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Analysis of Publications in the Field of Accounting Auditing with Traditional Bibliometric Methods and CiteSpace Based Visual Mapping Techniques

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Muhasebe Denetimi Alanındaki Yayınların Geleneksel Bibliyometrik Yöntemler ve CiteSpace Tabanlı Görsel Haritalama Teknikleri ile Analizi

Öz

Bu çalışmanın amacı, Web of Science Core Collection veri tabanında "Muhasebe Denetimi" alanında 2017-2021 yılları arasında yayınlanmış 1.655 yayının, CiteSpace analiz tekniği ve geleneksel bibliyometrik analiz yöntemi olmak üzere iki farklı analiz yöntemi ile analiz edilmesidir. Çalışmada, CiteSpace kullanılarak bibliyografik verilere dayalı muhasebe denetimi konusunu analiz etmek için atıf patlama modeli, bindirme harita modeli, en büyük kümelerin zaman çizelgesi, ana kümeler (majör uzmanlıklar) analiz teknikleri ve carrot2 kümeleme modeli kullanılmıştır. Çalışma kapsamında elde edilen bulguların muhasebe denetimi konusunda gelecekte yapılacak çalışmalara yol göstermesi amaçlanmaktadır.

Anahtar Kelimeler: Muhasebe Denetimi, Görsel Haritalama Teknikleri, CiteSpace, Bibliyometrik Analiz, Veri Madenciliği

JEL Kodları: M40, M42

Analysis of Publications in the Field of Accounting Auditing with Traditional Bibliometric Methods and Citespace Based Visual Mapping Techniques

Abstract

The aim of this study is to analyze 1,655 publications published between 2017-2021 in the field of "Accounting Auditing" in the Web of Science Core Collection database, with two different analysis methods, CiteSpace analysis technique and traditional bibliometric analysis method, within the scope of modern visual mapping techniques. The study used the citation explosion model, overlay map model, timeline of the largest clusters, major clusters (major specializations) analysis techniques and carrot2 clustering model to analyze the accounting auditing subject based on bibliographic data using CiteSpace visual mapping techniques. It is aimed that the findings obtained within the scope of the study will guide future studies on accounting auditing.

Keywords: Accounting Auditing, Visual Mapping Techniques, CiteSpace, Bibliometric Analysis, Data Mining

JEL Codes: M40, M42

Araştırma ve Yayın Etiği Beyanı	Bu çalışma bilimsel araştırma ve yayın etiği kurallarına uygun olarak hazırlanmıştır.
Yazarların Makaleye Olan Katkıları	İki yazarın makaleye olan katkısı eşittir.
Çıkar Beyanı	Yazarlar açısından ya da üçüncü taraflar açısından çalışmadan kaynaklı çıkar çatışması bulunmamaktadır.

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1. Introduction

Being able to evaluate the development and trend of scientific studies in a particular field in the literature over time and the direction in which scientific studies have evolved is essential not only in terms of the emergence of new findings from different scientific fields, but also in terms of the fact that new findings can fundamentally change the scientific knowledge in a particular field as a whole (Chen, 2011: 431-449). In this context, researchers can use traditional analysis methods such as meta-analysis or literature review in order to determine the most important studies in a particular scientific field and the dynamics of these fields of study. However, obtaining various inferences from scientific studies with these traditional methods used in data analysis is exceptionally troublesome for researchers and data analysis requires a long process. At this point, bibliometrics is an analysis method that examines the research on a specific subject in the scientific discipline and enables the determination of the most productive research as a result of this review, making comparisons between countries and Institutions and examining interdisciplinary scientific communication (Al, 2008: 18). Therefore, this analysis method can provide significant benefits to researchers by making it possible to identify the prominent features of scientific studies in a certain field and the trends of these studies over time. According to the literature, the first bibliometric study was carried out by Cole and Eales in 1917 by comparing the studies published in the field of anatomy between 1550-1850 and analyzed with a statistical method (Lawani, 1981: 295). It is accepted that the first bibliometric study carried out in Turkey was the study titled 'Growth in Turkish Positive Basic Sciences' by Özinönü in 1970, which aimed to determine the scientific productivity in the fields of astronomy, biology, physics, chemistry and mathematics. The work of Gross P.L.K and Gross E.M., published in the Journal of The American Chemical Society in 1927 and in which they analyzed their bibliography, is considered to be the first study in which citation analysis was performed (Al, 2008: 10).

It is possible to collect bibliometric analysis methods under two separate headings: traditional bibliometric parameters and analyzes performed through modern visual techniques. The bibliometric analysis method, which is carried out through traditional bibliometric parameters, is a basic information science field that allows the data to be analyzed by classifying, summarizing, and restricting with certain criteria, to determine the basic dynamics of the field and to quantitatively handle the material in the scientific discipline (Merigó and Yang, 2017). It is possible to count software such as Citespace, VOSviewer HistCite, Action Science Explorer (iOpener), Carrotssearch, Sci2, SciMAT among the software that allows researchers to analyze the value of scientific outputs in a particular field with modern visual techniques. CiteSpace, which is the software that researchers find the most complex among this different software that allows the value of scientific outputs to be analyzed with modern visual techniques, is a citation explosion model of scientific outputs in a specific field, overlay map model, scientific landscape, timeline, major clusters (major specializations) allow analysis with analyzes related to the carrot2 clustering model. In this way, the researcher can evaluate scientific outputs in a particular field on the basis of citations, co-citations, bibliographic matching, strongly linked authors, documents, sources, Institutions and countries, and identify closely related data. While performance analysis with the bibliometric analysis method is used to measure the scientific publication performance of Institutions or countries, the CiteSpace analysis technique is used as a basis for determining the basic dynamics of any scientific field, creating timelines for the citation explosion,

developments in the scientific field, mapping and visualizing the data obtained. Within the scope of this study, data obtained from databases related to accounting auditing were analyzed with the help of certain patterns with the CiteSpace analysis technique.

When the accounting audit field, which is discussed within the scope of the study, is examined, it is possible to say that accounting is one of the most important pillars of auditing. Auditing also evaluates accounting according to certain laws and standards. In this context, the audit may be inconclusive without accounting and accounting data, and the accounting data may not reflect the truth without auditing, and the reliability of the accounting data can be discussed. Therefore, it is possible to say that an accounting audit, which consists of the concepts of accounting and auditing that complement one of them, is of great importance for finding the errors in the accounting system and adapting to the innovations (Güney and Sarı, 2015: 62-80). In general, terms, accounting auditing is a process based on the determination of the degree of compliance of the opinions put forward about economic activities and events with the predetermined criteria, the collection of evidence and the evaluation of the evidence in order to present this information to the parties who need the results of the audit (Güredin, 1995: 3).

2. Literature Review

Some studies in the domestic and foreign literature on the CiteSpace analysis technique, studies dealing with accounting auditing with the bibliometric analysis method, and the results obtained from these studies are listed in Table 1 below.

Table 1: CiteSpace Analysis Technique and Some Studies in The Literature in which Accounting Auditing is Handled with Bibliometric Analysis Technique and The Results Obtained From These Studies

Authors	Year	Purpose of Study	Results Obtained from the Study	Identification of the Study
Keleş, D.	2022	The aim of this study is to analyze 1,089 studies on internal audit, which were scanned in the SCOPUS database and limited according to certain criteria, using VOSviewer mapping techniques.	According to the findings obtained from the study, the first study on the internal audit was conducted in 1958. Most work in this field has been done by "Gerrit Sarens" from the "Université Catholique de Louvain". The author with the highest number of authorship relations and the highest number of citations was also determined as "Gerrit Sarens". The country with the most cooperation with each other was determined as the USA. The most used keyword was "Internal Audit". It has been understood that the most cited source is the journal named "Managerial Auditing Journal" and the most cited institution is "Brigham Young University". In addition, the highest number of studies on internal audits were made in the fields of business, management and accounting, with 657 publications.	(Keleş, 2022: 42-58)

Gao, Y. & Ning, M.	2021	In the study, it was aimed to determine the trends of the studies on environmental accounting, and in this context, 1191 articles in the Web of Science Core Collection database were examined by CiteSpace analysis.	As a result of the analysis carried out in the Web of Science Core Collection database within the scope of the study, it was concluded that the studies on environmental accounting focused on long-term forest inventory data, green cost, international flow, Austrian livestock system and carbon accounting tool. In the study, it was also concluded that the authors most cited by the researchers were Daily et al., Süleyman et al., Costanza et al., Luyssaert and Schulze and Maler.	(Gao and Ning, 2021: 99-113)
Du, Y. & Chen, S. & Tang, L.	2021	The study aims to investigate the development in the field of carbon accounting and to determine the future research trend with CiteSpace, the data provided from the Web of Science database regarding carbon accounting for the years 2015-2020.	The results obtained from the study reveal that the number of studies on carbon accounting has increased in recent years. In addition, Institutions such as the Chinese Academy of Sciences, Leeds University and Beijing have been identified as major contributors to carbon accounting publications. It was determined that the authors who contributed the most to scientific studies on carbon accounting were Geoffrey P. Hammond, Paul W. Griffin, Connor C. Turvey, Jiahui Hong. In addition, it was concluded that the current issues in the reviewed literature focused on climate change and carbon emissions.	(Du, et al., 2021: 185-201)
Kurbanova, M. & Cavlak, H.	2021	The study aims to analyse with vosviewer program 381 studies written in the blockchain and audit field and scanned in the Scopus database, limited to certain criteria.	According to the findings obtained from the study, the most cited study on blockchain and auditing is 457. "MeDShare: Trust-Less Medical Data Sharing among Cloud Service Providers via Blockchain". The journal that published the most articles in the related field was determined as "IEEE Access", and the branch of science that published the most articles in this field was determined as "Computer Science". In addition, the highest number of articles published in this field The country is designated as China. The most prolific author is Sheldon, M.D. has been determined. In addition, within the scope of the study, the most studied topics in the related field are business, management and accounting.	(Kurbanova and Cavlak, 2021: 213-246)

Xue, Wuzhao & Li, Hua & Ali, Rizwan & Rehman, Ramiz Ur	2020	This study aims to determine the theoretical development of research on corporate financial performance and the trend of empirical studies. In this context, 875 scientific studies from Web of Science, ACM and Scopus databases for 2005-2019 were used for a visual analysis using Cite Space and Ucinet.	The results from the study revealed future research trends on corporate financial performance. In this context, it has been concluded that a green and sustainable corporate environment and corporate social responsibility are potential research areas in the future.	(Xue et al., 2020: 1-21)
Xia, Dongyan & Wang, Liansheng	2020	In the study, it is aimed to analyze the hot topics of the research carried out in the field of accounting between the years 2000-2020 with the CiteSpace analysis technique.	Results from the study show that information disclosure, earnings management, and executive compensation are hot topics in accounting research. In addition, the results obtained from the study have found that the research in the field of accounting has not changed significantly in the last ten years, and some classical subjects are still the subject of research in the field of accounting.	(Xia and Wang, 2020: 305-309)
Zhou, W. & Chen, Q. & Meng, S.	2019	In the study, a total of 2,384 scientific studies provided from the Web of Science database for the years 1998-2017 were analyzed with CiteSpace in order to determine the development of research on credit risk and to discover hidden connections in the literature.	The results obtained from the study reveal that research on credit risk has become an interdisciplinary subject, and these studies concentrate on business finance, economics, management science, and mathematics. It is among the results obtained from the study that the largest contribution to the literature in this field is provided by the USA, Europe and Asia, and there is a large number of cooperation between countries. In addition, the results obtained from the study are that the key researchers in the literature on credit risk are Merton Robert Cox and Jarrow Robert Alan and that the existing literature It reveals that it focuses on monetary policy, Counterparty risk, and Systemic risk.	(Zhou, et. al., 2019: 3451-3478)
Maia, Saulo Cardoso & de Benedicto, Gideon Carvalho & do Prado, José Willer & Robb, David Alastair & de Almeida Bispo, Oscar Neto & de Brito, Mozar José	2019	In this study, it is aimed to present a comprehensive analysis of scientific studies on credit unions using CiteSpace. In this context, the literature provided by Elsevier's, Scopus and Clarivate Analytics' Web of Science database was searched.	Networks of co-authorship, co-citations, and common keywords were mapped with the results from the study. In addition, the trend of future research on credit unions has also been determined. The results show that the research subjects focus on economic performance, corporate governance and accounting explanations.	(Maia et al., 2019: 929-960)

Mou, J. & Cui, Y. & Kurcz, K.	2019	In the study, it is aimed to analyze 6 different e-commerce focused journals related to the years 1999-2016 both quantitatively and with CiteSpace.	The results obtained from the study reveal that e-commerce studies focus on social media, social commerce, word of mouth communication and online reviews. It is also among the results obtained that scientific studies on e-commerce are mostly carried out by Zwass. In addition, it is aimed to provide guidance to researchers in future studies on e-commerce.	(Mou, et. al., 2019: 219-237)
Öztürk, S. & Yılmaz, C.	2018	The aim of the study is to analyze 2,599 international publications related to auditing and forensic accounting, which are restricted according to certain criteria, with the traditional bibliometric analysis method.	According to the findings obtained from the study, the publications related to audit and forensic accounting were mostly made in the field of business finance. Most studies in this field have been published as articles. Most studies in this area have been done in the USA and then in Australia. The most used keywords in the studies in this field were audit, fraud and forensic accounting concepts.	(Öztürk and Yılmaz, 2018: 173-188)

Within the scope of the study, the contributions of this study, which is aimed to examine the publications on accounting auditing published in the Web of Science Core Collection database between 1975 and 2021, with the CiteSpace analysis technique and bibliometric analysis technique, are presented below:

- In the Web of Science Core Collection database, publications on accounting auditing published between 1975 and 2021 were analyzed using the citation explosion model, overlay map model, timeline, major clusters (major specializations), carrot2 clustering model techniques, and the results were interpreted.

- In the Web of Science Core Collection database, the publications on accounting auditing, leading disciplines, the most cited publications on accounting auditing, the authors with the most publications, the journals with the most publications, the publications of Turkish origin and the most It was analyzed with the bibliometric analysis method in order to determine the countries with many publications.

- With the Google Books Ngram online analysis program, the numerical trend of the online books published on accounting auditing between the years 2000-2019 was analyzed.

- Since the scientific outputs prepared in the study on accounting auditing and scanned in the Web of Science Core Collection database were evaluated from a broad perspective between 1975-2021, the study will provide preliminary information and guide researchers to future scientific studies on accounting auditing.

3. Materials and Methodology

3.1. Data Collection

Within the scope of the study, 7,193 records were found in the Web of Science Core Collection database according to the search result made under the title "Topic" with the word "Accounting Audit" on 23/11/2021. When these records were restricted in terms of 2017-2021, a total of 3,065 records were reached. Within the scope of the Web of Science index, 2,714 records were obtained when restricted to the studies within the Science Citation Index Expanded (SCI- Expanded), Social Sciences Citation Index (SSCI), and Emerging Sources Citation Index (ESCI). As the last restriction, when the records were restricted to business finance, management, business, economics, and multidisciplinary sciences in terms of Web of Science categories, 1,655 records were obtained. Apart from this, no other sub-classification has been made among the auditing studies in accounting. In this context, 1,655 publications, which were obtained as a result of the search made with the word "Accounting Auditing" in the Web of Science Core Collection database and were limited to the criteria explained above, were analyzed in terms of certain criteria with two different analysis methods, CiteSpace analysis techniques and bibliometric analysis method. And the obtained results are visualized. In this context, the citation explosion model, overlay map (detailed map) model, scientific landscape, timeline, major clusters (major specializations), carrot2 clustering model were used in the analysis performed using the CiteSpace analysis technique. Therefore, in the analysis of publications with the CiteSpace analysis technique based on bibliographic data, citations, co-citations, bibliographic matching, authors, documents, sources, Institutions and countries with strong links were determined. In the analysis of the publications in the Web of Science database, using the bibliometric analysis method, the leading disciplines in the publications on accounting auditing, the most cited publications in the field of financial accounting, Turkish origin publications, the authors with the most publications, the journals with the most publications and the countries with the most publications were determined. Within the scope of the study, the trend of online books published on accounting auditing between 2000-2019 was analyzed with the Google Books Ngram online analysis program.

3.2. Examining the CiteSpace Analysis Technique

Today, there is some software that can be used for data analysis related to scientific studies in a certain field by using more modern visual mapping techniques, the characteristics of the data can be revealed more clearly, and in this direction, there is some paid or free software offered to researchers in practice. In order to perform data analysis more efficiently, there is some software offered to researchers free of charge or paid in the application. It is possible to count software such as Citespace, VOSviewer HistCite, Action Science Explorer (iOpener), Carrotssearch, Sci2, SciMAT among these software where data analysis is visualized with science mapping tools (Cobo et al., 2011: 1382-1402). Citespace analysis, which is freely available to researchers and found quite complex, is a Java application used to identify emerging trends in the literature and visualize scientific trends (Chen, et al., 2010: 1386-1409). Citespace is superior to other software in terms of statistical cluster inference analysis, creating its own KML file, overlay map, and detecting citation explosions (Chen, 2006, CiteSpace, 2018). In addition, CiteSpace also provides the opportunity to detect sudden changes in the scientific literature in a particular field (Chen et al., 2012: 593-608).

Within the scope of this study, citation, co-citation, bibliographic matching, authors, documents, sources, universities and countries with the strongest connection were

determined with the bibliometric analysis method used in data analysis and the data provided from the web of Science database on accounting auditing. In addition to this, data obtained from Web of Science databases on accounting auditing were analyzed with the help of CiteSpace analysis technique in data analysis, and the basic dynamics of the field and citation explosions were determined. In addition, timelines related to developments in the scientific field and charts related to major clusters were created, and the data obtained were visualized and interpreted. Within the scope of the study, the selection criteria (selection criteria) in all images created from Figure 2 to Figure 10 using the CiteSpace analysis method were accepted as Top N 100%.

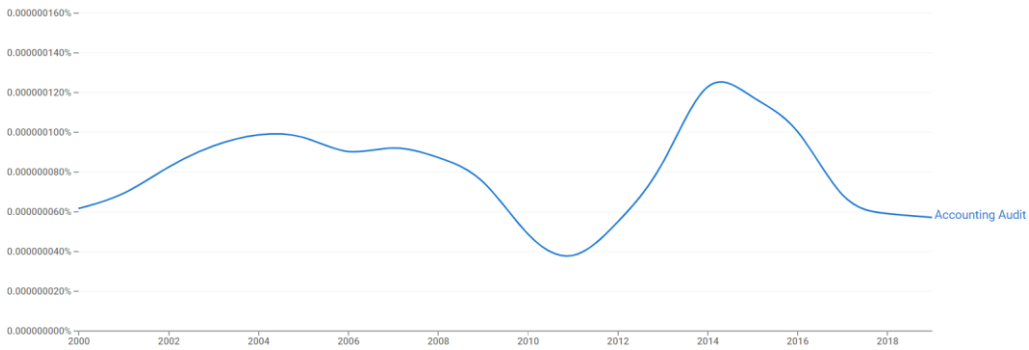
The Overlay Map model in CiteSpace, which is one of the analyzes handled within the scope of the study, enables the analysis of the citations made from one science field to another science field. In the map created with the Detailed Prepared Map model, there are science fields that are cited on the left and cited on the right. The Detailed Prepared Map model not only provides information on which science field is cited more and which science field is cited more heavily but also shows which science field has more scientific studies.

Carrot2 is free software that the Google search engine makes available to online researchers, contributing to open source by developing innovative text mining and visualization products. In this context, Carrot2 is able to cluster the topics in which the search term is included in the open-access sources and categorize them into thematic categories and present the total number of sources (Carrot Search, 2021).

4. Analysis of Publications on Accounting Auditing in Web of Science Database with Bibliometric Analysis Method

Within the scope of bibliometric analysis, according to the data provided by the Google Books Ngram Viewer program, the frequencies of the books published online on accounting auditing between 2000 and 2019 the years 2000-2019, are presented in Chart 1 below.

Figure 1. Online Books Published Between 2000-2019 on Accounting Auditing



Reference: (Google Books Ngram Viewer, 2021)

Table 2: Top 10 Disciplines in Publications on Accounting Auditing in The Web of Science Database

Research Area	Registration Number	Total Enrollment Rate (%1,655)
Business Finance	1.182	71.420
Management	258	15.589
Business	196	11.843
Economics	171	10.332
Multidisciplinary Sciences	42	2.538
Ethics	27	1.631
Environmental Studies	17	1.027
Public Administration	16	0.967
Operations Research Management Science	12	0.725
Green Sustainable Science Technology	5	0.302

When the data presented in Table 2 is examined, it is seen that the subject of accounting auditing is used in many disciplines. When the publications are evaluated in terms of research areas, it is concluded that the word accounting auditing is mostly used by the branches of science in the field of business finance (71.420). Other disciplines in which the phrase accounting auditing is used the most can be listed as management (15.589), Business (11.843), and economics (10.332), respectively, when expressed as a percentage of total publications.

Table 3: Information on the Top Five Publications on Accounting Auditing in the Web of Science Database Between 2017-2021

Author Names	Publication Name	Release Year	Number of Citations	Google Scholar Citations
Vasarhelyi, Miklos A.	Toward Blockchain Based Accounting and Assurance	2017	157	302
O'Leary, Daniel E.	Configuring blockchain architectures for transaction information in blockchain consortiums: The case of accounting and supply chain systems	2017	82	143
DeFond, Mark & Erkens, David H. & Zhang, Jieying	Do Client Characteristics Really Drive the Big N Audit Quality Effect? New Evidence from Propensity Score Matching	2017	77	124
Talbot, David & Boiral, Olivier	GHG Reporting and Impression Management: An Assessment of Sustainability Reports from the Energy Sector	2018	75	82
Rinaldi, Leonardo & Unerman, Jeffrey & de Villiers, Charl	Evaluating the integrated reporting journey: insights, gaps and agendas for future research	2017	74	114

When the data presented in Table 3 is examined, it is seen that the most cited publication on accounting auditing was published by Vasarhelyi, Miklos A. in 2017 with 157 (Google academic citations: 302) citations.

In Table 4 below, some information about 5 Turkish publications on accounting auditing in the Web of Science Core Collection database is presented.

Table 4: Information on Publications of Turkish Origin Written on the Subject of Accounting Auditing in the Web of Science Database Between 2017-2021

Author Names	Publication Name	Release Year	Number of Citations	Google Scholar Citations
Kara, Suat & Sakarya, Sakir & Ozcan, Pelin	Benford Law and Accounting Manipulations: A Sample Application	2021	-	-
Erdogan, Murat & Oruc Erdogan, Eda	Analysis of Income-Creating/Expense Reducing Activities Under Fraudulent Financial Reporting	2021	-	-
Kiymik, Hakki	Comparative Investigation Of Stock According to TAS, FRS for Lmes and TPL and Accounting Practices	2021	-	-
Tuan, Koray & Borak, Metin	Earnings Management and Financial Performance: An Empirical Investigation of the Istanbul Stock Exchange	2020	-	-
Cigerci, Ismail & Egmir, Rabia Tugba	Evaluation of Possible Block Chain Technology in Public Financial Audit in terms of Audit Efficiency	2019	-	-

Based on the data presented in Table 4, it is possible to say that the number of Turkish-origin publications written on accounting auditing in the Web of Science database is limited. In addition, when the data in the table is examined, it is seen that Turkish origin publications are not cited at all.

Table 5: Information on the Top Five Authors with the Most Publications on Accouting Audit in the Web of Science Database Between 2017-2021

Author Names	Country	Release Year	Average Number of Citations Per Post
Vasarhelyi, M.A.	USA	10	23.5
Bhuiyan, M.B.U.	New Zealand	9	16.3
Dickins, D.	USA	8	1.6
Habib, A.	New Zealand	8	5.4
Hussainey, K.	England	7	3.9

In Table 5 above, information on the top five authors with the most publications on accounting auditing is presented. As seen in the table, the author with the most publications on accounting auditing and the most cited is Vasarhelyi, M.A., with 10 scientific studies and an average of 23.5 citations per publication. Although the number of publications of the authors is close to each other, the most cited authors per publication are Vasarhelyi, M.A., and Bhuiyan M.B.U.

Table 6: Information on the Top Five Journals with the Most Publications on Accounting Auditing Between 2017-2021 in the Web of Science Database

Journal Name	Number of Publications	Journal's Impact Factor *	Journal's Web of Science Category *
Emerald Group Publishing	390	1.905	Business, Finance & Management
Wiley	245	1.672	Business, Finance
Amer Accounting Assoc	231	4.301	Business, Finance
Elsevier	184	7.55	Business
Taylor & Francis	126	3.063	Business, Finance

* The impact factors of the publications presented in Table 4 and the Web of Science category of the journal were taken from the Web of Science according to the year 2020.

In Table 6 above, the information of the first five journals with the most publications on accounting auditing in the Web of Science database is presented. According to the table, the highest number of publications on accounting auditing was published in the Emerald Group Publishing magazine, with an impact factor of 1,905 in the category of business, finance and management, with 390 publications. The least number of publications was published in Taylor & Francis magazine in the field of Business and Finance, which has 126 publications and an impact factor of 3.063.

Table 7: Information on the Top Five Universities with the Most Publications on Accounting Audit in the Web of Science Database Between 2017-2021

University	Number of Registrations	Total Enrollment Rate (%1,655)
State University System of Florida	40	2.417
University System of Georgia	37	2.236
Ministry of Education Science of Ukraine	34	2.054
California State University System	32	1.934
Rutgers State University New Brunswick	25	1.511

In Table 7 above, the information of the top five universities that have the most publications on accounting auditing in the Web of Science database is presented. According to the table, the most publications on accounting auditing were made in the State University System of Florida, with 40 publications.

Table 8: Index Information of Publications Between 2017-2021 in the Web of Science Database on Accounting Auditing

Index of Web of Science	Number of Registrations	Total Enrollment Rate (%1,655)
ESCI	858	51.843
SSCI	783	47.311
SCI-Expanded	46	2.779

In Table 8, the index information of the publications in the Web of Science database on accounting auditing is presented. Based on this information, it is possible to say that most of the publications are included in the ESCI Index. In addition, it can be said that the number of publications on accounting auditing in the SSCI Index is high.

Table 9: Classification of Publications in the Web of Science Database on Accounting Auditing Between The Years 2017-2021 in Terms of The First Four Document Types

Document Types	Number of Registrations				
	2017	2018	2019	2020	2021
Articles	247	290	317	424	358
Early Access	-	-	-	-	102
Review Articles	19	12	20	15	18
Editorial Materials	8	6	7	5	2

In Table 9, information on the document types of the publications in the Web of Science database on accounting auditing is presented. Based on this information, it is noteworthy that from 2017 to 2021, research articles were more numerous than review articles. In addition, the increase in research articles over the years has been at a higher level than the increase in review articles.

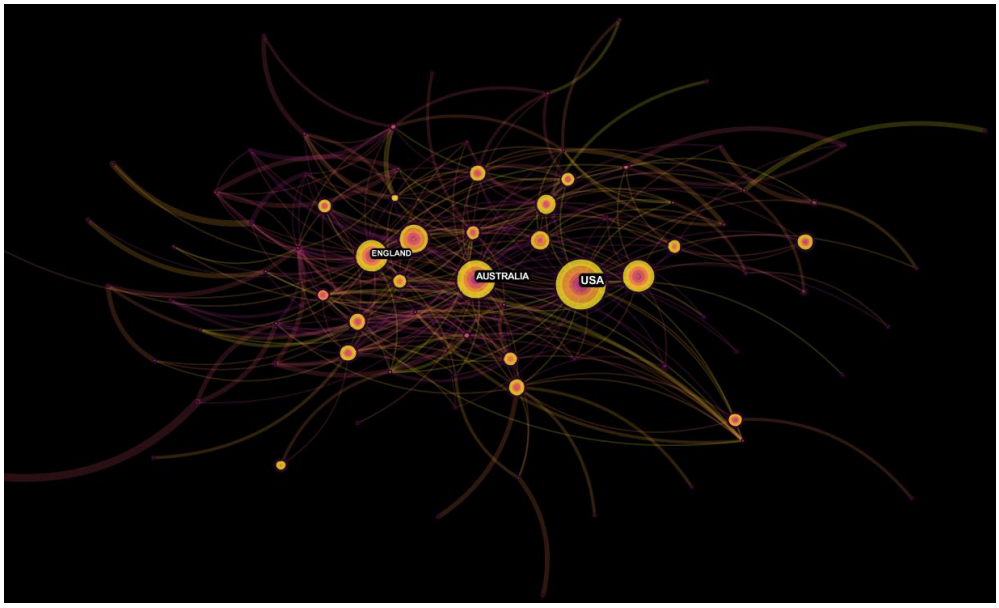
5. Analysis of Publications on Accounting Auditing in Web of Science Database with CiteSpace Method

Under this title, Co-Authorchip Network (COA), Author Co-Citation Analysis (ACA), Document Co-Citation Analysis (DCA), and Journal Co-Citation Analysis (JCA) analyzes are discussed.

5.1. The Collaboration Network of Accounting Auditing research

5.1.1. Country Collaboration Network

Figure 2: A Visualization of the Country Collaboration Network



In Figure 2 above, the cooperation of countries that published accounting auditing in the Web of Science database between 2017-2021 is shown. The cooperation network of countries consists of 349 countries and 98 cooperation links between them. In addition, the selection

criteria Top N%, 100 percent, were accepted in the creation of the map. According to the map, the country that has the most cooperation with other countries on accounting auditing is the USA. The USA is followed by Australia and England respectively. In Table 10 below, information on the top 10 countries that show the contribution of the countries where scientific studies on accounting auditing are made to establishing connections with other countries is also presented.

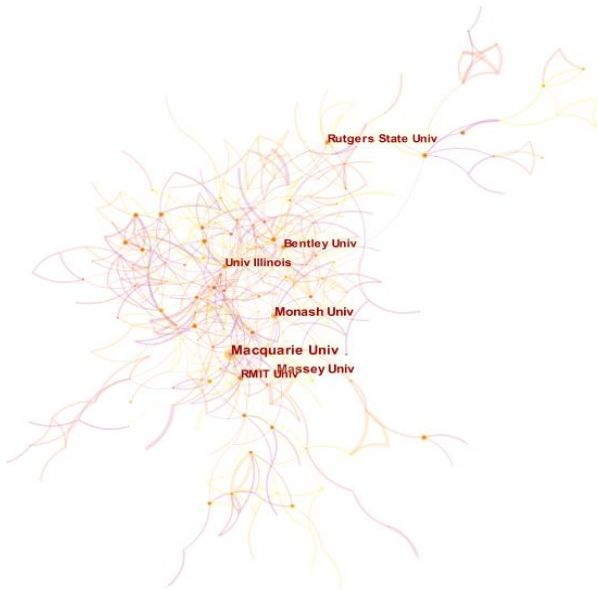
Table 10: The Top 10 Countries That Show the Contribution of the Countries Where Scientific Studies Are Carried Out in the Field of Accounting Auditing to Connecting with Other Countries

Country	Frequency
USA	689
Australia	266
England	178
China	175
Canada	134
New Zealand	92
Malaysia	85
Italy	77
Germany	74
France	57

According to the data presented in Table 10, the first three countries that contributed the most in establishing connections with other countries where scientific studies on accounting auditing are carried out are the USA, Austria and England, respectively.

5.1.2. Institution Collaboration Network

Figure 3. A Visualization of the Institution Collaboration Network



In Figure 3 above, the cooperation of Institutions that publish on accounting auditing is shown. The cooperation network of Institutions consists of 668 Institutions and 388 cooperation links between them. In addition, the selection criteria Top N%, 100 percent, were

accepted in the creation of the map. According to the map, it is seen that there are clusters of many Institutions that cooperate with other Institutions on accounting auditing. The institution that has the most cooperation with other countries is Macquarie University. Other Institutions that cooperate with other countries with high intensity are Monash University, Massey University, Rutgers State University and RMIT University, respectively. In Table 11 below, information about the top 10 Institutions that show the contribution of the Institutions where scientific studies on accounting auditing are made to establish connections with other Institutions is also presented.

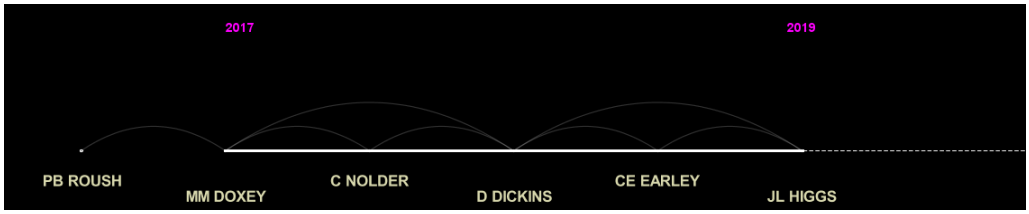
Table 11: The Top 10 Institutions That Show the Contribution of the Institutions where Scientific Studies are Carried Out in the Field of Accounting Auditing in Establishing Connections with Other Institutions

Institution	Country	Frequency
Macquarie University	Australia	52
Monash University	Australia	39
Massey University	New Zealand	36
Rutgers State University	New Jersey	29
RMIT University	Australia	29
Bentley University	USA	27
Illinois University	USA	26
Essex University	England	22
Utara Malaysia University	Malaysia	22
Peking University	Chinese	22

According to the data presented in Table 11, the first three Institutions that contributed the most in establishing connections with other Institutions where scientific studies on accounting auditing are carried out are Macquarie University, Monash University and Massey University, respectively.

5.2. Co-Authorchip Network (COA)

Figure 4: Co-Authorchip Network (COA) Timeline View



In Figure 4, a visual of the collaboration network of authors who published jointly on accounting auditing in the Web of Science database between 2017-2021 is presented. The authors' collaboration network consists of 4,069 authors and 2,955 collaboration links between them. In addition, the selection criteria Top N%, 100 percent, were accepted in the creation of the map. According to the map, in the scientific studies carried out in the relevant field, Roush, P.B., Doxey, M. M., Nolder, C., Dickins, D. and Higgs J.L. It is seen that there is a strong direct and indirect connection between them. In addition, in Figure 4, it is noteworthy that Dickins, D. was the author with the highest connection strength in 2018.

5.3. The Co-Citation Network of Accounting Auditing Research

5.3.1. Author Co-Citation Analysis (ACA)

Figure 5: A Visualization of The Author Co-Citation Network

In Figure 5 above, a map of the common citation network of the cited publications on accounting auditing between 2017-2021 in the Web of Science database is presented. Unified author co-citation network that contributes to the accounting auditing literature,

It consists of 108 nodes and 324 co-quote connections. In addition, the selection criteria Top N%, 100 percent, were accepted in the creation of the map. When Figure 5 is examined, it is seen that there are three different clusters in yellow, pink and burgundy colors on the map, and there is a complex relationship between citation sources. The sizes of the circles on the map represent the degrees of density. Accordingly, the clusters with the highest density power and the most commonly cited scientific studies are Defon, M.L. and Francis J.R. clusters. In addition, information on the ten most cited authors regarding the common citation frequency is presented in Table 12 below.

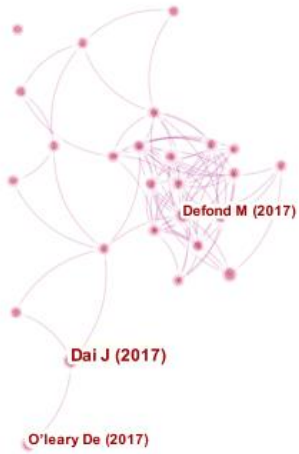
Table 12: Most Cited Authors with Common Citation Frequency

Citation Counts	References
74	Defond M.L.
73	Francis J.R.
59	Dechow, P.M.
58	Carcello J.V.
58	Defond, M.
53	Jensen M.C.
53	Kothari S.P.
52	Knechel W.R.
52	KPMG
48	Public Company Accounting Oversight Board (PCAOB)

According to the data presented in Table 12, the top three most cited authors regarding common citation frequency are Defond M.L. with 74 citations, Francis J.R. with 73 citations, respectively and Dechow, P.M., with 59 citations.

5.3.2. Document Co-Citation Network (DCN)

Figure 6: Merged Network of Citing Articles by Bibliographic Coupling



In Figure 6 above, a map of the combined network of the documents cited in the Web of Science database on accounting auditing between 2017-2021 and the articles cited via the bibliographic link is presented. In the creation of the map, the selection criteria Top N%, 100 percent were accepted. When Figure 6 is examined, it is seen that the first three authors most cited in scientific publications on accounting are Dai, J. & Vasarhelyi, O'Leary, D. E. and DeFond, M. & Erkens, D. H. & Zhang, J. In addition, in Table 13 below, information on the top ten most cited authors in the documents on accounting audit is presented.

Table 13: Information on the Top 10 Most Cited Authors in Documents on Accounting Auditing Via Bibliographic Link

Web of Science Citation Counts	Google Scholar Citation Counts	References
157	302	Dai, J. & Vasarhelyi, M. A. (2017)
82	143	O'Leary, D. E. (2017)
77	124	DeFond, M. & Erkens, D. H. & Zhang, J. (2017)
75	82	Talbot, D. & Boiral, O. (2018)
74	114	Rinaldi, L. & Unerman, J. & de Villiers, C. (2017)
73	200	Karpoff, J.M. & Koester, A. & Lee, D.S. & Martin, G.S. (2017)
69	149	Gull, A.A. & Nagati, H. & Chtioui, T. (2018)
62	154	Defond, M.L. & Lennox, C.S. (2017)
62	154	Kornberger, M. & Pflueger, D. & Mouritsen, J. (2017)
60	432	Alstadsaeter, A. & Johannesen, N. & Zucman, G. (2019)
58	123	Boiral, O. & Heras-Saizarbitoria, I. & Brotherton, M.C. (2019)

According to the data presented in Table 13, the top three most cited authors in scientific studies on accounting auditing are Dai, J and Vasarhelyi, M. A. with their studies of 2017, O'Leary, D. E. with their studies of 2017, and DeFond, M., Erkens, with their studies of 2017, respectively, D. H. and Zhang, J.

5.3.3. Journal Co-Citation Network (JCN)

Figure 7: A Visualization of the Journal Co-Citation Network

In Figure 7 above, a map of the common citation network for the most cited journals in scientific studies on accounting is presented. In the creation of the map, the selection criteria Top N%, 100 percent were accepted. When the map is examined, it is seen that there are many clusters of journals with the highest citation network in the relevant field. However, the largest cluster was observed in Accounting Review and subsequently in Contemporary

Accounting Research. In Table 14 below, information on the top ten most cited journals, and over 599 scientific studies on accounting auditing is presented.

Table 14: Top 14 Most Cited Journals Regarding Scientific Studies on Accounting Auditing

Journal	Frequency
Accounting Review	1.297
Contemporary Accounting Research	1.131
Journal of Accounting and Economics	1.043
Accounting Horizons	1.022
Accounting Practice Journal	889
Accounting Research Journal	890
Social Accounting	845
Journal of Financial Economics	775
The Journal of Finance	683
Journal of Accounting and Public Policy	599

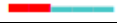
According to the data presented in Table 14, the top three journals most cited in scientific studies on accounting auditing are Accounting Review, Contemporary Accounting Research and Journal of Accounting and Economics, respectively.

5.4. Emerging Trends of Accounting Auditing Research

5.4.1. References with Bursts of Citation on Accounting Auditing Research

Information on the authors whose scientific publications were between 2017-2021 in the Web of Science database on accounting auditing have bursts of citations tabulated below.

Table 15: Top 10 Cited Authors with the Strongest Citation Bursts

Cited Author	Strength	Begin	End	2017 – 2021*
Defond, M. (2017)	11.4	2018	2019	
Gul, F.A. (2017)	9.52	2017	2018	
Carson, E. (2017)	6.33	2017	2018	
Francıs, J.R. (2017)	6.2	2017	2018	
Dumay, J. (2017)	6.09	2018	2019	
Knechel, W.R. (2017)	6.09	2017	2018	
Badolato, P.G. (2017)	5.17	2018	2019	
Abbott, L.J. (2017)	4.87	2017	2018	
Barth, M.E. (2017)	4.51	2017	2018	
Chen, X. (2017)	4.51	2017	2018	

*In the last column depict their dark blue color representing the years that articles have received slight increases in citations while red shows citations have risen dramatically.

In Table 15 above, information on the top 10 authors who have scientific studies on accounting auditing in the Web of Science database and who have the strongest citation explosions in this context are presented. In the creation of the map, selection criteria Top N%, 100 percent were accepted. When Table 15 is examined, it is seen that the citation explosions in the relevant field take 1 year, and the author with the strongest citation explosion between 2018-2019 is Defond, M., with a citation strength of 11.4. Subsequently, among the authors with the highest citation explosion between 2017 and 2018, Gul, F.A. and Carson, E., with a citation strength of 6.33.

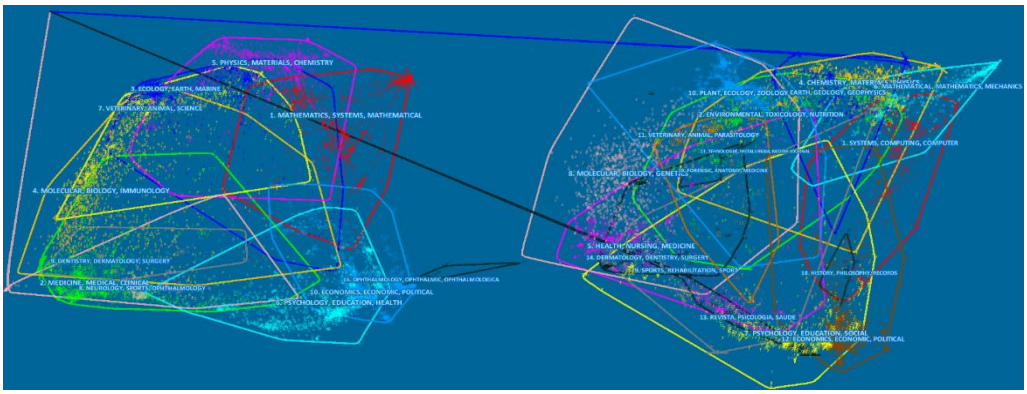
5.4.2. Keyword Analysis

Figure 8: A Visualization of The Keywords Network

In Figure 8 above, a map of the keyword network is presented to explore the direction of scientific research on accounting. In the creation of the map, selection criteria Top N%, 100 percent were accepted. When Figure 8 is examined, it is seen that there are six different clusters on the map. Corporate government, audit quality, real earning management, audit committee, data analytics, audit free, financial reporting, auditors and public sector are among the keywords used extensively in scientific publications on accounting auditing, according to the map.

5.4.3. Overly Map

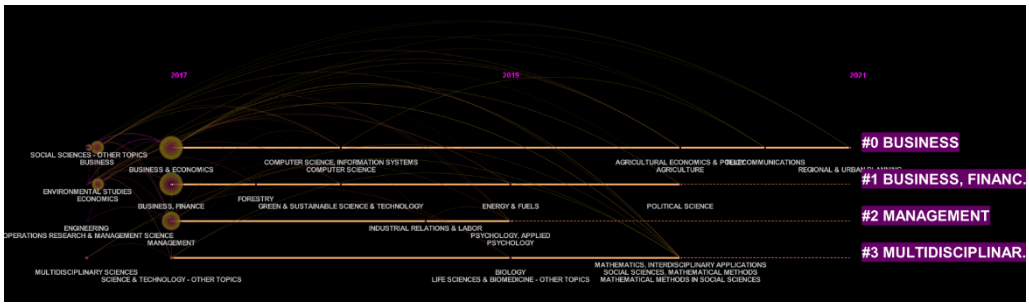
Figure 9: A Detailed Map of Cited Science Fields and Referenced Science Fields on Accounting Auditing



In Figure 9 above, a map of the citing and citing disciplines related to the studies on accounting auditing obtained with the Overly Map (detailed map) model in Web of Science is presented. When the data presented on the map is examined, it is noteworthy that scientific studies on accounting auditing are associated with many fields of science and that there is more than one cluster on the map. In addition, it is seen that the most cited science field is economics, which is clustered with light blue color on the left, and the most cited science fields are mathematics, mechanics, computer and computing, which are clustered with light blue color on the right.

5.4.4. Timeline of Scientific Studies within the Scope of Accounting Auditing

Figure 10. Timeline of Largest Clusters of Scientific Studies Covered by Accounting Auditing



In Figure 10 above, in the timeline of scientific studies within the scope of accounting, the largest clusters are numbered starting from 0. Cluster #0 represents the largest cluster. When the chart for the largest cluster is examined, it is seen that the #0 business cluster remained alive for five years. It is seen that the #1 business and finance cluster, which represents the second largest cluster, remains alive until 2020. According to the timeline, the third largest cluster is the #2 management cluster, which remained alive until 2019. The fourth largest cluster consists of cluster #3, which includes interdisciplinary scientific studies and remained alive until 2020. Therefore, when the timeline of the largest clusters of scientific studies within the scope of accounting auditing is examined, it is noteworthy that the business cluster #0, which constitutes the largest cluster, is still active.

5.4.5. CiteSpace Major Clusters (Major Specializations) of Scientific Studies Covered in Accounting Auditing

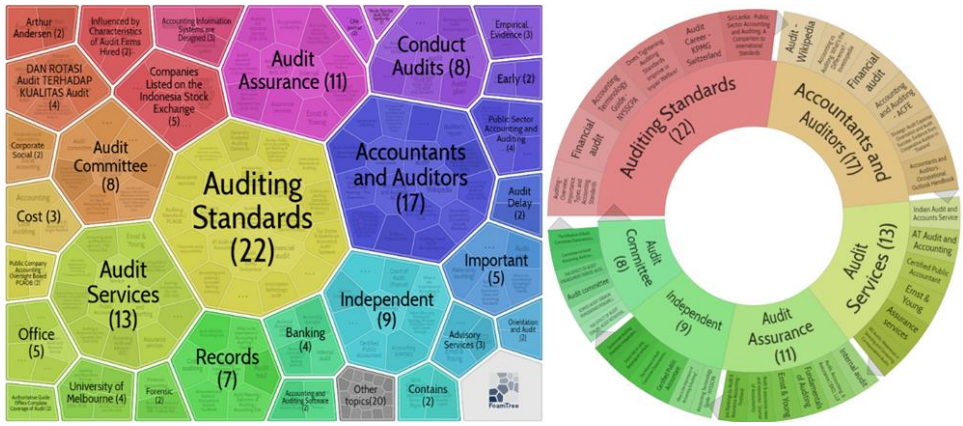
Table 16. Information on the Common Citation of the Three Largest Clusters in Scientific Studies on Accounting Auditing Found in the Reference Network

Cluster ID	Centrality	Silhouette	Mean (Cite Year)	References	Citation Counts
0	43	0,8568	2019	Business (201)	2.108
1	25	0,8023	2018	Business Finance (2017)	1.556
2	24	1	2018	Management (2017)	313

In Table 16 above, information on the common citation of the three largest clusters in the reference network in scientific studies on accounting auditing is presented. When the data presented in Table 2 is examined, it is seen that cluster #0, which constitutes the largest cluster, has 17 members and a silhouette value of 0.8568. The most actively cited author in #0 is Dong, W. (2018). In addition, the top item in terms of citation counts is in the business category in cluster #0, with 2,108 citations. The top item by centrality is also in the business category in cluster #0, with 43 centralities. Information on the common citation of the other two clusters is also presented in Table 16.

6. Carrot2 Clustering Model

Figure 11. Visualization of The Most Frequently Used Terms in Studies on Accounting Auditing



In Figure 11 above, a treemap and a pie-chart image obtained as a result of a search with the term accounting auditing in the Carrot2 clustering model are presented. When these images are examined, it is seen that a total of 119 results have been reached and the term occupies more space and is used more intensely than the others. In this context, it is seen that the term accounting auditing is the most used subject, with 22 usages in the subject of “audit standard” in both images. This term is followed by the terms accountants and auditors, audit services, audit assurance, and independent and audit committee, respectively.

7. Conclusion

In this study, which aims to examine the literature in the field of accounting and its trend over time, CiteSpace analysis, one of the visual mapping techniques, was used in the bibliometric analysis. In this context, in the Web of Science Core Collection database between 2017-2021, 7,193 records were found as a result of the search made under the title “Topic” with the word “Accounting Audit" and as a result of restricting the records to certain criteria, a total of 1,655 records, some bibliometric criteria and CiteSpace mapping were found technique, Co-Authorship, Co-Citation, Bibliographic Coupling and Co-Citation analysis. In addition, scientific studies within the scope of accounting auditing scanned in the Web of Science database were examined in terms of citation explosion model, the timeline of the largest clusters, major clusters and overlay map within the scope of CiteSpace analysis. In the study, science mapping techniques such as Google Ngram, Carrot2 Clustering Model were also used in the examination of scientific studies within the scope of accounting auditing. Therefore, in the analysis of the literature on accounting auditing with the CiteSpace analysis technique based on bibliographic data, citation, co-citation, bibliographic matching, authors, documents, sources, Institutions and countries with strong connections were determined.

The data obtained with the Google Ngram program within the scope of the study shows that the number of books published online in the field of accounting auditing reached the highest level in 2014 and that the books published in the related field decreased continuously from 2014 to 2018 and followed a stagnant course after 2018. However, in the study, according to the results of the traditional bibliometric analysis method, it was concluded that the author with the most publications in the publications prepared on accounting auditing in

the Web of Science database is Vasarhelyi, Miklos A., with an average of 23.5 citations per publication. Vasarhelyi, Miklos A. (2017) was found to be the most cited author on accounting auditing, again with his study titled "Toward Blockchain Based Accounting and Assurance". Although there are three publications of Turkish origin written on accounting auditing in 2021, it is among the results obtained within the scope of the study that no references were made to these studies. In addition, the results obtained from the study show that the university with the highest number of publications in the related field is the State University System of Florida, and the main discipline in accounting auditing is business finance. However, it is also among the results obtained from the study that the studies in the ESCI index are more numerous than the studies in other indexes and that the number of research articles is more than the articles based on the literature review.

In the study, as a result of the analysis of the bibliographic data related to the accounting audit from the Web of Science Core Collection database with the CiteSpace visual mapping technique, the cooperation network results of the countries show that the country with the strongest cooperation network is the USA. In the studies carried out by Keleş (2022) and Öztürk and Yılmaz (2018), the country with the strongest cooperation network in the publications on auditing was determined as the USA. The results of the cooperation network of the Institutions publishing on the accounting auditing show that the institution that has the most cooperation with other Institutions is Macquarie University. In addition, according to the co-authorchip (COA) analysis result, Dickins, D. had the highest link strength. According to the result of the author co-citation (ACA) analysis, the most commonly cited scientific study belongs to Defon, M.L., with 74 common citations. According to the document co-citation (DCN) analysis result, Dai, J. & Vasarhelyi (2007) is the most cited author in scientific publications on accounting auditing. According to the results of the Journal co-citation (JCN) analysis, the most cited source was Accounting Review. In addition, as a result of the analysis performed with the CiteSpace visual mapping technique, it was determined that the author with the strongest citation explosion in scientific studies in the field of accounting auditing was Defond M. (2017), with a citation power of 11.4. The results of the keyword network, which plays an important role in discovering the direction of scientific studies on accounting auditing, the keywords corporate government, audit quality, real earning management, audit committee, data analytics, audit free, financial reporting, auditors assets and public sector are used extensively in scientific publications. The results obtained from the Overly Map model reveal that the most cited science fields in scientific studies in the field of accounting auditing are mathematics, mechanics, computer and computing, and the most cited science field is economics. The results obtained from the timeline of the largest clusters reveal that the largest cluster and the only cluster that survived between 2017-2021 consisted of the #0 business cluster. When the information on the common citation of the largest cluster was examined, it was determined that the most active citation author was Dong, W. (2018), with 2,108 citations in the #0 business cluster. Finally, according to the results obtained from the Carrot2 clustering model, a total of 119 results were obtained in which the term accounting auditing was included, and it was determined that the related term was used in the audit standard field with a maximum of 22 uses.

In this context, it is possible to say that the trend in the field of accounting auditing could be evaluated from a very broad perspective in terms of analyzing the literature on accounting auditing in the Web of Science between 2017-2021 with the CiteSpace visual mapping

technique. Therefore, it is anticipated that this study, which presents a comprehensive analysis of the field of accounting auditing, will guide researchers in future scientific studies in the related field. In addition, in the studies to be carried out in the following period, modern visual mapping techniques such as Action Science Explorer (iOpener), Carrotssearch, Sci2, SciMAT, which can be described as the continuation of this study and will expand the study, will be analyzed with different criteria and the results obtained will be analyzed in this research compared with the results is planned.

References

Al, U. (2008). "Scientific Publication Policy of Turkey: A Bibliometric Approach Based on Citation Indexes". Hacettepe University, Institute of Social Sciences, Department of Information and Records Management, Doctoral Thesis.

Carrot Search (2021). "Carrot Search: Document Clustering and Visualization Software". retrieved from https://carrotsearch.com/, (Access: 10.12.2021).

Chen, C. (2006). "CiteSpace II: Detecting and Visualizing Emerging Trends and Transient Patterns in Scientific Literature". Journal of the American Society for Information Science and Technology. Vol. 57, No. 3: 359–77. doi: https://doi.org/10.1002/asi.20317.

Chen, C. (2011). 'Predictive Effects of Structural Variation on Citation Counts'. Journal of the American Society for Information Science and Technology. Vol. 63, No. 3: 431–49. doi: 10.1002/asi.21694.

Chen, C., Hu, Z., Shengbo L. and Teseng, H. (2012). "Emerging Trends in Regenerative Medicine: A Scientometric Analysis in CiteSpace". Expert Opinion on Biological Therapy. Vol. 12, No. 5: 593–608. doi: 10.1517/14712598.2012.674507.

Chen, C., Ibekwe-Sanjuan, F. and Hou, J. (2010). "The Structure and Dynamics of Co-Citation Clusters: A Multiple-Perspective Co-Citation Analysis". Journal of the American Society for Information Science and Technology. Vol. 61, No. 7: 1386–1409. doi: 10.1002/asi.21309.

CiteSpace, (2018). "CiteSpace".

Cobo, M., López-Herrera, A. G., Herrera-Viedma, E. Herrera, F. (2011). "Science Mapping Software Tools: Review, Analysis, and Cooperative Study Among Tools". Journal of the American Society for Information Science and Technology. Vol. 62, No. 7: 1382–1402. doi: 10.1002/asi.21525.

Du, Y., Chen, S. and Tang, L. (2021). "The Research Progress and Development Trend of Carbon Accounting: An Analysis Based on CiteSpace". China-USA Business Review Vol. 20, No. 4: 185–201. doi: 10.17265/1537-1514/2021.04.004.

Gao, Y. and Ning, M. (2021). "A Visualization Analysis of Environmental Accounting Research Based on CiteSpace". Pp. 99–113 in IEIS 2020, edited by M. Li, G. Bohács, G. Hua, D. Gong, and X. Shang. Singapore: Springer.

Google Books Ngram Viewer (2021). "Google Books Ngram Viewer". retrieved from https://books.google.com/ngrams, (Access: 11.11.2021).

Güney, S., Sarı. S. S. (2015). "Internal in Ensuring The Efficiency Of Accounting Audit The Role of Control". Journal of Social Sciences Institute. No. 5: 62-80.

Güredin, E. (1995). Accounting Audit and Financial Analysis, Anadolu University Publications, 2th Ed, No: 835, Turkey: Eskişehir.

Keleş, D. (2022). "Visual Network Mapping Aid Bibliometric Analysis of International Studies on Internal Audit". Journal of Uşak University Faculty of Applied Sciences. Vol. 2, No. 1: 42-58.

Kurbanova, M. and Cavlak, H. (2021). "Bibliometric Analysis of Articles in The Field of Blokchain and Audit. TİDE Academia Research. Vol. 3, No. 2: 213-246.

Lawani, S. M. (1981). "Bibliyometrics: Its Theoretical Foundations, Methods and Applications". International Journal of Libraries and Information Services. Vol. 31, No. 4: 294–95. doi: https://doi.org/10.1515/libr.1981.31.1.294.

Maia, S. C., de Benedicto, G. C., do Prado, J. W., Robb, D. A., de Almeida Bispo, O. N., de Brito, M. J. (2019). "Mapping the Literature on Credit Unions: A Bibliometric Investigation Grounded in Scopus and Web of Science". Scientometrics. Vol. 120, No. 3: 929–60. doi: 10.1007/s11192-019-03165-1.

Merigó, J. M. and Yang, J.-B. (2017). "Accounting Research: A Bibliometric Analysis: Accounting Research: A Bibliometric Analysis". Australian Accounting Review 27(1):71–100. doi: 10.1111/auar.12109.

Mou, J., Cui, Y. and Kurcz, K. (2019). "Bıblıometrıc and Vısualızed Analysıs of Research on Major E-Commerce Journals Usıng Cıtespace". Journal of Electronic Commerce Research Vol. 20, No. 4: 219–37.

Öztürk, S. and Yılmaz, C. (2018). "Investigation of Studies in Audit and Forensic Accounting with Bibliometric Analysis Technique". Black SEA International Scientific Journal. Vol. 39, No. 39: 173-188. https://doi.org/10.17498/kdeniz.406270

Xia, D. and Wang, L. (2020). "Hot Topics and Frontier Analysis of International Accounting Research Based on CiteSpace". pp. 305–9 in 2020 International Conference on Computer Science and Management Technology (ICCSMT).

Xue, W., Li, H., Ali, R. and Ramiz, Ur Rehman, R. (2020). "Knowledge Mapping of Corporate Financial Performance Research: A Visual Analysis Using Cite Space and Ucinet". Sustainability, Vol. 12, No. 9 :1–21. doi: 10.3390/su12093554.

Zhou, W., Chen, Q. and Meng, S. (2019). "Knowledge Mapping of Credit Risk Research: Scientometrics Analysis Using CiteSpace". Economic Research- Ekonomska Istraživanja, Vol. 32, No. 1: 3451–78. doi: 10.1080/1331677X.2019.1660202.