

# Entrepreneurial ecosystem in a post-COVID-19 world: A systematic literature review

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## ABSTRACT

**Objective:** The objective of the article is to provide insights into focus areas and research directions within the context of the entrepreneurial ecosystem following the pandemic era.

**Research Design & Methods:** The article is a qualitative systematic literature review that collects and analyses the studies related to the subject matter written after COVID-19 using a systematic quantitative assessment technique (SQAT).

**Findings:** Evidence from the review strongly suggests that spatial context plays a crucial role in shaping the trajectory of entrepreneurial activities. This influence is particularly evident in how a localized network of actors and resources dynamically contributes to the evolution of cities, transforming them into vibrant hubs, which is conducive to entrepreneurship. In essence, the geographical environment in which the entrepreneurial efforts are rooted has a substantial impact on business growth and success.

**Implications & Recommendations:** This study is devoted to exploring the thematic shift in entrepreneurial ecosystem research during the review period. Initiatives that encourage innovation districts, technology clusters, and collaborative spaces should be encouraged to foster the growth of venture creation.

**Contribution & Value Added:** This review has contributed value by updating and presenting thematic aspects of research focus within the entrepreneurial ecosystem, particularly in the aftermath of the global health crisis.

**Article type:** literature review

**Keywords:** entrepreneurial ecosystem; technology transfer office; university spin-offs; regional entrepreneurship; COVID-19

**JEL codes:** L26, L10

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## INTRODUCTION

The trajectory of our world was irrevocably altered when the World Health Organization confirmed the existence of a global virus that posed a serious threat to the fundamental structure of society. The repercussions of the crisis and the ensuing worldwide lockdown have not just transformed work dynamics and social interactions, but it has also exerted a profound impact on the economies of nations resulting in a situation where up to 60% of SMEs experienced liquidity shortage (Bartik *et al.*, 2020). Given the strategic importance of SMEs to the economic competitiveness of any nation (Gamidullaeva *et al.*, 2020); challenges as this pose a critical threat to their sustainability, hindering their ability to maintain optimum employment levels and contribute to overall economic resilience (Barboza & Capocchi, 2020).

## LITERATURE REVIEW

Recognizing the urgency to recalibrate the economy, researchers swiftly initiated an assessment of the pandemic to understand current vulnerabilities and emerging trends that could coalesce into a blueprint for the future to bolster resilience. For instance, Brown *et al.* (2020) examined the financing gap

that emerged during the crisis period in the UK, findings indicated that early-stage startups were adversely affected by a drastic reduction in the availability of seed funding in the first quarter of 2020. In response, the United Kingdom government introduced a new funding strategy that offered a matching fund for equity-funded startups providing support in the range of USD 37 500 to USD 6.7 million.

Furthermore, the COVID-19 pandemic caused a severe global economic downturn, with the IMF forecasting a 3% GDP loss in 2020 and a 5.8% growth rebound in 2021 (Malliet *et al.*, 2020). EU nations, facing increased unemployment and business suspensions, implemented measures like tax deferrals and direct cash transfers to support SMEs and stimulate job creation (Aga & Maemir, 2021).

The hope was that restoring the global supply chain and aggregate demand would save the economy. For example, during the lockdown, agricultural enterprises faced the challenge of logistics disruption, especially shortages of key inputs such as labour, feed, and delivery problems. About 60% of agricultural enterprises surveyed in China have encountered input shortages, which disrupted the livestock sector (Zhang, 2020). Moreover, smallholder farms experienced disruption in the supply of livestock feeds and a shortage of other essential raw materials due to logistics problems (Zhang *et al.*, 2020). Due to the drop in the global supply chain and disruption to consumption activities occasioned by the lockdown resulting in a large negative demand shock, several nations experienced low economic activities which led to a GDP decline. A study by Bekaert *et al.* (2020) showed that the 2020:Q1 real GDP growth shock resulted largely from an aggregate demand shock and also in 2020:Q2 – from both aggregate demand and aggregate supply shock in the United States.

Moreover, SMEs account for a staggering 99.8% of all employer firms, 65% of private sector employment and 54% of private sector gross output in the EU (Acharya & Steffen, 2020). Similarly, in Ghana, approximately 92% of registered businesses, 71% of employment, and 49% of gross domestic product (GDP) are attributed to the SME sector. The statistics emphasize the crucial nature of productive entrepreneurship as a job creation driver and employment generation (Doran *et al.*, 2016) and as a contributor to local economic growth through poverty reduction (Wairimu, 2015). The ramifications of a crisis like the COVID-19 pandemic on this vital sector could have far-reaching consequences on the entrepreneurial ecosystem and induce unplanned changes within the domain whose specific dynamics should be of interest to the academia.

Entrepreneurial ecosystem (EE) constitutes a distinct research field which characterizes entrepreneurship as a collaborative endeavour involving the efforts of several actors. Globally, it has gained recognition as a catalyst for regional innovation (Sambo, 2018); economic development (Gómez *et al.*, 2020; Guerrero *et al.*, 2021); and promoting industry-university collaboration (Fernandes & Ferreira, 2022). Entrepreneurial ecosystem embraces the analogy of natural biology to explain the intricacies of exploring opportunities within a network of interdependent actors. Similar to various terms in the realm of social science, EE has given rise to a range of definitions, with each author contributing a distinct perspective to this evolving concept. According to Stam (2015, p. 5) EE is a “set of interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship.” Furthermore, Spigel (2017, p. 2) describes EE as “combinations of social, political, economic, and cultural elements within a region that support the development and growth of innovative startups and encourage nascent entrepreneurs and other actors to take the risks off starting, funding, and otherwise assisting high-risk ventures”. While these definitions differ, they share a common belief that certain attributes outside the individual ventures coalesce to create systemic conditions that support the resultant outcome of aggregate value creation which shape and sustain an environment conducive for entrepreneurship to thrive in a particular geographic region.

A case in point is a study by Xie *et al.* (2021). They suggest that the Chinese government plays a more significant role in promoting entrepreneurship compared to Western economies. Their study was based on a fuzzy-set quantitative competitive analysis of 173 Chinese cities. It indicates that achieving high-quantity and high-quality entrepreneurship depends on various factors rather than a single factor. Similarly, in Nigeria, the city of Yaba in Lagos State is emerging as a tech startup hub, driven by private initiatives like Co-Creation Hub, despite limited government involvement. Supported by tertiary education institutions, banks, technical facilities, and robust physical infrastructure, Yaba’s ecosystem has led to the emergence of numerous startups with ripple effects observed in other regions of Lagos, surpassing even

the startup activity in European city like Berlin (Gomez *et al.*, 2023; Tiba *et al.*, 2020). Hence, examining the evolving dynamics of the EE during crises is crucial for understanding how actors respond within the ecosystem during trying times. In light of the above, the study aimed to systematically review and synthesize research on EE in the context of the transformative impacts of the COVID-19 pandemic. The gathered studies included in this review came from five databases: Emerald, Elsevier, Sage, Springer, and Taylor & Francis. Databases selection resulted from their reputation for publishing a substantial number of peer-reviewed articles. This review is time-bound as it covers articles published between 2020 and 2023. The rationale behind this specific timeline is to concentrate on recent developments in the EE domain to examine unintended changes induced by the pandemic and its associated dynamics during this specified period. The subsequent sections of this article are structured as follows. Section 2 will describe the methodology adopted in the review. Section 3 will lay out the analysis and results. Finally, section 4 will provide a conclusion on general trends and areas for future studies.

### RESEARCH METHODOLOGY

This study adopted the systematic quantitative assessment technique (SQAT) developed by Pickering and Byrne in 2014. This technique employs a systematic approach to evaluate articles for inclusion or exclusion in a review process. It emphasizes screening peer-reviewed original journal publications to ensure only a high-standard article is included (Pickering & Byrne, 2014). Moreover, SQAT enables the researcher to identify “important geographic, scalar, theoretical and methodological gaps in the literature” (Pickering & Byrne, 2014, p. 11). It follows a repeatable, logical and easily applicable pattern which are all important components of a systematic review (Zubairu, 2019). Finally, SQAT recommends five steps for an effective systematic review. Table 1 describes each step and how the current study applied it.

**Table 1. Description and Application of SQAT**

S/N	Step	Application in the current study
1	Define topic	Entrepreneurial ecosystem articles published between 2020 and 2023
2	Formulate re-search questions	Five research questions: 1. What is the time distribution of EE research articles? 2. In which countries were these articles written? 3. What methods were used to collect data? 4. What kind of EE articles were published? (conceptual vs. empirical) 5. What are the specific themes these articles explored, and what were the major findings in each theme?
3	Identify Keywords	“Entrepreneurial Ecosystem”
4	Identify and search databases	1. 5 databases utilized: Emerald, Elsevier, Sage, Springer, Taylor and Francis 2. “All in title search” using the phrase “Entrepreneurial Ecosystem”
5	Read and assess publications	1. Abstracts of articles found were read to ensure that they were dealing with an entrepreneurial ecosystem. 2. Literature reviews, book chapters and conference proceedings were not included; only peer-reviewed conceptual and empirical articles.

Source: own study, 2024.

A total of 122 peer-reviewed EE articles met the selection criteria from 6 prominent academic

**Table 2. EE Articles reviewed by publisher (2020-2023)**

S/N	Publisher	Number of EE Article
1	Emerald	28
2	Elsevier	32
3	Sage	8
4	Springer	20
5	Taylor and Francis	34
	<b>Total</b>	<b>122</b>

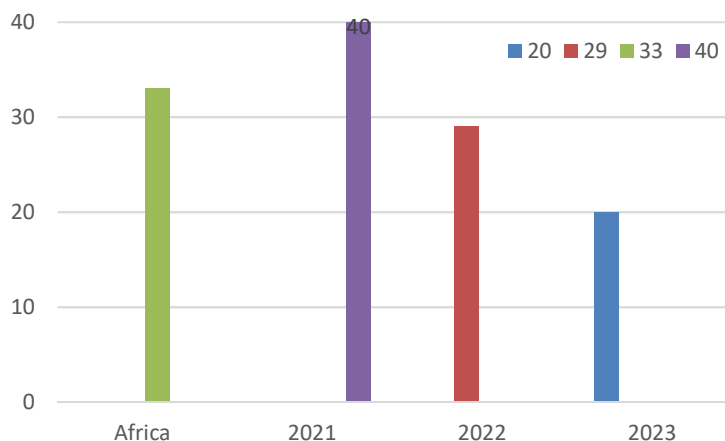
Source: own study, 2024.

journal publishers. Table 2 presents the EE articles breakdown by publisher.

## RESULTS AND DISCUSSION

### Time Distribution of EE Articles

Figure 1 presents the time distribution of the 122 entrepreneurial ecosystem (EE) articles examined in this study across the span of four years (2020-2023). The analysis disclosed a peak in 2021, when 40 articles were published, followed by 33 articles during the pandemic year of 2020. The research output exhibited a decline in 2022, with 29 articles. The lowest number of publications occurred in 2023, totalling 20 articles.

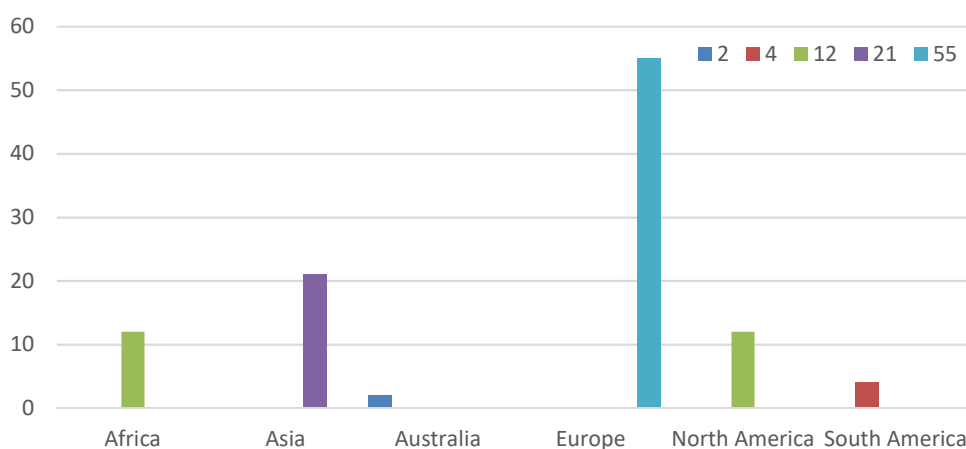


**Figure 1. Time distribution of EE articles**

Source: own elaboration.

### Geographic Distribution of SL Articles

Figure 2 presents the geographic distribution of the 122 EE articles included in this study. The figure showed that Europe has the highest number of articles published (55), followed by Asia (21), Africa and North America (12) respectively, South America (4), and finally Australia (2). Australia had the least number of studies during the review period. To provide an additional perspective on the geographic distribution of EE articles during the review period, let us note that China had the greatest number of EE articles with 10, closely followed by the United States of America with nine, and then the United Kingdom with eight and finally, Italy with seven articles.



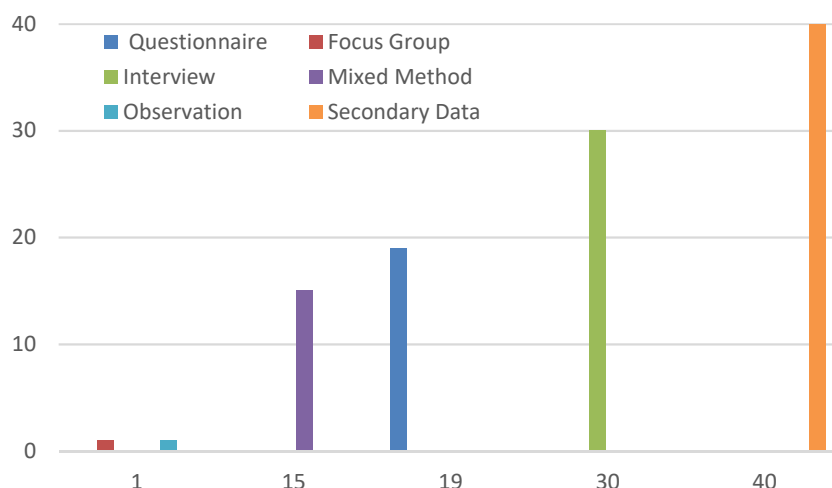
**Figure 2. Geographic distribution of EE articles**

Source: own elaboration.

### Article type

The study adopted a distinction between conceptual and empirical articles. The distribution of the 122 articles based on this classification was: 16 conceptual and 106 empirical. A substantial majority of the reviewed articles, totalling 86% (106 out of 122), were empirical, while the remaining articles were conceptual. This observation is noteworthy, especially considering previous criticisms of EE research for its perceived lack of empirical support (Spigel & Harrison, 2017; Roundy, 2017). The post-COVID-19 period has witnessed a response to this critique, with a discernible shift towards addressing this gap through an increased focus on empirical studies in the field of EE.

Figure 3 below presents the different data collection methods employed by the 106 empirical EE articles reviewed for this study. The data reveals a predominant reliance on secondary data in 40 studies, indicating a significant trend within the field. Interviews emerged as the second most commonly employed method, with 30 studies opting for this approach. Questionnaires were also a frequent part of studies (19 cases), and then a subset of studies (15) adopted a mixed-methods approach, showcasing a growing recognition of the value of combining various data collection strategies. On the other hand, focus groups and observation methods were less frequent (each used once). The findings hold several implications for the EE field. The prevalence of secondary data usage suggests a reliance on pre-existing information and databases, potentially indicating the need for more original research and first-hand data collection efforts. The popularity of interviews and questionnaires highlights a commitment to engaging with participants directly, emphasizing the importance of personal perspectives and experiences in EE research.



**Figure 3. Data collection methods**

Source: own elaboration.

### Themes

Analysis of the 122 articles in the field of EE indicates that authors examined a diverse array of themes. Given that entrepreneurship draws its roots from disciplines such as economics, sociology, and management, a broad spectrum of issues will probably further enrich and influence the field, resulting in a multidisciplinary approach that enhances our understanding of entrepreneurial dynamics. To sieve through the diverse topics, the study categorized the examined variables into macro, meso, and micro levels. Only those variables highlighted in at least two articles are selected to contribute to the overarching theme. This methodical approach allows for a focused and comprehensive analysis, ensuring that the most recurrent and significant aspects are considered in shaping the overall understanding of the subject matter.

**Table 3. EE theme categorization**

Dominant variables	Variable category	Authors
Regional entrepreneurship, political entrepreneurship, SME aggregate performance, SME internationalization, SME support policy, ecosystem support policy	Macro	Ferreira <i>et al.</i> , 2023; Arabi & Abdalla, 2020; Theodoraki & Catanzaro, 2022; Audretsch & Belitski, 2021; Content <i>et al.</i> , 2020; Biru <i>et al.</i> , 2021; Jabulile & Buntu, 2022; Jabeur <i>et al.</i> , 2022; Sohns & Wójcik, 2020, Egere <i>et al.</i> , 2022.
Academic entrepreneurship, gender entrepreneurship, spin-offs,	Meso	Prencipe <i>et al.</i> , 2020; Abootorabi <i>et al.</i> , 2021; Prokop, 2020; Vega-Gómez <i>et al.</i> , 2020; Secundo <i>et al.</i> , 2021; Wang <i>et al.</i> , 2023; Robyn <i>et al.</i> , 2023; Longva, 2021; Motoyama <i>et al.</i> , 2021.
Measurement framework, ecosystem characteristics, intermediary organizations, resource allocation/acquisition;	Micro	Leendertse <i>et al.</i> , 2022; Rocha <i>et al.</i> , 2022; Kaneshia <i>et al.</i> , 2023; Gueguen <i>et al.</i> , 2021; Johnson <i>et al.</i> , 2022, Hassen, 2020; Beyhan <i>et al.</i> , 2022; Torres & Godinho, 2022; Alaassar <i>et al.</i> , 2022; van Rijnsoever, 2020; Vardhan, J. & Mahato, 2022; Yang & Zhan, 2022; Scheidgen, 2020; Adams, 2021.

Source: own study, 2024.

### Macro Level Theme

Dominant themes under the macro level include regional entrepreneurship (see Content *et al.*, 2020; Audretsch & Belitski, 2021; Arabi & Abdalla, 2020); SME aggregate performance (see Biru *et al.*, 2021; Ferreira *et al.*, 2023; Jabulile & Buntu, 2022). Prior studies demonstrate that factors such as economic environment, government and education levels are essential determinants of entrepreneurship (Jabeur *et al.*, 2022). Content *et al.* (2020) used a latent class model to analyze the relationship between entrepreneurial activity and economic growth across 25 European nations. Their findings revealed that regions with stronger entrepreneurial ecosystems, such as those in eastern Germany, experienced more positive impacts on economic growth, with Eastern member states recovering quicker from the COVID-19 crisis compared to regions like Ireland, Greece, and Spain. Scholars attributed these differences to differences in regional characteristics related to the quality of EE present in each region.

Furthermore, Audretsch and Belitski (2021) investigated the drivers of regional economic development within entrepreneurial ecosystems, focusing on creative industries across nine countries in Europe. Their study revealed that regions with a higher concentration of creative industries tend to attract productive entrepreneurship, leading to accelerated growth and significant impacts on regional economic development. Creative industries foster a culture of innovation, facilitating the accumulation of successful and innovative entrepreneurs who drive creativity and knowledge for sustained economic growth. Similarly, Arabi and Abdalla (2020) aimed to examine the components of EE influencing regional economic growth. Employing a survey of 106 manufacturing firms in Sudan, the results revealed that the human capital component exerted the most substantial impact on entrepreneurial activities. This discovery holds particular significance when juxtaposed with the economic context of European nations, showcasing a stark contrast between Sudan's less developed economy and the more advanced European economies. The similarity in findings across such disparate economic landscapes suggests the universal importance of human capital in fostering entrepreneurial activity.

### Meso Level Theme

Moving to the meso-level theme, academic entrepreneurship has become a prominent subject of study within the entrepreneurial ecosystem. Among 122 studies reviewed, 14 examined various facets of academic entrepreneurship (see Prencipe *et al.*, 2020; Abootorabi *et al.*, 2021; Prokop, 2020; Vega-Gómez *et al.*, 2020; Secundo *et al.*, 2021; Wang *et al.*, 2023; Robyn *et al.*, 2023; Longva, 2021). Encour-

aging the development of University Spin-Offs (USOs) has become a crucial concern for both universities and governments due to their potential to generate value through research and knowledge transfer, thereby contributing to socio-economic growth.

Prencipe *et al.* (2020) conducted a cross-national analysis focusing on the growth of University USOs in Spain and Italy. While the regional context significantly influenced the growth of Spanish USOs in terms of both employment and sales, this effect was not observed for Italian USOs. The study suggested that factors such as the absence of technology transfer offices (TTOs), reduced regional public spending, cuts to public funds for Italian universities, and fragmented innovation policies across sectors might explain the limited impact of Italian regions on the growth of USOs.

In a similar study, Prokop (2020) examined four universities in the UK to determine the impact of EE on USOs adopting variables such as academic founders, incubators, access to VC, and the roles of TTOs and external entrepreneurs. The study revealed that the outcomes of university entrepreneurial ecosystems are contingent on the level of connectivity and filtration, with geographic characteristics also affecting the USOs' success.

Furthermore, Abootorabi *et al.* (2021) conducted a longitudinal study between 2000 and 2015. They analyzed USOs in Norway using 374 new ventures initiated within an academic setting that are either formed by a faculty member, staff member, or graduate student. They found higher economic activity in Oslo, Trondheim, and Kjeller, identified as industrial-academic hubs, suggesting that regional EEs with dense resources foster entrepreneurial dynamism. While incubation services initially supported startup survival, they did not significantly impact the long-term viability or growth of startups.

### Micro Level Theme

Here, themes related to individual components of EE are examined in the reviewed articles at the micro level. The ones that at least two authors discussed include measurement framework (see Leendertse *et al.*, 2022; Johnson *et al.*, 2022; Rocha *et al.*, 2022; Rocha *et al.*, 2022); ecosystem characteristics (see Torres & Godinho, 2022; Kansheba *et al.*, 2023; Hassen, 2020; Gueneau *et al.*, 2022; Yang & Zhan, 2022); and intermediary organizations (see Vardhan & Mahato, 2022; Beyhan *et al.*, 2022; Alaassar *et al.*, 2022; Alaassar *et al.*, 2022; Rijnsoever, 2022). The scarcity of standardized metrics for evaluating entrepreneurial ecosystems (EE) has prompted concerns among researchers. Addressing this challenge, Leendertse *et al.* (2022) conducted pioneering research to create a unified dataset aimed at measuring EE at the regional level, identifying key elements such as physical infrastructure, finance, formal institutions, and talent as fundamental for fostering entrepreneurship.

On the other hand, Evan *et al.* (2022) proposed a comprehensive framework for measuring entrepreneurial ecosystems (EE), emphasizing the interdependence among entrepreneurs, enterprises, government entities, and research institutions. Their database, "APPRISE RDBMS," integrates various data sources to assess EE quality and performance, aiding policymakers in making informed decisions. Similarly, Rocha *et al.* (2022) utilized real-time event-based social media data and social network analysis to evaluate EE at macro, meso, and micro levels, revealing spatial concentration's significance, active technology and business communities, and individuals' belief in achieving outcomes through social interactions.

The EE characteristics was another prominent theme see Kansheba *et al.*, 2023; Hassen, 2020; Gueneau *et al.*, 2022; Yang & Zhan, 2022). Kansheba *et al.* (2023) suggested that the performance of businesses within an ecosystem during crises can be understood by examining how the EE is affected. Drawing insights from a study conducted on a sample of 237 EE in Tanzania, the researchers investigated the role played by stakeholder engagement, collaboration, and support in the face of crises. The findings indicate that pandemic shocks, exacerbated by the stringent countermeasures implemented by governments, render EEs more vulnerable and have adverse effects on their quality and overall performance. Furthermore, Guéneau *et al.* (2022) adopted a mixed method of fuzzy-set qualitative comparative analysis and quantity graph theory to study closeness, cohesiveness, and inter-connectedness as attributes of EE network in five low-income African countries to determine its outcomes. The findings provided evidence supporting the idea that these attributes serve as foun-

dational elements contributing to the intensified total entrepreneurship activity (TEA) rate. In essence, the research identified strong closeness among EE actors as the primary and universally applicable causal condition for achieving a high TEA level or rate.

Furthermore, Hassen (2020) examined the forces shaping the entrepreneurial ecosystem (EE) in Qatar's ICT sector, identifying the rentier state model and the government's commitment to economic diversification as crucial factors. However, the rentier economy's reliance on oil revenue presented challenges, including a lack of STEM skills in the workforce and a prevailing preference for government employment among youth, which hinders entrepreneurial growth. Moreover, many entrepreneurs treated their businesses as supplementary income sources while maintaining public sector jobs, resulting in a lower incentive for full commitment to entrepreneurial ventures and potentially stagnating TEA levels.

The last sub-theme under the micro level theme that emerged from the review articles was intermediary organizations related to accelerators and incubators (see Vardhan & Mahato, 2022; Beyhan *et al.*, 2022; Alaassar *et al.*, 2022; Rijnsoever, 2022). Intermediary entities are inherently important in the ecosystem in facilitating and accelerating the integration of new ideas. Vardhan and Mahato (2022) analyzed 937 universities partnered with incubators in India, focusing on variables such as location, affiliation, innovation activities, and Ease of Doing Business (EODB). Their findings revealed a significant lack of engagement in innovation activities among state universities, with half of the universities in each category showing no participation in entrepreneurial initiatives. Moreover, they discovered a negative correlation between EODB and the presence of business incubators, suggesting universities' ineffective strategy in translating knowledge into meaningful services through innovative practices.

Furthermore, Beyhan *et al.* (2022) explored how accelerators establish their identity and mobilize resources to attain legitimacy, identifying two main strategies: "deal flow makers" and "welfare stimulators." These categories differ in various dimensions, particularly in their strategic focus, funding structure, and program design, with deal flow makers prioritizing attracting private investors by nurturing startups and welfare stimulators focusing on enhancing entrepreneurial skills and activities among founders.

## CONCLUSIONS

The study was a systematic review of the EE research landscape aiming to shed light on thematic trends within the domain in the aftermath of the COVID-19 pandemic. The SQAT methodology served to evaluate articles for inclusion. Previous systematic reviews conducted in this domain after the pandemic focused on examining measurement frameworks, methodologies, theories, geographic and industry focus, as well as analysis unit (Mago & Merwe, 2023). This study adopted a different approach to pinpoint emerging thematic trends and unravel topical issues addressed by researchers. The review article addressed a gap in the EE research domain by providing an overview of research priorities in the aftermath of COVID-19. The review themes were collated into three categories reflecting the analysis level. At the macro level, regional entrepreneurship and its impact on economic growth garnered the most studies with most authors dedicated to exploring the theme. Entrepreneurship is often demonstrated as a means of creating economic prosperity through the exploitation of opportunities inherent in a given environment (Neck & Greene, 2010). Research on entrepreneurship seems to suggest that the level of entrepreneurial activity varies meaningfully across countries and regions (Naude, 2018). Research increasingly establishes a connection between the upsurge in entrepreneurial activities to externalities within specific geographically bounded locations (Prencipe *et al.*, 2020; Prokop, 2020; Audretsch & Belitski, 2021). This underlines the pivotal role of geography as knowledge tends to flourish within the space of localized networks deeply embedded in specific regions. In essence, the evidence suggests that the spatial context significantly influences the development of entrepreneurial activities through the dynamics of localized networks.

It is pertinent to highlight that China, the epicentre of the pandemic, emerged as the most prolific region in EE research following the global health crisis. The prevalence of research output from this region is particularly noteworthy, and it is not merely coincidental. A substantial portion of the articles emanating from China focuses on regional entrepreneurship, the digital transformation of traditional



industries, and policies specifically aimed at fostering the creation of more unicorns (Yang *et al.*, 2022; Teresa *et al.*, 2023; Wang *et al.*, 2023; Song *et al.*, 2022; Yang & Zhang, 2022). This convergence of research themes strongly implies a deliberate and strategic focus, suggesting that the geographical context, compounded by the impact of the pandemic, has fuelled a concentrated effort in China towards investigating and promoting key facets of entrepreneurial development.

At the meso level, academic entrepreneurship was the most prominent research dimension after the pandemic focusing on diverse variables such as USOs, university-community collaborations, student venture creation and financing commercialization of university research. A significant proportion of the research originated in Europe (see Atonio *et al.*, 2020; Satu *et al.*, 2023; Stolz, 2023). We may attribute this prevalence primarily to the accessibility of public funding sources dedicated to R&D and the commercialization of innovative solutions in the region. The academic landscape plays a dual role in facilitating entrepreneurship, manifesting in two key ways. Firstly, academia serves as a conduit for fostering entrepreneurship by actively engaging in the commercialization of research outcomes. This is particularly crucial given the scarcity of individuals possessing both entrepreneurial capabilities and research expertise. The translation of academic research into viable commercial solutions not only contributes to economic development but also addresses the gap in entrepreneurial talent. Secondly, academia contributes to entrepreneurship by creating awareness about entrepreneurial opportunities and instilling the requisite entrepreneurial behaviour. This is achieved through an experiential learning approach, which equips aspiring entrepreneurs with practical insights and skills to translate ideas into products.

At the micro level, research focused on ecosystem characteristics within the EE domain. Given the severity of the pandemic's impact, the dynamics of the EE domain were inevitably influenced in significant ways thereby leading scholars to direct their attention towards understanding how these characteristics have evolved or adapted in response to the unprecedented challenges posed by the pandemic (Pocek, 2022). The focus here revolved around the important role of informal ties within the EE, particularly in accentuating the functions of intermediary organisations. These intermediaries play a critical role as connectors, facilitating the flow of a wide array of resources to entrepreneurs. Moreover, the efficacy of the EE network is contingent upon the expert management of relationships, establishing robust communication ties that align with both local and national agendas. Furthermore, the cultivation of a shared collaborative culture stands out as a key determinant in the success of the ecosystem.

This review acknowledges certain limitations that provide opportunities for refinement in future research. Firstly, the scope of the study was confined to articles published exclusively on platforms such as Emerald, Elsevier, Sage, Springer, Taylor and Francis. This selective approach might have resulted in the exclusion of valuable studies on EE published by other publishers during the period. Future researchers could broaden the selection criteria to cover a more diverse range of publishing sources. Secondly, the inclusion criterion focused solely on articles explicitly featuring "entrepreneurial ecosystem" in their titles. This might have overlooked relevant contributions, in which authors did not employ the term in their titles. A more expansive search strategy could address this limitation by considering articles that explore EE without necessarily having it in their titles. Lastly, the timeframe for article selection was constrained to the years 2020 to 2023, introducing a temporal limitation to the study. Future research could benefit from a more extensive temporal scope to capture a broader spectrum of EE developments and ensure a more comprehensive understanding of the field's evolution.

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The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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