

RESEARCH TRENDS AND EXPLORATION OF THE IMPACT INTERNATIONAL CERTIFICATION ON INDUSTRY PERFORMANCE: A BIBLIOMETRIC ANALYSIS

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Abstract:

Background: The development of the industry, which is increasingly oriented towards increasing competitiveness and quality, is closely related to the ownership of international certification in global competition. Industries that have international certification have a good reputation for improving industrial performance from financial and operational aspects.

Purpose: This study aims to analyze research trends, conceptual networks of international certification, and their impact on industrial performance.

Design/Methodology/Approach : The approach used in this study is exploratory with the help of bibliometric analysis visualization using r-packages and VOSViewer software. By using various exclusion and inclusion criteria, it was found that there were 450 relevant articles from the Scopus database in the 2014-2024 range with scientific fields, namely management, economics, business, and finance.

Findings/Results: The results of the analysis show that there are positive and negative relationships due to the application of international certification. In general, the application of international certification has a positive impact in increasing consumer confidence, increasing the efficiency of company operations, broader market access, improving the image and reputation of the company in the international market. On the other hand, international certification does not always have a positive impact. In some cases, certification has resulted in high costs such as audit costs, training costs, testing, and periodic maintenance costs. In addition, the negative impact of international certification will increase the company's administrative burden, orient the consumer focus on price rather than quality, and not always provide added value.

Conclusion: Hopefully, this research leads to the conclusion that international certification research has prospects in the preparation of future stakeholder policies.

Originality/State of art: This study fills a gap in the literature by introducing a comprehensive analysis of the effect of international certification on industry performance using bibliometric analysis. A comprehensive bibliometric study of this research trend is under-researched. Different from previous studies that only focus on one industry or certification type, this research conducts analyses across sectors and regions, offering a more in-depth global perspective. Bibliometric techniques such as co-citation and temporal analysis are increasingly being used to understand research patterns in the international certification literature

Keywords: bibliometrics, conceptual networks, international certification, industrial performance, research trends

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INTRODUCTION

Today's business development, giving rise to global competitiveness supported by other economic attributes, forces an industry to invest more in resources. The goal is to improve the efficiency of industrial management. One of them is the increasingly important role of standardization in the industry. Many industries have implemented the practice of applying international standard certification in organizing business activities from various countries. It is proven that the ISO international certification body, as one of the bodies engaged in international quality management standards, has been accepted by 170 countries in the world. Even until 2022, the number of world industries that obtain ISO international certification amounts to 2 million industries (International Organization for Standardization, 2022). It is a fact that industries that have certification have a good reputation compared to industries that do not have certification (Ali & Yusuf, 2021). The implementation of international certification is an important initiative for an industry to be able to improve business processes to meet global market access. So, it is important to understand the differences between certified and uncertified industries in terms of characteristics, business performance, and barriers faced. Other data shows that from 2018 to 2022, the trend of industries that have certification has increased, dominated by the basic metal and fabricated metal product sectors, wholesale retail trade, repairs of motor vehicles, motorcycles, personal household goods, electrical and optical equipment, construction, and machinery and equipment dominated by China with 500,000 industries followed by Japan, Germany, Spain, USA, UK with an average of under 50,000 industries (International Organization for Standardization, 2022).

International certification is defined as a conformity assessment process that certifies that products meet certain national or international standards (Ministry of Business, 2018). The process is carried out by conducting tests, inspections, and verification from certified institutions and ensuring that the product meets the established safety, quality, and performance requirements (Bakator & Čóčkalo, 2018; Milovanović et al. 2021). The definition of international certification put forward by the International Organization for Standardization (ISO) in 2004 states that international certification is a procedure where a third party provides written assurance that a product, process, or service meets certain requirements. The WTO (1994), in the

Agreement on Technical Barriers to Trade, defines international certification as a procedure whereby a third party provides written assurance that a product, process, or service conforms to specified requirements. The importance of international certification for industry cannot be underestimated; at least, there are several benefits that are felt when an industry has certification, namely 1) certification can increase consumer confidence in the products produced. Given that in the current era, consumers are increasingly critical and demand a guarantee of product quality and safety. A survey conducted by Nielsen in 2022 showed that 78% of Indonesian consumers choose certified products, especially in food, beverage, and cosmetic products (Cândido et al. 2016). 2) Certification can open up broad market access at the national or international level. 3) Certification is important to encourage improvements in industrial quality and productivity. This is in line with research conducted by LIPI Indonesia in 2022 on industries that have been certified can increase productivity by 23% in the span of 2 years after receiving certification (Nurcahyo et al. 2021). Not only that, according to (Canh et al. 2019; Zawawi et al. 2016) shareholders and creditors are more likely to be concerned about corporate financial performance. However, in the new era an enterprise's responsibilities have to extend to other stakeholders, including its employees, suppliers and communities. This study aims to extend the literature by examining the individual effects of product and process innovations, and then their interactions with external collaboration, on firm performance and corporate social responsibility (CSR International certification provides benefits in improving system management documentation, increasing effectiveness and customer satisfaction, and also increasing company improvement (continuous improvement)).

International socio-economic certification plays an important role for MSMEs as it improves their competitiveness and sustainability in the global market. In addition to guaranteeing product quality, these certifications also ensure compliance with social, ethical, and environmental sustainability standards, helping MSMEs build credibility and consumer trust, expand market access, and compete with larger companies. Some types of international certifications that are relevant for MSMEs in the socio-economic field include Fair Trade Certification, which ensures the welfare of workers and farmers through fair payment and decent working conditions, especially

in the agriculture and handicraft sectors. ISO 26000 (Social Responsibility) provides guidance on social responsibility, business ethics, human rights and contribution to sustainable development. SA8000 (Social Accountability) ensures ethical working conditions, workers' rights, occupational health and safety, and prohibits the exploitation of child labor. B Corp Certification assesses a company's overall social and environmental performance, including its impact on society and the environment. Meanwhile, Organic Certification (e.g., USDA Organic, EU Organic) is relevant for MSMEs in the agriculture and food sector to reach international organic markets by guaranteeing sustainable production without harmful chemicals. Statistically, the development of international certification publications related to the performance of umkm from 2014 to 2024 or in the last 10 years has fluctuated. This is due to market dynamics, regulations, competition, costs, public awareness, and the development of the standard itself. Companies need to adapt their certification strategies to these changes in order to remain competitive and relevant in the global market. The following is a graph of the trend of international certification publications in the period 2014-2024 (Figure 1).

International certification not only focuses on management and operational aspects but also has an impact on improving business performance from a financial perspective. Performance is the company's ability to achieve optimal organizational goals both from an operational and financial perspective (Gomes & Wojahn, 2017; Sutapa et al. 2017) which indicates that the measure of performance success is very broad. There have been many studies that explore

in more detail related to certification and employee performance, including research conducted by (Aminu & Mohd Shariff, 2015; Patyal & Maddulety, 2015) that certification has an impact on the company's financial activities, including turnover and profits generated by the industry. The diversity of the impact of international certification on industry performance also needs to be explored and identified further. Therefore, this research will focus on combining all related research within a certain time span so that it is more comprehensive and in-depth. This is based on the fact that there is no clear mapping of the development of this literature. This research will map the impact of international certification that has been carried out by researchers and its impact on industry performance, the field of science studied, research trends, and future research plans that will be carried out further. So based on this, the objectives of this research include: 1) analyze the trend of international certification research between 2014-2024 The basis for selecting the publication year 2014-2024 is to look at the implementation of certification over the past 10 years, which includes regulatory changes, shifting consumer preferences, technological developments, global trade dynamics, the evolution of certification standards, and the current growth of MSMEs; 2) analyze the conceptual, social, and knowledge base networks related to international certification research; 3) analyze the impact of international certification from various aspects. In line with this, this research is useful for identifying how the positive and negative impacts of international certification on business performance, as well as projections for the preparation of policies related to certification for the business industry by the government in the future.

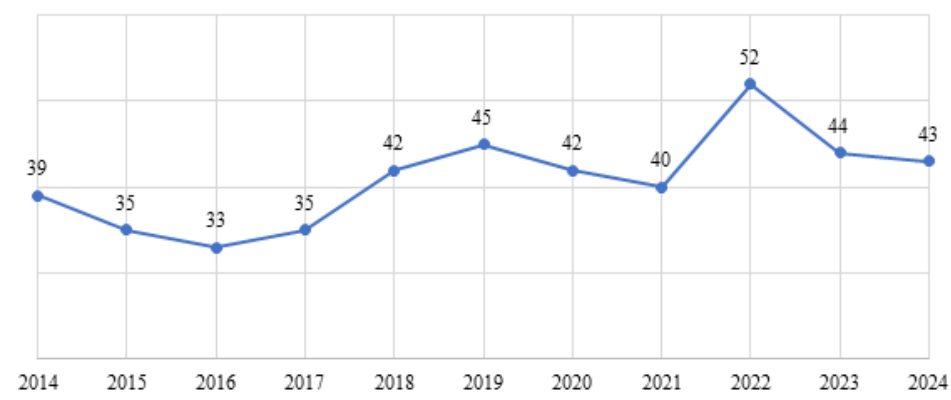


Figure 1. Number of International Certification Publications

METHODS

This study uses a bibliometric analysis approach that aims to identify and explore research topics related to international certification and its impact on industry performance. This analysis will assist in reviewing the scope of publications through research trends, concepts, keywords used, and keywords used (Centre et al. 2010). Bibliometric analysis is conducted to provide an overall picture of the theme, mapping the scientific field of the journal, linkages between journals, and ideas for further research (Herawati et al. 2022; Mulyanto et al. 2024; Saleh & Sumarni, 2016). The bibliometric method is an appropriate way to conduct trend research because it obtains an overview of the literature by selecting, filtering, and refining bibliographic data. This research design also uses the PRISMA diagram, which consists of five stages of the technique of determining eligibility criteria, determining information sources, selecting data, collecting data, and analyzing data (Aziza & Mardiah, 2023). The data source in this research comes from the SCOPUS and WoS database, which has the main keyword impact of international certification and a total of 1496 initial articles. Then, data filtering is carried out. Namely, only articles published in 2014-2024 are selected, the subject area only focuses on the fields of business, management, accounting, finance, which use English, open access, not duplicate with a final total of 450 articles. For visualization of results using BibTex and RIS for analysis using R-Packages and VOSViewer software.

The search document is summarized as follows: TITLE-ABS-KEY(impact AND of AND international AND certification) AND PUBYEAR > 2013 AND PUBYEAR < 2025 AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (OA, "all")) AND (LIMIT-TO (SUBJAREA, "SOCI") OR LIMIT-TO (SUBJAREA, "BUSI") OR LIMIT-TO (SUBJAREA, "ECON"))

The sentence provides detailed guidance on how to effectively conduct a scientific literature search in two large academic databases, namely Scopus and Web of Science (WoS). This search used the keywords impact, international certification, and business performance to find articles that discuss the impact of international

certification on business performance. To ensure relevant and up-to-date results, the search was limited to articles published in the last 10 years, from 2014 to 2024. This restriction aims to ensure that the literature accessed reflects recent developments in the field under study. In addition, the search was limited to English in order to obtain globally recognized scientific literature. The search results were also narrowed down by field of science, namely Social Sciences, Business Sciences, and Economics. The selection of these fields of science is done so that the articles found are more relevant to the topic under study, considering that these three fields are closely related to social impact, business strategy, and economic and productivity aspects. By using Scopus and WoS, both of which are highly reputable databases and include indexed international scientific journals, the quality of the articles accessed is more assured as they go through a rigorous selection process. After applying all these filters, 450 relevant articles were found. This number shows that even though the search was specific, there were still many relevant articles and enough to conduct a comprehensive literature review. In practice, the search step starts with entering keywords in the search field using logical operators such as AND, then setting filters for year of publication, selecting the English language, and restricting the field of study accordingly. With this structured and focused search strategy, the results obtained are expected to be relevant and up-to-date in research related to the impact of international certification on business performance. The design on the PRISMA diagram is described in Figure 2.

RESULTS

International Certification Research Trend

Document Analysis aims to identify trends and overview of articles collected over the last ten years 2014-2024. The author limits only scientific articles to be identified. Conference papers, book reviews, and book chapters are excluded in this study. Based on the search results that have been carried out on the Scopus and WoS database using the keywords "impact international certification," 450 documents were obtained.

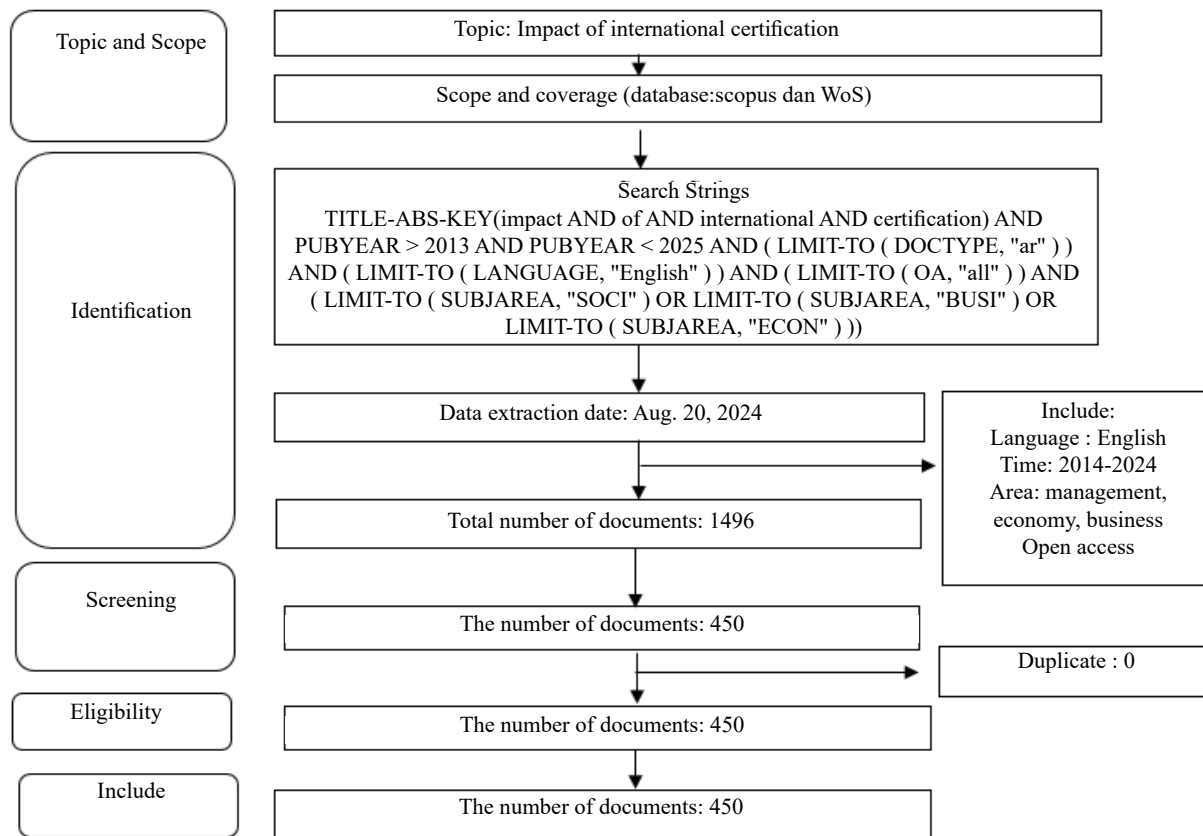


Figure 2. PRISMA diagram

Table 1 shows an overview of the 450 main articles analyzed over the past ten years, with an average annual growth rate of 1.51% and an annual number of 4 documents. Not only that, the average document citation is 8.9. From the author aspect, there are 385 authors spread across various countries, with a total of 1731 keywords relevant to the topic of this research. Eighteen authors compile articles as a single author, while international collaboration of authors is 18,55%. This research aims to identify and explore the impact of international certification on industry performance by using the Scopus database, which resulted in 450 articles originating from various countries in the world. The main dominants came from the United States, Germany, China, and the United Kingdom, with 18, 16, and 13 articles, respectively. At the same time, the most years of articles produced in the 2014-2024 range were in 2020 as many as 18 articles. This is also due to the disruption of the Covid pandemic which caused many industrial activities to be disrupted and decreased performance in that year.

In line with the number and countries producing relevant publications that fluctuate every year, the citation trend

also experienced a fluctuating decline in the article. The highest average annual citations were in 2015 and 2018 as much as 52.2 and 48.78. Table 2 describes the citation trend produced by the relevant authors. Not only the number, countries, and citations of the main producers of relevant articles, further identification also elaborates on the main author affiliation, and the main source of the researcher's destination journal. The prolific author who produced the highest number of cited articles was Blind Knut in a study entitled The effects of cooperation in accreditation on international trade: Empirical evidence on ISO 9000 certifications which describes how quality and performance improvements in industries that have used certification, especially ISO 9000. This research is relevant as a reference to the impact of certification on industrial performance with the output of the resulting policy recommendations to relevant stakeholders. While the main source of relevant journals is published in the journal sustainability (Q1) with a total of 19 articles dominated by other journals namely Corporate Social Responsibility And Environmental Management (Q1), Journal Of Industrial Engineering And Management (Q2), Journal Of Industrial Engineering And Management (Q2).

Table 1. Key information of relevant sources

Main Information	Results
Timespan	2014:2024
Sources (Journals, Books, etc)	345
Documents	450
Annual Growth Rate %	1.51
Document Average Age	5.71
Average citations per doc	8.995
References	0
Document Contents	
Keywords Plus (ID)	1731
Author's Keywords (DE)	1648
AUTHORS	
Authors	1204
Authors of single-authored docs	93
Authors Collaboration	
Single-authored docs	125
Co-Authors per Doc	2.86
International co-authorships %	18.55
DOCUMENT TYPES	
article	450

Table 2. Annual citations of relevant articles

Year	MeanTCperArt	N	MeanTCperYear	CitableYears
2014	10.50	4	0.95	11
2015	52.20	5	5.22	10
2016	18.17	6	2.02	9
2017	34.08	12	4.26	8
2018	48.78	9	6.97	7
2019	17.12	8	2.85	6
2020	18.06	18	3.61	5
2021	11.08	13	2.77	4
2022	9.33	12	3.11	3
2023	2.06	16	1.03	2
2024	1.08	12	1.08	1

Not only focusing on authors and key publication journals, this study will also identify the top 10 author affiliations as well as the main sponsors of relevant primary research related to the impact of international certification on industry performance (Table 3). Table 4 presents the main affiliations and sponsors of the international certification research trend. The dominant affiliation is from Kings College London and the main sponsor of relevant articles is the National Science Foundation.

Besides the need to identify author affiliations and main funding sponsors, it is also necessary to identify the

relationship between authors, reference journal sources and keywords used in this study visualized using the Three Field Plot. This diagram shows the relationship between author names on the left, keywords in the middle, and reference journals on the right that form lines and patterns that are interconnected. The three elements are connected by a gray plot line that indicates which authors most frequently contribute to international certification research. The size of the plot illustrates how many publications are related to the topic. This is visualized in Figure 3 three field plot. Not only the three field plot, another analysis that can be identified is the visualization of the main keywords

that are dominant in research related to international certification known as the word cloud. WordCloud is used in identifying and describing words that often appear related to the topic of international certification (Figure 4). The word cloud displays the essence of the word with illustrations using words in various sizes according to the reference article. Word clouds tend to be randomly shaped. However, it is dominated by the main words that appear large in size, which are dominated by certification, sustainability, development (Figure 4).

Network Analysis

Network analysis was conducted using VOSviewer which aims to map and provide an overview of the topic of the impact of international certification visualized in

the form of conceptual structure, intellectual structure and social structure. The size of the circles shown in the figure indicates the frequency of citations, different colors and proximity of groups of circles indicate different themes. Figure 5 shows the co-occurrence: network visualization which is divided into two dominant clusters with different colors, namely red, green, and blue. Each cluster contains key words that are frequently used in impact certification and are related to each other. Based on the output, it can be seen that the keywords that appear most together with other keywords are certification, sustainability, etc. There are 4 clusters available with each color reflecting the closeness of the keywords. Cluster 1 consists of 15 keywords, Cluster 2 consists of 5 keyword items, cluster 3 consists of 4 keyword items, and cluster 5 consists of 2 keywords (Table 5).

Table 3. Top 10 Authors and main journal sources

Most Authors	Average citations	Main Journal Source	Number of articles
Blind Knut	0.58	Sustainability (Switzerland)	19
Boiral Olivier	0.58	Corporate Social Responsibility and Environmental Management	3
Heras-Saizarbitoria Iñaki	0.58	Journal Of Industrial Engineering And Management	3
Maertens Miet	0.50	World Development	3
Agüero Luis	0.17	Accounting	2
Ahmed Fathima	0.50	Business Strategy And The Environment	2
Aizen Marcelo	0.17	Energy, Sustainability And Society	2
Akhade Kiran	0.33	International Forestry Review	2
Akhade Swapnil	0.33	Journal Of Cleaner Production	2
Akhmedova Guzalkhon O	0.25	Journal Of Open Innovation: Technology, Markets, And Complexity	2

Table 4. Top 10 Author Affiliations and Relevant Funding Sponsorships

Author Affiliation	Main Funding Sponsor
King's College London	National Science Foundation
KU Leuven	World Health Organization
University of East Anglia	US Agency for International Development
Instituto Superior de Engenharia do Porto	Natural Environment Research Council
Wageningen University & Research	National Natural Science Foundation of China
Consejo Nacional de Investigaciones Científicas y Técnicas	International Atomic Energy Agency
Universidade do Porto	European Commission
Deutsches Zentrum für Luft- und Raumfahrt (DLR)	Deutsche Forschungsgemeinschaft
The Australian National University	Bundesministerium für Bildung und Forschung
Free University of Bozen-Bolzano	Đại học Kinh tế Quốc dân

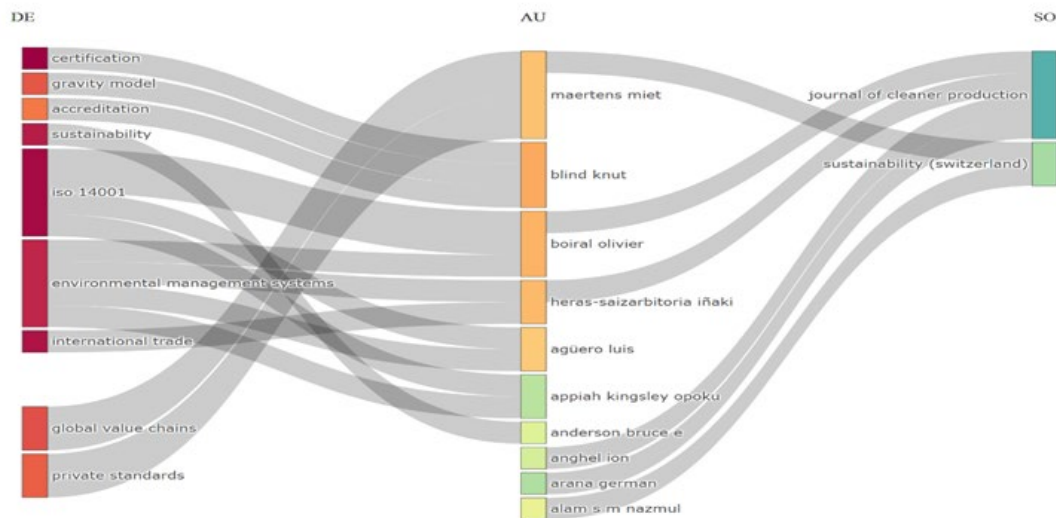


Figure 3. Three field plot



Figure 4. Word cloud

Table 5. Main Keyword Clusterization

Cluster	Keyword Item
Cluster 1	Certification, china, covid-19, education, human
Cluster 2	Environmental impact, environmental management, ISO 14001, sustainability, sustainability development
Cluster 3	Climate change, deforestation, european union, governance approach
Cluster 4	Environmental impact asset, international trade

Another visualization that can be displayed based on the dominant time series of keywords is the overlay network as visualized in Figure 6. The main keywords are based on the publication time of the article marked in yellow in the figure. It can be seen that from 2019 to 2020 shows that the more yellow the keywords are the more recently researched. This indicates that there

is a gap in future research keywords. In addition, it is further explained the output in Figure 6 which indicates that the dimmer a color, the less recent the research is (Priristia et al. 2021). It can be seen in Figure 6 that there are several words that are dim so that they can become gaps in the latest research in the future.

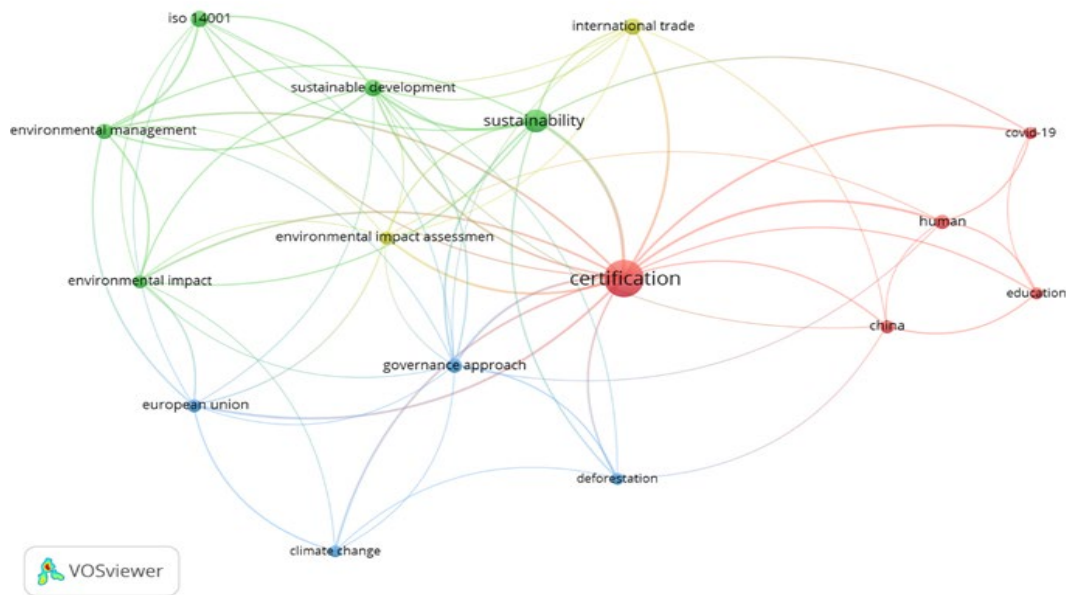


Figure 5. VOSViewer visualization

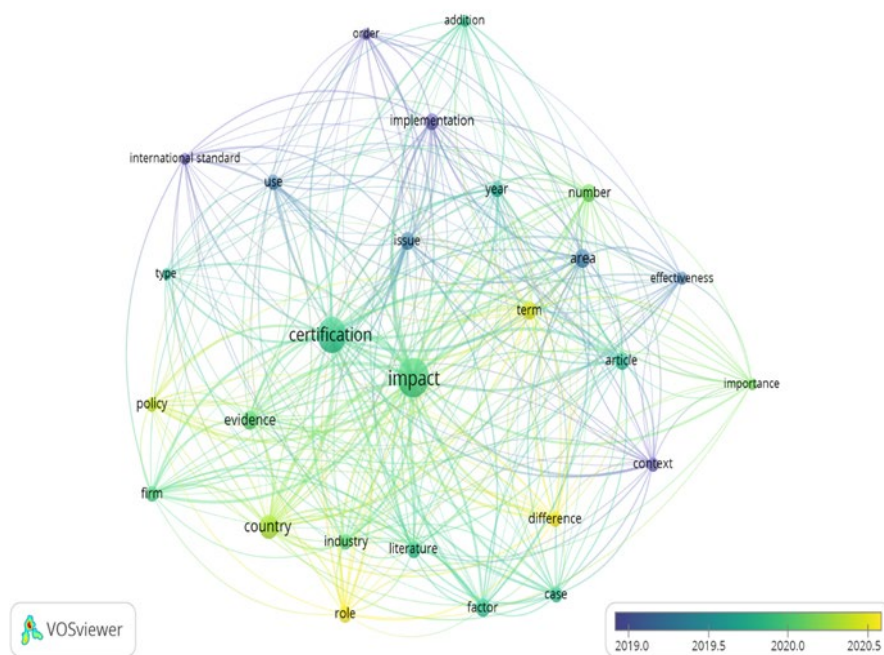


Figure 6. Co-occurrence: overlay visualization

Bibliometric analysis can also provide recommendations for new research topics in the future through the thematic features provided. Oktavianto, (2023) explains that a thematic map is a concentration or concentration of keywords by considering different groupings but in relation to one another within a certain framework and flow. There are at least four main quadrants in the thematic map (Figure 7), namely quadrant I (motor themes), which is the main theme as

a development material, which means that it has a high relevance to the topic and is often researched. Quadrant II (niche thees) refers to low centrality. This means that the theme has limited relevance, quadrant III (emerging or declining theme) is a research theme that has just emerged so that it is very little researched and has decreased due to lack of development. While quadrant IV (base themes) has a high level of relationship but is less developed to be researched.

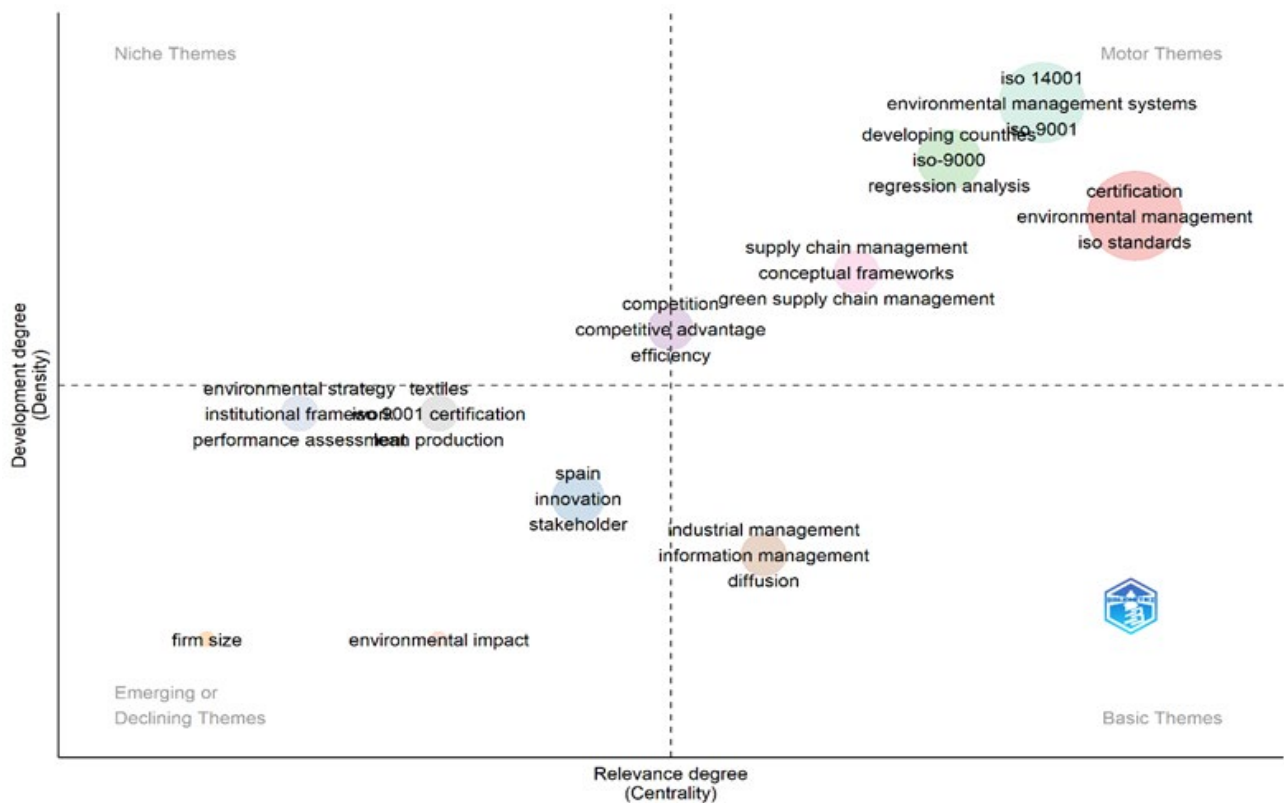


Figure 7. Thematic map

Impact of International Certification on Industry Performance

Many researchers have found better results in businesses and industries that have quality certification compared to those without such quality structures. International certification enables businesses to effectively manage all operations to achieve efficiency and improve performance (Anil & Satish, 2016; Chatterjee, 2018; Gupta, 2015). Many empirical studies conducted by other researchers have shown that international certification can increase competitiveness, improve performance, as well as business sustainability. On the other hand Qijun & Batt, (2016) added that the impact of standardization aims to increase the ability to exploit industrial network externalities, increase productive and innovative efficiency, perfect information access, minimize costs, encourage competition, increase capabilities and public welfare. Research conducted by Kafetzopoulos & Gotzamani, (2019) studied the benefits of quality accreditation on organizations. Findings from 74 companies showed that quality improvement can result in increased competitive advantage and organizational performance. In addition, Heras, Casadesus, and Ochoa (2001) conducted an

experimental study over 5 years of profitability of 400 ISO 9000 certified companies and 400 non-certified companies. They found that the firms earned higher profits after implementing the standards. However, the profits earned shrank to be slightly higher than those of the non-certified companies towards the end of the study period.

Research conducted by other researchers that certification has an impact on a) an increase in sales and exports conducted Research by (Tambunan, 2022) shows that industries with ISO certification tend to experience higher sales and export increases than those that are not certified, b). Impact on operational efficiency conducted by (Pratiwi et al. 2023) which found that the adoption of international certification is positively correlated with increased operational efficiency and industrial productivity. c). Increased profitability conducted studies by (Hasyim & Budiarta, 2023; Suryanto & Sahrani, 2022) indicates that in the long run, internationally certified industries show higher levels of profitability, d). Increased innovation conducted by several studies shows that the certification process can encourage innovation in the industry, because it encourages companies to

continuously improve their processes and products. e). as well as industries with international certification tend to have better resilience to economic shocks and market changes (Komara et al. 2019).

However, on the con side, some studies show different results related to the ownership of international certifications. The research conducted by oleh (Ochieng et al. 2015) which states that ISO 9001 certification has an effect on improving business performance, namely asset returns, but has no effect on industry revenue and profit in Kenya. Other research conducted by (Cândido et al. 2016) states that there is no significant difference in industry financial performance (level of sales, return on sales and return on assets) between companies that have ISO 9001 certification and those that do not apply in Portugal. In general, the impact of international certification on the performance of micro and small industries can be seen in several aspects (Table 6).

While these positive impacts are significant, it is important to note that the implementation of certification also presents challenges to the industry, particularly in terms of cost and process complexity. However, overall, product certification is proving to be an important strategic tool for IMKs to improve their competitiveness and performance in an increasingly globalized and competitive market. These studies reinforce previous findings that international certification generally has a positive impact on industry performance, including improved market access, productivity, innovation, and financial performance. However, some studies also suggest that these benefits may not be uniform and can be influenced by factors such as industry type, country level of development, and firm-specific characteristics. Recent research has also further emphasized the importance of certification in the context of globalization and changing consumer preferences.

Table 6. Positive and negative impacts of international certification on business performance

Positive Impact	Negative Impact
<ol style="list-style-type: none"> 1. Increased Market Access Product certification opens up opportunities for the industry to enter new markets, especially international markets. Research (Abdi et al. 2020) in Ethiopia shows that certification helps industries access global markets and improve their competitiveness. 2. Improving Financial Performance A Study by Kafetzopoulos & Gotzamani, (2019) that industries with certification show better financial performance, even during times of economic crisis. This is supported by research by Fontalvo-Herrera et al (2022) in Latin America which showed an improvement in financial indicators in certified SMEs. 3. Increased Productivity and Efficiency (Trifković, 2017) found that food safety certification in Vietnam contributed to increased industry productivity and profitability. Marulanda Grisales and Montoya Restrepo (2018) also revealed increased efficiency in certified industries in Colombia. 4. Innovation and Development: (Valdez-Juárez et al. 2016) showed a positive relationship between ISO 9001 certification and increased innovation in Mexican industries. 5. Increased Consumer Trust: Research (Sari et al. 2023) in Indonesia revealed that certification increases consumer confidence in industrial products. 6. Access to Funding: (Fatoki, 2019) found that certified industries in South Africa have better access to funding sources, which is important for business growth. 7. Export Performance: (Fikru, 2014) showed a positive impact of ISO 14001 certification on industrial export performance in developing countries. 8. Overcoming Trade Barriers: (Kinzius et al. 2019) revealed that international certification helps industries overcome non-tariff barriers to international trade. 9. Marketing Performance Improvement: A Study (Akoma et al. 2023) in Nigeria shows the positive contribution of international certification to industry marketing performance. 10. Durability in Competition: (Haseeb et al. 2019) found that halal certification helped industries in Malaysia increase their sales and market share. 	<ol style="list-style-type: none"> 1. High costs These costs include the costs of audits, training, testing, and periodic maintenance of certification. For small and medium-sized companies, these costs can be a significant burden and potentially reduce their profitability (Ochieng et al. 2015) 2. Certification can also add an administrative burden that requires a considerable allocation of human resources and time. Companies need to undertake detailed documentation and ensure compliance consistently to maintain certification. This can divert management focus from product innovation or other business strategies (Cândido et al. 2016) 3. Certifications do not always add significant value. If consumers do not care much or are not familiar with a particular certification, the impact on sales can be minimal. For example, in a local market that pays little attention to international certifications, a company may not see a significant increase in sales despite investing high costs in obtaining the certification (Kautsar et al. 2023; Sudarmiati et al. 2023)

Managerial Implications

This research provides important insights for managers and industry leaders regarding the importance of international certification adoption in improving firm performance. The findings show that the trend of international certifications such as ISO 9001 and ISO 14001 is consistently associated with improved performance in terms of quality, efficiency, and innovation in various sectors. Therefore, companies that have not adopted international certifications should consider doing so as part of a strategy to increase global competitiveness. In addition, the results of the bibliometric analysis show that innovation-focused industries tend to benefit more from certification, so managers need to tailor the type of certification adopted based on the company operational and strategic focus. By understanding these global trends, companies can take proactive steps to improve long-term performance, while strengthening their position in international markets. Ultimately, this research equips managers with the knowledge to utilise certification as a tool for growth, innovation and risk management, rather than just a regulatory obligation to comply with.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Based on the results of the analysis that has been carried out, the conclusion of this research focuses on international certification research trends including publication year, the main country of publication, the highest number of citations, and the main affiliation of researchers along with relevant funding sources. Not only that, this research also provides an overview related to the conceptual network sourced from the main keywords in relevant research, which is dominated by the keyword certification. Overall, the dominant previous research also focuses on the impact of international certification on industry performance both in terms of operational, financial, and industrial management. It is expected that this research can be the main reference for future researchers related to international certification which has high research prospects. In addition, stakeholder policies are also important to help the industry have international certification in order to be globally competitive.

Recommendation

Based on the results of the bibliometric analysis of international certification research trends and their impact on industrial performance, there are several important recommendations that can be given. First, for researchers, there is a need to conduct more in-depth follow-up research on the effect of international certifications, such as ISO 9001 and ISO 14001, on innovation, sustainability and productivity performance in various sectors. Future research should also consider contextual factors such as geographical location, firm size, and level of technology adoption that may moderate the impact of certification on performance. Secondly, for industry practitioners, we recommend that firms become more active in obtaining international certifications, as research findings show that such certifications significantly improve operational efficiency, product quality, and competitiveness in the global market. Companies in key sectors such as manufacturing, information technology, and logistics services are particularly encouraged to integrate international certifications in their operational strategies to achieve better long-term performance. Third, for policymakers, it is important to provide stronger support in the form of financial incentives, subsidies, or technical assistance for companies seeking international certification. This support can accelerate the adoption of certification, especially in developing countries, thereby improving the industry's competitiveness at the global level.

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