Bibliometric Analysis of Studies Related to Internal Auditing[1]

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A r t i c l e   I n f o

A b s t r a c t

The aim of the research is the bibliometric analysis of studies on internal auditing in the world. Within the scope of the research, data on 674 studies on internal audit in the web of science database between 2000 and 2024 were obtained. Later related studies; It was examined according to parameters such as publication year, author information, research areas, publication sources, publication countries, and publication languages. In addition, visual network maps of the studies were created using the "VOSviewer" program and their connections with each other were revealed. According to the research results, the highest number of articles published in the field of internal auditing was in 2016. It has remained scattered until today, and today the number of articles on internal audit has gradually decreased. Approximately 10% of the articles were written by 5 authors. The remaining works were written by 200 other authors. There is no standardization in the selection of keywords in relevant studies. The most critical limitation of the study is that within the scope of the analysis, only examining the studies scanned in WOS (Web of Science) and excluding the YÖK Thesis Archive in Turkey, Ulakbim (Tr-index), as well as international databases such as Scopus and Pubmed and other sources that are not included in the scope of analysis.

İç Denetim ile İlgili Çalışmaların Bibliyometrik Analizi

M a k a l e   B i l g i s i

Ö z e t

Araştırmanın amacı dünyada iç denetim üzerine yapılan çalışmaların bibliyometrik analizidir. Araştırma kapsamında öncelikle 2000-2024 yılları arasında web of science veritabanında bulunan iç denetim konusundaki 674 adet çalışma ile ilgili veriler elde edilmiştir. Daha sonra ilgili çalışmalar; yayın yılı, yazar bilgisi, araştırma alanları, yayın kaynakları, yayın yapılan ülkeler, ve yayın dillerine uygun olarak parametrelere göre incelenmiştir. Ayrıca "VOSviewer" programı kullanılarak çalışmaların görsel ağ haritaları oluşturulmuş ve birbirleriyle olan bağlantıları ortaya çıkarılmıştır. Araştırma sonuçlarına göre yıllar itibarıyla iç denetim alanında yayınlanan makale sayısı en fazla 2016 yılında gerçekleşmiştir. Günümüze gelene kadar dağınıklık göstermiş ve günümüzde ise iç denetim ilgili makale sayısı giderek azalmıştır. Makalelerin yaklaşık %10'luk kısmı 5 yazar tarafından yazılmıştır. Geriye kalan eserleri ise diğer 200 yazar yazmıştır. İlgili çalışmalarda anahtar kelimelerin seçiminde bir standardizasyon yoktur. Analiz kapsamında sadece WOS (Web of Science) taranan çalışmaların incelenmesi, Türkiye'de bulunan YÖK Tez Arşivi, Ulakbim (Tr-dizin), ayrıca uluslararası boyutta Scopus ve Pubmed gibi veri tabanları ve analiz kapsamına girmeyen diğer kaynakların hariç tutulması çalışmanın en kritik sınırlılığıdır.

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[1] Çetinoğlu, T. (2024). Bibliometric analysis of studies related to internal auditing, *Uluslararası Sosyal ve Ekonomik Çalışmalar Dergisi*, 5(1), 114-132,*DOI: 10.62001/gsijses.1470887*

INTRODUCTION

Internal auditing is a form of audit in which financial or non-financial information is examined and evaluated (Keleş, 2022). Although the external audit profession has a long history, internal audit started to gain importance after the 1940s. After these years, due to various developments in business life and the delegation of authority to professionals, the internal audit profession developed rapidly and gained an institutional identity with the Institute of Internal Auditing (IIA), which was established in the USA in 1941. Over time, the American Institute of Internal Auditors adopted a Code of Ethics, developed Standards for the Practice of Professional Internal Auditing, established a program that provides continuing education, established a Common Information Structure, and prepared a certification and examination program that enables individuals to be recognized as certified internal auditors. (Kurnaz & Çetinoğlu, 2010) In Turkey, the foundations of the Institute of Internal Auditors of Turkey (TİDE) were laid in 1994 and the Institute was transformed into a professional organization in 1995. In 1996, TIDE became a member of the International Institute of Internal Auditors and the European Confederation of Institutes of Internal Auditing (ECIIA)(Yöndemli, 2022).

Today, internal audit is no longer expected to lag and identify things after they have happened, but to step forward and make predictions, identifying not only risks but also opportunities. This is the most important difference between this definition and other definitions. It is no longer a review and evaluation, but a value-adding and development function. To fulfill this value-adding and enhancement function, there are three main areas that internal audit must address. The new dimensions of internal audit: Risk management, control, and institutionalization. (Kurnaz ve Çetinoğlu, 2010) Internal audit, which is a function of management in enterprises, is an independent audit function that evaluates the activities experts within the enterprise, provides the information needed by the management with feedback, contributes to the formation of management decisions and policies, and at the same time provides the opportunity to measure the effectiveness and efficiency of the internal control environment.(Aslan, 2010). It is an important defense against organizational risks. Internal audit information on governance, risk and control promotes positive change and innovation within the organization. Although a variety of academic research has been conducted in the field of internal auditing, fewer academic studies have been conducted in the top accounting journals compared to external auditing. Therefore, examining the bibliometric data of international internal audit research, determining the chronological developments, antecedents, themes, and influential publications in this field will be useful in terms of creating a holistic perspective on the field and will guide future research (Yöndemli, 2022).

Bibliometrics is the measurement of the impact of scientific publications on the scientific community through citations (King, 1987). Bibliometric analysis is performed in two different ways: performance analysis and science mapping. In this study, the mapping technique was adopted. The analysis conducted within the scope of mapping are as follows (Donthu vd., 2021):

Citation Analysis: Revealing the relationships between publications and identifying the most influential publications. **Co-citation Analysis:** The relationships between the cited publications and their main themes are revealed. **Bibliographic Coupling:** Relationships between cited publications, periodic and current themes are identified. **Co-word Analysis:** Existing and future relationships between topics, written content (words) are analyzed. **Co-authourship Analysis:** Social interactions and relationships between authors, authors and author affiliations (country, institution, etc.) are analyzed.

In this study, citation analysis, co-citation analysis, co-author analysis and bibliographic match analysis, which are scientific mapping techniques, were performed using VOSviewer software

program to reveal the relationships between the data obtained from the WoS database (Yöndemli, 2022).

The aim of the research is to bibliometrically analyze articles related to internal auditing in Turkey. Within the scope of the research, data was first obtained from 674 studies about internal audit on the web of science between 2000 and 2024. In the following, these articles; It was examined in the context of parameters publication year, author information, research areas, publication types, publication sources, publication institutions, publication countries, keywords, and publication languages. Additionally, visual network maps of the articles were created, and their relationships were examined using the "VOSviewer" program.

LITERATURE

In his study in 2005, Şengür analyzed the internal audit-related activities of one of Turkey's important conglomerates, based on the changes in the definition and practices of internal audit. (Demir, 2023)

In their 2010 study, Önce and Başar aimed to determine the trends by analyzing the studies on accounting published in academic journals in Turkey between 2000 and 2008. In the study, it was concluded that a total of 1,363 articles were published in the field of accounting and the highest number of articles were published in the Journal of Financial Solution, Journal of Accounting Science World, Journal of Accounting and Finance and Journal of Accounting and Auditing Review, respectively.

Steinbart et al. 2012 developed an explanatory model by discussing the roles of internal audit in ensuring information security. (Özdoğan and Mollaoğulları, 2020)

Kurnaz and Çetinoğlu, in their 2010 study titled Current Approaches in Internal Auditing, examined the concept of internal auditing in detail and explained the current concepts that may be related to internal auditing in detail.

Hotamışlı and Erem, in their study in 2014; Analyzed 562 studies published between 2005 and 2013. In the study, it was concluded that the institutions where the most studies were conducted were Marmara University, Trakya University and Istanbul University, and the journal received 250 citations in total.

Alkan, in his study in 2014; Examined a total of 656 postgraduate theses written between 1984 and 2012. It has been determined that the number of theses on TAS/TFRS is 160, of which 142 are master's theses and 18 are doctoral theses.

In their study in 2018, Roussy and Perron examined the publications in the field of internal auditing in leading journals between 2005 and 2017 through a literature review. As a result of the study, it was determined that internal audit activities have increased compared to the pre-SOX period, but research on the internal audit function has not yet been completed and there are issues that need to be clarified.

In their study in 2018, Öztürk and Yılmaz analyzed 2,599 academic studies published until February 2018 within the scope of SSCI in the fields of auditing and forensic accounting using the bibliometric analysis method. Publications increased after 1990. The most work was done in 2016. The first three of the most frequently used keywords were "audit, corporate governance and internal audit".

In their study conducted in 2018, Dinç and Atabay analyzed 248 articles published in 133 academic journals on auditing in the national literature between 2009 and 2016 by content analysis method and concluded that 66 articles were published on internal audit in the relevant years and internal audit was the most common research topic after independent auditing.

In their study conducted in 2021, Kurbanova and Cavlak conducted a bibliometric analysis of 118 studies scanned in the Scopus database on blockchain and internal audit. They stated that studies and citations in this field are increasing and that developed countries, especially China, are turning to this subject.

Behrend and Eulerich, in their study in 2019, analyzed 92 articles on audit committees between 1977 and 2018, accessed from the Scopus database, by bibliometric analysis method.

Kaya, in his study in 2019, analyzed 128 doctoral dissertations written on auditing in Turkey between 1995-2018 by content analysis method, and according to the results of the research, the highest number of dissertations in this field was written at "Marmara University" and the most intensively studied subject in the dissertations was internal audit/internal auditor. Within the scope of internal audit, "risk-focused internal audit" was the most studied topic.

In their study conducted in 2020, Behrend and Eulerich examined 174 research articles published in 5 leading accounting journals (Accounting, Organizations and Society, Contemporary Accounting Research, Journal of Accounting and Economics, Journal of Accounting Research, and The Accounting Review) between 1926 and 2016 using bibliometric analysis method.

In their study in 2020, Karavardar and Şahintürk evaluated the studies published in our country about internal audit and internal control (95 articles, 284 graduate theses, 14 books) using the content analysis method.

In their study conducted in 2020, Özdoğan and Mollaoğulları analyzed 17 Ph.D. theses written on the relationship between internal audit and independent audit in Turkey during 2009-2019 by content analysis method.

In his study in 2020, Salur analyzed 115 articles published in the field of auditing in Turkey 2002-2019.

In their study conducted in 2021, Pizzi et al. analyzed 105 articles on the impact of digital transformation on internal audit between 1985 and 2020, accessed from the Scopus database, using bibliometric analysis method.

RESEARCH METHODOLOGY

The scope of the study is a bibliometric analysis of studies on internal auditing in World. Within the scope of the research, data on 674 studies on internal audit in the Web of Science database between 2000 and 2024 were first obtained. Works with the concept of internal audit in their title were included in the study. In our study, the Vosviewer program was preferred because it provides visualization, mapping and multidimensional analysis, allows in-depth analysis of data sets, is considered one of the important programs that facilitate researchers in discovering new concepts, evolutions and relationships in the literature, and has strong aspects in terms of functionality. In this study, the Web of Science database, which uses various control mechanisms with advanced search indicators for advanced data analysis, was used.

FINDINGS

Table 1: Distribution of Studies by Year and Percentage

Publication Years	Record Count	% of 671	Publication Years	Record Count	% of 671
2024	3	0.447	2012	27	4.024
2023	31	4.620	2011	35	5.216
2022	28	4.173	2010	26	3.875
2021	40	5.961	2009	42	6.259
2020	37	5.514	2008	16	2.385
2019	34	5.067	2007	18	2.683
2018	34	5.067	2006	29	4.322
2017	29	4.322	2005	13	1.937
2016	67	9.985	2004	4	0.596
2015	35	5.216	2003	5	0.745
2014	20	2.981	2002	2	0.298
2013	43	6.408	2001	3	0.447
			2000	2	0.298

Table 1 shows the distribution and percentage distribution of studies on internal audit according to years. As can be seen, when the studies on internal audit in the Web of Science database are examined, it is seen that the most studies were conducted in 2000. When the table is examined, most studies were conducted in 2016 with 67 and 9.985%. 2016 is followed by 2013 with 43 publications and 2009 with 42 publications. Their percentages are around 6% on average.

Table 2: Distribution and Percentages of Studies According to Authors

Authors	Record Count	% of 674	Authors	Record Count	% of 674
Moeller, Robert	36	5.341	D'Onza, Giuseppe	7	1.039
Sarens, Gerrit	16	2.374	Hass, Susan	7	1.039
Cascarino, Richard E.	13	1.929	Marco Allegrini	6	0.890
Eulerich, Marc	13	1.929	Erasmus, Lourens	6	0.890
Coetzee, Philna P	10	1.484	Mihret, Dessalegn Getie	6	0.890
Wood, David A	9	1.335	Sarkis, Joseph	5	0.742
Barac, Karin	9	1.335	Drogalas, GEORGE	5	0.742
Fourie, Houdini	9	1.335	Seol, I.	5	0.742
Abdolmohammadi, Mohammad J.	8	1.187	Roussy, Melanie	5	0.742
Plant, KATO	8	1.187	Morais, Maria	5	0.742
Arena, Marika	8	1.187	Diz, Lourdes Borrajo	4	0.593
Coetzee, G. P.	7	1.039	Corchado Rodríguez, Juan	4	0.593
			Subramaniam, Nava	4	0.593

When the distribution and percentages of international studies on internal audit by authors are analyzed in Table 2, the top 25 authors who have done the most studies on internal audit are included. Accordingly, the author who has done the most studies is Moeller Robert with 36 works. Then, when the top 3 authors with the highest number of works are analyzed, Sarens Gerrit with 16 works and Cascarino Richard E. and Eulerich Marc with 13 works each. The percentage share of the author with the highest number of works among the authors was 5.341%

Table 3: Distribution of Studies According to Research Areas

Research Areas	Record Count	% of 674	Research Areas	Record Count	% of 674
Business Economics	507	75.223	Science Technology Other Topics	6	0.890
Computer Science	57	8.457	Mathematics	4	0.593
Engineering	34	5.045	Psychology	4	0.593
Public Administration	23	3.412	Criminology Penology	3	0.445
Social Sciences Other Topics	23	3.412	General Internal Medicine	3	0.445
Operations Research Management Science	20	2.967	Immunology	3	0.445
Education Educational Research	14	2.077	Mathematical Methods In Social Sciences	3	0.445
Health Care Sciences Services	12	1.780	Oncology	3	0.445
Government Law	11	1.632	Pathology	3	0.445
Information Science Library Science	11	1.632	Research Experimental Medicine	3	0.445
Environmental Sciences Ecology	10	1.484	Telecommunications	3	0.445
Public Environmental Occupational Health	7	1.039	Transplantation	3	0.445
			Area Studies	2	0.297

In Table 3, when the research areas of international studies on internal audit are analyzed, it is seen that the highest number of studies was conducted in the field of Business Economics with a rate of 75% in 507 times. This figure and percentage is quite high among other fields of study. This research area is followed by Computer Science with 57 times and 8% and Engineering with 34 times and 5% respectively.

Table 4: Distribution of Studies According to the Sources of Publication

Publication Titles	Record Count	% of 674	Publication Titles	Record Count	% of 674
MANAGERIAL AUDITING JOURNAL	78	11.573	BETRIEBSWIRTSCHAFTLICHE FORSCHUNG UND PRAXIS	6	0.890
BRINK S MODERN INTERNAL AUDITING A COMMON BODY OF KNOWLEDGE 8TH EDITION	36	5.341	QUALITY PROGRESS	6	0.890
SOUTHERN AFRICAN JOURNAL OF ACCOUNTABILITY AND AUDITING RESEARCH SAJAAR	26	3.858	ACCOUNTING HORIZONS	5	0.742
INTERNATIONAL JOURNAL OF AUDITING	25	3.709	AFRICAN JOURNAL OF BUSINESS MANAGEMENT	5	0.742
AUDITING A JOURNAL OF PRACTICE THEORY	13	1.929	INTERNATIONAL JOURNAL OF ACCOUNTING INFORMATION SYSTEMS	5	0.742
CORPORATE FRAUD AND INTERNAL CONTROL A FRAMEWORK FOR PREVENTION	13	1.929	JOURNAL OF BUSINESS ETHICS	5	0.742
WILEY CORPORATE FA	13	1.929	JOURNAL OF CORPORATE ACCOUNTING AND FINANCE	5	0.742
IBERIAN CONFERENCE ON INFORMATION SYSTEMS AND TECHNOLOGIES	12	1.780	JOURNAL OF EMERGING TECHNOLOGIES IN ACCOUNTING	5	0.742
ACCOUNTING REVIEW	8	1.187	QUALITY ACCESS TO SUCCESS	5	0.742
JOURNAL OF APPLIED ACCOUNTING RESEARCH	8	1.187	CRITICAL PERSPECTIVES ON ACCOUNTING	4	0.593
CORPORATE GOVERNANCE THE INTERNATIONAL JOURNAL OF BUSINESS IN SOCIETY	7	1.039	JOURNAL OF MANAGEMENT GOVERNANCE	4	0.593
ISSUES IN ACCOUNTING EDUCATION	7	1.039	LECTURE NOTES IN COMPUTER SCIENCE	4	0.593
			MEDITARI ACCOUNTANCY RESEARCH	4	0.593

As a result of the examination of the studies in Table 4 according to the sources in which they were published, it was determined that the most published source on internal audit in the international arena was Managerial Auditing Journal with 78 times and 11.5%, followed by Brink's Modern Internal Auditing a Common Body of Knowledge 8th Edition with 36 times and 5.3%, and Southern African Journal of Accountabılıty and Auditing Research Sajaar with 26 times and 3.8%.

Table 5: Distribution of Studies According to Countries of Publication

Countries/Regions	Record Count	% of 674	Countries/Regions	Record Count	% of 674
USA	200	29.674	TAIWAN	17	2.522
SOUTH AFRICA	61	9.050	CANADA	15	2.226
PEOPLES R. CHINA	40	5.935	GREECE	14	2.077
ENGLAND	38	5.638	NETHERLANDS	13	1.929
ITALY	37	5.490	TURKEY	13	1.929
AUSTRALIA	32	4.748	BRAZIL	12	1.780
MALAYSIA	30	4.451	NEW ZEALAND	10	1.484
ROMANIA	21	3.116	SWEDEN	10	1.484
BELGIUM	20	2.967	EGYPT	9	1.335
PORTUGAL	20	2.967	ISRAEL	9	1.335
GERMANY	19	2.819	SPAIN	9	1.335
SAUDI ARABIA	17	2.522	INDIA	8	1.187
			FINLAND	7	1.039

Table 5 shows the top 25 countries with the highest number of studies on internal audit when Web of Science is analyzed. When Table 5 is examined, it is determined that the country with the highest number of studies on internal audit is United States of America with 200 publications and 29.6%, the second country is South Africa with 61 publications and 9%, and the third country is the People's Republic of China with 20 publications and 5.9%. Again, when Web of Science was analyzed, it was determined that the number of publications on internal audit in Turkey was 13 and with this number of publications, Turkey ranked 17th among 25 countries with 1.9%.

Table 6: Distribution of Studies by Publication Language

Languages	Record Count	% of 674
English	632	93.769
Portuguese	16	2.374
German	6	0.890
Chinese	5	0.742
Turkish	5	0.742
Spanish	3	0.445
Croatian	2	0.297
Italian	1	0.148
Malay	1	0.148
Polish	1	0.148
Slovenian	1	0.148
Unspecified	1	0.148

When Table 6 is analyzed in terms of the publication languages of the studies on internal audit, it is determined that 632 publications were prepared in English with 93%. This is followed by 16 publications in Portuguese with 2.3% and 6 publications in German with 0.9%. In addition, the study published in Turkish ranks 5th with 5 publications and 0.7%

Co-Authorship of Authors

As a result of the co-authorship analysis, a network map was created with at least 1 study and at least 1 citation criterion to identify the authors who are most connected to each other and who are in collaboration. According to Figure 1, circles of the same color indicate that the authors have collaborative studies, circle sizes indicate the number of publications of the authors, and the lines between the circles indicate the authors who are related to each other. Accordingly, it has been determined that there are 6 clusters in which 16 out of 205 international authors working on internal audit have collaborated and there are 36 links and 47 total link strengths. In terms of clusters, the 16 most connected authors are all connected in 36 units in total. The most cited authors (Sarens Gerrit with 7 sources, 215 citations and 14 link strengths, Allegrini, Marco with 4 sources, 113 citations and 13 total link strengths, and Hass Susan with 5 sources, 113 citations and 12 total link strengths). The authors with the highest number of studies appear to be among the most connected.

Figure 1: Co-author Links Indicating Collaboration between Authors
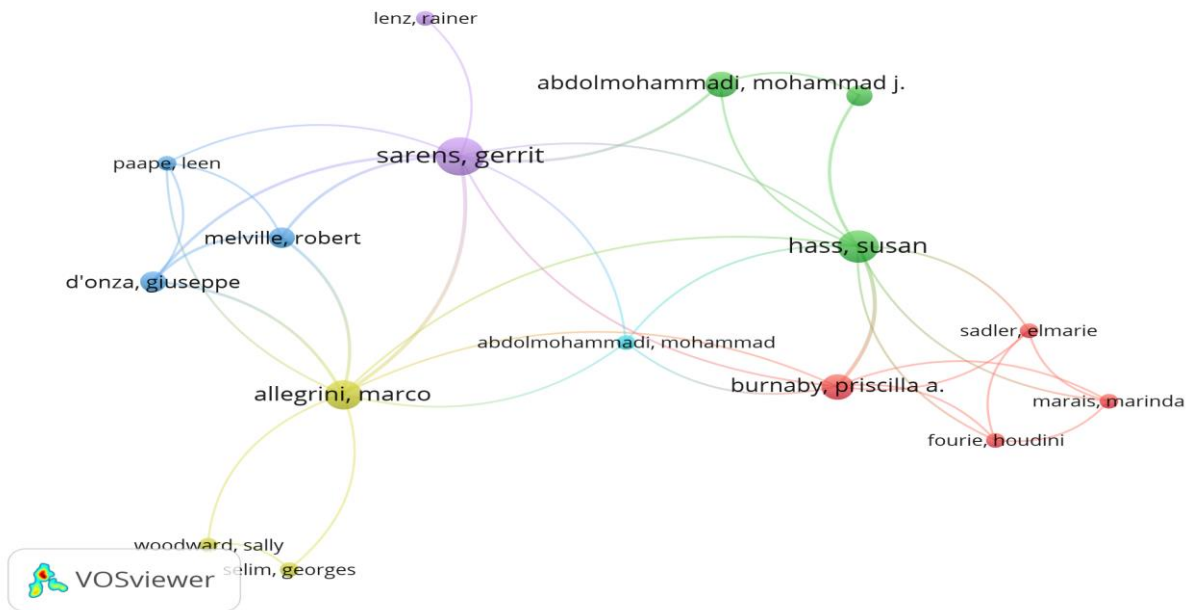
Figure 2: Density Map of Co-Author Ties Indicating Collaboration between Authors
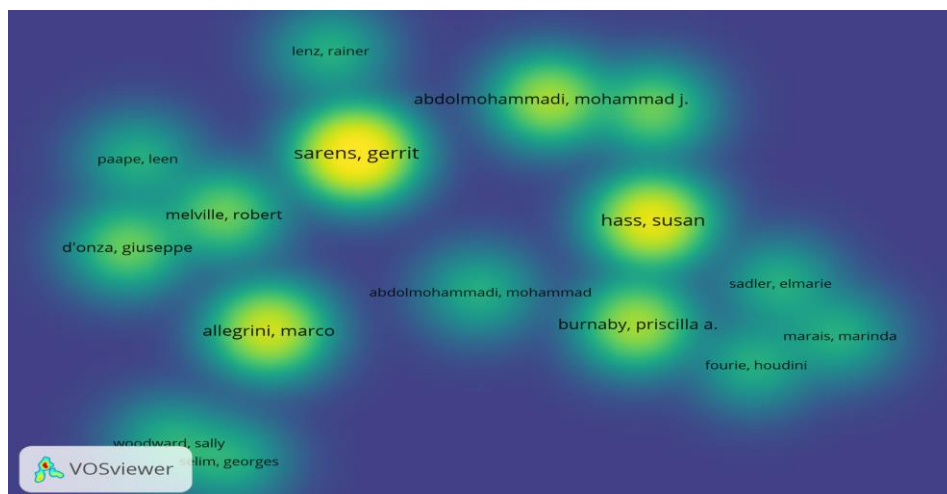
Citation of Authors Analysis

To determine the citation networks of the authors, a network map of author citation analysis with at least 1 publication and at least 1 citation criterion was created. Circles of the same color indicate the relationship of the authors, circle sizes indicate the number of citations of the authors, and the lines between the circles indicate the authors who have a citation relationship with each other. Accordingly, in the analysis made on 42 units that were found to be linked to each other from 205 authors working internationally on internal audit, a total of 5 clusters, 181 links and a total link strength of 251 were determined. The most cited authors (Sarens Gerrit with 7 sources, 215 citations and 14 link strength, Allegrini, Marco with 4 sources, 113 citations and 13 total link strength, and Hass Susan with 5 sources, 113 citations and 12 total link strength). The authors with the highest number of studies are seen among the most connected ones. Related authors are also among the first in terms of total link strength.

Figure 3: Authors' Citation Links
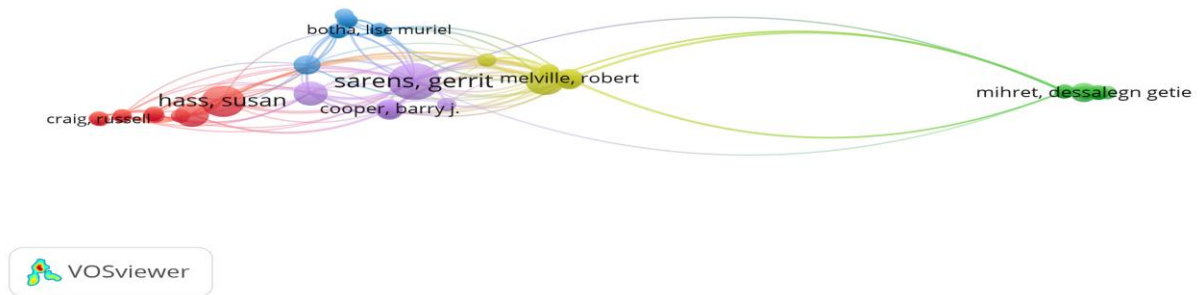
Figure 4. Authors' citation link density map
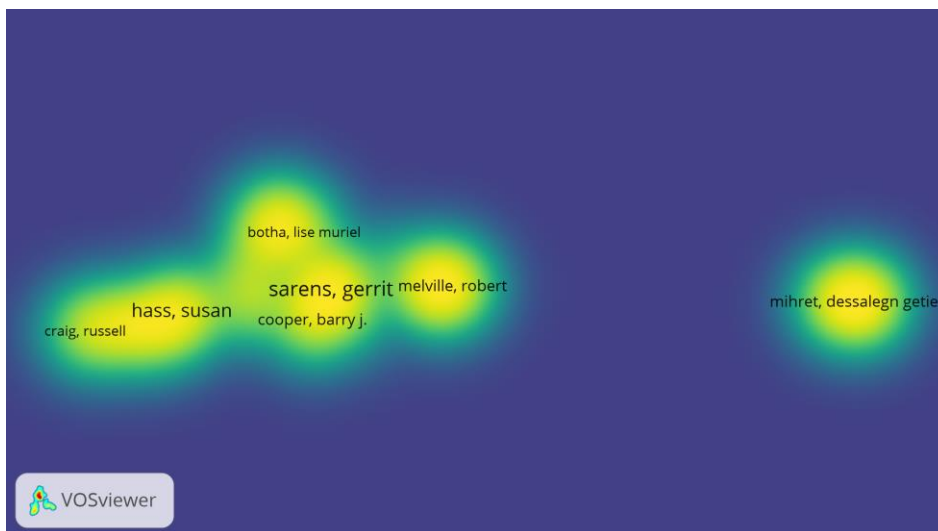
Citation of Countries

In the context of the scale where a country publishes at least 1 study and receives 1 citation, the analysis of 11 observation units that are connected to each other was carried out in order to create a network map of the citations received by publications according to their countries. Circles of the same color indicate that countries have studies together, circle sizes indicate the number of publications of the countries, and the lines between the circles indicate the countries that are related to each other. Accordingly, out of 82 countries that have conducted international studies on internal audit, 11 out of 82 countries have collaborated, 4 clusters, 28 links, and 82 total link strength. The most cited countries are the USA (10 publications, 228 citations and 32 total linkages), Belgium (7 publications, 215 citations and 36 total linkages) and the UK (6 publications, 139 citations and 25 total linkages).

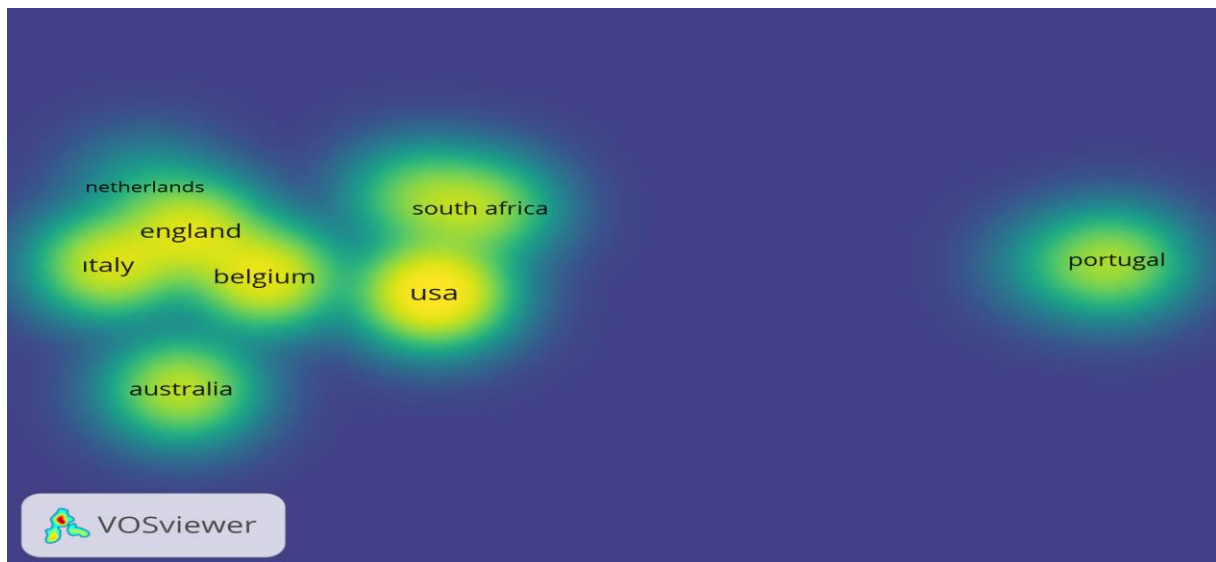**Figure 5:** Country Attribution Links
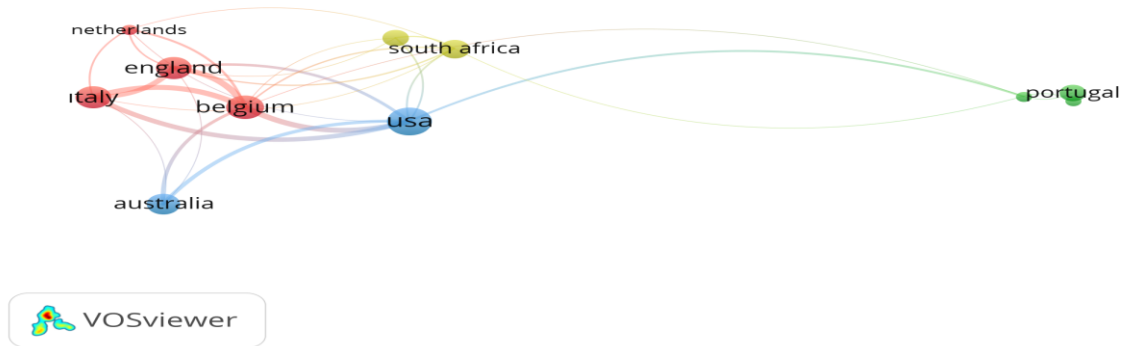
Figure 6: Citation link density map of countries

Citation of Organizations

Circles of the same color show the relationship between the institutions, circle sizes show the number of citations of the institutions, and the lines between the circles show the institutions that have a citation relationship with each other. Accordingly, in order to create an inter-institutional citation network map, the analysis was carried out through 30 inter-cited observation units with international studies on internal audit, which are related to each other in the focus of the criteria of publishing at least 1 work and receiving 1 citation from an institution. Louvain Catholic University (5 studies), Deakin University (5 studies), Pisa University (4 studies) were represented by Louvain Catholic University (133 citations and 45 total link strength), Deakin University (119 citations and 22 total link strength), Pisa University (113 citations and 37 total link strength). In total, 5 clusters, 139 links and total link strength were determined as 213.

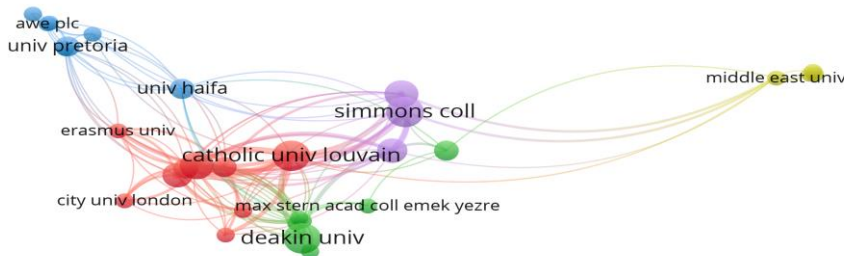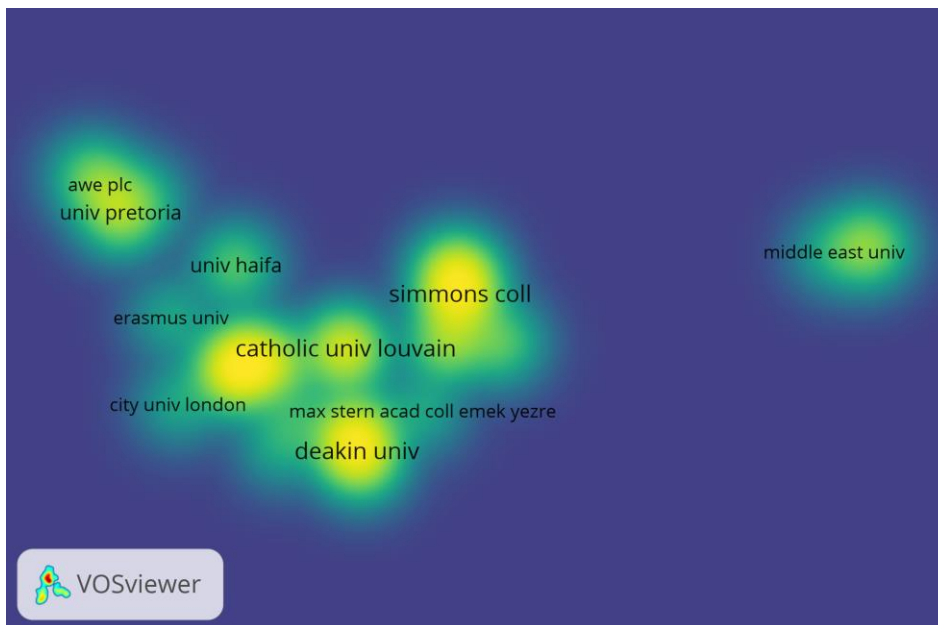**Figure 7:** Network Connections of Organizations

Figure 8: Network Connectivity Density Map of Organizations

Co-Occurrence of All Keywords

Circles of the same color indicate that keywords are used together, circle sizes indicate the number of keywords used, and lines between circles indicate keywords that are related to each other. Accordingly, it has been determined that 155 of the keywords used in international studies on internal audit are related to each other with a total of 29 clusters, 502 links and 538 total link strength. When the most frequently used keywords in the studies on internal audit are examined, the concepts of internal auditing with 34 repetitions and 128 link strengths, internal auditing with 11 repetitions and 56 link strengths, corporate governance with 8 repetitions and 38 link strengths, internal control with 3 repetitions and 21 link strengths, and risk management with 5 repetitions and 20 total link strengths were determined primarily. The strongest expressions in terms of total connection strength are internal auditing, internal auditing and corporate governance. As a result of the analysis that emerged in connection with 155 observation units in relation to each other, 29 clusters, 502 connections and 538 total connection strengths were revealed in total.

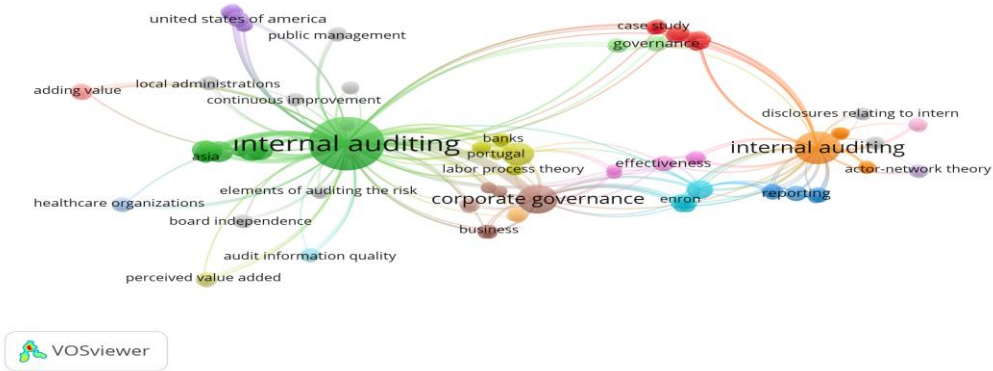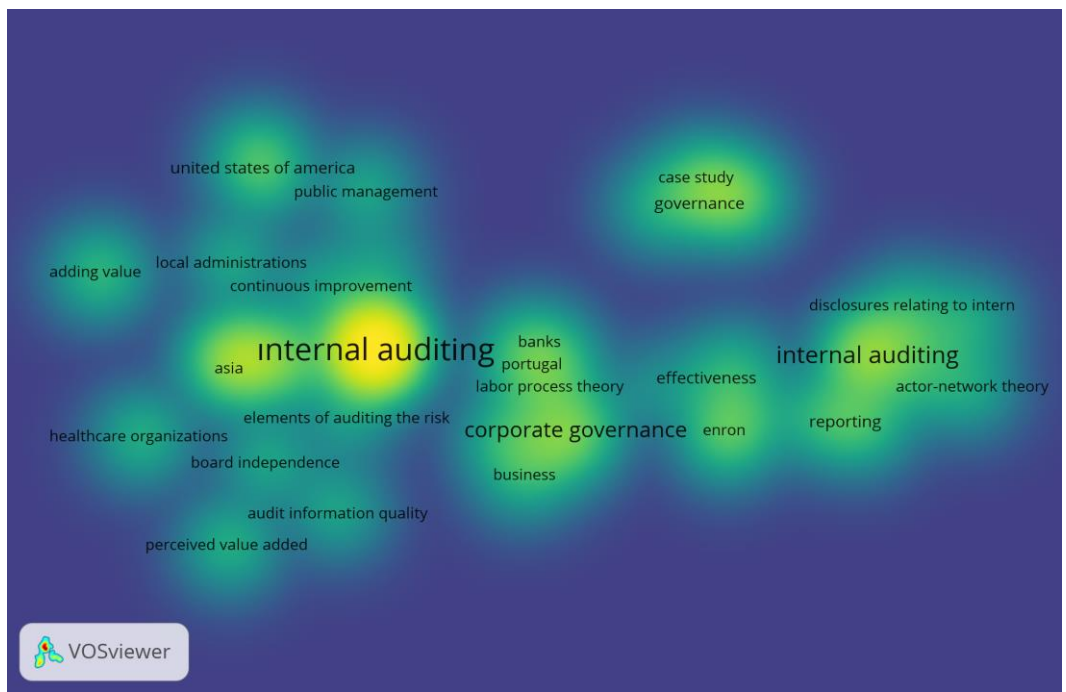**Figure 9:** The Most Frequently Used Keyword Links

Figure 10: Most Frequently Used Keyword Links Density Map

Bibliographic Coupling of Documents

Bibliographic matching refers to the citation of a common work cited by two independent sources. According to the analysis conducted with 32 unit works selected with the criterion of having at least 1 citation and having a link between them, 5 clusters 221 links and 524 total link strength were obtained. The publications with the highest number of bibliographic matches were Carcello (2005) with 66 citations, Hass (2006) with 62 citations and Sarens (2009) with 53 citations. The works with the highest total link strength were Mihret (2017), Sarens (2011b) and Mihret (2014).
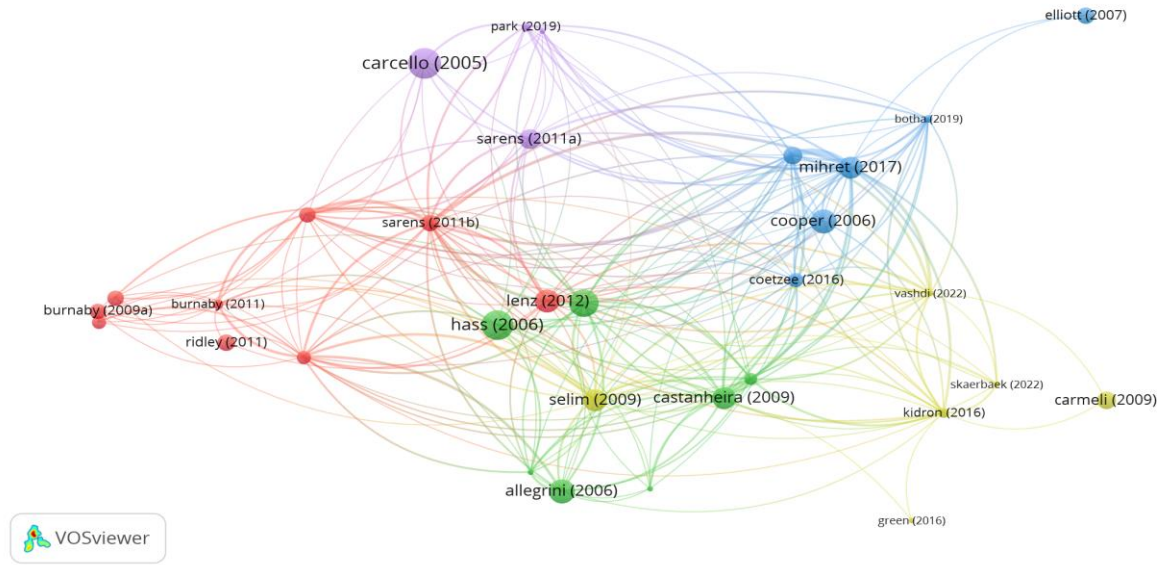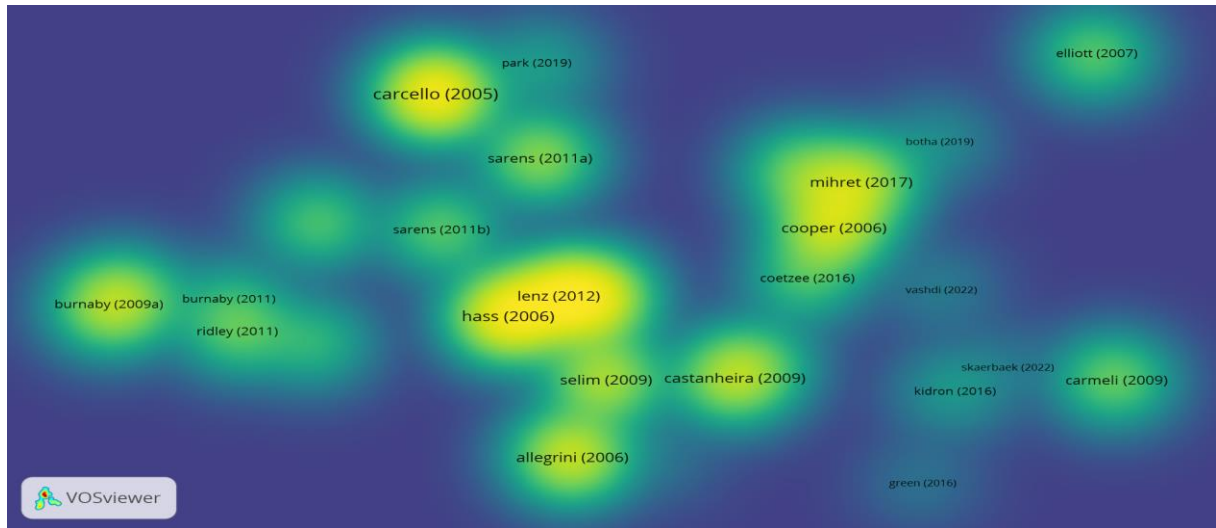
Figure 11: Bibliographic Match Links of the Works

Figure 12: Density Map of Bibliographic Match Links of Works

Bibliographic Coupling of Authors

As a result of the analysis conducted within the scope of 61 units, 10 clusters, 915 links and 7105 total link strength were determined. The authors with the most bibliographic matches were Sarrens Gerrit with 215 citations (1256 link strength), Marco Allegrini with 113 citations (958 link strength) and Susan Hass with 113 citations (541 link strength).
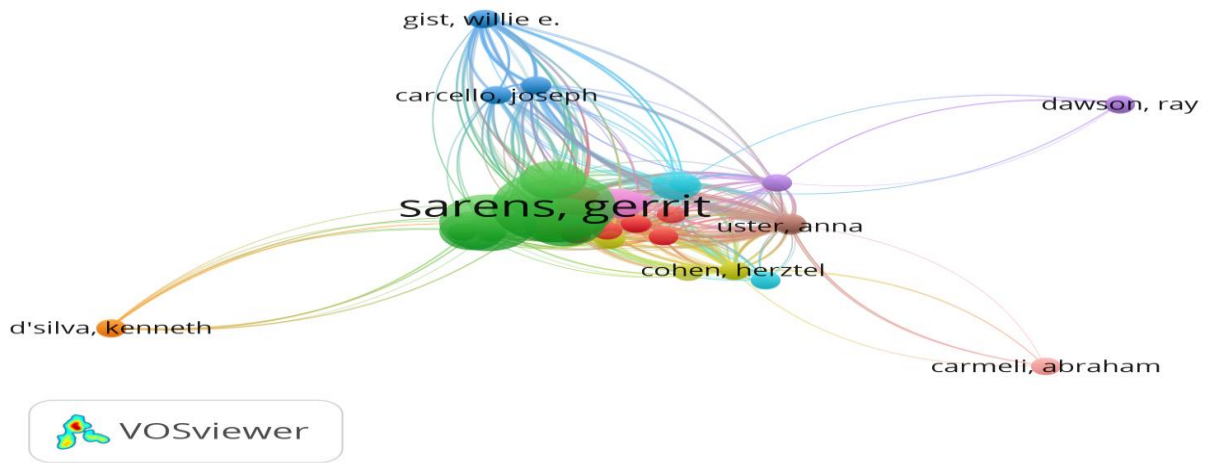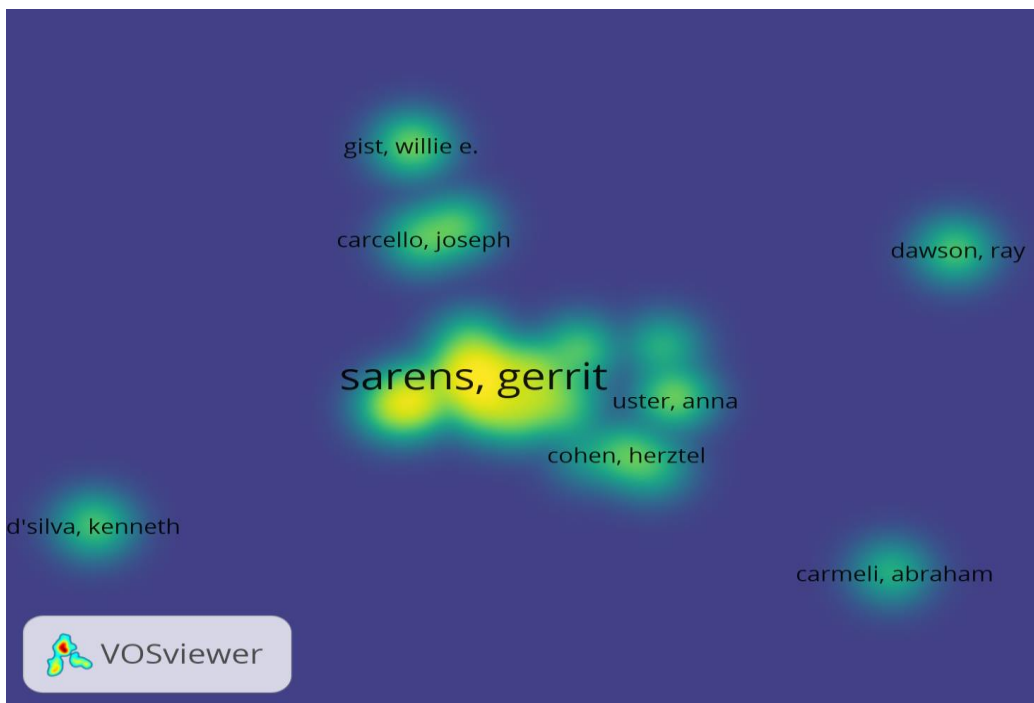
Figure13: Authors' Bibliographic Match Links

Figure 14: Authors' Bibliographic Match Links Density Map

CONCLUSION

Bibliometric analysis is a type of analysis that allows statistical analysis of the topics in any field in the literature in terms of indicators such as year of publication, author information, research areas, types of publications, publication sources, institutions, countries of publication, keywords and languages of publication, and the display of the relationships between them through visual network maps. This analysis method has an important role in revealing comprehensive statistical and visual data on a particular subject.

In the study, when the findings from Web of Science, resulting from bibliometric analysis and visual network mapping made through the "VOSviewer" program, are evaluated all together, in the research, first, 674 documents related to the concept of internal audit found in the Web of Science between 2000 and 2024. The study was examined, and data was obtained. Later, these studies; It was examined in terms of publication year, author information, research areas, publication sources, publication countries, and publication languages. Additionally, visual network maps were created using the "VOSviewer" program and their relationships were determined. According to the research results, the highest number of articles published in the field of internal auditing was in 2016. It has remained disorganized until today, and today the number of articles on internal audit has gradually decreased. Approximately 10% of the articles were written by 5 authors. The remaining works were written by 200 other authors. There is no standardization in the selection of keywords in relevant studies.

When the distribution and percentage distribution of the studies on internal audit by years are examined, it is seen that the most studies on internal audit in the Web of Science database were conducted in 2000. When the table is examined, the most studies were conducted in 2016 with 67 and 9.985%. 2016 is followed by 2013 with 43 publications and 2009 with 42 publications. Their percentages are around 6% on average. When the distribution and percentages of international studies on internal audit by authors are analyzed, the authors in the top 25 who have conducted the most studies on internal audit are included. Accordingly, the author who has done the most studies is Moeller Robert with 36 works. Then, when the top 3 authors with the highest number of works are analyzed, Sarens Gerrit with 16 works and Cascarino Richard E. and Eulerich Marc with 13 works each. The percentage share of the author with the highest number of works among the authors was 5.341%. When the research areas of international studies on internal audit are analyzed, it is seen that the most studies were conducted in the field of Business Economics 507 times with a percentage of 75%. This figure and percentage is quite high among other fields of study. This research area is followed by Computer Science with 8% (57 times) and Engineering with 5% (34 times). As a result of the examination of the studies according to the sources in which they were published, it was determined that the most published source on internal audit in the international arena was Managerial Auditing Journal with 78 times and 11.5%, followed by Brink's Modern Internal Auditing a Common Body Of Knowledge 8th Edition with 36 times and 5.3%, and Southern African Journal of Accountability and Auditing Research Sajaar with 26 times and 3.8%. When Web of Science is analyzed, the top 25 countries with the highest number of studies on internal audit are included. When Table 5 is examined, it is determined that the country with the highest number of studies on internal audit is USA with 200 publications and 29.6%, the second country is South Africa with 61 publications and 9%, and the third country is the People's Republic of China with 20 publications and 5.9%. Again, when Web of Science was analyzed, it was determined that the number of publications on internal audit in Turkey was 13 and with this number of publications, Turkey ranked 17th among 25 countries with 1.9%. When the publication languages of the studies on internal audit were analyzed, it was determined that 632 publications were prepared in English with 93%. This is

followed by 16 publications in Portuguese with 2.3% and 6 publications in German with 0.9%. In addition, the study published in Turkish ranks 5th with 5 publications and 0.7%. As a result of the co-authorship analysis, it was found that 16 out of 205 international authors working on internal audit have collaborated with each other in a total of 6 clusters, 36 links and 47 total link strengths. Specific to clusters, the 16 most connected authors are all connected in 36 units in total. The most cited authors (Sarens Gerrit with 7 sources, 215 citations and 14 link strengths, Allegrini, Marco with 4 sources, 113 citations and 13 total link strengths, and Hass Susan with 5 sources, 113 citations and 12 total link strengths). The authors with the highest number of studies are among the most connected ones. Within the scope of the study, in the analysis made on 42 units that were found to be interconnected among 205 international authors working on internal audit, a total of 5 clusters, 181 links and a total link strength of 251 were determined. The most cited authors (Sarens Gerrit with 7 sources, 215 citations and 14 link strength, Allegrini, Marco with 4 sources, 113 citations and 13 total link strength, and Hass Susan with 5 sources, 113 citations and 12 total link strength). The authors with the highest number of studies are seen among the most connected ones. Related authors are also among the top in terms of total link strength. Out of 82 countries with international studies on internal audit, 11 out of 82 countries collaborated with each other, resulting in 4 clusters, 28 links and 82 total link strengths. The most cited countries are the USA (10 publications, 228 citations and 32 total link strength), Belgium (7 publications, 215 citations and 36 total link strength) and the UK (6 publications, 139 citations and 25 total link strength). In addition, in order to create an inter-institutional citation network map, the analysis was carried out through 30 observation units with a citation relationship with 30 international studies on internal audit, which are related to each other in the focus of the criteria of publishing at least 1 work and receiving 1 citation from an institution. Louvain Catholic University (5 studies), Deakin University (5 studies), Pisa University (4 studies) were represented by Louvain Catholic University (133 citations and 45 total link strength), Deakin University (119 citations and 22 total link strength), Pisa University (113 citations and 37 total link strength). In total, 5 clusters, 139 links and total link strength were determined as 213. It has been determined that 155 of the keywords used in international studies on internal audit are related to each other, with a total of 29 clusters, 502 links and 538 total link strength. When the most frequently used keywords in the studies within the scope of internal audit are analyzed, the concepts of internal auditing with 34 repetitions and 128 link strength, internal auditing with 11 repetitions and 56 link strength, corporate governance with 8 repetitions and 38 link strength, internal control with 3 repetitions and 21 link strength, risk management with 5 repetitions and 20 total link strength were determined primarily. In terms of total connection strength, the strongest expressions were internal auditing, internal auditing and corporate governance. As a result of the analysis that emerged in connection with 155 observation units in relation to each other, 29 clusters, 502 connections and 538 total connection strengths were revealed in total.

This study differs from the studies in the literature in terms of scope and timeframe and includes the analysis of major international publications on internal audit in Web of Science. In this context, it is expected to contribute to the literature. Another contribution of the study is to guide future internal audit research in the national literature. It is thought that the study will guide future studies both in internal audit and in different disciplines of accounting and can be an important reference source.

Our study has some limitations. The most critical limitation of the study is that only the studies scanned in WOS (Web of Science) are examined within the scope of the analysis, and databases such as YÖK Thesis Archive in Turkey, Ulakbim (Tr-index), as well as international databases such as Scopus and PubMed and other sources not included in the scope of the analysis are excluded.

Considering these limitations that reveal the distinctive features of bibliometric analysis, it may be recommended to consider subjecting previously published studies to content analysis for similar or further research. In addition, it would be possible to find the most remarkable studies on this topic according to some basic indicators such as number of articles, number of citations, and keywords.

REFERENCES

Aslan, B. (2010). Bir yönetim fonksiyonu olarak iç denetim, *Sayıştay Dergisi,* 77, 63-86

Behrend, J. ve Eulerich, M. (2019). Four decades of audit committee research: a bibliometric analysis (1977– 2018), *SSRN*, 1-46.

Demir, Z. (2023). Bir holdingde yapılan iç denetim çalışmalarının örnek vakalarla analizi, *İşletme Araştırmaları Dergisi*, 15(1), 124-146

Dinç, E. ve Atabay, E. (2018). Türkiye'deki denetim literatürünün içerik analizi 2007–2016, *Muhasebe ve Denetime Bakış*, 17/53, 101-114.

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N. ve Lim, W. M. (2021). How to conduct a bibliometric analysis: an overview and guidelines. *Journal of Business Research*, 133, 285-296.

Karavardar, A. ve Şahintürk Y. (2020). Türkiye'de 2009-2019 yılları arasında iç denetim-iç kontrol konularında yayımlanmış akademik çalışmalar, *Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 19th International Business Congress Special Issue, 283-295.

Kaya, H. P. (2019). Türkiye de denetim alanında yazılmış olan doktora tezlerinin değerlendirilmesi, *Karabük Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 9/2, 556-576.

Keleş, D. (2022). İç denetim konusundaki uluslararası çalışmaların görsel ağ haritalaması destekli bibliyometrik analizi. *Uşak Üniversitesi Uygulamalı Bilimler Fakültesi Dergisi*, 2(1), 42-58

King, J. (1987). A Review of bibliometric and other science indicators and their role in research evaluation", *Journal of Information Science*, 13, 261-276.

Kurbanova, M. ve Cavlak, H. (2021). Blok zincir ve denetim alanındaki makalelerin bibliyometrik analizi, *TIDE AcademIA Research*, 3/2, 213-246.

Kurnaz, N. ve Çetinoğlu, T. (2010). *İç Denetim Güncel Yaklaşımlar* (1. Baskı). Umuttepe Yayınları.

Özdoğan, B. ve Mollaoğulları, B. F. (2020). Türkiye'de iç denetim ve bağımsız denetim ilişkisine yönelik yapılan lisansüstü tez çalışmaları üzerine bir araştırma, *Journal of Accounting and Taxation Studies*,

Pizzi, S., Venturelli, A.,Variale, M. ve Macario, G. P. (2021).Assessing the impacts of digital transformation on internal auditing: a bibliometric analysis, *Technology in Society,* 67, 2-11.

Salur, M. N.(2020). Türkiye'deki akademik dergilerde denetim alanında 2002- 2019 yılları arasında yayımlanmamış, bilimsel makalelerin içerik analizi. *Third Sector Social Economic Review*, 55/4,284

Yöndemli, Ö. S. (2022). Uluslararası iç denetim araştırmalarının bilim haritalaması tekniği ile incelenmesi. *Pamukkale Sosyal Bilimler Enstitüsü Dergisi*, 53, 283-299.