

## **Business Incubator: Its Role and Challenges ahead based on Bibliometric Analysis**

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### **ABSTRACT**

The purpose of this study is to provide views on the role of business incubators in supporting the entrepreneurial ecosystem. Bibliometric analysis methods (bibliometric coupling and co-word) were used to evaluate 430 business incubator databases from Web of Science in the last five years (2019-2023). The results show that the contribution of business incubators to entrepreneurship is highly dependent on social capital (network) as part of the entrepreneurial ecosystem element. The cluster themes found are discussed on the implications of theory and practice.

**Keywords:** business incubator; entrepreneurial ecosystem; social capital theory; bibliometric analysis.

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### **1. Introduction**

Business Incubation is a support process for business creation or development of successful startups. Incubator business studies have become important in the academic and scientific community (Lizeth Mayer-Granados & Paola Jimenez-Almaguer, 2011). Business incubators have a role to play in the sustainable entrepreneurship ecosystem (Nicholls-Nixon et al., 2021); being a catalyst for startup growth and development (Bocken, 2015; Carayannis & von Zedtwitz, 2005) and economy (Ratinho & Henriques, 2010) and become a trigger for the choice to become entrepreneurs for the younger generation (Guerrero et al., 2020). That proves business incubators are essential in building an ecosystem to create and grow new businesses.

Previous research illustrates that not all incubators succeed in creating new businesses. Even in Russia, the number of business incubators has decreased significantly (Slesarev, 2022); a lack of sponsorship, production space, and advanced technology facilities (prototypes) (Lose & Tengeh, 2015); discontinuation of support (Schwartz, 2009) thus hampering the function and role of the incubator. However, several other research results show that business incubators have improved

business results (Lange & Johnston, 2020); contribute significantly to Economic Development and increased creativity (Sarairoh, 2021); transfer knowledge, enhance entrepreneurial spirit, and innovate (Redondo et al., 2022). These research results show empirical contradictions, meaning that not all business incubators meet the expectations they should.

This study wants to provide an overview of business incubators' current and future roles because business incubators can be a solution to high unemployment if business incubators can create new businesses. Several review studies on business incubators have been conducted by (Albort-Morant & Ribeiro-Soriano, 2016; Hausberg & Korreck, 2020; Mian et al., 2016; Perdomo Charry et al., 2014) with various results and periods before 2018.

The motivation of this study is to provide a comprehensive view of the contribution of business incubators in supporting the entrepreneurial ecosystem. Provide insight into research trends, significant contributions, and potential future business incubator research directions. The research results will be discussed further, especially in supporting innovation and economic growth.

## **2. Literature Review**

A business incubator is an organization that aims to support new businesses or businesses that are just entering the growth phase (Hausberg & Korreck, 2020). Business incubators (BI) can accelerate the creation of new ventures (Bruneel et al., 2012) and as mutualism symbiotic institutions in industrial estates (Mulrow et al., 2017) funded by sponsors (e.g., governments or companies) and own funds from the rental costs of incubation participants (Hausberg & Korreck, 2020). The main reason for establishing business incubators is to encourage economic development by growing new businesses that create jobs and diversify the local economy. (Scarborough & Cornwall, 2019).

There are four phases in a traditional business incubator: pre-incubation, selection process, incubation, and post-incubation (Millette et al., 2020). At the initial stage, knowledge transfer from BI allows the startup to overcome its main difficulties: organizational aspects and financial capacity (Paoloni & Modaffari, 2022). In the pre-incubation phase, the incubate has an idea and makes a startup proposal. In the selection process phase, the incubate applies to a startup proposal. In the incubation phase, the incubate provides guidance, coordinates the incubation process, provides business support services, provides coaching, helps identify investors and financing, develops a business model, and shows business growth; and in the post-incubation phase, establish graduation requirements, demonstrate sustainable sales/income, obtain investor financing, demonstrate continuous expansion (Millette et al., 2020).

The process phase (incubation) is crucial for successful incubation in realising a business idea. The role of the incubator during the incubation process is to provide services to develop the incubation into a viable enterprise (Patton et al., 2009). Brun (2019) offers value chain incubator startups by adopting and incorporating value chain frameworks (Porter, 1985). This idea is another form of the importance of the incubation process of creating value through business incubators as a symbiosis of mutualism.

## **3. Research Methodology**

### 3.1 Bibliometric analysis

Bibliometric analysis is a quantitative approach that uses Web of Science (WoS) and Scopus databases to help researchers understand a particular field's knowledge structure. Bibliometric analysis is a form of science mapping that produces visual representations of document structures, journals, authors, and keywords as outputs (van Eck & Waltman, 2014). Today, bibliometrics is associated with performance measurement and appraisal, evaluation, and the direction of science policy (Ball, 2018). There are five analyses in bibliometrics, but only two were applied (Zupic & Čater, 2015). The two analyses used to view current and future structures (using VOSviewer) visually are:

- **Bibliographic coupling:** bibliographic coupling is suitable for exploring a spectrum of themes based on recent developments (Aria & Cuccurullo, 2017; Donthu et al., 2021). The analysis assumes that two publications share similar content with similar references, leading to a unique theme (Gingras, 2016; Rojas-Lamorena et al., 2022). Bibliographic coupling is more suitable than other bibliometric analyses (such as co-citation) because it extracts themes based on least cited publications, emerging trends, and smaller subfields (Bretas & Alon, 2021; Zupic & Čater, 2015).
- **Co-word analysis:** analysis extracts publication titles, abstracts, and keywords (Aria & Cuccurullo, 2017; Eck & Waltman, 2014). It analyses the interactions between keywords in a field through the description and visual representation (Rojas-Lamorena et al., 2022), evaluates the keyword's interaction within the subject area, and postulates future trends (Bernatović et al., 2022; Tan Luc et al., 2020). The output of the co-word analysis is a theme formed by a network of words representing the space of the conceptual field (Zupic & Čater, 2015).

### 3.2 Data collection

The database search was conducted through the Web of Science (WoS) indexed on September 18, 2023. Keywords are used for searches on the WoS database based on title, abstract, and keywords.

Table 1. Search string data in WoS

No	Keywords	Justification
1	"Business incubator*" OR "startup incubator*" OR "Entrepreneurship incubator*" OR "Business incubator Center"	To identify literature related to business incubators.
2	"Startup business" OR "startup development" OR "SME development" OR "Business mentoring" OR "Startup support*" OR "business seed funding"	To identify literature related to business startups, business development, small and medium business development, business mentoring, startup businesses, and business startup funding.

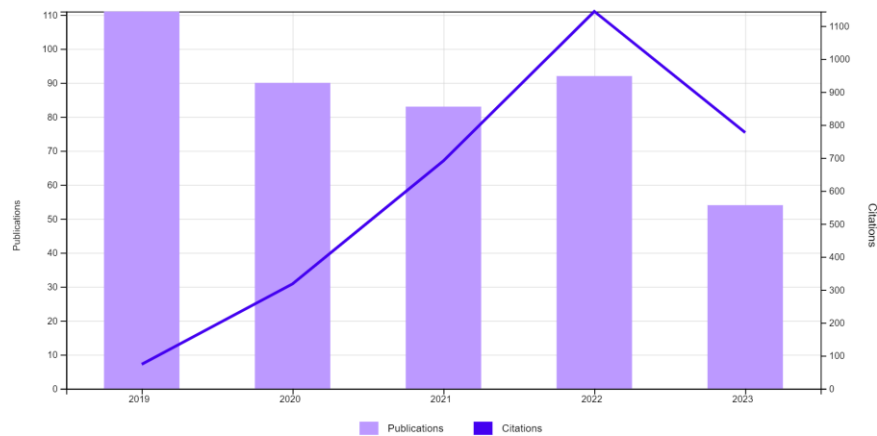
Data search on the WoS database is carried out because WoS is considered the best quality database, with more than 75 million scientific data from 254 disciplines (Singh et al., 2021). In this study, we provide a period limit for the last five years (2019-2023) and only articles in English. In detail, the search string data mining can be seen in Table 1.

## 4. Results

### 4.1 Descriptive analysis

The data found from the search results on the WoS document is 1668. After filtering by the last five-year period (2019-2023), only articles selected in English obtained 430 remaining article documents. The number of citations for papers analysed was 3,004 and 2,522 (without self-citations), with an average document citation of 6.99 with an H-Index of 25. Figure 1 shows the number of publications and citations since 2019.

Figure 1. Number of publications and citations on business incubator



### 4.2 Bibliographic coupling

Based on 430 documents analysed with a bibliography coupling, 43 met the threshold with a minimum citation of 20 per document. This analysis yielded six significant clusters (Figure 2). From the total link strength (TLS), the top 3 documents in the bibliographic coupling are Sansone et al. (2020) with 257 TLS, Good et al. (2019) with 246 TLS, and Lukeš et al. (2019) with 186 TLS. To see the full view of the bibliographic coupling document can be seen in Table 2.

The six clusters formed show specific themes based on keywords and elaborated to forecast trends in particular areas (Donthu et al., 2021). The clusters formed are labelled from the author's interpretation and discussed based on current trends and future development.

Cluster 1 (red): eleven documents labelled "Positive effects of incubators on the entrepreneurial ecosystem." Business incubators have given rise to and developed an entrepreneurial spirit (Li et al., 2020). In addition, the effect of business incubators on campus has also contributed to the nature of developing new businesses (Redondo et al., 2022). Services provided through networks, capital, and training have created creative innovations, creating new jobs (Lukeš et al., 2019). Emerging creativity has penetrated the use of waste as a new economic model known as the circular economy (Millette et al., 2020). Business incubators are proven to have a positive effect on the entrepreneurial ecosystem but must be supported by effective communication to attract

other incubates with creative business ideas. Therefore, incubators need to continue providing constructive inputs in mentoring incubate in pitching with investors who will become business partners (van Werven et al., 2019). As an incubation hub, business incubators must realise the importance of nurturing and developing internal and external networks to maintain an entrepreneurial ecosystem supporting startup success (Salimi, 2021) and have an entrepreneurial spirit (Boutris & Salimi, 2022).

Cluster 2 (green): ten documents labelled "Business incubator supports growth". Sustainable growth is expected not only under normal conditions. In abnormal conditions, the role of business incubators is also needed to raise the economic dignity of individuals or groups in exile (Meister & Mauer, 2019). Growth acceleration can be initiated through acceleration programs that involve the use of technology so that product or service startups can be launched quickly and efficiently (Stayton & Mangematin, 2019) and sustainable growth goals can be achieved (Surana et al., 2020). Empirically, business incubators can be a forum for actualising young people who have innovative business ideas that trigger them to choose their life careers to become entrepreneurs (Guerrero et al., 2020). The context of cluster 2, the expected growth of the business incubator effect, is not only on the growth of the number of entrepreneurs but also on the economic growth of a country.

Table 2. Top ten documents in bibliographic coupling

Rank	Publication by	Main focus	Journal	Citation	TLS
1	(Sansone et al., 2020)	Social effects of incubators on startups	Technological Forecasting and Social Change	42	257
2	(Good et al., 2019)	Design of the organisational ecosystem of the technology transfer process	Technovation	69	246
3	(Lukeš et al., 2019)	The effectiveness of business incubators for innovative startups.	Technovation	69	186
4	(Del Sarto et al., 2020)	The role of accelerators in the survival of startup companies	Technovation	47	176
5	(Nicholls-Nixon et al., 2021)	Dynamics of University Business Incubators	International Entrepreneurship and Management Journal	24	170
6	(Klofsten et al., 2020)	The importance of incubator size and specialisation	Technological Forecasting & Social Change	24	167
7	(Surana et al., 2020)	The role of incubators in supporting entrepreneurship	Technological Forecasting and Social Change	34	154
8	(Meister & Mauer, 2019)	The contribution of business incubators to refugees in business	International Journal of Entrepreneurial Behavior & Research	47	151
9	(Galbraith et al., 2021)	Incubation challenges and expansion with diverse models ahead	IEEE Transactions on Engineering Management	20	148

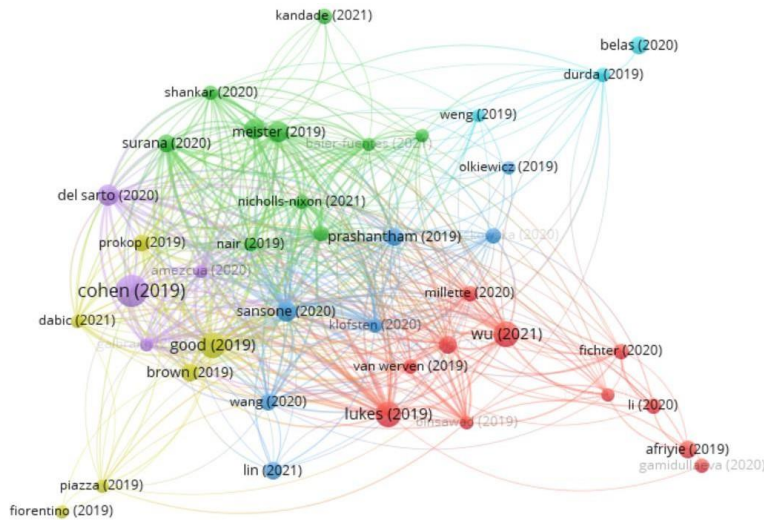
10	(Guerrero et al., 2020)	University entrepreneurial ecosystem and graduate career patterns	Journal of Management Development	28	140
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Ahmed et al. (2022) state that business incubators positively and significantly influence the sustainability of entrepreneurial growth. Chen et al. (2023) found that companies' income in technology business incubators increased.

Cluster 3 (blue): seven documents labeled "Challenges for social incubators". Social incubators have challenges in their operations because they do not have much economic motive. Even so, in terms of efficiency, they must be like business incubators and mix (Sansone et al., 2020); they must influence innovation (Wang et al., 2020) and have a positive relationship with partner institutions (Klofsten et al., 2020). They can contribute to product innovation (Gorączkowska, 2020). Research shows that social incubators have encouraged competition and created new social value (Nascimento et al., 2021).

Cluster 4 (yellow): six documents labeled "The importance of technology for cross-border promotion." Naturally, product and service innovations should be promoted. Business incubators must also facilitate cross-border promotion (Good et al., 2019) amid massive technological developments. On the other hand, the power of innovation networks also affects innovation capabilities (Brown et al., 2019).

Figure 2. Bibliographic coupling analysis



Cluster 5 (purple): four documents labelled "Acceleration of building an entrepreneurial ecosystem." The phenomenon, role, and variety of business incubators are essential to the entrepreneurial ecosystem (Cohen et al., 2019; Del Sarto et al., 2020). However, in practice, it is not always a good thing for startups to join a business incubator or accelerated business. Many aspects of business incubation practices negatively impact the early stages. Be careful in choosing an incubation program (Lukosiute et al., 2020).

Cluster 6 (cyan): three documents labelled "Social networks in startup development." Social networks are becoming an essential point in startup development. Social networks can help startups establish and develop themselves. The results showed that 63 per cent of startups use assistance from their business incubators, meaning that business incubators are still weak external networks (Durda & Ključnikov, 2019).

The summary of the bibliographic coupling analysis on business incubators can be seen in Table 3.

Table 3. Summary of bibliographic coupling analysis on business incubator

Cluster number and colour	Cluster label	Publication documents	Representative publication
1 (red)	The positive effect of incubators on the entrepreneurial ecosystem	11	(Wu et al., 2021), (Millette et al., 2020), (Li et al., 2020), (Redondo & Camarero, 2019), (Lukeš et al., 2019), (van Werven et al., 2019)
2 (green)	The business incubator supports growth	10	(Meister & Mauer, 2019), (Stayton & Mangematin, 2019), (Surana et al., 2020), (Guerrero et al., 2020), (Nair & Blomquist, 2019)
3 (blue)	Challenges for social Incubators	7	(Sansone et al., 2020), (Wang et al., 2020), (Klofsten et al., 2020), (Gorączkowska, 2020)
4 (yellow)	The importance of technology for cross-border promotion	6	(Brown et al., 2019), (Piazza et al., 2019)
5 (purple)	Acceleration of building an entrepreneurial ecosystem	4	(Cohen et al., 2019), (Del Sarto et al., 2020)
6 (cyan)	Social networking in startup development	3	(Durda & Ključnikov, 2019)

#### 4.3 Co-word analysis

A co-word analysis produced 50 keywords from 1996 with threshold values of 12 and 5 clusters. The network structure of the co-word analysis shows the proximity between clusters (c) and crosses each other. Crosses can be seen on clusters 1, 2, and 4 and clusters 1, 2, 3, and 5, indicating that these five themes are future trends related to research in business incubators.

Figure 3. Co-word analysis

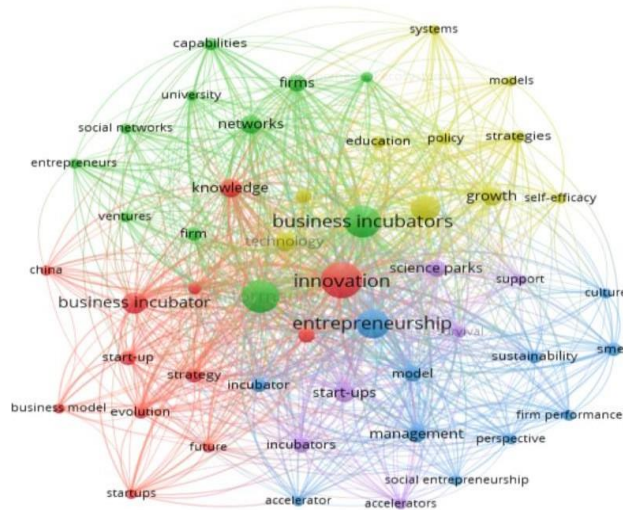


Table 4. Top ten keywords of co-word analysis

Rank	Keyword	Occurrence	TLS
1	Innovation (c.1)	152	612
2	Performance (c.2)	123	540
3	Business incubators (c.2)	117	486
4	Entrepreneurship (c.3)	98	411
5	Impact (c.4)	75	294
6	Business incubator (c.1)	54	175
7	Networks (c.2)	40	195
8	Growth (c.4)	40	182
9	Knowledge (c.1)	39	189
10	Startups (c.5)	39	170

Cluster 1 (red): with twelve keywords labeled "Innovation in business incubators." Innovation is always the expectation of business incubators, although not all incubates always have innovative business ideas. Innovation born from business incubators is influenced by many factors, including technical capabilities (Sedita et al., 2019) and capitalisation (Morrish et al., 2019). In addition, sometimes incubators that do not have a robust financial network will think that the innovations developed by incubate are very risky (Bessant & Tidd, 2015). Thus, innovation can run slowly and even stop.

Cluster 2 (green): with eleven keywords labeled "business incubators and networks". The incubator should mediate incubator firms' relationships conducive to business development. The network horizon is crucial because it describes how the mediating actor can identify relevant network structures (Holmen et al., 2013; Huemer, 2017). The incubator network can be a determinant of the success of incubate. Incubator with an extensive internal and external network to realize their business idea successfully (Wu et al., 2021) because business incubators can empower their networks in mentoring at the stages of the incubation and post-incubation process (Millette et al., 2020), so incubators with a vast network are preferred.



Cluster 3 (blue): with eleven keywords labeled "Business incubator and social entrepreneurship." The meaning of social entrepreneurship is to generate social benefits for society (Zulkefly et al., 2022). Social entrepreneurship has become a significant issue these days. However, few social incubators are willing to get involved because the approach is more social than economic (Sansone et al., 2020). Social entrepreneurship is needed to develop the entrepreneurial spirit of a particular community. So that they can create jobs collectively and still get economic benefits (Esfandiar et al., 2019).

Cluster 4 (yellow): with ten keywords labeled "Impact of the business incubator." The impact of the business incubator is the increase in enthusiasm for business success and entrepreneurial growth (Albort-Morant & Ribeiro-Soriano, 2016). Many studies prove its impact, including studies conducted (Ahmed et al., 2022; Binsawad et al., 2019; Machado et al., 2020; Olkiewicz et al., 2019; Soetanto & Jack, 2016). So regardless of the advantages and disadvantages, business incubators are still needed and improved in performance.

**Table 5. Summary of co-word analysis on business incubator**

Cluster number and colour	Cluster labelled	Number of keywords	Representative keywords
Cluster 1 (red)	Innovation in business incubators	12	Innovation, business incubator, startup, business model, creation, knowledge
Cluster 2 (green)	Business incubators and networks	11	Performance, Business incubators, firms, ventures, entrepreneurs, networks, social networks
Cluster 3 (blue)	Business incubator and social entrepreneurship	11	Entrepreneurship, incubator, model, management, social entrepreneurship
Cluster 4 (yellow)	Impact of the Business Incubator	10	Impact, growth, technology, business incubation, policy
Cluster 5 (purple)	Business incubator and survival	6	Startups, science parks, incubators, survival

Cluster 5 (purple): with six keywords labeled "Business incubator and survival." Business incubators must be creative in maintaining good relationships with incubatees, investors or sponsors to survive (Manconi et al., 2022). Because business incubators cannot live sustainably without supporting partners (Fernández Fernández et al., 2015; Lose & Tengeh, 2015). The summary of the co-word analysis on business incubators can be seen in Table 5.

## **5. Discussion**

### *5.1 Theory implications*

The role of business incubators in creating new entrepreneurs must be recognised, although not all incubations are successful (Slesarev, 2022). The success of incubators in assisting incubate cannot be separated from the interdependence between them. The strength of the incubator's internal and external networks is also a determining factor in choosing an incubate to join an incubator. The chain of interdependence on success in the incubation process depends on the existing ecosystem.

Stam & van de Ven (2021) conveyed his findings that high-growth companies in a region are closely related to the quality of their entrepreneurial ecosystem.

A business incubation theory is needed to integrate the factors that allow us to predict and explain the outcome of incubation (Hackett & Dilts, 2004). Incubator networks as social capital determine the emergence of innovations in business and industry (Bessant & Tidd, 2015). The strength of the actor incubator network is a critical factor in building and developing a favorable entrepreneurial ecosystem (Fubah, 2021). The results showed that many incubate utilise the incubator's external network to develop their business (Redondo & Camarero, 2019).

Theoretically, the power of networks becomes the social capital of incubator actors. Incubator social capital is significant in building a conducive and mutually beneficial entrepreneurial ecosystem (Neumeyer et al., 2019). Incubation theory includes principles that guide the incubation process in resolving competition conflicts and market failures (Maital et al., 2008). However, incubation theory is still unsatisfactory in explaining what theory should be used to explain the importance of entrepreneurial ecosystems in supporting incubator and incubation success. Several theories are often used to explain entrepreneurial ecosystems, such as cluster theory, process theory, resource dependency theory, systems theory, network theory, stakeholder theory, and others. However, social capital theory is considered more appropriate when viewed from the relationship between actors (incubate and incubator) (Fubah, 2021). This condition can be considered for research on the success of incubators and incubates in the future.

### *5.2 Practical implication*

The review results provide practical implications for incubator managers that the power of social capital is critical to partnering and developing entrepreneurship. However, managers must improve other elements because internal and external networks are part of the entrepreneurial ecosystem (institutional arrangement). According to E Stam & Ven (2021), other elements are divided into two, namely institutional arrangement (formal institution, culture, and network) and endowment resources (physical infrastructure, demand, intermediaries, talent, knowledge, leadership, and finance). In practice, these elements should be available but must still be adjusted to the conditions of each incubator.

## **6. Conclusion**

The paper presents an overview of the business incubator, its role, and the challenges ahead. Based on two bibliometric analyses, this paper presents the current state of the art and future research direction. From the bibliographic coupling analysis that represents current research, six themes were found (positive effects of incubators on the entrepreneurial ecosystem, business incubator support growth, challenges for social incubators, the importance of technology for cross-border promotion, acceleration of building an entrepreneurial ecosystem and social networks in startup development). Meanwhile, in the co-word analysis that represents the future research direction, five groups were obtained based on keywords (Innovation in business incubators, Business incubator and network, Business incubator and social entrepreneurship, Impact of the business incubator, and Business incubator and survival). Networking as part of an entrepreneurial

ecosystem is an important part of a business incubator's social capital to help incubate business ideas as solutions for economic growth.

## References

- Ahmed, N., Li, C., Qalati, S. A., Rehman, H. U., Khan, A., & Rana, F. (2022). Impact of Business Incubators on Sustainable Entrepreneurship Growth with Mediation Effect. *Entrepreneurship Research Journal*, 12(2), 137–160. <https://doi.org/10.1515/erj-2019-0116>
- Albort-Morant, G., & Ribeiro-Soriano, D. (2016). A bibliometric analysis of international impact of business incubators. *Journal of Business Research*, 69(5), 1775–1779. <https://doi.org/10.1016/j.jbusres.2015.10.054>
- Aria, M., & Cuccurullo, C. (2017). bibliometrix : An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4), 959–975. <https://doi.org/10.1016/j.joi.2017.08.007>
- Ball, R. (2018). *An introduction to bibliometrics: New developments and trends*. Chandos Publishing. <https://doi.org/10.1016/C2016-0-03695-1>
- Bernatović, I., Slavec Gomezel, A., & Černe, M. (2022). Mapping the knowledge-hiding field and its future prospects: a bibliometric co-citation, co-word, and coupling analysis. *Knowledge Management Research & Practice*, 20(3), 394–409. <https://doi.org/10.1080/14778238.2021.1945963>
- Bessant, J., & Tidd, J. (2015). *Innovation and Entrepreneurship* (3rd ed.). John Wiley & Sons, Ltd.
- Binsawad, M., Sohaib, O., & Hawryszkiewicz, I. (2019). Factors impacting technology business incubator performance. *International Journal of Innovation Management*, 23(1), 1–30. <https://doi.org/10.1142/S1363919619500075>
- Bocken, N. M. P. (2015). Sustainable venture capital – catalyst for sustainable start-up success? *Journal of Cleaner Production*, 108, 647–658. <https://doi.org/10.1016/j.jclepro.2015.05.079>
- Boutris, G., & Salimi, N. (2022). Identifying Impact of the Entrepreneurship Ecosystem on the Success of Entrepreneurial Start-up Firm. In J. Rezaei, M. Brunelli, & M. Mohammadi (Eds.), *Advances in Best-Worst Method* (p. 185). Springer. <https://doi.org/10.1007/978-3-031-24816-0>
- Bretas, V. P. G., & Alon, I. (2021). Franchising research on emerging markets: Bibliometric and content analyses. *Journal of Business Research*, 133(April 2020), 51–65. <https://doi.org/10.1016/j.jbusres.2021.04.067>
- Brown, R., Mawson, S., Lee, N., & Peterson, L. (2019). Start-up factories, transnational entrepreneurs and entrepreneurial ecosystems: unpacking the lure of start-up accelerator programmes. *European Planning Studies*, 27(5), 885–904. <https://doi.org/10.1080/09654313.2019.1588858>
- Brun, E. C. (2019). Understanding a Business Incubator as a Start-Up Factory: A Value Chain Model Perspective. *International Journal of Innovation and Technology Management*, 16(03), 273–284. <https://doi.org/10.1142/S0219877019500251>
- Bruneel, J., Ratinho, T., Clarysse, B., & Groen, A. (2012). The Evolution of Business Incubators: Comparing demand and supply of business incubation services across different incubator generations. *Technovation*, 32(2), 110–121. <https://doi.org/10.1016/j.technovation.2011.11.003>
- Carayannis, E. G., & von Zedtwitz, M. (2005). Architecting gloCal (global–local), real-virtual incubator networks (G-RVINs) as catalysts and accelerators of entrepreneurship in transitioning and developing economies: lessons learned and best practices from current development and business incubation . *Technovation*, 25(2), 95–110. [https://doi.org/10.1016/S0166-4972\(03\)00072-5](https://doi.org/10.1016/S0166-4972(03)00072-5)
- Chen, P., Yan, Z., & Wang, P. (2023). How can the Digital Economy Boost the Performance of Entrepreneurs? A Large Sample of Evidence from China’s Business Incubators. *Sustainability (Switzerland)*, 15(7). <https://doi.org/10.3390/su15075789>
- Cohen, S., Fehder, D. C., Hochberg, Y. V., & Murray, F. (2019). The design of startup accelerators. *Research Policy*, 48(7), 1781–1797. <https://doi.org/10.1016/j.respol.2019.04.003>
- Del Sarto, N., Isabelle, D. A., & Di Minin, A. (2020). The role of accelerators in firm survival: An fsQCA analysis of Italian startups. *Technovation*, 90–91(November), 102102. <https://doi.org/10.1016/j.technovation.2019.102102>

- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133(May), 285–296. <https://doi.org/10.1016/j.jbusres.2021.04.070>
- Durda, L., & Ključnikov, A. (2019). Social networks in entrepreneurial startups development. *Economics & Sociology*, 12(3), 192–208. <https://doi.org/10.14254/2071-789X.2019/12-3/13>
- Eck, N. J. Van, & Waltman, L. (2014). Measuring Scholarly Impact. In *Measuring Scholarly Impact*. <https://doi.org/10.1007/978-3-319-10377-8>
- Esfandiari, K., Sharifi-Tehrani, M., Pratt, S., & Altinay, L. (2019). Understanding entrepreneurial intentions: A developed integrated structural model approach. *Journal of Business Research*, 94(August 2016), 172–182. <https://doi.org/10.1016/j.jbusres.2017.10.045>
- Fernández Fernández, M. T., Blanco Jiménez, F. J., & Cuadrado Roura, J. R. (2015). Business incubation: innovative services in an entrepreneurship ecosystem. *Service Industries Journal*, 35(14), 783–800. <https://doi.org/10.1080/02642069.2015.1080243>
- Fubah, C. N. (2021). Relevant theories in entrepreneurial ecosystems research: an overview. *Academy of Entrepreneurship Journal*, 27(6), 1–18.
- Galbraith, B., Mcadam, R., & Cross, S. E. (2021). The Evolution of the Incubator: Past, Present, and Future. *IEEE Transactions on Engineering Management*, 68(1), 265–271. <https://doi.org/10.1109/TEM.2019.2905297>
- Gingras, Y. (2016). *Bibliometrics and Research Evaluation: Uses and Abuses*. The MIT Press.
- Good, M., Knockaert, M., Soppe, B., & Wright, M. (2019). The technology transfer ecosystem in academia. An organizational design perspective. *Technovation*, 82–83(June), 35–50. <https://doi.org/10.1016/j.technovation.2018.06.009>
- Gorażczkowska, J. (2020). Enterprise innovation in technology incubators and university business incubators in the context of Polish industry. *Oeconomia Copernicana*, 11(4), 799–817. <https://doi.org/10.24136/oc.2020.032>
- Guerrero, M., Urbano, D., & Gajón, E. (2020). Entrepreneurial university ecosystems and graduates' career patterns: do entrepreneurship education programmes and university business incubators matter? *Journal of Management Development*, 39(5), 753–775. <https://doi.org/10.1108/JMD-10-2019-0439>
- Hackett, S. M., & Dilts, D. M. (2004). A Systematic Review of Business Incubation Research. *Journal of Technology Transfer*, 29, 55–82.
- Hausberg, J. P., & Korreck, S. (2020). Business incubators and accelerators: a co-citation analysis-based, systematic literature review. *The Journal of Technology Transfer*, 45(1), 151–176. <https://doi.org/10.1007/s10961-018-9651-y>
- Holmen, E., Aune, T. B., & Pedersen, A. C. (2013). Network pictures for managing key supplier relationships. *Industrial Marketing Management*, 42(2), 139–151. <https://doi.org/10.1016/j.indmarman.2012.12.003>
- Huemer, L. (2017). Strategizing in horizons and verizons. *IMP Journal*, 11(2), 274–288. <https://doi.org/10.1108/imp-12-2015-0069>
- Klofsten, M., Lundmark, E., Wennberg, K., & Bank, N. (2020). Incubator specialization and size : Divergent paths towards operational scale. *Technological Forecasting & Social Change*, 151, 1–13. <https://doi.org/10.1016/j.techfore.2019.119821>
- Lange, G. S., & Johnston, W. J. (2020). The value of business accelerators and incubators – an entrepreneur's perspective. *Journal of Business and Industrial Marketing*, 35(10), 1563–1572. <https://doi.org/10.1108/JBIM-01-2019-0024>
- Li, C., Ahmed, N., Qalati, S. A., Khan, A., & Naz, S. (2020). Role of business incubators as a tool for entrepreneurship development: The mediating and moderating role of business start-up and government regulations. *Sustainability (Switzerland)*, 12(5), 1–23. <https://doi.org/10.3390/su12051822>
- Lizeth Mayer-Granados, E., & Paola Jimenez-Almaguer, K. (2011). Business incubators in Mexico: a descriptive analysis. *CIENCIAUAT*, 6(2), 8–13. [https://www.webofscience.com/wos/woscc/full-record/WOS:000215586800001\(overlay:export/exc\)](https://www.webofscience.com/wos/woscc/full-record/WOS:000215586800001(overlay:export/exc))

- Lose, T., & Tengeh, R. (2015). The Sustainability and Challenges of Business Incubators in the Western Cape Province, South Africa. *Sustainability*, 7(10), 14344–14357. <https://doi.org/10.3390/su71014344>
- Lukeš, M., Longo, M. C., & Zouhar, J. (2019). Do business incubators really enhance entrepreneurial growth? Evidence from a large sample of innovative Italian start-ups. *Technovation*, 82–83(3), 25–34. <https://doi.org/10.1016/j.technovation.2018.07.008>
- Lukosiute, K., Jensen, S., & Tanev, S. (2020). *Is Joining a Business Incubator or Accelerator Always a Good Thing ? July 2019*. <https://doi.org/10.22215/timreview/1251>
- Machado, A. de B., Catapan, A. H., & Sousa, M. J. (2020). Management Models for Business Incubators. *International Journal of Technology Diffusion*, 11(2), 33–44. <https://doi.org/10.4018/ijtd.2020040103>
- Maital, S., Ravid, S., Seshadri, D. V. R., & Dumanis, A. (2008). Toward a grounded theory of effective business incubation. *Vikalpa*, 33(4), 1–13. <https://doi.org/10.1177/0256090920080401>
- Manconi, M., Bellomo, S., Nosella, A., & Agostini, L. (2022). Attributes of Business Incubators: A Conjoint Analysis of Venture Capitalist’s Decision Making. *Journal of Risk and Financial Management*, 15(5). <https://doi.org/10.3390/jrfm15050213>
- Meister, A. D., & Mauer, R. (2019). Understanding refugee entrepreneurship incubation – an embeddedness perspective. *International Journal of Entrepreneurial Behavior & Research*, 25(5), 1065–1092. <https://doi.org/10.1108/IJEBr-02-2018-0108>
- Mian, S., Lamine, W., & Fayolle, A. (2016). Technology Business Incubation: An overview of the state of knowledge. *Technovation*, 50–51, 1–12. <https://doi.org/10.1016/j.technovation.2016.02.005>
- Millette, S., Eiríkur Hull, C., & Williams, E. (2020). Business incubators as effective tools for driving circular economy. *Journal of Cleaner Production*, 266(3), 121999. <https://doi.org/10.1016/j.jclepro.2020.121999>
- Morrish, S. C., Whyte, M. C., & Miles, M. P. (2019). Incubator mediation in commercialising disruptive innovation. *Journal of Strategic Marketing*, 27(2), 177–189. <https://doi.org/10.1080/0965254X.2017.1384751>
- Mulrow, J. S., Derrible, S., Ashton, W. S., & Chopra, S. S. (2017). Industrial Symbiosis at the Facility Scale. *Journal of Industrial Ecology*, 21(3), 559–571. <https://doi.org/10.1111/jiec.12592>
- Nair, S., & Blomquist, T. (2019). Failure prevention and management in business incubation: practices towards a scalable business model. *Technology Analysis and Strategic Management*, 31(3), 266–278. <https://doi.org/10.1080/09537325.2018.1495325>
- Nascimento, L. da S., da Costa Júnior, J. C., Salazar, V. S., & Chim-Miki, A. F. (2021). Coopetition in social entrepreneurship: a strategy for social value devolution. *International Journal of Emerging Markets*. <https://doi.org/10.1108/IJOEM-09-2020-1062>
- Neumeyer, X., Santos, S. C., & Morris, M. H. (2019). Who is left out: exploring social boundaries in entrepreneurial ecosystems. *The Journal of Technology Transfer*. <https://doi.org/10.1007/s10961-018-9694-0>
- Nicholls-Nixon, C. L., Valliere, D., Gedeon, S. A., & Wise, S. (2021). Entrepreneurial ecosystems and the lifecycle of university business incubators: An integrative case study. *International Entrepreneurship and Management Journal*, 17(2), 809–837. <https://doi.org/10.1007/s11365-019-00622-4>
- Olkiewicz, M., Wolniak, R., Eva-Grebski, M., & Olkiewicz, A. (2019). Comparative analysis of the impact of the business incubator center on the economic sustainable development of regions in USA and Poland. *Sustainability (Switzerland)*, 11(1). <https://doi.org/10.3390/su11010173>
- Paoloni, P., & Modaffari, G. (2022). Business incubators vs start-ups: a sustainable way of sharing knowledge. *Journal of Knowledge Management*, 26(5), 1235–1261. <https://doi.org/10.1108/JKM-12-2020-0923>
- Patton, D., Warren, L., & Bream, D. (2009). Elements that underpin high-tech business incubation processes. *Journal of Technology Transfer*, 34(6), 621–636. <https://doi.org/10.1007/s10961-009-9105-7>
- Perdomo Charry, G., Arias Pérez, J. E., & Lozada Barahona, N. E. (2014). Business incubator research: a review and future directions. *Revista Científica Pensamiento y Gestión*, 37(December 2016), 41–65.

- <https://doi.org/10.14482/pege.37.7020>
- Piazza, M., Mazzola, E., Abbate, L., & Perrone, G. (2019). Network position and innovation capability in the regional innovation network. *European Planning Studies*, 27(9), 1857–1878. <https://doi.org/10.1080/09654313.2019.1642856>
- Porter, M. E. (1985). *Competitive Advantage: Creating and Sustaining Superior Performance*. In *Studia Politica*. The Free Press.
- Ratinho, T., & Henriques, E. (2010). The role of science parks and business incubators in converging countries: Evidence from Portugal. *Technovation*, 30(4), 278–290. <https://doi.org/10.1016/j.technovation.2009.09.002>
- Redondo, M., & Camarero, C. (2019). Social Capital in University Business Incubators: dimensions, antecedents and outcomes. *International Entrepreneurship and Management Journal*, 15(2), 599–624. <https://doi.org/10.1007/s11365-018-0494-7>
- Redondo, M., Camarero, C., & van der Sijde, P. (2022). Exchange of knowledge in protected environments. The case of university business incubators. *European Journal of Innovation Management*, 25(3), 838–859. <https://doi.org/10.1108/EJIM-08-2020-0341>
- Rojas-Lamorena, Á. J., Del Barrio-García, S., & Alcántara-Pilar, J. M. (2022). A review of three decades of academic research on brand equity: A bibliometric approach using co-word analysis and bibliographic coupling. *Journal of Business Research*, 139, 1067–1083. <https://doi.org/10.1016/j.jbusres.2021.10.025>
- Salimi, N. (2021). How Does the Entrepreneurship Ecosystem Contribute to the Performance of Entrepreneurial Start-Up Firms? In J. Rezaei, M. Brunelli, & M. Mohammadi (Eds.), *Advance in Best-Worst Method: Proceedings of the Second International Workshop on Best-Worst Method (BWM2021)* (p. 297). Springer.
- Sansone, G., Andreotti, P., Colombelli, A., & Landoni, P. (2020). Are social incubators different from other incubators? Evidence from Italy. *Technological Forecasting and Social Change*, 158(July 2019), 120132. <https://doi.org/10.1016/j.techfore.2020.120132>
- Saraireh, S. A. M. (2021). The Role of Business Incubators in the Economic Development and Creativity in Jordanian Universities : Evidence from Mutah University. *Academic Journal of Interdisciplinary Studies*, 10(1), 266–282. <https://doi.org/DOI:https://doi.org/10.36941/ajis-2021-0023>
- Scarborough, N. M., & Cornwall, J. R. (2019). *Essentials of Entrepreneurship and Small Business Management* (Ninth Edit). Pearson Education Limited.
- Schwartz, M. (2009). Beyond incubation: an analysis of firm survival and exit dynamics in the post-graduation period. *The Journal of Technology Transfer*, 34(4), 403–421. <https://doi.org/10.1007/s10961-008-9095-x>
- Sedita, S. R., Apa, R., Bassetti, T., & Grandinetti, R. (2019). Incubation matters: Measuring the effect of business incubators on the innovation performance of start-ups. *R and D Management*, 49(4), 439–454. <https://doi.org/10.1111/radm.12321>
- Singh, V. K., Singh, P., Karmakar, M., Leta, J., & Mayr, P. (2021). The journal coverage of Web of Science, Scopus and Dimensions: A comparative analysis. *Scientometrics*, 126(6), 5113–5142. <https://doi.org/10.1007/s11192-021-03948-5>
- Slesarev, M. A. (2022). Business Incubators in Russia: 2020 Survey in International Comparative Perspective. *MGIMO Review of International Relations*, 15(4), 102–129. <https://doi.org/10.24833/2071-8160-2022-4-85-102-129>
- Soetanto, D., & Jack, S. (2016). The impact of university-based incubation support on the innovation strategy of academic spin-offs. *Technovation*, 50–51, 25–40. <https://doi.org/10.1016/j.technovation.2015.11.001>
- Stam, E., & Ven, A. Van de. (2021). Entrepreneurial ecosystem elements. In *Small Business Economics*. Springer. <https://doi.org/10.1007/s11187-019-00270-6>
- Stam, Erik, & van de Ven, A. (2021). Entrepreneurial ecosystem elements. *Small Business Economics*, 56(2), 809–832. <https://doi.org/10.1007/s11187-019-00270-6>
- Stayton, J., & Mangematin, V. (2019). Seed accelerators and the speed of new venture creation. *The Journal*

- of Technology Transfer*, 44(4), 1163–1187. <https://doi.org/10.1007/s10961-017-9646-0>
- Surana, K., Singh, A., & Sagar, A. D. (2020). Strengthening science, technology, and innovation-based incubators to help achieve Sustainable Development Goals: Lessons from India. *Technological Forecasting and Social Change*, 157(April), 120057. <https://doi.org/10.1016/j.techfore.2020.120057>
- Tan Luc, P., Xuan Lan, P., Nhat Hanh Le, A., & Thanh Trang, B. (2020). A Co-Citation and Co-Word Analysis of Social Entrepreneurship Research. *Journal of Social Entrepreneurship*, 13(3), 324–339. <https://doi.org/10.1080/19420676.2020.1782971>
- van Eck, N. J., & Waltman, L. (2014). Visualizing Bibliometric Networks. In Y. Ding, R. Rousseau, & D. Wolfram (Eds.), *Measuring Scholarly Impact* (pp. 285–320). Springer International Publishing. [https://doi.org/10.1007/978-3-319-10377-8\\_13](https://doi.org/10.1007/978-3-319-10377-8_13)
- van Werven, R., Bouwmeester, O., & Cornelissen, J. P. (2019). Pitching a business idea to investors: How new venture founders use micro-level rhetoric to achieve narrative plausibility and resonance. *International Small Business Journal: Researching Entrepreneurship*, 37(3), 193–214. <https://doi.org/10.1177/0266242618818249>
- Wang, Z., He, Q., Xia, S., Sarpong, D., Xiong, A., & Maas, G. (2020). Capacities of business incubator and regional innovation performance. *Technological Forecasting & Social Change*, 158. <https://doi.org/10.1016/j.techfore.2020.120125>
- Wu, W., Wang, H., & Wu, Y. J. (2021). Internal and external networks, and incubatees' performance in dynamic environments: entrepreneurial learning's mediating effect. *The Journal of Technology Transfer*, 46(6), 1707–1733. <https://doi.org/10.1007/s10961-020-09790-w>
- Zulkefly, N. A., Abdul Ghani, N., Chin, C. P. Y., Hamid, S., & Abdullah, N. A. (2022). The future of social entrepreneurship: modelling and predicting social impact. *Internet Research*, 32(2), 640–653. <https://doi.org/10.1108/INTR-09-2020-0497>
- Zupic, I., & Čater, T. (2015). Bibliometric Methods in Management and Organization. *Organizational Research Methods*, 18(3), 429–472. <https://doi.org/10.1177/1094428114562629>