

## Mapping the research on corporate governance in sensitive industries

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### Abstract

**Research Question:** Which are the trends and the impact in the research area covering corporate governance in sensitive industries?

**Motivation:** The research enhances prior literature on corporate governance under specific risk, uncertainty and socio-economic conditions. The referenced topics and timeframe highlight the focus on sensitive industries as a challenge, considering the mixed effects of crises conditions.

**Idea:** This paper creates a comprehensive overview on the corporate governance in sensitive industries research landscape, considered under universalist, social constructivist, and presentation perspectives.

**Data:** Information on publication trend, papers' main characteristics, academic collaboration, and factors with significant influence on times cited are collected for a sample of 926 scientific publications from the Web of Science database.

**Tools:** The network visualization for co-authorship and co-occurrence of keywords is based on using VOSviewer software, while statistical and econometric analysis of the database is performed using SPSS Statistics V.23.

**Findings:** The results emphasize that most of the papers are published in leading journals, while 2022 is the year that stands out with the highest number of publications. From the perspective of the business field, the research focus is on Banking, Energy, Logistic, Pharmaceutical, and Tourism industries. Muchmore, statistical analysis demonstrates that there is a significant difference between the types of publications. Regression analysis shows that times cited are positively and statistically significant correlated with cited reference count and article age.

**Contribution:** This study may be of great interest to academic and business environments. It summarizes information for a specific topic, whose evolution managers and practitioners are

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interested in. Furthermore, it fills the gap in examining the research impact based on several characteristics that exert an influence on times cited, contributing to the body of knowledge regarding the classification of research features under the universalist, social constructivist, and presentation perspectives.

**Keywords:** corporate governance, sensitive industries, network analysis, regression analysis

**JEL codes:** M41, G34

## 1. Introduction

The dynamics of the macroeconomic environment and the multitude of socio-political, demographic, and cultural transformations determine, at a global level, the need for increased adaptability of the business environment. Among the decisions adopted by the companies, consolidation and application of corporate governance principles are considered beneficial for the development of long-term business plans and strategies. Moreover, researchers focus on corporate governance as an integrated part in sustainability development background. Particularly, they draw attention to environmental sustainability, as a significant challenge for the business environment. According to existing studies in the literature, whether corporate governance is adapted to the specifics of the activity and the geographical regions where the companies are located, then value creation increases (Almashhadani & Almashhadani, 2022; Enciso-Alfaro & García-Sánchez, 2022).

To create a comprehensive overview of the research landscape on corporate governance, a concise synopsis of the concepts is necessary to be presented. Wicaksono *et al.* (2019) and Constantinescu *et al.* (2021) draw attention to investors' growing interests towards the interaction between financial and non-financial data in company's reports. Environmental, social and governance factors disclosure support the presentation of non-financial data, their aim being to propose long-term evolutionary perspectives. Hence, corporate governance refers to the guarantee to the providers of financing sources that the investments made are profitable. Furthermore, the interdependencies between the shareholding structure and the management are characterized by a set of common purposes. In this specific circumstance, the adoption of governance leads to the reduction of agency costs.

The main purpose of this study is to examine a fifteen-year evidence for research on corporate governance in sensitive industries, to improve understanding of publications' dynamics, academic interest in specific business sectors, key characteristics of papers, scientific collaboration, and factors associated with research impact. Research methodology, based on studies conducted by Caraiani *et*

*al.* (2018), Baker *et al.* (2020), Lungu *et al.* (2020), Baker *et al.* (2022), Senadheera *et al.* (2022), Cumming *et al.* (2023), Wahyuningrum *et al.* (2023), Zou *et al.* (2023), and Legendre *et al.* (2024) combine bibliometric analysis and regression analysis. Descriptive statistics allow to identify the characteristics of the studies, while network analysis techniques provide an overview of collaboration between authors and universities, as well as the most addressed themes based on authors' keywords. Additionally, econometric analysis sheds a new light on bibliographic characteristics and their influence exerted on times cited. Bibliographic data are examined as variables covering, article age, number of pages, cited references, special issue category and the frequency of articles' access. Total number of citations is measured through two indicators. On the one hand, the number of times cited in Web of Science Core collection is taken into consideration as the first independent variable. On the other hand, for robustness check and research validation the regression analysis is extended with an additional econometric model for the number of times cited in all scientific databases.

This study is motivated by previous literature showing that research on corporate governance under the influence of risk and uncertainty socio-economic conditions and in specific industries is a recurrent topic. Some industries are considered sensitive due to the hurdles they face in social and economic imbalances. The range of research interests is broad, including focus on companies that carry out activities in Healthcare (Dal Mas *et al.*, 2023), Financial (Galletta *et al.*, 2022) and Hospitality (Guillet & Mattila, 2010; Clark *et al.*, 2021) industries. Muchmore, Qi *et al.* (2023) study the Banking industry considering global financial crisis effects. They state that the topic of financial business field is diverse and pertains to numerous roles, both within and outside the bank. Ayadi *et al.* (2019) study corporate governance mechanisms and the financial crisis, while Abdoush *et al.* (2022) approach the corporate governance topic, both in financial crisis and non-crisis times.

Moreover, authors consider the impact of COVID-19 pandemic crisis conditions and their worldwide repercussions on socioeconomic landscape. Analysing the health crisis period may be justified by previous studies that address the corporate governance topic under the COVID-19 pandemic, approaching different scientific methodologies. For example, Hoang *et al.* (2022) find that the negative effects of the pandemic crisis are reduced in startups if companies have large boards of directors and the condition related to CEO duality is fulfilled. Alshhadat and Al-Hajaya (2023) draw attention to creating a new framework for corporate governance, adapted to changing circumstances caused by COVID-19 in the business world. Using interview as the main research method, authors identify several crucial pillars, such as flexibility, risk management, IT infrastructure, internal control, and policies to support corporate governance.

Other researchers focus on sensitive industries addressing corporate social responsibility (CSR), or environmental, social, and governance dimensions (ESG),

as connected with corporate governance. Benavides-Velasco *et al.* (2014) study the hospitality industry, and the main findings highlight that the level of corporate social responsibility implementation positively influences performance related to clients, employees, and society. Iyer and Jarvis (2019) provide a research review of CSR in the hospitality industry, while Kuzey *et al.* (2021) explore the correlation between CSR and performance in healthcare, financial and tourism business fields. Ding *et al.* (2021) explore the correlation between stock returns and corporate characteristics in the context of COVID-19 and find that corporate social responsibility activities carried out before the pandemic crisis exert a positive influence on stock prices.

The motivation of this research is attributed to specific combination of scientific methods used in prior literature and considered relevant in examining the research area. For example, Xu *et al.* (2021) perform a bibliometric analysis on crisis literature and entrepreneurship, while Lagasio and Cucari (2019) use meta-analytical review as the main research method in studying corporate governance, complemented with social and environmental disclosure. Bilal *et al.* (2023) approach corporate governance topic related to environmental disclosure, with the aim of discussing significant facets of scientific literature.

Results are considered in the context of previous research and their impact is valued throughout the publication and citation trend, key characteristics, and academic collaboration. Contribution of this study is ensured by the time frame (2008-2022) and by the specific business environment, represented through the analysis of sensitive industries. The comparative approach is facilitated based on crisis and non-crisis reference periods, and on various industries included. This may add to the identification of niches for future research, with important implications for scientific and business activities.

The rest of the paper is organized as follows. Section 2 covers an overview of the existing literature on corporate governance in sensitive industries and develops the research questions. Section 3 highlights the research methodology, describing data collection and data processing. The results are discussed in Section 4, while Section 5 concludes with a summary of the findings, limitations, and perspectives for future research.

## 2. Literature review and research questions

According to Rezaee (2004), corporate governance represents the main control and management mechanism for companies, which delineates the power sharing between corporate executives and investors, ensuring that they have strong business relationships. Corporate governance guarantees a precise setting of business objectives, ensuring that all resources are used efficiently to fulfil established purposes, permanent monitoring of activities, and quantify the performance

obtained. The value creation process for stakeholders is based on a high-quality corporate governance system. Gachie and Govender (2017) and Wahyuningrum *et al.* (2023) support these statements, identifying a series of benefits of good corporate governance, of which management quality, market advantage, cost reduction, economic innovation. Moreover, sustainable development, appropriate business operations, and the accomplishment of corporate goals may also be mentioned.

Corporate governance represents a field intensively debated in the literature, both from its evolution point of view and from the influences exerted in different business areas, with implications for financial and non-financial reporting. Wahyuningrum *et al.* (2023) suggest that weak corporate governance practices may lead to institutions' vulnerability, whose main consequences are critical crises and corporate failures. Likewise, Solomon (2020) emphasizes corporate governance failures under the conditions of the credit crunch and the global financial crisis. The well-known financial scandals, such as Enron and Parmalat demonstrate the weaknesses of corporate governance, simultaneously highlighting the need for consolidated regulatory policies and practices codes.

Moreover, researchers are interested in corporate governance connected with the major changes in socio-economic context, related to environmental or social dimensions. For example, Srivastava (2015) studied corporate governance during the financial crisis, and the results demonstrate that characteristics such as CEO duality and ratio of inside directors significantly influence financial performance. Likewise, Villanueva-Villar *et al.* (2016) studied corporate governance correlated with value creation under economic crisis conditions and found that board size and board independence are the significant variables. Using a structured literature review, Koutoupis *et al.* (2021) highlighted that developed countries distinguish through research on corporate governance in the pandemic crisis period. Naeem *et al.* (2022) studied the COVID-19 period and found that gender diversity significantly influences the relationship between corporate governance attributes and corporate sustainable performance.

Research on sensitive industries, such as Oil and Gas Extraction, Energy, Transportation and Warehousing, Health Care and Social Assistance, Construction, or Manufacturing were widely addressed along the time, as consequences of pressures triggered by law and regulations (Montes-Sancho *et al.*, 2022). Moreover, Garcia *et al.* (2017) accentuates the idea that sensitive industries are constantly under social and political pressure. They consider that sensitive industries are represented by those which are prone to produce significant damages on environmental and social dimensions and have a higher risk of occurring. Recently, Chemical and Pharmaceutical fields are considered sensitive industries (Yang & Yulianto, 2022) especially in the context of pandemic crisis. In light of previous research, it may be considered that sensitive industries are both those that significantly influence the environment and those whose sensitivity is determined by crisis conditions.

Corporate governance in sensitive industries is a long-discussed topic in literature. One of the industries that represents a challenge for researchers, given the vast set of norms that regulate corporate governance, is the Banking industry. Qi *et al.* (2023) focus on bank risk literature, their findings demonstrating the increasing interest among academics in bank risk research particularly as a response to the global financial crisis. Furthermore, authors emphasize that among the main topics approached in the relationship with bank risk are counted interrelations with corporate governance. Likewise, Galletta *et al.* (2022) focus on research evolution in the Banking industry, analyzing the environmental, social, and governance (ESG) performance. The main findings consist in a complete evaluation of research trends, as well as the intellectual growth, citations, keywords, and authors' affiliations analysis, together with scientific collaboration. Khan *et al.* (2022) approaches the review for the bibliometric papers related to the financial industry. They found that research focused on specific core subjects such as corporate governance, together with market dynamics and behavioral finance. Bhatia and Gulati (2021) pursue in their research the assessment of how board governance influences bank performance. Their results emphasize that bank performance is positively influenced by boards with gender diversity and a high ratio of outside and non-executive directors. Furthermore, Matuszak *et al.* (2019) studied the Banking industry from the perspective of corporate governance influences, and found that board characteristics, such as size, female leadership, or foreign members exerted a significant influence on CSR disclosure.

Diniz *et al.* (2024) use bibliometric techniques to study the Maritime industry and port sector in the light of sustainable development goals. Port operations are closely related to the maritime sector, which is a pillar of world economic growth and development and provides essential infrastructure for economic expansion. These business fields may be associated with the Transportation industry, because of their implications in international trade. Furthermore, the Maritime industry, as an integrated component of Transportation industry, is of research interest for Andreou *et al.* (2014), which examined corporate governance correlated with financial decisions adopted by the management, and with firm performance. Retrospective analysis of the results reveals that firm performance may depend on corporate governance, through board size, CEO duality, and corporate governance committees. Milanese *et al.* (2020) used systematic literature review to examine sustainable reporting in Pharmaceutical industry, while the Energy industry is studied by Constantinescu *et al.* (2021), who focus on corporate governance as an integrated part of ESG factors.

Kuo *et al.* (2021) approached the topic of CSR, studying its influence on Airline industry companies. Their findings suggest that if ESG performance is considered one of the measures of CSR, this fact contributes to the positive influence exerted on

short-term key performance indicators. These short-term influences may provide long-term perspectives for management.

Furthermore, scientific literature addresses the corporate governance topic in Hospitality and Tourism industries. For example, Legendre *et al.* (2024) examine corporate governance, environmental and social factors, with insights into Hospitality and Tourism industries. Moreover, Jain *et al.* (2023) perform a comprehensive analysis of previous studies on luxury hospitality and offers some significant new insights. They present the intellectual framework conducting a quantitative analysis, main findings creating an overview on hospitality research. According to the results, the research trend is ascending, the United States and China being identified as the most productive countries in terms of publications. Uyar *et al.* (2020) pay attention to corporate governance as an integrated part of corporate social responsibility in the Hospitality and Tourism industry. They found that CSR committees influence stakeholders' goals and demand. In addition, an independent board of directors ensures the quality of corporate governance and CSR commitments when they care about strengthening the governance structure, meeting shareholders' interests, and generating long-term value. Furthermore, participation in CSR activities is directly proportional to the ratio of women on the board.

Hence, prior studies approach analysis on the industries considered sensitive, such as Banking and Financial (Galletta *et al.*, 2022; Khan *et al.*, 2022; Khan, 2022; Qi *et al.*, 2023; Wider *et al.*, 2023), Tourism and Hospitality (de Bruyn *et al.*, 2023; Jain *et al.*, 2023; Legendre *et al.*, 2024), Pharmaceutical (Milanesi *et al.*, 2020), Energy (Constantinescu *et al.*, 2021), or Airline (Kuo *et al.*, 2021). To explore the fifteen-year evidence of research on corporate governance in sensitive industries, five research questions are formulated:

**RQ1.** *How has the research on corporate governance in sensitive industries developed during the last 15 years?*

**RQ2.** *Which are the most prominent sensitive industries explored in prior research?*

**RQ3.** *Which are the characteristics of research on corporate governance in sensitive industries?*

**RQ4.** *How the research on corporate governance in sensitive industries may be characterized in term of co-authorship and co-occurrence of keywords?*

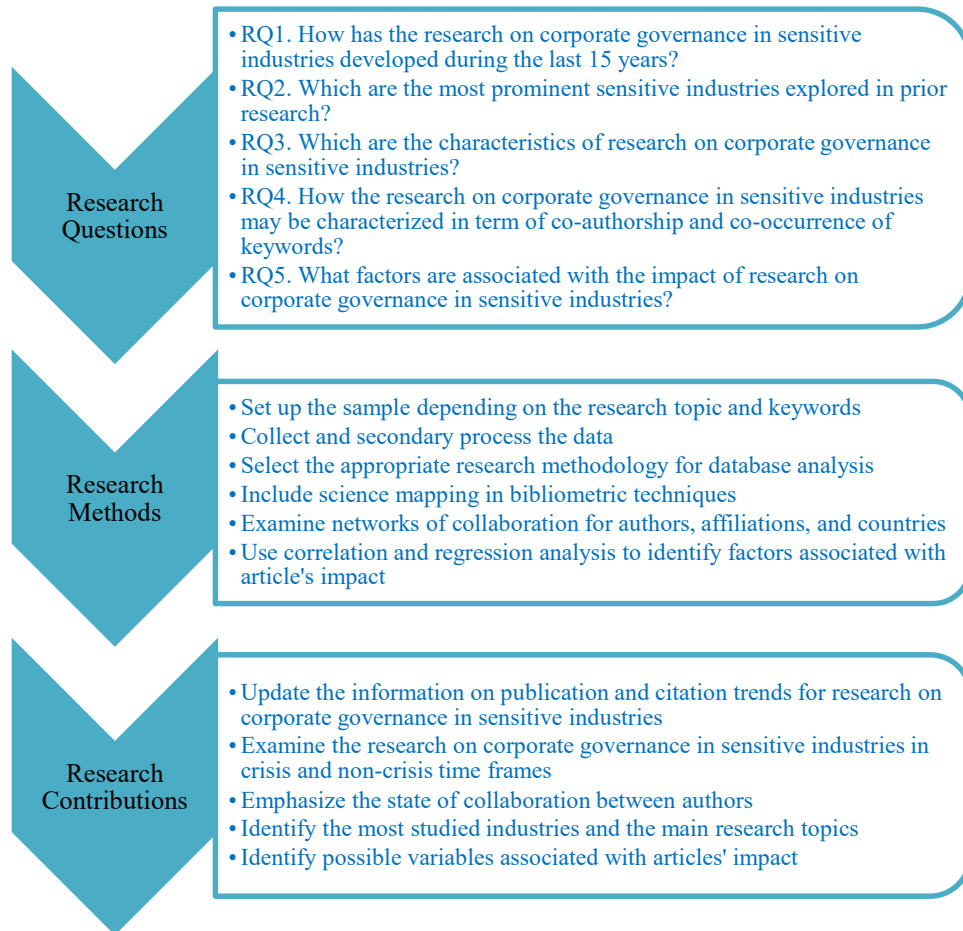
**RQ5.** *What factors are associated with the impact of research on corporate governance in sensitive industries?*

### 3. Research methodology

This research provides a review of scientific papers published during the last fifteen-year aiming at analysing the evolution, insights and factors associated with research

on corporate governance in sensitive industries. The literature review covers the theoretical framework of the research field, based on relevant papers in this area. The investigation is substantiated by prior studies that use bibliometric analysis (Bilal *et al.*, 2023) and structured literature review (Dal Mas *et al.*, 2023) as the primary research methodology, completed with econometric analysis approach (Baker *et al.*, 2020; Baker *et al.*, 2022).

The source of the data collection, as well as the steps taken in conducting this research are designed according to Baker *et al.* (2020), Baker *et al.* (2022), Khan (2022), Cumming *et al.* (2023), and further highlighted in Figure 1.



**Figure 1. Research framework**

Adapted from Baker *et al.* (2020); Baker *et al.* (2022); Khan (2022); Cumming *et al.* (2023)



Bibliometric analysis, combined with descriptive and statistical analysis is performed to explore research dynamics, defining characteristics, and scientific cooperation. Frequency analysis examines the evolution of publishing, with type, year, and business fields information included. The empirical character of this study is ensured by statistical indicators and independence t-tests, completed with descriptive and network analysis.

Regression analysis is performed in the light of a theoretical background (Stremersch *et al.*, 2007; Meyer *et al.*, 2018; Baker *et al.*, 2022) underlying three scientometric perspectives: *universalism*, *social constructivism*, and *presentation* that may explain the research impact measured as times cited. *Universalism* emphasizes that articles' citations are based on what information the authors disseminate. Within this perspective, quality and domain dimensions are discussed. Article's quality influences the times cited, based on the fact that noteworthy articles are characterized as originals, with significant contributions, being considered that they may offer a higher motivation for future research horizons. Article's domain may affect the number of citations considering the variety of features in terms of research method and studied topic. *Social constructivism* suggests that articles' impact is determined by authors' characteristics. Hence, discussion is oriented towards the prominence and standing of the researchers within the hierarchical scientific system, their noteworthy and publications' history, along with self-promotion. Furthermore, times cited may be influenced by authors' characteristics such as gender, affiliation, and country. *Presentation* perspective highlights that articles are cited based on the way authors present their work. The scientific expression is, therefore, tailed in accordance with three items: length of the title, stand out words, and clarity of exposition for disseminated information. Likewise, it is considered that enhancing an article's impact may be accomplished by providing a visual representation of the conceptual models, or tables and appendices that clarify the methodological issues and results overview. Well-structured articles characterized by readability of the content are preferred by readers because they are easier to understand.

### 3.1 Data collection and sample characteristics

For this study, the source for secondary data is the Web of Science Core Collection Database, which is provided by Clarivate Analytics. Data are collected for the period between 2008 and 2022, the search strategy being based on keywords *corporate governance* and *sensitive industries*, and on *corporate governance* combined with each industry considered sensitive (*Airline, Banking, Energy, Healthcare, Hospitality, Logistic, Pharmaceutical, Tourism, and Transportation*). The first filter is represented by period and specific searching keywords.

The analysis time frame (2008-2022) may be justified based on perspectives suggested by Bilal *et al.* (2023). Authors consider that an extended analysis period

provides results that are more comprehensive and broadly applicable. Moreover, Qi *et al.* (2023) emphasizes that topic for one of the sensitive industries (Banking) has garnered significant attention from scholars, financial industry professionals, and regulatory bodies in the wake of the 2008 global financial crisis. These statements may justify the starting analysis period in this study. Hence, the research reference time frame consists in detecting the global financial and pandemic crisis influences exerted on scientific research activity.

Web of Science database selection is motivated by prior studies which conducted bibliometric analysis on similar topics. Considering the literature, it is suggested that Web of Science represents a comprehensive and multidisciplinary bibliographic resource. In the Web of Science, highly relevant scientific publications are included, this database provides bibliographic valuable information such as publication type, volume, year, number of pages, and journal issue number. These statements are supported by Xu *et al.* (2021), Galletta *et al.* (2022), Khan *et al.* (2022); Bilal *et al.* (2023), de Bruyn *et al.* (2023) and Legendre *et al.* (2024).

Initially, the sample consisted of 1,827 studies. The final database is processed using *Microsoft Excel* software, by selecting specific Web of Science research areas (*Business, Economics, and Management*). A total number of 901 papers were excluded based on missing data related to authors' keywords, abstract, publication year, duplicates and studies not included in defined research areas. Table 1 shows the details on sample selection.

**Table 1. Sample selection**

<b>Sample</b>	<b>Number of observations</b>
Initial sample	1827
Less studies not covered in Business, Economics and Management research areas	(488)
<i>Intermediate sample before excluding unsuited research areas</i>	<i>1339</i>
Less missing data for:	
Authors' information	(3)
Publication year	(76)
Abstract information	(24)
Authors' keywords	(80)
<i>Intermediate sample after exclusion of missing data</i>	<i>1156</i>
Less duplicates	(230)
Final sample	926

Subsequently, data is gathered for a set of variables selected to characterize the publications: name of the authors, affiliation, title of the paper, abstract, keywords, publication type, publication year, cited reference count, times cited, and number of pages. The network visualization for co-authorship and co-occurrence of keywords

is based on using *VOSviewer* software, while statistical and econometric analysis of the database is performed using *SPSS Statistics Version 23*.

### 3.2 Bibliometric analysis

Bibliometric analysis examines the scientific contributions found in books, conference proceedings or academic journals, using statistical methods. The bibliometric approach facilitates the examination of the contributions made by scientific representatives within a research topic, reflect closely at the scientific sources' body of knowledge, and examine how different authors perform in a research field (Baker *et al.*, 2020; Baker *et al.*, 2022; Enciso-Alfaro & García-Sánchez, 2022; Bilal *et al.*, 2023; Wahyuningrum *et al.*, 2023).

According to Diniz *et al.* (2024), *VOSviewer* allow to determine research areas, identify gaps in the literature, and prevailing trends, highlight sources and authors, clarify the relationships between keywords, and identify the countries that stand out by research activities. Selecting *VOSviewer* as a tool for bibliometric analysis in line with previous research conducted by Galletta *et al.* (2022), Jain *et al.* (2023), Qi *et al.* (2023), Legendre *et al.* (2024).

Bibliometric approach investigates the research landscape, covering by publication trends, research characteristics according to publication type/industry, the most studied business fields, and search topic. Analysis is addressed based on RQ1, RQ2, and RQ3. Moreover, science mapping, as a bibliometric technique, highlights the academic state of collaboration, together with authors' interest in specific research areas. Hence, network visualization may be understood as a response for the RQ4. The science mapping created through network visualization reveals structural connections and relevant interactions between universities and authors, which is essential for the summary of results and the future research horizon. Moreover, analysis is completed by examining the frequently used keywords.

### 3.3 Regression analysis

Regression analysis is approached to identify possible factors with a positive and significant influence on the research's impact measured by the number of citations of each article, according to RQ5. Linear regression is employed to ascertain the relationship between various characteristics of the articles and the number of times the article was cited. The underlying conceptual model is adapted according to Stremersch *et al.* (2007), Meyer *et al.* (2018), Baker *et al.* (2020) and Baker *et al.* (2022). The dependent variable measuring the research impact consists of number of times the article is cited in Web of Science database (TIMES\_CITEDWOS). The cut-off date for the measurement of times cited is 9<sup>th</sup> of January 2023. Additionally, to address the robustness checks, a secondary dependent variable is used, measuring the citations in all databases (TIMES\_CITEDALLDB).

Using Stremersch *et al.* (2007) perspectives on the influence of scientometric characteristics of articles on the citations received, combined with Baker *et al.* (2022) conceptual framework, four groups of possible factors are included as independent variables in the regression model: universalism, social constructivism, presentation, and additional attributes.

$$\text{ART\_IMPACT}_i = \alpha_0 + \alpha_1 \text{UNIVERSALISM} + \alpha_2 \text{SOCIAL\_CONSTRUCTIVISM}_i + \alpha_3 \text{PRESENTATION}_i + \alpha_4 \text{ADDITIONAL\_ATTRIBUTES}_i + \varepsilon_i$$

where ART\_IMPACT takes subsequently TIMES\_CITEDWOS and TIMES\_CITEDALLDB values for the article *i*. The three categories of factors are replaced in the regression equations with a list of independent variables further explained in section 4.4. The error term is represented by  $\varepsilon_i$ .

This analysis is applied to the 926 articles included in the database used for this research.

## 4. Results

### 4.1 Publication and citation trends of corporate governance in sensitive industries research

The first research question (*RQ1. How has the research on corporate governance in sensitive industries developed during the last 15 years?*) draws on examining the trend of research, considering information about three types of publications (Table 2) and fifteen years timeframe (Table 3). Scientific journals stand out as the most significant publication type, with the highest number of papers published (824 papers, 89%), followed by conference proceedings (84 papers, 9.1%), and then by book chapter type, for which only 18 papers are found (1.9%).

Table 2. Publication type frequency analysis

Publication Type	Frequency	Percent (%)
Book Chapter	18	1.9
Conference	84	9.1
Journal	824	89.0
<i>Total</i>	<i>926</i>	<i>100.0</i>

The trend of research on corporate governance in sensitive industries is determined based on the absolute and relative number of publications per year, from 2008 to 2022, accompanied by number of citations and the related industries in which the research was conducted (Table 3). The trend is interpreted as comprehensive, and it could be considered that the general trend is upward, except for the decrease in 2010, when the total number of publications is reduced with 11 studies compared to 2009. Likewise, it is noticed that the number of studies published in 2016 is lower than the

number of those published in 2015, the difference being given by two studies. Furthermore, the analysis emphasizes that 20 fewer studies were published in 2019, compared to 2018. An important upward trend is observed for the period between 2020 and 2022, for each year, the number of studies published being higher than in the previous. From this point of view, 2022 represents a referenced year, highlighting 141 (15.2%) published papers.

**Table 3. Publication and citation trends – yearly frequency analysis**

<b>Year</b>	<b>Frequency (%)</b>	<b>Times Cited WOS (%)</b>	<b>Business Field Focus</b>
2008	18 (1.94%)	1095 (6.70%)	Banking, Energy, Pharmaceutical
2009	24 (2.59%)	1570 (9.61%)	Banking, Energy, Tourism
2010	13 (1.40%)	212 (1.29%)	Banking, Pharmaceutical
2011	21 (2.27%)	667 (4.08%)	Banking, Logistic
2012	26 (2.81%)	1200 (7.35%)	Banking, Hospitality
2013	34 (3.67%)	1236 (7.57%)	Banking, Energy, Pharmaceutical
2014	35 (3.78%)	1245 (7.62%)	Banking, Energy, Logistic, Transportation, Tourism
2015	48 (5.18%)	1045 (6.40%)	Banking, Energy, Pharmaceutical, Tourism
2016	46 (4.97%)	1206 (7.38%)	Airline, Banking, Energy, Hospitality, Logistic, Tourism
2017	86 (9.28%)	1755 (10.74%)	Banking, Energy, Hospitality, Logistic, Pharmaceutical, Tourism
2018	111 (11.99%)	1713 (10.49%)	Airline, Banking, Energy, Logistic, Pharmaceutical, Tourism, Transportation
2019	91 (9.94%)	1295 (7.93%)	Airline, Banking, Energy, Hospitality, Logistic, Tourism
2020	112 (12.09%)	1115 (6.82%)	Airline, Banking, Energy, Healthcare, Hospitality, Logistic, Pharmaceutical, Tourism
2021	120 (12.96%)	644 (3.94%)	Airline, Banking, Energy, Hospitality, Pharmaceutical, Logistic, Tourism
2022	141 (15.23%)	339 (2.08%)	Banking, Energy, Hospitality, Logistic, Pharmaceutical, Tourism, Transportation
<i>Total</i>	<i>926 (100%)</i>	<i>16,337 (100%)</i>	
<i>Average per year</i>	<i>62 (6.70%)</i>	<i>1089 (6.70%)</i>	

A variability may be detected in term of times cited, with the lowest frequency for papers published in 2010, and the highest for those published in 2017. The number of sensitive industries addressed in corporate governance research increased over time, from 2 or 3 types before 2013 to 7 or 8 types after 2020, the most salient being Banking and Energy.

The results presented in Table 4 allow for an in-depth analysis of the reference period and address *the dynamics of research in crisis periods versus non-crisis periods different*. The purpose of this supplementary analysis is to delimit the time frame into three periods, the response aiming at identifying possible influences exerted by crisis conditions (financial and pandemic), compared to non-crisis periods.

**Table 4. Publications per crisis/non-crisis periods**

Period	Frequency (%)	Times Cited WOS (%)	Business Field Focus
<i>2008-2009 Crisis period</i>			
Total articles	42 (4.54%)	2665 (16.31%)	Banking, Energy,
Average per year	21 (2.27%)	1333 (8.16%)	Pharmaceutical, Tourism
<i>2010-2019 Non-crisis period</i>			
Total articles	511 (55.18%)	11574 (70.84%)	Airline, Banking, Energy,
Average per year	51 (5.51%)	1157 (7.08%)	Hospitality, Logistic, Pharmaceutical, Tourism, Transportation
<i>2020-2022 Crisis period</i>			
Total articles	373 (40.28%)	2098 (12.84%)	Airline, Banking, Energy,
Average per year	124 (13.39%)	699 (4.28%)	Healthcare, Hospitality, Logistic, Pharmaceutical, Tourism, Transportation

The period between 2008 and 2009 faced many difficulties generated by the global financial crisis which started at the end of 2007. In this period, publishing interest is increasing, with the total number of studies being 42, representing 4.5% of the sample. These values may be attributed to the research attention paid to corporate governance by researchers, especially in fields strongly affected by the financial crisis. Based on the business field focus included in Table 4, it may be concluded that researchers were concentrated on *Banking, Energy, Pharmaceutical, and Tourism* industries. To argue these assumptions, a study performed by Erkens *et al.* (2011) on corporate governance in companies that carried out activities in the financial field, taking into consideration 2007-2008 crisis conditions, may be mentioned. Their results emphasize the important impact of corporate governance on financial performance during the crisis, from the point of view of risk taking and financing policies. Furthermore, Gupta *et al.* (2013) approached the corporate governance topic under global financial crisis conditions in non-financial companies,

and their findings suggest that the efficiency of capital markets decreased under crisis circumstances.

The time frame between 2010 and 2019 could be considered a non-crisis period. At the end of 2019, the moment of onset of the pandemic crisis, its extent created confusion and its repercussions could not be monitored. Instability at the academic level may be observed in the decrease of the number of studies published in 2019 compared to 2018. Researchers maintain their increasing interest in publishing on corporate governance in sensitive industries, with an average of 51 papers per year. However, the area of interest is extended, and the industries for which the research interest prevail are represented by *Airline, Banking, Energy, Hospitality, Logistic, Pharmaceutical, Tourism, and Transportation*. Moreover, even if the 2010-2019 could be considered a non-crisis one, researchers continued observing the effects of the global financial crisis.

For the period between 2020 and 2022, the academic field faced a new socio-economic context, determined by pandemic phenomenon, and its worldwide disastrous consequences. Starting from these conditions, researchers approached the topic and studied cause-effect relationships in detail, correlated with corporate governance in sensitive industries. These arguments explain the upward publication trend for the period 2020-2022. For example, Qui *et al.* (2021) conducted research on the influence exerted by corporate social responsibility activities on stock returns in companies that carried out hospitality industry activities. The authors examined the reaction of stakeholders to the evolution of the stock market. Their results emphasize that investors have favourable reactions to the corporate social responsibility activities in pandemic crisis conditions, because these activities have the role of protecting employees, clients, or suppliers. The results presented in Table 4 allow for a summary of studies published between 2020 and 2022, measured absolute and relative. The average number of studies (127 papers) is significantly higher, compared with previous periods. The total papers published represent 40% of the sample, and focus on *Airline, Banking, Energy, Hospitality, Logistic, Pharmaceutical, Tourism, Transportation* business fields.

To further analyse the data, starting from the results obtained for RQ1, this study approaches the second research question (*RQ2. Which are the most prominent sensitive industries explored in prior research?*), which aims at identifying the number of published studies, according to the search topic used. The *corporate governance* keyword is combined, at a time, with keywords referring to *sensitive industries* in general, and the transition to specific business fields is completed by including keywords for each industry in the search topic. The sample includes both industries considered sensitive by definition (*Airline, Banking, or Energy*) and industries considered sensitive based on the fact that they are significantly influenced by global financial or pandemic crisis conditions (*Hospitality, Logistic, Pharmaceutical, Tourism, Transportation*).

Table 5 illustrates the results for the search topic frequency analysis. Research on *Banking industry* stands out with more than half (536 publications, 57.9%) of the studies included in the sample, taking into consideration aspects of corporate governance in sensitive industries. According to the literature (Kara *et al.*, 2022; Citterio & King, 2023), Banking industry is a long-researched topic because the effects of crises, be it financial or pandemic, have been negative and difficult to predict in this field. Moreover, interest for research on *Energy industry* and corporate governance is high, this search topic being ranked second, with 109 studies (11.8%). Guérin and Suntheim (2021) approach the environmental performance of economic entities in the context of the COVID-19 crisis. Furthermore, Stocker *et al.* (2020) study sustainability issues.

**Table 5. Search topic frequency analysis**

Search Topic	Frequency	Percent (%)	Times cited (WOS)	Average citations per paper
Corporate governance & Airline industry	18	1.9	264	15
Corporate governance & Banking industry	536	57.9	10,025	19
Corporate governance & Energy industry	109	11.8	1764	16
Corporate governance & Healthcare industry	7	0.8	29	4
Corporate governance & Hospitality industry	49	5.3	711	15
Corporate governance & Logistic industry	49	5.3	1005	21
Corporate governance & Pharmaceutical industry	27	2.9	447	17
Corporate governance & Sensitive industries (generally addressed)	68	7.3	1389	20
Corporate governance & Tourism industry	47	5.1	457	10
Corporate governance & Transportation industry	16	1.7	246	15
<b>Total</b>	<b>926</b>	<b>100.0</b>	<b>16,337</b>	<b>152</b>

Analysing the search topic based on *corporate governance* and *sensitive industries (generally addressed)*, 68 studies (7.3%) were returned. The next areas approached by researchers are *Hospitality industry* (Jain *et al.*, 2023; Legendre *et al.*, 2024) and *Logistic industry*, with 49 studies each (5.3%) and *Tourism industry* (de Bruyn *et al.*, 2023), with 47 papers (5.1%). For the *Pharmaceutical*, *Airline*, *Transportation* (Andreou *et al.*, 2014; Diniz *et al.*, 2024), and *Healthcare* (Dal Mas *et al.*, 2023) industries, fewest studies are published (between 7 and 27 studies along the entire period).



Previous studies conducted on sensitive industries validate this research. On the one hand, de Bruyn *et al.*, (2023) study the topic of sustainability in *Tourism industry*, using a comprehensive bibliometric analysis as the main research method. Authors consider that studying Tourism industry is relevant, based on the fact that it represents one of the business fields in the world with essential contributions to economic development, being well known for its ability to generate job opportunities, which support global employment and poverty avoidance. On the other hand, Dal Mas *et al.* (2023) use structured literature review for an interdisciplinary approach related to *Healthcare industry*, taking into consideration the issues of contemporary digital transformation under pandemic crisis conditions. Authors consider healthcare as one of the industries with the fastest rate of growth in the world, and their analysis suggest that COVID-19 pandemic determined a revolutionary use of digital technologies across all areas, pushing the entire healthcare industry toward significant challenges.

Furthermore, a brief discussion about the number of citations (Times cited) is addressed. The frequency of studies on corporate governance in various sensitive industries may be linked to the times cited and average citations per paper, reported in Web of Science Core (Table 5). Higher numbers of times cited are noted for Banking (10,025) and Energy (1,764) industries. These findings are consistent with prior literature because Banking (Galletta *et al.*, 2022; Qi *et al.*, 2023) and Energy (Constantinescu *et al.*, 2021) are representative research industries. For increasing relevance, analysis includes the average values of citations per paper, which have a supporting role in the results. Most of citations per paper are counted for Logistic (21) and Sensitive industries – generally considered (20). The Banking industry is ranked on the third position, with an average of 19 citations/paper, followed by Pharmaceutical (17) and Energy (16) industries.

#### **4.2 Characteristics of research on corporate governance in sensitive industries**

To respond the third research question (*RQ3. Which are the characteristics of research on corporate governance in sensitive industries?*), a descriptive analysis detailed by publication type is approached, starting to studies conducted by Donthu *et al.* (2021), and Baker *et al.* (2022), which performed bibliometric analysis. Based on sample collected from the Web of Science database, the detailed analysis by *publication types* addresses: *number of references, number of citations* (both in WOS Core collection and in all databases), *and article length*.

In-depth statistical analysis is performed by calculating the main statistical indicators (minimum, maximum, mean, and standard deviation), similar to Baker *et al.* (2022), extended next with the one-way ANOVA tests. The results are summarized in Table 6 and confirm the research findings, showing that there is a significant difference among the three types of publications. The identified characteristics refer to the total

number of bibliographic references, the number of times a paper is cited in *Web of Science Core collection* and in *All databases*, and last, but not least, examined characteristics present information about the total number of pages.

**Table 6. Descriptive statistics and independence t-tests for papers' characteristics, grouped by publication categories**

Papers' characteristics	Publication Type	Valid N (listwise)	Min.	Max.	Mean	Std. Deviation	One-way ANOVA
Cited reference count	Book Chapter	18	16	129	62.83	33.888	63.35***
	Conference	84	3	119	29.15	22.381	
	Journal	824	6	297	70.62	32.990	
Times cited (WOS Core collection)	Book Chapter	18	0	39	6.39	10.071	10.05***
	Conference	84	0	19	1.37	3.211	
	Journal	824	0	448	19.55	39.135	
Times cited (All databases)	Book Chapter	18	0	39	6.39	10.071	10.00***
	Conference	84	0	20	1.43	3.338	
	Journal	824	0	460	19.95	40.036	
Article length (Number of pages)	Book Chapter	18	17	48	28.17	9.488	76.22***
	Conference	84	4	35	10.19	5.150	
	Journal	824	4	56	19.89	7.690	

\*\*\* Correlation is significant at 1% level (2-tailed).

The total number of studies cited by the authors in their research is highlighted through the *Cited reference count*. The minimum limit varies between 3 and 16. The lowest number of references is attributed to conference papers. The maximum limit ranges between 119 and 297; most references are cited in scientific journals. Studies published in books are in the second position, with maximum references of 129. On average, book chapters and articles in journals are quite similar, with means of 62.83, and 70.62, respectively. For conference papers the mean is of 29.15, less than half compared to books chapters and journals. The differences identified by descriptive statistics are further supported by the one-way ANOVA results. These findings validate the purpose of the investigation and respond adequately to the research question demonstrating a better documentation of studies published in scientific journals and books.

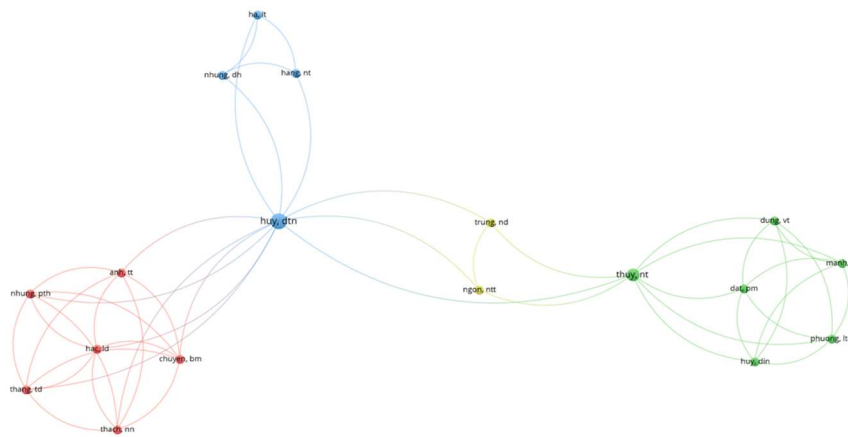
*The times cited*, on the Web of Science Core Collection and in All databases, measure the number of times publications are cited. Characteristics may be considered relevant because they allow for comparability. For the times cited, the minimum number is 0 and the maximum varies between 39 and 460, depending on the publication type. The most cited papers are articles published in leading journals, and the book chapter type of publication is second in the ranking. The publication type with the smallest number of times cited is represented by the conference proceedings. The differences identified for the number of citations are further supported by the one-way ANOVA results. These results represent a response to the research question and an argument for scientific validation of leading journals.

For the characteristic regarding *the article length*, descriptive statistics results reveal a minimum number of pages (between 4 and 17), that for the three types of publications, while the maximum number ranges between 35 and 56. The highest number of pages are identified for papers published in journals (56 pages), followed by book chapter type, with 48 pages, and by conference papers, with 35 pages. However, on average, the studies published in book chapters are the most extensive, with 28.17 pages, followed by articles published in journals (19.89 pages) and in conference proceedings (10.19 pages). Overall, the differences identified for the number of pages are further supported by the one-way ANOVA results. These findings confirm the extensive content of studies published in books' chapters and in journals, as a response to the research question.

### **4.3 Network analysis of corporate governance in sensitive industries research**

Network analysis of research on corporate governance in sensitive industries is performed using *VOS viewer software*. It examines the scientific collaboration between authors illustrating the number and the strength of links and the number of publications in which the most covered topics occur together. This section aims to respond to *RQ4. How the research on corporate governance in sensitive industries may be characterized in term of co-authorship and co-occurrence of keywords?*

To examine authors' collaboration on corporate governance in sensitive industries, a network analysis of *co-authorship* is performed. Network visualization enables to observe the nodes sizes of the authors, which suggest the number of links established with other researchers, from a scientific collaboration point of view. The criteria regarding authors and documents per author are set in *VOS viewer*. The maximum number of authors for an article is set at 25, and another condition is that the authors have at least one paper published. Results are displayed in Figure 2.



**Figure 2. Co-authorship analysis grouped by number of articles published**

The analysis implies that the generated clusters are comprised of authors with the most relevant collaborations among them or with others. Figure 2 shows four generated clusters, each of them highlighted with a different colour, presented in relevance order and displaying the names of authors for which a high degree of collaboration is noted. For the first cluster, the attributed colour is red, and it contains 6 authors (Anh, T.T., Chuyen, B.M., Hac, L.D., Nhung, P.T.H., Thach, N.N., and Thang, T.D.). The second cluster is marked with green and is composed of 6 authors (Dat, P.M., Dung, V.T., Huy, D.T.N., Manh, P.T., Phuong, L.T.M., and Thui, N.T.). The four authors (Ha, L.T., Hang, N.T., Huy, D.T.N., and Nhung, D.H.) included in the third cluster are marked with blue, and the last cluster, highlighted with yellow, is composed of only two authors (Ngon, N.T.T. and Trung, N.D.).

Furthermore, an analysis based on total link strength (Alhosani & Nobanee, 2023), illustrated in Table 7, extends the co-authorship analysis by frequency of papers and times cited, along with the main topics addressed by researchers with the highest intensity of collaboration.

**Table 7. Top 10 authors according to total link strength**

Authors	Total link strength	Number of papers	Times cited	Main topics based on title, keywords and abstract, grouped by industry
Huy, D.T.N.	12	3	47	<b>Banking:</b> Risk management in the context of Industry 4.0; COVID-19 effects; Sustainability; Information system; New viewpoints on corporate governance matters that banks may use; Sustainable growth; Risk information disclosure and measurement; Macroeconomic factors on market risk
Zhou, J.	11	3	34	<b>Energy:</b> Sources of performance; Sustainable competitive advantage <b>Tourism:</b> Corporate social responsibility; Satisfying stakeholders' interests; Economic sustainable development; Moderating role of internal governance mechanisms
Hasan, I.	10	4	55	<b>Banking:</b> Corporate governance quality; Agency costs; Bank accounting regulations; Institutional characteristics; Auditing
Karaman, A.S.	10	4	76	<b>Hospitality:</b> Board characteristics; CSR performance; Firm financial performance; Sustainability reporting; ESG performance <b>Airline:</b> Sustainability performance; Sustainability reporting; Global Reporting Initiative <b>Logistic:</b> Non-financial benefits; ESG pillars; CSR awarding
Kilic, M.	10	5	174	<b>Sensitive:</b> Climate change disclosure in banking industry; Sustainability reports; Legitimacy Theory <b>Banking:</b> Integrated reporting; Non-financial companies; Gender diversity; Firm size; Board characteristics

## Accounting and Management Information Systems

Authors	Total link strength	Number of papers	Times cited	Main topics based on title, keywords and abstract, grouped by industry
Uyar, A.	10	4	76	<p><b>Hospitality:</b> Board characteristics (independence, diversity, sustainability committee); CSR performance Sustainability reporting; ESG performance</p> <p><b>Airline:</b> Sustainability reporting and performance; Global Reporting Initiative Framework; Worldwide Governance Indicators</p> <p><b>Hospitality:</b> Board characteristics; CSR performance; Firm financial performance; Sustainability reporting; ESG performance</p> <p><b>Airline:</b> Sustainability performance; Sustainability reporting; Global Reporting Initiative</p> <p><b>Logistic:</b> Non-financial benefits; ESG pillars; CSR awarding</p>
Wang, K.	10	3	38	<p><b>Energy:</b> Environmental performance; Corporate environmental information disclosure; Corporate strategic decisions</p> <p><b>Banking:</b> Internal corporate governance; Financial market development</p> <p><b>Airline:</b> Airline efficiency performance; Corporate governance; Market discipline</p>
Haron, R.	9	8	86	<p><b>Banking:</b> The moderating role of intellectual capital in the relationship between corporate governance and banks' performance; Board characteristics; Performance of Banking industry; Agency Theory; Stewardship Theory; Resource Dependence Theory; Return on Assets; Return on Equity; Ownership concentration; Financial leverage; Agency conflicts; Bankruptcy risk</p>
Nomran, N.M.	9	6	63	<p><b>Banking:</b> Supervisory board characteristics (reputation, education, expertise) Banks' financial performance; Regulatory environment; Governance system; Social performance; Return on Assets; Return on Equity; Ownership concentration; Agency conflicts</p>
Chen, Y.L.	9	3	33	<p><b>Banking:</b> Market competition in the relationship between corporate governance and capital structure dynamics; Enterprise risk management adoption; Agency costs; Shareholders' rights; Financial crisis period</p>

The inclusion of the author Huy, D.T.N. in two of the 4 main co-authorship clusters (Figure 2) is validated by the link strength analysis (Table 7), where the same author is identified as having the most intensity of collaboration. Muchmore, findings also show that authors with a link strength higher than 10 collaborate in a limited number of papers (3 to 5), illustrating the stability of research teams. Most of the authors make scientific contributions to the Banking industry related to sustainability,

performance, or agency concepts, without excluding terms as risk management, or financial crisis.

The analysis of main topics based on title, keywords and abstract, grouped by industry indicates a possible pattern in frequency and co-occurrence of keywords used in corporate governance research. A frequency analysis of the most used keywords (also used by Bilal *et al.*, 2023, and Qi *et al.*, 2023) acknowledges the previously highlighted ideas (Table 8). Along with corporate governance and governance, other frequently used concepts are corporate social responsibility, banking, performance, and sustainability.

**Table 8. The most frequently used keywords**

Author keywords	Total occurrences
Corporate governance	238
Corporate social responsibility	80
Banks	56
Banking industry	37
Performance	30
Sustainability	29
Firm performance	27
Governance	26
Board of directors	25
Financial performance	21
Islamic banks	21
CSR	20
Ownership structure	20

Keywords may be considered the essence of a research paper, both individually and in connection to other keywords. Figure 3 presents the results of *co-occurrence of keywords* analysis in the field of corporate governance in sensitive industries research. VOSviewer software is used to perform the keywords co-occurrences network, in line with previous research (Galletta *et al.*, 2022; Khan *et al.*, 2022; Khan, 2022; Bilal *et al.*, 2023; de Bruyn *et al.*, 2023; Jain *et al.*, 2023; Qi *et al.*, 2023; Diniz *et al.*, 2024; Legendre *et al.*, 2024).

A total number of 113 unique keywords were identified in the 926 papers included in the analysis. For this network analysis, the condition is that a keyword appears at least 5 times, and the clusters identified by different colours in Figure 3 are presented in relevance order.

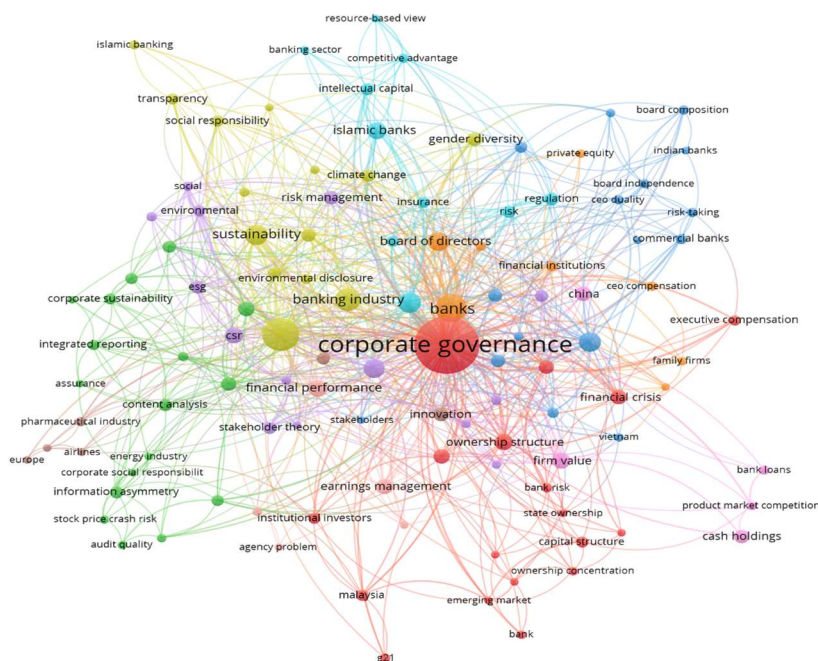


Figure 3. Keywords co-occurrence analysis

It may be noticed that the most frequent keyword is *corporate governance* that co-occur with characteristics referring to the board of directors (size, independence, duality, structure, diversity, gender diversity, CEO compensation), and ownership (ownership concentration and structure, international investors, government or state ownership, small and medium enterprises, and capital structure). Likewise, the most encountered business field-specific keywords are those relating to *banking* (financial) sector (banks, insurance, commercial banks, financial institutions, bank loans, cash holdings), but there are also frequently noticed keywords about specific industries (Pharmaceutical, Airline, Hotels). Additionally, the *sustainability* keyword emerges with a lower intensity, but with links to multiple related terms (environment, energy industry, social, climate change, environmental performance and disclosures, sustainability reporting, integrated reporting, sustainable development). Last but not least, the *financial and audit* related keywords may be observed as co-occurring (efficiency, profitability, financial performance, earnings management, ethics, assurance, audit quality).

#### 4.4 Factors of research on corporate governance in sensitive industries

The fifth research question (RQ5. *What factors are associated with the impact of research on corporate governance in sensitive industries?*) is designed to identify possible determinants to increase the *research impact measured in terms of times*

cited. For this purpose, the regression model presented in Section 3.3 is developed following the approach used in previous studies conducted by Stremersch *et al.* (2007), Meyer *et al.* (2018), Baker *et al.* (2020) and Baker *et al.* (2022). According to the literature, the dependent variables included in the regression analysis are considered to significantly increase the research quality.

The dependent and independent variables used in this research are displayed in Table 9, which also includes descriptive statistics and explanations for each variable.

**Table 9. Variables’ details and descriptive statistics**

Variables	Definition	Min.	Max.	Mean	Std. Dev.
<i>Dependent (Article Impact)</i>					
TIMES_CITEDWOS	Article’s total number of citations in Web of Science Core.	0	448	17.64	37.35
TIMES_CITEDALLDB	Article’s total number of citations in All Databases.	0	460	18.01	38.21
<i>Independent</i>					
<i>Universalism</i>					
SPECIAL_ISSUE	If the article appears in a special issue, assign value 1, otherwise 0.	0	1	0.07	0.26
NO_PAGES	Total number of pages in an article.	4	56	19.17	8.12
<i>Social constructivism</i>					
CITED_REFCOUNT	Total number of references cited in an article.	3	297	66.71	34.30
<i>Presentation</i>					
VIEWS_180DAYS	Total number of times a study’s full text has been viewed or saved during the previous 180 days.	0	165	4.87	11.37
<i>Additional attributes</i>					
ARTICLE_AGE	The difference between 2023 and publication year.	1	15	5.21	3.67

Extending the presentation in Table 9, the corresponding theoretical stances are highlighted for the independent variables. Two variables are considered under the *universalist perspective*. According to the theoretical background, a higher impact of the research is acknowledged by inclusion in the special issue category, due to improvement of scientific dialogue on specific themes, hence, being more likely to increase readers’ attention (Baker *et al.*, 2022). In this study, a dummy variable (SPECIAL\_ISSUE) highlights the research originality, the value 1 being attributed if the article is included in a special issue, otherwise the value is 0. A special issue is considered an innovative issue or one that focuses on a specific relevant topic. Likewise, prior studies (Dang & Li, 2018; Meyer *et al.*, 2018) emphasize that articles with an extended content may increase their citation count. This supports the use of the number of pages (NO\_PAGES) to reflect the articles’ length. Furthermore, the *social constructivist perspective* is addressed through cited references count (CITED\_REFCOUNT) variable, measuring the total number of bibliographic sources cited in an article. Baker *et al.* (2022) indicate that a higher number of



references may reflect a stronger link to research topic, increasing the attention of researchers interested in that subject. Under the *presentation perspective*, the relevance of articles, related to “how the authors say and what they say” (Stremersch *et al.*, 2007, p. 174) is considered. The independent variable VIEWS\_180DAYS indicate the views and saves during the 180 days, previous to the date the database was collected. The *additional attributes perspective* includes in the analysis ARTICLE\_AGE variable, also used by Baker *et al.* (2020), computed as the difference between 2023 (the year the data was collected and publication year). According to the literature, the research impact may be significantly influenced by additional independent variables.

Parametric (Pearson) coefficients and their significance are included in the correlation matrix shown in Table 10. The discussion covers the findings involving the independent variables that may be positively or negatively related to the dependent ones (TIMES\_CITEDWOS and TIMES\_CITEDALLDB).

**Table 10. Correlation matrix**

Variables	1	2	3	4	5	6	7
1. TIMES_CITEDWOS	1	1***	-0.015	0.006	0.136***	0.206***	0.369***
2. TIMES_CITEDALLDB	1.000***	1	-0.016	0.006	0.137***	0.203***	0.369***
3. SPECIAL_ISSUE	-0.015	-0.016	1	0.034	0.046	0.004	0.007
4. NO_PAGES	0.006	0.006	0.034	1	0.436***	0.013	-0.215***
5. CITED_REFCOUNT	0.136***	0.137***	0.046	0.436***	1	0.195***	-0.250***
6. VIEWS_180DAYS	0.206***	0.203***	0.004	0.013	0.195***	1	-0.214***
7. ARTICLE_AGE	0.369***	0.369***	0.007	-0.215***	-0.250***	-	1
						0.214***	

Note. The symbol \*\*\* indicates significance at the 1% level. The detailed list of all variables is presented in Table 9.

The correlations between independent and dependent variables are mixed, both positive and negative, with a high significance, however low strength. Detailing, the variables reflecting the universalism perspective, that indicate the inclusion in a special issue (SPECIAL\_ISSUE) and the article’s length (NO\_PAGES) are not statistically significant in relation to the dependent variables (TIMES\_CITEDWOS and TIMES\_CITEDALLDB). The variables illustrating the other three perspectives are significantly correlated with the total number of citations, consistent with previous studies’ results. Thus, at 0.01 level, the number of references included in the articles (CITED\_REFCOUNT), the number of views and usage for the last 180 days (VIEWS\_180DAYS), and the article age (ARTICLE\_AGE) are positively associated, statistically significant at the 0.01 level, with articles’ impact, measured based on times cited in Web of Science Core (TIMES\_CITEDWOS) and times cited in All Databases (TIMES\_CITEDALLDB). The findings indicate that articles with a higher number of references, more views during the last 6 months, and a longer publication period have also a higher number of citations. These are in accordance with results presented by Meyer *et al.* (2018), Baker *et al.* (2020) and Baker *et al.* (2022).

To identify possible factors that may influence the article’s impact in the area of research conducted on corporate governance in sensitive industries, the linear regression is applied, with results presented in Table 11. The regression analysis focusses on the relationship between times cited and specific article-related characteristics presented as independent variables. The dependent variable illustrating the article’s impact is measured by the total number of times the article is cited in Web of Science Core Collection. To validate the results, an additional variable measuring the number of citations in All Databases is used to run the econometric equation. The two resulting models are presented as follows:

$$\begin{aligned} \text{TIMES\_CITEDWOS}_i &= \beta_0 + \beta_1\text{SPECIAL\_ISSUE}_i + \beta_2\text{NO\_PAGES}_i + \\ &\quad \beta_3\text{CITED\_REFCOUNT}_i + \beta_4\text{VIEWS\_180DAYS}_i + \\ &\quad \beta_5\text{ARTICLE\_AGE}_i + \varepsilon_i \quad (\text{Model 1}) \\ \text{TIMES\_CITEDALLDB}_i &= \beta_0 + \beta_1\text{SPECIAL\_ISSUE}_i + \beta_2\text{NO\_PAGES}_i + \\ &\quad \beta_3\text{CITED\_REFCOUNT}_i + \beta_4\text{VIEWS\_180DAYS}_i + \\ &\quad \beta_5\text{ARTICLE\_AGE}_i + \varepsilon_i \quad (\text{Model 2}) \end{aligned}$$

Moreover, Table 11 includes information regarding the total number of observations, R-Squared, Durbin-Watson and Variance Inflation Factor (VIF).

**Table 11. Linear regression analysis**

Variables	Dependent variable:	Dependent variable:	VIF
	TIMES_CITEDWOS	TIMES_CITEDALLDB	
	Model 1	Model 2	
SPECIAL_ISSUE	-0.029 (-1.034)	-0.030 (-1.069)	1.003
NO_PAGES	0.021 (0.671)	0.020 (0.639)	1.268
CITED_REFCOUNT	0.196*** (6.011)	0.197*** (6.047)	1.319
VIEWS_180DAYS	0.270*** (9.147)	0.268*** (9.062)	1.084
ARTICLE_AGE	0.480*** (15.995)	0.480*** (15.989)	1.122
Observations	926	926	
R-Squared	0.260	0.259	
F-stat (Sig.)	64.672***	64.465***	
Durbin-Watson	2.038	2.040	

Note. The symbol \*\*\* indicates significance at the 1% level. The detailed list of all variables is presented in Table 9.

To address the endogeneity concerns, and to quantify the degree of multicollinearity in multiple regression variables, the values for Variance Inflation Factors (VIFs) are computed using SPSS software. According to the prior literature indicated by Baker *et al.* (2020) and Baker *et al.* (2022). VIFs higher than 4 generally draw concerns on the research approach, while VIFs of 10 needs corrections on the regression models, because this value indicates significant issues of multicollinearity. As shown in

Table 11, the VIFs for all independent variables range from 1.003 for special issue category (SPECIAL\_ISSUE) to 1.319 for number of references (CITED\_REFCOUNT). Therefore, multicollinearity does not represent a critical concern for the study. Supporting the results of parametric correlation matrix, the regression coefficients indicate that the variables considered under universalism are not significantly associated with the number of citations. However, the variables chosen for the perspectives related to social constructivism, presentation and additional attributes are found directly and significantly associated with article's impact.

The variables related to the total number of pages (NO\_PAGES) and special issue (SPECIAL\_ISSUE) are under the *universalism*. Both in *Model 1* and *Model 2*, the impact of the number of pages is positive, but not statistically significant, while the impact of special issue is negative, and not significant as related to times cited. The negative influence is contrary to findings presented by Baker *et al.* (2022). This negative association may be attributed to the fact that a small number of articles in the sample (66 of 926, or 7%) are included in a special issue. It is generally understood that a special issue includes articles with a narrow, occasionally unique topic, which draw greater attention and citations (Baker *et al.*, 2022). Articles published in special issues are considered lead articles, able to catch the attention of academic environment, which may increase the number of citations. Thus, the results of this study may not support the previous research, due to the limitation of publications in a special issue.

Cited reference count (CITED\_REFCOUNT) is the variable under the *social constructivism* and the regression results highlight that the association with times cited, both in Model 1 and Model 2, is positive and statistically significant at the 0.01 level. These findings are in accordance with Baker *et al.* (2022), implying that times cited are correlated with the articles' knowledge represented by the total number of bibliographic references cited. Therefore, it may be considered that the research relevance level is directly related to a higher number of cited references.

The influence of the total number of times the full text of an article has been downloaded or viewed in the preceding 180 days (VIEWS\_180DAYS) is positive and statistically significant both in Model 1 and Model 2. These findings suggest that the more times an article is accessed, the more it is cited. Results found for the ARTICLE\_AGE variable emphasize that recent publications might be seen as more relevant because they address current issues in novel ways and are tailored to the ever-changing economic environment focused on growing emphasis on sustainability.

According to the results' overview, several recommendations for academic environment may be formulated. For example, if the authors focus on characteristics that exert a positive and statistically significant influence on articles' impact

(CITED\_REFCOUNT, VIEWS\_180DAYS, NO\_PAGES), the impact of their research work may increase through an upward trend in the number of citations.

## 5. Conclusion, limitations, and future research horizon

This study provides a fifteen-year evidence overview of research on corporate governance in sensitive industries. The evolution is examined for the period 2008-2022, the relevance being ensured by time frame, detailed for crisis and non-crisis periods, specifics of the business fields, as well as possible factors that may explain the research impact. Bibliometric analysis using statistical, descriptive, and network analysis combined with regression analysis provides appropriate answers to the five research questions addressed in the paper. Results setting up the evolution of research, based on publication and citation trend, industries the scholars focused on, and article impact, are validated in the context of previous studies.

The analysis according to the year and type of publication suggests that scientific journals stand out by the largest number of studies published. Muchmore, by delineating the time frame in crisis and non-crisis periods, and by examining the publications according to the business field focus, it may be noticed that, in financial crisis, researchers mainly focused on Banking and Energy industries, while in pandemic period, industries list is extended, with fields as Airline, Pharmaceutical, Logistic, Transportation, or Hospitality. The relevance of research on corporate governance in sensitive industries, based on descriptive analysis and statistical tests, aims to identify the characteristics of research, highlighting the better documented, the most cited, and the most extensive publications. Furthermore, the specifics of the studies are analysed based on co-authorship and co-occurrence of keywords. Results suggest that a high state of collaboration between authors determines an increased degree of research validation, and dissemination of results, that may be supported by the multicultural approach, considering different financial and non-financial standards applied by companies (Montes-Sancho *et al.*, 2022), state laws and regulations (Garcia *et al.*, 2017), and the different influences exerted by global financial, pandemic, or war crises (Naeem *et al.*, 2022), in a specific business field represented by sensitive industries. Scientific collaboration between authors, according to the total link strength and number of papers, lead to an in-depth examination of top 10 authors research activity, based on main topics studies, papers' titles, keywords, and abstracts. Findings show that research focus is on Banking, Energy, Hospitality and Airline industries, studying topics regarding corporate governance quality, sustainability performance, financial performance. The co-occurrence of keywords analysis, which may represent a basis for future research horizon, highlights that the most frequent keywords are representative for corporate governance and its characteristics (board, ownership, corporate social responsibility etc.) and mostly related to performance. Muchmore, the most used business field-

specific keyword is Banking industry, based on the number of papers including it in the keyword list.

Findings of econometric analysis are applicable to academic stakeholders, including the scientific journals' management and individual researchers, whose main purpose is to maximize the number of citations. Results may be useful in monitoring the papers' output and coming up with innovative concepts, for its international growth, such as topics and special issues for developed and emerging countries or specific industries that allow for comparison analyses. Keeping track of scientific collaboration and journal's primary topics may help the academic representatives, both experienced researchers and students, expand the range of subjects their publication covers, being aware of extending the collaboration horizons. The positive and statistically significant association between times cited and cited reference count is in line with prior literature. For example, Meyer *et al.* (2018) highlight that citation counts represent an important tool for evaluating the quality and influence of papers, journals, researchers, and organizations. Hence, those authors who intend to increase citations for their work may find this information valuable.

The contribution of this study may be seen threefold, for the field of research on corporate governance in sensitive industries. First, the output of performance analysis allows to create an overview of the interest granted by academic environment to corporate governance in the particular topic of sensitive industries. Second, the results validation is supported by comparison between crisis and non-crisis periods, together with identifying the most prominent studies. Third, the contribution is complemented by relevant interactions and structural connections, provided through science mapping of authors collaboration, simultaneously with the prominent research areas based on co-occurrence of keywords. Furthermore, it may be considered that this study adds to the body of knowledge in classifying research characteristics in accordance with four theoretical perspectives: universalism, social constructivism, presentation, and additional attributes.

The limitations of this research may reside, first, in the lack of a meta-analysis, which includes the study of the methodological specifics, research methods, and the main findings, ensuring a holistic representation of future research directions. These limitations may also be attributed to the number of studies. Second, the only source for gathering data is Web of Science. Combining data from additional sources such as Google Scholar and Scopus may extend research horizons. Therefore, future studies may address an in-depth analysis for a relevant sample of the dataset, but also an extended quantitative approach based on econometric modelling. Muchmore, scholars may extend the research to other industries considered sensitive or to another time frame, to compare the results with the existing ones, for increasing validation and reliability. Likewise, completing the regression analysis with other variables contributes to identifying the research influence factors and to formulate

several recommendations for authors, to increase their scientific impact. Among the additional variables may be considered research methodology used, number of authors, authors' nationality, title length and novelty, number of tables and figures.

**Acknowledgments:** This paper was co-financed by The Bucharest University of Economic Studies during the PhD program. A draft of this paper was presented at the 18<sup>th</sup> edition of the International Conference Accounting and Management Information Systems (AMIS 2023). The authors appreciate peers' insightful recommendations. Special thanks are addressed to the editor and all the anonymous reviewers for the helpful comments and the constructive suggestions.

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