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Abstract

This article discusses the concept of entrepreneurial ecosystems. In particular, three propositions are made for further development of the concept. First, it is argued that entrepreneurial ecosystems should be regarded a part of the regional innovation system. Second, the scope of the concept should be expanded beyond high-performance start-ups and their founders to include the entire universe of 'everyday' entrepreneurship. Third, the concept should account for the incumbent firms and the regional workforce. The paper then outlines main challenges of further development of the concept.

Keywords: Regional entrepreneurship, entrepreneurial ecosystems, regional development, entrepreneurship policy

JEL classification: L26, R11, O2

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1. Introduction[1]

The concept of entrepreneurial ecosystems (EE) has gained enormous popularity in recent years.[2] An obvious source of this increased attention is the recognition that entrepreneurship can be an important driver of innovation, economic development, and well-being (Fritsch 2013; Wiklund et al. 2019). This goes together with empirical analyzes that demonstrate the importance of the national, regional, sectoral, and temporal context for entrepreneurial activity (Baker and Welter 2020). Contributions to the EE literature come from diverse disciplinary backgrounds, resulting in a considerable variety of approaches and lines of thought. Although the concept of EE may appear rather promising, it did not yet deliver in at least three important respects: identification of causal relationships, theory development and policy guidance.

This paper discusses a number of issues in the EE literature that may be considered responsible for these deficits. The aim is to provide direction for further fruitful debate by formulating relevant questions and applying an appropriate research methodology. The following section (Section 2) deals with the definition of entrepreneurial ecosystems and the relationship with an concept of the innovation system. Section 3 critically discusses the scope of the EE approach in two important respects. First, it is argued that the focus of the EE concept on the tiny group of high-performance start-ups implies that the great bulk of not-so-dynamic new businesses is left unaccounted for. Second, the concept of EE should not be too narrowly focused on founders and start-ups, but particularly include the incumbent firms. The next section discusses what are the key elements of an EE (Section 4) and Section 5 deals with the nature and the sources of systemic properties of EEs. Section 6 proposes important conceptual adjustments that follow from the critical evaluation of the EE approach and discusses the main challenges for further development of the concept and makes suggestions for further research on regional entrepreneurship. Section 7 contains some final remarks.

[1] I am indebted to Björn Asheim, Alex Coad, Marcus Dejardin, Matthias Menter, Haifeng Qian, and Michael Wyrwich for helpful comments on earlier versions of this manuscript.

[2] See for example Brown and Mason (2017); Theodoraki, Dana and Caputo (2022); Wurth, Stam and Spigel (2022, 2023) and the contributions in Huggins et al. (2024).

2. Definition and boundaries of EE

There is no 'one' concept of an EE. Rather, definitions may vary between authors. The following discussion is oriented at the ideas and definitions as put forward by Erik Stam and Ben Spigel[3] that became rather influential and can be considered representative for the largest part of the literature on EE. Regarding the definition of an EE, most scholars probably agree with Wurth, Stam and Spigel (2023, 227) who regard an EE as "a set of interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship within a particular territory". To explicitly account for the geographic dimension of EE is particularly meaningful since empirical research has in many ways demonstrated the pronounced variation of entrepreneurial activity and its effects across regions (Sternberg 2022) and nations (GEM 2024).[4] The significant role of the geographic context also makes the region an important arena for policies aimed at promoting entrepreneurship (Feldman and Oh 2024). The appropriate geographic definition of an EE does, however, depend on geographic specificities and how the economy is embedded in its wider geographic context.

Research on the determinants and the effects of entrepreneurial activity in a regional context is in no way anything new. Alfred Marshall (1920) described and analyzed regional ecosystems (that he termed "industrial districts") of mostly small- and medium-sized entrepreneurial firms in England already at the outset of the 20th century, but the issue gained pace only in the 1970s (e.g., Bolton 1971; Gudgin 1978).[5] What could be regarded as new in the recent literature on EE as compared to the earlier studies of regional entrepreneurship is the explicit systemic character of the concept. The general idea behind the notion of a system is that not only the individual elements are important, but that the interaction of these elements plays a considerable role. The relevant relationships between the elements of the system are manifold and complex, including a large share of

[3] See Wurth, Stam and Spigel (2022, 2023), Stam (2015), Stam and Van de Ven (2021), Spigel and Harrison (2018),

[4] The adequate scope of an EE – regional, sectoral, national, or global – depends on the question that is to be addressed. For example, if the issue is the design of formal institutions that apply nationally, a national or sectoral perspective may be appropriate.

[5] Four special issues of the journal *Regional Studies* on regional entrepreneurship published in 1984, 1994, 2004 and 2014 constituted important landmarks of this research (Fritsch and Storey 2014).

indirect links. As a consequence of the complex network of relationships, changes in one part of the system are likely to significantly affect all the other parts.

A crucial point that is quite frequently overlooked or even misconceived in the EE literature is the relationship with the concept of innovation systems. The concept of innovation systems that was developed in the late 1980s[6] is based on the recognition that innovation processes are characterized by a pronounced division of labor between actors and institutions, including the public sector.[7] Both concepts, EE and innovation systems, are closely intertwined, since knowledge, innovation, and entrepreneurship in a certain geographic area or in a certain economic sector share more or less the same population, workforce, firms, education system, knowledge base, and institutional context. Moreover, they are governed by about the same set of policy makers and their strategies. Both concepts are also conceptually linked because as already emphasized by Joseph Schumpeter (1911/1934) new businesses and entrepreneurs play an important role in introducing innovation.[8] Given these rather close connections, it is surprising that a large part of the EE literature does hardly mention the concept of innovation systems.

These huge overlaps and close interconnections suggest that EE and innovation systems should be considered to be one integrated system. In fact, it can be argued that the relevance of an analysis of entrepreneurship is rather limited if it a priori disregards important relationships in the fields of innovation and knowledge. Given that the concept of the innovation system represents the

[6] The concept of innovation systems was first developed at the level of whole countries (national innovation systems; see Chaminade et al. 2018) but was soon also applied to regions (regional innovation systems; see Asheim et al. 2019).

[7] Lundvall et al. (2009, 7) define an innovation system as "… an open, evolving and complex system that encompasses relationships within and between organizations, institutions and socioeconomic structures which determine the rate and direction of innovation and competence-building emanating from the process of science-based and experience-based learning".

[8] Qian and Acs (2023) and Qian and Fu (2024) stress a number of differences between EEs and innovation systems arguing that these are separate concepts. One of their arguments is that EE focuses on people, while the innovation system is about firms and organizations. This argument is, however, not convincing because the individual level (the entrepreneur, the inventor) and as the level of the respective organization (the new firm, the incumbent firm, the innovative firm) may play important roles in both concepts. Further differences between the two concepts put forward by Qian and Acs (2023) and Qian and Fu (2024) pertain to the measure of outcome and the role of different actors (entrepreneurs, incumbents, government, universities). However, all these distinctions between EE and innovation systems are highly debatable. See also Spigel and Harrison (2018) and Santos (2024).

much more comprehensive approach that includes entrepreneurs as just one of several types of actors, EE should be understood as a subsystem of the innovation system.

3. Scope of entrepreneurial ecosystems

About all of the EE literature places the formation of new businesses at the center of attention, and is more or less entirely concentrated on founders and start-ups. Quite frequently, the focus is on 'productive' new businesses in the sense of highly-innovative and high-growth start-ups (Wurth et al. 2022; 2023). The focus on high-performance new businesses and their founders implies that other parts of the regional business ecology such as established firms, start-ups that are not expected to show high growth and their founders are a priori more or less disregarded. In the following I argue that both, the focus on high-performance businesses (Section 3.1) as well as the restriction on start-ups and their founders (Section 3.2) are inappropriate.

3.1 Focus on high-performance start-ups?

The justification that is usually given for limiting the evaluation of an EE's output on highly innovative and high-growth start-ups states that these types of new businesses represent 'productive' entrepreneurship that make a rather significant contribution to regional growth. This reasoning is questionable for several reasons (Dejardin and van Stel 2024). First, high-growth start-ups are a rather rare species that represents only a tiny share of all new businesses. For example, Andrews et al. (2022) in their study for the US classify only a share of 0.06% of all start-ups in the 1988-2010 period as showing significant growth.[9] This also holds for high-tech start-ups whose economic performance is on average not much different and often not significantly superior as compared to those new businesses that are not particularly innovative (Fritsch 2013).[10] In countries such as Germany, the UK, or

[9] The criterion for growth applied by Andrews et al. (2022, 5) is that "the start-up achieves an initial public offering (IPO) or is acquired at a meaningful positive valuation within 6 years of registration."

[10] One reason for a limited growth performance of highly innovative new businesses is that many of them have a relatively high propensity of failure due to higher uncertainty with regards to technological developments, competitive dynamics, and the development of demand. A concentration on highly innovative start-ups is also a much too narrow perspective because businesses that are not particularly innovative may make important contributions to regional

the USA, less than one out of a thousand start-ups is sufficiently promising to attract Venture Capital. Hence, focusing on the tiny fraction of highly innovative and high-growth start-ups disregards the largest part of all start-ups that Welter et al. (2017) label 'everyday' entrepreneurship.

It is important to bear in mind that high-performance start-ups do not emerge out of thin air but are embedded in the regional economy that can be regarded as a seedbed where relatively low-performing everyday entrepreneurship plays an important role (Kim and Kim 2022). In particular, both low- and high-performance start-ups and firms in a region may have complementary roles. A narrow focus on high performance start-ups ignores such complementarities and the role of less impactful entrepreneurship in general. That some less populated regions have a high-performance start-up only every few years clearly indicates the limited relevance of an approach that focusses on these types of new businesses for entrepreneurship policy.[11]

A severe problem of any policy that aims at fostering high-performance start-ups is that the success of new businesses can hardly be predicted ex ante with any certainty. This holds particularly for high-growth firms, the 'gazelles' (Henrekson and Johansson 2010; Coad and Srhoj 2020). Hence, even if one should regard high-performance start-ups an appropriate and desirable policy target, the problems of identifying such promising start-up projects in practice make such a strategy hardly feasible. The empirical finding that most high-growth firms are not particularly young but expand only at a considerable time after finishing their establishing stage (e.g. Acs et al. 2008; Coad and Karlsson 2022; Henrekson and Johansson 2010) illustrates the problem of assessing the growth prospects of a nascent firm ex ante. Furthermore, high growth of firms is typically an episode that may last some few years but does hardly apply for longer time periods.

growth. In fact, investigations of the characteristics of high-growth firms in the US and other countries demonstrated that the vast majority of these firms were not affiliated with high-tech industries (see, for example, Acs et al. 2008; Henrekson and Johansson 2010).

[11] Since it has been argued that the EE should be regarded a component of the innovation system, including the everyday entrepreneurship implies a wide concept of the innovation system that also includes the non-innovative firms. A justification for including the non-innovative firms is the innovation system is that they can be an important target for a policy that aims at fostering innovation.

In contrast to the vast majority of the EE literature that focuses on the tiny share of highly innovative and high-growth start-ups, it may be much more fruitful to analyze the diversity of everyday entrepreneurship and, hence, entrepreneurship in general. A reason for this expectation is that the relatively large number of start-ups and entrepreneurs that are not performing exceptionally well represent the regional conditions for entrepreneurship far better than the typically tiny fraction of high-performance start-ups. In some regions such highly innovative or high-growth start-ups may even be non-existent.

3.2 Too much emphasis on founders and start-ups

An important argument against focusing on founders and start-ups is that this may not be the relevant dependent variable. Assuming that the key policy target is a region's economic development, start-ups represent 'only' an intermediate variable based on the hope that new business formation may positively contribute to prosperity. Therefore, analyses of the effect of regional entrepreneurship should also consider measures of overall regional development, such as GDP per capita (e.g., Audretsch and Belitzki 2021) or the well-being of the regional population.

Research clearly shows that the main part of the effect that new businesses have on regional development is due to the competition between start-ups and the incumbent firms in and outside the region (Fritsch 2013; Fritsch and Changoluisa 2017). While the (direct) effect of successful start-ups on regional development is positive by definition, there are two important indirect effects. First, negative displacement effects in incumbents who lose demand and second, positive effects in those incumbents who are able to react to the new firm entry with improved productivity and competitiveness. A constellation without such positive and negative indirect effects is more a theoretical possibility than a realistic scenario, and quite often, the indirect effects are quantitatively more important than the development of the newcomers (Fritsch 2013).

The important role of incumbent firms in the effects of new businesses for regional development means that a relevant concept of an EE should include incumbents. Another reason to include incumbents is that their workforce

constitutes a major part of the regional reservoir of potential founders.[12] They also represent an important part of the regional knowledge base and that part of the regional culture that is relevant for entrepreneurship.

The importance of indirect effects of start-ups on incumbents clearly speaks against judging the relevance of start-ups for regional growth entirely based on their development. On the one hand, taking the number or the development of start-ups as a dependent variable may imply an overestimation of the contribution of the new businesses to overall growth as the displacement effects in the incumbent firms are not accounted for. On the other hand, the development of the surviving start-ups underestimates the overall effects of new business formation because it disregards positive productivity spillovers on incumbent firms. It is important to note that even those new businesses that fail economically and have to be closed soon after entry can have a pronounced positive effect on competition, for example, by inducing product- and process innovation in incumbent firms (Fritsch 2013).

4. What are the key elements of an EE?

The question 'What are the key elements of an EE?' pertains to the most important factors and resources that are necessary or desirable for the sound performance of an EE. These elements are candidates for a relevant theory of EE and may represent levers for entrepreneurship policy. Stam and van de Veen (2021) provide a widely cited list of what they consider to be important elements of an EE. The authors distinguish two types of EE elements, institutions and resources. Institutions are the codified rules of the game (formal institutions including the quality of government), the culture and non-codified modes of behavior (informal institutions), and social networks. Resources are physical infrastructures that enable actors to meet face-to-face, access to financial resources, local leadership (guidance for collective action), talent (human capital), resources devoted to knowledge creation, knowledge, the level of local demand, and the presence of producer services. That all these elements can also be

[12] The reason for the importance of the regional workforce is that most new businesses are located close to the founder's residence (see Dahl and Sorenson 2012; Figueiredo, Guimaraes and Woodward 2002).

assumed important for regional innovation activity shows the close relationship of the concept of EE with the concept of a regional innovation system. Stam and van de Ven (2021) show for regions of the Netherlands that there is high correlation between most of the measures of the elements they believe to be important for an EE.

Although the list of relevant EE elements given by Stam and van de Ven (2021) can claim some degree of plausibility, empirical proof of a causal relationship between these elements, regional entrepreneurial activity, and regional growth is largely missing. Simple correlations or regressions are not sufficient in this respect (see Queissner et al. 2024 for an overview). Much more research is necessary to find out what the relevant elements and relationships in EE are.[13] There is good reason to assume that the relevance of a certain EE element can considerably vary across countries and that the importance of single elements may be significantly shaped by certain regional characteristics. One reason for expecting differences between countries is that regions are embedded in a national and international context, and not everything that may be necessary or desirable for good performance of an EE is specific to the respective region. This particularly pertains to basic formal institutions, such as tax law, market regulation, and the protection of intellectual property, which apply throughout a country.

Another important question is whether the resources considered important for entrepreneurial activity need to be located in the region. Is it necessary that a certain resource is located within the region, or can it be sufficient if this resource is available from outside? Empirical examples showing that geographic proximity to a certain resource (e.g., Venture Capital and knowledge) does not play a significant role need further investigation (see Fritsch and Schilder 2012). Obviously, the answer to the question of which key elements of an EE should be located in the region depends to a considerable extent on a country's geography. This includes the geographic size of a country and the geographic distance between regions, the settlement structure, and the communication infrastructure.

[13] An example of such a study is Motoyama and Knowlton (2017).

5. What makes the systemness in entrepreneurial ecosystems?

The general idea behind the notion of a system is that the elements of the system are closely connected by direct and indirect links. As a result of mutual dependence and co-evolution, developments in one part of the system are likely to affect many (if not all) other parts. A popular characterization of such 'systemness' is that the whole, the EE, is more than simply the sum of its parts, the elements of the EE. This raises the question of what generates and represents the systemic character of an EE?

There is no common definition of systemness, and it is unclear how the systemic properties of EE could be measured (see Lehmann 2024 for an overview). One aspect of systemness is synergy, which describes the phenomenon that the combined power of factors is greater than the power of each factor individually. However, synergy is a static concept that does not include dynamic properties such as the ability of the system to self-organize and adapt to changing contextual conditions (Martin and Sunley 2007; Leydesdorff 2021).

Based on the systems idea and the pronounced correlations between the factors that they consider to be key elements of an EE, Stam and van de Ven (2021, 827) argue that "the ecosystem should be treated as a whole system …; it should not be decomposed in ten elements for explaining the relative influence of different elements of the system". From a methodological point of view, such a holistic approach means to surrender to the complexity of the interrelationships. Consequently, one should not attempt to empirically distinguish and disentangle the different effects and relationships within the system in order to identify key levers for policy intervention. Orientation could be provided by a valid theory that, however, does not exist. The lack of a theoretical foundation limits the usefulness of the concept for policy guidance.

The question of what constitutes the systemness of an EE or of an innovation system remained largely unexplored and deserves further investigation. A key issue here is how to measure systemic properties. In the literature on innovation systems, it is often argued that the interplay of actors and system elements, in particular the intensity and effectiveness of the division of innovative labor between actors, is important for the systemic properties to be effective (Asheim et al. 2019). Based on this idea, several authors take the links

between actors (e.g., R&D cooperation), the degree of mobility of actors between organizations, or the intensity of knowledge flows between actors and organizations as proxies for the extent to which the potential of the systemic properties of an innovation system is exploited. However, such measures are largely limited to the static aspects of systemness. An ex-ante assessment of the dynamic properties of the system such as an 'adequate' response to change is hardly possible.

6. Conclusions and outlook

6.1 Conceptual requirements

The discussion of the current state of the EE approach and its shortcomings suggests three types of conceptual requirements that a relevant approach to regional entrepreneurial activity should meet.

- *First*, regional entrepreneurial activity should be considered as part of the regional innovation system taking into account the close link between entrepreneurship, knowledge, and innovation. The integrated analysis of regional entrepreneurial activity, innovation, and knowledge and their interplay is particularly important for understanding the emergence and development of high-impact firms.
- *Second*, it is important to expand beyond the narrow focus on high-performing start-ups and their founders to the whole universe of everyday entrepreneurship in the region. As it is Since it is hardly possible to identify high-impact start-ups ex ante, policies limited to high-performance start-ups are hardly feasible. Moreover, the development in most regions is significantly influenced by the vast majority of start-ups that do not appear to be very promising in their early stages.
- *Third*, the analysis should include older established firms and their entrepreneurial behavior (intrapreneurship). One reason is that many high-growth firms need more than a decade to reach a significant stage of development. Another important reason is that incumbent firms are crucial for the impact of new firms on regional development, which is largely based on

competition with established firms (Fritsch 2013). Incumbents are also an important source of potential start-ups.

The likelihood of producing relevant explanations and policy recommendations can be expected to increase significantly if these requirements are met.

6.2 Challenges and further research

A key challenge of future research in the field of regional entrepreneurship and economic development is the exploration of the main causal relationships that are important for the development of an appropriate theory and for policy guidance. This particularly includes the identification of the relevant institutions and resources that should be present in a region and the main relationships between actors and institutions.

A weakness of the current state of the EE literature is that it does not adequately account for the often pronounced historical roots of entrepreneurial activity in a region and its evolution over time (Fritsch and Wyrwich, 2023). It is therefore important to get behind current regional entrepreneurship rates and conditions in order to understand how they have evolved over time and what causes changes in ecosystem performance. Much can be learned from a closer inspection of 'leapfrogging' regions that experienced positive change in the level and quality of new business formation. More in-depth analyses of the evolution of an EE could be particularly helpful in developing political strategies with clearly identified priorities. In this regard, qualitative case studies may lead to more valuable insights than quantitative analyses. Research on the long-term development of regional entrepreneurial activity suggest the importance of considering the values and attitudes of the regional population, which are the main elements of regional culture.

A further important requirement that a useful EE theory should fulfill is to identify configurations of market or system failure where public intervention is desirable. From a policy perspective, the relevance of a certain element for the performance of an EE and the regional availability of this element are only necessary conditions. The sufficient condition to justify public intervention is that this element does not occur spontaneously and quickly enough through interactions within the private sector, but requires public support. Therefore, even

if the system has considerable self-healing properties, the critical question to be answered is whether these mechanisms are strong enough and work fast enough to yield satisfactory results in a reasonable time frame.

7. Final remark

Currently, EE is just a concept for describing and analyzing the emergence of high performing start-ups in a regional context. Most of the EE literature as represented by Wurth, Stam and Spigel (2022, 2023), focuses on only a very small fraction of the regional economy and ignores the main parts of the regional 'ecosystem' context. Compared to previous concepts and analyses of regional entrepreneurship such as regional systems of entrepreneurship (Qian et al. 2013) and the regional entrepreneurship and development index (Szerb et al. 2019), the EE concept is a significant step backwards. It contains hardly any theory, and the main policy recommendations follow directly from the underlying assumptions.

It could be argued that the EE concept is currently at an early stage and may soon gain more explanatory power. However, the serious misconceptions of the approach leave little hope in this regard. From today's perspective, EE seems to be mainly a descriptive term that has become a buzzword.

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