

Knowledge-Based Entrepreneurship for Sustainable Economic Growth

David J. Teece

Professor, University of California, Berkeley, USA

Abstract

Knowledge-based entrepreneurship has emerged as a significant driver of sustainable economic growth by transforming intellectual resources, technological capabilities, and innovative ideas into valuable economic activities. Unlike traditional entrepreneurship models that primarily depend on physical resources and market opportunities, knowledge-based entrepreneurship relies on research, creativity, digital competencies, human capital, and continuous innovation. In contemporary economies, the ability to generate, utilize, and commercialize knowledge has become essential for improving productivity, strengthening competitiveness, and supporting long-term economic development. This research examines the role of knowledge-based entrepreneurship in promoting sustainable economic growth through innovation ecosystems, entrepreneurial learning, technology adoption, and value creation mechanisms. The study adopts a conceptual research approach by analysing existing theoretical perspectives and scholarly contributions related to knowledge economies, innovation-driven enterprises, and sustainable development. The analysis highlights that knowledge-oriented entrepreneurial activities contribute to economic resilience by encouraging high-value industries, employment generation, technological advancement, and efficient resource utilization.

The study further discusses major challenges affecting knowledge-based entrepreneurship, including limited access to innovation resources, inadequate entrepreneurial capabilities, financial constraints, and uneven digital infrastructure. The findings indicate that supportive policy frameworks, research collaboration, entrepreneurial education, and technology-enabled platforms are essential for creating sustainable entrepreneurial ecosystems. The paper concludes that knowledge-based entrepreneurship represents a strategic pathway for achieving inclusive economic growth by connecting human intelligence, technological innovation, and sustainable development objectives.

Keywords: Knowledge-Based Entrepreneurship, Sustainable Economic Growth, Innovation Ecosystem, Knowledge Economy, Entrepreneurial Development, Digital Transformation, Intellectual Capital.

1. Introduction

The global economic environment has experienced a fundamental transformation from resource-based production systems toward knowledge-driven economic structures. In traditional economic models, growth was mainly associated with physical capital, labour availability, and natural resources. However, contemporary economies increasingly depend on knowledge creation, technological innovation, research capabilities, and intellectual resources to achieve competitive advantage. This transformation has

positioned knowledge-based entrepreneurship as a critical mechanism for generating sustainable economic value through the development and commercialization of innovative ideas.

Knowledge-based entrepreneurship refers to entrepreneurial activities where knowledge, expertise, research outcomes, and technological capabilities serve as the primary foundations for business creation and expansion. These enterprises often emerge from scientific discoveries, digital innovations, creative solutions, and specialized expertise. Unlike conventional business models, knowledge-based ventures focus on continuous learning, innovation improvement, and adaptation to changing market conditions. Such characteristics make them particularly important for economies seeking sustainable growth in a rapidly changing technological environment.

The relationship between entrepreneurship and economic growth has been widely recognized in economic and management research. Entrepreneurial activities contribute to economic development by creating employment opportunities, increasing productivity, encouraging competition, and introducing innovative products and services. However, the increasing complexity of global challenges has shifted attention toward entrepreneurship models that integrate sustainability, technological advancement, and knowledge utilization. Knowledge-based entrepreneurship provides such an approach by combining innovation capacity with economic and social development objectives.

The expansion of digital technologies, artificial intelligence, data analytics, and global communication networks has further strengthened opportunities for knowledge-driven enterprises. Entrepreneurs can now access international markets, develop technology-enabled solutions, and collaborate across geographical boundaries. These developments have created new possibilities for start-ups, research-based enterprises, and innovation-oriented organizations to contribute significantly to economic transformation. However, successful knowledge-based entrepreneurship requires supportive ecosystems involving education institutions, research organizations, investors, policymakers, and industry stakeholders.

Sustainable economic growth requires more than short-term financial expansion; it demands productive systems capable of generating long-term value while addressing social and environmental concerns. Knowledge-based entrepreneurship contributes to this objective by promoting efficient resource utilization, encouraging green innovations, and developing solutions for emerging societal challenges. Therefore, understanding the mechanisms, opportunities, and limitations of knowledge-based entrepreneurship is essential for policymakers, researchers, and business leaders aiming to build resilient and sustainable economies.

2. Review of Literature

2.1 Evolution of Knowledge-Based Entrepreneurship

Knowledge-based entrepreneurship has developed as an important research area due to the increasing significance of knowledge resources in modern economic systems. Earlier entrepreneurship theories primarily emphasized risk-taking, market opportunities, and capital investment as the foundation of business development. However, contemporary perspectives highlight that knowledge, innovation capability, technological expertise, and intellectual assets have become essential resources for creating competitive and sustainable enterprises. The emergence of knowledge economies has changed the role of entrepreneurs from traditional business operators to innovation-oriented knowledge creators who identify opportunities through research, creativity, and technological advancement.

Drucker emphasized that knowledge has become a primary economic resource capable of generating productivity improvements and organizational transformation. According to knowledge-based economic perspectives, enterprises that effectively acquire, integrate, and apply knowledge are better positioned to achieve innovation leadership and long-term competitiveness. This approach has encouraged the development of entrepreneurial models where universities, research institutions, technology firms, and innovation networks contribute actively to business creation.

The evolution of digital technologies has further accelerated knowledge-based entrepreneurship by reducing barriers to information access and enabling entrepreneurs to develop scalable solutions. Digital platforms, cloud computing, artificial intelligence, and advanced analytics have created opportunities for knowledge-intensive ventures across different sectors. These developments have expanded entrepreneurship beyond conventional industries and created new possibilities in areas such as biotechnology, software development, renewable energy, financial technology, and advanced manufacturing.

2.2 Knowledge Economy and Sustainable Business Development

The knowledge economy represents an economic structure where innovation, information, and intellectual capabilities serve as major sources of value creation. Researchers have highlighted that sustainable economic development increasingly depends on the ability of societies and organizations to generate, distribute, and apply knowledge effectively. In this context, knowledge-based entrepreneurship acts as a connecting mechanism between innovation resources and market-oriented solutions.

Sustainable business development requires organizations to balance economic performance with environmental responsibility and social value creation. Knowledge-driven enterprises contribute to this objective by developing innovative technologies, improving operational efficiency, and creating solutions that address social and environmental challenges. For example, entrepreneurs using advanced research and digital technologies can develop clean energy systems, sustainable production methods, and resource-efficient business models.

The integration of knowledge management practices with entrepreneurship has become increasingly important for achieving sustainable growth. Organizations that promote continuous learning, research collaboration, and innovation culture are more capable of adapting to changing market environments. Therefore, knowledge-based entrepreneurship provides a foundation for developing resilient enterprises capable of supporting long-term economic progress.

2.3 Innovation Ecosystems and Entrepreneurial Growth

Innovation ecosystems play a significant role in strengthening knowledge-based entrepreneurship by connecting entrepreneurs with universities, investors, government agencies, research organizations, and industry partners. A supportive ecosystem enables entrepreneurs to access knowledge resources, technical expertise, financial support, and market opportunities required for business growth. Previous studies on entrepreneurial ecosystems indicate that successful knowledge-driven ventures rarely develop independently.

Instead, they emerge through collaborative networks where knowledge exchange and innovation partnerships facilitate the transformation of ideas into commercial outcomes. Universities and research

institutions particularly contribute by providing scientific knowledge, skilled human resources, and research-based innovations.

Government policies also influence the growth of knowledge-based entrepreneurship by establishing supportive regulations, funding mechanisms, innovation programs, and digital infrastructure. Economies that encourage entrepreneurship education, research investment, and technology adoption generally demonstrate stronger innovation capabilities. Thus, innovation ecosystems represent an essential foundation for promoting sustainable entrepreneurial development.

3. Objectives of the Study

The present study aims to examine the importance of knowledge-based entrepreneurship as a strategic approach for achieving sustainable economic growth. The research focuses on understanding how knowledge resources, innovation capabilities, and entrepreneurial practices contribute to economic development in technology-driven environments.

The major objectives of the study are:

- To analyse the conceptual relationship between knowledge-based entrepreneurship and sustainable economic growth.
- To examine the role of innovation, digital transformation, and intellectual capital in supporting knowledge-driven enterprises.
- To identify major challenges affecting the development and expansion of knowledge-based entrepreneurial ecosystems.
- To explore strategic approaches for strengthening knowledge-based entrepreneurship through education, policy support, and collaborative innovation networks.
- To evaluate the contribution of knowledge-intensive enterprises toward long-term economic sustainability and competitiveness.

4. Research Methodology

4.1 Research Design

This study adopts a conceptual research design based on qualitative analysis of existing academic literature, theoretical frameworks, and scholarly discussions related to knowledge-based entrepreneurship and sustainable economic growth. The conceptual approach is suitable for examining complex relationships between entrepreneurship, innovation systems, knowledge management, and economic development.

The research integrates insights from entrepreneurship studies, innovation management literature, economic development theories, and sustainability research. The study does not present primary survey data; instead, it develops an analytical understanding of how knowledge-driven entrepreneurial models influence sustainable economic outcomes.

4.2 Data Sources and Analytical Approach

The study is based on secondary information obtained from academic books, peer-reviewed research articles, entrepreneurship theories, innovation studies, and economic development literature. Relevant concepts were analysed to identify the relationship between knowledge creation, entrepreneurial activities, and sustainable growth.

A thematic analysis approach was applied to organize the reviewed concepts into major dimensions such as innovation capability, entrepreneurial learning, technology adoption, ecosystem development, and sustainability outcomes.

4.3 Conceptual Framework of the Study

The conceptual framework explains that knowledge resources act as the foundation of entrepreneurial innovation. These resources are transformed into business opportunities through entrepreneurial capabilities, technological applications, and supportive ecosystems. The resulting enterprises contribute to productivity improvement, employment generation, and sustainable economic development.

Table 1: Conceptual Relationship Between Knowledge-Based Entrepreneurship and Sustainable Growth

Knowledge-Based Element	Entrepreneurial Contribution	Sustainable Growth Outcome
Knowledge Creation	Development of innovative ideas and solutions	Improved competitiveness
Digital Capability	Technology-enabled business models	Higher productivity
Intellectual Capital	Efficient utilization of expertise	Long-term value creation
Innovation Ecosystem	Collaboration among stakeholders	Sustainable economic development

5. Analysis

5.1 Role of Knowledge Resources in Entrepreneurial Development

Knowledge resources have become a fundamental driver of entrepreneurial development by enabling individuals and organizations to identify opportunities, develop innovative solutions, and create competitive business models. In knowledge-based economies, entrepreneurial success depends not only on financial investment but also on the ability to generate, manage, and apply specialized knowledge. Entrepreneurs who effectively utilize research outcomes, technological expertise, and market intelligence are better positioned to develop products and services that meet evolving economic and social requirements.

Knowledge-based enterprises create value by converting intellectual resources into practical applications. These enterprises often operate in technology-intensive sectors where innovation speed, adaptability, and continuous learning determine long-term performance. The ability to combine scientific knowledge with entrepreneurial capabilities allows organizations to introduce advanced solutions, improve productivity, and respond effectively to market changes.

The analysis indicates that knowledge resources strengthen entrepreneurial activities through improved decision-making, innovation capability, and strategic flexibility. Entrepreneurs with strong knowledge capabilities are more capable of managing uncertainty, adopting emerging technologies, and developing sustainable business strategies.

5.2 Innovation Capability and Sustainable Economic Performance

Innovation capability represents a major component of knowledge-based entrepreneurship because it determines an enterprise’s ability to create new products, services, and operational approaches. Sustainable economic growth requires continuous innovation that improves productivity while reducing environmental and social challenges. Knowledge-driven enterprises contribute to this process by introducing advanced technologies, efficient production systems, and value-oriented solutions.

The relationship between innovation and economic sustainability can be understood through the ability of entrepreneurial organizations to generate higher-value economic activities. Innovation-oriented businesses often create employment opportunities, improve industrial competitiveness, and encourage knowledge exchange within economic systems. Start-ups and technology-based enterprises particularly contribute to economic transformation by introducing disruptive solutions and expanding emerging markets.

The analysis demonstrates that innovation capability is not developed independently. It requires investment in education, research infrastructure, digital technologies, and collaboration between different stakeholders. Therefore, sustainable economic growth depends on establishing environments where entrepreneurs can continuously develop and apply knowledge.

5.3 Impact of Knowledge-Based Enterprises on Economic Transformation

Knowledge-based enterprises contribute significantly to economic transformation by shifting economies from traditional production systems toward innovation-driven development models. These enterprises support the creation of high-skilled employment, technological advancement, and new market opportunities. Their contribution extends beyond financial outcomes by supporting social development and sustainable resource utilization.

The increasing importance of digital entrepreneurship has further expanded the influence of knowledge-based businesses. Digital platforms allow entrepreneurs to access global markets, collaborate internationally, and provide innovative solutions with relatively lower infrastructure requirements. This transformation has encouraged the growth of technology-based start-ups and knowledge-intensive industries.

Table 2: Contribution of Knowledge-Based Entrepreneurship to Sustainable Economic Growth

Development Dimension	Contribution of Knowledge-Based Entrepreneurship
Economic Growth	Creation of innovative industries and employment opportunities
Technological Advancement	Adoption and development of emerging technologies
Social Development	Improvement of services and accessibility
Environmental Sustainability	Promotion of resource-efficient solutions
Global Competitiveness	Strengthening innovation capacity

6. Challenges

6.1 Limited Access to Knowledge Infrastructure

One of the major challenges affecting knowledge-based entrepreneurship is unequal access to knowledge infrastructure. Successful knowledge-driven ventures require advanced educational systems, research facilities, digital connectivity, and innovation support mechanisms. However, many regions continue to experience limitations in these areas, restricting entrepreneurial opportunities and reducing participation in innovation-based economic activities.

The absence of strong knowledge infrastructure creates difficulties for entrepreneurs attempting to transform innovative ideas into commercially viable solutions. Limited access to research resources, technical expertise, and professional networks can slow down innovation processes and reduce competitiveness. Small and emerging entrepreneurs particularly face challenges in obtaining specialized knowledge required for business development.

Improving knowledge infrastructure requires coordinated efforts among governments, educational institutions, and private organizations. Investment in research capabilities, digital systems, entrepreneurship education, and technology access can strengthen the foundation required for knowledge-based entrepreneurial growth.

6.2 Financial Constraints and Commercialization Barriers

Knowledge-based enterprises often require significant investment for research, development, testing, and market expansion. Unlike traditional businesses, innovation-oriented ventures may experience longer development cycles before generating financial returns. This creates difficulties in attracting investment and maintaining operational stability during early stages.

Many entrepreneurs possess innovative ideas but face challenges in converting these ideas into successful commercial products. Limited access to venture capital, insufficient financial support programs, and inadequate market connections can restrict the growth potential of knowledge-driven enterprises. These barriers are particularly significant for research-based start-ups and technology-intensive ventures.

5. Analysis

5.1 Role of Knowledge Resources in Entrepreneurial Development

Knowledge resources have become a fundamental driver of entrepreneurial development by enabling individuals and organizations to identify opportunities, develop innovative solutions, and create competitive business models. In knowledge-based economies, entrepreneurial success depends not only on financial investment but also on the ability to generate, manage, and apply specialized knowledge.

Entrepreneurs who effectively utilize research outcomes, technological expertise, and market intelligence are better positioned to develop products and services that meet evolving economic and social requirements.

Knowledge-based enterprises create value by converting intellectual resources into practical applications. These enterprises often operate in technology-intensive sectors where innovation speed, adaptability, and continuous learning determine long-term performance. The ability to combine scientific knowledge with entrepreneurial capabilities allows organizations to introduce advanced solutions, improve productivity, and respond effectively to market changes.

The analysis indicates that knowledge resources strengthen entrepreneurial activities through improved decision-making, innovation capability, and strategic flexibility. Entrepreneurs with strong knowledge capabilities are more capable of managing uncertainty, adopting emerging technologies, and developing sustainable business strategies.

5.2 Innovation Capability and Sustainable Economic Performance

Innovation capability represents a major component of knowledge-based entrepreneurship because it determines an enterprise’s ability to create new products, services, and operational approaches. Sustainable economic growth requires continuous innovation that improves productivity while reducing environmental and social challenges. Knowledge-driven enterprises contribute to this process by introducing advanced technologies, efficient production systems, and value-oriented solutions.

The relationship between innovation and economic sustainability can be understood through the ability of entrepreneurial organizations to generate higher-value economic activities. Innovation-oriented businesses often create employment opportunities, improve industrial competitiveness, and encourage knowledge exchange within economic systems. Start-ups and technology-based enterprises particularly contribute to economic transformation by introducing disruptive solutions and expanding emerging markets.

The analysis demonstrates that innovation capability is not developed independently. It requires investment in education, research infrastructure, digital technologies, and collaboration between different stakeholders. Therefore, sustainable economic growth depends on establishing environments where entrepreneurs can continuously develop and apply knowledge.

5.3 Impact of Knowledge-Based Enterprises on Economic Transformation

Knowledge-based enterprises contribute significantly to economic transformation by shifting economies from traditional production systems toward innovation-driven development models. These enterprises support the creation of high-skilled employment, technological advancement, and new market opportunities. Their contribution extends beyond financial outcomes by supporting social development and sustainable resource utilization.

The increasing importance of digital entrepreneurship has further expanded the influence of knowledge-based businesses. Digital platforms allow entrepreneurs to access global markets, collaborate internationally, and provide innovative solutions with relatively lower infrastructure requirements.

Table 2: Contribution of Knowledge-Based Entrepreneurship to Sustainable Economic Growth

Development Dimension	Contribution of Knowledge-Based Entrepreneurship
Economic Growth	Creation of innovative industries and employment opportunities
Technological Advancement	Adoption and development of emerging technologies
Social Development	Improvement of services and accessibility
Environmental Sustainability	Promotion of resource-efficient solutions
Global Competitiveness	Strengthening innovation capacity

6. Challenges

6.1 Limited Access to Knowledge Infrastructure

One of the major challenges affecting knowledge-based entrepreneurship is unequal access to knowledge infrastructure. Successful knowledge-driven ventures require advanced educational systems, research facilities, digital connectivity, and innovation support mechanisms. However, many regions continue to experience limitations in these areas, restricting entrepreneurial opportunities and reducing participation in innovation-based economic activities.

The absence of strong knowledge infrastructure creates difficulties for entrepreneurs attempting to transform innovative ideas into commercially viable solutions. Limited access to research resources, technical expertise, and professional networks can slow down innovation processes and reduce competitiveness. Small and emerging entrepreneurs particularly face challenges in obtaining specialized knowledge required for business development.

Improving knowledge infrastructure requires coordinated efforts among governments, educational institutions, and private organizations. Investment in research capabilities, digital systems, entrepreneurship education, and technology access can strengthen the foundation required for knowledge-based entrepreneurial growth.

6.2 Financial Constraints and Commercialization Barriers

Knowledge-based enterprises often require significant investment for research, development, testing, and market expansion. Unlike traditional businesses, innovation-oriented ventures may experience longer development cycles before generating financial returns. This creates difficulties in attracting investment and maintaining operational stability during early stages.

Many entrepreneurs possess innovative ideas but face challenges in converting these ideas into successful commercial products. Limited access to venture capital, insufficient financial support programs, and inadequate market connections can restrict the growth potential of knowledge-driven enterprises. These barriers are particularly significant for research-based start-ups and technology-intensive ventures.

Addressing commercialization challenges requires stronger connections between entrepreneurs, investors, research institutions, and industry partners. Effective funding mechanisms, innovation grants, and entrepreneurial mentoring programs can support the transition from knowledge creation to market application.

6.3 Skill Gaps and Changing Technological Requirements

Rapid technological advancement has increased the demand for advanced skills and continuous learning. Entrepreneurs must continuously update their knowledge regarding digital technologies, market trends, business strategies, and innovation practices. However, skill gaps remain a significant challenge in developing effective knowledge-based enterprises.

Educational institutions often face difficulties in aligning academic programs with rapidly changing industry requirements. The absence of practical entrepreneurial training and technology-oriented learning opportunities can limit the ability of individuals to participate effectively in knowledge-driven economies.

Developing lifelong learning systems, industry-academic collaboration, and entrepreneurial education programs is essential for reducing skill gaps. A skilled workforce enables entrepreneurs to utilize knowledge resources effectively and contributes to sustainable economic development.

7. Discussion

7.1 Knowledge-Based Entrepreneurship as a Driver of Economic Sustainability

The findings of the study indicate that knowledge-based entrepreneurship represents a powerful mechanism for achieving sustainable economic development. Unlike traditional entrepreneurship models focused mainly on resource utilization and market expansion, knowledge-based entrepreneurship emphasizes innovation, creativity, and intellectual capability. This approach enables enterprises to generate long-term economic value while responding to technological and social changes.

Knowledge-driven enterprises contribute to sustainability by developing efficient technologies, improving productivity, and creating employment opportunities based on advanced skills. Their ability to integrate knowledge with entrepreneurial action allows economies to move toward innovation-oriented growth models. Such transformation is particularly important in an environment where technological disruption and global competition continue to influence economic structures.

7.2 Strengthening Entrepreneurial Ecosystems for Future Growth

A strong entrepreneurial ecosystem is essential for maximizing the benefits of knowledge-based entrepreneurship. Collaboration between universities, industries, governments, investors, and entrepreneurs creates opportunities for knowledge exchange and innovation development. These partnerships support the transformation of research ideas into practical economic solutions.

Policy frameworks also play an important role in strengthening knowledge-based entrepreneurial ecosystems. Supportive regulations, research incentives, digital infrastructure development, and entrepreneurship education programs can encourage innovation-driven business activities. Economies that invest in knowledge creation and entrepreneurial capabilities are more likely to achieve sustainable and inclusive growth.

8. Conclusion

Knowledge-based entrepreneurship has become an important pathway for achieving sustainable economic growth by connecting knowledge creation, innovation capabilities, and entrepreneurial activities. The study highlights that modern economic development increasingly depends on the ability of individuals and organizations to transform intellectual resources into valuable products, services, and solutions. Knowledge-driven enterprises contribute not only to economic expansion but also to technological progress, employment generation, and sustainable development.

The analysis demonstrates that innovation capability, digital transformation, intellectual capital, and supportive entrepreneurial ecosystems are essential factors influencing the success of knowledge-based ventures. However, challenges related to infrastructure limitations, financial barriers, and skill gaps continue to restrict the full potential of knowledge-driven entrepreneurship. Addressing these challenges requires coordinated efforts from governments, educational institutions, industries, and innovation stakeholders.

Future economic development will increasingly depend on societies' ability to create and utilize knowledge effectively. By strengthening research systems, promoting entrepreneurial education, improving technology access, and encouraging innovation collaboration, economies can develop more resilient and sustainable growth models. Knowledge-based entrepreneurship therefore represents not only a business strategy but also a broader framework for building future-oriented and inclusive economies.

References

1. Acs, Z. J., Braunerhjelm, P., Audretsch, D. B., & Carlsson, B. (2009). The knowledge spillover theory of entrepreneurship. *Small Business Economics*, 32(1), 15–30. <https://doi.org/10.1007/s11187-008-9157-3>
2. Agarwal, R., Audretsch, D., & Sarkar, M. B. (2007). The process of creative construction: Knowledge spillovers, entrepreneurship, and economic growth. *Strategic Entrepreneurship Journal*, 1(3–4), 263–286.
3. Audretsch, D. B. (2007). The theory of knowledge spillover entrepreneurship. *Journal of Management Studies*, 44(7), 1242–1254. <https://doi.org/10.1111/j.1467-6486.2007.00722.x>
4. Audretsch, D. B., & Keilbach, M. (2008). Resolving the knowledge paradox: Knowledge-spillover entrepreneurship and economic growth. *Research Policy*, 37(10), 1697–1705. <https://doi.org/10.1016/j.respol.2008.08.008>
5. Audretsch, D. B., & Belitski, M. (2021). The role of R&D and knowledge in regional entrepreneurship. *Regional Studies*, 55(5), 825–839.
6. Audretsch, D. B., & Belitski, M. (2022). Entrepreneurial ecosystems in cities: Establishing the framework conditions. *Journal of Technology Transfer*, 47, 1–24.
7. Audretsch, D. B., & Fiedler, A. (2024). Bringing the knowledge spillover theory of entrepreneurship to circular economies: Knowledge and values in entrepreneurial ecosystems. *International Small Business Journal*, 42(4). <https://doi.org/10.1177/02662426231218357>
8. Audretsch, D. B., Belitski, M., Fiedler, A., & Khlystova, O. (2025). Five research themes of knowledge spillover theory of entrepreneurship: An analysis of 30 years of research. *International Journal of Management Reviews*, 27(4), 544–561. <https://doi.org/10.1111/ijmr.70000>
9. Bertello, A., Battisti, E., De Bernardi, P., & Bresciani, S. (2022). An integrative framework of knowledge-intensive and sustainable entrepreneurship in entrepreneurial ecosystems. *Journal of Business Research*, 142, 683–693. <https://doi.org/10.1016/j.jbusres.2021.12.054>
10. Braunerhjelm, P., Acs, Z. J., Audretsch, D. B., & Carlsson, B. (2010). The missing link: Knowledge diffusion and entrepreneurship in endogenous growth. *Small Business Economics*, 34(2), 105–125.
11. Carlsson, B., Acs, Z. J., Audretsch, D. B., & Braunerhjelm, P. (2009). Knowledge creation, entrepreneurship, and economic growth: A historical review. *Industrial and Corporate Change*, 18(6), 1193–1229.
12. Guerrero, M., Amorós, J. E., & Urbano, D. (2019). Entrepreneurial ecosystems and economic development: The role of knowledge and innovation. *Small Business Economics*, 53, 1–18.
13. Huggins, R., & Thompson, P. (2015). Entrepreneurship, innovation and regional growth: A network approach. *Small Business Economics*, 45(1), 103–128.



14. Malerba, F., & McKelvey, M. (2020). Knowledge-intensive innovative entrepreneurship: The role of innovation systems. *Small Business Economics*, 54, 503–522.
15. Stam, E., & Spigel, B. (2016). Entrepreneurial ecosystems. In R. Blackburn, D. De Clercq, & J. Heinonen (Eds.), *The SAGE handbook of small business and entrepreneurship* (pp. 407–422). SAGE.
16. Stam, E., & van de Ven, A. (2021). Entrepreneurial ecosystem elements. *Small Business Economics*, 56(2), 809–832. <https://doi.org/10.1007/s11187-019-00270-6>
17. Autio, E., Nambisan, S., Thomas, L. D. W., & Wright, M. (2018). Digital affordances, spatial affordances, and the genesis of entrepreneurial ecosystems. *Strategic Entrepreneurship Journal*, 12(1), 72–95. <https://doi.org/10.1002/sej.1266>
18. Nambisan, S., Wright, M., & Feldman, M. (2019). The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes. *Research Policy*, 48(8), 103773. <https://doi.org/10.1016/j.respol.2019.03.018>
19. Ratten, V. (2020). Coronavirus (COVID-19) and entrepreneurship: Changing life and work landscape. *Journal of Small Business & Entrepreneurship*, 32(5), 503–516.
20. Belitski, M., Guenther, C., & Kritikos, A. S. (2021). Economic effects of entrepreneurship and innovation in knowledge-based economies. *Small Business Economics*, 56, 1–15.