



How Entrepreneurial Universities Drive Economic Growth? A literature Review

Kardiyem Kardiyem^{1*}, Bandi Bandi², Susilaningsih Susilaningsih³, Fery Setyowibowo⁴

^{1,2,3,4} Sebelas Maret University, Surakarta, Central Java, Indonesia
*kardiyem@student.uns.ac.id

Abstract. The role of the University has been transformed, namely focusing on education, research and supporting economic globalization. Universities are shifting from traditional to entrepreneurial roles. This study aims to discuss current issues regarding entrepreneurial universities. The focus is on the importance of universities in economic growth. This study uses a literature review approach. There are 30 relevant articles reviewed collected from Google Scholar. Articles are open access, full text journals, and indexed journals with publication dominance in the last 10 years (2014-2023). The search for articles took place from 29 June - 1 July 2023. The findings show that universities have a strategic role as a driver of economic growth. Entrepreneur university is carried out through teaching, research and entrepreneurship activities. Teaching activities function to develop entrepreneurial mindset and effects related to the determinants of the production function. Furthermore, using endogenous growth theory, these effects can be converted into economic growth factors. At entrepreneurial universities, research results are seen as knowledge capital whose results will be commercialized for use by industry players. Entrepreneurial capital is also needed to analyze market opportunities. Without entrepreneurial capital, the transformation and commercialization of knowledge will be difficult. Therefore, there must be coherence between knowledge capital and entrepreneurial capital. Thus the development of teaching and research functions, as well as technology transfer through linkages with industry and the dissemination of entrepreneurial thinking among the academic community and entrepreneurial universities have created an innovation infrastructure that has a positive impact on economic growth.

Keywords: Education, Entrepreneurial University, Economic Growth.

1 Introduction

In the concept of macroeconomics, economic growth is typically related to factors such as investment, technology, capital, health, and education. Education is an important factor for sustainable economic growth. Discussing education cannot be separated from university. Universities in Indonesia are currently faced with three challenges. The first challenge is environmental and social challenges as well as an uncertain and complex situation caused by the rapid advancement of technology. Universities are expected to be able to produce educational output that meets the needs of the wider community in accordance with ever-changing social dynamics, and provide acceleration for social welfare [1]. This situation requires higher education to be able to survive by developing a knowledge-based economy and constantly innovating and expanding their capacity to provide research with added value.

The second challenge comes from the decision to change university status. The change from State Higher Education Institution of Public Service Agency or State Higher Education Institution of Public Service Agency (PTN-BLU) to State Higher Education Institution of Incorporated Legal Entity or State Higher Education Institution of Legal Entity (PTN BH) results in a shift in university's responsibilities. PTN BH status allows a university to have independent governance in terms of making decisions, managing money, selecting/dismissing lecturers as well as educational personnel, arranging/ending study programs, generating endowments, and forming commercial organizations. As a result of this regulation, a university must establish a corporate organization to fund a variety of activities. Because of the reduction in public funding, universities have been obliged to seek new economic resources. This means that students and the government are no longer the main source of funding for a university. The third challenge is related to the role of universities as creators of human capital and drivers of economic growth in a country. All the challenges have an impact on the transformation of the role of a university.

In recent years, there has been a transformation in the role of universities which do not only focus on education and research but also focus on the important role in supporting economic globalization. University is transitioning from traditional to entrepreneurial roles.[2] define three characteristics of an entrepreneurial university: first, having goals, including creating knowledge, application, and knowledge exploitation. Second, having the function of organizational function as departments, such as faculties, laboratories, as well as research centers, and having the function as service transfer support, which consists of business incubators and spin off companies. Third, Having not only normal academic activities, but also research commercialization. This opinion is in line with [3], [4]that currently the university is focusing on playing an important role in terms of science and technology-based economic development as well as an entrepreneurial university. At this point, a university is regarded as the main factor in creating economic growth, competitiveness, and creation of wealth in this modern world.

The entrepreneurial university is a new concept that is gaining attention and interest among scientific professionals in comparison to other management and business disciplines [5]. The conception and significance of the new view of entrepreneurial universities in economic knowledge, especially in terms of the transformation/reform of universities, have involved the influence of the social and innovation ecosystem as well as entrepreneurial university 's sustainability [6]. The concept of an entrepreneurial university is becoming popular among universities, especially for analyzing the economic contribution of a university to society [7] [8] [9]. Entrepreneurial university practices that have been developing so far include ownership of entrepreneurship programs, business incubators, applied research centers, collaborations with the business sector to help start-up creation, technology transfer, and knowledge-based innovation. Knowledge and skills possessed by human resources in universities are used to produce a work that has selling value.

Over the last three decades, the expansion of entrepreneurship and other commercial operations by academic institutions has fueled an increase in the number of scientific research [2]. In fact, the study of entrepreneurship 's level in universities is still debatable, considering the backgrounds and skills of those who work in the educational institution. This can be seen in an attitude that is sometimes skeptical about the ability

of universities to become entrepreneurs, given the fact that the government gives a lot of funding assistance for universities [10]. According to [11] the commercialization of scientific research findings plays a critical role in public and academic discourse, and entrepreneurial universities are seen as the primary phenomenon that emerges due to economic exploitation of research findings. In this regard, the role of entrepreneurial universities in economic growth, i.e. developing a knowledge-based and innovative economy through social innovation, has become a major topic in academia, business, management, research & development, and policy-making debates about the potential to leverage knowledge and innovation to generate wealth and marketability. [12]. In contrast to the opinion of [13] he sees clear opportunities towards entrepreneurial university due to the continuous efforts to seek new knowledge and ideas. These opportunities tend to give other opportunities to the development of surrounding cities near the university as the pioneers in using the scientific knowledge for regional business and progress. In line with the results of [14] entrepreneurial universities increasing dialogue between education and science for sustainable development.

The creation of an entrepreneurial university begins with the construction of successful interactions among all players in the knowledge triangle: education, science, and business. When evaluated through the lens of macroeconomic analysis, the emergence of entrepreneurial universities attracts attention. Based on the problems explained above, it can be researched more about the role of entrepreneurial universities in economic growth. This study is also based on the findings of [10] which suggest to conduct research related to entrepreneurial universities and global economic growth. In particular, it is critical to study how entrepreneurial university activities might be turned into the primary production factors that contribute to long-term social and economic growth [15]; [16, 17].

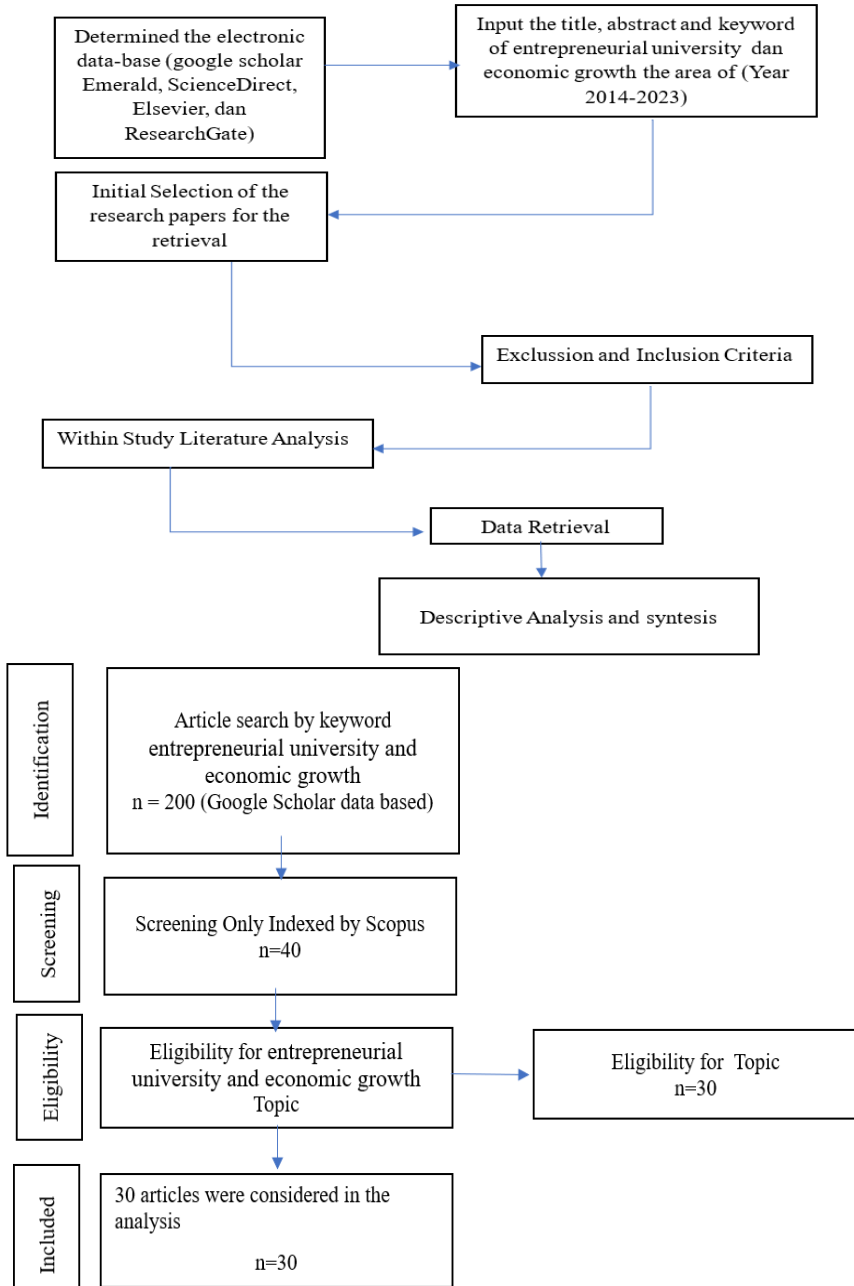
This study attempts to analyze the previous research related to the entrepreneurial university and its role in driving economic growth. It is hoped that this study would help higher education use the entrepreneurial university conceptual framework to enhance economic growth.

2 Methodology

This study uses a literature review approach to present a comprehensive picture of how an entrepreneurial university can boost economic growth. The author of this study search and analyze empirical studies from various sources such as scholarly journals, books, and other publications on the issue of entrepreneurial universities and economic growth. Using relevant keywords, the search for the previous studies is undertaken through Google Scholar as academic databases. The articles used are open access, full text journals, and indexed journals with publications dominated for the last 10 years (2014-2023) and are relevant to the topic being studied. The search of the articles took place between June 29 and July 1, 2023. The total number of articles reviewed is 30 articles. The analysis in this literature review is divided into four steps: 1) locating and gathering relevant information on how entrepreneurial universities might contribute to increasing economic growth; 2) Reducing and categorizing the collected materials to suit the topics discussed; 3) Analyzing information obtained in depth to gain insight

from the collected material ; 4) Presenting the final conclusion as the closing stage of the literature review process. The steps taken are shown in Figures 1 and 2 below:

Fig. 1. Stages of Literature Study



3 Results and Discussion

The core activities of universities are universally teaching and research, but universities are currently undergoing internal transformation to adapt to external conditions and legitimize their role in the economy, giving rise to a new type of university known as an entrepreneurial university [15, 18, 19]. Entrepreneurship is one of the most important main tools in the restructuring of any university that wants to be able to compete, develop, and grow over time, while maintaining the fundamental values of the university's academic role [20]. Based on this perspective, this special discussion focuses on entrepreneurial universities in a regional context and examines the effectiveness of innovative entrepreneurial orientation in meeting the societal needs in a sustainable way that drives economic growth.

The new discourse on the presence of an entrepreneurial university basically does not only have an impact on the emergence of a new format of university, namely PTN BH.[21] argues that the spread of entrepreneurial universities is caused by an imbalance between high society demands (demand overload) and the limited capabilities of a university to respond. Furthermore, [21] provides three crucial aspects in creating an entrepreneurial university: strengthening the core management of universities, increasing the role of peripheral universities, and financing-based diversification. All of this is intended to help universities improve their ability to discover sources of finances to support the implementation of education on their own. When a university pursues money on its own, it means that the role of the university is transformed. This transformation occurs as traditional universities shift their concentration from teaching to a new knowledge-based economy that leads to the commercialization of research findings. According to [22], when public funding is reduced, the nature of universities changes, sparking public discussion over the role of universities in society. The relevant point of the discussion is the increasing emphasis on the commercialization of university research, particularly in broadening commercialization beyond the traditional focus on innovation licensing [23]. According to [24] the essence of the paradigm changes that a university must face is the need to shift from an individual-based university that emphasizes the development of science and research to a university that prioritizes social aspects by prioritizing knowledge sharing. Many universities throughout the globe have adopted adjustments toward an entrepreneurial university over the last two decades [25]. The visualization of the paradigm changes in a university by [24] can be shown in Figure 1 below:

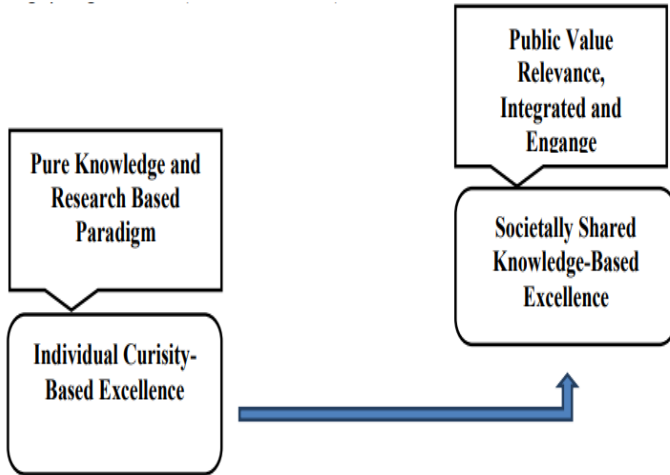


Fig. 3. Paradigm Changes in Higher Education

Examining universities from an economic perspective is closely tied to macroeconomic theory because universities generate human capital, which is one of the variables that contribute to economic growth. According to endogenous economic theory [26], [27] investment in knowledge and human resources increase economic growth both directly and indirectly through 'knowledge spillover'. [28] extends endogenous economic theory by proposing the knowledge spillover theory of entrepreneurship, which argues that knowledge creation can cause an overflow of knowledge, creating technological opportunities. Furthermore, the knowledge spillover theory of entrepreneurship proposes an essential role in the transmission channel of the knowledge spillover, eventually contributing to a better understanding of the development processes of a knowledge-based economy.

Universities play an important role in the entrepreneurial innovation ecosystem because they strengthen political strategies to drive economic growth through innovation and entrepreneurial activities, particularly in developing countries [29]. Entrepreneurial universities are becoming increasingly popular across the world, serving as engines for regional economic growth. The strategic position of the university at the intersection of teaching, research, and knowledge transfer is the key for the university to become an agent of innovation and entrepreneurship. At present, [30] confirms that a university is widely acknowledged as an important instrument in promoting a knowledge-based economy. Universities and research institutes, where much knowledge is created, are viewed as vital catalysts for economic and social development through the formation of new innovative companies that contribute value through knowledge creation. In this context, entrepreneurial universities play a central role, in line with the 3 demands of the university's mission, namely teaching, research, and entrepreneurship activities. Based on endogenous growth theory [26][27], the outcomes of these three activities may be converted into economic growth factors [31] in the long term and have a beneficial influence on the economy and society in [32] a [33] certain area. To do so, [17] argues that an entrepreneurial university needs

to become an entrepreneurial organization, its university community needs to become an entrepreneur, and its interactions with the society surroundings need to follow entrepreneurial patterns.

In essence, the application of an entrepreneurial university through teaching, research, [34][35]and entrepreneurship [16] can be done by developing an entrepreneurial perspective in learning and teaching. The outcomes of these missions are linked to production function variables such as human capital, knowledge, social capital, and entrepreneurship [19]. Furthermore, using endogenous growth theory, these findings may be converted into factors of economic growth [36], [37]. The findings of research conducted by [19] that teaching activities, research, and entrepreneurial activities have a role in economic growth. Academic entrepreneurship and economic growth are intertwined, and universities prepare professors for academic-industry partnerships on research and technology projects [38]. Visually, figure 2 illustrates the role of entrepreneurial universities in driving economic growth:

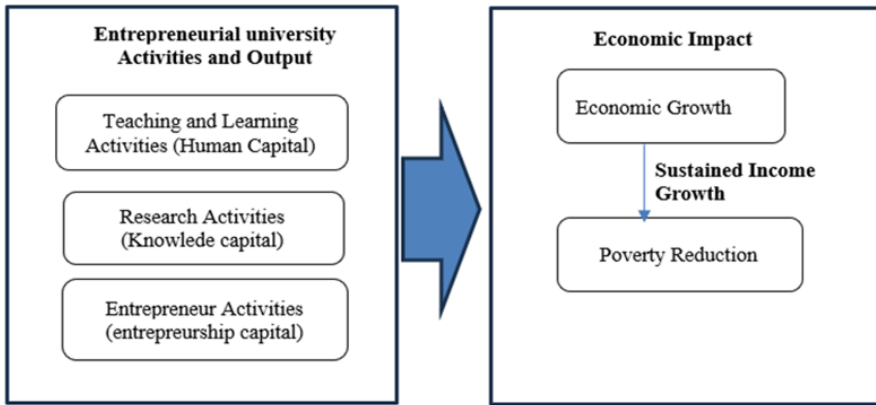


Fig. 4. The channels of effect of entrepreneurial universities to economic growth Modified from Guerrero and Urbano (2012)

Through teaching activities, universities can contribute to the development of a more creative society. Another thing that can be done in teaching activities is to study using a new approach such as hybrid or blended learning which blends lessons in traditional classes with online material. Learning must be provided in an engaging and interactive manner in order to attract students' interest in entrepreneurship, particularly early semester students. According to [39], the development of entrepreneurial knowledge begins in the university context. Creative teaching activities will generate human capital with the aim of becoming an entrepreneur. Fulfillment of entrepreneurship can be effectively achieved if you are able to plan entrepreneurial learning activities that are well patterned and structured in a guideline with the aim of producing independent and professional business entrepreneurs [40]. As a result, entrepreneurial universities have the potential to influence the economic concept of human capital. In macroeconomics, human capital is considered a factor of production by [26], referring to the stock of competences, knowledge, abilities, and skills gained through education and training [41].

Apart from being a form of scientific development, research activities at universities are also an arena for expressing thoughts, concepts, and innovations in order to tackle societal problems. This activity also demonstrates the university's involvement to bring about good change in a variety of sectors. New findings are research results that are beneficial to the development of science and society as a whole. At an entrepreneurial university, research output is viewed as both knowledge development and knowledge capital [42]. Universities are no longer viewed as 'isolated knowledge islands', but rather as institutions that are increasingly interacting with external partners through business activities [42] this means that commercialization of research and collaboration with industry are critical for modern institutions. In line with [43], that entrepreneurial university is characterized by an increasingly complex mix of public-private involvement. In the global knowledge-based economy, universities act as agents for the creation of intellectual property rights. Science and technological innovation are explored through research activities, and the findings are commercialized for use by industry players. In line with the findings of [44] who conducted a bibliometric analysis based on 78 papers on entrepreneurial universities using the Web of Knowledge database, universities as a structure are becoming increasingly oriented to the commercialization of knowledge. One of the interesting findings of this study is that research activities at most UK universities have contributed the most to economic growth.

Along with the university's traditional mission of teaching and research, [45] it incorporates a third goal, entrepreneurship, which focuses on contributing to economic and social growth [46]. Several entrepreneurship studies have shown that the emergence of entrepreneurship in universities may boost innovation, job creation, and economic development. Entrepreneurial activities, in general, generate output in the form of entrepreneurial capital. In the context of an entrepreneurial university, the meaning of entrepreneurial capital refers to the availability and utilization of entrepreneurial resources by universities and stakeholders in creating, transforming and commercializing knowledge as well as developing a productive entrepreneurial ecosystem. The role of entrepreneurial capital is needed to analyze market opportunities or needs. Without entrepreneurship capital, knowledge transformation and knowledge commercialization will be difficult to do. Therefore, there must be coherence between knowledge capital and entrepreneurship capital in practice. When combined with the capacity to read current opportunities, qualified applied research capabilities will produce findings that are in line with industry needs. Then, what is no less important in implementing entrepreneurship is strengthening business orientation which has been formulated as a target to be achieved by a business unit. Success is controlled by the entrepreneur based on the formulated orientation [47]. [45] suggested that if the business model intends to establish applied research skills to anticipate and deal with market possibilities, the intertwine between knowledge capital and entrepreneurship capital might have a substantial influence on the success of knowledge commercialization. Entrepreneurship capital is anticipated to produce and assist the development and growth of new start-ups at a university, hence influencing economic growth. This is in line with the conclusions of the study [48] that the development of teaching and research functions, as well as technology transfer through linkages with industry and the dissemination of entrepreneurial thinking in entrepreneurial academic communities and universities, have resulted in the creation of an innovation

infrastructure with numerous positive effects on microeconomic and macroeconomic development.

4 Conclusion

The study of the topic 'university' from an economic perspective is closely related to macroeconomic theory because universities generate human capital, which is one of the factors in economic growth. The knowledge spillover theory of entrepreneurship is a recent development of endogenous economic theory that posits that knowledge creation may lead to knowledge overflow and technological opportunities. Universities play an important role in the entrepreneurial innovation ecosystem as they strengthen political strategies to boost economic growth through innovation and entrepreneurship. Entrepreneurial universities are gaining popularity around the world, serving as engines for regional economic growth. The strategic position of the university at the intersection of teaching, research, and knowledge transfer is critical for a university to become an agent of innovation and entrepreneurship. Entrepreneurial university implementation is carried out through teaching, research, and entrepreneurship activities. Teaching activities serve to develop an entrepreneurial mindset in learning and teaching. The outcomes of these missions are related to the determinants of the production function, for example, human capital, knowledge, social capital and entrepreneurship. Furthermore, these results can be converted into the factors of economic growth based on endogenous growth theory. At an entrepreneurial university, research output is not only seen as knowledge development but also as knowledge capital. Science and technological innovation are explored through research activities, and the findings are commercialized for use by industry players. The role of entrepreneurial capital is needed to analyze market opportunities or needs. Without entrepreneurship capital, knowledge transformation and knowledge commercialization will be difficult to do. Therefore, in reality there must be coherence between knowledge capital and entrepreneurship capital. Through the development of teaching and research functions, as well as the transfer of technology through linkages with industry and the dissemination of entrepreneurial thinking in the academic community, the entrepreneurial university has created an innovation infrastructure, with many positive effects on economic growth.

References

1. Budiyanto, dan S., Tetap Program Studi Pendidikan Akuntansi, D., Tetap Program Studi Pendidikan Akuntansi Universitas Muhammadiyah Surakarta JIAYani Tromol Pos, D., Surakarta, P.: Membidik Mahasiswa sebagai Calon Wirausahawan. *Jurnal Pendidikan Ilmu Sosial*. 25, (2015)
2. Chang, Y.C., Yang, P.Y., Martin, B.R., Chi, H.R., Tsai-Lin, T.F.: Entrepreneurial universities and research ambidexterity: A multilevel analysis. *Technovation*. 54, 7–21 (2016). <https://doi.org/10.1016/j.technovation.2016.02.006>
3. Fayolle, A., Redford, D.T.: Introduction: Towards more entrepreneurial universities - myth or reality? (2014)

4. Mian, S.A.: University's involvement in technology business incubation: what theory and practice tell us? (2011)
5. Markin, E., Swab, R.G., Marshall, D.R.: Who is driving the bus? An analysis of author and institution contributions to entrepreneurship research. *Journal of Innovation and Knowledge*. 2, 1–9 (2017). <https://doi.org/10.1016/j.jik.2016.10.001>
6. Cai, Y., Ahmad, I.: From an Entrepreneurial University to a Sustainable Entrepreneurial University: Conceptualization and Evidence in the Contexts of European University Reforms. *Higher Education Policy*. 36, 20–52 (2023). <https://doi.org/10.1057/s41307-021-00243-z>
7. Leisyte, L., Horta, H.: Introduction to a special issue: Academic knowledge production, diffusion and commercialization: Policies, practices and perspectives. *Sci Public Policy*. 38, (2011). <https://doi.org/10.3152/030234211X12960315267697>
8. Audretsch, D.B., Lehmann, E.E., Wright, M.: Technology transfer in a global economy. *Journal of Technology Transfer*. 39, 301–312 (2014). <https://doi.org/10.1007/s10961-012-9283-6>
9. Etzkowitz, H., Dzisah, J., Clouser, M.: Shaping the entrepreneurial university: Two experiments and a proposal for innovation in higher education. *Industry and Higher Education*. 36, (2022). <https://doi.org/10.1177/0950422221993421>
10. Ratten, V.: Entrepreneurial universities: the role of communities, people and places. *Journal of Enterprising Communities*. 11, 310–315 (2017). <https://doi.org/10.1108/JEC-03-2017-0021>
11. Vesperi, W., Gagnidze, I.: Rethinking the university system: toward the entrepreneurial university (the case of Italy). *Kybernetes*. 50, 2021–2041 (2019). <https://doi.org/10.1108/K-12-2018-0662>
12. Heaton, S., Lewin, D., Teece, D.J.: Managing campus entrepreneurship: Dynamic capabilities and university leadership. *Managerial and Decision Economics*. 41, 1126–1140 (2020). <https://doi.org/10.1002/mde.3015>
13. Gianiodis, P.T., Markman, G.D., Panagopoulos, A.: Entrepreneurial universities and overt opportunism. *Small Business Economics*. 47, 609–631 (2016). <https://doi.org/10.1007/s11187-016-9753-6>
14. Gagnidze, I.: The role of international educational and science programs for sustainable development (systemic approach). *Kybernetes*. 47, (2018). <https://doi.org/10.1108/K-03-2017-0114>
15. Guerrero, M., Urbano, D.: Academics' start-up intentions and knowledge filters: An individual perspective of the knowledge spillover theory of entrepreneurship. *Small Business Economics*. 43, 57–74 (2014). <https://doi.org/10.1007/s11187-013-9526-4>
16. Guerrero, M., Urbano, D., Cunningham, J., Organ, D.: Entrepreneurial universities in two European regions: A case study comparison. *Journal of Technology Transfer*. 39, 415–434 (2014). <https://doi.org/10.1007/s10961-012-9287-2>
17. Urbano, D., Guerrero, M.: Entrepreneurial Universities: Socioeconomic Impacts of Academic Entrepreneurship in a European Region. *Gender and Society*. 27, 40–55 (2013). <https://doi.org/10.1177/0891242412471973>

18. Guerrero, M., Urbano, D.: The development of an entrepreneurial university. *Journal of Technology Transfer*. 37, 43–74 (2012). <https://doi.org/10.1007/s10961-010-9171-x>
19. Guerrero, M., Cunningham, J.A., Urbano, D.: Economic impact of entrepreneurial universities' activities: An exploratory study of the United Kingdom. *Res Policy*. 44, 748–764 (2015). <https://doi.org/10.1016/j.respol.2014.10.008>
20. Fernandez-Nogueira, D., Arruti, A., Sáenz, N.: The entrepreneurial university: A selection of good practices ONISEE Analysis of the impact and role of Higher Education Institutes in the socio-economic development of regions. View project. (2018)
21. Clark, B.R.: *The Entrepreneurial University: New Foundation for Colleiality, Autonomy and Achievement*. Higher Education Management. (2001)
22. Wright, M.: *Academic entrepreneurship in Europe*. Edward Elgar (2007)
23. Thursby, J.G., Thursby, M.C.: Who is selling the ivory tower? Sources of growth in university licensing. In: *Management Science*. pp. 90–104. INFORMS Inst.for Operations Res.and the Management Sciences (2002)
24. Gibb, A.: *Leading the entrepreneurial university: Meeting the entrepreneurial development needs of higher education institutions*.
25. Van Toan, D.: *Research on the Model of Entrepreneurial University and Advanced University Governance: Policy Recommendations for Public Universities in Vietnam*. *VNU Journal of Science: Policy and Management Studies*. 37, (2021). <https://doi.org/10.25073/2588-1116/vnupam.4295>
26. Lucas, R.E.: *ON THE MECHANICS OF ECONOMIC DEVELOPMENT**.
27. Romer, P.M.: *Increasing Returns and Long-Run Growth*. (1986)
28. Acs, Z.J., Braunerhjelm, P., Audretsch, D.B., Carlsson, B.: The knowledge spillover theory of entrepreneurship. *Small Business Economics*. 32, 15–30 (2009). <https://doi.org/10.1007/s11187-008-9157-3>
29. Herrera, F., Guerrero, M., Urbano, D.: *Entrepreneurship and Inovation Ecosystem's Drivers the role of Higher Eductaion Organizations, Innovative and Sustainable Ecosystems*. *Entrepreneurial, Innovative and Sustainable Ecosystem*. (2018)
30. Sidrat, S., Frikha, M.A.: Impact of the qualities of the manager and type of university on the development of the entrepreneurial university. *Journal of High Technology Management Research*. 29, 27–34 (2018). <https://doi.org/10.1016/j.hitech.2018.04.003>
31. Solow, R.M.: *A Contribution to the Theory of Economic Growth*. (1956)
32. Audretsch, D.B., Keilbach, M.: *The Theory of Knowledge Spillover Entrepreneurship**. (2007)
33. Coleman, J.S.: *Social Capital in the Creation of Human Capital*.
34. *The Tripel Helix-University-Industry-Goverment Inovation: The Tripel Helix-University_industry-Goverment Inovation and Entrepreneurship*. Routledge
35. Charles, D., Kitagawa, F., Uyarra, E.: Universities in crisis?-new challenges and strategies in two English city-regions. *Cambridge Journal of Regions, Economy and Society*. 7, 327–348 (2014). <https://doi.org/10.1093/cjres/rst029>
36. audretsch2004.

37. Audretsch, D.B., Keilbach, M.: Entrepreneurship capital and economic performance. *Reg Stud.* 38, 949–959 (2004). <https://doi.org/10.1080/0034340042000280956>
38. Rao, B., Mulloth, B.: The role of universities in encouraging growth of technology-based new ventures. *International Journal of Innovation and Technology Management.* 14, (2017). <https://doi.org/10.1142/S0219877017500146>
39. Abdelkafi, N., Hansen, E.G.: Ecopreneurs' creation of user business models for green tech: an exploratory study in e-mobility. *International Journal of Entrepreneurial Venturing.* 10, (2018). <https://doi.org/10.1504/ijev.2018.090978>
40. Suranto, S., Muhtadi, M., Priyono, K.D., Santosa, T.B.: Pengembangan Inkubator Kewirausahaan di Universitas Muhammadiyah Surakarta. *Warta LPM.* 19, 1–9 (2016). <https://doi.org/10.23917/warta.v19i1.1959>
41. Becker, G.S. (Gary S.: Human capital : a theoretical and empirical analysis, with special reference to education. The University of Chicago Press (1993)
42. Zhang, Q., MacKenzie, N.G., Jones-Evans, D., Huggins, R.: Leveraging knowledge as a competitive asset? The intensity, performance and structure of universities' entrepreneurial knowledge exchange activities at a regional level. *Small Business Economics.* 47, 657–675 (2016). <https://doi.org/10.1007/s11187-016-9759-0>
43. Nelles, J., Vorley, T.: Entrepreneurial architecture: A blueprint for entrepreneurial universities. *Canadian Journal of Administrative Sciences.* 28, 341–353 (2011). <https://doi.org/10.1002/CJAS.186>
44. Mascarenhas, C., Marques, C.S., Galvão, A.R., Santos, G.: Entrepreneurial university: towards a better understanding of past trends and future directions, (2017)
45. Cunningham, J.A., Lehmann, E.E., Menter, M., Seitz, N.: The impact of university focused technology transfer policies on regional innovation and entrepreneurship. *Journal of Technology Transfer.* 44, 1451–1475 (2019). <https://doi.org/10.1007/s10961-019-09733-0>
46. Miller, K., McAdam, R., McAdam, M.: A systematic literature review of university technology transfer from a quadruple helix perspective: toward a research agenda. In: *R and D Management.* pp. 7–24. Blackwell Publishing Ltd (2018)
47. Sari, I.A., Rahmantika, D.N., -, M.Y.: The Effect of Firm Characteristics and Entrepreneur Characteristics on The Success of MSME Business in Central Java Province. *Jurnal Manajemen DayaSaing.* 23, 26–35 (2021). <https://doi.org/10.23917/dayasaing.v23i1.12593>
48. Budyldina, N.: Entrepreneurial universities and regional contribution. *International Entrepreneurship and Management Journal.* 14, 265–277 (2018). <https://doi.org/10.1007/s11365-018-0500-0>

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