Global Trends in Internal Control and Public Sector Accounting Fraud Research: A Bibliometric Study

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ABSTRACT

Manuscript type: Literature review

Research aims: This research aims to review global trends in the topic of internal control and accounting fraud in the public sector using a bibliometric approach to identify patterns, developments, and gaps in the available literature.

Design/Methodology/Approach: This study used bibliometric analysis of databases such as Scopus and Emerald to explore trends in "internal control and public sector accounting fraud", involving literature selection based on keywords, data filtering, and processing using Biblioshiny R-Studio and VOSviewer for collaborative and thematic analysis and visualisation.

Research findings: Public sector accounting fraud and internal control research during 2018-2023 revealed a major focus on 'fraud', 'corporate governance', and 'internal control', with 473 papers predominantly authored by a relatively small group of contributors. This trend reflects a global response to emerging issues such as regulatory reforms and the impact of pandemic, underscoring the importance of international collaboration and the growing role of academic institution in addressing public sector accountability.

Theoretical contribution/Originality: This research makes a theoretical contribution by using bibliometric analysis to uncover trends and dynamics in "internal control and public sector accounting fraud", highlighting the role and impact of international collaboration and the influence of global factors in the field.

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Practitioner/Policy implication: This research emphasises the importance of adopting more effective internal controls and strong governance within the public sector to prevent fraud, providing practical insights for practitioners and policymakers. In addition, the findings suggest the need for international collaboration and policy adaptation to global changes such as the pandemic, to improve transparency and accountability.

1. Introduction

Internal control in the public sector is a critical element to ensure the integrity, accuracy and reliability of financial information. In the context of the public sector, internal control is not only concerned with the protection of assets and the prevention of misuse of resources, but is also important in ensuring transparency and accountability in the management of public funds. The increasing complexity of the global economic environment, characterised by various policy and regulatory reforms, has added to the challenges of effective internal control implementation (Abuzayed et al., 2024; Carozzi et al., 2024; Ma & Su, 2024, p. 1; Wang et al., 2024). The importance of internal control is emphasised by numerous cases of accounting fraud that have shaken public confidence in government institutions (Guenduez et al., 2024, p. 1; Sánchez-Vidal et al., 2024).

On the other hand, accounting fraud in the public sector has become an increasingly troubling issue. Fraud not only results in significant financial losses for the government and other stakeholders, but also erodes public trust in the integrity of government institutions (Boubaker et al., 2024, p. 1). Factors such as weaknesses in internal control structures, lack of transparency in financial reporting, and lack of accountability are often attributed as the main causes of fraud (Wan et al., 2024, p. 334). Global trends show an increase in accounting fraud cases in the public sector, fuelling the need for further research to identify the patterns, causes and impacts of fraud (Lucey et al., 2023, p. 1). Bibliometric studies in this topic are important to understand recent developments in research, as well as to determine future research directions that can help address this issue more effectively.

Bibliometric studies related to the topic of internal control and public sector accounting fraud have been reviewed by several researchers (Bruns et al., 2020; Grossi et al., 2023; Montesdeoca et al., 2019; Polzer et al., 2023; Tajudin et al., 2022). Research by

Montesdeoca et al. (2019) found that effective corporate governance and sound accounting procedures, in conjunction with specific psychological traits exhibited by managers and staff, play a pivotal role in mitigating irresponsibility. This underscores the importance of governments crafting policies that integrate responsible corporate governance with environmental sustainability to limit the societal consequences of accounting fraud. Research by Bruns et al. (2020) found that post-1990 public sector accounting research, influenced by the New Public Management branch of scholarship, shows disciplinary fragmentation and opportunities for future research that recognises multi-disciplinarity and branching as foundational in its investigations. In addition, research by Silva et al. (2021) revealed that a notable absence of research exists concerning the examination of IFRS enforcement approaches across diverse nations and how they influence the quality of accounting. This highlights the necessity for additional investigation to assess the efficacy of enforcement mechanisms related to IFRS. Furthermore, research by Tajudin et al. (2022) found that Western academics have paid attention to public sector accounting research since 1906, with intensive research after 2000, resulting in six conceptual structural themes in public sector accounting, namely "Public Sector", "Public Sector Accounting", "Accounting", "Government Accounting", "Accounting Change", and "Performance". In addition, research by Grossi et al. (2023) found that the convergence of different perspectives in public sector accounting scholarship and practice has highlighted important future themes such as the role of accounting in serving the public, hybridity, and value diversity. Supporting factors such as accounting expertise, the profession, and digitalisation have also been emphasised, showcasing a wealth of diverse perspectives. Finally, the research of Polzer et al. (2023) reveals that International Public Sector Accounting Standards (IPSAS) is an important issue for Developing/Low-Income Economies, with most studies using secondary data and content analysis of existing materials, and offers a thorough understanding of the position and stage of IPSAS reform in these countries as well as the factors influencing the development of such reforms.

This study aims to analyse bibliometrics related to internal control and fraud in public sector accounting, appears to use very current and relevant literature data, taking into account important findings from previous studies. The studies have highlighted critical aspects such as the impact of new public management on public sector accounting, shortcomings in research on IFRS enforcement, thematic evolution in public sector accounting, and the importance

of IPSAS for low-income economies. This research not only follows in the footsteps of recent literature, but also innovates by adding a focus on internal control, an aspect that has not been examined in depth in previous literature. This allows this research to provide new insights into the way internal controls can play a role in preventing fraud in the public sector, adding an important dimension to the existing understanding and enriching the literature in this area.

This research aims to review global trends in the topic of internal control and accounting fraud in the public sector using a bibliometric approach to identify patterns, developments, and gaps in the available literature. This research makes a significant contribution both in the academic realm and for government institutions. From an academic perspective, this study enriches the literature by presenting a comprehensive analysis of trends and gaps in research on internal control and accounting fraud in the public sector. Through the bibliometric approach, this study provides in-depth insights into the evolution of the topic, the relationship between scholarly works, and under-researched areas, so as to direct the direction of future research to be more focused and useful. Meanwhile, for government institutions, the findings of this study have the potential to provide evidence-based policy recommendations to improve the effectiveness of internal control and accounting fraud prevention strategies. This not only helps in minimising financial risks, but also in strengthening transparency, accountability and public trust in the public sector. As such, this research offers substantial added value in efforts to improve governance and integrity in the public sector.

2. Literature Review

2.1 Internal Control In the Public Sector

An internal control system is a structured framework of procedures and policies developed by an organisation's management and supervisory board. Its aims to ensure the achievement organisational objectives in three main areas: operational efficiency, reliable financial reporting, and adherence to laws and regulations (Hoai et al., 2022; Li & Ding, 2023, p. 1). In the public sector, internal control is particulary critical due to need for transparency and accountability in managing public funds (Vu & Nga, 2022, p. 1).

Internal control consists of several components: control environment, risk evaluation, control activities, information and comunication, and monitoring. The control environment forms he foundation by influencing employees' attitudes and ethical values

(Liu, 2023, p. 1; Luo & Tian, 2023). Risk assessment refers to the process of identifying and evaluating risks that may hinder the achievement of organisational objectives. In practice, one of the most significant challenges is presence of conflicts of interests, which diminish the commitment of high-ranking officials. For instance, social conflicts of interest prevailed in Kupang District, whereas political conflicts were more dominant in North Central Timor (Muskanan, 2014, p. 180).

Control activities are mechanisms to ensure management directives are properly exected. The negative association between weak internal control and increased financial fraud due to corporate financialisation (Tian & Sun, 2023, p. 1). Furthermore, information and communication channels must ensure that all employees are informed about their responsibilities and internal control policies. Lastly, continuous monitoring, either through internal audits or feedback systems, helps sustain the effectiveness of internal controls over time.

2.2   *Internal Control and Fraud Prevention*

Effective internal control systems are essential for preventing fraud in the public sector. Accounting fraud ranging from financial misreporting and asset misappropriation to bribery and corruption undermines public trust and results in significant losses to public resources (Boller et al., 2024, p. 1; Richardson et al., 2022). To mitigate these risks, governments must implement robust accounting standards, regular audits, legal enforcement, and anti-fraud frameworks (Button et al., 2023; Soomro et al., 2021, p. 1).

Among the most effective fraud prevention strategies are operational audits, active audit committees, internal whistleblowing policies, staff rotation, and the use of forensic accounting techniques (Horne, 2017; Noch et al., 2022; Othman et al., 2015, p. 59). Technology, such as integrated financial management information systems (IFMIS), further enhances fraud detection by enabling real-time monitoring of transactions (Spink, 2023, p. 766). Moreover, transparency in budgeting, procurement, and public financial reporting fosters a culture of accountability, which is essential for deterring fraudulent activities (Papík & Papíková, 2022, p. 1; Sulistyawati et al., 2023).

2.3 *The Role of Education and Training in Strengthening Internal Control*

An often underexplored but crucial element of internal control and fraud prevention is human capital development. Training programs for public sector employees significantly improve awareness of ethical standards, fraud risks, and reporting protocols. Such initiatives equip personnel with knowledge about various types of fraud and the procedures to follow when encountering unethical behavior (Luna et al., 2024, p. 1; Rahman & Zhu, 2024; Zhao et al., 2023)

Beyond formal training, a culture of integrity should be cultivated through continuous professional development and leadership commitment. Equally important is the protection of whistleblowers and the availability of secure complaint systems, which encourage the reporting of suspicious activities without fear of retaliation (J. Spink et al., 2016, p. 68). Civil society, media, and NGOs also play a watchdog role in monitoring government spending and ensuring accountability (Zhao et al., 2023). Therefore, fraud prevention in the public sector is not solely a matter of systems and procedures but also of education, awareness, and collaboration across various stakeholders, including state institutions, employees, and the general public (Thomas & Indriaty, 2023).

3. Methods

3.1 *Bibliometric Analysis*

Bibliometrics involves the use of quantitative analysis of scientific publications and written works to gauge the influence, developments, and patterns within a specific research domain. Bibliometric analysis manifests in two categories, namely literature performance analysis and scientific mapping (Donthu et al., 2021). Researchers use these analyses to recognise topic trends, intellectual structures, research features, and delve deeper into the collaboration patterns of a particular field in the current literature. The increasing literature related to public sector accounting makes bibliometric analysis useful in the study of internal control and public sector accounting fraud to gather information, evaluate research performance and provide evidence-based insights by analysing previous research publications. The analysis includes the number of publications per year, influential sources, influential authors, trend topics, co-occurrence, thematic evolution, and co-authorship using VOSviewer and Bibliometrix R.

3.2 Identification of Keywords

Literature data collection was conducted using the PRISMA protocol (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). The PRISMA protocol is a standardised approach to systematically identify, evaluate and synthesise relevant research results.

The researcher conducted a term search for the keywords *"internal control*" AND "fraud*" AND ("public sector*" OR "government*" OR "public*") AND "accounting"* from the Scopus, Emerald, SAGE Journal, and MDPI databases. The literature search in Scopus was carried out using the Publish or Perish (PoP) software. Meanwhile, researchers conducted direct searches on the Emerald, SAGE Journal, and MDPI databases, then imported them into the PoP software to obtain data metrics.

3.3 Identification and Screening of Data

The data search was conducted on 4 January 2024, at 17.19 (GMT+8). At the identification stage, a total of 638 documents were obtained from 2018-2023. After removing duplicate documents (n=6), 632 documents were ready to go through the screening process. In this process, various inclusion and exclusion criteria were applied. A total of 60 documents were discarded because they were published before 2018 and were not scientific articles.

3.4 Eligibility

We used Mendeley to screen papers based on inclusion and exclusion criteria. A total of 572 documents successfully passed the data screening. There were inclusion and exclusion criteria in this stage. A total of 20 documents were discarded because they were not in the field of accounting/economics. A total of 79 documents were discarded because they did not fit the topic of internal control and public sector accounting fraud as a whole. Therefore, 473 papers were eligible for bibliometric analysis. Overall, the document screening process is presented in Figure 1 below.

Figure 1. PRISMA Protocol
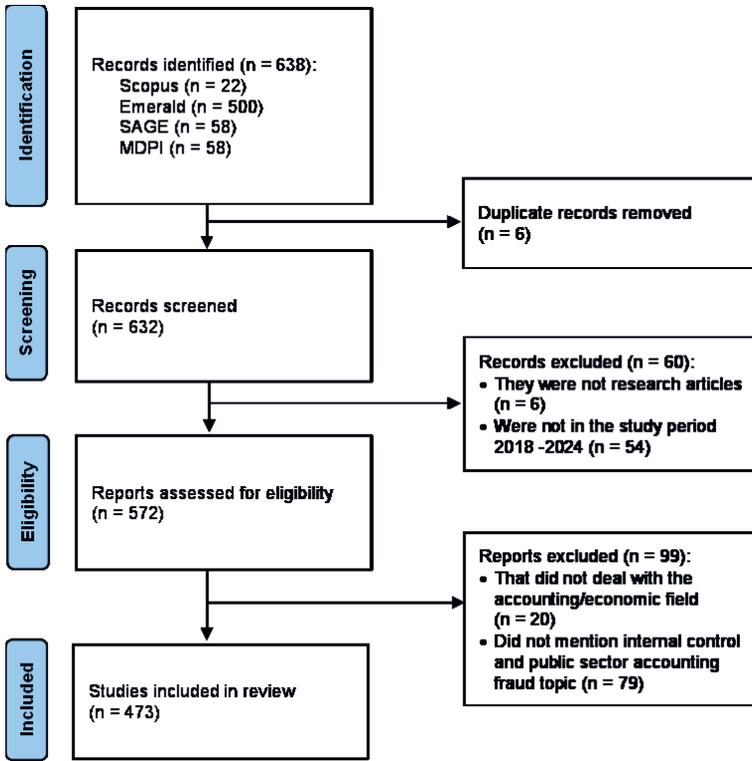
3.4 Data Processing and Analysis

After collecting bibliographic data from various databases of 473 scientific articles related to the topic of internal control and public sector accounting fraud, the next step was to perform data processing using Biblioshiny R-Studio and VOSviewer software. Through Biblioshiny R-Studio, bibliographic data was imported for bibliometric analysis, including distribution of publication year, citation frequency, and visualisation of author collaboration. Along with that, VOSviewer was used for researcher collaboration map creation and thematic analysis, revealing patterns of interrelationships among researchers as well as identifying key topics in the literature on the topic of internal control and public sector accounting fraud.

Through the integration of the results from both software tools, this study provides an overall picture of the development of research on internal control and public sector accounting fraud,

with a particular focus on Asian countries—such as Indonesia, Malaysia, China, and Vietnam—as well as comparative insights from other regions including North America and Europe, as identified through author affiliations and publication origins in the dataset. The geographical scope of the analysis was determined based on the institutional affiliations of the authors and the countries of publication indexed in the Scopus database.

The analysis of researcher collaboration, literature distribution, and key thematics generated from these tools enables in-depth interpretation of research trends and research contributions to the scientific literature. This approach provides comprehensive and valuable insights in understanding and describing the research landscape on the topic of internal control and public sector accounting fraud.

4. Results

4.1 Citation Metrics

The topic "internal control and public sector accounting fraud" covers the publishing period from 2018 to 2023. Over this five-year period, data has been collected that reflects the dynamics and impact of research in this area. This data provides valuable insights into trends and academic contributions in the topic, especially through the analysis of citation metrics that assess how often these works are referenced in other academic literature. With a reference date of 4 January 2024, this data offers an up-to-date perspective on the influence and relevance of research in the field of public sector accounting and internal control.

Of the 473 papers published in the five-year period, there were a total of 19 citations, resulting in an average of 3.17 citations per year. The citation per paper ratio was quite low at 0.04, indicating that each paper was referenced less frequently on average. In terms of author productivity, there was an average of 11.25 citations per author and 220.50 papers per author, indicating a significant contribution from a small number of authors. The structure of author collaboration is illustrated by the average of 2.68 authors per paper, with the median and mode being 3 and 2, respectively. Further analysis can be seen from the 'age-weighted citation rate' which stands at 5.33, indicating the added value of more recent citations. The Hirsch index (h-index) for this dataset is 3, indicating that three papers have been cited at least three times. Meanwhile, the Egghe index (g-index) is 4, indicating that the four most-cited papers have accumulated the

majority (84.2 per cent) of citations. This highlights that there are some highly influential papers in this pool. The PoP hI,norm index is 2, with an hI,annual score of 0.33, reflecting the consistency and impact of the research over the period. Finally, the Fassin hA index is 1, providing an additional perspective on the academic impact of these papers.

Table 1. Metric data

Metric	Value
Reference date	2024-01-04 17:19:33 (GMT+8)
Publication years	2018-2023
Citation years	5 (2018-2023)
Papers	473
Citations	19
Citations/year	3.17 (acc1=2, acc2=1, acc5=0, acc10=0, acc20=0)
Citations/paper	0.04
Citations/author	11.25
Papers/author	220.50
Authors/paper	2.68/3.0/2 (mean/median/mode)
Age-weighted citation rate	5.33 (sqrt=2.31), 3.37/author
Hirsch h-index	3 (a=2.11, m=0.50, 13 cites=68.4% coverage)
Egghe g-index	4 (g/h=1.33, 16 cites=84.2% coverage)
PoP hI,norm	2
PoP hI,annual	0.33
Fassin hA-index	1

4.2   *Annual Scientific Production*

Figure 2 below illustrates the annual publication trends from 2018 to 2023 in the context of "internal control and public sector accounting fraud". The trends reflect academic output in the specified subject, providing an indication of how research interest and focus has changed over time. These trends can be interpreted as a reflection of the evolution of academic dialogue and a response to changes in the external environment, such as policy changes, developments in public sector accounting practices, or financial scandals that gain public attention.

Figure 2. Publication per year
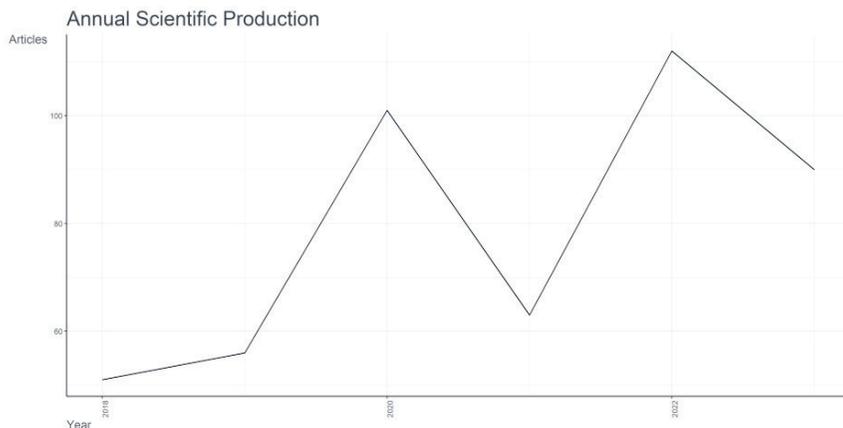
The data shows that starting from 51 articles in 2018, there was a steady increase until 2019. A dramatic increase occurred in 2020, with articles published almost doubling the previous year's number, reaching 101 publications. This may indicate a response to certain drivers in the field, such as changes in regulation or increased awareness of the importance of internal controls to prevent fraud in public sector accounting. However, scientific production drops in 2021 before surging to a peak in 2022 with 112 publications. The drop in 2023 to 90 articles may reflect a normalisation of research interest or an adjustment to research capacity after a period of intense activity. Overall, these trends suggest that there are quite variable dynamics in scholarly production that may be influenced by factors such as topic relevance, policy influence, and actual events in the context of internal control and accounting fraud in the public sector.

4.3   Sources

Figure 3 illustrates the distribution of scientific documents published in various sources or journals relevant to the topic of "internal control and public sector accounting fraud". The journals mentioned in the chart represent the main contributors to the literature in this field. This data is presented in bubble chart format, where the size of the bubble is directly proportional to the number of documents published by each source. This allows the reader to quickly assess which sources contribute the most publications to the research corpus of this subject.

Figure 3. Most relevant sources
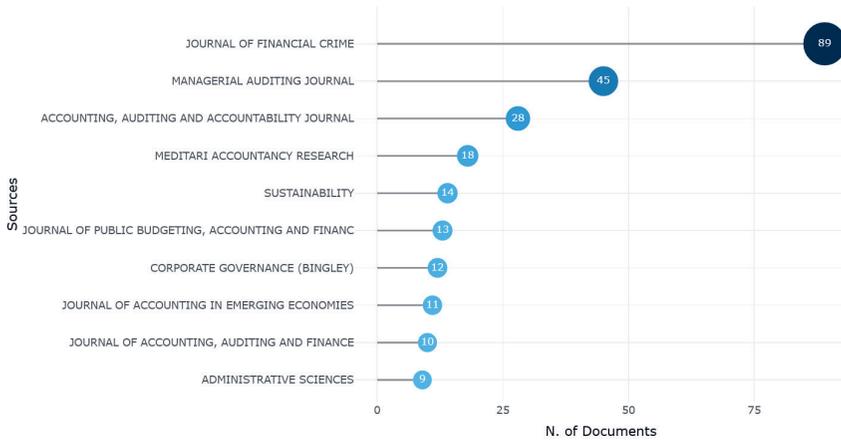
Based on Figure 3 above, *Journal of Financial Crime* stands out as the most dominant source with the most number of documents, followed by *Managerial Auditing Journal* and *Accounting, Auditing and Accountability Journal*. This suggests that the *Journal of Financial Crime* has a greater focus or is the preferred forum for research relating to fraud in the public sector and internal control. The much lower number of documents in the other journals suggests that while they contribute to the academic dialogue in this area, they have a broader focus or lack specialisation in the identified topics. In addition, the variation in publication numbers between these sources reflects differences in the popularity, access and distribution of research among academic and practitioner communities. Furthermore, the annual growth rate of journals is presented in Figure 4 below.

Figure 4 reveals that the *Journal of Financial Crime* has significantly increased its publication output from 11 articles in 2018 to 89 articles in 2023, signalling the journal's important role in disseminating research on financial fraud. Meanwhile, the *Managerial Auditing Journal* and the *Accounting, Auditing and Accountability Journal* also showed consistent growth in the number of publications, with the former moving from 8 to 45 articles, and the latter from just 1 article in 2018 to 28 articles in 2023. *Meditari Accountancy Research* and *Sustainability* show a steady but more moderate upward trend, reflecting their growing contributions but on a smaller scale. Overall, these trends indicate an increase in interest and research in this area, and confirm the position of these four journals as key sources of information for the academic community researching fraud in the public accounting and internal control sectors.

Figure 4. Sources production over time
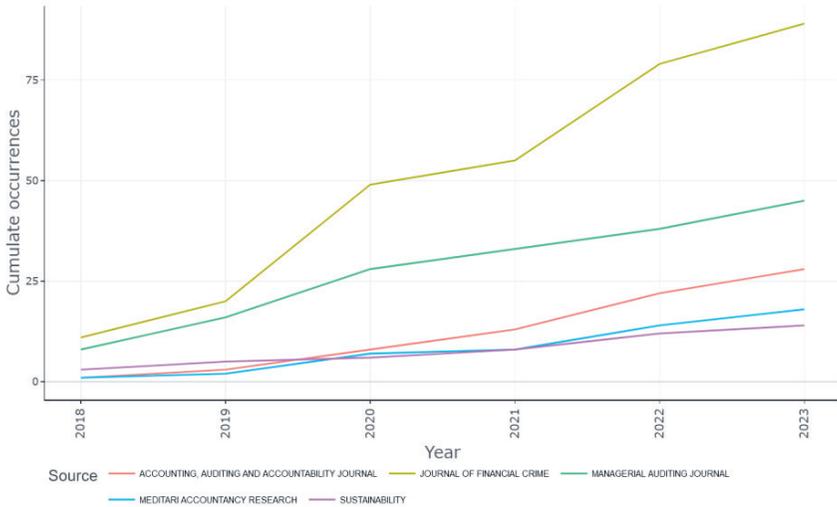
4.4   Leading Country

Table 2 and Figure 5 present the geographical distribution of the number of scientific publications per country by continent, relating to "internal control and public sector accounting fraud". The data shows significant variation in publication output between countries, with some countries standing out in their contribution to the scientific literature. The analysis covers global publications on internal control and public sector accounting fraud, as indexed in the Scopus database, with regional comparisons based on author affiliations. The study observes notable disparities in publication output across countries within the same continent—for example, between Indonesia and China in Asia, or between the USA and Canada in the Americas. These contrasts are highlighted to illustrate regional research capacity, institutional involvement, and national policy emphasis, which may influence the academic focus and visibility of public sector governance issues. To assess regional contributions, the study utilised author affiliations as a proxy for country-level research activity, allowing for comparison across different regions and nations.

Table 2. Total publication per country by continent

Continent	Country	Publications
Asia	Bahrain	3
	Bangladesh	1
	China	25
	Cyprus	10
	Hong Kong	2
	India	15
	Indonesia	43
	Iran	19
	Iraq	1
	Israel	1
	Japan	2
	Jordan	5
	Kuwait	2
	Lebanon	2
	Malaysia	63
	Oman	3
	Pakistan	4
	Palestine	1
	Qatar	4
	Saudi Arabia	14
	Singapore	4
	South Korea	8
	Taiwan	5
	Thailand	5
	Turkey	4
	United Arab Emirates	7
	Vietnam	5
	Yemen	1
Africa	Benin	6
	Egypt	9
	Ghana	10
	Kenya	1
	Libya	1
	Nigeria	11
	South Africa	13
	Sudan	1

| Continent	Country	Publications
	Tanzania	4
	Tunisia	15
	Uganda	6
	Zambia	1
America	Canada	16
	USA	125
	Argentina	2
	Brazil	6
	Chile	2
	Colombia	1
	Ecuador	1
Oceania	Australia	35
	New Zealand	17
	Papua New Guinea	1
	Solomon Islands	1
Europe	Belgium	1
	Denmark	1
	Estonia	1
	Finland	3
	France	4
	Germany	2
	Greece	12
	Hungary	1
	Italy	15
	Latvia	2
	Lithuania	2
	Malta	3
	Netherlands	5
	Norway	7
	Poland	1
	Portugal	8
	Romania	6
	Serbia	1
	Slovenia	1
	Spain	7
	Sweden	6
	Switzerland	1
	Ukraine	1

Figure 5. Countries' scientific production
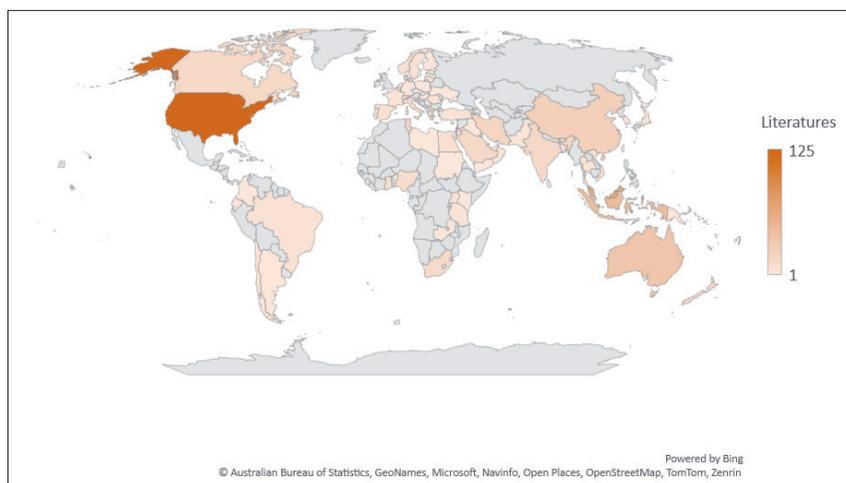
Further analysis shows that the USA leads globally with a total of 125 publications, primarily based on author affiliations with institutions located in the United States. This indicates the country's significant contribution to research on internal control and public sector accounting fraud, reflecting both academic capacity and institutional emphasis on governance-related. In Asia, Malaysia and Indonesia are the largest contributors with 63 and 43 publications respectively, indicating a strong research base on the topic in these two countries. In Europe, Italy and Turkey have the same number of publications, indicating similar research interests. Australia leads in Oceania with 35 publications, and in Africa, Tunisia and Nigeria hold the largest number of publications. This mapping illustrates the importance of regional context in directing the focus of accounting research and may reflect how issues of fraud in the public sector and internal control are viewed and addressed in different regions of the world.

Figure 6 illustrates the collaboration network between countries in the research on "internal control and public sector accounting fraud" using data generated by VOSviewer. In this visualisation, each country is represented by a node, and the thickness and length of the lines between the nodes reflect the strength and frequency of collaboration between the countries. The USA appears to be the main centre in this network, with strong and frequent collaboration relationships with other countries such as China and Malaysia, which also show significant interconnections. This indicates that the USA plays a central role in international research and partnership

Figure 6. Countries collaboration network
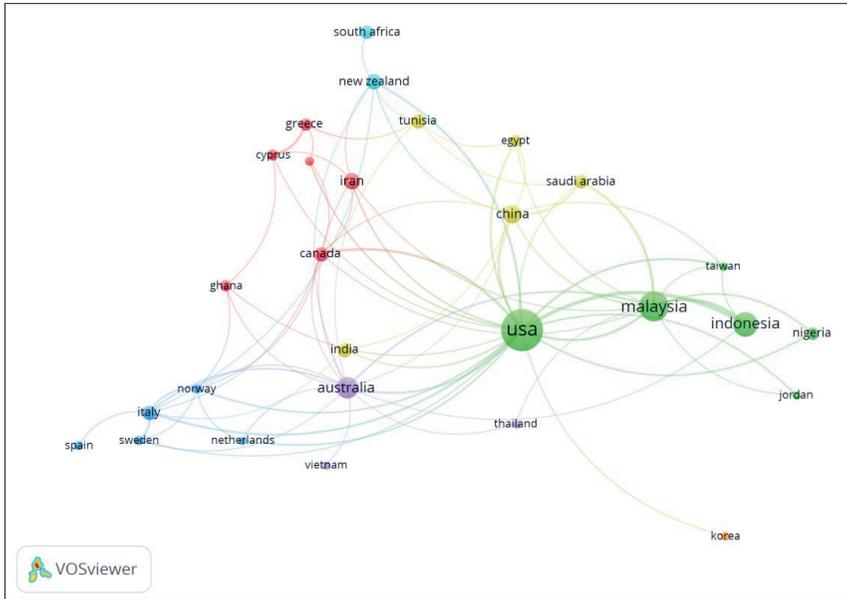
building on this topic, while Malaysia and Indonesia, which are closely connected to each other, stand out as key players in Asia. The graph as a whole illustrates the global pattern of interconnectedness in research, highlighting how knowledge and innovation are shared and developed through cross-border co-operation.

4.5 Author

The following data shows the list of researchers who have the greatest contribution to research on "internal control and public sector accounting fraud" in terms of the number of articles published. Based on Figure 7, MAULIDI A stands out as the researcher with the highest number of articles at 11, while NAWAWI A, SAID J, SALEHI M, and SALIN ASAP have 9 articles each. However, when considering fractional contribution which allocates a share of each article to its authors based on the number of authors per article, these figures change. MAULIDI A still leads the way with a fractional score of 7.17, indicating that although he has the most articles, his contributions are spread among several authors. MAULIDI A's most recently published article is "Philosophical Understanding of the Dynamics and Control of Occupational Fraud in the Public Sector: Contingency Analysis" published in *International Journal of Ethics and Systems* in 2023.

Figure 7. Most relevant authors
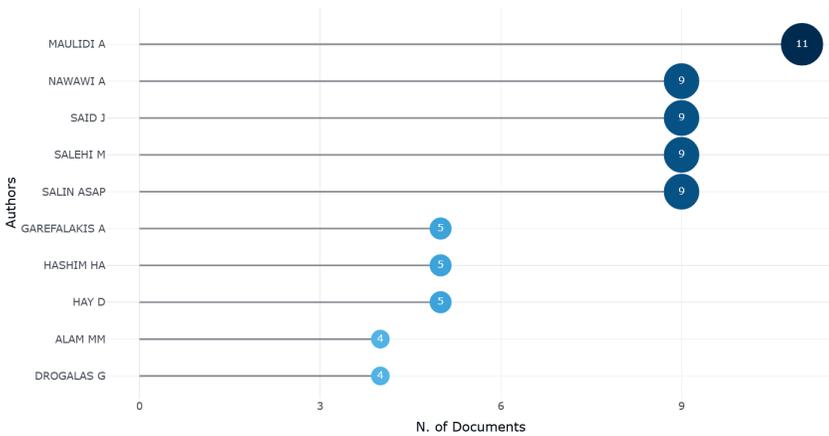
In addition, NAWAWI A and SALIN ASAP have both authored 9 articles, their fractional value is 3.50, suggesting that they may have collaborated with other authors in some of these publications. Similarly, SAID J has a lower fractional contribution than SALEHI M (2.62 versus 3.17), indicating different levels of collaboration in their research. Researchers with a smaller number of articles such as GAREFALAKIS A, HASHIM HA, HAY D, ALAM MM, and DROGALAS G showed lower fractional contributions corresponding to a smaller number of articles, confirming that they have an important but more specific role in this research corpus.

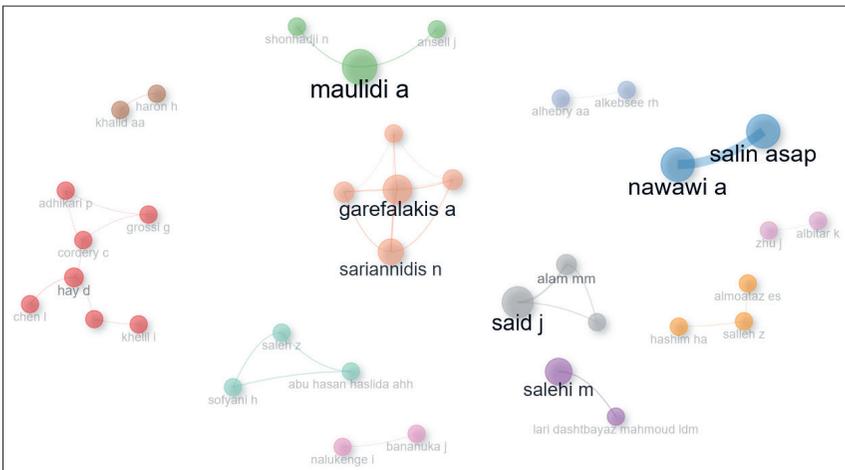Figure 8. Author colaboration network

Figure 8 illustrates the collaboration map between authors in the field of "internal control and public sector accounting fraud," the size of each author's node signifies the number of publications and the lines connecting between nodes indicate the collaborative authorship. MAULIDI A stands out as the centre of collaboration with many lines converging on him, confirming his position as a key author in this network. GAREFALAKIS A and SARANIDIS N also appear to be active collaborators with several relationships created, while SALIN ASAP and NAWAWI A, despite showing a significant number of publications, have fewer collaboration networks, indicating their possible role as lead authors in their publications. This overall visualisation offers a perspective on the structure and dynamics of collaboration in the production of academic literature, highlighting how individual contributions and collaborations influence the development of knowledge within the field.

4.6   Affiliation

Figure 9 lists 15 leading affiliates or institutions based on their publication output on the topic of "internal control and public sector accounting fraud," visualised using a bubble chart where bubble size corresponds to the number of publications. Universiti Teknologi MARA (Malaysia) tops the list with 27 articles, followed by Bina Nusantara University (Indonesia) and Islamic Azad University (Iran), with 11 and 9 articles, respectively.

**Figure 9. Most relevant affiliations**
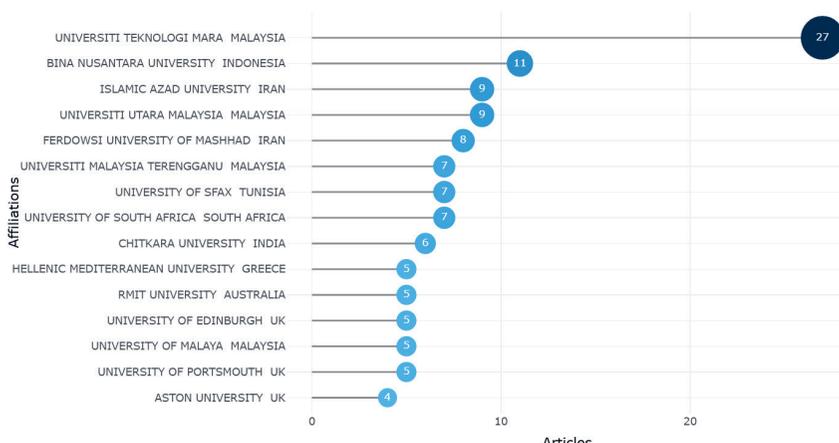
The emphasis on Malaysia and Indonesia in this discussion stems directly from their institutions' significant publication output in the dataset. Rather than selecting these countries arbitrarily, their mention reflects objective bibliometric data indicating regional leadership in this area. In particular, Malaysia is represented by several active research institutions—such as Universiti Utara Malaysia and Universiti Malaysia Terengganu—suggesting a strong institutional focus on governance and public sector accountability research. Despite the notable presence of Southeast Asian universities, the overall institutional landscape is diverse, spanning multiple continents. Contributions also come from institutions in Tunisia, South Africa, India, Greece, Australia, and the United Kingdom. This geographic diversity underscores the global relevance of the research topic and indicates that internal control and public sector fraud are critical issues addressed by academic communities worldwide.

4.7   Keywords

Figure 10 illustrates the ten most frequently occurring keywords in the global literature on "internal control and public sector accounting fraud." The bubble chart visualises the frequency of each keyword, with bubble size corresponding to the number of occurrences. "Fraud" emerges as the most dominant keyword, appearing 71 times, followed by "corporate governance" (51 times) and "internal control" (38 times). Other prominent keywords include "corruption", "accountability", and "internal audit", reflecting core themes commonly addressed across diverse regions and institutional contexts. These keywords were derived from all documents included in the bibliometric dataset, without limiting the analysis to any specific country or region, thereby capturing global research trends in this field.

The high frequency of the keyword "fraud" indicates a major focus of this research area, confirming that fraud is a central area of concern in the study of internal control and public sector accounting. The keywords "corporate governance" and "internal control" indicate that these aspects are also considered important by researchers in preventing or detecting fraud in organisations. Keywords such as "corruption" and "accountability" reflect issues closely related to fraud, highlighting the correlation between good corporate governance, transparency and compliance in combating fraud and corruption. Overall, the most frequently occurring keywords provide insight into the dominant themes that are the focus of current research in the domain.

Figure 10. Most frequent keywords
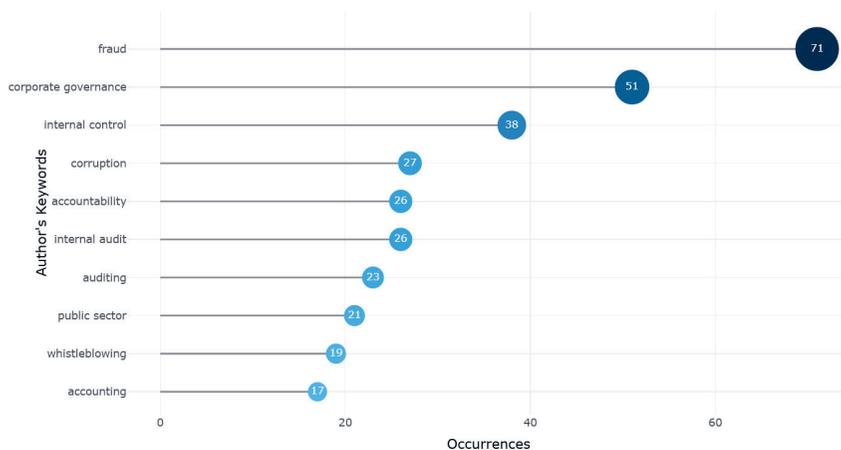
Figure 11. Keywords network visualisation
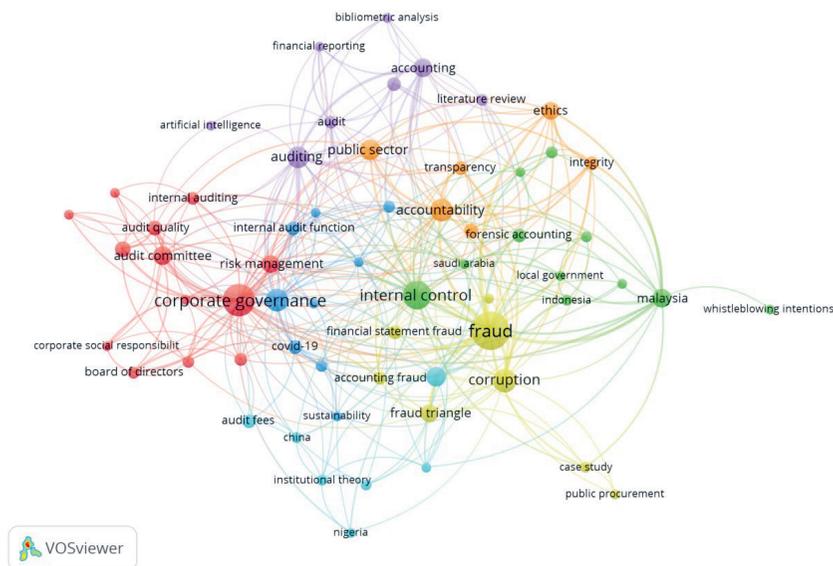

Figure 11 shows the network visualisation of keywords used in the literature related to "internal control and public sector accounting fraud" using the VOSviewer tool. In this map, keywords are depicted as nodes, and the lines connecting the nodes represent thematic relationships or conceptual kinship between these topics in the existing literature. Larger nodes, such as "fraud", "corporate

governance", and "internal control", signify a higher frequency of these keywords in the literature, while thicker lines indicate more frequent relationships between these topics.

This visualisation shows that "fraud" is central to this network, suggesting that this is a very central topic in research related to internal controls and accounting fraud in the public sector. Keywords such as "corporate governance" and "internal control" appear as other important concepts, often closely related to "fraud", reflecting the importance of good governance and effective controls in preventing fraud. The connection between "fraud" and "corruption" is also prominent, suggesting that these two areas are often scrutinised together. Other nodes such as "audit", "accountability", and "public sector" also show strong linkages, highlighting various aspects that researchers consider important in understanding and addressing fraud and corruption in the context of public sector accounting.

4.8 Internal Control and Sector Public Accounting Fraud Trend Topics

Figure 12 outlines the keywords that represent trending topics in research related to "internal control and public sector accounting fraud" over the period 2018 to 2023. The data is presented by showing the frequency of appearance of each keyword, as well as the first quartile (Q1), median (med), and third quartile (Q3) of publication years. The keyword "Malaysia" appears 17 times and has a median publication year of 2019, signalling a significant research

Figure 12. Trend topics on 2018-2023
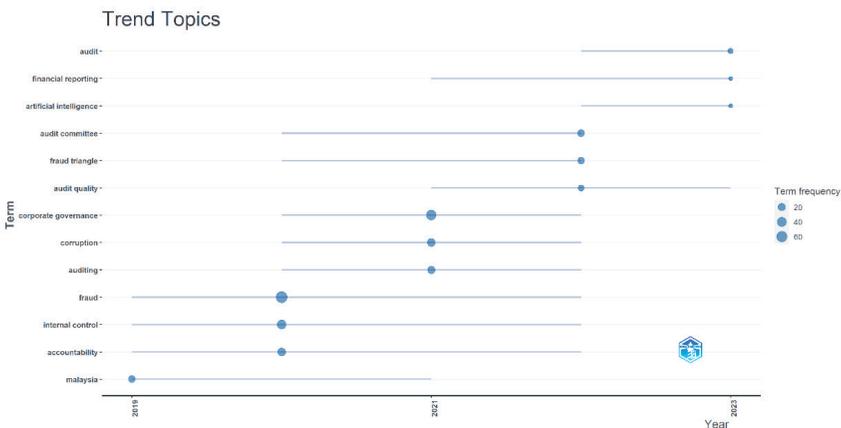
focus on Malaysia in the early period of the timeframe. "Fraud" was the most frequently covered topic with 71 occurrences and a median publication year of 2020, indicating that this was a focal point in research throughout the observed period.

The topics of "corporate governance", "corruption" and "auditing" all showed an increase in interest from 2020 and remained a focus until 2022, corresponding to their median and third quartiles. This indicates that these issues have become increasingly relevant in academic discussions and practice over the past few years. It is interesting to note that "audit quality" started to gain more attention more recently, with the first quartile in 2021 and the third quartile in 2023, signalling that audit quality became a growing concern later in the period. The "fraud triangle", which is a framework for understanding the factors that lead someone to commit fraud, also shows an increasing trend with a median of 2022. This picture reflects how research focus shifts and evolves over time, and highlights areas that have and are likely to continue to receive attention in public sector accounting.

Figure 13. Overall thematic evolution in two cutting points
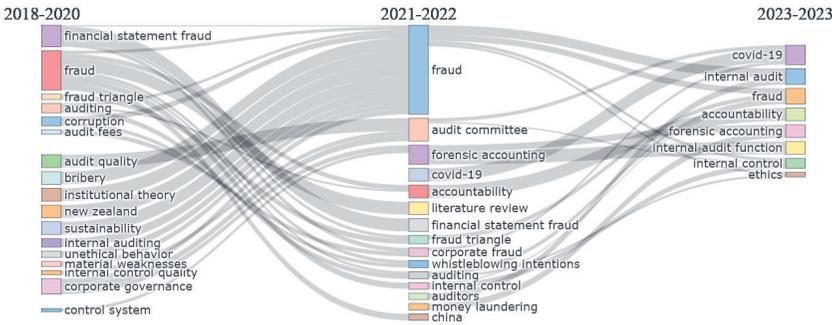
Figure 13 displays the thematic evolution in the "internal control and public sector accounting fraud" literature by dividing it into three time periods: 2018-2020, 2021-2022, and 2023-2023. The thematic flow from left to right shows the shift in topic focus over time. In the first period, "fraud", "fraud triangle", and "corruption" dominated the discussion, while in the second period, "audit committee" and "forensic accounting" started to appear with increasing significance, indicating a shift in focus towards corporate responsibility and detailed financial examinations. In the final period, "Covid-19" became significant, signalling the influence of the pandemic on the

research topic, with "internal audit", "accountability", and "forensic accounting" remaining important issues. This illustrates how global events and current trends can influence the direction and intensity of accounting research.

4.8.1 Development of internal control and public sector accounting fraud research topics in time slice 1 (2018-2020)

Figure 14 maps the research themes in the field of "internal control and public sector accounting fraud" over the period 2018-2020, categorised by level of novelty (vertical axis) and level of relevance (horizontal axis). In the "Basic Themes" area, which has a high level of relevance and novelty, we find topics such as "corporate governance", "fraud", and "internal audit", indicating that these are basic areas that consistently receive attention in research. "Motor Themes", such as "financial statement fraud" and "corruption", are recognised topics that continue to drive research in this area. On the other hand, "Niche Themes" indicate more specific and possibly emerging areas within the field, such as "forensic accounting" and "violation of norms". "Emerging or Declining Themes" include topics such as "internal control quality" and "real earnings management", signalling topics that are developing or possibly declining in research focus. These are presented in Figure 14 below.

Figure 14. Thematic maping in time slice 1 (2018-2020)

4.8.2 Development of internal control and public sector accounting fraud research topics in time slice 2 (2021-2022)

Figure 15 displays the thematic map for the period 2021-2022, which classifies research topics based on their level of importance and development in the literature on "internal control and public sector accounting fraud". In this map, basic themes such as "fraud", "corporate governance", and "internal control" remain front and centre, indicating that they are basic concepts that are constantly relevant in research. Motor themes include "forensic accounting" and "internal audit function", which act as driving topics that connect the basic themes with other research areas. Topics such as "audit committee", "audit quality", and "financial reporting quality" appear as emerging or declining themes, indicating that these are areas of growing or perhaps declining academic focus. Whereas "Niche Themes" include topics such as "corporate fraud" and "audit fees", which indicate specific areas with more limited development in the literature. These are presented in Figure 15 below.

Figure 15. Thematic maping in time slice 2 (2021-2022)

4.8.3 Development of internal control and public sector accounting fraud research topics in time slice 3 (2023)

Figure 16 is a thematic map covering research in 2023, categorising topics based on development density (i.e., how much they are being developed) and centrality (i.e., how relevant they are in the literature). "Basic Themes" such as "fraud", "corporate governance"

and "corruption" dominate as the most discussed and consistently relevant subjects in the research, indicating that these are core areas that continue to take centre stage. In the "Motor Themes" sector, topics such as "forensic accounting" and "money laundering" mark issues that are driving current research, perhaps in response to current needs in governance and regulation. "Niche Themes" highlight areas such as "ethics" and "bibliometric analysis", indicating more specific topics and perhaps targeting newer or less explored areas of research. "Emerging or Declining Themes" include "artificial intelligence" and "internal audit weaknesses", which may represent new trends in research or areas that are losing focus. These are presented in Figure 16 below.

Figure 16. Thematic mapping in time slice 3 (2023)
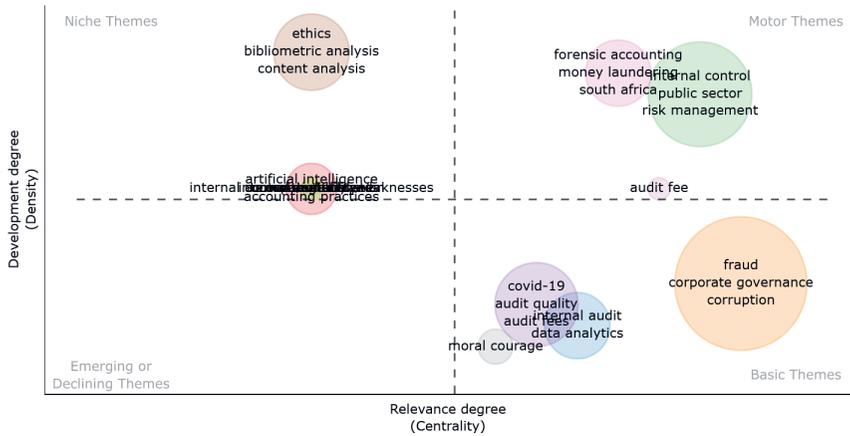
5. Discussion

Research on "internal control and public sector accounting fraud" from 2018 to 2023 shows that there are 473 papers with a total of 19 citations, indicating important contributions from a small number of authors. Publication trends show a response to factors such as regulatory changes and awareness about internal controls. The network of international collaborations between countries and between authors highlights the importance of co-operation in research. Academic institutions from different countries contributed significantly to the research, confirming that this was a global endeavour. The most frequently occurring words in the literature on "internal control and fraud in public sector accounting" between

2018 and 2023 are "fraud", "corporate governance", and "internal control". The thematic mapping shows a shift in research focus, with "fraud" as a consistent core, while "audit committee" and "forensic accounting" increased in importance, and "Covid-19" emerged as a new influence, reflecting its impact on accounting research topics.

This finding is in line with the research of Montesdeoca et al. (2019) which found that effective corporate governance and sound accounting practices, combined with specific psychological attributes of managers and employees, play a crucial role in diminishing irresponsibility. This underscores the importance of governments crafting policies that integrate responsible corporate governance with environmental sustainability to minimise the societal consequences of accounting fraud. In addition, research by Tajudin et al. (2022) found that Western academics have paid attention to public sector accounting research since 1906, with intensive research after 2000, resulting in six conceptual structural themes in public sector accounting, namely "Public Sector", "Public Sector Accounting", "Accounting", "Government Accounting", "Accounting Change", and "Performance". In addition, research by Grossi et al. (2023) found that the alignment on significant forthcoming topics, such as the role of accounting in serving the public, hybridity, and embracing diverse values, along with facilitating factors like accounting expertise, the profession, and digitalisation in the domain of public sector accounting education and practice, underscored the diversity of perspectives.

In the context of the public sector, internal control is very important because it is related to the management of public resources that must be carried out with transparency and accountability (Vu & Nga, 2022, p. 1). Within this system, several elements are encompassed, including the control environment, risk evaluation, control procedures, information exchange, and supervision. The control environment establishes the foundation for shaping employees' views, consciousness, and behaviors concerning the significance of control within the organisation (Liu, 2023, p. 1; Luo & Tian, 2023). Accounting fraud, which can include financial statement manipulation, asset misappropriation, and corruption and bribery, causes substantial losses to public resources and undermines public trust in government institutions (Boller et al., 2024, p. 1; Richardson et al., 2022). These fraud prevention strategies should be comprehensive, involving measures such as the implementation of strong accounting and reporting standards, effective internal oversight and audit, and strict enforcement of laws and regulations (Button et al., 2023; Soomro

et al., 2021, p. 1). Operational audits, enhanced audit committees, strengthened internal controls, the introduction of fraud reporting policies, employee rotation, the establishment of fraud hotlines, and the utilisation of forensic accountants represent some of the most impactful measures employed in the public sector for detecting and preventing fraud (Horne, 2017; Noch et al., 2022; Othman et al., 2015, p. 59).

6. Conclusion and Suggestions

6.1 Conclusion

Research in public sector accounting has consistently emphasised "fraud", "corporate governance", and "internal control" as core themes. The growing attention to "audit committee" and "forensic accounting" reveals the field's adaptation to changes in corporate practices and the increasing need for transparency and fraud prevention. The emergence of Covid-19 as an influence factor also marks the importance of flexibility and crisis response in accounting practice and research. These conclusions underline the continuous evolution in public sector accounting research topics, with adjustments to global challenges and current industry trends.

6.2 Implication

This research provides critical insights for academics, practitioners and policymakers. For academics, the findings highlight key areas that require further exploration, such as the impact of the pandemic on internal controls. Practitioners can utilise a deeper understanding of "forensic accounting" and "audit committees" to improve anti-fraud practices. Policymakers can use these findings to develop more robust regulations, given the importance of corporate governance and internal controls that has been reinforced by this research evidence.

6.3 Limitation

The main limitation of this research is its focus on literature available up to a certain reference date, which may limit the understanding of recent developments in the field of 'internal control and public sector accounting fraud'. Secondly, this research may be limited in its ability to capture the specific contextual nuances of different geographies or sectors, given the variations in accounting and regulatory practices between countries. This may affect the generalisability of the findings to contexts that are broader or different from the one studied.

6.4   Future Research

Future researchers could explore the impact of recent external factors on internal controls and fraud in the public accounting sector. This suggestion would provide a better understanding of how the global crisis affects accounting practices and internal controls. Furthermore, research that focuses more on cross-country or sector comparisons could provide insights into how cultural and regulatory contexts affect the implementation of internal controls and fraud prevention efforts. This approach will provide a deeper understanding of the factors that influence the effectiveness of internal controls in different environments.

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