

Analysing Corporate Governance Research in the Pharmaceutical Industry: A Bibliometric Study

Sangeetha Narayanan¹, Subhendu Kumar Pradhan²

^{1,2}VITBS, Vellore Institute of Technology, Vellore, Tamilnadu, India

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Abstract

This study examines the current body of literature on Corporate Governance, aiming to provide an overview of publication metrics, collaboration patterns, key areas of focus, emerging trends in research, and potential future avenues for an investigation. To achieve the goals of this research, a range of bibliometric methods were employed. These included performance analysis, citation analysis, network analysis, trend analysis, and thematic mapping. These techniques were applied to a dataset of 303 documents sourced from the Scopus database, spanning the years 1987 to 2023. The Biblioshiny application of the R-studio software was utilized for this purpose. Extensive investigations of Corporate Governance began in 2008. The United States is the leading contributor, followed by the United Kingdom, and the majority of the leading contributors collaborate. The research pinpointed the most prominent journals, authors, and publications within the field by conducting a thorough citation analysis. The study offers a crucial understanding of the current state of research and suggests avenues for future research to fill this research gap.

Keywords: Corporate Governance, Pharmaceutical, Bibliometric Analysis, Scopus Database, Biblioshiny, Citation Analysis, Thematic Mapping.

1. Introduction

The core objective of Corporate Governance is to increase transparency, accountability, justice, social responsibility, and autonomy within organizations. By prioritizing these principles, Corporate Governance safeguards the shared interests of stakeholders, leading to the maximization of profitability and the creation of new job opportunities. In today's ever-changing business environment, which is characterized by rapid technological advancements, globalization, larger company sizes, intensified competition, and the need for superior performance and responsiveness to customer demands, organizations face significant challenges in ensuring their growth and survival. Through the implementation of sound governance principles, companies can optimize their financial performance, attract investors, and foster sustainable growth. This contributes to the generation of new employment opportunities, thereby supporting overall economic development. By acknowledging the vital role of corporate governance as a strategic tool, this study offers valuable insights for organizations that aim to navigate the complexities of the contemporary business landscape. By aligning governance principles with the dynamic forces of technological advancements, globalization, and customer expectations, organizations can position themselves as leaders in their respective industries, thereby ensuring long-term viability.

This paper aims to conduct an extensive review of the existing literature on Corporate Governance and integrate it using diverse bibliometric analysis techniques. The goal is to assess the current state of the field and chart out directions for future research. This will aid academicians new to the field of Corporate Governance research in planning their research accordingly.

Specifically, this paper addresses the following questions:

Research Question 1: What is the current publication trend in the pharmaceutical industry's corporate governance field?

Research Question 2: Which nations, journals, authors, and studies have made substantial contributions to the body of knowledge?

Research Question 3: What is the current state of research on corporate governance? What are the tendencies of this research?

Research Question 4: What are the prospective research directions in corporate governance?

The study was divided into seven sections to answer the research questions. Sections 1 and 2 introduce the concept of corporate governance and justify the need for a literature review on the topic. Section 3 outlines the methods used for data extraction, cleansing, and preparation. The fourth section presents the results of the bibliometric analysis, shedding light on the countries, journals, authors, and studies that have made substantial contributions to the body of knowledge. Future research directions in the field of corporate governance are discussed in Section 5, which outlines the potential research areas. Section 6 summarizes and concludes the study's main findings and Section 7 discusses the limitations inherent to the study. By adhering to this organized structure, this study intends to address the research questions effectively and provide a comprehensive understanding of corporate governance in the pharmaceutical industry.

2. Research Methodology

Bibliometric software

This study employs bibliometric analysis, (Gardazi et al., 2023; Paul and Perwez, 2023) a scientific method employing mathematical and statistical techniques to investigate data objectively, to analyse existing research in the field of Corporate Governance. By employing bibliometric analysis, it is possible to obtain a comprehensive and in-depth understanding of the knowledge carrier, especially when dealing with a large volume of data comprising numerous studies. Web-based applications such as CiteSpace, Pajek, BibExcel, and others are available for conducting bibliometric analysis, and each has its benefits and drawbacks. The biblioshiny application of R-studio software was used to accomplish the objectives of this study. (Bakshi and Verma, 2023; Yazdani et al., 2022) Biblioshiny application is a one-of-a-kind web application that facilitates in-depth analysis of data features, such as production trends in the field of study, influential countries, prolific authors, prominent organizations, local and global citations, and frequently used keywords, among others. As demonstrated by Moral-Munoz et al. (2020) and Xie et al. (2020), it is extensively used for intelligent network mapping and comprehending social and intellectual structures.

Database choice

The Scopus database was used as a primary resource to investigate academic literature on corporate governance in the pharmaceutical industry. Scopus is a comprehensive bibliographic database that includes scholarly journals, conference papers, and novels. By utilizing the Scopus database, this study seeks to gain access to a variety of scholarly works pertinent to corporate governance in the pharmaceutical industry. The purpose is to gain valuable insights from the existing literature to increase comprehension and knowledge in this field.

Data extraction and Data cleaning

This study employed specific search terms and criteria to retrieve the literature on corporate governance in the pharmaceutical industry. Boolean operators AND and OR were used to search for ("corporate governance" "Board of Directors" "ownership structure" "board characteristics" "pharma" and "pharmaceutical") in the article's title, abstract, and keywords. This ensured that the articles containing these terms in the title, abstract, or keywords were included in the bibliometric analysis. The search returned 2,718 documents in total. To ensure quality, the study included only journal-

published research articles and reviews. Book chapters, editorials, conference papers, notes, and other grey literature with questionable review processes were eliminated. Only articles published in English were included for convenience. The scope of the study was restricted to "Business, Management, and Accounting" and "Economics, Econometrics, and Finance". By applying these inclusion-exclusion criteria, this study intended to compile a comprehensive corpus of high-quality literature on corporate governance in the pharmaceutical industry for further analysis and investigation.

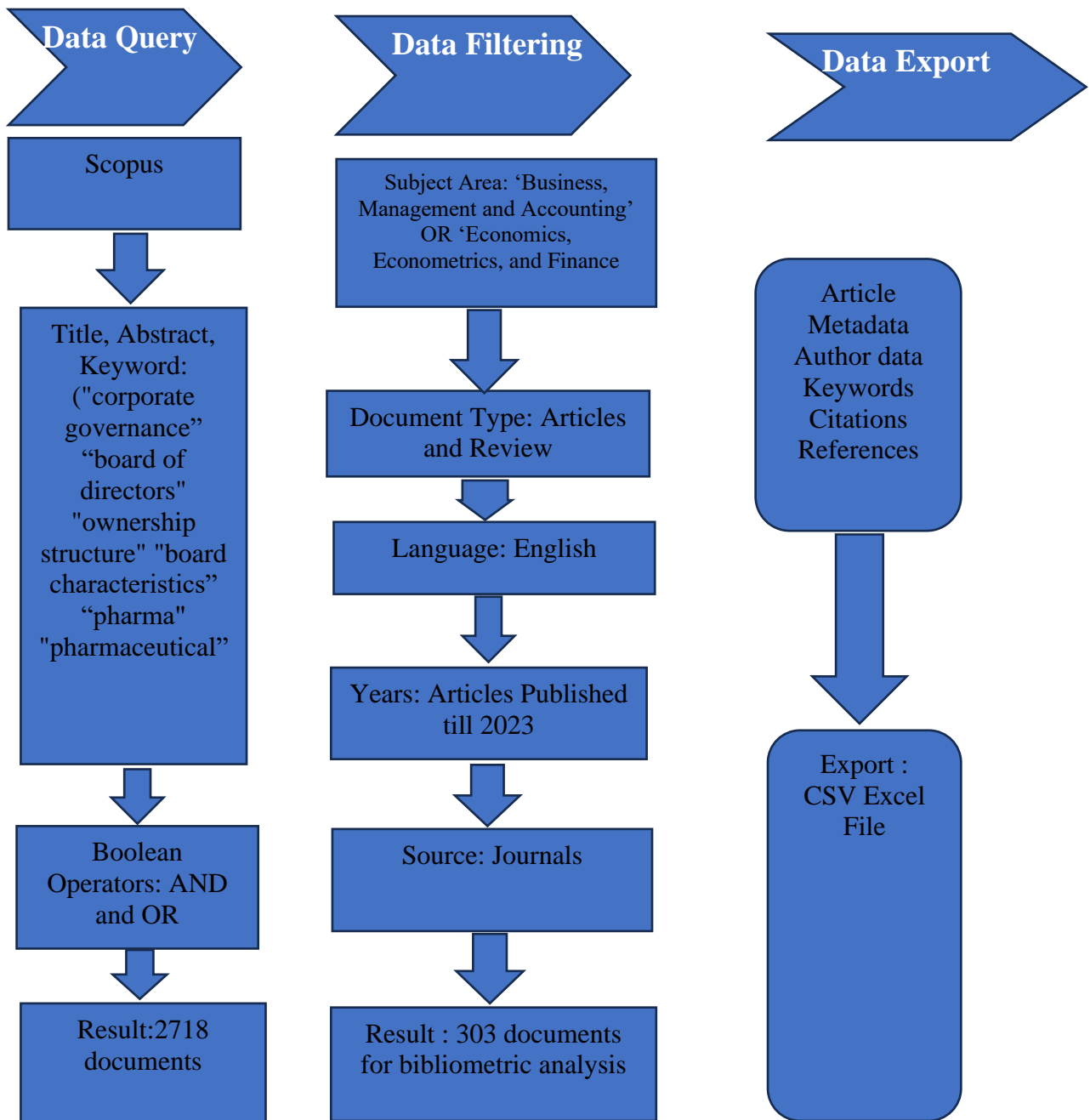


Figure 1: Data extraction and cleaning process
Source: Author’s own

3. Data Analysis
Descriptive statistics

Table 1 shows the most important details of the data used in this study. It includes 303 articles (documents) published in 216 journals for approximately 36 years, from 1987 to 2023. This considerable number of articles and length of time indicates the vast scope of academic research conducted in the pharmaceutical industry's corporate governance field.

Table:1 Main information

Description	Results
Period	1987:2023
Sources (Journals)	216
Total number of documents(a)	303
Single-authored Documents(b)	70
Multi-authored documents(a-b) c	233
Average citations per doc	25.73
Keywords Plus (ID)	925
Author's Keywords (DE)	1034
Total no.of authors (d)	718
Authors per document(d/a)	2.36

There are a total of 718 authors who have contributed to the literature on corporate governance, demonstrating their global presence. This illustrates the expansive scope and collaborative character of research in the field of corporate governance. In addition, the fact that only 70 of the 303 documents analyzed in the study are written by a single author reinforces the trend of collaboration and multiple perspectives in the study of corporate governance. The abundance of articles with multiple authors suggests a concerted effort to advance knowledge and comprehension in this field.

Publication trends

Numerous significant inferences can be drawn from the data presented in this table. Over the years, the number of articles addressing Corporate Governance in the pharmaceutical industry has gradually increased. Beginning with one article in 1987, the number of articles in this field of study reached a peak of 35 in 2022, indicating a growing interest in this area of study. The average number of citations per article varied across years, indicating fluctuations in the impact and influence of published research. Notably, 2002 had the highest mean number of citations per article, at 350. This suggests that the scholarly community accorded a great deal of attention and recognition to papers published during that year. In addition, the mean total citations per article varied significantly throughout the dataset, ranging from as low as 0.85 in 2023 to as high as 144.67 in 2000. This disparity indicates that the visibility and influence of individual articles in the field of corporate governance within the pharmaceutical industry vary. Additionally, there was an irregular distribution of articles across years, with some years having a greater number of publications than others.

Notable years of increased research activity in the pharmaceutical industry include 2008, 2014, 2015, and 2020, reflecting an increased interest in corporate governance during these years.

Table 2 provides insightful information on the evolving landscape of corporate governance research in the pharmaceutical industry. It highlights a growing corpus of academic work, expanding scholarly engagement, varying citation impacts, and a concentration of research efforts in particular years. These findings highlight the significance of corporate governance in the pharmaceutical industry and the expanding interest in this area of research.

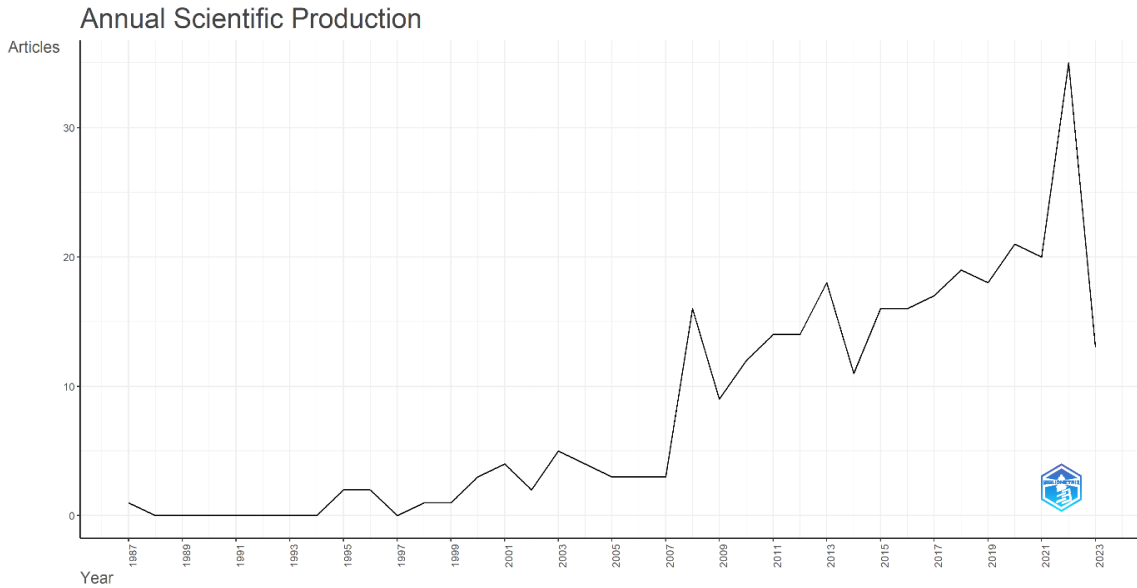


Figure 2: Annual scientific production

Source: Author’s own

Table 2: Publication Trends and Citations

Year	No. of articles	Mean Total citations per article
1987	1	5
1995	2	4
1996	2	11
1998	1	48
1999	1	104
2000	3	144.67
2001	4	78
2002	2	350
2003	5	21.8
2004	4	47.25
2005	3	84.67
2006	3	15
2007	3	8.33

2008	16	43.06
2009	9	34.67
2010	12	41.33
2011	14	54.71
2012	14	17.79
2013	18	13.94
2014	11	24.36
2015	16	35
2016	16	23.44
2017	17	20.76
2018	19	10.79
2019	18	10.33
2020	21	25.67
2021	20	10.25
2022	35	2.2
2023	13	0.85

Country research output, impact output, and Collaboration results

This section examines the most productive and influential countries in corporate governance research based on document production and citations. We used network analysis to identify corporate governance-collaborating countries. These data help us to understand corporate governance research worldwide and the nations that contribute to it. We evaluated each country's research based on the number of publications and citations. Network analysis reveals corporate governance research collaborations between countries. These factors help us understand how countries collaborate in corporate governance studies.

Table 3 shows corporate governance research productivity, impact, and collaboration potential by country. It highlights diverse contributions and countries with significant research output and citation impact.

Table 3: Most productive and Influential countries

Country	Number of Documents	TC	Average Citation per Document
USA	183	3151	24.48
United Kingdom	69	2230	46.72
Netherlands	25	457	65.29
India	54	449	29.93
Iran	28	353	44.13

Italy	35	294	22.62
China	53	211	16.23
Australia	21	125	31.25
Austria	8	107	26.75
France	13	93	18.60
Sweden	15	72	18.00
Germany	22	71	10.14
Pakistan	17	71	23.67
Belgium	6	47	47.00
Spain	8	44	14.67
Bangladesh	11	33	11.00
Denmark	9	32	8.00
New Zealand	8	32	16.00
Canada	19	31	6.20
Switzerland	9	30	15.00

The US has led corporate governance research with 183 articles. China (53) and the UK (69) . With 3151 citations, the US has the highest corporate governance research. Likewise, the UK (2230) and the Netherlands (457) have high citation numbers. The average number of citations per document indicates the scientific impact of each nation. The Netherlands' 65.29 citations per document show that its research is well-known. The UK and Iran have high citation rates (46.72 and 44.13, respectively). Canada has 6.20 citations per document, while the Netherlands has 65.29. Research output varies by country in terms of its impact and influence. This table depicts the worldwide component of corporate governance research, with contributions from India, Italy, Australia, France, Sweden, and other countries

The Figure 3 collaboration network analysis provides insights into collaborative patterns and influential countries in the field of corporate governance research. This highlights the presence of distinct clusters, countries with high betweenness and closeness centrality, and countries with significant influence based on their citation networks. This information can aid researchers and policymakers in understanding the global landscape of corporate governance research collaboration and identifying potential areas for future collaboration and knowledge exchange.

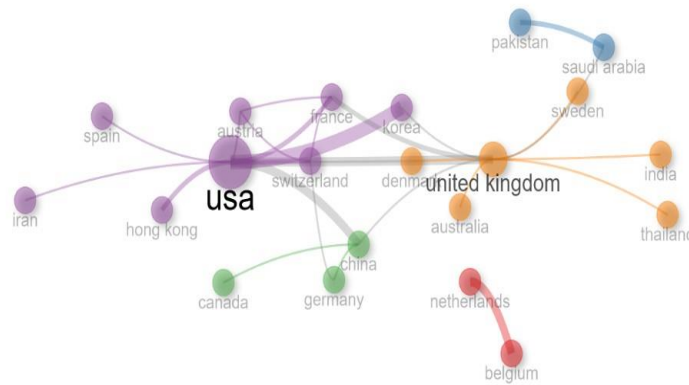


Figure 3: Collaboration network among countries

Countries such as the United Kingdom, Sweden, and France are part of this category, showing a higher level of collaboration. The UK and Thailand had strong betweenness scores, demonstrating their importance in bridging research connections. Saudi Arabia, Pakistan, and Germany had greater proximity ratings, indicating closer contact and possible information flow. China, the US, and France have higher Page Rank values, indicating greater influence and impact on corporate governance research.

Journal performance

The corporate governance sources and their cite scores are listed in Table 4. "Research Policy" had the most articles with 7 and a high Cite Score of 15.1. This suggests that academics are citing "Research Policy" publications. "Technology Analysis and Strategic Management" is next with 9 articles and a Cite Score of 7.1. Others had fewer articles and citation scores. "Corporate Ownership and Control," "European Accounting Review," and "Journal of Pharmaceutical Health Services Research" each had 3 articles with lower Cite Scores of 0.2, 5.6, and 1.7. These articles provide corporate governance insights despite their small numbers. Harvard Business Review stands out with six articles but a 2.4 Cite Score. This suggests that although articles published in this prestigious journal may not receive as many citations, they are still significant and contribute to the corpus of corporate governance knowledge.

Table 4: Most productive and Influential journals

Sources	No. of Articles	Cite score
Technology Analysis and Strategic Management	9	7.1
Research Policy	7	15.1
Harvard Business Review	6	2.4
International Journal of Pharmaceutical and Healthcare Marketing	6	2.8
Journal Of Intellectual Capital	5	12.1

Journal Of Product Innovation Management	5	14.1
Review Of International Political Economy	4	8.1
Corporate Governance	3	9
Corporate Ownership and Control	3	0.2
European Accounting Review	3	5.6
Health Marketing Quarterly	3	1.7
Innovation: The European Journal of Social Science Research	3	5.2
International Journal of Health Governance	3	2.5
Journal Of Engineering and Technology Management - Jet-M	3	7.2
Journal Of Pharmaceutical Health Services Research	3	1.7
Organization Science	3	7.4
Science And Engineering Ethics	3	7.7
Technovation	3	12.3
World Development	3	10.9
Asia Pacific Journal of Management	2	7.5

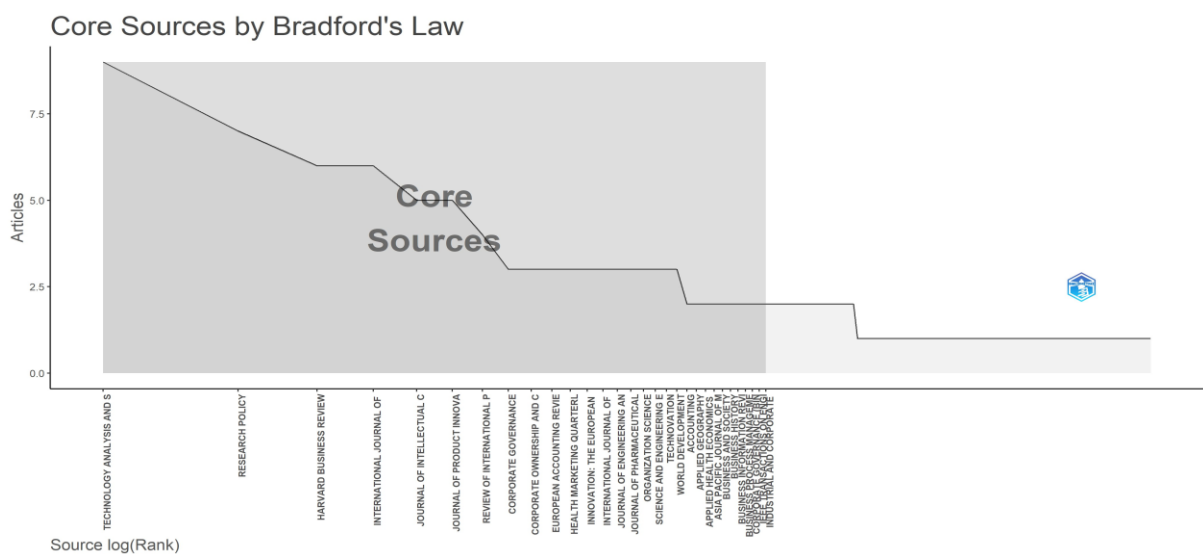


Figure 4: Bradford's Law

"Applied Geography" and "Applied Health Economics and Health Policy" may provide insights into the financial, geographic, and health policy components of corporate governance in the pharma business. Overall, Bradford Law in Figure 4, suggests that corporate governance in the pharmaceutical sector draws from a wide variety of sources, including those specific to corporate governance and others that provide contextual understanding from disciplines such as accounting, geography, and health policy. This demonstrates a multidimensional strategy for investigating corporate governance practices in the pharmaceutical industry, integrating multiple perspectives to enrich the analysis.

Author influence

Table 5: Most productive authors

Authors	Articles	Total citations	Average citations per document	Publication start year
Almaqtari Fa	5	26	5.2	2019
Farhan Nhs	5	26	5.2	2019
Tabash Mi	5	26	5.2	2019
Li M	4	30	7.5	2012
Duysters G	3	233	77.6	2009
Gnyawali Dr	3	37	12.3	2005
Gopalakrishnan S	3	25	8.3	2009
Offstein Eh	3	37	12.3	2005
Perrone G	3	35	11.6	2013
Vanhaverbeke W	3	233	77.6	2009
Adams Ca	2	693	346.5	2002
Adams J	2	11	5.5	2017
Aigbogun O	2	14	7	2016
Ashwin As	2	115	57.5	2015
Babar Z-U-D	2	109	54.5	2013
Bataglia W	2	12	6	2012
Billitteri C	2	32	16	2013
Cassels A	2	8	4	2016
Danaeefard H	2	8	4	2021
Farazmand A	2	8	4	2021
George R	2	115	57.2	2015
Gilsing V	2	58	29	2012
Guo T	2	26	13	2020
Hoy Mg	2	23	11.5	2013
Ju I	2	12	6	2017

Table 5 provides a comprehensive summary of the publication histories of the authors, emphasizing Almaqtari, Farhan NHS, and Tabash as the most prolific authors with five papers each. Farhan, Almaqtari, and Tabash published a notable paper titled "Does Corporate Governance Modify the Relationship Between Liquidity Ratios and Financial Performance? Evidence from Indian Pharmaceutical Companies" (Farhan et al., 2019) published in 2019 in the esteemed academic journal "Academic Journal of Interdisciplinary Studies." This study examines the influence of liquidity ratios on Indian pharmaceutical firms' financial performance and the moderating effect of corporate governance on this relationship. The current ratio and rapid ratio have a significant and positive effect on financial performance, as measured by return on assets and Tobin's Q. In addition, this study identifies corporate governance as a key moderating factor between liquidity ratios and net operating margins. This study contributes to the existing literature by introducing corporate governance as a

moderating factor, thereby enhancing our understanding of the intricate relationship between liquidity and firm performance.

Adams CA was the most influential among the top 20 most prolific authors, with an author's Citation Publication Duration (ACPD) score of 346.5. Internal Organizational Factors Influencing Corporate Social and Ethical Reporting: Beyond Current Theorising" (Adams, 2002) was published in the prestigious "Accounting, Auditing and Accountability Journal" in 2002. The internal contextual factors that influence the nature and scope of corporate social reporting were investigated. This study identifies these influential factors through interviews with seven large multinational corporations in the chemical and pharmaceutical sectors of the United Kingdom and Germany. This study highlights the limitations of existing social reporting theories and presents a corporate social reporting model that incorporates a wider range of factors. Adam's work contributes considerably to the field by enhancing the comprehension of the intricate dynamics involved in corporate social reporting.

Authors with the maximum publication output may not necessarily have the greatest influence. Figure 5 illustrates the publication and citation trends of authors over time, which can be consulted for a more comprehensive understanding. The horizontal columns represent the authors' active years, the size of the bubbles represents the number of articles they have published and the colour of the bubbles corresponds to the number of citations they have received. This suggests that the majority of authors who are both prolific and influential have been publishing for an extended period. This prolonged period of activity may be one of the factors contributing to the increased citation counts.

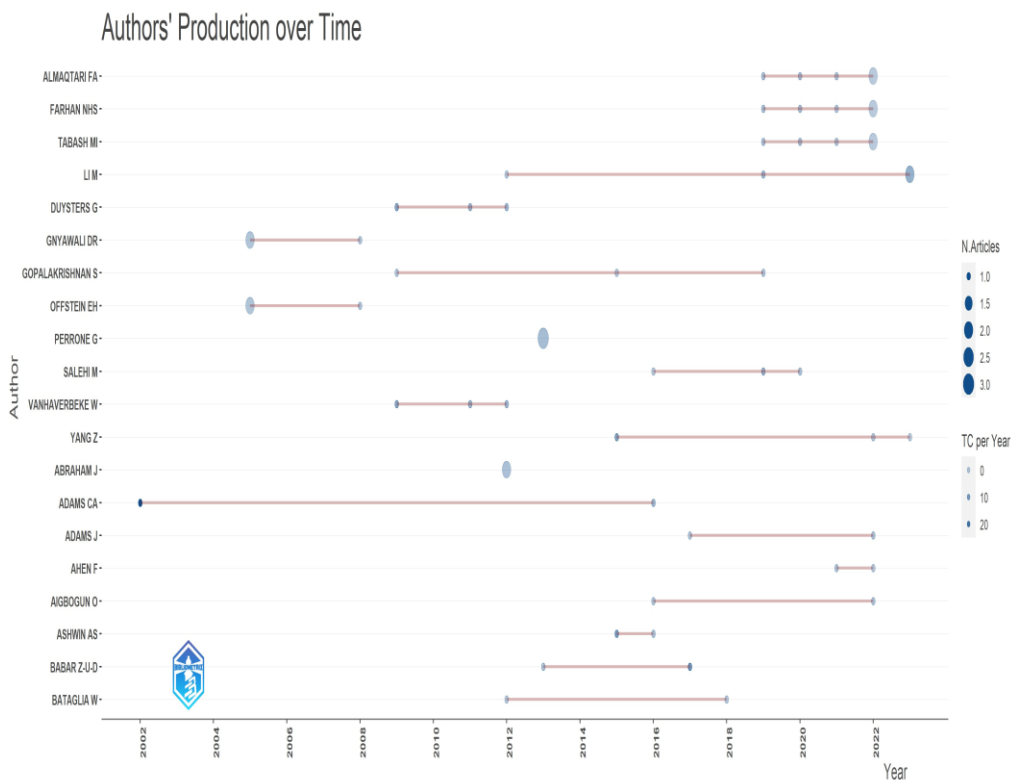


Figure 5: Author's production over time

Citation analysis is a bibliometric method used to identify documents that have significantly impacted a specific research field. These highly influential documents have been frequently cited by other researchers in the same field. While global citation analysis considers the total number of citations received by a document, local citation analysis focuses on the citations within a particular dataset, such as 303 documents. table 6 presents the most influential documents on corporate governance in the pharmaceutical sector based on local and global citations.

Table 6: Most influential documents

S. No	Title	Author (year)	Journal	Local Citations	Global Citations
1	“Let the Sunshine In”: The Impact of Industry Payment Disclosure on Physician Prescription Behavior	(Guo et al., 2020)	Marketing Science	0	13
2	“Clear and Conspicuous” and Distraction: Coping with Incongruent Audiovisual Content in Direct-to-Consumer Advertisements	(King, 2022)	Journal of Public Policy & Marketing	0	1
3	“A co-evolutionary perspective on the drivers of international sourcing of pharmaceutical R&D to India”	(Haakonsson et al., 2013)	Journal of Economic Geography	0	26
4	A holistic Risk management framework to Address the Global Noise-induced hearing loss pandemic	(Nehme et al., 2015)	Corporate Ownership & Control	0	1
5	A Multi-Criteria Decision Analysis Approach for Aligning IT and Supply Chain Strategies	(Bouayad et al., 2022)	International Journal of Supply and Operations Management	0	0
6	“A Romanian Insight on Corporate Governance Awareness”	(Stanciu, n.d.)	Quality-Access to Success	0	1
7	“A supply chain resilience model for business continuity: The way forward for highly regulated industries”	(Aigbogun et al., 2022)	Uncertain Supply Chain Management	0	3
8	“Activist investment: institutional investor monitoring of portfolio companies”	(Nisar and Martin, 2007)	Management Decision	0	7

9	“Algal biofuels: impact significance and implications for EU multi-level governance”	(Benson et al., 2014)	Journal of Cleaner Production	0	28
10	“Alliance Experience and Governance Flexibility”	(Lee et al., 2015)	Organization Science	0	28

The article titled "Algal biofuels: impact significance and implications for EU Multi-level Governance" by Benson et al. (2014), published in the Journal of Cleaner Production, and the article "Alliance Experience and Governance Flexibility" are among the most widely cited papers on a global scale. These studies have examined various aspects related to their respective topics. The first paper focuses on the potential negative environmental impacts of large-scale algal production of biofuels and assesses the adequacy of governance arrangements for environmental protection. The authors employed a qualitative impact assessment methodology to compare the significance of potential impacts from different production scenarios. Additionally, this study analysed the current environmental governance of algal biofuel technologies in the European Union. The second study investigated how firms involved in an alliance may have different perceptions of risks and preferences for an alliance structure. This emphasizes that firms with more alliance experience are better equipped to safeguard their interests under any given alliance structure, which ultimately gives them a competitive advantage.

Most frequently used keywords

Word cloud analysis is a valuable tool in the field of bibliometric analysis as it helps to identify the most significant and impactful keywords related to a specific topic. By visually representing the frequency of keywords, a word cloud provides a comprehensive view of prominent research themes within a dataset. When used in conjunction with other mapping and enrichment techniques, such as thematic mapping, word cloud analysis becomes even more powerful.



Figure 6: Word cloud of the keywords used in corporate governance research

A word cloud is a visual representation technique that effectively displays the relative frequency of keywords in a given dataset. The size of each keyword in the word cloud corresponds to its frequency of occurrence. Figure 6, presents a word cloud showing the 50 most commonly used keywords. As expected, the keyword "corporate governance" stands out as the most frequently used, appearing 30 times in the dataset. Following closely behind is the keyword "pharmaceutical industry," which

appears 20 times. These keywords were consistently employed by authors throughout the document, highlighting their significance and prominence in the research topic.

Trends in corporate governance

In this section, we analyse the trends in keywords used by authors over the years, with a specific focus on the evolution of corporate governance research. By conducting a trend analysis, we can gain valuable insights into the research emphasis given to this field in the past. This analysis, when combined with other techniques such as thematic mapping, can be instrumental in predicting future research directions. The graphical parameters used for this analysis include a minimum word frequency per year of six and a maximum of five keywords per year. This means that only keywords that appeared at least six times were considered, and a maximum of five keywords were selected for each year.

The results of this analysis are shown in Figure 7. In the graph, the years are represented on the x-axis, whereas the keywords are presented on the y-axis. The length of the bars and the size of the nodes indicate the breadth of the research topic and year of extensive research in the field, respectively. By examining the trends depicted in the graph, we can gain insights into the changing research landscape and key areas of focus in corporate governance research over time.

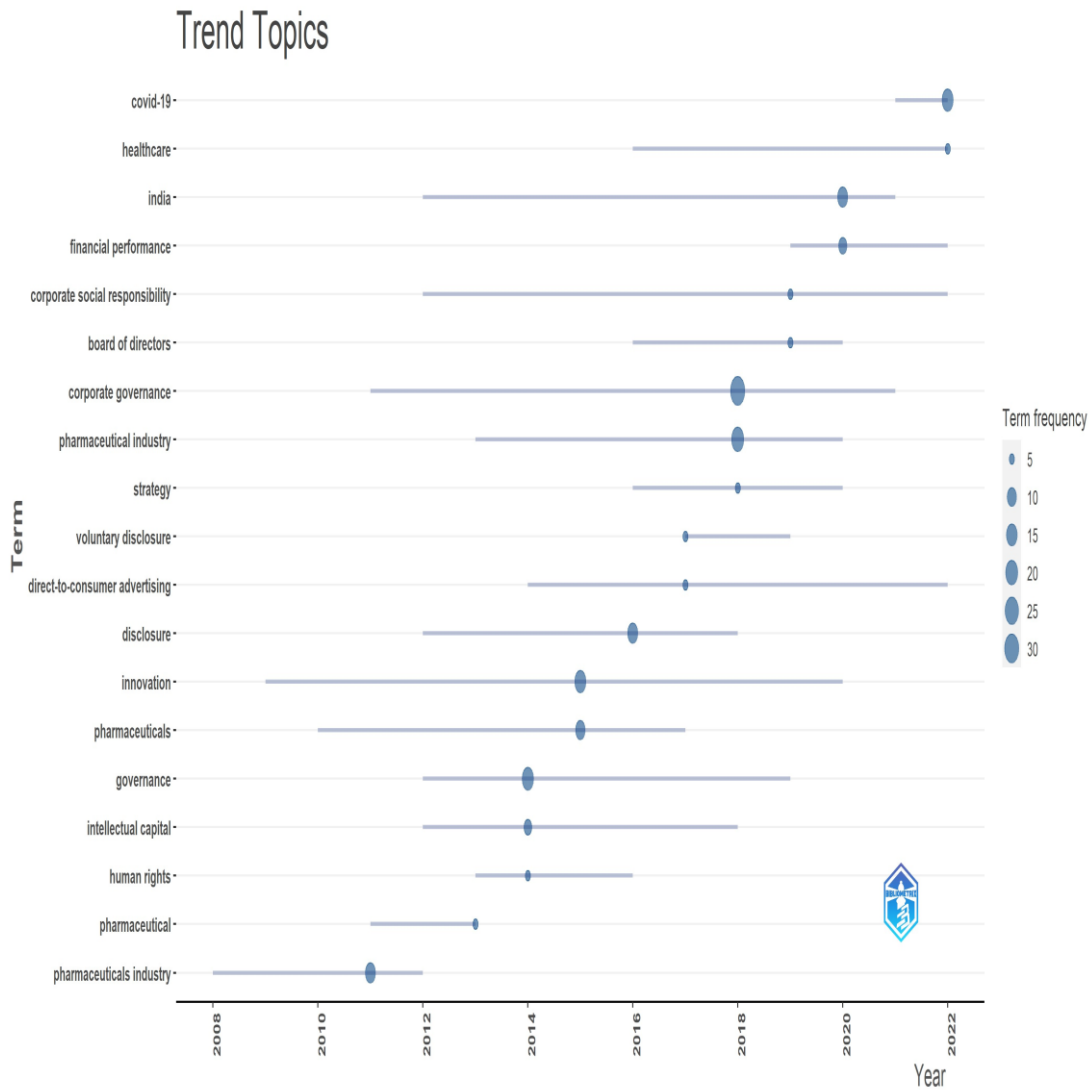


Figure 7: Corporate governance research trends

Pharmaceutical keyword analysis revealed fascinating research trends over time. "Pharmaceuticals industry" appeared 12 times, starting in 2008 and peaking in 2011 and 2012. Researchers may have studied pharmaceutical industry dynamics, market developments, competition, and structure over the years. "Pharmaceutical" appeared five times, first in 2011 and then in 2013. This suggests a pharmaceutical-specific corporate governance approach. Researchers may have examined pharmaceutical company governance issues such as ethical considerations, regulatory compliance, and decision-making procedures. "Governance" appeared 17 times, rising steadily from 2012 to 2019. This indicates a growing interest in governance practices and their effects on the pharmaceutical business. Governance, board structure, accountability, and organizational performance have been studied. "Intellectual capital" appeared seven times, between 2012 and 2018. This suggests an emphasis on pharmaceutical IP management and the use of pharmaceutical IP. Researchers may explore ways to boost innovation, competitiveness, and value through intellectual capital. Pharmaceutical innovation is crucial to corporate governance. Governance may encourage innovation, research, and intellectual property (IP) management. "Financial performance," "corporate social responsibility," "strategy," and the "board of directors" offer a full analysis of pharmaceutical corporate governance. Governance practices, financial outcomes, ethical obligations, strategic decision-making, and board effectiveness have been studied. The rise of "COVID-19" and "Healthcare" reflects worldwide events and their impact on the pharmaceutical business. Researchers are likely to research the pandemic's governance difficulties and how governance manages healthcare crises.

This keyword analysis shows how pharmaceutical corporate governance research is changing. It shows industry dynamics, developing trends, and the complexity of governance. Governance research has examined industry-specific issues, intellectual property management, innovation, and responses to external factors such as the COVID-19 pandemic. These findings inform researchers, policymakers, and industry practitioners of pharmaceutical governance practices.

Thematic Mapping

Thematic mapping analyses textual topics. Thematic maps show themes in quadrants for intuitive examination. (Aria & Cuccurullo, 2017) suggesting the use of thematic maps to understand topic density and centrality. This graph categorizes the themes into two dimensions. The X-axis measures the centrality or thematic importance. This study prioritizes essential themes. Density shows theme growth or prominence on the Y-axis. Denser themes were researched in more detail. The mean and median were used to evaluate each study theme's centrality and density, respectively. Thematic map positioning can be quantified using these measures. The thematic maps have four quadrants based on centrality and density (Figure 8). The quadrants organize themes by their traits: High Centrality and high Density: Themes in this quadrant are important and well-explored. These are well-known areas of study. High Centrality, Low Density: These themes are important yet underexplored. These issues are important but require further exploration. Low Centrality and, High Density: These themes are less central, but are widely discussed. Niche or specialized research subjects may have garnered attention in specific fields or communities. Low Centrality, Low Density: The themes in this quadrant are peripheral and underexplored. These themes may be promising or neglected ones.

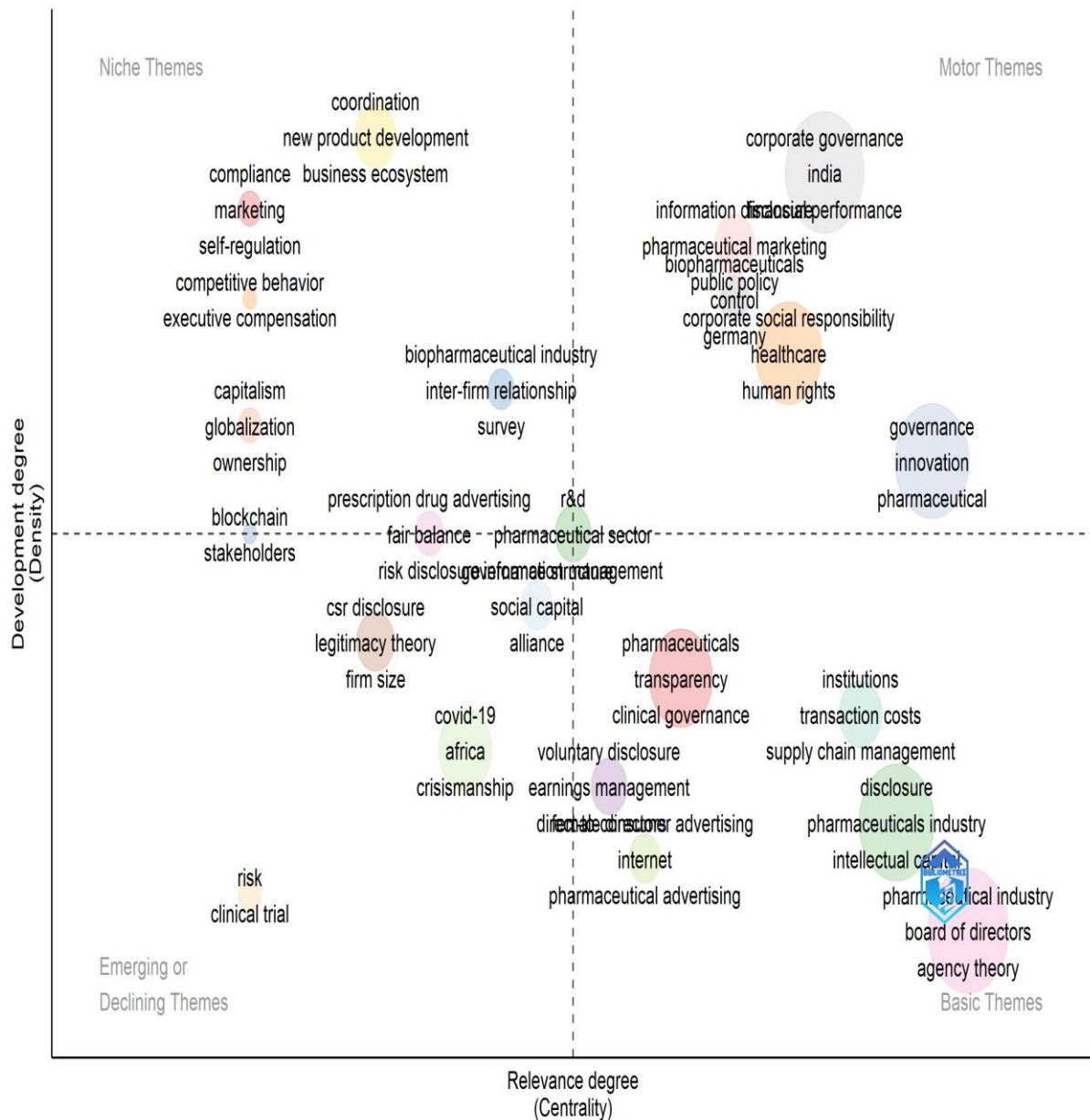


Figure 8: Thematic mapping of corporate governance

Pharmaceutical research focuses on these motor themes in the upper right quadrant. Corporate governance examines the ethical decision-making procedures of pharmaceutical businesses (Adams, 2002). Corporate social responsibility evaluates the ethical, environmental, and charitable practices of pharmaceutical companies. Biopharmaceutical research has advanced biological treatments and their problems (Yang et al., 2019). Pharmaceutical marketing examines how corporations' market their products in a highly regulated pharmaceutical industry (Jambulingam et al., 2009). Healthcare systems, policies, and practices emphasize drugs and healthcare delivery. The upper right quadrant indicates the considerable influence of these themes and the research foundation. Scholars and practitioners have spent many years studying and researching these topics, resulting in a wealth of literature and ongoing research. These main themes examine regulatory frameworks, stakeholder participation, biopharmaceutical development innovation, effective marketing methods, and the effects of drugs on healthcare outcomes.

The thematic map basics are in the lower right quadrant. These concepts are fundamental to the research field, which is yet to be studied. Pharmaceutical themes include "clinical governance," "healthcare," "agency theory," "board of directors," and "health governance." "Clinical governance

focuses on patient safety, risk management, and continual improvement to deliver high-quality healthcare. Healthcare management and administration include healthcare systems, policies, and patient care. Agency theory focuses on aligning interests, assessing performance, and resolving conflicts between principals (shareholders or stakeholders) and agents (managers or executives) in organizations. The pharmaceutical company's board of directors oversees strategic decision-making and organizational performance (Johennesse and Budidarma, 2022). Health governance includes public health, healthcare financing, and stakeholder cooperation.

Emerging or vanishing topics are in the lower left quadrant of the thematic map. The limited growth and emergence of these themes suggest a need for future research. This quadrant contains pharmaceutical themes like "risk," "clinical trial," "governance structure," and "social capital.". The pharmaceutical industry's risk theme involves identifying, assessing, and managing uncertainties and potential dangers (Renn et al., 2011). This involves risk analysis, risk mitigation, and drug development, manufacturing, and distribution risk assessment. New medications, therapies, and medical interventions have been tested in humans through clinical trials. This area includes clinical trial design, implementation, ethical considerations, and regulatory frameworks. Governance structure investigates pharmaceutical businesses' organizational structures and methods for decision-making, accountability, and openness. The board composition, executive leadership, and governance frameworks were also examined (Kolev et al., 2019). Social capital in the pharmaceutical industry includes relationships, trust, and social interactions (Bhatti et al., 2021).(Nabi et al., 2023) Social connections, collaborations, and knowledge sharing among stakeholders—healthcare practitioners, researchers, policymakers, and industry players—are examined in this section.

Niche themes are in the upper left quadrant of the thematic map. These themes are dense, reflecting their evolution and prominence in the research. They are not important for corporate governance, suggesting that they are isolated from larger conversations. The corporate governance themes of the pharmaceutical industry include the "biopharmaceutical industry," "globalization," and "new product development.". The biopharmaceutical sector focuses on specific qualities, problems, and opportunities to develop and commercialize biologically produced pharmaceutical products (Kim et al., 2022). This encompasses biotechnology advances, regulatory considerations, market dynamics, and innovation in this specialized area. Globalization examines how globalization, interconnection, and cross-border operations affect pharmaceutical corporate governance. International legislation, harmonization, global supply chains, and the governance consequences of multinational enterprises are covered in this area. The development of pharmaceutical products involves the creation of new products. This theme covered medication discovery and formulation techniques, intellectual property protection, regulatory barriers, and technological integration. These specialized subjects have been widely studied and developed, but they are not central to corporate governance. Thus, they may not be directly involved in pharmaceutical governance debates. However, these specialized issues can still provide essential insights and help to understand pharmaceutical corporate governance.

4. Future Direction

Assessing the Impact of Corporate Governance on Drug Development and Approval:

The pharmaceutical industry relies heavily on successful drug development and regulatory approval. Future research could investigate how corporate governance practices influence decision-making in drug development pipelines, clinical trials, and interactions with regulatory bodies. Understanding the link between governance and the efficiency of drug development could lead to improved processes and accelerated access to innovative medicines.

Governance and Pharmaceutical Ethics:

Ethical considerations are crucial in the pharmaceutical sector, particularly regarding clinical trials, patient safety, and marketing practices. Future research could explore the relationship between corporate governance and ethical decision-making, ensuring that ethical principles are embedded in corporate culture and operations. This study contributes to promoting responsible and ethical behavior within the industry.

Corporate Governance and Technological Innovation:

The pharmaceutical industry is experiencing rapid technological advancements, such as artificial intelligence, big data analytics, and precision medicine. Investigating how corporate governance fosters a culture of innovation, encourages investment in emerging technologies, and manages associated risks could provide insights into an industry's capacity to embrace transformative technologies.

Governance and Environmental, Social, and Governance (ESG) Performance:

Stakeholders are increasingly focusing on environmental and social performance metrics, in addition to financial performance. Future research could explore the relationship between corporate governance and ESG performance in the pharmaceutical industry. Understanding how governance practices influence sustainability initiatives, social responsibility, and long-term value creation can be beneficial for companies and investors.

5. Summary and Conclusion

This study aimed to contribute to the understanding of corporate governance research in the pharmaceutical industry by conducting a comprehensive bibliometric analysis. A wide range of 303 documents from the Scopus database, spanning 1987 to 2023, were analysed using advanced bibliometric techniques such as performance analysis, citation analysis, trend analysis, and thematic mapping. The findings of this study shed light on several important aspects of corporate governance research in the pharmaceutical industry. Performance analysis helped to identify influential countries, journals, authors, and studies that have made significant contributions to the field. The citation analysis provided insights into the most impactful documents and their influence within the research community. Trend analysis allowed for the identification of research emphases and shifts over time, offering valuable insights into the evolution of corporate governance research in the pharmaceutical industry. Thematic mapping helped to identify key themes and their relationships, providing a comprehensive understanding of the research landscape.

Based on the analysis, the study provides valuable suggestions for future research in the field of corporate governance in the pharmaceutical industry. These suggestions include exploring the relationship between corporate governance and emerging trends such as sustainability, intellectual property protection, access to medicines, and digital transformation. Additionally, this study highlights the importance of investigating governance practices in risk management, stakeholder engagement, compliance, R&D investment, and patient safety within the pharmaceutical industry. By addressing these research gaps, future studies can contribute to advancing the knowledge in the field of corporate governance in the pharmaceutical industry. The findings of this study serve as a foundation for researchers, policymakers, and industry professionals to guide their future research endeavours and make informed decisions regarding corporate governance practices in the pharmaceutical sector.

6. Limitation

The present study utilized the Scopus database for data collection because of its extensive coverage and to prevent duplication. It is important to acknowledge some limitations:

1. Exclusion of other databases: By solely relying on the Scopus database, there is a possibility that important studies available in other databases such as Web of Science and Google Scholar were not included in the analysis. Future studies should incorporate multiple databases to ensure more comprehensive coverage of the literature.
2. Language bias: This study focuses on research articles published in English. This language restriction might have resulted in the omission of relevant studies published in other languages. Including studies in different languages can provide a more global perspective on Corporate Governance research in the pharmaceutical industry.
3. Tool selection: The study employed the Biblioshiny tool in the R package for bibliometric analysis. While this tool is useful and provides valuable insights, there are alternative tools available such as VOS Viewer and Cite Space that offer different visualizations and network analyses. Utilizing multiple tools can enhance the robustness of bibliometric analyses and provide a more comprehensive understanding of the research patterns.
4. Generalizability: It is important to note that the findings and conclusions of this study are specific to the dataset and time period analyzed. The dynamics of Corporate Governance research in the pharmaceutical industry may have evolved since the data collection cutoff. Therefore, caution should be exercised when generalizing the results to other contexts or periods.

Addressing these limitations in future research can contribute to a more inclusive and comprehensive analysis of Corporate Governance research in the pharmaceutical industry. By considering a wider range of databases, languages, and analytical tools, researchers can obtain a more accurate and holistic understanding of this field.

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