



Article

# Building a Bridge: Knowledge Sharing Flows into Entrepreneurial Ecosystems

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**Abstract:** Entrepreneurial ecosystems remain under-theorised and conceptually fragmented, making it challenging to comprehend their disposition and performance in the business process. Accordingly, in this research, we explored how knowledge sharing flows through entrepreneurial ecosystems to make analyses and trials to assess new ventures' creation, continuity, and development opportunities. We carried out a systematic literature review on the Web of Science database. The analysis was carried out in two stages: (i) content analysis using NVivo software and (ii) statistical processing and clustering with the support of VOSviewer and Bibliometrix software. Moreover, we reviewed entrepreneurial literature and proposed conceptual model mapping relations through all main actors and knowledge flow in ecosystems. Our findings suggest the knowledge path in the near field sharing mechanisms resulting in a new conception of traditional structures and relations used to judge and decide how to assess opportunities for new ventures' opening, maintenance, and growth. This study contributes to entrepreneurial literature, demonstrating knowledge sharing flow through entrepreneurial ecosystems, considering an embracing, dynamic, and multilevel approach. Furthermore, it highlights political and social contributions to include new emergent perspectives: resource scarcity and structural and institutional gaps. This representation is the first knowledge management model applied to different economies and areas, respecting their singularities.

**Keywords:** entrepreneurial ecosystems; knowledge sharing; start-ups; bibliometric analysis; systematic literature review



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## 1. Introduction

The concept of entrepreneurial ecosystems (EEs) emerged to clarify the continuum of regions with high-growth entrepreneurship [1,2]. A view widely used in academia to designate an entrepreneurial ecosystem refers to a community with numerous stakeholders that provides a favourable environment for creating and developing new ventures inside a region [3,4]. Along with the broad academic and political interest [5], this concept has gained considerable attention among practitioners, researchers, and policy makers [6,7]. The emerging domain of entrepreneurial ecosystems remains unsystematic, unclear, and conceptually fragmented with blurred boundaries [2,8], making it hard to perceive its structure and leverage on the entrepreneurship procedure [9]. Although these ecosystems emerge as a global phenomenon, research has been largely static and concentrated in central regions of advanced economies, not covering dynamic factors or emerging economies [10–13].

An integrated perspective is a current stage in entrepreneurship policy [14,15], highlighting the purpose of the EE and the mechanisms of how it is sustained, moulded, and developed. This integrated perspective advocates entrepreneurial activity as an individual behaviour of entrepreneurs ingrained in the local matter [2,8] instead of focusing on disconnected entrepreneurial movements [7,16,17]. The most theoretical model proposed in the literature is limited to analysing advanced economies and highlighting static attributes focusing on a one-level approach [18].

Further in-depth research is required to provide integrated, active, and multilevel dynamics to capture how knowledge sharing is influenced by resource availability and institutional structures and positions [19]. Thus, we aim to address the research question: how do knowledge sharing flows extend approaches to understanding entrepreneurial ecosystems? Accordingly, we address the horizontal and vertical interactions by embracing a variety of resources, structures, and institutional gaps. Moreover, understanding EE studies focused on advanced economies emphasising big central areas, proximity to universities, and complex industries, the concept of latecomer regions was proposed for emerging economies and contingency areas [20,21]. This broader perspective leads to a rich stream of discussion on EEs from a knowledge sharing perspective considering some peculiarities linked to resource access, structures, and institutional gaps. In brief, the literature evolution is unsystematic and probably reflects the authors' hermeneutic biases. Despite the literature continuing to grow to explore distinct research trends and with complexity increasing around 2018 [22–24], there is no systematic analysis exploring the role of knowledge sharing evolution in EEs. With this paper, we aim to fill this gap using bibliometric analysis tools to verify how intellectual bases have evolved. For both experienced researchers and newcomers, our analysis affords a systematic review of literature development plus demanding turning points and emerging interests detailing potential meaningful directions for future research.

## 2. Background: Knowledge Sharing through Entrepreneurial Ecosystems

The interest in entrepreneurial ecosystems has been growing in recent years. Despite the similarities in proximity and territorial delimitation focusing on the entrepreneurial process' social and economic context, the entrepreneurial ecosystem concept positions the individual entrepreneur as the leading actor [25]. The definition of entrepreneurial ecosystems appears with Spilling [1]. The current description found so far is Riaz [26], who understands entrepreneurial and business ecosystems as linked subsets of a regional economic ecosystem with the commercial exploitation of ideas as complements to organisational assets.

Notwithstanding the growing political and academic interest in EEs, the theoretical domain remains emerging, under-theorised, and fragmented [11]. The proposed conceptual models are primarily based on advanced economies and present challenges in replicating different economies and contexts. Such challenges could be explained by the differences between the logic of resources (provision, access, and mobilisation), interaction logic (regular business process, horizontal network standards and particular structural elements), and governance logic (coordination, alignment of benefits, and commitment) [10].

Given the salient features common to emerging and non-central regions—the scarcity of resources, structural gaps, and institutional gaps [19,27–30]—an in-depth study on entrepreneurial ecosystems is fundamental to see them in their entirety. Perceived as an intrinsic part of the entrepreneurial ecosystem, start-ups play a fundamental role in the progress of nations. Without these entities, several economies would be subject to lesser exploitation of opportunities in new market niches and minor attraction of investors interested in developing these organisations [31–33]. Thus, the flow of knowledge in start-ups promotes innovation by creating new organisational learning by adopting new collaborative and innovative technologies [34–36].

Start-up regions, commonly referred to as EEs, are global phenomena [37], and creating new businesses became a crucial part of fostering economic growth and regional development [38]. The systemic approach to this phenomenon could help reduce the gaps between advanced and emerging economies. While such institutional gaps can hamper economic development, they can also provide opportunities for institutional development [39,40]. Although the growth of EEs in non-central regions and emerging economies has been increasing in the past two decades, little is known about how they operate in these environments [41,42]. These new emerging regions assume an increasingly relevant

position and demand more attention to their gaps [43–45], going through a transition to an economy based on knowledge, entrepreneurship, and innovation [46–48].

If economic incentives are adequate and institutions and structures are well-positioned early, the knowledge usually follows the desired sharing [49]. The goals of some actors can cause conflicts and misalignment in the EE. This strife could be addressed by plural coordination through the alignment of needs, regional priorities, mentoring experience, and the combination of entrepreneurs and intermediaries [50,51]. In emerging regions, short-term economic incentives may even support collective benefits, but long-term stakeholder involvement and commitment are needed [51,52].

Commitment engagements in emerging EEs can be reflected through investor risk sharing, mentor volunteer time, and updating business models focusing on continued innovation [47,53]. Among the gaps, the authors pointed out several restrictions of different natures: institutional regulatory frameworks, market settings, access to financing, establishment and dissemination of knowledge and innovation, formation of entrepreneurial capacities and cultures, lack of effective interaction between educational and research institutions, and entrepreneurs and the fear of failure [54,55]. When neither worked nor properly filled, such gaps can stagnate the evolution of SEs. Stagnation generates adverse effects such as excessive bureaucracy, high taxes, lack of institutional support, informal trade, inconsistencies in articulations, depersonalised networks, limited funding, and difficulties in the internationalisation of new firms [56]. Accordingly, it is necessary to seek an EE management model whose knowledge sharing encourages and ensures new ventures' creation, survival, and development [56].

### 3. Method

A systematic literature review protocol was followed to ensure primary research's greatest strength, synthesis, and reliability in a specific field [57,58]. The review focused on papers about entrepreneurial ecosystems, considering their components, resources, results, and moderating and control variables to reveal their characteristics and specificities and shed light on future research paths. We carried out the data analysis in two stages to identify its intellectual bases and evolution: (i) bibliometric analysis using citation, co-citation, and co-occurrence techniques was performed to explore trends in documents, keywords, authors, and journals with the support of the VOSviewer software version 1.6.17 [59] and Bibliometrix R-tool [60]; (ii) qualitative content analysis was performed manually and using the NVivo software to identify turning points, intellectual structure, and how research has evolved. By assessing the comprehensive indicators' results, biases can be attenuated, increasing the validity of the research and reducing the likelihood of omitting important information about the field [61]. The systematic literature review protocol and the article selection process are detailed in Table 1.

**Table 1.** Systematic literature review protocol.

| Step                    | Input             | Description                                                                                                                                                                                                                                                                                                |
|-------------------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Search method and scope | Database          | Web of Science—WoS                                                                                                                                                                                                                                                                                         |
|                         | Types of articles | Published in journals—full search<br>Topic (title, abstract, and keywords)                                                                                                                                                                                                                                 |
|                         | Scope             | Web of Science research. Available online:<br><a href="https://www.webofscience.com/wos/woscc/summary/edd0b5d8-3560-4a91-8e24-7489bc4f6080-346e01e9/relevance/1">https://www.webofscience.com/wos/woscc/summary/edd0b5d8-3560-4a91-8e24-7489bc4f6080-346e01e9/relevance/1</a> (accessed on 02 April 2022). |
|                         | Research equation | ("entrepreneur*") AND [(ecosystem*) OR (eco-system*)] AND<br>[("startup*") OR ("start-up*")] AND ("knowledge*")                                                                                                                                                                                            |
|                         | Research date     | 2 April 2022                                                                                                                                                                                                                                                                                               |

Table 1. Cont.

| Step                       | Input                                         | Description                                                                                                           |
|----------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Research selection process | Research selection process                    | WoS—4698 articles<br>Only full article (3476 articles)                                                                |
|                            | Records screened                              | Only manager, business, and economics categories (2102 articles)<br>Only in English (2029 pieces)                     |
|                            | Full-text articles assessed for eligibility   | Manual scrutiny after reading: screen title, abstract, keywords, and conclusions (56 articles)                        |
|                            | Studies included in the qualitative synthesis | Manual scrutiny after reading method and results sections (52 articles)<br>Thoroughly analysed articles (52 articles) |
| Criteria for inclusion     | Study methods                                 | Qualitative, quantitative, and mixed                                                                                  |
|                            | Focus                                         | Entrepreneurial ecosystems                                                                                            |
|                            | Years                                         | 1900–2022: full search                                                                                                |
|                            | Types of studies                              | Provide a theoretical contribution, both theoretical and empirical studies                                            |
| Exclusion criteria         | Related to Languages                          | Not related to management, business, or economics<br>English only                                                     |
|                            | Types of publications                         | Non-papers                                                                                                            |
|                            | Topic parameters                              | Topic field to exclude studies without a primary focus on entrepreneurial ecosystems                                  |
|                            |                                               | Unrelated discipline                                                                                                  |
|                            |                                               | Duplicated studies                                                                                                    |
|                            | Results and conclusion parameters             | Pure empirical and descriptive studies with the little theoretical contribution                                       |
|                            |                                               | Studies focused on only one component of the entrepreneurial ecosystem rather than the system all at once             |
|                            |                                               | Results unavailable electronically or by other reasonable means                                                       |
|                            |                                               | Studies centred on a large corporation or only innovation alternately entrepreneurship                                |

To obtain better results, the search strategy used the "\*" with word roots to retrieve singular and plural variations or differences in spelling and endings of words.

## 4. Bibliometric Results

### 4.1. Dataset

The first analysis provided by Bibliometrix is the description of the metadata about the collection, as shown in Table 2. Next, this report presents a summary of the results collected and analysed. Thus, 128 authors wrote 52 papers which I analysed—only six pieces are single-authored.

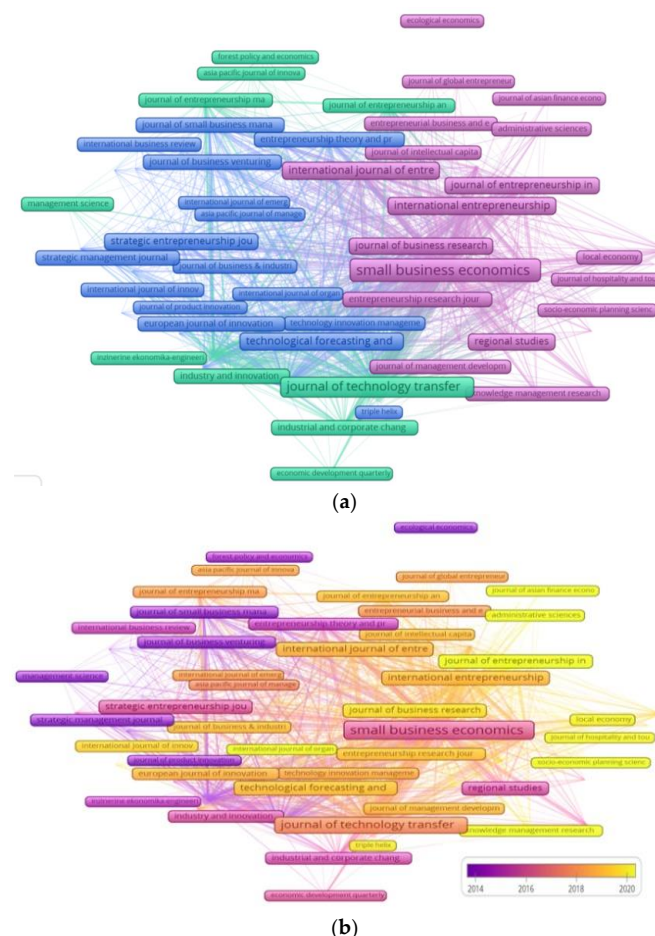
The descriptive results also indicate the main research types (empirical (43), conceptual (3), and systematic reviews (4)) and research methods (case and multiple case studies (33), regressions (9), factor analysis (3), and mixed and other methods (6)). The main regions investigated were Europe (16), the USA (13), Asia (11), Latin America (9), and others (4). The Europe region includes the U.K., most Asian studies focused on China [62], and Latin American studies did not focus on more than one country [63,64].

### 4.2. Journals

Figure 1a,b shows the most relevant network and overlay visualisation journals. The most pertinent network (a) research sources for bibliographic coupling were *Small Business Economics* and *The Journal of Technology Transfer*, leading the purple and green clusters. *Technological Forecasting and Social Change* and *Strategic Entrepreneurship Journal* led the blue cluster by the same criteria. By the temporal overlap criterion (b), the journals with more recent highlights, from 2020 onwards, were *Journal of Entrepreneurship in Emerging Economies* and *Knowledge Management Research*.

**Table 2.** Dataset by Bibliometrix.

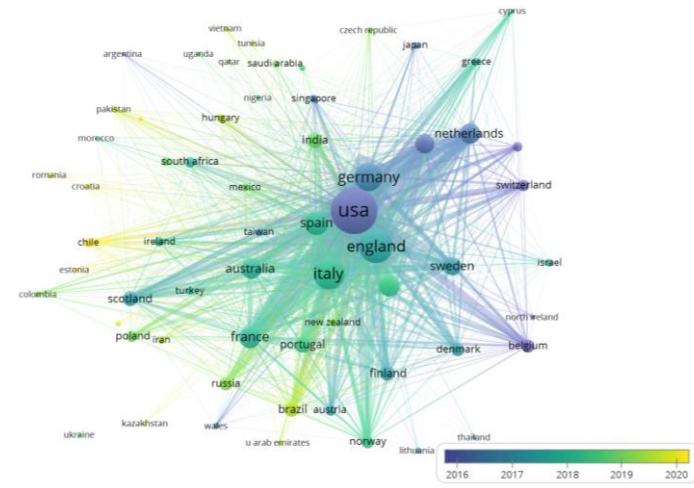
| Description                             | Results   |
|-----------------------------------------|-----------|
| Main Information About Data             |           |
| Timespan                                | 2015–2021 |
| Sources (journals)                      | 34        |
| Documents                               | 52        |
| Average years from publication          | 3.33      |
| Average citations per document          | 36.96     |
| Average citations per year per document | 7146      |
| References                              | 3506      |
| Document Type                           |           |
| Article                                 | 51        |
| Document Contents                       |           |
| Keywords plus (ID)                      | 239       |
| Author’s keywords (DE)                  | 190       |
| Authors                                 |           |
| Authors                                 | 128       |
| Authors of single-authored documents    | 6         |
| Authors of multi-authored documents     | 122       |
| Author Collaboration                    |           |
| Single-authored documents               | 6         |
| Documents per author                    | 0.406     |
| Authors per document                    | 2.46      |
| Co-authors per documents                | 2.65      |
| Collaboration index                     | 2.65      |

**Figure 1.** Journals’ bibliographic coupling (VOSviewer). (a) Network visualisation; (b) overlay visualisation.





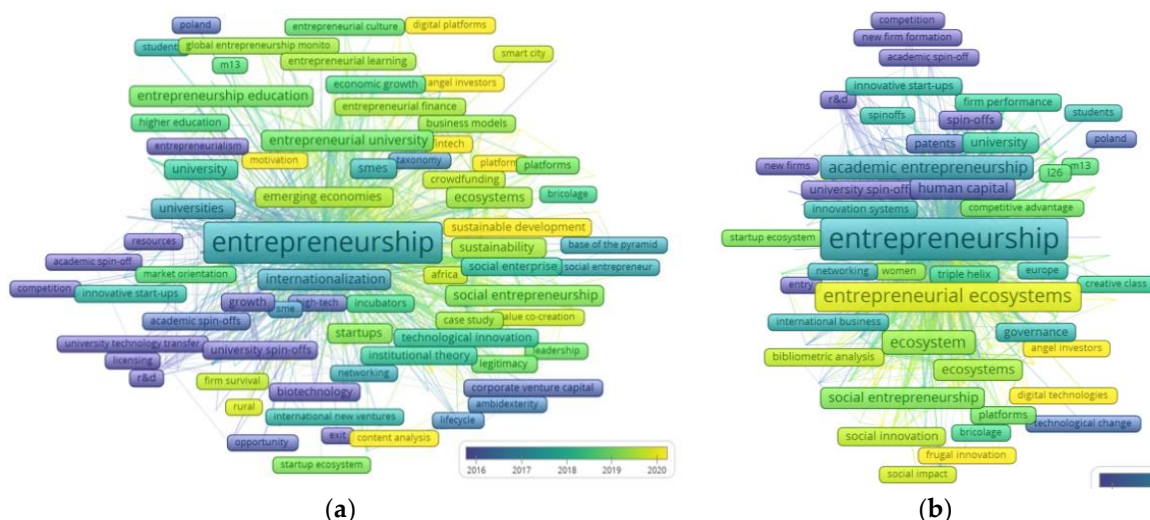
England, Italy, Germany, and Spain are the most cited countries in this field. The evolution of colours, from dark blue to yellow, shows the emergence of quotes from some countries. America, Europe, and Australia had great prominence between 2016 and 2018. On the other hand, some emerging Latin, African, and Middle Eastern economies have shown nascent significance from 2019 onwards.



**Figure 4.** Overlay visualisation of countries' citations (VOSviewer).

#### 4.6. Keywords

Co-occurrence analysis of the authors' keywords is valuable for identifying clusters. We used all 190 keywords and the complete count method. Thus, the study, by association, provided four clusters of temporal overlap, using non-normalised scores, shown in Figure 5a,b, with rotation differences. The software specified 2016 to 2020 as the default criteria because it displays a more colourful image, allowing a comprehensive temporal analysis. In 2016, the field of study focused on themes related to universities and generated opportunities, such as spin-offs, patents, resources, and technology transfer.



**Figure 5.** Co-occurrence analysis of authors' keywords (VOSviewer). (a) Horizontal rotation; (b) vertical rotation.

The keyword entrepreneurship, which reached its peak in 2017, began to be associated with taxonomies and life cycles of start-ups and small businesses and gave rise to two new concepts. University entrepreneurship emerged along with entrepreneurship education and learning related to higher education. Social entrepreneurship is related to business

models and sustainability, primarily in emerging economies. As of 2019, researchers began to focus their studies of entrepreneurial ecosystems on emerging themes related to digital technologies and platforms, sustainable development, and frugal innovation.

## 5. Thematic Analysis

The bibliometric analysis results support the thematic discussion in this section. The software NVivo 11 (QSR International, Massachusetts, US) [67] was used to analyse the co-occurrence of words between articles, as shown on Figure 6, to identify the main subjects in each cluster listed in the next section to help interpret the similarities of themes inside sets and their differences. Moreover, qualitative content analysis was performed to diagnose turning points, intellectual arrangement, and how the research has evolved.



Figure 6. Word cloud (NVivo).

### 5.1. Entrepreneurial Ecosystems Components Development

In this cluster, the studies are supported by field theories, socially situated entrepreneurial knowledge, knowledge spillover, resources, and constraints. The research focused on the relationships between the attributes that form EEs using clusters and regional innovation systems' concepts. Moreover, the main objective is to measure these relationships' causes, effects, and efficiency to identify the strong and weak links in the entrepreneurial ecosystem [68–70]. While some studies focus on identifying how resources flow between EE structures [30,71,72], others focus on understanding the differences between the relationships and distribution of resources in EEs over clusters and innovation systems [73,74].

The cluster presents research analysing at micro, meso, and macro levels with many empirical and qualitative studies, enabling a better reading and understanding of the EE formation process. Then, at the micro-level, the authors researched the founders of start-ups, mentors, and small enterprises in different studies, focusing on each one of the arrangements, desires, and abilities [75–77]. At the meso level, EE connection, development, coordination, selection expertise, and key and intermediary actors were analysed [78,79]. Furthermore, ecosystems were researched based on their territoriality at the macro level to understand how entrepreneurial education and policies to promote entrepreneurship and new firms are stimulated and developed [80–82].

By systematising the EE formation process, the authors seek to understand: (i) how resources flow and are produced internally, (ii) how successful and unsuccessful experiences are reused, and (iii) how the connections created by local entrepreneurs attract resources, people, and new ventures. Therefore, the EE is divided into inputs (financial, institutional, social, and knowledge capital), outputs (gross entrepreneurship, based on performance and based on productivity), and results (diffusion of new business models). Then, the relationships were framed considering processes (knowledge sharing and spillover, new scalable businesses, and testing of experimental business models), structures (digital and spatial resources and nature and lack of opportunities), and contingencies (policies and regulations, culture) [30,65,69,83].

The structural analysis of the EEs also presents the intermediaries as important disseminators of knowledge, since they connect industries and organisations in a specific context



through sharing information, experiences, and understanding. Among the intermediaries listed are mediators (responsible for informal relationships), relational ones (in charge of developing skills and experiences), social ones (in an account of market transactions), and institutional ones (whose attribution is to resolve institutional and technological failures, responsible for technology transfers) [75–77,81,82].

The findings point to various directions and need further studies with a greater diversity of EEs. Similarly, the accumulation and multiplication of experiences, greater engagement and encouragement for opening new firms, recycling of talent (success and failure), migration and attraction of new entrepreneurs, and permanence of knowledge, relationships, and know-how in EEs are pointed out [75,76,84]. Some authors emphasise increasing high-growth ventures and job creation [76,77]. Others bring the amplified attraction of capital that would directly benefit the region's tax base [78,79]. Likewise, gentrification and the increase in the cost of living were identified as possibilities for results that, depending on territorial aspects, can be considered positive or negative [47,80,85].

In summary, the attributes listed as necessary for the formation of EEs are (i) cultural: stories of successful and unsuccessful entrepreneurship shared norms and values; (ii) social: talents, relationships, presence of mentors, and investment capital; and (iii) materials: support services, policies, and governance, presence of universities, physical infrastructure, and market opening. Hence, cluster analysis indicates the need to measure the EE's overall results, capturing the interactions between its agents in the decision-making processes to create a multilevel and multi-component management model, which realises how digitisation's centrality influences its structures and processes.

### 5.2. Alliances and Relationships between Ecosystems' Key Actors

The research in this cluster captures the alliances and relationships between key actors and stakeholders of the entrepreneurial ecosystem, taking as a central point the start-ups and entrepreneurs and, from this perspective, understanding why some EEs have considerably advanced rates of high-growth ventures. Additionally, the research is based on the theories of organisational ecology, absorptive capacity, resource-based view, economic development, entrepreneurial cognition, corporate life cycle, and social networks. Knowledge structures were also identified to make judgments and decisions involving assessing opportunities to create ventures and risk-taking by the entrepreneurs and their start-ups.

The significant effort was to understand how key actors, stakeholders, and start-ups perceived value in their relationships so that they could be stimulated, monitored, and measured. The value perceived by entrepreneurs and start-ups in forming alliances was access to political, physical, technological, market, financial, cultural, contextual, institutional, and informational resources [86–88]. Stakeholders and key actors have sought to foster new start-ups through alliances for technology development (developing and acquiring technology and obtaining licenses) or improving knowledge flow (developing projects, receiving customers, providing licences, and other goals such as cost reduction) [62,89,90].

As the centre of the studies, the authors adopted start-ups. They divided them into three aspects: entrepreneurs (individual characteristics and perceptions), teams (characteristics and perceptions of the whole team), and business models (characteristics and perceptions of this type of business). Likewise, the critical actors of EEs were grouped into (i) research institutes—science parks, universities, incubators, accelerators, research laboratories, co-working, and maker-spaces; (ii) government organisations—regulatory agencies, legislators, and public development banks; (iii) private sector—SMEs, large corporations, angel investors, and venture capitalists; and (iv) other stakeholders—civil society, NGOs, and crowdfunding [22–24].

Permeating the relationships, the authors present the environmental conditions, moderating factors, and control variables capable of positively or negatively influencing the EE results. Furthermore, were mentioned as requirements of the EEs: the geographic proximity, specific context, the relevance of relations and strategies necessary to form alliances,

adaptation, adherence, digitisation, governance mechanisms, and opportunities for access to resources [22,68,86,91–94].

Moreover, the moderating factors and control variables were grouped into four categories: (i) economic indicators: population characteristics, density, growth, and unemployment rate; (ii) individual traits: gender, age, education, and nationality/presence of immigrants; (iii) organisational knowledge: creation and absorption of knowledge, identification of market demands, risk-taking, prior patents, ability to argue, and initial funding; and (iv) organisational characteristics: location, subsector, time, and size [47,62,89,95–98].

Summarising the main findings, the commitment of those involved, the validation of risks, and the additionalities of the ecosystem obtained through the alliances are fundamental to achieving positive results. Among the intangible results, one can cite the reduction in entry barriers and survival of start-ups, greater dissemination of knowledge and technology transfer, better management of resources and access to credit, regional development, ecosystem collaboration, and improved levels of commitment and trust among parties involved [22,86,92]. Furthermore, the tangible results identified and measured were the number of new open ventures, the survival time of start-ups, number of patents, licensing and new products and services launched, internationalisation of firms, and development of available software [47,88,91,99,100].

### 5.3. Subsystems, Underlying Mechanisms, and Trans-Local Relationships

This last cluster presents the research that focuses on the relationship between different EEs and how subsystems, underlying mechanisms, and trans-local relationships influence the knowledge flow, affecting these EEs through externalities. The cluster also analyses exchanges between territories, comparing ecosystems in central and developed regions with non-central regions, pointing out their quirks and specific needs. Then, their main research objective is to explore how its context shapes the entrepreneurial process through experience-based information processing.

EEs can be approached as the knowledge and business subsystems that mediate issues related to the support network, financial flow, risk-taking by start-ups, and connectivity with the private sector. When well-managed, they flow into critical knowledge and technology transfer processes: a proliferation of risky projects, open innovation, technology commercialisation, internationalised incubation practices, and public policies to promote academic entrepreneurship [101–109].

This group uses institutional theories, hybrid organisations, social capital, public choice, and slack resources to analyse EEs holistically, even giving great importance to territorial issues and external exchanges. Within this approach, Haines [103] points out networking relationships (idea sharing, accessing resources, and encouragement), champions (the driving force of teams), and stakeholder engagement. Good et al. [110] complement the list by adding purpose (transfer of knowledge and technology, commercialisation of technology and research, and generation of intellectual property), processes and activities (isolation of efforts by components/actors), structure (close relationships), and people and culture (human capital and demographic) as the main aspects to be analysed in the EE.

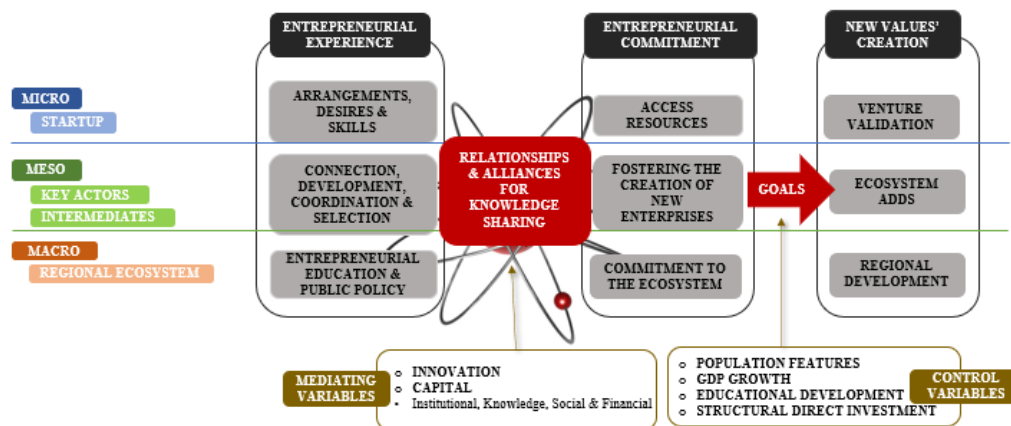
EEs can also be approached as joining a set of independent actors that promote productive entrepreneurship in a specific territory, emphasising regional aspects of entrepreneurship that are expanded or diminished by geographic issues. Psychometric, industrial location, economic and knowledge dissemination theories were used. In this second group of authors, innovation was pointed out as a mediator in the relationship between productive entrepreneurship and the openness and dynamics of the market and institutional, financial, social. Such relationships may also change control variants such as population, educational development, GDP growth, and direct structural investment [22–24,63,111].

In summary, the main findings are directed toward the broad socio-economic impact. Objectives were adapted to individual contexts, procedural perspectives, greater collaboration between actors, emerging structures, digitisation, overcoming entry barriers, and new learning and opportunities.

## 6. Research Implications

### 6.1. Theoretical Implications

The conceptual model (Figure 7) provides a synergistic view of the role of knowledge sharing through EEs and thus brings together the findings presented in Sections 4 and 5. It delivers a synthesised answer to the research question: what circumstances and parameters affect entrepreneurial activities and impact EEs?



**Figure 7.** Conceptual model—the knowledge path through entrepreneurial ecosystems.

In short, the model shows how knowledge sharing at individual, intermediary, and ecosystem levels is related to the entrepreneurial experience to form alliances that increase commitment at all layers to generate value creation for businesses, and which mediating and controlling variables can interfere in this process. In micro terms, knowledge sharing within start-ups starts from the individual entrepreneurial experience. New arrangements, desires, and skills are developed to increase access to resources that directly influence individual and team commitment and result in the validation of the business. Whether through success or failure, knowledge must be absorbed within the ecosystem.

In meso terms, knowledge sharing between start-ups and intermediaries occurs through the development of connections that result in the promotion and creation of new companies that develop technology directly or generate knowledge from new patents, licensing, and projects. This results in better management and distribution of resources between the parties involved and the creation of policies that are more appropriate to the needs of each ecosystem.

Considering a macro and regional analysis, the entrepreneurial experience fostered through entrepreneurial education and public policies directly influences the commitment of the ecosystem in its internal and external relations and can affect regional development. Permeating relations at all levels, the mediating variables of innovation adoption and capital distribution affect alliances for knowledge sharing to a greater or lesser degree. Likewise, population, income, infrastructure, and access to education control variables can modify the overall results of the ecosystem.

The theme is contemporary, has temporal parallels, and features different highlights. The outcomes revealed fundamental discoveries that challenge the existing models' universal replication. Our findings suggest a path for knowledge sharing and the mechanisms of sharing that result in a new conception of the traditional structures and relationships used by new ventures to make assessments, judgements, and decisions. The conceptual model illustrates the trajectory of knowledge sharing through EEs and relationships mediated by key actors.

The model represents the first attempt to capture the knowledge flow through EEs applied to different contexts respecting their singularities. The model also shows how some tenant anchors conduct start-up interactions to accelerate multilevel knowledge replication inside and outside EEs. This study contributes to entrepreneurial literature demonstrating

knowledge sharing flow considering an integrated, dynamic, and multilevel approach. Additionally, it also highlights political and social contributions to include new emergent perspectives: resource scarcity and structural and institutional gaps.

This integrated perspective provides implications for studying EEs and entrepreneurship's geography more broadly. The first one is identifying the numerous categories and configurations of features that make up an EE. It provides a more comprehensive understanding that considers local specificities and an arrangement for further research methodologies that can evaluate and correlate EEs to expose the distinct ways in which they emerge, switch over time, and leverage the entrepreneurship process. The second involvement is that it affords an enlarged view of ecosystems by recognising how they relate to their components. It creates the need to develop the reading and understanding of ecosystems considering their underlying subsystems and mechanisms. Finally, the importance of the accords among different features shows the need for new trans-local studies that admit and measure the impact of moderating and control variables. More empirical studies in different cultures and regions are also needed, considering the centrality or not of EEs concerning large metropolises and contingent areas.

### 6.2. Implications for Practice

Discoveries afford valuable reports to practitioners (e.g., managers, policy makers, and entrepreneurs) for comprehension of the scopes and tournaments emerging from knowledge flow—not merely on the single start-up level but also between key actors, intermediaries, and ecosystem levels. This enhanced insight can also be vital in alliances with significant stakeholders, notably when knowledge sharing leads to performance improvement in entrepreneurial ecosystems. This calls for further collaboration among various actors to raise the likelihood of taking advantage of knowledge sharing. Moreover, this refined comprehension is also vital for preparing ventures internally, assisting to place them in a higher position in the market and enriching their impact on the business and its operations.

Public policy should build essential support for new programmes. It should support creative entrepreneurship at different stages of maturity of firms and not expect programmes to create business cultures and networks to raise the base level of innovative entrepreneurship and high-performing firms in regions. Additionally, researchers should develop metrics in collaboration with practitioners to point out the presence of the ecosystem features and confront them across numerous regions. While some metrics such as investments, the number of new start-ups, and business closures are promptly available, measurable data on cultural perspectives and social media effectiveness are, by comparison, much more difficult to obtain. Our findings provide a more comprehensive and rigorous approach to understanding how EEs affect the entrepreneurial process. It also supports more accurate and credible policy advice to reinforce existing ecosystems and evolve thriving ecosystems in regions with no growth histories of a successful business.

## 7. Conclusions

In this paper, we discussed the trajectory of knowledge sharing in EEs and the relationships mediated by learning actors. Our findings contribute to the understanding of how tenant actors conduct start-up interactions to accelerate knowledge replication at various levels, e.g., within and outside, of ecosystems. Additionally, we unfolded conceptions of traditional structures and relations used to make assessments, judgments, and decisions to assess new ventures' creation, survival, and development opportunities. Therefore, supported by our analyses on EEs, we propose a comprehensive concept of EEs: a multi-stakeholder community that affords an empathetic environment for new creations of innovation-focused ventures within a region through their interactions in networks.

Furthermore, we strengthened the theoretical foundation of the flourishing literature with the following foremost contributions. We reported the most critical actors, unfolding their relationships in mediating knowledge sharing through ecosystems. This grounding is



helpful to entrepreneurs and policy makers by highlighting distinctive economic singularities and emphasising the need to consider resource scarcity and institutional and structural gaps as possible restrictions to the application of existing models in different economies.

Moreover, we drew a conceptual framework capturing the knowledge flow, taking an integrated and multilevel approach to accounting. This point is thought-provoking because it demonstrates the challenges of replicating existing models universally. Our framework contributes to being applied in emergent economies respecting their idiosyncrasies to maximise regional development. It identifies the main EE drivers, tenant actors, and knowledge roles in the broader economic and social context. Therefore, our study contributions are valuable to scholars researching EEs. Scrutinising the literature status quo allows support to their decisions concerning future research. Similarly, it supports young scholars to grasp the significant research on this topic.

## 8. Limitations

This research has some limitations. The study board chosen did not enable the inclusion of all studies at hand. Likewise, the findings reveal the field's status quo at a particular time. It means the analysis is backwards-oriented [112]. Furthermore, the chosen methodology, the top authors, institutions, and countries that have subscribed to the evolvement of the topic even now were not identified. Although the software VOSviewer and Bibliometrix work with data extracted from the four main bibliographic databases, only WoS was used by indication of the creators themselves in their respective tutorials due to the difference in the arrangement and types of metadata made available in the report of each database.

To accomplish the main objective, various analytical and methodological procedures were adopted to establish the ruling themes. Thereby, it is unclear whether papers were cited with negative or positive purposes. The pivot on economics, business, and management also implies that discernment of other connected research domains could be supplied. Additionally, endeavours in other regions were not considered. Nonetheless, the papers could help accomplish and advance our comprehension of this field's progress over time. Consequently, future investigations also could expand research through other databases using mixed methods to measure and compare results. Moreover, it should include different perspectives from emergent and non-developed economies to amplify our concept model reproduction in even more contexts.

## 9. Future Research

Although EE research has gained interest recently and is still growing, this zone is faulty, entailing stated limitations that unlock several fields for future agendas. Accordingly, we suggest relevant trends for future research. Based on the cluster focused on EE's components, it is possible to point out some queries: (i) What is the relationship between geography, personality, and entrepreneurial phenomenon? (ii) What is the success or failure impact of the entrepreneurs if the EE fails to allocate resources correctly? How far do start-ups survive EE failures? (iii) What type of entrepreneur is excluded from EEs? (iv) How does the search for EE support vary depending on the territorial, market, and population aspects?

Regarding alliances and relationships, we recommend more comparative studies between different industries, countries, and economies to map the nature of the decision-making processes of other actors in identifying and choosing partners for alliances. Moreover, it is vital to determine the EE interdependence level per start-up stage and its importance in the regional and institutional context of each EE.

We suggest future research paths expanding studies in non-central EEs from a local perspective to understand how critical subsystems interact and prioritise policy makers, emphasising the purpose of the social and economic geographic context. Furthermore, the universities' understanding of the resulting impact and influence on technology transfer processes should lead to comprehension of start-up teams' composition and

entrepreneurship-driving mechanisms (entrepreneurial education, experiential knowledge, and regional development).

Therefore, more research is needed to develop a universal definition of the brand-new term Digital Entrepreneurial Ecosystems—DEE—regarding the EE topic evolution. Traditional literature focuses on interactions between biotic (individual) and abiotic entities (institutions). Despite the importance of their elements, and considering that most of them are similar to EEs, we need to check if they are all equally necessary and if different outputs might require other conditions. A more combined view of the numerous aspects mainly concerns the policy perspective. Likewise, further studies comparing regions' performances are needed to determine which conditions constitute bottlenecks. That way, policy makers could target different levels of EE pillars' performance and elect the ones that constrain the emergence of outcomes needed. Thus, they should consider specific levels of conditions to optimise resource allocation.

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