INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN ECONOMICS & MANAGEMENT SCIENCES

OPEN ACCESS JOURNAL

Vol 14, Issue 1, (2025) E-ISSN: 2226-3624

The Innovation Beat: Global Rhythms and Pulse Points

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To Link this Article: http://dx.doi.org/10.6007/IJAREMS/v14-i1/24500 DOI:10.6007/IJAREMS/v14-i1/24500

Published Online: 05 February 2025

Abstract

Global innovation is emerging as a prominent catalyst for global economic growth and is reshaping the global economic landscape. Innovation has gained significance in light of the global issues that humanity is confronting, including biosecurity, digitalization, ethics of science and technology, global warming, resource shortages, and environmental degradation. The aim of this paper is to synthesize and analyze global innovation drivers and trends through a literature review. The study first establishes the definition of global innovation and thoroughly examines its drivers at both the macro and micro scales. Macro-level drivers include factors such as industrial regulations, national cultures, and social interactions. On the other hand, micro-level drivers consist of business excellence, firm-university cooperation, and technological creation and dissemination. Furthermore, the article delineates five prominent patterns in worldwide innovation: expansion in cutting-edge technological domains, emphasis on sustainable development, global innovation networking, global innovation multipolarity, and integration of multidisciplinary. The results of this research may serve as a valuable resource for policymakers, scholars, and other stakeholders engaged in global innovation. They deliver essential insights to further global innovation efforts.

Keywords: Global Innovation, Innovation Drivers, Innovation Trends, International Cooperation, Sustainable Development

Introduction

Innovation, which has experience the globalization level, is becoming the major key in restructuring industrial development in both developed and the development nations all over the world. In relation to this, the nations need to learn how to address these problems and one of the approaches involves focusing on innovation. The current generation of the world can also tackle other important questions like biosecurity, digitalization, ethical science and technology, global warming, scarcity of resources, and environmental pollution. These things pull for the invention of unique and innovative strategies since they are complex problems. Moreover, there is a great opportunity for globalization to make impressive contributions to the further evolution of the world economy's high-quality increase, strengthening national

competitiveness, and cooperation. The World Intellectual Property Organization(WIPO) has predicted that several nations across various regions including Latin America and the Caribbean, Sub-Saharan Africa, North Africa and West Asia, Europe, Central and South Asia, South-East Asia, East Asia, and Oceania would put increasing focus on innovation in the coming years (WIPO, 2023). The drivers and trends of innovation, irrespective of scale, must objectively be known by all organizations currently. This research entails the identification and analysis of existing literatures on the drivers and trends of innovation in the context of the global economy. This paper seeks to have a better understanding of innovation across the entire world, which will be crucial during formulation of hypotheses for future innovation. Consequently, the insights provided in this analysis will be beneficial for understanding the nature of innovations and deciding on the strategies to be employed by policymakers and enterprises. Further, it will help in collaboration and fostering of innovation across countries and in turn contribute towards the furtherance of innovation activities across the world. After that, a comprehensive evaluation of the measure and other factors that can influence this global innovation will be conducted.

Literature Review

Global Innovation

Innovation is a key element in management, and it usually refers to the process of breaking out of the box to obtain a new product or service (Kahn, 2018). Global innovation is defined as the expansion of innovation beyond the constraints of location, culture, field, industry, and discipline, to include innovation on a worldwide level. Global innovation involves the practice of businesses seeking external resources that align with and complement their existing assets (Westland, 2017). Binz & Truffer(2017) posits that global innovation emerges within a framework where the creation of technological knowledge enables the advancement of research and development endeavors. Additionally, there is a necessity to seek external sources for more feasible and applicable opportunities, either through the validation of technological knowledge or as a manifestation of pursuing market goals. Technological advancements have facilitated the dissemination of information, hence making previously implicit knowledge more apparent. Consequently, businesses are no longer able to rely exclusively on their own restricted internal resources to drive innovation (Yu et al., 2021). In the midst of a swiftly evolving global market landscape, the sluggish performance of any entity might result in a decrease in its ability to compete. The absence of worldwide innovation in a particular field might also result in an incapacity to use distinctive resources or abilities, hence restricting the promotion of more innovation inside the business(Diercks et al., 2019).

Drivers of Global Innovation

The analysis of the global drivers of innovation can help innovation actors to distinguish and implement innovation processes more comprehensively, and the driving factors of innovation may differ from nation to nation and from one geographic area to another (Wilson et al., 2023). It is therefore necessary to further analyse global drivers of innovation to gain new insights and perspectives (refer to Table 1).

This section will discuss the global drivers of innovation from two perspectives. At the macro level, relevant national or regional policy factors are the guiding drivers of global innovation, especially when it comes to major livelihood issues such as electricity and the

environment (Silva & Klagge, 2013). Conversely, the Global Innovation Index (GII) showed a favourable correlation with country culture, social interaction, and national individualism (Tambosi Junior et al., 2021). According to Beise（2004), the factors that drive global innovation include a region's or country's advantage in demand, exports, prices, transfers, and market structure. These factors work together as a collective force to encourage global innovation.

In terms of micro-drivers, for example, a study of EU-28 panel data for 2014-2015 and 2017-2018 shows that business excellence, research collaboration between firms and universities, and cluster development are drivers of global innovation in EU countries (Marčeta & Bojnec, 2020). Apart from that, the development, acceptance, and spread of applied technologies play a crucial role, particularly in sectors that have a strong need for technology-based solutions (Gruenhagen et al., 2022). Blockchain technology can also be used as a sustainable tool for organizations to move towards global innovation, which can be demonstrated especially in the food supply chain. Effective knowledge sharing is treated as an important factor in global innovation as well, and therefore organizations' knowledge management practices should also be emphasized (Rezaei et al., 2023). Global innovation in manufacturing, particularly in poor nations, has placed substantial emphasis on green value chains (Meng et al., 2022). Competition for talent is a crucial approach in human resource management for innovation agents. For instance, a research conducted by a US project outsourcing programme found talent restrictions as a significant explanatory factor for worldwide innovation activity (Lewin et al., 2009). Furthermore, the intricate intermingling of various technologies, the utilization of digital platforms, the effectiveness of research outcomes, and other related issues need worldwide innovation to align many elements at the individual level with the resources accessible to the innovators. (Gong et al.2024, Lazarev et al., 2021). Both macroeconomic and microeconomic factors are exerting influence on the overall innovation profile of businesses at a worldwide level. Hence, it is essential for any firm to be cognizant of the evolving patterns of global influencers to adapt to the ever-changing landscape.

Table 1
Global Drivers of Innovation

Author（s）	Title	Drivers
Beise, （2004）	Lead markets: country-specific drivers of the global diffusion of innovations	Demand advantages, export advantages, price advantages, transfer advantages and market structure advantages
Marčeta, M., & Bojnec, Š. (2020).	Drivers of Global Competitiveness in the European Union Countries in 2014 and 2017	Business Excellence, Business-University Research Collaboration, and Cluster Development
Gruenhagen, J. H., Cox, S., & Parker, R. (2022).	An actor-oriented perspective on innovation systems: Functional analysis of drivers and barriers to innovation and technology adoption in the mining sector	Development, adoption and diffusion of applied technologies
Rezaei, M., Sadraei, R., Jafari-Sadeghi, V., & Vrontis, D. (2023).	Knowledge is of no value unless to be shared. A synthesis of knowledge-sharing drivers in born-globals	Effective knowledge-sharing
Friedman, N., & Ormiston, J. (2022)	Blockchain as a sustainability-oriented innovation?: Opportunities for and resistance to Blockchain technology as a driver of sustainability in global food supply chains	Blockchain technologies
Meng, S., Yan, H., & Yu, J. (2022).	Global Value Chain Participation and Green Innovation: Evidence from Chinese Listed Firms	Green value chains
Lewin, A. Y., Massini, S., & Peeters, C. (2009).	Why are companies offshoring innovation? The emerging global race for talent	Manpower Competition
Gong, Z., Wang, Y., & Li, M. (2024)	Determining the drivers of global innovation under COVID-19: An FSQCA approach	Rationalisation and optimisation of innovation-related resources and inputs
Lazarev, G. I., Tat'ayna, V. V., & Andreev, V. A. (2021)	Digital transformation of russian economy: challenging the highest rank in the global innovation development	Digital economy expansion, spending on technology solutions, industry investment, public service technology renewal, digital platforms (cloud computing, cloud storage, data analytics, e-learning services), competition for top talent, research efficiency
Silva & Klagge, 2013	The Evolution of the Wind Industry and the Rise of Chinese Firms: From Industrial Policies to Global Innovation Networks	Industry Policies
Tambosi Junior et al., 2021	Innovation of Nations: An Analysis From The Bias Of National Culture	National culture, social interaction and national individualism

Trends of Global Innovation

In today's global context, progress and future leadership heavily depend on the ability to generate innovative ideas and drive their implementation. The current global trends in innovation are marked by increased variety and dynamism, and are multifaceted in nature.(Dutta et al., 2023). These trends include expansion in cutting-edge technological domains, emphasis on sustainable development, global innovation networking, global innovation multipolarity, and integration of multidisciplinary approaches.

Expansion in Cutting-Edge Technological Domains

At the very core of global innovation trends is the cutting-edge technological innovation aspect to drive business and society. The widespread application of Artificial Intelligence (AI) and Machine Learning (ML) has had a huge impact on the world economy, and the emergence of AI and ML has provided a core driver for the development of social productivity. This industry is now in contact with this technology and vice versa, and these Media & Publishing are deeply immersed in those sectors as essential contributors. Since AI could evaluate even more clinical pictures than human-based approaches, they anticipated that accuracy in disease diagnosis would be significantly greater, and the self-assurance of clinicians would increase distinctly (Higgins et al., 2023). In addition to that, AI and ML can enhance the improvement of the given data as it entails handling of irrelevant data and the identification of specific data necessary for a particular task as well. Therefore, when implemented in such a way, accomplishment decisions may contribute in the work on the lack of information in individuals, particularly physicians, and remove the subjective components that stem from manual categorization. Conversely, they have maintain and enhance the patient dimension and deepen the doctor-patient relationship (Walsh et al., 2019). It is therefore quite certain that the healthcare business will employ AI and ML more as this changes the methods of medical processes. First, the application of block chain technology has such peculiarities as the decentralized structure, high reliability, and openness. Among these, there are a number of specific applications, which may be said to offer a particularly large increase in the level of convenience we are able to expect in society today. For instance, block chain as a solution can lower risks incurred in the financial industry for transactions, record digital right rights and ownership at the point of infringement. It also can enhance information security when using the Internet of Things as it builds up to be an enhanced way of confirming identities, and heighten the rights of property and notarization in public services(Xu et al., 2023; Tyagi et al., 2023). Quantum computing, as a component of a worldwide pattern of advancement, has exceptional potential to enable global advancements in fields such as banking, healthcare, materials science, and others. This is due to its highly sophisticated parallel processing skills and its capacity to handle vast quantities of information (Gupta et al., 2023; Rosch-Grace & Straub, 2022). Therefore, the development of cutting-edge technologies will continue to be the focus of global innovation-driven development in the future.

Emphasis on Sustainable Development

In general, the concept of sustainable development can be stated as a necessity of development for the current generation to meet its social needs, starting with the responsibility for the result to the subsequent generations (Ruggerio, 2021). The United Nations' Agenda for Sustainable Development 2023 outlines an Action Plan for change on the international level that comprises 17 action directions that should be taken to achieve commonly agreed goals for sustainable development. They are beneficial for states across the

world as it lays down a good framework of how international issues can be addressed (Karashima, 2002). Regarding the further development of these ideas, it is possible to note the fact that in the context of sustainable development one of the key aspects is the development of green energy, for example, in the form of solar panels or wind turbines. This process entails the replacement of the ineffective fossil fuel energy by the re-new able ones to alter the energy system. Specifically, it has aimed at the efficient utilization of the waste, resource productivity gain, and environmental conservation (Corrocher & Mancusi, 2021). It is thus necessary to recognize the influence that multinational companies have in directing sustainability innovations for global sustainable development, despite the potential functional heterogeneities existing across different geographic areas or industries (van der Waal et al., 2021). Countries are also collaborating on patents for energy technology to encourage global environmental sustainability (Cecere et al., 2014). Simultaneously, there is a fast and widespread growth of smart city ideas and partnerships worldwide. These initiatives aim to foster sustainable social development by implementing inclusive technology advances in areas such as education and healthcare.(Blasi et al., 2022).

Global Innovation Networking

Global innovation networking (GIN) refers to the development of multi-form, multi-type, and multi-level innovation networks between or among regional or countries and it is mainly reflected in the innovation chain, value-added chain, and supply chain. The main subjects of GIN may mainly include but not limited to countries/regions, enterprises, universities/research institutes, schools, etc.; its core objectives are knowledge sharing and the dissemination of resource allocation, innovation drive, the reasonable (Loorbach et al., 2020). For example, the internationalization channel of research and development (R&D) ensures that knowledge transfers and technological accomplishments spread through national commerce because transnational corporations are essential in this process (Papanastassiou et al., 2020). The technological advancement that continues to experience rapid growth is also another favorable factor for the formation of the idea of global innovation networking because the influence helps to cut across the regions at relatively lesser cost and difficulty and enhances the efficiency of international cooperation (Hu et al., 2024).

Besides, accessing and exploiting the benefits of each region or country's comparative advantage, the development of Global Value Chains (GVCs) can create affiliation networks of innovative agents in the component of the accumulation of knowledge, technology transfer, and talent mobility (McWilliam et al., 2020). States are equally instrumental to advance national approach to innovation, for instance, Russia is allocating over 10 billion rubles in 2021 to create the National Science and Technology Valley on the base of Moscow University, all aimed to be achieved within five years, as it was identified by Petrella et al., (2021). Germany has also established a unique quantum research consortium to support the advancement of the quantum technology (Ukpabi et al., 2023). In short, policy support is one of the most important factor to rely upon in all the countries pertaining to innovation.

Global Innovation Multipolarity

Global innovation multipolarity refers to the fact that innovation is not taking place in a single region or country, but is distributed and active in all regions and countries around the globe (Vlados et al., 2022). According to WIPO(2023), in the 21st century, innovation is no longer confined to developed countries like Europe and the United States, but are now

prominently observed in emerging nations such as China, Malaysia, Thailand, Brazil, Turkey, India, South Africa, Pakistan among others. This shift has had a profound social impact in changing the dynamics of innovation from a national perspective to a global one. It suggests the overwhelming role of several centers in the development of innovative, which is directly related to the successive progress of technology and based on technical advancement. It eliminates geographically based constraints and enables the inclusion of far more countries to be involved in the upsurge of invention (Soare, 2022). At the same time, institutionalization of multiple geographical locations of global innovation center may foster knowledge and technology share between the international organizations. It can also result in a progressive international competition, which forces organizations to increase their innovation activities in order to facilitate international interactions (Peters, 2023). Global Innovation Multipolarity will become increasingly evident as a global driver of innovation.

Integration of Multidisciplinary

One of the trends in global innovation is the growing tendency towards multidisciplinary integration and cooperation (Morss et al., 2021) asserts that effective interdisciplinary innovation integration is demonstrated by the capacity of different disciplines to leverage their unique strengths and collaborate with multiple parties. This makes it easier for the collaboration to work on new dynamics and solve new emergent problems, which in turn creates new paradigms. For instance, interdisciplinary integration of AI in environmental science can create Climate Change Prediction models and process the weather data in quick time; it can perform progress and efficient monitoring; it can help in protection of bio-diversity, in identification of the endangered species and monitoring data; and in optimization of the resources usages and reduction of wastage (Shuford, 2024). The interdisciplinary convergence of AI and medicine holds new promise for drug development and discovery, early cancer screening, patient care, and physician diagnosis (Bajwa et al., 2021). Such transformative forces can foster the development of global innovation. By drawing on the experience of interdisciplinary integration, emerging economies can reconfigure the resources of their institutions to drive global innovation at multiple levels (Anand et al., 2021). A literature review of 61 articles on interdisciplinary fusion showed that interdisciplinary fusion is a key factor in fostering creativity and that it is a strategic and popular approach to achieving global innovation (Moirano et al., 2020). One of the trends in global innovation will be more multidisciplinary integration.

Discussion

In the above context, global drivers and trends were analysed in an overview. This section will further discuss the implications and significance of these findings in practical applications, which are expected to shed some light on the subject of global innovation participation. This research discusses global factors at both the macro and micro levels, as shown in Table 1. An analysis is conducted on both the macro-level perspective, which includes industry policy factors, national culture, social interaction, and national individualism, and the micro-level perspective, which includes university-enterprise cooperation, technology adoption, and knowledge sharing. These factors are identified as drivers of global innovation. These drives occasionally cannot be discreet but work together to push the innovation of the entire world (Oturakci, 2023).

Regarding the discussion of the global innovation trends as the topics of this study, this article presents an analysis on the developments on frontiers of technology, sustainable development, networking of innovation, multipole and interdisciplinary. These trends reflect the diversity and complexity of current global innovation activities. The application of cutting-edge technologies (e.g. artificial intelligence, machine learning, blockchain, quantum computing, etc.) in healthcare, finance, etc. provides a leapfrog lead for industry development and innovation (Edler et al., 2023; Zhang et al., 2023). Sustainable development, on which countries and other organisations around the globe are focusing, enhances the efficient use of global resources and is an enduring research priority for the future.(Li et al., 2023). Global innovation as a large network, through the cooperation and support of transnational corporations, research institutions and governments to promote new trends in global innovation and enhance the efficiency of global innovation (Hu et al., 2024b). Global innovation is no longer singularly focussed on one region or country, but is characterised by multi-polarity, which makes the global landscape of innovation more diverse and broad-based (Tung et al., 2023). Disciplines are no longer developed in isolation from each other, but require interdisciplinary co-operation to generate more creativity and lead the wave of innovation. (Moirano et al., 2020).

Conclusion

This research studies the factors and patterns that influence global innovation by conducting a thorough analysis of existing literature. This research emphasises the significance of both national and local policy support. The effectiveness of innovation policy in promoting the advancement of cutting-edge technologies, particularly in addressing global livelihood challenges, is directly proportional to its favorability. The significance of incorporating many disciplines is also emphasised. In order to achieve new breakthroughs in innovation and generate more inventive outcomes, it is necessary to combine a wider range of disciplines in the future. This will create a positive cycle of innovation. The convergence of global networking and multipolarity has facilitated global innovation by promoting resource sharing, enhancing efficiency, and lowering costs. Furthermore, the emphasis on sustainable development has immense global strategic importance and serves as a pivotal pathway for future innovation.

The theoretical significance of this study emerges from its detailed examination of global innovation across multiple dimensions. The research examines drivers from various scales to enhance current theoretical structures through a detailed examination of the complex connections between policy frameworks and cultural elements and collaborative ventures. This research creates a detailed innovation model fit for use in developing new theoretical theories. The analysis finds present-day relevance when applied to today's worldwide circumstances. Globalization together with urgent global matters makes three key trends - technological growth and sustainability emphasis and network innovation - essential to address. Policy creators benefit from utilizing these innovative insights to build more specific innovation policies. Businesses who grasp these trends use this knowledge to discover new business prospects while maintaining their business competitiveness. This research integrates theoretical principles with practical applications, serving crucial purposes in academic and practical arenas.

An important study contribution of this work is the comprehensive analysis of global drivers from both macro and micro perspectives. This approach is particularly valuable for gaining a deeper understanding of the intricate nature of global innovation. Furthermore, this document outlines five significant patterns in worldwide innovation that may provide strategic and practical advice to policymakers, organisational participants, educators, and researchers. Furthermore, this study analyses the prevailing worldwide driving patterns, providing valuable reference and insights for future studies.

Nevertheless, this research is subject to some constraints. Firstly, the literature data sources lack comprehensive coverage of all study topics and are evaluated based on current studies, which may have drawbacks. Subsequent investigations may use more data sources to depict and elucidate the worldwide determinants. Furthermore, it is important to note that the research span of this study was limited to the understanding available at the time. Consequently, some aspects such as technology advancements and sustainable development may not have been comprehensively addressed. In the future, there is potential for in-depth discussions on the implementation of advanced technology and sustainable development. Furthermore, this research has a weakness in its literature selection process. It only included material written in English, thus overlooking non-English literature and so impacting the overall comprehensiveness of the study. Further research may expand the range of reliable non-English literary sources to improve the thoroughness of the study, particularly in areas and nations that are indicative of worldwide innovation advancement.

References

Anand, J., McDermott, G., Mudambi, R., & Narula, R. (2021). Innovation in and from emerging economies: New insights and lessons for international business research. Journal of International Business Studies, 52(4), 545-559. http://doi.org/10.1057/s41267-021-00426-1

Bajwa, J., Munir, U., Nori, A., & Williams, B. (2021). Artificial intelligence in healthcare: transforming the practice of medicine. Future Healthcare Journal, 8(2), e188-e194. http://doi.org/10.7861/fhj.2021-0095

Beise, M. (2004). Lead markets: country-specific drivers of the global diffusion of innovations. Research Policy, 33(6-7), 997-1018. http://doi.org/10.1016/j.respol.2004.03.003

Binz, C., & Truffer, B. (2017). Global Innovation Systems—A conceptual framework for innovation dynamics in transnational contexts. Research Policy, 46(7), 1284-1298. http://doi.org/10.1016/j.respol.2017.05.012

Blasi, S., Ganzaroli, A., & De Noni, I. (2022). Smartening sustainable development in cities: Strengthening the theoretical linkage between smart cities and SDGs. Sustainable Cities and Society, 80, 103793. http://doi.org/10.1016/j.scs.2022.103793

Cecere, G., Corrocher, N., Gossart, C., & Ozman, M. (2014). Technological pervasiveness and variety of innovators in Green ICT: A patent-based analysis. Research Policy, 43(10), 1827-1839. http://doi.org/10.1016/j.respol.2014.06.004

Corrocher, N., & Mancusi, M. L. (2021). International collaborations in green energy technologies: What is the role of distance in environmental policy stringency? Energy Policy, 156, 112470. http://doi.org/10.1016/j.enpol.2021.112470

Diercks, G., Larsen, H., & Steward, F. (2019). Transformative innovation policy: Addressing variety in an emerging policy paradigm. Research Policy, 48(4), 880-894. http://doi.org/10.1016/j.respol.2018.10.028

Dutta, S., Lanvin, B., Rivera León, L., & Wunsch-Vincent, S. E. (2023). Global Innovation Index 2023: Innovation in the face of uncertainty.. WIPO.

Edler, J., Blind, K., Kroll, H., & Schubert, T. (2023). Technology sovereignty as an emerging frame for innovation policy. Defining rationales, ends and means. Research Policy, 52(6), 104765. http://doi.org/10.1016/j.respol.2023.104765

Gong, Z., Wang, Y., & Li, M. (2024). Determining the drivers of global innovation under COVID-19: An FSQCA approach. Plos One, 19(2), e295403. http://doi.org/10.1371/journal.pone.0295403

Gruenhagen, J. H., Cox, S., & Parker, R. (2022). An actor-oriented perspective on innovation systems: Functional analysis of drivers and barriers to innovation and technology adoption in the mining sector. Technology in Society, 68, 101920. http://doi.org/10.1016/j.techsoc.2022.101920

Gupta, S., Modgil, S., Bhatt, P. C., Chiappetta Jabbour, C. J., & Kamble, S. (2023). Quantum computing led innovation for achieving a more sustainable Covid-19 healthcare industry. Technovation, 120, 102544. http://doi.org/10.1016/j.technovation.2022.102544

Higgins, O., Short, B. L., Chalup, S. K., & Wilson, R. L. (2023). Artificial intelligence (AI) and machine learning (ML) based decision support systems in mental health: An integrative review. International Journal of Mental Health Nursing, 32(4), 966-978. http://doi.org/10.1111/inm.13114

Hu, F., Qiu, L., Wei, S., Zhou, H., Bathuure, I. A., & Hu, H. (2024a). The spatiotemporal evolution of global innovation networks and the changing position of China: a social network analysis based on cooperative patents. R&D Management, 54(3), 574-589. http://doi.org/10.1111/radm.12662

Hu, F., Qiu, L., Wei, S., Zhou, H., Bathuure, I. A., & Hu, H. (2024b). The spatiotemporal evolution of global innovation networks and the changing position of China: a social network analysis based on cooperative patents. R&D Management, 54(3), 574-589. http://doi.org/10.1111/radm.12662

Kahn, K. B. (2018). Understanding innovation. Business Horizons, 61(3), 453-460. http://doi.org/10.1016/j.bushor.2018.01.011

Karashima, N. (2002). General Assembly. TRENDS IN THE SCIENCES, 7(8), 44-45. http://doi.org/10.5363/tits.7.8_44

Lazarev, G. I., Varkulevich, T. A. V., & Andreev, V. A. (2021). Digital transformation of russian economy: challenging the highest rank in the global innovation development. Nexo Revista Científica, 34(01), 74-81. http://doi.org/10.5377/nexo.v34i01.11286

Lewin, A. Y., Massini, S., & Peeters, C. (2009). Why are companies offshoring innovation? The emerging global race for talent. Journal of International Business Studies, 40(6), 901-925. http://doi.org/10.1057/jibs.2008.92

Li, X., Wu, T., Zhang, H., & Yang, D. (2023). National innovation systems and the achievement of sustainable development goals: Effect of knowledge-based dynamic capability. Journal of Innovation & Knowledge, 8(1), 100310. http://doi.org/10.1016/j.jik.2023.100310

Loorbach, D., Wittmayer, J., Avelino, F., von Wirth, T., & Frantzeskaki, N. (2020). Transformative innovation and translocal diffusion. Environmental Innovation and Societal Transitions, 35, 251-260. http://doi.org/10.1016/j.eist.2020.01.009

Marčeta, M., & Bojnec. (2020). Drivers of Global Competitiveness in the European Union Countries in 2014 and 2017. Organizacija, 53(1), 37-52. http://doi.org/10.2478/orga-2020-0003

McWilliam, S. E., Kim, J. K., Mudambi, R., & Nielsen, B. B. (2020). Global value chain governance: Intersections with international business. Journal of World Business, 55(4), 101067. http://doi.org/10.1016/j.jwb.2019.101067

Meng, S., Yan, H., & Yu, J. (2022). Global Value Chain Participation and Green Innovation: Evidence from Chinese Listed Firms. International Journal of Environmental Research and Public Health, 19(14), 8403. http://doi.org/10.3390/ijerph19148403

Moirano, R., Sánchez, M. A., & Štěpánek, L. (2020). Creative interdisciplinary collaboration: A systematic literature review. Thinking Skills and Creativity, 35, 100626. http://doi.org/10.1016/j.tsc.2019.100626

Morss, R. E., Lazrus, H., & Demuth, J. L. (2021). The "Inter" Within Interdisciplinary Research: Strategies for Building Integration Across Fields. Risk Analysis, 41(7), 1152-1161. http://doi.org/10.1111/risa.13246

Oturakci, M. (2023). Comprehensive analysis of the global innovation index: statistical and strategic approach. Technology Analysis & Strategic Management, 35(6), 676-688. http://doi.org/10.1080/09537325.2021.1980209

Papanastassiou, M., Pearce, R., & Zanfei, A. (2020). Changing perspectives on the internationalization of R&D and innovation by multinational enterprises: A review of the literature. Journal of International Business Studies, 51(4), 623-664. http://doi.org/10.1057/s41267-019-00258-0

Peters, M. A. (2023). The emerging multipolar world order: A preliminary analysis. Educational Philosophy and Theory, 55(14), 1653-1663. http://doi.org/10.1080/00131857.2022.2151896

Petrella, S., Miller, C., & Cooper, B. (2021). Russia's Artificial Intelligence Strategy: The Role of State-Owned Firms. Orbis, 65(1), 75-100. http://doi.org/10.1016/j.orbis.2020.11.004

Rezaei, M., Sadraei, R., Jafari-Sadeghi, V., & Vrontis, D. (2023). Knowledge is of no value unless to be shared. A synthesis of knowledge-sharing drivers in born-globals. Asia Pacific Journal of Management http://doi.org/10.1007/s10490-023-09896-3

Rosch-Grace, D., & Straub, J. (2022). Analysis of the likelihood of quantum computing proliferation. Technology in Society, 68, 101880. http://doi.org/10.1016/j.techsoc.2022.101880

Ruggerio, C. A. (2021). Sustainability and sustainable development: A review of principles and definitions. Science of the Total Environment, 786, 147481. http://doi.org/10.1016/j.scitotenv.2021.147481

Shuford, J. (2024). Interdisciplinary Perspectives: Fusing Artificial Intelligence with Environmental Science for Sustainable Solutions. Journal of Artificial Intelligence General science (JAIGS) ISSN:3006-4023, 1(1), 106-123. http://doi.org/10.60087/jaigs.v1i1.87

Silva, P. C., & Klagge, B. (2013). The Evolution of the Wind Industry and the Rise of Chinese Firms: From Industrial Policies to Global Innovation Networks. European Planning Studies, 21(9), 1341-1356. http://doi.org/10.1080/09654313.2012.756203

Soare, S. R. (2022). Innovation as Adaptation: NATO and Emerging Technologies.. German Marshall Fund of the United States.

Tambosi Junior, J., Tambosi, S. S. V., & Falaster, C. D. (2021). A INOVAÇÃO DAS NAÇÕES: UMA ANÁLISE SOB O VIÉS DA CULTURA NACIONAL. Revista Gestão Organizacional, 14(3), 158-174. http://doi.org/10.22277/rgo.v14i3.5522

Tung, R. L., Zander, I., & Fang, T. (2023). The Tech Cold War, the multipolarization of the world economy, and IB research. International Business Review, 32(6), 102195. http://doi.org/10.1016/j.ibusrev.2023.102195

Tyagi, A. K., Dananjayan, S., Agarwal, D., & Thariq Ahmed, H. F. (2023). Blockchain—Internet of Things Applications: Opportunities and Challenges for Industry 4.0 and Society 5.0. Sensors, 23(2), 947. http://doi.org/10.3390/s23020947

Ukpabi, D., Karjaluoto, H., Bötticher, A., Nikiforova, A., Petrescu, D., Schindler, P., Valtenbergs, V., & Lehmann, L. (2023). Framework for understanding quantum computing use cases from a multidisciplinary perspective and future research directions. Futures, 154, 103277. http://doi.org/10.1016/j.futures.2023.103277

Waal, J. W. H., Thijssens, T., & Maas, K. (2021). The innovative contribution of multinational enterprises to the Sustainable Development Goals. Journal of Cleaner Production, 285, 125319. http://doi.org/10.1016/j.jclepro.2020.125319

Vlados, C., Chatzinikolaou, D., & Iqbal, B. A. (2022). New Globalization and Multipolarity. Journal of Economic Integration, 3(37), 458-483.

Walsh, S., de Jong, E. E. C., van Timmeren, J. E., Ibrahim, A., Compter, I., Peerlings, J., Sanduleanu, S., Refaee, T., Keek, S., Larue, R. T. H. M., van Wijk, Y., Even, A. J. G., Jochems, A., Barakat, M. S., Leijenaar, R. T. H., & Lambin, P. (2019). Decision Support Systems in Oncology. JCO Clinical Cancer Informatics(3), 1-9. http://doi.org/10.1200/CCI.18.00001

Westland, J. C. (2017). Global innovation management. Bloomsbury Publishing.

Wilson, G. A., Case, T., & Dobni, C. B. (2023). A global study of innovation-oriented firms: Dimensions, practices, and performance. Technological Forecasting and Social Change, 187, 122257. http://doi.org/10.1016/j.techfore.2022.122257

Wipo, W. I. P. O. (2023). Global Innovation Index 2023: Innovation in the face of uncertainty. : Geneva: WIPO.

Xu, J., Wang, C., & Jia, X. (2023). A Survey of Blockchain Consensus Protocols. Acm Computing Surveys, 55(13s), 1-35. http://doi.org/10.1145/3579845

Yu, T. H., Huarng, K., & Huang, D. (2021). Causal complexity analysis of the Global Innovation Index. Journal of Business Research, 137, 39-45. http://doi.org/10.1016/j.jbusres.2021.08.013

Zhang, Z., Jin, J., Li, S., & Zhang, Y. (2023). Digital transformation of incumbent firms from the perspective of portfolios of innovation. Technology in Society, 72, 102149. http://doi.org/10.1016/j.techsoc.2022.102149