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## A research profile on internal audit quality

*Perfil de pesquisa sobre qualidade na auditoria interna*

*Perfil de investigación sobre calidad en auditoría interna*

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### ABSTRACT

Gaps in internal audit function (IAF), such as internal audit quality (IAQ), began to be pointed out by studies carried out after Sarbanes-Oxley (SOX) Act publication. As a subject still under development in the literature, this article seeks to delineate a research profile for the IAQ in the period from 1999 to 2021. To this end, a bibliometric profile on the subject was conducted, resulting in the identification of how the research area has progressed over the last 22 years, encompassing research clusters, main fields of study and citations networks. As a result, two maps were created: one based on text data and one based on bibliographic data.

**Keywords:** internal audit activity; internal audit quality; Sarbanes-Oxley Act; research profile; bibliometric profile.

### RESUMO

As lacunas acerca da atividade de auditoria interna (AAI), como a qualidade na auditoria interna (QAI), começaram a ser apontadas por pesquisas desenvolvidas após a divulgação da Lei Sarbanes-Oxley (SOX). Por constituir um assunto que ainda está em desenvolvimento na literatura, este artigo busca delinear o perfil de pesquisa sobre a QAI no período de 1999 a 2021. Para este fim, foi efetuado o perfil bibliométrico sobre o tema, resultando na identificação de como a área de pesquisa progrediu ao longo dos últimos 22 anos, englobando os aglomerados de pesquisa, os principais campos de estudo e as redes de citações. Como resultado, foram gerados dois mapas: um baseado em dados de texto e um baseado em dados bibliográficos.

**Palavras-chave:** atividade de auditoria interna; qualidade na auditoria interna; Lei Sarbanes-Oxley; perfil de pesquisa; perfil bibliométrico.

### RESUMEN

Las lagunas en la actividad de auditoría interna (AAI), como la calidad en auditoría interna (CAI), comenzaron a señalarse mediante estudios realizados después de la publicación de la Ley Sarbanes-Oxley (SOX). Como es un tema aún en desarrollo en la literatura, este artículo busca delinear el perfil de investigación sobre CAI en período de 1999 a 2021. Para eso, fue conducido el perfil bibliométrico sobre el tema, resultando en como se ha progresado el área de investigación en los últimos 22 años, abarcando los clústeres de investigación, los principales campos de estudio y las redes de citas. Como resultado, se generaron dos mapas: uno basado en datos de texto y otro basado en datos bibliográficos.

**Palabras clave:** actividad de auditoría interna; calidad en auditoría interna; Ley Sarbanes-Oxley; perfil de investigación; perfil bibliométrico.

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## 1 INTRODUCTION

Internal audit (IA) makes use of a methodology to measure and improve all related processes to governance, risk management and internal controls in terms of effectiveness (IIA, 2017). The internal audit function (IAF) can be considered independent if its practices adhere to standards internationally accepted, as well as its activities are performed autonomously, due both to the adjustment of the level of reporting to senior management and the timely issuance of reports to the Board of Directors (IIA, 2013). The IAF is believed to be a governance branch and, when effective, is widely believed to conduct distinct significant roles during the process of financial reporting (Ismael & Kamel, 2021).

In general, enhancing IAF and promoting internal auditors' performance are supposed to lead any organization in accomplishing its goals (Abdallah et al., 2021). IAF is relevant for providing robustness of corporate governance function. Despite having expanded its area of activity and its scope from the mid-twentieth century, its tasks and main functions are rarely understood within the organizational scope, particularly concerning its integration into the governance scenario (IBGC, 2018). The Institute of Internal Auditors (IIA) states that entities that make effective use of IA have a greater capacity to: (i) distinguish risks and weaknesses in both procedures and systems; (ii) perform repair actions properly; and (iii) support continuous improvement on a regular basis (IIA, 2010).

Considerable scrutiny has been given to IAF by organizations in consequence of its roles (Abdallah et al., 2021). Throughout the several scandals that occurred in both public and private organizations, particularly those in WorldCom and Enron in the early 2000s, greater attention has been given to the IAF, as an instrument for maintaining effective corporate governance and disseminating quality financial reports (Prawitt et al., 2009). In the context of the Brazilian public sector, the repercussions of operations carried out to fight the proliferation of corruption activities by public agents have consolidated not only the notoriety but also the importance of IA, which – to some extent – could justify a greater investment in research that promotes improvements in its performance. The growth in its relevance is also due to a broader responsibility for consulting activities within the risk management function (Alzeban & Gwilliam, 2014), even leading central roles in both development and analysis of risk management (Vinnari & Skærbæk, 2014) and also in fighting corruption amongst entities (Asiedu & Deffor, 2017).

The interest in IAF is recent (Coetzee & Lubbe, 2014; Regoliosi & D'eri, 2014; Shabnam et al., 2014; Pizzini et al., 2015; Trotman & Trotman, 2015; Roussy & Brivot, 2016) and some gaps in knowledge about this subject matter were identified by Gramling et al. (2004), in one of the first articles written about this theme after the Sarbanes-Oxley Act (SOX). Although IAF in the public sector has also begun to

be studied recently (Neu et al., 2013; Roussy, 2013; Everett & Tremblay, 2014; Vinnari & Skærbæk, 2014; Roussy, 2015; Roussy & Brivot, 2016), this topic still lacks some research, as the definition of internal audit remains comprehensive (Roussy, 2013) and still susceptible to several perceptions (Roussy & Brivot, 2016).

Recently, Alaraji (2020) researched the rapport amid corporate governance foundations, control and IAF performance in Iraqi firms, concluding that the more the commitment in establishing corporate governance, the greater will be the boost and the accomplishment in IAF and internal controls, reflected in more reliability and detachment of financial statements. Kaawaase et al. (2021) tried to provide the association among corporate governance roles, IAQ and the quality of financial reports in Uganda's financial entities and found out that either board attributes and IAQ are quite related to better financial reports. Ismael & Kamel (2021) investigated the relationship between IAQ and United Kingdom firms in earnings management procedures and demonstrated the consistent role of IA in diminishing the incidence of atypical accruals, corroborating the negative relation amid IAQ and earnings management. Krichene & Baklouti (2021) tried to figure out the approaches of internal auditors on IAQ and to emphasize their contrasting characteristics considering their impressions of IAQ antecedents and demonstrated that features as the internal auditors' expertise, reporting autonomy, conformity with IPPF, liaison with the external auditors, internal auditors' private affinities, admission to data and area of activity presents a positive relation with IAQ in various levels of significance.

Roussy & Perron (2018) proceeded to a systematic review of the literature (SRL) post-SOX covering three main subjects: (i) multiple IA roles; (ii) internal audit quality (IAQ); and (iii) practice of IA. The research found out that the first two topics are still under discussion meanwhile the third one remains incipient, despite the volume of publications between 2005 and 2017. One of the gaps pointed out by the authors was that the research on IAQ is dominated by the perspective of external auditors, which may generate misconceptions about how the IAQ is conceptualized and evaluated, exclusively by those involved in the practice of IA. Since Roussy & Perron (2018) focused on the SLR, that they have not deepened the study pattern on IAQ, that they have restricted their study to the interstice 2005-2017 and that IAQ is still a subject in developing amidst scientific literature, this work aims to delineate the research profile on the IAQ in the period between 1999 and 2021, expanding the scope of the authors and preparing the path to future studies in IAQ field, including a comprehensive SLR about this very specific topic rather IAF or IA in general. Therefore, this work is relevant because it inaugurates bibliometric research on the specific topic of IAQ both nationally and internationally since there are no current studies that dissociate the IAQ theme from broader approaches of IA.

## 2 THEORETICAL FRAMEWORK

### 2.1 Internal audit quality (IAQ)

Knechel et al. (2013) understand that the most important to be considered in IAQ are the four attributes of the audit itself: (i) inputs; (ii) process; (iii) outcomes; and (iv) context. Gonthier-Besacier et al. (2016) suggest that the perception of IAQ is impacted by the professional's role in the audit process and may also be affected by the professional's characteristics.

Alaraji (2020) stands that the use of corporate governance pillars in private sector companies has committed to enhancing and implementing quality in control function and IAF, reinforcing the internal control system and IA, in addition to improving financial statements in terms of neutrality and trustworthiness. Ismael & Kamel (2021) measure IAQ using four distinctive proxies: (i) size; (ii) independence; (iii) methodology; and (iv) management, skills and knowledge.

For Gonthier-Besacier et al. (2016) previous studies highlight the distinct perceptions of IAQ amid the various stakeholders, corroborating the study carried out by Roussy & Brivot (2016), which suggests that the IAQ should be interpreted considering four perspectives: (i) the Institute of Internal Auditors' perspective (IIA); (ii) the internal auditors' perspective; (iii) the external auditors' perspective; and (iv) the members of the Audit Committee's perspective.

From the external auditor and the audit committee's perspective, there is little consensus on how to determine and even present the audit quality (Knechel et al. 2013). The specific theme IAQ has been discussed only from the point of view of the external auditor, mostly regarding the disclosure of financial statements (Prawitt et al., 2009; Mat Zain et al., 2015; Abbott et al., 2016). High levels of IAQ would enable greater levels of efficiency, as well as the increase of external auditors to rely on internal auditors' work (Prawitt et al., 2009; Mat Zain et al., 2015).

From this perspective, IAQ should be assessed based on the independence of the IAF and on the competence of internal auditors (Prat Dit Hauret, 2003; Lesage & Ben Saab, 2009) to the external audit base its judgment on the support provided by the IAF throughout financial statements assessment (Messier et al., 2011; Prawitt et al., 2011, Abbott et al., 2012a, Bame-Aldred et al., 2012). In this sense, the greater the focus on assurance work, the higher the independence of the IAF (Dezoort et al., 2001; Gramling et al., 2004; Gramling & Myers, 2006; Lin et al., 2011). On the other hand, the bigger the involvement of IAF in organizational operations, the lower the probability of IAF to be perceived as independent and as presenting high quality (Gramling et al., 2004; Gramling & Myers, 2006; Glover et al., 2008; Prawitt et al., 2009).

Thus, the primary IAQ indicators for independence should be: (i) the degree of internal auditors' works used by the external auditors (Munro & Stewart, 2011; Prawitt et al., 2011; Abbott et al., 2012a, 2012b; Davidson et al., 2013;

Issa & Kogan, 2014; Singh et al., 2014; Malaescu & Sutton, 2015; Pizzini et al., 2015; Bhattacharjee et al., 2016; Chen et al., 2017), understood as a measure of IAF performance (Desai et al., 2010; Trotman & Duncan 2017); and (ii) the effectiveness of the Audit Committee performance, considered as a factor of functional independence (Abbott et al., 2007, 2010; Andreson et al., 2012; Carcello et al., 2005; Mat Zain & Subramaniam, 2007; Davies, 2009; Regoliosi & D'Eri, 2014; Christ et al., 2015; D'Onza et al., 2015).

Some investigations face either positive or negative interactions of IAQ with some proxies of independence. Those with positive correlation are:

- a) Proportion of assurance work (Gramling et al., 2004; Lin et al., 2011);
- b) Critical essence of organizational audited processes (Archambeault et al., 2008);
- c) Fixed remuneration of main audit executives (Schneider, 2010);
- d) Close relations between audit executives and audit committee (Gramling et al., 2004; Archambeault et al., 2008; Christopher et al., 2009; Holt & Dezoort, 2009; Prawitt et al., 2009; Stewart & Subramaniam, 2010; Anderson et al., 2012; Holt, 2012; Zaman & Sarens, 2013; Boyle et al., 2015; D'Onza et al., 2015);
- e) Audit committee's independence and competence (Christopher et al., 2009); and
- f) IAF outsourcing by a professional accountancy firm (Gramling & Vandervelde, 2006; Glover et al., 2008; Stewart & Subramaniam, 2010; Brandon, 2010; Desai et al., 2010; Desai et al., 2011; Abbott et al., 2012a; Prawitt et al., 2012; Pike et al., 2016).

In return, the following IAQ indicators are negatively correlated with independence:

- a) Proportion of operational or advisory tasks (Gramling et al., 2004; Glover et al., 2008; Prawitt et al., 2009; De Zwaan et al., 2011);
- b) Variable remuneration (Schneider, 2010; Omar & Stewary, 2015);
- c) Use of IAF as an area for the main executives' continuing professional training (Christopher et al., 2009; Messier et al., 2011; Christ et al., 2015);
- d) Meaningful engagement of senior management with the IA plan (Christopher et al., 2009); and
- e) Close relations between internal auditors and senior managers (Norman et al., 2010; Holt, 2012).

Competence may present the following as key factors for its evaluation: (i) technical skills of internal auditors and leadership skills of IAF executives (Abdolmohammadi, 2012); (ii) experience time (Messier & Schneider, 1988); (iii) familiarity with organizational processes (Munro & Stewart, 2010; Abdolmohammadi, 2013); (iv) use of specialists or a professional accountancy firm for partial execution of

internal audit tasks (Desai et al., 2011; Bartlett et al., 2016); (v) some difficulty in recruiting highly qualified candidates due to their negative perceptions of internal auditor's role (Bunrton et al., 2015; Bartlett et al., 2016; Bartlett et al., 2017); (vi) performance of internal audit as a boot camp for senior management (Trotman & Duncan, 2017); and (vii) professional qualification (Brown, 1983). Also, an IA team needs to gather the expertise, competence and other mandatory skills to be assigned to a particular engagement as IIA Standard 1210 establishes (Krichene & Baklouti, 2021).

The IAQ from the perspective of internal auditors is poorly documented in the literature (Roussy & Brivot, 2016). Some exceptions include articles that indicate that independence and competence are also important for the activity of internal auditors (Sarens, 2009; Norman et al., 2010; Roussy, 2013) and also intertwine the notion of independence with the ability to ensure confidentiality (Burnaby & Hass, 2009). The internal auditors must execute their roles with independence and objectivity so no obstruction should be identified during the engagements or while communicating their findings, as shown in IIA Standard 1110 (Krichene & Baklouti, 2021). Roussy & Brivot (2016) present that internal auditors' competence is closely entwined to technical skills and organizational expertise, along with IAQ criteria that may be assessed in terms of adherence to the IIA Code of Ethics.

The next IAQ indicators might be considered when influenced by IA (Roussy & Perron, 2018): (i) shareholders' judgment and decisions (Holt & Dezoort, 2009); (ii) earnings management level (Abbott et al., 2016; Gras-Gil et al., 2012; Prawitt et al., 2009; Sierra Garcia et al., 2012); (iii) risk of fraud and the probability of its avoidance, detection and dissemination by IA (Asare et al., 2008; Coram et al., 2008; Ege, 2015); and (iv) deficiencies in internal controls (Mazza & Azzali, 2015; Farkas & Hirsch, 2016).

Under The Institute of Internal Auditors' perspective, the IIA understands that IAQ encompasses compliance with the International Professional Practices Framework, a.k.a IPPF, and defines IA from a hybrid perspective, emphasizing the characteristics of independence and objectivity in the assignments performed (Roussy & Brivot, 2016). For the IIA, IAQ is directly associated with meeting clients' expectations and with the performance of the auditor's professional duties, as long as in compliance with IPPF standards. The IPPF aims to delineate the basis for the IA practice, furnish a guideline for IAF, determine principles to the IAF evaluation and advocate the strengthening of both organizational activities and procedures (Krichene & Baklouti, 2021).

The IPPF designates that the Chief Audit Executive (CAE) must develop a quality program to examine the whole IAF and to enable the improvement of the activities

performed by internal audit in Attribute Standards 1300 to 1322. In addition, all the results obtained during the assessment must be communicated timely.

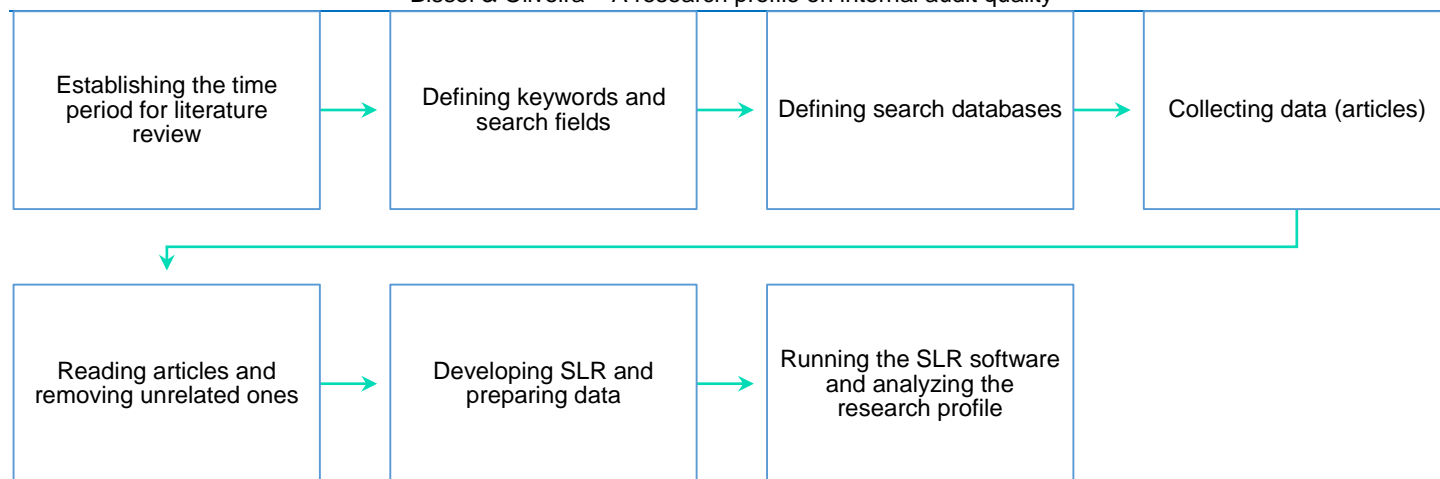
The Supplementary Guidance entitled Quality Assurance and Improvement Program (QAIP), some generic instructions are offered about the overall content of the internal audit quality program, which should contain three sections: (i) governance; (ii) professional practice; and (iii) communication. According to this publication, it may be demonstrated that the elements of the QAIP are part of those listed in IPPF standards, only addressing the IIA's perspective of IAQ. The publication itself mentions it is not necessary to assess individual standards for each assignment. However, the assignment direction must be consistent with a determined method that enables quality and it is then aligned with IPPF (IIA, 2012).

### 3 METHODOLOGY

The research profile aims to map the study, expanding the analysis of the literature throughout a scanning process all over the existing publications (Oliveira et al., 2018). Porter et al. (2002) recognize that this technique proposes to broaden the literature review, without replacing it, to achieve the objectives related to discerning the structure of the subject, relevant variables, appropriate methods and key needs. This would imply both the collection and analysis of comprehensive searches of compilations of existing literature, based on the scientific and technological databases available to the public (Guo et al., 2010). Most of the developed research profiles might be categorized as bibliometry, which consists in the counting of bibliographic activity associated with a given theme (Porter et al., 2002). Bibliometric mapping is a critical theme in the bibliometric field and indicates two distinctive conditions: (i) the creation of bibliometric maps; and (ii) graphical portrayal of such maps (Van Eck & Waltman, 2010).

To outline the research profile on IAQ, the following questions were asked: (i) what is the bibliometric profile of the subject matter (including the most used keywords, the most cited authors, journals and authors who published the most on this subject?); (ii) how has this research field progressed over the past 22 years?; (iii) what are the largest research agglomerates on IAQ?; (iv) what are the major fields of study on IAQ?; (v) what are the most relevant networks related to this topic?

With regard to addressing the questions raised upon the research profile, the protocol proposed by Oliveira et al. (2018) was adopted in this study since distinguishes eight steps to be fulfilled along the elaboration process of research profile and subsequent Systematic Literature Review (SLR) on a given subject, as can be seen in Figure 1.



**Figure 1.** SLR steps.

Source: Developed by the authors based on Oliveira et al. (2018).

Articles identification was performed taking into account search strings in different electronic databases to recognize relevant publications within the stipulated scope for this research. The databases surveyed included Web of Science (WoS) and Scopus, chosen because both constituted the most comprehensive bases for bringing off bibliographic searches and also having their data used in the bibliometric analysis (Mongeon & Paul-Hus, 2016; Oliveira et al., 2017). Oliveira et al. (2017) pointed out that WoS and Scopus covered approximately 95% of the resulting articles examined by the authors.

The following parameters have been defined for the databases search: (i) combination of strings "internal audit quality" or "internal audit function quality" or "quality of internal audit function", which are associated with quality in

internal audit or quality in the internal audit function; (ii) restriction for searching articles in the English language, since in international databases it is possible to be available articles in other languages, such as Mandarin; (iii) location of strings in the title, abstract and keyword fields of the papers, to allow a widening scope in the search; (iv) delimitation of time between 1999 and 2021. Articles with "in press" or "online early" statuses were not included in the search.

Regarding all the keywords used in the search, some words were listed and IAQ-related terms were combined as well (Roussy & Perron, 2018). The search was then performed on 12/07/2021 on Scopus and WoS, generating a total of 135 documents, as shown in Table 1.

**Table 1**  
Scopus and WoS search summary

Database	Search strings	Documents found
Scopus	( TITLE-ABS-KEY ( "internal audit quality" ) OR TITLE-ABS-KEY ( "internal audit function quality" ) OR TITLE-ABS-KEY ( "quality of internal audit function" ) ) AND ( LIMIT-TO ( PUBSTAGE , "final" ) ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) ) AND ( LIMIT-TO ( LANGUAGE , "English" ) ) AND ( LIMIT-TO ( PUBYEAR , 2021 ) OR LIMIT-TO ( PUBYEAR , 2020 ) OR LIMIT-TO ( PUBYEAR , 2019 ) OR LIMIT-TO ( PUBYEAR , 2018 ) OR LIMIT-TO ( PUBYEAR , 2017 ) OR LIMIT-TO ( PUBYEAR , 2016 ) OR LIMIT-TO ( PUBYEAR , 2015 ) OR LIMIT-TO ( PUBYEAR , 2014 ) OR LIMIT-TO ( PUBYEAR , 2013 ) OR LIMIT-TO ( PUBYEAR , 2012 ) OR LIMIT-TO ( PUBYEAR , 2011 ) OR LIMIT-TO ( PUBYEAR , 2010 ) OR LIMIT-TO ( PUBYEAR , 2009 ) OR LIMIT-TO ( PUBYEAR , 2007 ) OR LIMIT-TO ( PUBYEAR , 2005 ) OR LIMIT-TO ( PUBYEAR , 2001 ) )	67
Web of Science	((TS=("internal audit quality")) OR TS=("internal audit function quality" )) OR TS=("quality of internal audit" )) OR TS=("quality of internal audit function" ) Refined By: Publication Years: 2001 or 2005 or 2009 or 2011 or 2012 or 2015 or 2016 or 2017 or 2018 or 2019 or 2020 or 2021 Document Types: Articles or Proceedings Papers or Review Articles Languages: English	68

Source: Developed by the authors based on Scopus and WoS.

Table 2 shows the result obtained after redundancy evaluation using as a parameter the search results available on the Scopus platform because it presents the largest number of studies compared to the other bases (Oliveira et al., 2018).

**Table 2**  
Number of non-duplicated articles

Database	Documents found
Scopus	67
Web of Science	31
Total	98

Source: Developed by the authors based on Scopus and WoS.

Thus, 98 articles were cataloged and analyzed by VOSviewer software, using Research Information Systems (.ris) and Comma Separated Value (.csv) files generated by the searches previously performed in WoS and Scopus databases, respectively. VOSviewer uses data from databases such as Scopus and WoS to develop bibliometric networks, allowing the user to select between the total or fractional counting method (Perianes-Rodriguez et al., 2016). The program also offers a detailed examination of bibliometric maps and allows the display of a map in different ways, presenting features that facilitate the comprehensive evaluation of a given map (Van Eck & Waltman, 2010).

The following maps have been used in the analysis performed with VOSviewer: (i) map based on text data; and (ii) map based on bibliographic data.

#### 4 ANALYSIS AND DISCUSSION OF RESULTS

##### 4.1 Map based on text data

According to Mattei et al. (2021), different researches comprised the liaison amongst fees payable and audit quality, as well as the quality of the financial audit carried out. The authors also have identified that studies performed amid the late 1990s and early 2000s focused on auditors attributes and how IAF would assist public bodies

The total counting of text data was performed, considering the analysis of the title and abstract text fields,

with a minimum number of ten occurrences of each term. The ten most relevant terms can be seen in Table 3.

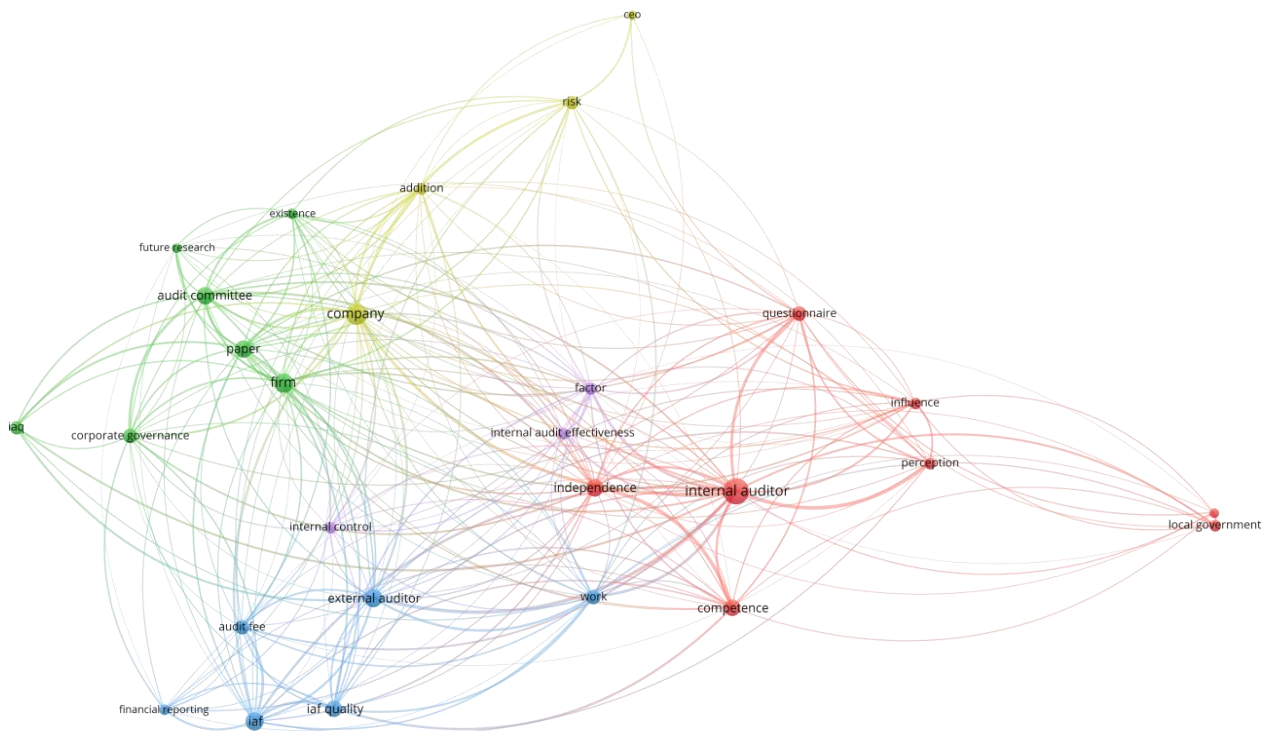
**Table 3**  
Most relevant terms in network articles

Term	Occurrence	Relevance
internal auditor	68	0.4007
company	47	0.3264
firm	38	0.3263
external auditor	33	0.1722
iaf	33	0.529
paper	32	0.269
independence	30	0.5186
audit committee	29	0.4463
iaf quality	28	0.5073
competence	26	0.7257

Source: VOSviewer.

It can be established the terms that appeared the most in articles were: (i) internal auditor (68 occurrences); (ii) company (47 occurrences); (iii) firm (38 occurrences); (iv) external auditor; and (v) iaf (33 occurrences). The use of those terms is justified because they are directly related to the IAQ theme, which normally refers to the internal auditor role, the internal audit function (IAF) and its performance in a company/firm. Moreover, it is worth mentioning the very first studies on IAQ made use of the external auditor's perspective of IAQ, which also explains adopting this expression.

The top five clusters of terms can be seen in Figure 2, reaching 28 connected items.



**Figure 2.** Clusters formed with the most relevant terms in the network.  
Source: VOSviewer.

## 4.2 Map based on bibliographic data

### 4.2.1 Co-authorship: authors

The ten best-ranked authors who collaborated were obtained considering the minimum of one document per author and a minimum of ten citations per author, which may be verified in Table 4.

Amidst the authors who collaborated the most in the network, the following can be highlighted: (i) Wood, D. A. (339 citations); (ii) Prawitt, D. F. (262 citations); (iii) Smith, J. L. (218 citations); (iv) Maletta M. J. (196 citations); and (v) Gramling, A. A. (193 citations).

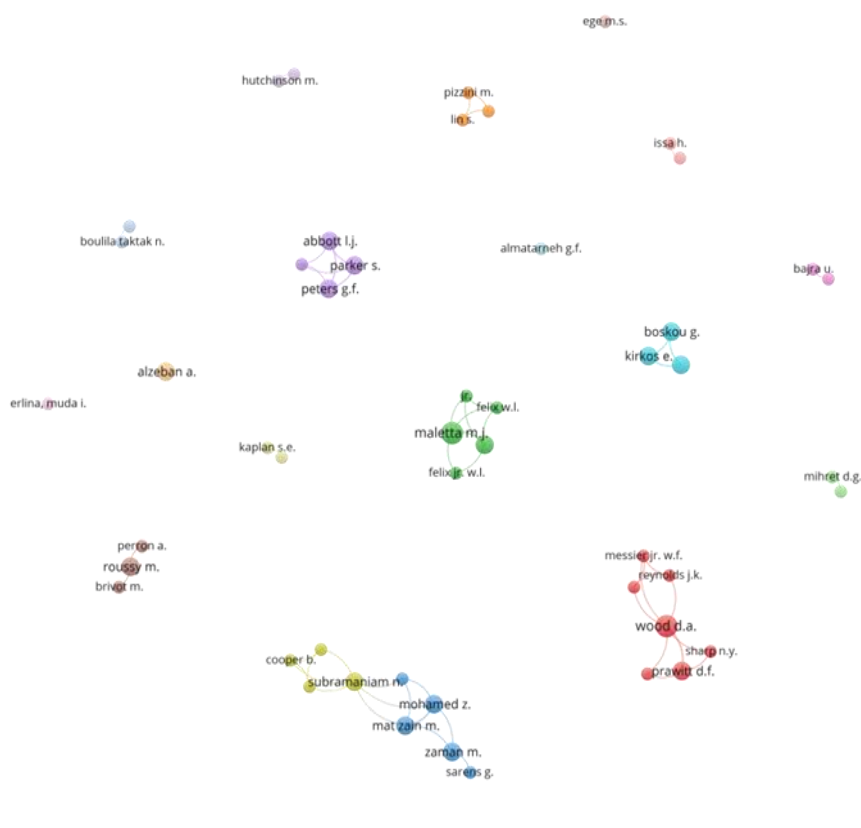
**Table 4**

The ten authors who collaborated the most in the network

Author	Documents	Citations
Wood D.A.	3	339
Prawitt D.F.	2	262
Smith J.L.	1	218
Maletta M.J.	3	196
Gramling A.A.	2	193
Felix W.L.	1	150
Abbott L.J.	2	127
Parker S.	2	127
Peters G.F.	2	127
Mihret D.G.	1	98

Source: VOSviewer

Figure 3 shows the clusters of authors who collaborated in co-authorship, summing 50 authors.



**Figure 3.** Collaboration between authors in the network.

Source: VOSviewer.

Table 5 presents the studies of the top five authors in the network, where it can be observed that the three most cited authors have a common paper (Prawitt; Smith & Wood, 2009). This paper is one of the most cited nowadays, not only due to the subject of earnings management but also because it addressed the topic after the publication of SOX.

After the financial scandals in the early 2000s, the IA knowledge became more prominent in 2004 with the literature review performed by Gramling, Maletta, Schneider & Church, initiating the post-SOX studies of IAF, determining opportunities and recommending various research avenues in this field (Roussy & Perron, 2018). In

one of the most relevant studies concerning the IA, Prawitt, Wood & Smith (2009) have identified that IAQ is negatively related to earnings management, when estimated by abnormal accruals and forecasts provided by analysts. In 2011, Prawitt, Wood & Sharp verified that in order to minimize audit fees, it is mandatory that internal auditors conduct tasks under the oversight of external auditors. The research of Messier Jr, Reynolds, Simon & Wood (2011) found that IAF is less objective when is used as a training ground by the management.

One point to be granted is the fact that only one study (Bhattacharjee, Maletta & Moreno, 2017), inserted all

previous ones in Table 5 presents less than five years of publication, indicating that older works tend to be more cited than newer ones.

**Table 5**

The five authors who collaborated the most in the network

Coauthor	Title	Others coauthors	Journal	Year
Wood D.A.	Internal audit quality and earnings management	Prawitt, D. Smith, J.	Accounting Review	2009
	The effect of using the internal audit function as a management training ground on the external auditor's reliance decision	Messier, W. Reynolds, J. Simon, C.	Accounting Review	2011
	Reconciling archival and experimental research: Does internal audit contribution affect the external audit fee?	Prawitt, D. Sharp, N.	Behavioral Research in Accounting	2011
Prawitt D.F.	Internal audit quality and earnings management	Wood, D. A. Smith J.	Accounting Review	2009
	Reconciling archival and experimental research: Does internal audit contribution affect the external audit fee?	Wood, D. A. Sharp, N.	Behavioral Research in Accounting	2011
Smith J.L.	Internal audit quality and earnings management	Prawitt, D. Wood, D. A.	Accounting Review	2009
Maletta M.J.	The contribution of internal audit as a determinant of external audit fees and factors influencing this contribution	Felix, W. Gramling, A.	Journal of Accounting Research	2001
	The influence of nonaudit service revenues and client pressure on external auditors' decisions to rely on internal audit	Felix, W. Gramling, A.	Contemporary Accounting Research	2005
	Audit reviewers' judgments in multiple client audit environments	Bhattacharjee, S. Moreno, K.	Behavioral Research in Accounting	2017
Gramling A.A.	The influence of nonaudit service revenues and client pressure on external auditors' decisions to rely on internal audit	Felix, W. Maletta M. J.	Contemporary Accounting Research	2005
	The contribution of internal audit as a determinant of external audit fees and factors influencing this contribution	Felix, W. Maletta M. J.	Journal of Accounting Research	2001

Source: Developed by the author based on VOSviewer and Mendeley Reference Manager.

#### 4.2.2 Country citation

The rank of the ten most cited countries was obtained considering the minimum of one document per country as well as a minimum of one citation per country and can be checked in Table 6.

**Table 6**

Ten most cited countries in the network

Country	Documents	Citations
United States	15	904
Malaysia	11	132
Australia	7	124
Ethiopia	2	98
Norway	1	77
Belgium	1	43
United Kingdom	1	43
Canada	2	33
Saudi Arabia	2	23
Indonesia	8	22

Source: VOSviewer.

According to Table 6, it is possible to demonstrate that the five countries with more collaborations in the network were: (i) United States (15 documents and 904 citations); (ii) Malaysia (11 documents and 132 citations);

(iii) Australia (seven documents and 124 citations); (iv) Ethiopia (two documents and 98 citations); and (v) Norway (one document and 77 citations).

After reviewing literature about public sector auditing, Mattei et al. (2021) pointed out a tendency of published articles in some locations as: (i) Australasia (38); (ii) Northern Europe (28); (iii) the UK (22); (iv) North America (18); (v) Africa and the Middle East (13); (vi) Asia (13); (vii) Central and South America (9); (viii) Southern Europe (10); and (ix) Eastern Europe (2). The systematic literature review carried out by Rana et al. (2021) demonstrated the distribution of papers as it follows for five articles or more: (i) Australia (30); (ii) the UK (21); (iii) Cross-countries (17); (iv) Canada (9); (v) United States (9); (vi) Denmark (7); (vii) Norway (5).

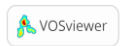
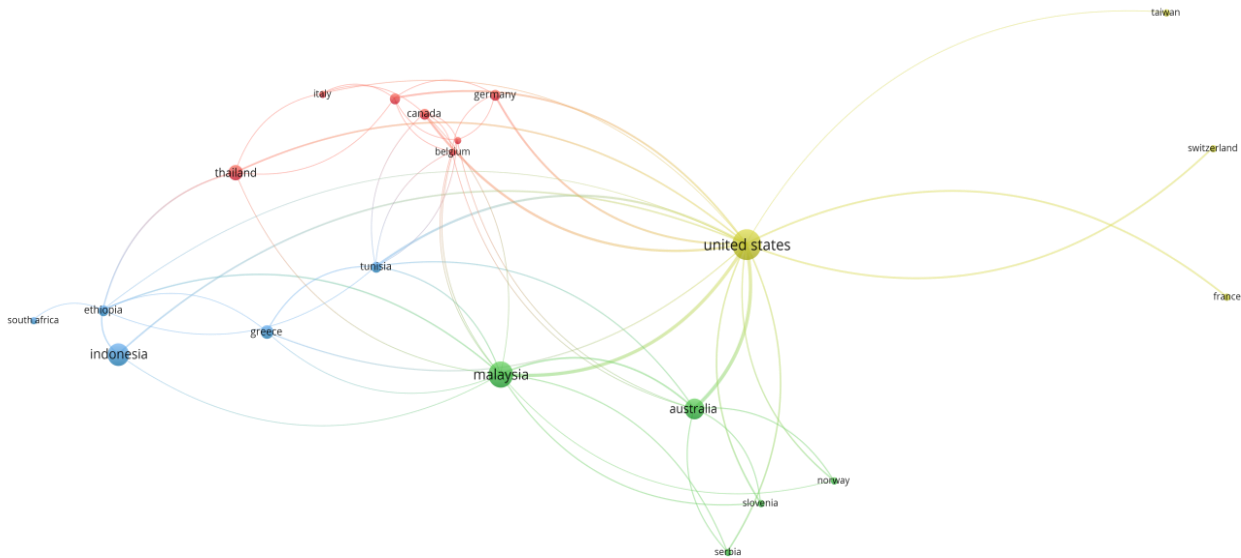
Figure 4 shows the clusters formed by the most cited countries in the network, totaling 21 connections.

Although 11 studies found in the network were carried through in Malaysia, compared to the 15 carried out in the United States, the latter maintains sovereignty over the number of citations (904 vs.132), principally if it is taken into account that the five authors who most collaborated in the



network carry out their research in that country. Nonetheless, it might be observed that in terms of the number of studies, Australia (with seven articles) and

Indonesia (with eight articles) produced more than five studies about IAQ in the period assessed.



**Figure 4.** Most cited countries in the network.  
Source: VOSviewer.

**4.2.3 Document citation**

The network of the ten most cited documents was obtained considering the minimum of one occurrence and can be noted in Table 7. It is possible to corroborate that the documents with more than 45 citations in the network were: (i) Prawitt, D. F. (2009), with 218 citations; (ii) Felix, W. L. (2001), with 150 citations; (iii) Mihret, D. G. (2007), with 98 citations; (iv) Messier Jr., W. F. (2011), with 77 citations; (v) Kaplan, S. E. (2007), with 77 citations; (vi) Abbott, L. J. (2016), with 71 citations; (vii) Ege, M. S. (2015), with 61 citations; (viii) Pizzini, M. (2015), with 58 citations; (ix) Abbott, L. J. (2012), with 56 citations; and Johl S. K. (2013), with 46 citations.

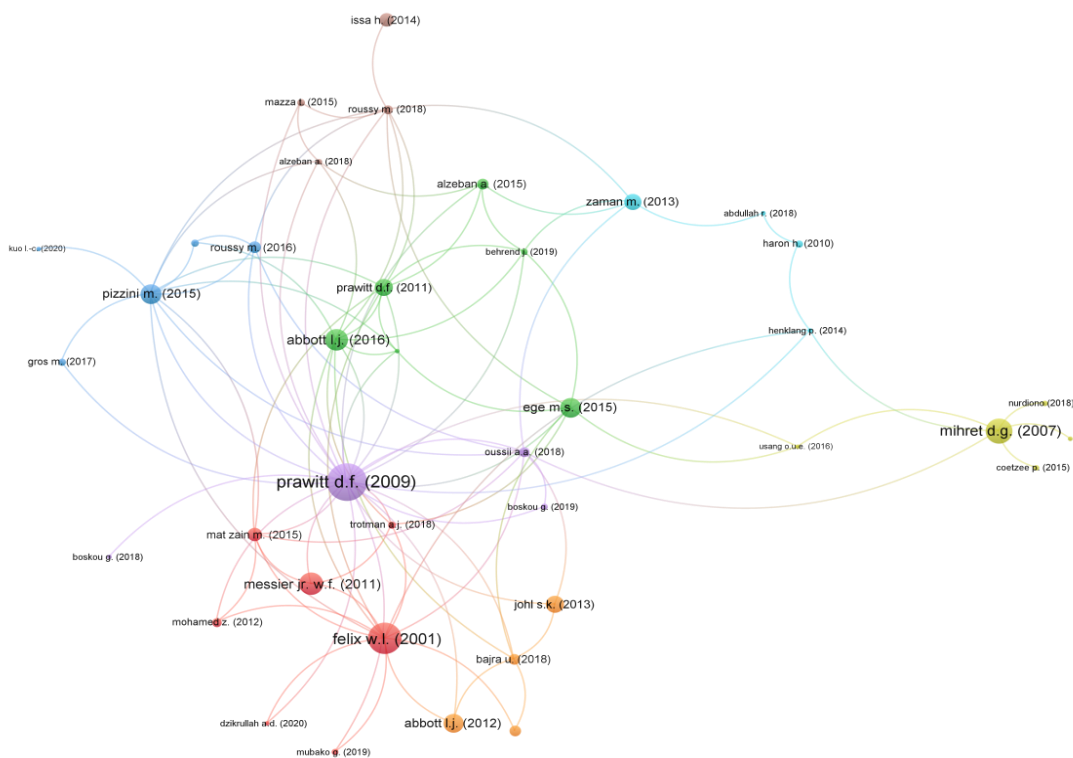
**Table 7**

Ten most cited documents in the network

Country	Citations	Link strength
Prawitt D.F. (2009)	218	26
Felix W.L. (2001)	150	13
Mihret D.G. (2007)	98	6
Messier Jr. W.F. (2011)	77	4
Kaplan S.E. (2007)	77	0
Abbott L.J. (2016)	71	10
Ege M.S. (2015)	61	7
Pizzini M. (2015)	58	12
Abbott L.J. (2012)	56	3
Johl S.K. (2013)	46	3

Source: VOSviewer.

Figure 5 shows the clusters led by the most cited documents, totaling 39 connections.



**Figure 5.** Most cited documents in the network. Source: VOSviewer.

Table 8 presents the five most cited articles in the network, considering the number of citations of the first author.

**Table 8**  
The five most cited articles in the network

Main author	Title	Journal	Year
Prawitt, D.	Internal audit quality and earnings management	Accounting Review	2009
Felix, W. L.	The contribution of internal audit as a determinant of external audit fees and factors influencing this contribution	Journal of Accounting Research	2001
Mihret, D. G.	Internal audit effectiveness: An Ethiopian public sector case study	Managerial Auditing Journal	2007
Messier Jr., W. F.	The effect of using the internal audit function as a management training ground on the external auditor's reliance decision	Accounting Review	2011
Kaplan, S. E.	Intentions to report questionable acts: An examination of the influence of anonymous reporting channel, internal audit quality, and setting	Journal of Business Ethics	2007

Source: Developed by the author based on VOSviewer and Mendeley Reference Manager.

As previously marked, the most cited studies refer to research effectuated more than five years ago, especially the work of Prawitt, Smith & Wood (2009) which was the most cited in the network for the period analyzed. As pointed out by Roussy & Perron (2018), this study presents IAF as

one of the governance branches particularly given its ability to increase the reliability of financial information.

#### 4.2.4 Source citation

The ten most cited sources in the network were obtained considering the minimum of one document per source along with a minimum of one citation per source and can be found in Table 9.

**Table 9**  
Ten most cited sources in the network

Source	Documents	Citations
Accounting Review	3	356
Managerial Auditing Journal	7	223
Journal of Accounting Research	2	221
Auditing	3	122
Journal of Business Ethics	1	77
International Journal of Auditing	4	56
Behavioral Research in Accounting	2	47
Contemporary Accounting Research	1	43
Journal of Information Systems	1	27
Australian Accounting Review	2	26

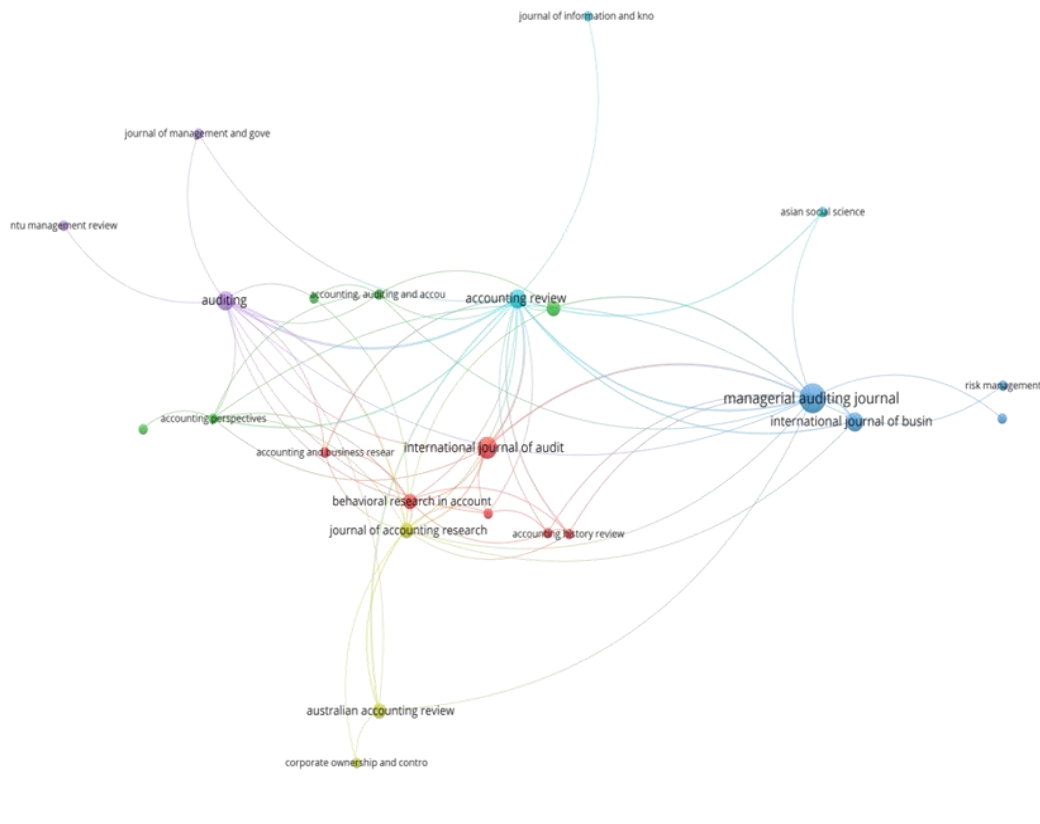
Source: VOSviewer.

The following sources presented more than 50 citations in the network during the period: (i) Accounting Review (three documents and 356 citations); (ii) Managerial Auditing Journal (seven documents and 223 citations); (iii) Journal of Accounting Research (two documents and 221 citations); (iv) Auditing (three documents and 122 citations); (v) Journal of Business Ethics (one document and 77 citations); and (vi) International Journal of Auditing (four documents and 56 citations).

Confirming this trend, Rousy & Perron (2018) found 16 articles published by *Managerial Auditing Journal*, 12 articles published by *Auditing* and 10 articles published by the *International Journal of Auditing*, while analyzing post-

Sarbanes-Oxley Act articles, encompassing three main subjects: (i) various roles of IA; (ii) IAQ; and (iii) IA practice.

Figure 6 points out the clusters formed by the sources, totaling 24 connections.



**Figure 6.** Most cited sources in the network.  
Source: VOSviewer.

Accounting Review consists of a journal that has been publishing studies in the Accounting field since 1926, which justifies the number of citations. Conversely, *Managerial Auditing Journal* (seven articles), *Auditing* (three articles) and *International Journal of Auditing* (four articles) are focused on the internal audit field and, hence, resulting in more publications about IAQ than Accounting Review.

**5 CONCLUSIONS**

Regarding the current research on IAQ, this topic has been discussed mostly from the external auditor perspective, notably about the disclosure of financial statements. It was understood that the level of confidence of external auditors in internal auditors' works was used to determine higher levels of both efficiency and quality within the IAF. In this respect, the IAQ should be measured by taking as evaluation elements the independence of the IAF and the competence of the internal audit team when providing support for external auditors' activities. Nevertheless, several perceptions of IAQ may coexist, according to the perspective used as a cornerstone for the analysis. In this sense, the IAQ should be interpreted from four perspectives: (i) the Institute of Internal Auditors'

perspective (IIA); (ii) the internal auditors' perspective; (iii) the external auditors' perspective; and (iv) the members of the Audit Committee's perspective.

According to the bibliometry performed for the interstice between 1999 and 2021 and a set of 98 articles, over the results achieved by based on text data mapping, it was identified that the most cited term was internal auditor, with 68 occurrences. In sequence, the based on bibliographic data mapping demonstrated that: (i) the author who most collaborated in the network in co-authorship was Wood, D. A., with 339 citations; (ii) the country that most collaborated in the network were the United States, with 15 documents and 904 citations; (iii) the most cited document in the network was Prawitt, D. F. (2009), with 218 citations; and (iv) the most cited source in the network was Accounting Review, with three documents and 356 citations.

As Roussy & Gramling (2018) did not concentrate their brief research profile on IAQ, they found 91 articles written from 2005 to 2017, considering only post-SOX internal audit literature. Furthermore, the authors used ABM Inform/Global and Business Source Premier as databases, contrasting with the use of Scopus and WoS databases in this very study. Also, they identified that *Managerial Auditing Journal* published 16 articles on the IA topic, *Auditing: a*

Journal of Practice and Theory published 12 articles and the International Journal of Auditing published ten articles.

For future research, it is suggested to expand the scope of bibliometry for more databases (e.g. ABM Inform /Global and Business Source Premier), to ensure that all studies are being compiled. On the other hand, it is also recommended to perform an SLR review about IAQ starting in 2018 to continue Roussy & Perron (2018) study, considering IAQ was one of the three themes researched by the authors and deserves an individual article due to its relevance. Alternatively, it is proposed to conduct a comprehensive SLR about the topic for the period between 1999 and 2021. After five years, longitudinal research is recommended to monitor the progress of the subject, through the expansion of the bibliometric profile conducted in this study.

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