similar entrepreneurial ecosystem concepts for key papers to include in the analysis process (although we have not included in the search term). The key papers we considered include Bell and Albu (1999), Chaminade and Vang (2008), Etzkowitz et al. (2005), Freeman (2002), Ghani et al. (2014), Intarakumnerd et al. (2002), Lengyel and Leydesdorff (2011), and Liu and White (2001). These papers, on the one hand, cover a wide range of the emerging economies set out in the previous section and received high citations; on the other hand, their insights are highly relevant to the new venture creation process concerned in entrepreneurial ecosystems. In subsequent framework development of E4s, we take into account the multiple factors and determinants documented in these papers, such as knowledge and technology dynamics, resource scarcity and insufficient institutions, etc. Altogether, the

[1] https://www.investopedia.com/terms/e/emergingmarketeconomy.asp

search process provided us with 36,896 results and the screening process gave us 19 key empirical studies on E4s.

2.1 Descriptive results

For the entrepreneurial ecosystem review, we list the key definitions identified in Table 7 in Appendix 2. We also list all the 68 papers surveyed, including their journals, paper types, empirical approach, and publication year in Table 6 in Appendix 1. *Small Business Economics* and *Strategic Entrepreneurship Journal* turn out to have published the most entrepreneurial ecosystem papers with a focus on the advanced economy, as can be seen from Table 1 in Appendix 1. We also see a rapid publication trend in terms of entrepreneurial ecosystems since the 2010s, as illustrated in Fig. 1 in Appendix 1. Table 2 in Appendix 1 shows that the majority of the papers, 51 out of 68 (75%), are atheoretical. As illustrated in Table 3 in Appendix 1, papers identified mainly use the single case study approach (57%) with qualitative data such as interviews and archival files. Six empirical papers leverage regression analysis and eight rely on multiple case studies. One paper employs simulation approach and one adopts the exploratory factor analysis. Countries covered by these papers mainly focus on the USA (47.5%) and Europe in general (10%), as illustrated in Table 4 in Appendix 1.

For the E4s review, we summarized the 19 empirical studies in Table 8 in Appendix 3, including their publication outlets, empirical approaches, publication years, settings, and data sources. These key papers are published in various outlets including top journals such as *Academy of Management Journal*, *Strategic Management Journal*, and *Strategic Entrepreneurship Journal*, and regional journals focusing on China, Africa, and Brazil. We also see a growing trend in the publication of E4s since 2015, as can be seen in Fig. 2 in Appendix 1. Key countries discussed include China, Brazil, Mexico, India, Chile, South Africa, and Malaysia, as can be seen in Table 5 in Appendix 1.

2.2 Thematic analysis

After the descriptive analysis, we conducted the thematic analysis where key emerging themes are identified (Tranfield et al. 2003). Instead of synthesizing a large number of empirical studies, we leveraged a thematic analysis which is interpretative and emergent (Barnett-Page and Thomas 2009; Thomas and Harden 2008). This approach is normally used to synthesize mostly qualitative and conceptual research that do not have a maturely defined construct. Following this approach, each key paper was read in detail and coded in data extraction forms to extract general information including paper discipline, key concepts, key findings, literature streams, implied theories, and patterns. In addition, the grouping and clustering technique was used to explore relationships within and between studies, identify common themes, and critically assess the heterogeneity across studies. After that, coding results were organized and synthesized to answer the review questions proposed. Higher-order codes were thus developed. In the next two sections, we will present the result of this thematic analysis of our two systematic literature reviews.

3 The entrepreneurial ecosystem construct

From our systematic literature review on entrepreneurial ecosystems in general, three independent yet interdependent themes have emerged which provide the general profile of the entrepreneurial ecosystem construct. Figure 3 in Appendix 2 illustrates the graphical presentation. Since the entrepreneurial ecosystem construct originates mostly from the context of advanced economies, the three commonalities are largely based on them. We will illustrate separately the challenges in applying these principles to emerging economies in the next section.

The first characteristic, interaction logic, emphasizes the importance of structure and associated interactions among various structural elements that engender entrepreneurship activities in the ecosystems. Scholars from this stream adopt a configuration and system perspective. The second characteristic, resource logic, underlines productive resource allocation, driven by new ventures, as the ultimate outcomes of regional entrepreneurial ecosystems. The third characteristic, recognizing the necessity of system- and agent-driven perspectives to unlock entrepreneurship-driven economic growth, goes one step further to explore the governance principles. We now illustrate each logic in detail.

3.1 Interaction logic—structural interaction system

The first important dynamic of EEs is based on the *interaction logic*, where structural elements,

interactions, and associated knowledge spillovers are vital to understanding the performance of entrepreneurial ecosystems. As Autio (2016) suggests, entrepreneurial ecosystems are "fundamentally *interaction systems* comprised of loosely connected, hierarchically independent, yet mutually co-dependent stakeholders" (p. 20). Such interaction logic draws heavily on the innovation system literature where a network of structural components is involved in innovation generation. Instead of focusing on the productive resource allocation as system-level outcomes, this research tradition emphasizes the entrepreneurial innovation generated by a system of structural configuration, including actors, networks, and institutions (Bergek et al. 2008). External structures, rather than entrepreneurial agencies, engender entrepreneurship and innovation. For example, Feld (2012) highlights the importance of interactions in the successful entrepreneurial community: Boulder county in the USA. Studying EEs in St. Louis, Motoyama and Knowlton (2016) found that it is the interactions with other cohort entrepreneurs, rather than resource munificence, that support entrepreneurs and their firm expansion. Spigel (2017) suggests that the interactions and relationships between 10 cultural, social, and material attributes reproduce the overall entrepreneurial ecosystems. This logic also bears the flavor of the complex adaptive system theory which emphasizes the complexity embedded in the interactions among agents, organizations, and sociocultural forces (Roundy et al. 2018). As Roundy et al. put it, "EEs are best treated as systems and that systems theory, an analytical approach representing phenomena as sets of stocks and flows regulated by interactions" (Roundy et al. 2018, p. 2).

System-level innovation outcomes in entrepreneurial ecosystems are a result of specific interaction contents, interaction patterns, and resulting structural elements. As discussed in many key papers, the comparison between entrepreneurial ecosystems and traditional clusters and innovation systems is also leveraged here to explore the unique interaction dynamics (Spigel and Harrison 2018; Stam and Spigel 2016). Firstly, knowledge acts as the key resource within the entrepreneurial ecosystem where innovation is generated through interdependent interactions. Entrepreneurial ecosystems are the cluster type where the cluster's shared knowledge base is not industry- or technology-specific, but rather, focused on a *generic business process* (Stam and Spigel 2016): the start-up and scale-up of new entrepreneurial ventures. Virtually all cluster types are characterized by some kind of shared knowledge base, and an important element of the vitality of the cluster is its ability to facilitate related learning, knowledge sharing, and knowledge spillovers through formal and informal interactions (Maskell 2001). However, in cluster types documented in received literature, this knowledge base tends to be technical, relating either to a given industry (e.g., a furniture cluster) or a given generic technology (e.g., a biotechnology cluster). In contrast to traditional clusters, entrepreneurial ecosystems generate unique interaction contents in the sense that entrepreneurs do not gravitate toward entrepreneurial ecosystems in order to "learn the ropes" of a given industry or technology, but rather, in order to become more effective in organizing their ventures for start-up and scale-up (Spigel 2016). The advancement of digital technologies further helps lower the threshold of starting a new venture and enable iterative and experimentation-driven heuristics rather than planning-oriented business model design (Ewens et al. 2018; Reis 2011). This creates a knowledge dynamic where the entrepreneurial ecosystem facilitates creation and spillover of knowledge on how to organize effectively, and entrepreneurs combine this cluster knowledge with their specialist knowledge about a given technology or industry (Tallman et al. 2004). From the perspectives of the digital economy phenomenon, Autio et al. (2018) further propose that entrepreneurs learn about business model experimentation through interactions which contribute to radical business model innovations as system-level outcomes. Although possessing a relatively narrow definition, their argument emphasizes the technological aspects, or "the sociotechnical process of applying digitizing techniques to broader social and institutional contexts that render digital technologies infrastructural" (Tilson et al. 2010, p. 749), that makes entrepreneurial ecosystems unique.

Different interaction contents are associated with different interaction patterns. Because most traditional clusters consist of spatially concentrated value chains, they tend to be characterized by vertical networking and horizontal competition within the cluster (Marshall 1920; Porter 1998). Meanwhile, as firms in successive stages of the value chain are complements rather than substitutes, they have a natural incentive to collaborate to enhance the efficiency of their interactions. In contrast, as value chains typically point to a specific market, firms in the same value chain stage are potential substitutes and thus have less incentive to collaborate

(Maskell 2001). This pattern is reflected in the directionality of voluntary and involuntary knowledge flows within the cluster, with voluntary knowledge flows being predominantly vertical and involuntary knowledge flows horizontal. In contrast, traditional, linear, and vertical value chain structure is less characteristic of entrepreneurial ecosystems because digitalization has the effect of breaking down and horizontalizing value chains through decoupling (Yoo et al. 2012), disintermediation (Katz 1988), and generativity (Zittrain 2006). Facing different targeted markets and innovate with digitally enabled business model design such as Uber and Airbnb, new ventures in the same developmental stage within the ecosystems are less likely to compete against one another in entrepreneurial ecosystems. As all start-ups compete with the incumbents in similar means—i.e., new entrepreneurial opportunity pursuit and scale-up through radical business model innovation—they have a natural incentive to share their experiences with one another, especially for those who do not share the same sectors. The result is a distinctive networking pattern with *horizontal networking and vertical competition* (against industry incumbents) and associated knowledge flows (voluntary horizontal knowledge flows, predominantly involuntary vertical knowledge flows) (Autio et al. 2018).

The above observations help understand why characteristic structural elements of entrepreneurial ecosystems, such as accelerators, co-working spaces, and maker spaces, emerge and place so much emphasis on experience sharing and mutual mentoring (Spigel 2016). As discussed above, entrepreneurial ecosystems structural elements are functioned to facilitate iterative heuristics on business model design and horizontal knowledge sharing about the business creation process (Autio et al. 2018). They are different from traditional clusters and corresponding structural elements. For example, flexible specialized production systems emphasize the importance of providing benefits for the industry, and therefore, the structural elements may involve industry associations (Piore and Sabel 1984). And system of learning and innovation focuses on the technology commercialization through technology-push innovation from basic research, and therefore, the structural elements may involve science parks (Doloreux 2002).

To summarize, interaction logic is key to understanding the nature and content of entrepreneurial ecosystem dynamics. Through this lens, we can view entrepreneurial ecosystems as a cluster type that presents the unique general business process as interaction content, radical business model innovation as interaction outcome, horizontal networking and vertical competition as interaction patterns, and accelerators and similar new organizational innovation as interaction structural elements. Combined, these myriad interactions provide a mechanism which drives the entrepreneurial process of opportunity identification and exploitation as well as productive resource allocation.

3.2 Resource logic—resource allocation system

The second important dynamic of EEs is the *resource logic*, perceiving entrepreneurial ecosystems as resource allocation systems driven by entrepreneurs and regulated by institutional contexts (Acs et al. 2014; Spigel and Harrison 2018). Wrapped with economics flavor (Acs et al. 2014), entrepreneurial ecosystems are "fundamentally *resource allocation systems*, that are driven by individual-level opportunity pursuit, through the creation of new ventures, with this activity and its outcomes regulated by country-specific institutional characteristics." (p. 476). Entrepreneurs and new ventures act as the mechanism or mean that drives the system-level outcome of entrepreneurial ecosystems—productive resource allocation (Autio and Levie 2017). Entrepreneurs act as the coordinators of resource flow by bringing together labor, capital, and knowledge. Entrepreneurial ecosystems differ from traditional clusters because they organize resources around entrepreneurial opportunity discovery and pursuit, rather than "flexibly specialized production system" in industrial cluster literature and "localized system of learning and innovation" in innovation system literature (Autio et al. 2018). Entrepreneurship-related resources within regional entrepreneurial ecosystems may include finance, human, knowledge, and physical infrastructure. Productive resource allocation is achieved through ample resource provision, easy resource access, and efficient resource mobilization. It has an individual-centric perspective where entrepreneurial agents are rational and seek to maximize their economic and/or social returns from their start-ups.

Resource provision refers to the cultivation, accumulation, and recycling of high-quality resources entrepreneurs require. Resources are provided by various stakeholders within entrepreneurial ecosystems. Financial resources can be provided by the state through subsidies and grants, private bodies through equity or debt

investment, or serial entrepreneurs through reinvestment of their exit income. Human resources can be channeled from educational institutions, large established firms, and successful or failed new ventures. Specialized technical knowledge and entrepreneurial methods can be prepared by research or educational institutions as well as existing firms through mentorship. Infrastructural resources such as office spaces can be provided by intermediaries such as co-working spaces and incubators. Besides direct investment, recycling is also a key element of resource provision (Spigel and Harrison 2018). Entrepreneurs who failed release resources to other users within the ecosystems and entrepreneurs who successfully exited can stay in the ecosystems as serial entrepreneurs, mentors, or angel investors. Such recycling dynamic reflects the "stickiness" of an EE to attract and keep resources within the region (Markusen 1996). The existence of serial entrepreneurs in a region provides added value to attract more entrepreneurs (Pitelis 2012). Exploring how business incubation assists new ventures, sponsorship governance literature suggests buffering mechanism that supports entrepreneurial activities, where resource-munificent context is provided to insulate new ventures from the hostile external environment (Amezcua et al. 2013). This approach emphasizes on isolation and passive acceptance of external resources. For ventures receiving buffering support, internal and generic resources are developed to enable smooth opportunity identification and exploitation. Although necessary, this legacy of buffering support, especially government-backed, alone is suffering from a number of failed evidences, e.g., lack of entrepreneurial success given the presence of government subsidies (Audretsch et al. 2007). This is because, for resources to be effectively useful, entrepreneurs also need to be able to gain access and mobilize them through social networks. Given the limitation of resource provisions, not all ventures can equally access to these critical resources.

Echoing social network theory, resource access is facilitated by local social networks within entrepreneurial ecosystems (Stuart and Sorenson 2005). Given the liability of newness, new ventures lack legitimacy, capability, and power to gain access to resources for opportunity exploitation within an ecosystem. Particularly, when critical resources are tightly embedded in close social circles, it is significantly difficult for entrepreneurs to obtain trust from these communities (Mesquita 2007). Entrepreneurial networks are deeply embedded within institutions environment. Entrepreneurial ecosystems should provide the institutional context and structural elements that allow entrepreneurs to overcome such liabilities of newness. According to the sponsorship governance theory (Amezcua et al. 2013), new ventures can resort to sponsors such as government programs and accelerators for resource access, where sponsors act as the bridge between entrepreneurs and regional entrepreneurial ecosystems. Because these sponsors usually connect with a large number of actors within the ecosystem, they possess a rich network to different parts of the ecosystem (Zhang and Li 2010). Specifically, if entrepreneurs actively develop networks with these sponsors, they can gain access to diverse tangible assets and distant clients, sales referrals, and recommendations. Field building activities also help new ventures to be involved in a community of entrepreneurs and other stakeholders (Amezcua et al. 2013). What's better in bridging compared with buffering is the fact that these social resources appreciate rather than diminish over time and are necessary to acquire additional resources.

Finally, for resource allocation to be productive, entrepreneurs also must be able to know how to effectively mobilize resources obtained in ecosystems. Resource mobilization is manifested through a trial-and-error process and enhanced with the quality of entrepreneurial efforts (Acs et al. 2014). This is a process of "entrepreneurial churn" (Haltiwanger et al. 2012; Reynolds et al. 2005). If a venture operated successfully with scalable business models, more resources are allocated to this venture up to market saturation. If, however, an entrepreneur exploits an incorrect opportunity or fail to assembly correct resources, this venture will fail and the resources it owns will be released for other uses. Myriads such decisions are made in ecosystems, driving resource allocation ultimately to productive uses. This system-level outcome enhances the total factor productivity of the economy and strengthens the overall entrepreneurial ecosystems. For example, in measuring entrepreneurial ecosystems, labor resource reallocation indicates the pace at which an individual switches jobs and suggests the improvement in quality matching between jobs' demands and individuals' supplies (Bell-Masterson and Stangler 2015).

To summarize, the resource logic, viewing entrepreneurial ecosystems as resource allocation systems driven by entrepreneurs, is vital to understanding the essence of the outcomes of entrepreneurial ecosystems.

3.3 Governance logic—ecosystem policy approach

The third dynamic of EE is the *governance logic*, where effective governance of the entrepreneurial ecosystem is proposed as a critical policy tool for entrepreneurship-driven economic development (Auerswald 2015; Isenberg 2011; Stam 2015). They follow the theory of Schumpeter, accepting the importance of entrepreneurship in stimulating economic growth (Acs et al. 2018). Standing in the position of the policymakers, they then illustrate the different government principles or designs of entrepreneurial ecosystems for effective outcomes. They suggest that entrepreneurship is a highly context-dependent activity and government actions have significant impacts. Basing on the evolutionary/ecological perspective, they deemphasize the government logic of subsidizing the production of an undersupplied input and advocate for a more broad-based supporting strategy that targets at enabling entrepreneurial ecosystems at a regional or a national scale (Auerswald 2015). They call for a more systematic approach rather than fragmented ones (Groth et al. 2015; Markley et al. 2015). Entrepreneurial ecosystems consist of a variety of different stakeholders or supporting programs including those backed by regional/subnational/national governments, public sector bodies such as universities, and private bodies. Each actor possesses different or related goals and functions, so the governance mechanisms of entrepreneurial ecosystems need to guide concerted instead of isolated actions (Spigel 2016).

The first element of governance logic is multipolar coordination, where multiple stakeholders together, rather than a central actor, coordinate ecosystem operations (Motoyama and Knowlton 2016). Autio and Levie (2017) shifted the research landscape from identifying key elements for a successful framework to exploring governance mechanisms of entrepreneurial ecosystems. They draw on socio-ecological and collective governance literature given a similar level of complexity. Traditional methods such as "market failure" and "system failure" tend to be based on the assumptions of hierarchical and static relationships, where top-down and siloed approach are mainly emphasized (Lundström and Stevenson 2005). Specifically, "market failure" logic assumes that once the proper economic incentives are in place, the desirable actions will follow naturally. Similarly, "system failure" perspective assumes that once the proper institutions or structures are in place, the desirable actions will follow automatically. However, such assumptions do not apply to the management of entrepreneurial ecosystems which means proper economic incentives or structures alone cannot guarantee the realization of the action. Such complexity of ecosystem dynamics is manifested in four aspects (Autio and Levie 2017). First, knowledge is distributed across multiple stakeholders who collectively produce ecosystem-level outcomes. Second, the complexity of causal chains in ecosystems means that direct and indirect cascading effects occur when actions are taken by stakeholders. Third, since no one owns entrepreneurial ecosystems and no one in entrepreneurial ecosystems can have a full picture of how the ecosystems work, each stakeholder may possess different goals that are not perfectly aligned. Fourth, a high level of inertia may exhibit because of imperfect information sharing and complex causal relationships. Therefore, ecosystem management should be focused on whether the ecosystem as a whole, rather than pure economic and structural incentives, supports new venture creations and scale-ups. Substantial challenges exist to draw all stakeholders in the ecosystem to coordinate and work for a collective goal. For example, Pitelis (2012) highlights one important barrier—the problem of appropriability, where entrepreneurs will only engage in multipolar coordination or ecosystem creation when the value they can appropriate within the ecosystem is higher than that by being alone. What's more, entrepreneur-led, grass-root organizations very often have limited influence given their lack of resources that often exclusively belong to large organizations (Feld 2012). To achieve effective multipolar coordination, each stakeholder in the ecosystem has to be convinced that participation of coordination not only benefits individuals, the overall pie of benefits also increases through ecosystem co-creation (Feld 2012). This means that not only entrepreneurs but also state-sponsored and private-sponsored supporting organizations need to participate in ecosystem co-creation (Rice et al. 2014). The level of multipolarity may depend on the life cycle of an entrepreneurial ecosystem where a hierarchical governance structure with anchor tenant to take stewardship role presents in the "birth phase" of an entrepreneurial ecosystem, while a relational governance structure with self-reinforcing and horizontal feedback networks presents in the "consolidation phase" of an entrepreneurial ecosystem (Colombelli et al. 2017). Mature entrepreneurial ecosystems, therefore, may present a high level of institutional thickness where there is a high level of coordination

between a large number of stakeholders with well-accepted objectives and a shared vision of regional development goals (Spigel 2016).

Multipolar coordination is enabled through engaging commitments from all stakeholders within the ecosystems over a long period of time to not only co-create an effective ecosystem but also continue to innovate (Goswami et al. 2018; Rice et al. 2014). Because multiple stakeholders are involved in the ecosystems through dyadic interactions, it is hard to pinpoint the source of specific ecosystem outcomes. Such a lack of causality and clarity makes stakeholders hard to identify each other. Given the lack of owner to control the functioning of the ecosystems, stakeholders are essentially undertaking voluntary actions to produce collective goods for the ecosystems (Autio and Levie 2017). According to the collective governance literature, collective benefits cannot be obtained through short-term economic incentives because such an approach may lead to extrusion of common goods motivations (Vollan 2008). Such common benefits can be motivated through deep stakeholder engagement to stimulate intrinsic commitment with long-term vision (Rice et al. 2014). The commitment engagement may be reflected in the solicitation of mentor volunteering time, pollinating risk-sharing attitude from investors, and upgrading services and models of intermediaries (Goswami et al. 2018). Feldman and Zoller (2012) also suggest that "a spirit of authenticity, engagement and common purpose" can motivate commitments from stakeholders to serve as dealmakers within the region. A strong entrepreneurial culture also helps to attract commitment to the ecosystem, where high social status can be obtained through participation (Spigel 2016). In the study of six university-based entrepreneurial ecosystems, Rice et al. (2014) suggest that in order to promote continuing innovation from all stakeholders over a long period of time, it is important for ecosystem leaders to "adopt a portfolio approach that supports continual innovation, recognizes and celebrates successes, and provides cover for champions when innovative initiatives do not pan out." (p. 495). Active participation also needs to realize that taking multiple roles simultaneously is the norm (Auerswald 2015).

Effective coordination and commitment are ensured by aligning goals and benefits of stakeholders in the ecosystem (Rice et al. 2014). Related to the previous point, because each stakeholder in the ecosystems assumes their own goals and the services that ecosystems provide are diffused among different stakeholders, we can easily see misalignments such as service duplication and objective conflicts. Alignment may be reflected in the match between founder needs and mentor expertise, the match between founder and intermediaries' objectives, and the match between the founder and regional priorities (Goswami et al. 2018). The incentives for scientific scholars should also be aligned to encourage more entrepreneurial efforts (Fuerlinger et al. 2015). According to institutional thickness, not only quantity but also quality and diversity matter for the successful alignment between stakeholders (Spigel 2016). The community of supporting organizations is better off to provide services together that span across industries or entrepreneurial process. Instead of providing all services by one stakeholder, providing complementary but dissimilar services can reduce transaction costs (Pitelis 2012) and help identify each other's area of expertise, which in turn facilitates alignment for ecosystem sustainability. For example, ventures that successfully graduate from early stage supporting programs can be referred to programs focusing on the late-stage entrepreneurial process. It is the linkage between those co-specialized service providers that are critical to providing aligned benefits and goals. To achieve these aligned benefits, multiple stakeholders within an entrepreneurial ecosystem need to be open and collaborative and to proactively embrace new members who want to join the community (Mason and Brown 2014). For policymakers, responsive listening is an important step to understand the goals and needs from each stakeholder (Auerswald 2015), through more local and in-person events (Motoyama et al. 2013).

To summarize, stakeholder engagement dynamics is vital to understanding the management of entrepreneurial ecosystems, where multipolar coordination, commitment engagement, and benefit alignment facilitate entrepreneurial opportunities identification and pursuit. Ultimately, the system-level outcome—productive resource allocation—is achieved through effective stakeholder engagement.

We have now summarized three independent yet interdependent themes and their corresponding elements that, through different angles, together come to a relatively comprehensive understanding of entrepreneurial ecosystem dynamics. Entrepreneurial ecosystems are operated through an adaptive governance system to achieve productive resource allocation around horizontal interactions through new venture creation. Resource

allocation is channeled through networks which provide guidance to interaction patterns. Entrepreneurs gain resource access through interactions with peers and resource providers. These two dynamics reinforce each other to facilitate entrepreneurial activities and keep entrepreneurial ecosystems resilient. The effective operation of these two dynamics of entrepreneurial ecosystems depends on effective governance system.

However, these three common characteristics of entrepreneurial ecosystems are largely based on the context of advanced economies because the assumptions behind these propositions are sound resource and structural and institutional environments which are in general deficient in emerging economies. Therefore, in the following, we will discuss findings from reviews of research on entrepreneurial ecosystems in emerging economies.

4 Entrepreneurial ecosystems in emerging economies

Our review of E4s literature reveals three key findings that challenge the direct application of advanced economy entrepreneurial ecosystems model to emerging economy entrepreneurial ecosystems. The studies mainly focus on exploring the constraints of entrepreneurial and innovation activities. *First*, the presence of institutional voids is highlighted as key barriers for entrepreneurs in E4s. *Second*, resource scarcities are emphasized, including financial, human, knowledge, and physical infrastructure, as inhibitors of entrepreneurial activities in emerging economies. *Third*, structural gaps are brought out to illustrate the absence of actors and networks in E4s. Combined, these three characteristics in E4s exert significant barriers in their transition to a knowledge-based economy with sound market-related institutions. We next articulate each in detail and summarize the findings in Table 9 in Appendix 3. The corresponding conceptual model of E4s dynamics is presented in Fig. 4 and the last row of Table 9 in Appendix 3.

4.1 Institutional voids

The first characteristic of E4s is the presence of institutional voids (Khanna and Palepu 1997). This theme draws upon the institutional theory that emphasizes institutional influences on firm performances (Meyer and Rowan 1977). Institutions are the humanly constructed "rules of the game" that guide and regulate economic, political, and social activities, and can take the form of both formal (rules and laws) and informal institutions (cultural norms) (North 1990, 1991). Formal institutions refer to codified legal and political structures, written rules, or standards, as well as written contracts that reduce risk and uncertainty (Boettke and Coyne 2009). Informal institutions consist of cultural norms, belief systems, traditions, customs, unwritten codes of conduct, and ideologies (Baumol 1990; Hofstede 1980). Scott (1995, p. 33) also categorized them as "social structures composed of cultural-cognitive, normative, and regulative elements." Market-related institutional voids occur when "specialist intermediaries, regulatory systems, and contract-enforcing mechanisms" (Khanna and Palepu 2006, p. 62) are absent or deficient. Salient formal institutions may include intellectual property protections, contracts enforcement, firm entry procedures, and the laws and regulations about firm competitions and bankruptcy (Autio et al. 2014a).

Several studies have highlighted specific institutional voids in these contexts. Studying the Brazilian context for entrepreneurship, Arruda et al. (2013) identified institutional constraints in the regulatory framework, market conditions, access to finance, the creation and diffusion of knowledge, entrepreneurial capabilities, and entrepreneurial culture such as fear of failure. In light of GEI methodology, Junior et al. (2016) identified the main bottleneck in the Brazilian entrepreneurial ecosystem—the lack of interaction and cooperation between educational institutions and entrepreneurs. Examining the BRIC contexts of entrepreneurship, Manimala and Wasdani (2015) summarized nine types of deficiencies characterizing emerging economies: underdeveloped institutions, unclear and inconsistent government policies, inadequate governance, disjointed infrastructure, limited funding options, inhibiting culture, personalized networks, ill-funded and ambivalent educational system, and reluctant internationalization. Focusing on Mexican entrepreneurial ecosystems, Guerrero and Urbano (2017a) identified a negative effect of dark institutional conditions including the government (bureaucracy, taxes, and lack of support), the society (extortions by organized crime and impunity), and the market (informal trade) on entrepreneurial activities. Institutional voids also manifest in adjacent studies about industrial clusters and innovation systems,

such as Ghani et al. (2014), whose findings support that access to household banking and labor laws play important roles in promoting local new venture creations. These and similar studies typically posit that deficiencies in institutional conditions hinder the creation of entrepreneurial new ventures, inhibit their access to resources for growth, inhibit their access to markets, and weaken their position in terms of property rights and contract enforcement (Djankov et al. 2002; Manolova et al. 2008). Because of such reasons, entrepreneurial entry tends to be of poorer quality in a context characterized by institutional voids and biased toward necessity- than opportunity-driven entry (Reynolds et al. 2002). There is also empirical evidence to support this conjecture: in their study of GEM and World Bank data, Autio and Fu (2015) found one standard deviation change in the quality of political and economic institutions, respectively, to have an up to 50% effect on the ratio between formal and informal entrepreneurial entry in low-income and emerging economies, with improvements in institutional quality strongly encouraging formal entry and depressing informal entry. What's more, given the dysfunction of formal institutions, entrepreneurs in emerging economies operate in a "suboptimal ecosystem." According to Adly and Khatib (2014), "suboptimality" accounts for the "final outcome of the weakness of formal structures and insufficiency of alternative means for doing business informally" (p. 11). The broad base of small businesses in emerging economies is composed of informal entrepreneurship.

To overcome these voids, informal norms of reciprocity (such as *guanxi* in China and *blat* in Russia) and network-based trust are leveraged to protect ventures from high level of uncertainty where formal rules and enforcement are lacking or unstable (Puffer et al. 2010; Tonoyan et al. 2010). They also help new ventures to secure critical resources such as licenses or loans, win government contracts, speed up the application process, settle business disputes, and channel market information in emerging economies (Ahlstrom and Bruton 2006; Bruton et al. 2013). Therefore, such ongoing relationships among firms for future businesses substitute for the missing market-related institutions (McMillan and Woodruff 2002). Business groups, as well as family businesses (Khanna and Palepu 2000), are also proposed to substitute institutional voids and to prevent corresponding market failures in emerging economies (Khanna et al. 2005). Given the high level of trust within business groups, the mechanism for this solution is the internal allocation of resources such as technology and capital that serves as a preferred and cost-efficient alternative for deficient market structure. Finally, a growing number of studies started to highlight institutional intermediaries within E4s as a vehicle to fill institutional voids and thus promote entrepreneurial activities. For example, Armanios et al. (2017) found that given the lack of private funding in emerging economies, science parks in China are established as a type of institutional intermediaries that bridge the voids between public funding and new ventures through two mechanisms, namely skill adequacy and context relevance. Similarly, Start-Up Chile is considered as a key institutional intermediary in Chilean entrepreneurial ecosystems connecting government funds to start-ups (Gonzalez-Uribe and Leatherbee 2014). Studying accelerators in Bangalore entrepreneurial ecosystems, Goswami et al. (2018) identified four types of accelerator expertise—connection, development, coordination, and selection—to connect founders and ecosystems, leading to ventures validation and ecosystem additionality.

4.2 Resource scarcities

The second observation from received literature is the challenge of resource scarcities in E4s. Although digitalization shifts the locus of entrepreneurial opportunity pursuit and deemphasizes the importance of location, external specialized resources such as business angels, VCs, and specialized human capital tend to remain location-specific. External resources present low mobilization and high stickiness, and variation across them should be observed in regional rather than national context. This resource logic has a deep root in population ecology and resource dependency perspectives, where powerful constraints of external environment and dependency on external resources hinder new firm development (Hannan and Freeman 1977; Pfeffer and Salancik 2003). In their perspectives, it is the interdependencies between resources each actor owns that drive ventures to network with other organizations. Therefore, the lack of rich networks with key resource providers can inhibit resource access and mobilization. Resource scarcities for new ventures are more salient in emerging economies than those in advanced economies, making the acquisition of resources more important for ventures operating in these countries. In general, extant research of E4s has identified the lack of four key

resources that inhibit entrepreneurial activities, namely finance (Wu et al. 2016), human capital (Aidis et al. 2008), knowledge (Goswami et al. 2018), and physical infrastructure (Sheriff and Muffatto 2015). Similar findings in adjacent studies of industrial clusters and innovation systems also support the scarcity of these resources in emerging economies hindering the further growing of start-ups (Bell and Albu 1999; Ghani et al. 2014; Liu and White 2001). These resource scarcities for new ventures in emerging economies are reflected in resource provision, access as well as mobilization.

Among them, financial resource gap has been found to be one of the most important factors contributing to start-up failures in many emerging economies (Ahlstrom and Bruton 2006; Sheriff and Muffatto 2015). This is due to a lack of private investments and substantial scale of public resources in emerging countries. On the one hand, domestic private investors such as venture capitalists and angels are still new concepts and at nascent stages of development (Guerrero and Urbano 2017b). Stakeholders within the ecosystem have a limited understanding of what roles these new forms of investors play (Goswami et al. 2018). On the other hand, institutional credit through banks or government funds remains limited to new ventures given their lack of personal relationships with government officials and presence of institutions voids (Adly and Khatib 2014; Alfred and Laura 2016). Fear of failure culture also inhibits domestic investors to engage in new venture investments associated with a high level of risks (Arruda et al. 2013). The capital gap is further deteriorated by the fact that foreign VCs are reluctant to invest money in emerging economies given cultural, geographic, and institutional distance. And if they invest, they tend to invest in more information-transparent firms such as later financing rounds and later-stage ventures (Dai et al. 2012). Therefore, the main sources of funding for entrepreneurs in emerging economies are still self-savings and business profits (Adly and Khatib 2014). As a result, entrepreneurs are facing a substantial early-stage financial gap in emerging economies.

Labor gaps in emerging economies are reflected in the lack of high-quality and innovative founders and the insufficiency of specialized employees. Although GEM (Global Entrepreneurship Monitor) has reported that more entrepreneurs are reported in developing countries than in developed countries, the majority of them are necessity-driven entrepreneurs who engage/start new ventures because of unemployment. Opportunity-driven entrepreneurs with high growth aspirations are few in emerging economies. This is partly because institutional voids in emerging economies reduce expected returns to an entrepreneurial career and partly because high education increases the opportunity costs of entrepreneurship (Smallbone and Welter 2001). Individuals with human capital in emerging economies are more likely to work for someone else instead of starting their own ventures than are individuals in advanced economies (Cao and Autio 2018). What's more, given the uncertainty avoidance culture and lack of access to finance in emerging economies, high-quality individuals tend to engage in employment rather than high-risk entrepreneurial careers (Alfred and Laura 2016). For example, Brazilian entrepreneurial ecosystems also show low rates of entrepreneurs with superior training (Júnior et al. 2016). Besides self-selection into entrepreneurship during the early stage of the entrepreneurial process, hardship for recruiting high-quality employees for scale-up in the later stage is also highlighted in received studies (Manimala and Wasdani 2015). This is partly due to the lack of attractiveness of jobs in new ventures relative to large established firms.

Knowledge gap has been highlighted as the lack of latest entrepreneurship-related methods such as business model experimentation and lean entrepreneurship and the absence of mentoring experiences. According to the human capital theory (Davidsson and Honig 2003), the knowledge gained through education and training as well as work experiences increases entrepreneurs' cognitive abilities, leading to more probability of recognizing and exploiting entrepreneurial opportunities. Such lack of knowledge in emerging economies exerts a significant challenge for entrepreneurs and new ventures operating in these ecosystems. For example, according to Goswami et al. (2018), finding mentors with specific entrepreneurship experiences in emerging economies such as Bangalore can be a challenge because "many mentors were corporate executives with no entrepreneurial experience, only information technology experience, and no exposure to up-and-coming fields such as education, healthcare, life sciences, or sports" (p. 13). What's more, entrepreneurs in emerging economies such as China may possess high educational knowledge but relatively lower levels of entrepreneurial skills and knowledge due to the anti-private legacy (Peng 2001; Smallbone and Welter 2001). As entrepreneurs in emerging economies obtain the majority of their knowledge through informal ties such as mentorship (Adly

and Khatib 2014), the lack of startup experiences of mentors in E4s also deteriorates external learning opportunities for entrepreneurs. To illustrate, mentors in Bangalore accelerators are noted to be corporate executives that possess no entrepreneurial experience and no exposure to emerging fields such as healthcare and life sciences (Goswami et al. 2018). Almost all incubators in China are founded and operated by local governments and universities which are all state-owned (Zhang and Sonobe 2011). Given the powerful role of government in emerging economies, intermediary managers are considered quasi-government officials, being appointed by the government to assume market-building activities. They very often lack the necessary managerial and entrepreneurial skills to select and evaluate promising new ventures. Absent cross-border experiences and lack of careers at foreign firms also limit their ability to provide high-quality training on the scale-up process to international markets. Such entrepreneurship-related knowledge gap is even worse for emerging economies that transited from communism where government owned everything.

Finally, emerging economies often encounter critical gaps in physical infrastructures including underdeveloped roads, bridges, telecommunication networks, water and sanitation facilities, and power plants (Manimala and Wasdani 2015; Sheriff and Muffatto 2015). This is reflected in the huge demand for and investments in the infrastructure of emerging economies in the past two decades. According to the 2016 World Bank Enterprise Survey, business owners in around 30% of developing countries perceive unreliable electricity services as a major obstacle to their activities. Constraints in these basic infrastructures have adverse impacts on the quantity and quality of entrepreneurial activities.

In response to resource gaps in E4s, emerging economy policymakers tend to prioritize basic needs satisfaction by addressing "market failure" through subsidies or tax incentives (Wang et al. 2017). What's more, networks with key resource providers, mainly governments supported, are vital for entrepreneurs in E4s to gain access to critical resources. Entrepreneurs relying heavily on government subsidies tend to exhibit a low level of growth potential and engage in bribe activities. Vertical value chain networks based on a specific industry are also emphasized in received literature of E4s. Finally, a large volume of studies have examined influx of nonlocal entrepreneurs such as returnee entrepreneurs who possess advanced knowledge and entrepreneurial skills (Liu et al. 2010a; Qin et al. 2017; Wright et al. 2008). Their foreign exposure fills the gaps in local labor and knowledge market, facilitating resource access through adoption and adaptation of international knowledge and business models tested successfully in advanced economies. Table 9 in Appendix 3 summarizes the impact of resource scarcities on the three characteristics of entrepreneurial ecosystem dynamics.

4.3 Structural gaps

The third observation from received studies on EEs is the highlight of *structural gaps.* Empirical research has shown that the existence and successful collaboration of structural agents such as the Triple Helix model has a positive impact on entrepreneurial innovations not only in advanced economies but also in emerging economies such as Mexico (Guerrero and Urbano 2017b). Mentoring services provided by specialized supporting organizations have also been found to add value to the entrepreneurial community in emerging economies such as Chile (Gonzalez-Uribe and Leatherbee 2014). Some studies in industrial clusters and innovation systems also point out similar structural gaps such as the lack of coordination between local agents (Lengyel and Leydesdorff 2011), and deficiencies in the Triple Helix of emerging economies (Etzkowitz et al. 2005). Specifically, structural gaps of entrepreneurial ecosystems in emerging economies are associated with lack of high-quality supporting organizations, underproportioned private institutions, an overemphasized role played by actors with foreign exposure, and powerful established firms.

First, E4s tend to lack high-quality entrepreneurship supporting organizations. Especially, private supporting actors can be few and even rare for some countries, who play a central role in the process of building entrepreneurial ecosystems (Sheriff and Muffatto 2015). Structural actors in advanced economies such as educational organizations, accelerators, and venture capitalists are found to be inadequate to facilitate entrepreneurial activities in emerging economies (Alfred and Laura 2016; Sheriff and Muffatto 2015). Such a gap is reflected in the mismatch between supply and demand as well as the lack of proper execution and expertise. For example, the lack of mentors and role models has been found to be one major challenge for emerging economies in Africa (Sheriff and Muffatto 2015). What's more, more events that organized on a regular basis rather than annually are

needed to help entrepreneurs recruit team members, test ideas, and find early adopters and investors. *Second*, the absence of private supporting organizations implies the much greater role played by the state and governments in E4s. In other words, the primary stakeholders in E4s tend to be the state and its agencies rather than private entities (Du and Mickiewicz 2016). Emerging economies generally share a legacy of state intervention (Child et al. 2007). Government is considered the primary resource provider such as licenses and permits in emerging economies for new ventures and plays a significant role in the supply of physical infrastructure and investment of human resources and innovations (Melaas and Zhang 2016). While NGO and other associations in advanced economies exert a large influence on regulatory action through lobbying, emerging economies often rely on regulatory actors to introduce new rules through the top-down approach (Child et al. 2007). For example, in China, governments act as the main designer and task allocator for Chinese Silicon Valley—Zhongguancun (Li et al. 2017). Studying the entrepreneurial development in Wenzhou, China, Liu et al. (2013) found that the industrial districts were developed both by the government and the companies, and in total, four major groups of government agencies were generated along with the industrial district development. *Third*, the noteworthy role played by actors with foreign exposure, including foreign VCs, FDIs, MNCs, and returnee entrepreneurs, is also highlighted (Armanios et al. 2017). Received studies emphasize that these actors bring advanced international knowledge and institutional arrangements into emerging economies and help nurture entrepreneurial talents and innovations (Dai et al. 2012; Liu et al. 2010b). Such capital, trade, and human mobility assist emerging economies in closing the "skills gap" (Filatotchev et al. 2011). *Fourth*, large established firms in E4s exert a larger influence on new ventures than those in advanced economy entrepreneurial ecosystems. This is because of the collusion between incumbents and corrupted governments, where new ventures very often encounter extra costs in entering market. Also, property protection and contract enforcement are unevenly distributed in favor of a few large incumbents.

While in general important everywhere, networks play a greater role in entrepreneurial ecosystems of emerging economies than of advanced economies. *First*, networks in emerging economies tend to rely heavily on informal rather than formal ones. This is partly due to the lack of supporting organizations and partly due to weak formal institutions. Such interpersonal networks help entrepreneurs to acquire critical resources and reach out to informal resource holders when they have limited ability to leverage formal institutions (Batjargal et al. 2013). For example, Egyptian and Tunisian entrepreneurs are reported to acquire entrepreneurship skills mostly through informal ties including family ties, apprenticeship, and mentorship (Adly and Khatib 2014). Specifically, because governments are primary actors in E4s, political connections are important for entrepreneurs in emerging economies to protect themselves from expropriation, gain access to resources, and plan future expansion (Ge et al. 2017; Le and Nguyen 2009; Puffer et al. 2010). *Second*, firms within emerging economies often partner with foreign entrants to learn and get access to advanced technology, knowledge, and marketing skills, e.g., "downstream alliance" (Li and Atuahene-Gima 2002). *Third*, networks among entrepreneurs are not strong enough to sustain robust entrepreneurial ecosystems in emerging economies. Entrepreneurs have been found to be almost all self-motivated or encouraged by families and friends to engage in entrepreneurial careers, rather than other peer encouragement from other entrepreneurs (Alfred and Laura 2016). *Fourth*, networks among these supporting organizations such as incubators are limited (Manimala and Wasdani 2015). Public incubators tend to rely heavily on government funding for service provision (Armanios et al, 2017), and thus, they do not have incentives to reward and attract high-quality staffs and start-ups. On the other hand, private incubators operate very often in earning models but their international networks are still limited. This is in contrast with the EE studies conducted in advanced economy such as Montana and Chattanooga in the USA (Motoyama et al. 2016, 2017), where dense networks of supporting organizations are in place to support a high level of entrepreneurship. *Fourth*, while we see a rapidly growing number of public policies and supporting programs have been initiated during the last two decades, most of the structural elements suffer from duplication and ineffective coordination (Sheriff and Muffatto 2015). In other words, the relationship among these actors is poorly aligned and integrated, leading to the waste of resources that hamper self-sustaining entrepreneurial ecosystems. More coordination among all entrepreneurship initiatives and activities is needed (Závodská et al. 2014). For example, social franchising in Bangladesh has been studied by McKague et al. (2017) to address market and

government coordination failures in its entrepreneurial ecosystems.

In response to the structural gaps within E4s, received literature emphasizes the importance of leveraging "system failure" approach to fill the absent function and process. In examining the entrepreneurship policies in Latin America countries, Kantis and Federico (2012) summarized three key factors of entrepreneurial ecosystems: (1) ecosystem actors including entrepreneurs and specialized supporting institutions, (2) the networks that clue these actors together, and (3) the entrepreneurial culture that supports the entrepreneurial efforts. They found that entrepreneurship policies in Latin America mainly focus on addressing the first factor. Given the absence and inefficient status of specialized supporting institutions in Latin America, it is reasonable that policymakers put great efforts toward building the institutional structure for entrepreneurs. "This is evident in the cases of Brazil, Mexico, and Chile, where governments subsidize business incubator networks, or in Argentina, where new intermediate actors are being created and supported." (Kantis and Federico 2012, p. 13).

5 Concluding remarks

5.1 Theoretical contributions

Research on entrepreneurial ecosystems has been mostly atheoretical and paid little attention to emerging economies. Our theoretical arguments make several important contributions to the entrepreneurial ecosystem literature.

First, this paper adopts a process perspective to systematically review existing research on entrepreneurial ecosystems, where the focus is on entrepreneurial ecosystem dynamics. With the exception of recent work from Spigel and Harrisons (2018), existing studies have centered on designing static frameworks and identifying successful components. While recent studies start to provide pieces of the ecosystem process, they do not provide a comprehensive framework for entrepreneurial ecosystem dynamics as developed here. Our framework can systematically address how entrepreneurial ecosystems work in terms of the system-level resource allocation goal, digital-enhanced interaction dynamics, and adaptive governance.

Second, this paper fills a gap in entrepreneurial ecosystem research by improving understanding of the issues and challenges affecting entrepreneurship and new venture creation in emerging economies. The inclusion of emerging economies provides the potential to expand the theoretical understanding of entrepreneurial ecosystems in general. Reflecting and incorporating salient features of emerging economies allows for adaptation and extension of existing theories by incorporating new context-specific variables. A more fine-tuned theory of entrepreneurial ecosystems can then be generalized to other contexts. From the perspective of policy design, this treatment also supports better-informed entrepreneurship policy design in emerging economies.

Third, this paper integrates single country studies about entrepreneurial ecosystems in emerging economies by highlighting similarities across these countries. The focus on similarities contributes to a more generalizable framework that can be applied to a wider range of emerging economies. The characteristic similarities we suggested in emerging economies include digital absence, resource scarcities, structural gaps, and institutional voids. These salient features of E4s provide a basis for further empirical research.

5.2 Discussion

Besides the above findings, we also noticed two things. First, little insights can be extracted with regard to the drivers of the entrepreneurial ecosystem phenomenon in both the advanced and emerging economy literature, except for the paper by Autio et al. (2018). They argue that entrepreneurial ecosystems could be considered as a digital economy phenomenon that is driven and enabled by digital affordances. In this sense, digitalization stands out as one of the most important drivers for the emergence of entrepreneurial ecosystems. Received studies on the entrepreneurial ecosystems of emerging economies, as well as those of advanced economies, have not yet explored the pervasive transformation from digitalization. This is partly due to the newness of this phenomenon and partly due to the unproportionate focus on gaps in resource, infrastructural, and institutional conditions in these ecosystems. The main attention has been given to the map of entrepreneurial ecosystem components to identify gaps relative to successful ecosystem frameworks based on advanced economies. For example, Sheriff and Muffatto (2015) benchmarked entrepreneurial ecosystems in four African countries to the entrepreneurial ecosystem model developed by Isenberg

(2011) based on advanced economies to identify weak domains as challenges facing these emerging ecosystems. The assumption is that it is the existence of these absent components that explains the underdevelopment of E4s. Under this logic, they tend to suggest that these waiting-to-address gaps are the main drivers of entrepreneurial ecosystems phenomenon and policymakers should try their best to fill these gaps in order to stimulate entrepreneurial activities in emerging economies.

However, little have they distinguished between drivers and results of entrepreneurial ecosystems, leading to unclear and palliative policy implications. For example, a lack of entrepreneurial culture has been identified as one of the main barriers in E4s (Sheriff and Muffatto 2015). However, the fact that entrepreneurial culture is a necessary condition does not guarantee that it is the driver of entrepreneurial ecosystem phenomenon. In other words, the emergence of entrepreneurial culture can be the *result*, rather than the *driver*, of agglomeration of entrepreneurial activities reflected in successful entrepreneurial ecosystems. The reason is twofold. First, the prevalence of entrepreneurial activities, lean methodology, and accelerator phenomenon cannot be driven simply by cultivating entrepreneurial culture. By lowering the start-up costs through digital enablers (e.g., smartphones and 4G/5G networks, cloud computing, etc.), digital technologies afford iterative and experimentation-driven approach—an approach that differs significantly from the traditional, linear, and planning-oriented approach. Such iterative approach thus requires intensive collaborations and knowledge spillovers from peers and mentors which leads to new organizational innovations such as accelerators, incubators, co-working spaces, maker spaces, and hackathon. With these multipliers, entrepreneurial activities agglomerate, and as these activities agglomerate, entrepreneurial culture becomes more prevalent among local residents, thus forming a virtuous cycle (see also Arthur 1989). Second, digital enablers are *delocalized* in their nature—this means entrepreneurial culture could become more transferable and mobilized than before. Consider APP developers, who could literally program in another city, these digital entrepreneurs weakened the determining effects of local culture, but have no doubt added to the entrepreneurial culture wherever they are based—as long as they mingle with local communities. In this sense, identifying gaps in culture in the digital age, therefore, provides relatively less guidance in why entrepreneurial ecosystem emerges and how entrepreneurial ecosystem works. In other words, simply implementing and cultivating entrepreneurial culture is not a sufficient condition for higher entrepreneurial activities in entrepreneurial ecosystems. Similar logic applies to gaps in other components identified by extant research such as financial resources and accelerator programs. This gap and confusion is fundamental because we may risk providing inappropriate policy guidance that is costly and palliative rather than targeting the fundamental propeller.

Therefore, we see little insights generated from both advanced and emerging entrepreneurial ecosystem studies in terms of the drivers of entrepreneurial ecosystem phenomenon. Scholars could pay more attention to the transformation of digitalization underlying entrepreneurship activities, as the absence of digitalization in the studies could significantly constrain the understanding of how entrepreneurial ecosystems work, especially in emerging economies where digital transformation is more critical for the prosperity of their entrepreneurial ecosystem (e.g., new ventures in China around Alibaba and Tencent's digital platforms). Without realizing the digital transformation on the value creation process (from vertical and linear to horizontal and distributed), existing research still bases their analyses on the vertical value chain and industry-specific interactions. Such lack of ecosystem perspective is also reflected in the leverage of traditional clusters frameworks. For example, Subrahmanya (2017) leveraged Triple Helix and clusters theories to compare the entrepreneurial ecosystems between Bangalore and Hyderabad in India. Even though she described these two ecosystems as hubs of technology start-ups, the analysis is still based on the vertical industrial value chain and linear technology commercialization, where major industries are highlighted.

Ndemo and Weiss's work on the digitalization and new venture creations in Kenya has set up a great example for further research (Ndemo and Weiss 2016). Particularly, the one by Bramann (2017) suggests a model that explains how Kenya developed its ICT ecosystems in a resource-scarce context. Another finding highlighting digital elements is the paper from Li et al. (2017) who studied Chinese Silicon Valley—Zhongguancun. However, their understanding of digital transformation is limited because they only interpret digital entrepreneurship ecosystems as hubs to develop digital entrepreneurship that pursues opportunities utilizing digital technologies. Digitalization effect does not

limit to specific industry or process, nor does it limit to firms in digital industries. Extant research, in general, does not realize the fundamental impact of digitalization on how a business creates, delivers, and captures value. Such lack of attention directly leads to a low level of emphasis on the importance of digital infrastructure, on horizontal interaction patterns, and on radical business model innovation. When the focus on digitalization is absent, E4s will be less likely to harness the digital affordances to transform entrepreneurial practice and ecosystem dynamics.

Second, the distinctiveness of entrepreneurial ecosystems compared to other similar concepts such as "industrial districts," "regional clusters," "innovative milieus," and "national and regional system of innovation" has not been discussed substantially in most of the received studies on EEs. Some studies have even used entrepreneurial ecosystems with these traditional concepts interchangeably (Auerswald and Dani 2017; Miller and Acs 2017). This is problematic because without placing this new phenomenon into a broader theoretical tradition, it is difficult to create a rigorous and comprehensive conceptual foundation for future research (Stam and Spigel 2016). All these traditional literatures bear the general characteristic of geographically defined boundedness that affords location-specific advantages in production and innovation (Tallman et al. 2004). Although these conceptual antecedents provide crucial theoretical insights in understanding entrepreneurial ecosystems phenomenon, the underlying mechanisms are not necessarily the same. Future research needs to have the definition and uniqueness clearly articulated before embarking on any theoretical and empirical explorations.

5.3 Policy implications

Based on the systematic review of entrepreneurial ecosystems literature in advanced and emerging economies, we provide the following policy recommendations.

First, to engage digitalization to understand the fundamental driver of entrepreneurial ecosystems, policymakers in emerging economies should realize how digitalization transforms the way ventures create, deliver, and capture value, which underlies the unique dynamics of entrepreneurial ecosystems relative to traditional clusters and innovation systems (Autio et al. 2018). Previous policies relying on the innovation system and cluster theories should be carefully re-evaluated and expanded with entrepreneurial ecosystem policies, where digital transformation is incorporated.

Second, to address resource scarcities in emerging economies, E4s should proactively leverage international knowledge from stakeholders with foreign exposures. For finance gaps, more international investors should be provided with channels of investments in emerging economy new ventures. For labor gaps, returnees and employees from MNCs should be targeted for encouragement to bring international knowledge home. For knowledge gaps, brokering services should be created to connect new ventures with high-quality mentors within international accelerators or investing organizations.

Third, to reduce reliance on government supports, government programs exhibit low performance measured by the number of new venture success because they have low incentives to attract high-quality employees. E4s should engage private supporting organization for success-driven business models. What's more, E4s should proactively engage the connection between public- and private-backed organizations.

Fourth, to improve entrepreneurship policies to involve ecosystem thinking, emerging economies' policymakers should realize the shortcomings and inappropriateness of "market failure" and "system failure" approaches in promoting entrepreneurship. Ecosystem thinking should be leveraged by engaging all stakeholders to collectively identify bottlenecks and to co-manage ecosystems. This should be realized by motivating private parties, creating a hub of connections, encouraging commitment and collaborations among supporting organizations, and aligning benefits for all participants.

Appendix 1. Review procedures for search, selection, and exclusion

1. The systematic review of entrepreneurial ecosystems

A. Criteria for *inclusion* for review

   a. Studies providing theoretical contributions
   b. Both *theoretical and empirical* studies
   c. Focus on entrepreneurial ecosystems
   d. All years (1970–2018)

B. Search method and scope (949)

a. A full search of articles within database Web of Science ISI Social Sciences Index

i. Focus on title and abstract
ii. Search strings ($n = 589$)

- TS=((entrep* OR start-up* OR startup*) AND (ecosystem* OR eco-system*))

b. Expanded search to guarantee exhaustiveness ($n = 360$):

i. Google scholars first 30 pages (272)
ii. ProQuest (9)
iii. Snowball (54)
iv. Other sources include hand searching, personal contacts, working papers and other gray literature (25)

C. *Exclusion* criteria by theoretical relevance (881)

a. Not related to management, business or economics ($n = 165$)
b. Foreign language articles ($n = 50$)
c. Nonpapers, including reports, speeches, call for papers, magazines, and blogs (64)
d. Screen title and abstract to exclude studies in which the primary focus is not on entrepreneurial ecosystems ($n = 602$)

i. Single-use, multiple without elaboration, and grammatical coincidence
ii. Unrelated discipline such as environmental studies
iii. Duplicated studies
iv. Pure empirical and descriptive studies that provide little theoretical contribution
v. Studies focused on corporate-level open innovation
vi. Studies focused on nongeographical ecosystem concepts such as business ecosystems
vii. Studies focused on new firm location choice
viii. Studies focused on the relationship between entrepreneurship and economic growth
ix. Studies focused on only one or two components of entrepreneurial ecosystems, rather than the ecosystem as a whole
x. Exclude papers from the same authors that present similar arguments or theories. Keep the representative papers with high citations
xi. For gray literature, check the quality by referring to the quality assessment guidance from Adams et al. (2017) and only include articles that are fit-for-purpose, provide contributions and are evaluated by field experts
xii. Results unavailable electronically or by other reasonable means

This review resulted in 68 key papers on entrepreneurial ecosystems.

2. The systematic review of *empirical studies* on E4s

A. Criteria for *inclusion* for review

a. Empirical articles including both quantitative and qualitative studies
b. All sectors
c. All years (1970–2018)

B. Search method and scope (36,896)

a. A full search of articles within database Web of Science ISI Social Sciences Index

i. Focus on title and abstract
ii. Search strings ($n = 36,886$)

1. TS=((("entrepreneur*") OR ("new venture*") OR ("new firm*") OR (new enterprise*) OR ("startup") OR ("start-up") OR (SME*) OR ("small firm*") OR ("small and medium-sized enterprise*") OR ("micro and small business*") OR ("firm formation") OR ("scale-up") OR ("scaleup") OR (standup) OR ("business model*") OR ("scalable business model") OR ("experimentation") OR ("lean method") OR ("lean startup") OR ("disruption orient*") OR ("growth oriented") OR ("entrepreneurial firm*") OR ("nascent entrepreneur*") OR (unicorn) OR (digital entrepreneur*") OR ("digital startup*"))
2. AND (("emerging econom*") OR ("emerging-market") OR ("emerging countr*") OR Brazil OR Chile OR China OR Colombia OR Hungary OR Indonesia OR India OR Malaysia OR Mexico OR Peru OR

Philippines OR Russia OR ("South Africa") OR Thailand OR Turkey)

3. AND ((institution*) OR ("institution* void*") OR (cultur*) OR (normative) OR (regulatory) OR (resource*) OR ("institution* gap*") OR ("institution* failure") OR ("market failure*") OR ("intermedia*") OR (sponsor*) OR ("external factor*") OR (barrier*) OR (constraint*) OR ("founding environment*") OR ("resource* gap*") OR ("resource* scarcit*") OR ("resource* munificen*") OR (accelerator*) OR (incubator*) OR ("coworking space*") OR ("financ*") OR ("venture capital*") OR ("angel investor*") OR (crowdfunding*) OR ("human capital") OR ("science park*") OR ("entrepreneur* ecosystem*") OR ("startup ecosystem") OR ("start-up ecosystem") OR ("family business*") OR ("family-owned business*") OR ("business group*") OR ("returnee entrepreneur*") OR ("transnational entrepreneur*") OR ("entrepreneur* education")) OR ("mentor*") OR ("knowledge spill-over*"))
   b. Expanded search to guarantee exhaustiveness ($n = 10$):
      i. Expand to gray literature that focuses on E4s (Google Scholar first 30 pages and ProQuest)
      ii. Employ the snowballing technique by browsing through references of potentially relevant articles
      iii. A focused search of selected key journals to ensure that articles of relevance not using specified keywords are included

1. JBV, ETP, SMJ (top entrepreneurship journal)
2. AMJ, ASQ, and OS (top management journal)
3. SEJ (entrepreneurship journal related special issues not available on Web of Science database)
4. Known special focused journals including *Research Policy* and *Small Business Economics*

C. *Exclusion* criteria by theoretical relevance (36,877)

   a. Reviews, editorials, book reviews, meeting abstracts, news items, discussion, retraction, software review, commentaries, biographical item, speeches, call for papers, magazines, blogs correction, letter, and note ($n = 13{,}360$)
   b. Foreign language articles ($n = 1119$)
   c. Not related to management, business, or economics ($n = 19{,}563$)
   d. Screen title and abstract to exclude studies in which the primary focus is not on emerging economy entrepreneurial ecosystems ($n = 2833$)
      i. Single-use, multiple without elaboration, and grammatical coincidence
      ii. Conceptual papers
      iii. Duplicated studies
      iv. Unrelated discipline such as environmental studies
      v. Studies in countries that are not in the list of emerging economies
      vi. Noncontextual factors such as individual traits, capabilities, self-efficacy, prior knowledge, and sense-making
      vii. Studies focused on large corporations rather than SMEs and entrepreneurship, e.g., corporate entrepreneurship and intrapreneurship
      viii. Studies focused on the role of entrepreneurship in economic development and global networks
      ix. Studies focused on innovation rather than entrepreneurship
      x. Studies focused on new firm strategies such as marketing, risk management, and talent management strategies
      xi. Studies focused on new construct and measurement development or validations
      xii. Studies focused on firm-level capabilities, e.g., entrepreneurial orientation and absorptive capacity
      xiii. Studies focused on only one or two components of entrepreneurial ecosystems, rather than the ecosystem as a whole
      xiv. Results unavailable electronically or by other reasonable means

This review resulted in 19 key empirical studies on E4s.

Table 1 Publications on advanced economy entrepreneurial ecosystems by journals and types of research: top 7

Journal	Empirical	Conceptual	Total counts
Small Business Economics	7	3	10
Strategic Entrepreneurship Journal	1	2	3
European Planning Studies	0	2	2
Harvard Business Review	1	1	2
Journal of Business Research	1	1	2
Research Policy	0	2	2
Entrepreneurship Theory and Practice	0	1	1

Table 2 Publications on advanced economy entrepreneurial ecosystems by types of research

Types of research	Total counts	Percentage
Empirical	37	54
Conceptual	17	25
Policy report	8	12
Literature review	6	9
Total	68	100

Table 3 Publications on advanced economy entrepreneurial ecosystems by research methods

Research methods	Total counts	Percentage
Single case study	21	57
Multiple case study	8	21
Exploratory factor analysis	1	3
Simulation	1	3
Regression analysis	6	16
Total	37	100

Table 4 Publications on advanced economy entrepreneurial ecosystems by countries

Countries	Total counts	Percentage
USA	19	47.5
UK	2	5
France	2	5
Australia	2	5
Finland	2	5
Canada	2	5
Netherlands	2	5
South Korea	1	2.5
Singapore	1	2.5
Germany	1	2.5
Norway	1	2.5
Italy	1	2.5
Europe	4	10
Total	40	100

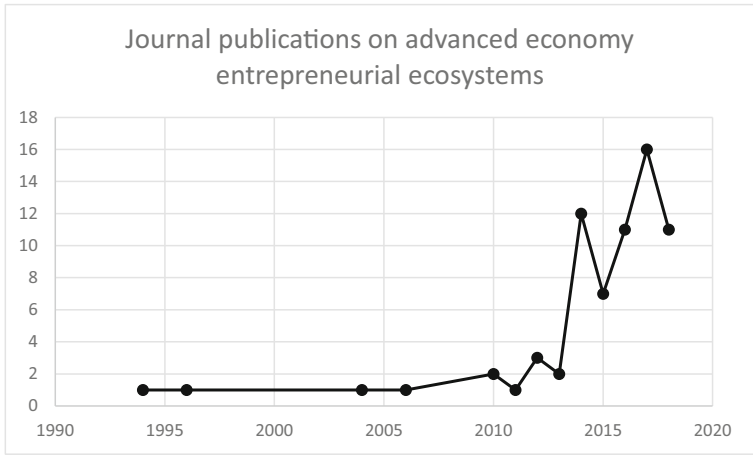

Fig. 1 Summary: trends of publications on advanced economy entrepreneurial ecosystems

Table 5 Publications on emerging economy entrepreneurial ecosystems by countries

Countries	Total counts	Percentage
China	5	22
Mexico	4	18
Brazil	3	14
India	3	14
South Africa	2	9
Chile	2	9
Malaysia	1	5
Emerging economies in general	2	9
Total[a]	22	100

[a] Some papers cover more than one emerging economies

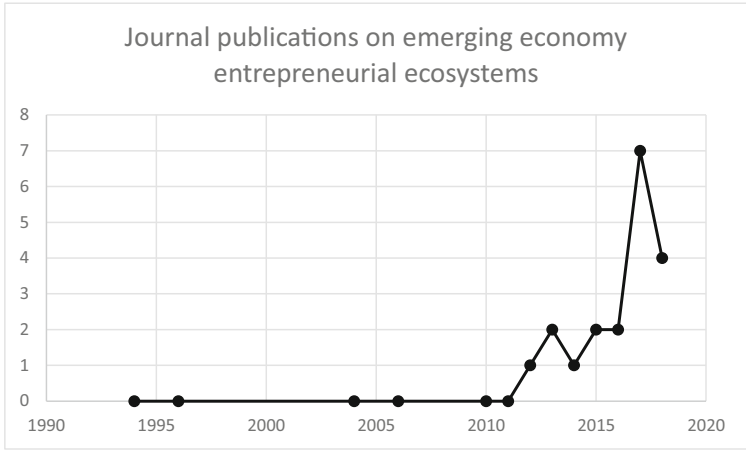

Fig. 2 Summary: trends of publications on emerging economy entrepreneurial ecosystems

Table 6 List of key research on entrepreneurial ecosystems with a focus on advanced economy context

	Author (year)	Title	Source	Type	Location	Research method
1	Spilling (1996)	The entrepreneurial system: on entrepreneurship in the context of a mega-event	*Journal of Business Research*	Empirical	Lillehammer, Norway	Single case study
2	Neck et al. (2004)	An entrepreneurial system view of new venture creation	*Journal of Small Business Management*	Empirical	Boulder County, Colorado, USA	Single case study
3	Cohen (2006)	Sustainable valley entrepreneurial ecosystems	*Business Strategy and the Environment*	Empirical	Victoria, British Columbia, Canada	Single case study
4	Harrison and Leith (2010)	Voodoo institution or entrepreneurial university? Spin-off companies, the entrepreneurial system and regional development in the UK	*Regional Studies*	Empirical	Northern Ireland, UK	Single case study
5	Isenberg (2010)	How to start an entrepreneurial revolution	*Harvard Business Review*	Empirical	Rwanda, Chile, Israel, Taiwan, and Iceland	Multiple case studies
6	Isenberg (2011)	The entrepreneurship ecosystem strategy as a new paradigm for economic policy: principles for cultivating entrepreneurship	*Presentation at the Institute of International and European Affairs*	Report	NA	NA
7	Feld (2012)	Startup communities: building an entrepreneurial ecosystem in your city	*Start-up Communities: Building an Entrepreneurial Ecosystem in Your City (Book)*	Empirical	Boulder County, Colorado, USA	Single case study
8	Pitelis (2012)	Clusters, entrepreneurial ecosystem cocreation, and appropriability: a conceptual framework	*Industrial and Corporate Change*	Conceptual	NA	NA
9	Qian et al. (2012)	Regional systems of entrepreneurship: the nexus of human capital, knowledge and new firm formation	*Journal of Economic Geography*	Empirical	US metropolitan areas	Regression analysis
10	Vogel (2013)	The employment outlook for youth: building entrepreneurial ecosystems as a way forward	*G20 Youth Forum*	Conceptual	NA	NA
11	Motoyama et al. (2013)	Leveraging regional assets: Insights from high-growth companies in Kansas City	*Ewing Marion Kauffman Foundation*	Empirical	Kansas City, USA	Single case study
12	WEF (2014)	Entrepreneurial ecosystems around the globe and early-stage company growth dynamics—the entrepreneur's perspective	*World Economic Forum*	Report	NA	NA
13	Isenberg (2014)	What an entrepreneurship ecosystem actually is	*Harvard Business Review*	Report	NA	NA
14	Mason and Brown (2014)	Entrepreneurial ecosystems and growth-oriented entrepreneurship	*Organization for Economic Cooperation and Development (OECD)*	Report	NA	NA
15	Autio et al. (2014a)	Entrepreneurial innovation: the importance of context	*Research Policy*	Conceptual	NA	NA
16	Autio et al. (2014b)	Analyses on the Finnish high-growth entrepreneurship ecosystem	*Aalto University School of Business Small Business Centre*	Empirical	Finland	Multiple case studies
17	Acs et al. (2014)	National systems of entrepreneurship: measurement issues and policy implications	*Research Policy*	Conceptual	NA	NA
18	Stam (2014)	The Dutch entrepreneurial ecosystem	*SSRN eLibrary*	Empirical	Netherlands	

Table 6 (continued)

	Author (year)	Title	Source	Type	Location	Research method
						Single case study
19	Motoyama and Knowlton (2014)	Examining the connections within the startup ecosystem: a case study of St. Louis	*Ewing Marion Kauffman Foundation*	Empirical	St. Louis, USA	Single case study
20	Motoyama et al. (2014)	Think locally, act locally: building a robust entrepreneurial ecosystem	*Ewing Marion Kauffman Foundation*	Empirical	Kansas City, USA	Single case study
21	Kline et al. (2014)	A spatial analysis of tourism, entrepreneurship and the entrepreneurial ecosystem in North Carolina, USA	*Tourism Planning and Development*	Empirical	North Carolina, USA	Regression analysis
22	Kshetri (2014)	Developing successful entrepreneurial ecosystems: lessons from a comparison of an Asian tiger and a Baltic tiger	*Baltic Journal of Management*	Empirical	Estonia and South Korea	Multiple case studies
23	Rice et al. (2014)	University-based entrepreneurship ecosystems: a global study of six educational institutions	*International Journal of Entrepreneurship and Innovation Management*	Empirical	USA, France, Mexico, and Singapore	Multiple case studies
24	Auerswald (2015)	Enabling entrepreneurial ecosystems	*The Oxford Handbook of Local Competitiveness*	Report	NA	NA
25	Markley et al. (2015)	Creating entrepreneurial communities: building community capacity for ecosystem development	*Community Development*	Empirical	Kansas, USA, and 2 substate regions in Victoria, Australia	Multiple case studies
26	Stam (2015)	Entrepreneurial ecosystems and regional policy: a sympathetic critique	*European Planning Studies*	Conceptual	NA	NA
27	Bell-Masterson and Stangler (2015)	Measuring an entrepreneurial ecosystem	*SSRN eLibrary*	Conceptual	NA	NA
28	Fuerlinger et al. (2015)	The role of the state in the entrepreneurship ecosystem: insights from Germany	*Triple Helix*	Empirical	Germany	Single case study
29	Desai and Motoyama (2015)	The regional environment: Indianapolis-insights from high-growth companies	*SSRN eLibrary*	Empirical	Indianapolis, USA	Single case study
30	Groth et al. (2015)	What Europe needs is an innovation-driven entrepreneurship ecosystem: introducing EDIE	*Thunderbird International Business Review*	Report	Europe	NA
31	Audretsch and Belitski (2016)	Entrepreneurial ecosystems in cities: establishing the framework conditions	*The Journal of Technology Transfer*	Empirical	70 European cities	Exploratory factor analysis
32	Carayannis et al. (2016)	Entrepreneurship ecosystems: an agent-based simulation approach	*The Journal of Technology Transfer*	Empirical	NA	Simulation
33	Cukier et al. (2016)	Software startup ecosystems evolution: the New York City case study	*2nd International Workshop on Software Startups*	Empirical	New York City, USA	Single case study
34	Mack and Mayer (2016)	The evolutionary dynamics of entrepreneurial ecosystems	*Urban Studies*	Empirical	Phoenix, Arizona, USA	Single case study
35	Roundy (2016)	Start-up community narratives: the discursive construction of entrepreneurial ecosystems	*The Journal of Entrepreneurship*	Conceptual	NA	NA
36				Empirical		

Table 6 (continued)

	Author (year)	Title	Source	Type	Location	Research method
	Motoyama and Knowlton (2016)	From resource munificence to ecosystem integration: the case of government sponsorship in St. Louis	*Entrepreneurship and Regional Development*		St. Louis, Missouri, USA	Single case study
37	Stam and Spigel (2016)	Entrepreneurial ecosystems	*USE Discussion paper series*	Conceptual	NA	NA
38	Motoyama et al. (2016)	Little town, layered ecosystem: a case study of Chattanooga	*Ewing Marion Kauffman Foundation*	Empirical	Chattanooga, Tennessee, USA	Single case study
39	Spigel (2016)	Developing and governing entrepreneurial ecosystems: the structure of entrepreneurial support programs in Edinburgh, Scotland	*International Journal of Innovation and Regional Development*	Empirical	Edinburgh, Scotland, UK	Single case study
40	Haines (2016)	Developing a startup and innovation ecosystem in regional Australia	*Technology Innovation Management Review*	Empirical	Cairns, Australia	Single case study
41	Autio (2016)	Entrepreneurship support in Europe: trends and challenges for EU policy	*European Union DG Growth*	Report	Europe	NA
42	Spigel (2017)	The relational organization of entrepreneurial ecosystems	*Entrepreneurship: theory and practice*	Empirical	Waterloo, Ontario, and Calgary, Alberta, Canada	Multiple case studies
43	Alvedalen and Boschma (2017)	A critical review of entrepreneurial ecosystems: towards a future research agenda	*European Planning Studies*	Literature review	NA	NA
44	Autio (2017)	Entrepreneurial ecosystems: concepts and policy challenges	*Finnish Strategic Research Council*	Report	Finland	NA
45	Motoyama et al. (2017)	A new frontier: entrepreneurship ecosystems in Bozeman and Missoula, Montana	*Ewing Marion Kauffman Foundation*	Empirical	Bozeman and Missoula, Montana, USA	Multiple case studies
46	Auerswald and Dani (2017)	The adaptive life cycle of entrepreneurial ecosystems: the biotechnology cluster	*Small Business Economics*	Empirical	USA	Single case study
47	Acs et al. (2017)	The lineages of the entrepreneurial ecosystem approach	*Small Business Economics*	Literature review	NA	NA
48	Bruns et al. (2017)	Searching for the existence of entrepreneurial ecosystems: a regional cross-section growth regression approach	*Small Business Economics*	Empirical	107 European NUTS1-2 regions across 16 EU member states	Regression analysis
49	Brown and Mason (2017)	Looking inside the spiky bits: a critical review and conceptualization of entrepreneurial ecosystems	*Small Business Economics*	Literature review	NA	NA
50	Sussan and Acs (2017)	The digital entrepreneurial ecosystem	*Small Business Economics*	Conceptual	NA	NA
51	Miller and Acs (2017)	The campus as entrepreneurial ecosystem: the University of Chicago	*Small Business Economics*	Empirical	Chicago, USA	Single case study
52	Colombelli et al. (2017)	Hierarchical and relational governance and the life cycle of entrepreneurial ecosystems	*Small Business Economics*	Empirical	Turin, Italy	Single case study
53	Theodoraki et al. (2018)	A social capital approach to the development of sustainable entrepreneurial ecosystems: an explorative study	*Small Business Economics*	Empirical	South France	Multiple case studies
54	Audretsch and Link (2017)	Embracing an entrepreneurial ecosystem: an analysis of the governance of research joint ventures	*Small Business Economics*	Empirical	USA National Research Joint Venture	Regression analysis

Table 6 (continued)

	Author (year)	Title	Source	Type	Location	Research method
					Database (NRJVD)	
55	Roundy et al. (2017)	The resilience of entrepreneurial ecosystems	*Journal of Business Venturing Insights*	Conceptual	NA	NA
56	Roundy (2017)	"Small town" entrepreneurial ecosystems: implications for developed and emerging economies	*Journal of Entrepreneurship in Emerging Economies*	Conceptual	NA	NA
57	Autio and Levie (2017)	Management of entrepreneurial ecosystems	*The Wiley Handbook of Entrepreneurship*	Conceptual	NA	NA
58	Spigel and Harrison (2018)	Toward a process theory of entrepreneurial ecosystems	*Strategic Entrepreneurship Journal*	Conceptual	NA	NA
59	Autio et al. (2018)	Digital affordances, spatial affordances, and the genesis of entrepreneurial ecosystems	*Strategic Entrepreneurship Journal*	Conceptual	NA	NA
60	Thompson et al. (2018)	How entrepreneurial ecosystems take form: evidence from social impact initiatives in Seattle	*Strategic Entrepreneurship Journal*	Empirical	Seattle, Washington, USA	Single case study
61	Malecki (2018)	Entrepreneurship and entrepreneurial ecosystems	*Geography Compass*	Literature review	NA	NA
62	Cavallo et al. (2018)	Entrepreneurial ecosystem research: present debates and future directions	*International Entrepreneurship and Management Journal*	Literature review	NA	NA
63	Stam (2018)	Enabling creative destruction: an entrepreneurial ecosystem approach to industrial policy	*USE Working Paper series*	Conceptual	NA	NA
64	Stam (2018)	Entrepreneurial ecosystems: a systems perspective	*USE Working Paper series*	Empirical	12 regions in the Netherlands	Regression analysis
65	Fuentelsaz et al. (2018)	Institutional dynamism in entrepreneurial ecosystems	*Entrepreneurial Ecosystems (Book)*	Conceptual	NA	NA
66	Scaringella and Radziwon (2018)	Innovation, entrepreneurial, knowledge, and business ecosystems: old wine in new bottle	*Technological Forecasting & Social Change*	Literature review	NA	NA
67	Acs et al. (2018)	Entrepreneurship, institutional economics, and economic growth: an ecosystem perspective	*Small Business Economics*	Empirical	46 countries	Regression analysis
68	Roundy (2018)	The emergence of entrepreneurial ecosystems: a complex adaptive systems approach	*Journal of Business Research*	Conceptual	NA	NA

Appendix 2. Entrepreneurial ecosystems dynamics

Table 7 List of formal definitions of entrepreneurial ecosystems

	Paper	Definitions
1	Spilling (1996)	"The entrepreneurial system consists of a complexity and diversity of actors, roles, and environmental factors that interact to determine the entrepreneurial performance of a region or locality." (p. 91)
2	Cohen (2006)	"Entrepreneurial ecosystems represent a diverse set of interdependent actors within a geographic region that influence the formation and eventual trajectory of the entire group of actors and potentially the economy as a whole. Entrepreneurial ecosystems evolve through a set of interdependent components which interact to generate new venture creation over time" (pp. 2–3)
3	Isenberg (2010)	"The entrepreneurial ecosystem consists of a set of individual elements – such as leadership, culture, capital markets, and open-minded customers- that combine in complex ways." Nine principles are proposed to integrate these elements into a holistic system: "1) stop emulating Silicon Valley; 2) shape the ecosystem around local conditions; 3) engage the private sector from the start; 4) favor the high potentials; 5) get the big win on the board; 6) tackle cultural change head-on; 7) stress the roots; 8) do not over-engineer clusters; help them grow organically; 9) reform legal, bureaucratic, and regulatory framework." (p. 3)
4	Isenberg (2011)	"Entrepreneurship ecosystem consists of a dozen or so elements (which we consolidate into six domains including policy, finance, culture, supports, human capital, and markets) that, although they are idiosyncratic because they interact in very complex ways, are always present if entrepreneurship is self-sustaining." (p. 6)
5	Feld (2012)	Four principles for entrepreneurial ecosystems: "1) Entrepreneurs must lead the startup community. 2) The leaders must have a long-term commitment. 3) The startup community must be inclusive of anyone who wants to participate in it. 4) The startup community must have continual activities that engage the entire entrepreneurial stack." (p. 23)
6	Qian et al. (2012)	"economic, social, institutional and all other important factors that interactively influence the creation, discovery and exploitation of entrepreneurial opportunities" (p. 562)
7	Vogel (2013)	"…an interactive community within a geographic region, composed of varied and interdependent actors (e.g. entrepreneurs, institutions and organizations) and factors (e.g. markets, regulatory framework, support setting, entrepreneurial culture), which evolves over time and whose actors and factors coexist and interact to promote new venture creation." (p. 6)
8	Mason and Brown (2014)	"a set of interconnected entrepreneurial actors (both potential and existing), entrepreneurial organisations (e.g. firms, venture capitalists, business angels, banks), institutions (universities, public sector agencies, financial bodies) and entrepreneurial processes (e.g. the business birth rate, numbers of high growth firms, levels of 'blockbuster entrepreneurship', number of serial entrepreneurs, degree of sellout mentality within firms and levels of entrepreneurial ambition) which formally and informally coalesce to connect, mediate and govern the performance within the local entrepreneurial environment" (p. 5)
9	Acs et al. (2014)	"A National System of Entrepreneurship is a dynamic, institutionally embedded interaction between entrepreneurial attitudes, ability, and aspirations, by individuals, which drives the allocation of resources through the creation and operation of new ventures." (p. 479)
10	Spigel (2017)	"Entrepreneurial ecosystems are combinations of social, political, economic, and cultural elements within a region that support the development and growth of innovative startups and encourage nascent entrepreneurs and other actors to take the risks of starting, funding, and otherwise assisting high-risk ventures." (p. 2)
11	Roundy (2016)	"the sets of actors, institutions, social structures and cultural values that produce entrepreneurial activity" (p. 233)
12	Audretsch and Belitski (2016)	"systems of entrepreneurship (further ecosystem) as institutional and organizational as well as other systemic factors that interact and influence identification and commercialization of entrepreneurial opportunities" (p. 2)
13	Stam and Spigel (2016)	"set of interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship within a particular territory" (p. 1)
14	Wadee and Padayachee (2017)	"an entrepreneurial ecosystem refers to the set of elements, individuals, organizations or institutions outside the individual entrepreneur that are conducive to the choice of a person to become an entrepreneur, or the probability of his or her success following launch." (p. 288)
15	Theodoraki et al. (2018)	"The entrepreneurial ecosystem includes three dimensions: actors who form it and their interactions (formal and informal network), physical infrastructure, and culture." (p. 50)
16	Autio (2017)	"Entrepreneurial ecosystems are regionally embedded interaction systems that drive the allocation of resources towards productive uses through the creation and scale-up of new ventures." (p. 23)

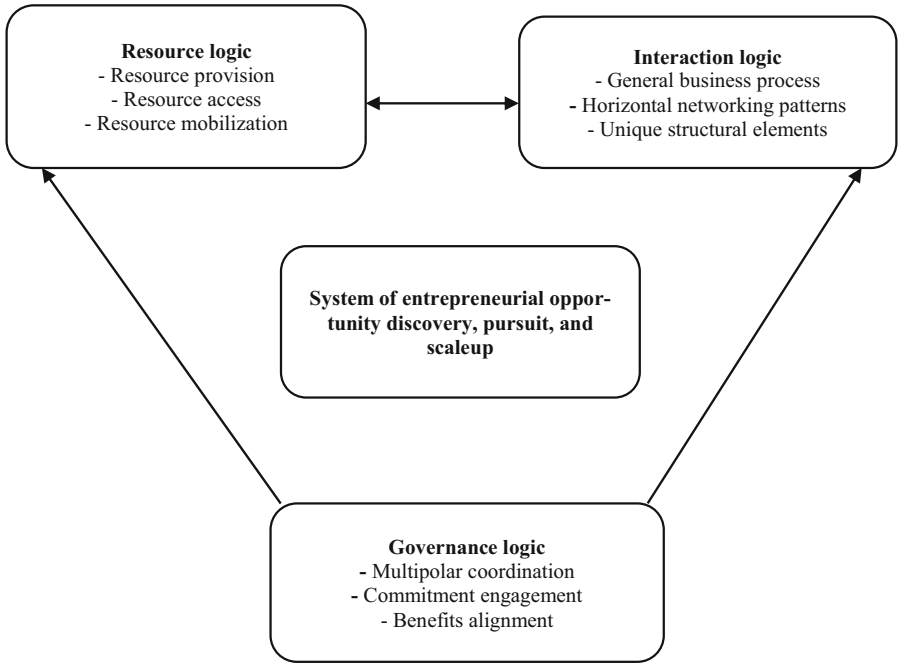

Fig. 3 Conceptual model of entrepreneurial ecosystems dynamics

Appendix 3. Entrepreneurial ecosystems in emerging economies

Table 8 List of key empirical research on entrepreneurial ecosystems in emerging economies

	Author (year)	Title	Source	Method	Location	Sample
1	Kantis and Federico (2012)	Entrepreneurial ecosystems in Latin America: The role of policies	*International Research and Policy Roundtable (Kauffman Foundation)*	Qualitative	Brazil, Mexico, Argentina, Chile, and Uruguay	Interviews with key informants in each country, supplemented by information from policy reports and institutional documents
2	Arruda et al. (2013)	The Brazilian entrepreneurial ecosystem of startups: an analysis of entrepreneurship determinants in Brazil as seen from the OECD pillars	*Journal of Entrepreneurship and Innovation Management*	Mixed method	Brazil	Quantitative secondary data from OECD and interviews with 30 respondents
3	Liu et al. (2013)	Industrial cluster, government agency and entrepreneurial development: a case study of Wenzhou City, Zhejiang Province	*Chinese Management Studies*	Qualitative	Zhejiang, China	Historical documents, statistical data, in-depth interviews, and open-ended questionnaires survey
4	Gonzalez-Uribe and Leatherbee (2014)	Business accelerators and new venture performance: evidence from Start-Up Chile	*SSRN eLibrary*	Quantitative	Chile	3258 applicants, 616 and 2642 participants and nonparticipant of Start-Up Chile
5	Manimala and Wasdani (2015)	Entrepreneurial ecosystem: perspectives from emerging economies	*Entrepreneurial ecosystem: Perspectives from emerging economies (Book)*	Qualitative	Emerging economies	Secondary data analysis
6	Sheriff and Muffatto (2015)	The present state of entrepreneurship ecosystems in selected countries in Africa	*African Journal of Economic and Management Studies*	Literature review	Africa	Desk research
7		Analysis of the Brazilian entrepreneurial ecosystem	*Desenvolvimento em Questão*	Quantitative	Brazil	GEI index

Table 8 (continued)

	Author (year)	Title	Source	Method	Location	Sample
	Júnior et al. (2016)					
8	Dutt et al. (2016)	How open system intermediaries address institutional failures: the case of business incubators in emerging-market countries	*Academy of Management Journal*	Mixed method	68 emerging countries defined by the World Bank	133 incubators in 68 emerging economies from 2008 to 2010, Russia, Kazakhstan, Chile, Argentina, South Africa, Nigeria, and India for qualitative interviews
9	Guerrero and Urbano (2017a)	The dark side of entrepreneurial ecosystems in emerging economies: exploring the case of Mexico	*Academy of Management Proceedings*	Quantitative	Mexico	2012/2014 National Victimization Survey
10	Guerrero and Urbano (2017b)	The impact of Triple Helix agents on entrepreneurial innovations' performance: an inside look at enterprises located in an emerging economy	*Technological Forecasting and Social Change*	Quantitative	Mexico	Cross-section dataset of 19,188 Mexican enterprises interviewed in the period of 2006 to 2012
11	Armanios et al. (2017)	How entrepreneurs leverage institutional intermediaries in emerging economies to acquire public resources	*Strategic Management Journal*	Quantitative	China	139 firms (77 science park firms and 62 nonscience park firms)
12	Subrahmanya (2017)	Comparing the entrepreneurial ecosystems for technology startups in Bangalore and Hyderabad, India	*Technology Innovation Management Review*	Qualitative	Bangalore and Hyderabad, India	51 interviews in Bangalore and 38 in Hyderabad from August 2015 to January 2016
13	Li et al. (2017)	Digital entrepreneurship ecosystem as a new form of organizing: the case of Zhongguancun	*Frontiers of Business Research in China*	Qualitative	Beijing, China	51 interviews and 4-month observation
14	Wadee and Padayachee (2017)	Higher education: catalysts for the development of an entrepreneurial ecosystem, or ... Are we the weakest link?	*Science Technology and Society*	Qualitative	South Africa	South Africa
15	GALI and Deloitt (2017)	Accelerating startups in emerging markets: insights from 43 programs	*Global Accelerator Learning Initiative in collaboration with Deloitte*	Mixed method	India, Kenya, Mexico, Nicaragua, South Africa, and Uganda	2455 ventures that applied to 43 programs operating in 9 countries
16	Goswami et al. (2018)	Accelerator expertise: understanding the intermediary role of accelerators in the development of the Bangalore entrepreneurial ecosystem	*Strategic Entrepreneurship Journal*	Qualitative	Bangalore, India	54 interviews, 8 accelerators, 49 websites, 13 online interviews, 26 online news, and 301 pages of policy documents
17	Yi and Uyarra (2018)	Process mechanisms for academic entrepreneurial ecosystems: insights from a case study in China	*Science, Technology and Society*	Case study	Zhejiang, China	20 interviews, secondary university data
18	Du et al. (2018)	From a marketplace of electronics to a digital entrepreneurial ecosystem (DEE): the emergence of a meta-organization in Zhongguancun, China	*Information Systems Journal*	Case study	Beijing, China	48 interviews with key stakeholders
19	Yusoff et al. (2018)	Fostering the entrepreneurial ecosystem: the roles of government agencies in Malaysia	*Advanced Science Letters*	Case study	Malaysia	Reviewing the roles of 10 governmental agencies that are involved in entrepreneurship development

Table 9 Theoretical model of entrepreneurial ecosystems dynamics in emerging economies

	Resource logic	Interaction logic	Governance logic
Institutional voids (national) – Formal institutions – Informal institutions	– Fewer resources dedicated to entrepreneurship – Unequal resource access – Internal resource mobilization	– Informal interactions – Internal networks through business groups or family businesses	– Lack of voluntary collaborations among stakeholders – Lack of trust among stakeholders
Resource scarcities (regional) – Finance – Labor – Knowledge – Infrastructure	– Insufficient resource provision – Limited resource access – High knowledge influx – High resource adaptation	– Networks with key resource providers, mainly public – Networks with MNCs and other bodies for international and advanced knowledge resources	– Focus on filling gaps through linear "market" approach such as subsidies – Focus on bringing in foreign resources for adoption and adaptation
Structural gaps (regional) – Actors – Networks	– High reliance on governments as main resource providers – Foreign actors provide international and advanced knowledge – Resource distribution in favor of large incumbents	– High reliance on personal and political networks – Network with foreign bodies for international knowledge – Low connectivity among actors – Low spinoff rates	– Focus on filling gaps through the "system" approach – Government as main actors to design ecosystem and responsible for task allocation – Suffer from duplication and ineffective coordination
Overall effect	– Insufficient resource provision – Unequal resource access – Resource importation – Internal resource mobilization – Unproductive resource allocation	− Vertical collaboration and horizontal competition − Industry-specific knowledge spillovers − Informal interactions − Internal networks	− Centralized design − Task allocation − Market and system approaches − Insufficient collaborations

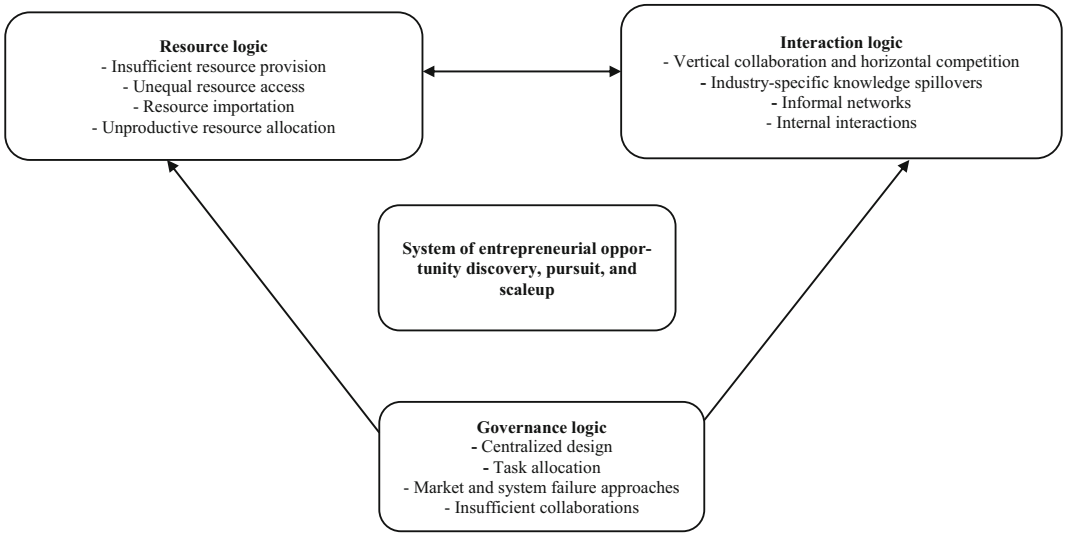

Fig. 4 Conceptual model of entrepreneurial ecosystems dynamics in emerging economies

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