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Innovation System and Efficiency: A Bibliometric Review

Jianglin Jiang^{1,2*}, Rossazana Ab-Rahim¹, Rosita Hamdan¹

1 Faculty of Economics and Business, Universiti Malaysia Sarawak, Kota Samarahan 94300, Sarawak, Malaysia.
2 Shaoxing University Yuanpei College; Shaoxing, 312000, China

Email: 107807916@qq.com

ORCID: <https://orcid.org/0000-0002-8201-6414>

*Corresponding author email: 107807916@qq.com

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Abstract: Doing a bibliometric analysis of published literature using data from Scopus, this study seeks to provide light on the present status of research in the area of innovation systems and efficiency. The study finds possible areas of collaboration among researchers, organisations, and institutions by examining authors, research institutions, published articles, and research trends. The results of this study have important practical and policy ramifications, especially for decision-makers who want to develop and put into practice regulations that encourage innovation and boost productivity. The study's findings can help businesses and organization's by pointing them in the direction of best practices and methods for enhancing the effectiveness of their innovation systems. The study can also help programs for education and training that aim to improve innovative systems and efficiency by fostering knowledge and skill development. Finally, the study can offer insightful information on potential future research directions in the area of innovation systems and efficiency, enabling scientists to spot areas that still require more research. In conclusion, this study offers a thorough and current evaluation of the body of research on innovation systems and effectiveness. In especially for politicians, corporations, organization's, and educators striving to improve innovation systems and efficiency, the practical and policy implications of the findings show the potential impact of this study on the outcomes in terms of innovation and efficiency.

Author Correspondence: 107807916@qq.com

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1. Introduction

Innovation and efficiency are the core competitiveness of economic development (Wu, Song, & Zhao, 2018). The concept of innovation was first put forward by Schumpeter in 1912. Schumpeter believed that innovation was “establishing a new production function”, and summarized innovation into five new combinations (Schumpeter, 1990). Innovation has different system levels from the level of technological innovation. At the national level, it is the national innovation system, at the regional level, it is the regional innovation system, and at the industrial level, it is the industrial innovation system. Jan (2022) highlighted the irreplaceability of innovation in optimizing solutions for energy-efficient systems, a characteristic deeply intertwined with the structure of such systems. The key to the operation of the innovation system is to establish a cooperative innovation network (Liu, 2000). Doloreux and Gomez (2020) stated that National Systems of Innovation (NSI) highlights the essentially systemic nature of innovation, involving both organisations and state in the innovation process within a nation. The efficiency of innovation system is directly related to the efficiency of national innovation system and the country’s comprehensive national strength and competitiveness (Li, 2013). This essay attempts to make a summary of the research on innovation system and efficiency, and better use the theory of innovation system to guide the practice of national development of countries.

1.1 Problem statement

Despite the growing interest in understanding the relationship between innovation systems and efficiency, there is a lack of a comprehensive and up-to-date analysis of the existing literature. Many studies have focused on specific aspects of the innovation system, such as R&D or technology transfer, without providing a holistic view of the system and its impact on efficiency. Moreover, there is a need to identify the main trends and research gaps in this field, which can guide future research and policy-making efforts. Therefore, the main problem addressed by this study is the lack of a systematic and comprehensive bibliometric review of the literature on innovation systems and efficiency, which can provide insights into the current state of research and help identify areas for further investigation.

2. Research design

2.1. Data sources

In order to ensure the integrity and accuracy of the obtained data, Scopus database is used, which has the most literature and the general subject range. The search

time was 1st August 2022, and 567 valid documents were obtained by keyword search focusing on “innovation system” and “efficiency”.

2.2. Methodology of the study

This essay focuses on the theme of innovation system and efficiency. Vosview and Citespace software are used for visual analysis of knowledge maps. Knowledge map is developed on the basis of citation analysis theory and information technology visualization. Citespace and Vosview software systems are two information visualization software used to measure and analyze scientific literature data, showing the internal mechanism of scientific evolution in the research field and the development trends in the research field. This essay uses the information visualization analysis technology of these software to conduct information visualization analysis on the annual trend, authors and institutions, keyword co-occurrence and topic clustering of selected literature, so as to analyze the internal relationship of literature, identify current research hot issues, summarize the characteristics of research and predict its possible development trend.

3. Research results and analysis

3.1. Trend of relevant document issuance

Through the annual distribution, the relationship between the number of papers in the efficiency research field of the innovation system and the change of time can be presented, and then the development speed and research status of this field can be understood, so the development trend of the past prediction can be sorted out. According to the collected data, 567 papers related to the efficiency of the innovation system were published internationally in the 26 years from 1996 to 2022. The distribution trend chart was obtained through statistics on the number of each year.

It can be clearly observed from the figure that the research related to innovation system and efficiency shows an upward distribution, and the overall number of documents issued increases every year. At the same time, it can be seen from the Figure 1 that the number of research articles in this field has increased from 1 in 1996 to 44 in 2022, and the number of articles published during this period has increased relatively evenly year by year. It can be observed from the figure that the number of articles issued in the 15 years from 2008 to 2022 has increased rapidly, and reached the peak of 64 articles in 2021. A total of 526 articles were published in the past 15 years, with an annual average of about 35 articles, accounting for 92.7% of the total. This indicates that international research in this field has a research boom period from 2008 to 2022.

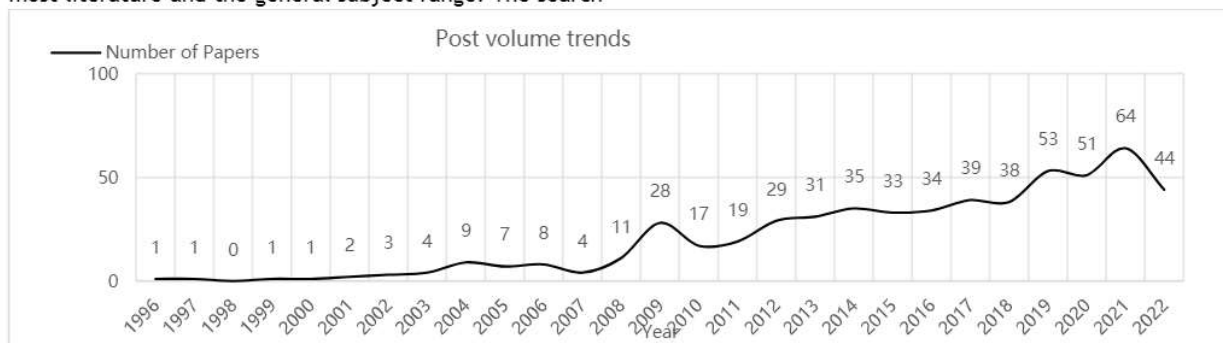


Figure 1. Number of Articles Published from 1996 to 2022