

The governance of entrepreneurial ecosystems

Massimo G. Colombo · Giovanni Battista Dagnino ·
Erik E. Lehmann · MariPaz Salmador

Accepted: 30 September 2017 / Published online: 28 November 2017
© Springer Science+Business Media, LLC, part of Springer Nature 2017

Abstract The “entrepreneurial ecosystem” metaphor is capturing attention in academia, industry, and government. The entrepreneurial ecosystem approach is used in corporate, national, or local contexts, and has grown in prominence given the vital need to transform economies around the creation of innovative ideas, products, services, and technologies. Entrepreneurial ecosystems involve a network, a system, of interactions of individuals and organizations, like financial intermediaries, universities and research institutions, suppliers and customers, multinational companies, or the government. The entrepreneurial ecosystem literature has thus mainly focused on identifying the relevant stakeholders like entrepreneurial firms and entrepreneurs and how they interact with other stakeholders within a more or less defined system. Despite the popularity of the entrepreneurial ecosystem approach, the literature has almost

overlooked and largely ignored the governance of entrepreneurial ecosystems. This special Issue of *Small Business Economics* critically examines issues concerning the governance of entrepreneurial ecosystems.

Keywords Entrepreneurship · Ecosystem · Governance

JEL classification L26 · R1

1 Introduction

The metaphor or meme of “ecosystems” has become popular in industry, academia, and government, thereby capturing increasing attention in both more developed and transforming economies around the creation of innovative products and services, leading to wealth creation and competitiveness (Isenberg 2014; Isenberg and Onymeah 2016; Acs et al. 2017a, b, c; Stam 2015, 2017). In this context, “entrepreneurial ecosystems” gain increasing popularity as a vehicle to describe, explain, advertise, and transport thoughts, frameworks, and opinions on how entrepreneurs interact with their environment as economic agents (Minà et al. 2016; Minà and Dagnino 2017). The current “entrepreneurial ecosystem” literature is mainly based on the analogy of natural ecosystems, intended “as a community of living organisms in conjunction with the nonliving components of their environment, interacting as a system, linked together through nutrient cycles and energy flows” (Smith and Smith 2015 p.19. See Bertoni et al.

M. G. Colombo
Department of Management, Economics, and Industrial
Engineering, Politecnico di Milano, Milan, Italy
e-mail: massimo.colombo@polimi.it

G. B. Dagnino
Department of Economics and Business, University of Catania,
Catania, Italy
e-mail: dagnino@unict.it

E. E. Lehmann (✉)
Augsburg University, Augsburg, Germany
e-mail: erik.lehmann@wiwi.uni-augsburg.de

M. Salmador
Universidad Autónoma de Madrid, Madrid, Spain
e-mail: maripaz.salmador@uam.es

2017 for an application to the venture capital ecosystem). The analogy to the natural sciences is based on the assumption that economic agents interact with the environment, while the environment is almost entirely exogenously given. In this vein, Acs et al. (2017a, b, c, p. 2) interpret ecosystems as a combination of biotic (agents) with abiotic (institutional) components. Although it is widely claimed that Moore (1993) introduced the metaphor of “ecosystems” in the business and management literature (Hayter 2016, p. 635), the recourse to natural ecological systems was coined long time ago by Joseph Alois Schumpeter and his evolutionary character of business life cycles (Nelson and Winter 1982) and the relationship between the environmental context and economic organizations as an ecological (Carroll 1988; Hannan and Freeman 1989) and social system (Lawrence and Lorsch 1967).

While the ecological metaphor may be fruitful when it is in line with bio-inspired designs, like learning from natural and biologically evolved systems (Oh et al. 2016), it comes at the risk of drawing false analogies between natural ecosystems and artificial ecosystems—in particular—when neglecting or abstracting from governance issues. Either when entrepreneurial ecosystems are analyzed as artificial or natural systems, governance aspects matter.¹ This special issue of *Small Business Economics* on “The Governance of Entrepreneurial Ecosystems” is a response to this almost overlooked aspect in the rapidly growing entrepreneurial ecosystem literature. Within this literature, questions whether ecosystems evolve over time like natural ecosystems or are created and man-made call to be answered, then raising further questions on the governance of entrepreneurial ecosystems.

The transfers of the metaphor “ecosystem” seem incomplete without defining the boundaries, as open, closed, or penetrable, and the governance structure of the ecosystem. If entrepreneurial ecosystems evolve over time in autarky, they are governed by a Smithian “invisible hand,” like a genetic code, a selection process of Darwinian adaptation and the survival of the fittest. Then, in this understanding, no or very limited space is left for policy intervention and therefore entrepreneurial

and other types of ecosystems coexist in an autarkic fashion, thereby reflecting natural equilibrium as described by (neo-)classical equilibrium theory. Any policy interventions, even in the best intention as a “feeder of an ecosystem” (Stam 2015) or a *wise dictator*, could disturb a hitherto existing equilibrium path leading to adverse effects for the whole entrepreneurial ecosystem. Exogenous shocks, albeit positive and affecting only one of the species of an ecosystem, may then have adverse effects for the ecosystem as a whole.

Alternatively, if entrepreneurial ecosystems are interpreted and analyzed as artificial systems, then the question of the boundaries of an entrepreneurial ecosystem arises, and then questions concerning the governance structure of the artificial ecosystem are the following: How should resources be allocated efficiently within the boundaries of the ecosystem? How should the costs and the benefits be distributed among the elements of an ecosystem? Which agents should be set in charge to organize, manage, and control this process of allocation and distribution? Finding answers to these questions rests in the focus of corporate governance research (Audretsch and Lehmann 2014; Bertoni et al. 2013; Dagnino et al. 2016) and can be transferred to the governance of ecosystems. Literature has identified the existence of multiple ecosystems, which are simply assumed to co-exist, often within the same or overlapping boundaries, defined by the main and dominant agent like business ecosystems (Clarysse et al. 2014), entrepreneurial ecosystems (Acs et al. 2016, Acs et al. 2017a, c; Stam 2015), cities (Audretsch and Belitski 2017), university ecosystem (Hayter 2015; Wright et al. 2017), or defined in a functional way like service- (Minà and Dagnino 2017), innovation- (Adner and Kapoor 2010; Acs et al. 2016), production-, financial- or digital- (Sussan and Acs 2017) ecosystem. However, this literature almost abstracts from externalities across and among the different ecosystems, and how these externalities could be structured and governed to mitigate adverse effects. This special issue is a first step to close this gap in literature.

While national and local governments praise their countries or cities as “entrepreneurial ecosystems,” managers of incubators, accelerators, or research parks are now managers of “entrepreneurial ecosystems” (Isenberg 2014; Visnjic et al. 2017), and governance issues of entrepreneurial ecosystems are almost faded out. Despite the rapidly growing literature on “entrepreneurial ecosystems,” critical voices appear

¹ The Great Barrier Reef is a natural, autarkic ecosystem which has evolved over thousands of years, locally defined and bounded by the coral reef off the Australian coast. Rebuilding the coral reef within an aquarium, even when all the creatures of the reef are considered, quite inevitably, would still remain an artificial ecosystem, governed by a visible hand, even (when) just pressing the energy button.

wondering about whether old wine is sold in new skins (Oh et al. 2016; Brown and Mason 2017). No wonder, as Isenberg and Onymeah (2016, p. 64) lament, that the popular use of the entrepreneurial ecosystem metaphor typically refers to formal institutions like incubators, angel investors, or networks, whose leaders or members explicitly intend to foster entrepreneurship. Like “entrepreneurship” is often paralleled with a dynamic, future-oriented firm policy (Dagnino et al. 2017), the entrepreneurial ecosystem metaphor is paralleled with a future-oriented national innovation system approach (Acs et al. 2016, 2017b, c), almost neglecting that the empirical evidence of entrepreneurial start-up activities on performance measures, like firm survival, growth, or adverse effects on other firms is rather mixed (Hathaway and Litan 2014).

Moore (1993, 1997) proclaims that nowadays ecosystems take the place of what was formerly known as markets or industries, and that competition and rivalry is now replaced by cooperation and networks, thereby leading to supplementary performance, value and, at least, survival for the members of an ecosystem. While Moore (1993, p. 76) explicitly mentions the boundaries of an ecosystem, within which different actors with different abilities coevolve, the entrepreneurial ecosystem’s governance structure remains a black box. Given the need to examine efficient governance strategies in ecosystems, this special issue tries to fill into this void. Our aim is to understand whether entrepreneurial ecosystems are either artificial or evolve naturally, are governed top-down by a “visible hand,” or navigated bottom-up by an “invisible” Darwinian process.

2 Entrepreneurial ecosystems and governance issues

Like the “rugged landscapes” literature in strategic management (Levinthal 1997) is built around the idea that problems are arbitrarily complicated, the emerging literature on the strategic management of entrepreneurial ecosystems shows essentially no or little specific logic or regularity, is almost eclectic, and since its onset largely remains practitioner-centric (Autio et al. 2017). This literature is, explicitly or implicitly, aligned to the analogy of natural ecosystems, as a community of living organisms in conjunction with the nonliving components of their environment, where the “eco” part of the word is assumed to be related to the environment, and “system” implying the functioning as a collection of

related parts to operate as a unit (Smith and Smith 2015 p.19). Like organisms in nature, various actors or groups of stakeholders coexist and coevolve and the analogy of “biological ecosystems is thus the best and powerful analogy for understanding networks” (Iansiti and Levien 2004a, p. 8). “[And] what does this have to do with economics, one might ask?” (Acs et al. 2017a, b, c. The answer to this question is provided by Acs et al. (2017a, b, c, p. 2) with the analogy, that “an ecosystem is about performance and performance is what economics is about”, and “where entrepreneurship is an important output of such systems” (p. 2).

Another answer goes the other way round: some 700 years B.C. the “ecosystem” metaphor was coined by the Greek philosopher Hesiod, better known as the first “economist” in history, and then used in the natural sciences in the recent past. Hesiod was concerned about the (mis-)allocation of resources within households (*oikos* – “eco”). Such household represented the smallest economic and social unit in ancient Greek City States, an autarkic “ecosystem” constituted by three related, but distinct concepts: the family, the family’s property, and the house/farm. The first “ecosystem” thus encompasses the family as a set of individuals and the family’s property like cattle (and also slaves), as the biotic community, and the land, house, or farm as the physical environment, a self-sustaining and almost autarkic unit, under the governance of the *despot* (the landlord). The performance of the *oikos* was measured by augmenting the material wealth and increasing the social prestige of the family to ensure and guarantee the survival of the *oikos* (see Weber 1978, p. 238). Hesiod could thus be renowned as the founding father of corporate governance theory, since his treatise of the *oikos* was mainly concerned about how to increase and distribute wealth. In the same vein, but some 2700 years later, Adner et al. (2013, p. x) postulate that the strategy in ecosystems “must account for creating a differentiated value proposition to attract not only the end consumer, but for the required partners as well”. As the boundaries of the ancient *oikos* are determined by the value creation process, Adner et al. (Adner et al. 2013, p. x) argue that “the boundaries of the ecosystem are intimately related both to the nature of the value proposition as well as to the structure of interdependencies”. The strategic management of ecosystems thus lies in the explicit considerations of actors who “lie off the critical path to the end consumer: participation (who needs to be included), structure (who hands off to

whom), and governance (who sets the rules)” (p.x). An entrepreneurial ecosystem is then characterized by the *participation* of entrepreneurial firms as an important output of economic systems and an important mechanism to explain the outcome of economic systems (Acs et al. 2017a, b, c, p. 2), a *structure* that fosters entrepreneurship, like financiers, sources of knowledge spillovers, suppliers or consumers, and *governance*, to coordinate and motivate entrepreneurial activities by setting rules and norms. This special issue follows these initial ideas of the *oikos* as described by the couple Hesiod-Adner et al. (2013), considering these three pillars: participation, structure, and the governance of entrepreneurial ecosystems, with a strong focus on the last one.

There are, in general, two dissimilar viewpoints on the evolution of entrepreneurial ecosystems: the bottom-up approach and the top-down approach. While the “entrepreneurial ecosystem” literature implicitly draws on these aspects, it falls short to explicitly mention and discuss them, thereby neglecting to consider the governance issues in “ecosystems.” The bottom-up approach assumes that ecosystems evolve over time like natural ecosystems. This approach fits into the classical theory in economics, where ecosystems evolve over time, governed by an “invisible” hand, which coordinates and motivates the members of an autarkic ecosystem just because of their self-interested behavior. Such bottom-up ecosystems, like Silicon Valley, benefit from path dependencies and a specific culture that coordinates and motivates the members of the entrepreneurial ecosystem. Culture, the sum of rules, norms, and behaviors shared by a specific group of individuals as informal institutions that interrelate with the formal ones (Holmes et al. 2013), serves as the “invisible hand” in governing ecosystems. Likewise a Darwinian process selects the species which are best adapted to the environment, the cultural selection process positively selects norms, rules, and behaviors guaranteeing the performance, the existence, and survival of the entrepreneurial ecosystem. Most prominently for this strand of the literature is Isenberg (2010, 2011, 2014), who defines entrepreneurial ecosystems as being self-sustaining, without an objective that motivates all of the actors. An entrepreneurial ecosystem is thus by definition a dynamic, self-regulating network of many different types of actors with complex interactions (Salmador and Bueno 2005), where entrepreneurs are a driver of the ecosystem, but only one essential element out of many (Isenberg 2014, p.3). Every entrepreneurial ecosystems

has important connectors and influencers who may not be entrepreneurs, but serve as crucial catalysts, customers, market channels, or just feeders of entrepreneurial success, and thus build the broad spectrum of entrepreneurial “flora and fauna.” The governance of entrepreneurial ecosystems is then mainly coordinated and motivated in a self-regulating way by the interests of the different stakeholders, such as banks, public officials, entrepreneurs, investors, and large corporations. Such a self-regulating mechanism requires the costs and benefits of the ecosystem to be traded-off against each other and self-interested actors to coordinate and motivate the actors in the entrepreneurial ecosystem by means of an “invisible hand.” The performance of such an ecosystem is then described best by evolutionary stable market equilibrium, where costs and benefits of the actors are in equilibrium. Thus, intrinsic to the entrepreneurship ecosystem metaphor is not only how essential critical elements are to increase the number of companies growing more rapidly, but that these elements interact in ways that make the whole entrepreneurial ecosystem self-sustaining (Isenberg and Onymeah 2016, p. 64). The underlying assumption is that “neither intention nor formality are essential [entrepreneurial] ecosystem elements” (Isenberg and Onymeah 2016, p. 64), and critical elements need not to be intentional and formal.

Such an approach (Isenberg 2010, 2011, 2014) almost excludes or even overlooks governance issues that rest beyond the “invisible hand,” and thus offers no rationale for policy implications: spending public taxes to promote and foster “entrepreneurial ecosystems” requests a logic of why taxes are spent for some actors receiving a “gift,” while other actors could not benefit of the same treatment or are discriminated (Lehmann and Menter 2017).

The top-down approach assumes that ecosystems could be created and governed by a Chandlerian “visible hand.” The ecosystem itself is considered an open system, where necessary resources are provided by the government as the “feeder” of an ecosystem (Stam 2015, p. 2). Ecosystems in general are then defined as “dynamic, institutionally embedded interactions between attitudes, abilities, and aspirations, by individuals which drive the allocation of resources” (Acs et al. 2014, p. 469), and the “visible hand” of public policy (Audretsch and Belitski 2017; Lehmann and Menter 2017). The top-down entrepreneurial ecosystems have soared great popularity for managerial and policy

implications to foster and promote entrepreneurship in many countries (Stam 2015; Acs et al. 2016, 2017a, c; Rampersad 2016). There is a broad sense in the top-down ecosystem community that a holistic and integrative approach is required to embrace the several activities ecosystems involve and to facilitate co-creation within ecosystems (Stam 2015; Acs et al. 2014, 2017b). This top-down approach implies that ecosystems could be even created from scratch or at least shaped by policy makers, and is reflected in a top-down governance structure where decision-makers strategize from the top. The top-down approach is favored when necessary information about markets and technologies are available at the top level, and long-term plans and strategies could be formalized. The necessary strategies and plans could then be tailored and communicated top-down, in particular, when ecosystems are used as instruments to pursue a global strategic political goal. Such ecosystems are created and fewer evolved over time.

If bottom-up entrepreneurial ecosystems could benefit from external resources (Stam 2015), then public policies could intervene to increase the overall benefits outspreading from the ecosystem. This condition requires a governance structure balancing the cost and benefits of public policy. Otherwise, pure top-down ecosystems may be created from scratch to channel critical resources and circumvent cannibalization effects, but it comes at the cost of innovativeness (Lehmann and Seitz 2017).

Consequently, an organizational structure needs to be adopted; governance, leadership, and management controls be implemented, and motivation and coordination policies be reinforced, either in an explicitly and formal way or implicitly and informally, thereby leading to a “bottom-up-top-down” approach. In such an entrepreneurial ecosystem, some actors, like entrepreneurial firms and new ventures, are more essential to the performance of the whole ecosystem than others (i.e., their own output is more incremental for the performance of other actors and members of the ecosystem than the output of others). Governing ecosystems is then about governing relationships to achieve competitive advantages, coordinating, motivating, and governing the entrepreneurial network. Thus, the *boundaries* of an entrepreneurial ecosystem are determined by the relationships with the key actors, such as the entrepreneurs, of the ecosystem involved and engaged in relationship specific investments with the ecosystem. Such

relationship investment creates switching costs and a hold-up position (Williamson 1985), but also generates the value and competitive advantage of the entrepreneurial ecosystem. The boundaries of the entrepreneurial ecosystem are thus determined by the specific investment made by the relationship, the benefits generated, and the costs of leaving the entrepreneurial ecosystem. The definition of an entrepreneurial ecosystem then should encompass the complementarities between the relevant elements of the system, the interrelated agents, and the *eco* or the environment (Bosma et al., 2017). Such concept of *complementarity* involves the interactions among changes in different choice variables in affecting overall performance (Roberts 2004, p. 34). The performance of the entrepreneurial ecosystem is then mainly driven by productivity-enhancing and cost-reducing interdependencies and interactions of the actors that facilitate the development of technologies and innovation to generate and commercialize new products and processes (Kapoor and Lee 2013; Acs et al. 2017a, b, c). The adequate and overall *performance* measure of entrepreneurial ecosystems is given by the competitive advantage achieved by all the actors involved in the relationship, which may be reflected by highly valuable entrepreneurial firms like the so-called “unicorns” and “gazelles” (Acs et al. 2017; Stam 2017).

Given the substantial level of public and private investment of resources in entrepreneurial ecosystems, there is an increased need to ensure that they are effectively and efficiently governed to achieve the desirable outcomes (Rampersad 2016). In fact, the challenge facing the governance of entrepreneurial ecosystems is complex, due especially to the diversity of the stakeholders involved bearing heterogeneous, and sometimes opposed and thus conflicting, goals. While heterogeneous stakeholders are prone to the appearance of governance problems in general, entrepreneurial ecosystems in particular differ at least in two additional ways from traditional governance analysis. Analytical and practical governance issues are based on organizational units, which are defined by their boundaries, either by spatial boundaries like cities (Audretsch and Belitski 2017; Lehmann and Menter 2017), political boundaries like nations (Acs et al. 2014), or organizations like universities (Stam 2015; Hayter 2016; Wright et al. 2017), technology, and research-parks (Audretsch and Link 2017), and define who is in and who is not (Kuratko et al. 2017).

This raises the hitherto insufficiently answered question on the governance of entrepreneurial ecosystems: how is it possible to increase local performance by stimulating innovation and entrepreneurial activities? And, secondly, how is it possible to distribute the benefits generated? Since these two research questions are closely interrelated, the size of the pie is affected by the way it is carved (Tirole 2006, p.6), and the governance of entrepreneurial ecosystems has to encompass relevant aspects of selecting the relevant stakeholders, their interest, and motivation, but also crucial aspects of incentives. Efficient governance structures in entrepreneurial ecosystems thus need to be concerned about the provision, allocation, and distribution of critical resources and incentives. If the size of the pie—the outcome of the entrepreneurial ecosystem—is affected by how it is carved—how the incentives are balanced—then a misbalance of incentives may lead to adverse effects like underinvestment decisions and therefore to a smaller pie.

3 Papers included in the special issue

The papers in this special issue were selected following a general open call, arguing, in a broad sense, that an entrepreneurial ecosystem encompasses a group of firms, including start-ups, individual and institutional investors, like venture capitalists, banks, business angels, informal individual investors, universities and other knowledge creating institutions, and one or more coordinating entities serving as a formal or informal governance structure. While these actors derive substantial benefits in terms of scale economies as well as entrepreneurial flexibility, from being embedded in an efficient ecosystem and thus share broadly similar general goals associated to its development, their specific interests may well diverge. For instance, entrepreneurs and individual investors may have intrinsic motivations and private benefits, which are not shared by other actors, while local development often is the primary objective of local policy making bodies. This divergence of objectives renders governance issues crucial.

Papers that were not desk rejected were invited to be presented at the “paper developing workshop” organized by the University of Catania in Southern Italy and then subject to a regular review process, with the seven papers presented here successfully navigating this process. The papers adopt empirical and theoretical

perspectives, analyze case and field studies, and focus on clusters and regional innovation systems, highlighting governance issues in a specific context. These perspectives reflect the diverse levels of governing the entrepreneurial ecosystem.

Entrepreneurial ecosystems are associated and characterized by the interrelation and cooperation of agents and institutions. These specific relationships are the kernel of entrepreneurial ecosystems since they could not be simply replicated, are not marketable, and are hardly to implement. The management of entrepreneurial ecosystems is thus the management of specific relationships to enhance and improve these networks and the relationships among the actors. Within this context, research joint ventures (RJVs) play a critical role in the governance of entrepreneurial ecosystems (Colombo et al. 2016). In their paper ‘Embracing an Entrepreneurial Ecosystem: An Analysis of the Governance of Research Joint Ventures’, Audretsch and Link (2017) examine how one important type of relationship, research joint ventures, is governed within the context of an entrepreneurial ecosystem. Based on agency theoretical arguments, they investigate the relationship between the governance structure of an RJV and the likelihood that the venture will embrace elements of its research-based ecosystem. Using data from the National Research Joint Venture Database, Link and Audretsch study finds that, when the governance structure of the RJV affords the organizer/leader and research director (the principal) the ability to exert control over the activities of the other members of the RJV (the agents), universities are less likely to be invited to participate as a research member.

Important agents in governing entrepreneurial ecosystems are large corporations. Large corporations not only serve as providers of critical resources to the ecosystem, but they are also critical in the exploitation and expropriation of new ideas and technologies created by entrepreneurial firms. Based on their market power, they are able to milder moral hazard problems in the allocation of resources and the distribution of the generated profits and benefits of the ecosystem. The study of Bhawe and Zahra (2017) is focused in the role of large corporations in governing entrepreneurial ecosystem and, in particular, multinational enterprises (MNE). Their analysis highlights key sources of heterogeneity in types of new firms that might emerge in a local ecosystem and how they might develop over time as a result of MNEs’ entry, creating wealth. Bhawe and

Zahra show that, despite the rise in MNEs' entry, empirical evidence on their efficacy in invigorating local entrepreneurial systems has been mixed. They propose that this finding may arise from a lack of focus on local ecosystems' absorptive capacity, which is essential to spawning different types of entrepreneurial ventures that combine both replicative and truly innovative local firms. They further argue that the dynamic interplay between knowledge flows through spillovers from MNEs and absorptive capacity is likely to promote the emergence, evolution, and sustainability of different types of new local firms and that, over time, these developments encourages co-specialization between local new ventures and MNEs.

New venture creation and entrepreneurship are indispensably linked to the provision of financial resources, in particular equity (Colombo and Murtinu 2017; Block et al. 2017). There exists overwhelming evidence supporting the role of equity investors in governing entrepreneurial firms. With their stakes within a venture, they decide, whether ventures survive or have to be liquidated. Consequently, private equity investors like venture capitalists play an important role in governing entrepreneurial ecosystems. VCs take control through their board seats along with other contractual rights that can bring about changes in a start-up necessary to successfully attract a strategic acquirer (Colombo and Shafi 2016). Consistent with this view, Cumming et al. (2017) show that VCs often replace the founding entrepreneur as CEO long before an acquisition exit. They focus on two alternative routes that lead entrepreneurial start-ups to acquisition outcomes instead of liquidation. On one hand, acquisitions can come about through the control route with external financiers such as venture capitalists (VCs). On the other hand, acquisitions can come about through more advice and support provided to the start-up, such as the one provided by an incubator or technology park. Based on a sample of 251 companies in the USA over the years from 2007 to 2014, Cumming et al. (2017) present evidence that is strongly consistent with their propositions and show a tension between VC-backing of start-ups resident in technology parks insofar as such start-ups are slower to become, and less likely to be acquired.

An important issue in the corporate governance literature is dedicated to the size and composition of boards, in particular the relationship of insiders and outsiders (Tirole 2006). This literature assumes that insiders are reluctant to supervise and control the CEO, while

outsiders may also bring their expertise within the board (Audretsch and Lehmann 2014). In their study "The governance of universities and the establishment of academic spinoff", Meoli et al. (2017) analyze how different modes of governance of universities shape the entrepreneurial ecosystem. In particular, the paper analyzes how the governance structure of universities fosters the establishment of academic spinoffs. The authors use a regulatory change imposing to Italian State owned universities—the enrollment of lay members (i.e., external directors) in their board of directors, as an event and analyze its "treatment effect." While half of the universities appoint the minimum number of lay members required, other universities appoint more, up to creating a board of outside directors where only the rector is internal. The authors assume that these outside lay members may vary in their type of experiential capital. While some of these outsiders are entrepreneurs or managers of private firms, others are local stakeholders, such as lawyers or members of foundations or chambers of commerce. Such variance should then be reflected in the stimulus they exert on the creation of spinoffs. Using a regression discontinuity design on a sample of 1234 spinoffs from 66 universities, the longitudinal study of 1122 university-year observations shows that the rate of establishment of technology spinoffs increases with the number of entrepreneurs appointed as outsiders in the board. Local stakeholders appointed as outsiders in the university's board of directors are however associated with an increased establishments of service-oriented spinoffs.

Instead of relying on analogies to the natural science, academics in the social sciences refocus their view on the initial term of ecosystems as a community of individuals, interacting together in a bounded area encompassing resources, materials, goods, and institutions, like shared norms and rules, as basic pillars of entrepreneurial ecosystems (Acs et al. 2015, 2016; Stam 2015), where universities could provide the necessary leadership to coordinate and motivate the community members (Hayter 2016). As Miller and Acs (2017) point out, a question that immediately comes to mind when studying ecosystem performance is what the proper unit of analysis is: the country, the state, the city, the region, or something smaller, like an incubator or accelerator? They study the University of Chicago to explore the governance of the campus as an entrepreneurial ecosystem and the output produced by that campus ecosystem.

Complementary to their case study is the one of Colombelli et al. (2017) focusing on the Polytechnic University of Turin in Northern Italy. They explore the way the evolution of entrepreneurial ecosystems is shaped by different governance designs. They propose a theoretical framework in which they discuss what type of governance design fits the needs of an entrepreneurial ecosystem best throughout its evolution. The conceptualization of a new framework allows specifying a set of propositions, which then are tested using Turin's entrepreneurial ecosystem. The implications derived from the case study highlights the need for a complex relational form of governance, encompassing a systemic and participative approach rooted in shared cooperative norms and informal routines.

Ghio et al. (2017) investigate the interplay among three main elements of an entrepreneurial ecosystem: local universities, local financial system, and residents' individual attitudes. Their study analyzes how the local availability of university knowledge interacts with the relative presence of cooperative banks in the local banking industry and with the residents' tendency to behave opportunistically to determine the creation of high-tech ventures in a territory. Cooperative banks, which have trust-based relationships with the local community, are a valuable source of finance for entrepreneurial ideas, but are restrained by their inherent risk aversion. Accordingly, the authors argue that university knowledge and local presence of cooperative banks can interact either positively or negatively in determining the creation of high-tech ventures at the local level. The empirical part of the paper estimates zero-inflated negative binomial regressions, where the dependent variable is the number of new high-tech ventures established in 792 province-industry pairs in the period 2012–2014. The results confirm that in provinces where residents tend to behave opportunistically, the relative presence of cooperative banks magnifies the positive effect of university knowledge on high-tech entrepreneurship. Conversely, this effect is negligible in provinces with less opportunistic residents.

Recent criticisms of entrepreneurial ecosystems have centered on the lack of explicit cause-effect relationships, attribution, units of analysis, the different use of network definitions, as well as the static nature of existing frameworks. Cunningham et al. (2017) take these criticisms seriously and therefore focus on the micro level in governing entrepreneurial ecosystems. They introduce the principal investigator (PI) into center

stage of the governance framework to identify the value creation indicators (the benefits), the problem categories (the costs), and the solving mechanisms that PIs may use to govern entrepreneurial ecosystems in an effective and efficient way. In leading large-scale research programs, PIs interact with different actors within entrepreneurial ecosystems and manage governance issues, conflicts, and tensions effectively at the micro level to deliver the anticipated benefits and costs for each actor. The PI framework may thus provide an actor-centered basis for future empirical research on entrepreneurial ecosystem, in particular in balancing and evaluating the associated costs and benefits in the governance of entrepreneurial ecosystems.

4 Conclusion and future research

While in the last few years entrepreneurial ecosystems have become pretty popular in academia, it still remains a practitioner-centered field of interest with still limited theoretical, empirical, and conceptual body of inquiry underpinning the key phenomenon. An aspect that has been almost neglected in the literature regards the question of the governance structure and the boundary of the entrepreneurial ecosystem. This special issue of *Small Business Economics* intends to significantly enlarge and thicken our understanding of both the theoretical and conceptual developments directly associated with entrepreneurial ecosystems' governance models and their evolutionary paths when small agglomeration becomes larger and established. The title "The Governance of Entrepreneurial Ecosystems" intends to underscore the significance of two closely related themes: (1) connecting developments in entrepreneurial ecosystems to the current discourse about governance and (2) developing new frameworks and models of entrepreneurial ecosystems' governance processes, mechanisms, relationships, and practices. Since the set of papers included in this special issue presents a small and highly selective segment of the broad emerging field on the governance of the entrepreneurial ecosystem, we acknowledge that additional research is needed to fill the gap in the literature. Important topics that are worth exploring regards the integration of entrepreneurial ecosystems into a broader context, linking them to other kinds of ecosystems such as digital, innovation, and business ecosystems. This in turn may contribute to define the formal and/or informal structure of an

entrepreneurial ecosystem, the role of inertial bottom-up and/or top-down forces, and to analyze some critical junctures in the evolution of the governance of entrepreneurial ecosystems.

Future research should also tackle governance dilemmas by formalizing multi-principle and multi-agent problems, conceptualizing the relationships between different institutional settings and ownership modes, and developing performance measures encompassing the costs and benefits spreading out from the direct participation in an entrepreneurial ecosystem.

References

- Acs, Z. J., Autio, E., & Szerb, L. (2014). National systems of entrepreneurship: measurement issues and policy implications. *Research Policy*, *43*(3), 476–494.
- Acs, Z. J., Audretsch, D. B., Lehmann, E. E., & Licht, G. (2016). National systems of entrepreneurship. *Small Business Economics*, *46*(4), 527–535.
- Acs, Z. A., Stam, E., Audretsch, D. B., & O'Connor, A. (2017a). The lineages of the entrepreneurial ecosystem approach. *Small Business Economics*, *49*, 1–17.
- Acs, Z. J., Audretsch, D. B., Lehmann, E. E., & Licht, G. (2017b). National systems of innovation. *Journal of Technology Transfer*, *42*(5), 997–1008.
- Acs, Z. A., Estrin, S., Mickiewicz, T. & Szerb, L. (2017c). *Institutions, Entrepreneurship and Growth: The Role of National Entrepreneurial Ecosystems*, SSRN Working paper N. 2912453. doi:<https://doi.org/10.2139/ssrn.2912453>.
- Adner, R., & Kapoor, A. (2010). Value creation in innovation ecosystems: how the structure of technological interdependence affects firm performance in new technology generations. *Strategic Management Journal*, *31*(3), 306–333.
- Adner, R., Oxley, J. E. & Silverman, B.S. (2013). Introduction: Collaboration and Competition in business ecosystems. In R. Adner, J. E. Oxley & B.S. Silverman (Eds.), *Collaboration and competition in business ecosystems* (Advances in Strategic Management), Volume 30. Bingley: Emerald Books, p i.
- Audretsch, D. B., & Belitski, M. (2017). Entrepreneurial ecosystems in cities: establishing the framework conditions. *Journal of Technology Transfer*, *42*(5), 1030–1051.
- Audretsch, D. B., & Lehmann, E. E. (2014). Corporate governance and entrepreneurial firms. *Foundations and Trends in Entrepreneurship*, *10*(1/2), 1–160.
- Audretsch, D. B. & Link, A. N. (2017). Embracing an entrepreneurial ecosystem: an analysis of the governance of research joint ventures. *Small Business Economics*, this Issue.
- Autio, E., Nambisan, S., Thomas, D. W. L., & Wright, M. (2017). Digital affordances, spatial affordances, and the genesis of the entrepreneurial ecosystem. *Strategic Entrepreneurship Journal*, forthcoming.
- Bertoni, F., Colombo, M. G., & Croce, A. (2013). Corporate governance in high-tech firms. In M. Wright, D. Siegel, K. Keasey, & I. Filatotchev (Eds.), *Oxford handbook of corporate governance* (pp. 365–388). Oxford: Oxford University Press.
- Bertoni, F., Colombo, M.G. & Quas, A. (2017). The role of governmental venture capital in the venture capital ecosystem: an organizational ecology perspective. *Entrepreneurship Theory & Practice*, forthcoming.
- Bhawe, N., & Zahra, S. A. (2017). Inducing heterogeneity in local entrepreneurial ecosystems: the role of MNEs. *Small Business Economics*, this issue.
- Block, J. H.; Colombo, M. G., Cumming, D. J., & Vismara, S. (2017). New players in entrepreneurial finance and why they are there. *Small Business Economics*, in print. doi: <https://doi.org/10.1007/s11187-016-9826-6>.
- Brown, R., & Mason, C. (2017). Looking inside the spiky bits: a critical review and conceptualisation of entrepreneurial ecosystems. *Small Business Economics*, *49*(1), 11–30.
- Carroll, G. R. (1988). *Ecological models of organizations*. Cambridge: Cambridge University Press.
- Clarysse, B., Wright, M., Bruneel, J., & Mahajan, A. (2014). Creating value in ecosystems: crossing the chasm between knowledge and business ecosystems. *Research Policy*, *43*(7), 1164–1176.
- Colombelli, A., Paolucci, E., & Ughetto, E. (2017). Hierarchical and relational governance and the life cycle of entrepreneurial ecosystems. *Small Business Economics*, this issue.
- Colombo, M. G., & Murtinu, S. (2017). Venture capital investments in Europe and portfolio firms' economic performance: Independent versus corporate investors. *Journal of Economics & Management Strategy*, *26*(1), 35–66.
- Colombo, M. G., & Shafi, K. (2016). Swimming with sharks in Europe: when are they dangerous and what can new ventures do to defend themselves? *Strategic Management Journal*, *37*(11), 2307–2322.
- Colombo, M. G., D'Adda, D., Pirelli, L., & L. H. (2016). The participation of new technology-based firms in EU-funded R&D partnerships: The role of venture capital. *Research Policy*, *45*(2), 361–375.
- Cumming, D., Wert, J. C., & Zhang, Y. (2017). Governance in entrepreneurial ecosystems: venture capitalists vs. technology parks. *Small Business Economics*, this issue.
- Cunningham, J. A., Menter, M., & Wirsching, K. (2017). Entrepreneurial ecosystem governance: a principal investigator centered governance framework. *Small Business Economics*, this issue.
- Dagnino, G. B., Levanti, G., & Mocchiari Li Destri, A. (2016). Structural dynamics and intentional governance in strategic interorganizational network evolution: a multilevel approach. *Organization Studies*, *37*(3), 349–373.
- Dagnino, G. B., King, D. R., & Tienari, J. (2017). Strategic management of dynamic growth. *Long Range Planning*, *50*(4), 427–430.
- Ghio, N., Guerini, M., & Lamastra-Rossi (2017). The creation of high-tech ventures in entrepreneurial ecosystems: exploring the interactions among university knowledge, cooperative banks, and individual attitudes. *Small Business Economics*, this issue.
- Hannan, M. T., & Freeman, J. H. (1989). *Organizational ecology*. Cambridge: Harvard University Press.
- Hathaway, I., & Litan, R. E. (2014). Declining Business Dynamism in the United States: A Look at States and Metros. *Economic Studies* at Brookings, 1–7.

- Hayter, C. S. (2016). A trajectory of early-stage spinoff success: the role of knowledge intermediaries within an entrepreneurial university ecosystem. *Small Business Economics*, 47(2), 633–656.
- Holmes, R. M., Miller, T., Hitt, M. A., & Salmador, M. P. (2013). The interrelationships among informal institutions, formal institutions, and inward foreign direct investment. *Journal of Management*, 39(2), 531–566.
- Iansiti, M., & Levien, R. (2004). *The keystone advantage: what the new dynamics of business ecosystems mean for strategy, innovation, and sustainability*. Boston: Harvard Business Press.
- Isenberg, D. (2010). The big idea: how to start and entrepreneurial revolution. *Harvard Business Review*, 88(6), 40–50.
- Isenberg, D. (2011). The Entrepreneurship Ecosystem Strategy as a New Paradigm for Economic Policy: Principles for Cultivating Entrepreneurship. Babson Global <https://www.slideshare.net/DanIsenberg/the-entrepreneurship-ecosystem-strategy-for-economic-growthpolicy-iiea-dublin-2011-1>. Accessed August 14 2017.
- Isenberg, D. (2014). What an entrepreneurship ecosystem actually is, Harvard Business Review, May 12, 2014, accessed under <http://hbr.org/2014/05/what-an-entrepreneurial-ecosystem-actually-is/> on June 14th 2017.
- Isenberg, D., & Onymeah, V. (2016). Fostering scaleup ecosystems for regional economic growth. *Innovations*, 11(1/2), 60–79.
- Kapoor, R., & Lee, J. M. (2013). Coordinating and competing in ecosystems: How organizational forms shape new technology investments. *Strategic Management Journal*, 34(3), 274–296.
- Kuratko, D., Fisher, G., Bloodgood, J. M., Hornsby, S., & J. S. (2017). The paradox of new venture legitimization within an entrepreneurial ecosystem. *Small Business Economics*, 49, 119–140.
- Lawrence, P. R., & Lorsch, J. W. (1967). *Organization and environment. Managing differentiation and integration*. Boston: Harvard University Press.
- Lehmann, E. E., & Menter, M. (2017). Public cluster policy and performance. *Journal of Technology Transfer*. <https://doi.org/10.1007/s10961-017-9626-4>.
- Lehmann, E. E., & Seitz, N. (2017). Freedom and innovation, a country and state level analysis. *Journal of Technology Transfer*, 42(5), 1009–1029.
- Meoli, M., Paleari, S. & Vismara, S. (2017). The governance of universities and the establishment of academic spinoff. *Small Business Economics*, this issue.
- Miller, D. J., & Acs, Z. J. (2017). The campus as entrepreneurial ecosystem: the University of Chicago. *Small Business Economics*, 49, 75–95.
- Minà, A. & Dagnino, G. B. (2017). Mapping entrepreneurial ecosystems inquiry: a content analysis of the literature and its implications, in: Alvarez, S., Carayannis, E.G., Dagnino, G.B. & Faraci, R. (eds.), *Entrepreneurial ecosystems and the diffusion of startups*, Northampton, MA: Edward Elgar. **In press.**
- Minà, A., Dagnino, G. B., & Ben-Letaifa, S. (2016). Competition and cooperation in entrepreneurial ecosystems: a life-cycle analysis of Canadian ICT ecosystems. In F. Belussi & L. Orsi (Eds.), *Innovation, alliances and networks in high-tech environment* (pp. 65–81). Abingdon: Routledge.
- Moore, J. F. (1993). Predators and prey—A new ecology of competition. *Harvard Business Review*, 71(3), 75–86.
- Nelson, R., & Winter, S. (1982). *An evolutionary theory of economic change*. Cambridge: Belkap Press.
- Oh, D.-S., Philips, F., Park, S. & Lee, E. (2016). Innovation Ecosystems: A Critical examination. *Technovation*, 54 1–6.
- Rampersad, G. (2016). Entrepreneurial ecosystems: a governance perspective. *Journal of Research in Business, Economics and Management*, 7(3), 1122–1134.
- Roberts, J. (2004). *The modern firm*. Oxford: Oxford University Press.
- Salmador, M. P., & Bueno, E. (2005). Strategy-making as a complex, double-loop process of knowledge creation: four cases of established banks reinventing the industry by means of the internet. In G. Szulanski, J. Porac, & Y. Doz (Eds.), *Strategy process (advances in strategic management, volume 22)* (pp. 267–318).
- Smith, T. M., & Smith, R. L. (2015). *Elements of ecology* (9th ed.). Essex: Pearson Publishers.
- Stam, E. (2015). *Entrepreneurial ecosystems and regional policy: a sympathetic critique*, Utrecht School of Economics, Discussion paper series 15–07.
- Stam, E. (2017). *Measuring the Entrepreneurial Ecosystem*, Utrecht School of Economics, Discussion paper series 17–11.
- Sussan, F., & Acs, Z. J. (2017). The digital entrepreneurial ecosystem. *Small Business Economics*, 49, 55–73.
- Tirole, J. (2006). *The theory of corporate finance*. Princeton: Princeton University Press.
- Visnjic, I., Cennamo, C., Neely, A., Visnjic, N. (2017). Governing the City: Unleashing Value from the Business Ecosystem. *California Management Review*, 59, 109–140.
- Weber, M. (1978). In G. Roth & C. Wittich (Eds.), *Economy and society: an outline of interpretive sociology*. Berkeley: California University Press.
- Williamson, O. E. (1985). *The economic institutions of capitalism*. New York: Free Press.
- Wright, M., Siegel, D. S. & Mustar P. (2017). An emerging ecosystem for student start-ups. *Journal of Technology Transfer*, 42(4), 909–922.