

ECONOMIC AND FINANCIAL CRIME, FORENSIC ACCOUNTING AND SUSTAINABLE DEVELOPMENTS GOALS (SDGS). BIBLIOMETRIC ANALYSIS

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Abstract

Purpose: The aim of this work is to stress the needs for enhancing the role of forensic accounting in fighting economic and financial crime, in the context of the new international regulation movements in this area enhanced by the International Federation of Accountants (IFAC).

Theoretical framework: Corruption, money laundering, tax evasion and other frauds significant hamper the economic growth and human development and, ultimately, the UN Sustainable Development Goals. The present paper also stresses the role of good governance in fighting the frauds, in order to achieve the most suitable sustainable development of the society.

Design/methodology/approach: In this view, we made a bibliometric systematic review on forensic accounting and its contribution towards fraud detection and prevention and their relationship with good governance and Sustainable Developments Goals (SDGs). In this view, two powerful bibliometric visual software tools, Bibilioshiny and VOSviewer are used in order to analyze published papers identifies in Scopus and Web of Science databases over the time.

Findings: Our findings reveal the main red flags identified in literature as used tools by forensic accounting, the evolution in time of the interest of the topic, the distribution in space among world countries and connectivity with patterns of a good governance. Visual designs and scientific maps are useful to show these findings, in a visual way.

Research, Practical & Social Implications: Our findings are useful for managers and policy makers to provide important avenues that may help in reaching the 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, in the area of using forensic accounting in preventing fraud. □

Originality/value: The originality of this study consists in the fact that it uses a new approach known as scientific mapping and it combines a mix of two bibliometric software: Bibilioshiny and VOSviewer. Furthermore, this study differs from others in that it examines the intersection of three diverse topics: economic and financial crime, forensic accounting, and sustainable development goals.

Index Terms— Ecocomic crime; Financial forensics, Sustainable development

I. INTRODUCTION

The United Nations Member States approved the Sustainable Development Goals (SDGs) in 2015 as the basis of the 2030 Agenda for Sustainable Development [1]. They originated following the "Millennium Development Goals" (MDGs) of 2000-2015 [2]. The Millennium Development Goals (MDGs) were established in the year 2000, during the United Nations Millennium Summit with the objective to facilitate progress in development and eliminate hunger and extreme poverty [3], [4]. Afterwards, the focus shifted to a larger and more in-depth agenda [2]. The Sustainable Development Goals (SDGs) were introduced in 2015 as an updated set of development goals having an implementation time span of 2015 to 2030 with validity for both the global South and the global North. The first SDG objective remains to end poverty everywhere [3], [5]. SDGs differ from their predecessors in that they integrate all facets of development, economic, social, and environmental, and are of equal significance for all countries, nationally as well as internationally (Edwards and Ross, 2016). SDG 16.4 aims to reduce illegal money flows in order to combat organized crime, SDG 16.5 aims to eliminate corruption, and SDG 16.A aims to improve expertise and international cooperation in order to combat crime and terrorism [5], [7]. As a result, it is clear that the concept of Sustainable Development Goals is linked to economic and financial crime. Bologna and Lindquist (1995) define forensic accounting as "the application of financial skills, and an investigative mentality to unresolved issues, conducted within the context of rules of evidence. As an emerging discipline, it encompasses financial expertise, fraud knowledge, and a sound knowledge and understanding of business reality and the working of the legal system." Forensic accounting is a valuable tool in the detection and prevention of crime. In this context, the purpose of this research is to conduct a literature review on economic and financial crime, forensic accounting, and sustainable development goals.

In order to comprehensively illustrate the development and interactions of items in a research area by analyzing the relevant literature, bibliometric analysis is one of the most effective and reliable statistical methods. Moreover, bibliometric analysis is a method based on quantitative evaluation that have a significant potential in giving researchers a deep understanding and a comprehensive overview of a certain domain of research [9]–[13]. Preferred Reporting Items for Systematic Reviews and Meta Analysis (PRISMA), bibliometric performance analysis, and scientific mapping were used in the review. The main advantage of the bibliometric approach is that it can reveal the internal structure, current state, and development patterns of a specific study topic [9], [12], [13].

The originality of this study consists in the fact that it uses a new approach known as scientific mapping and it combines a mix of two bibliometric software: Biblioshiny [14] and VOSviewer. Furthermore, this study differs from others in that it examines the intersection of three diverse topics: economic and financial crime, forensic accounting, and sustainable development goals.

This review contributes to the field of study in numerous ways. First, it aids in comprehending the evolution of research in the chosen area. Second, taking past literature reviews into account, this article is a pioneer in bibliometric research on Sustainable Development Goals and forensic accounting. Third, this study contributes to the advancement of science by not only examining and discussing the findings of analyses but also defining future research paths and inspiring academics to pursue investigations in this subject.

The remainder of this article is structured as follows. The approach for the bibliometric literature review and the research questions are presented in the next section. The third section of the paper focuses on the steps that were taken to collect the final sample of articles, as well as the bibliometric and network analyses that were used. The fourth section of the paper presents and discusses the study's findings. The final section contains the conclusions.

Research method and questions

The quantitative study of scientific research intends to enhance the understanding of a particular field, and bibliometric analysis is crucial in this regard [15]. A bibliometric examination is a quantitative evaluation of the specialized terminology, production, development, collaboration, and use of scientific works [16]. The primary objective of a bibliometric analysis is to gather and analyze accessible research related to the topic of interest in order to create objective results which can be verified and replicated again [17]. [18] describes bibliometric analysis as a modern scientometric discipline that involves the use of statistical tools for examining scientific activity in an area of research. Bibliometric mapping is a visual representation of the connections across areas of study, disciplines, places, and publications or authors [19]. In the past few years, the bibliometric research has grown in importance in business and financial studies due to the fact that it permits the summarization of large quantities of scientific information in order to explain and determine the current state of the intellectual structure and developing patterns of an area of study [9]–[12], [20], [21]. Bibliometric analysis has grown in relevance as a tool for quantifying and evaluating academics' results, collaboration across researchers and entities, production comparison, highly cited outputs, and analysis of co-citations [16]. Furthermore, bibliometric investigation highlights focal research and accurately portrays the linkages between publications on a specific research topic through determining how many times they have been co-cited by other papers [16], [22], [23].

The main purpose of this article is to examine the literature about economic crime, forensic accounting, and the Sustainable Development Goals and determine the present stage of development of research on this topic. In order to achieve this, a bibliometric literature review was conducted, and the following research questions were formulated:

RQ 1. How is developing the literature about Economic and financial crime, Forensic accounting and Sustainable Developments Goals (SDGs)?

RQ 2: Is there a connection in the literature between economic crime, forensic accounting, and the Sustainable Development Goals (SDGs)?

As a result, it was determined that the bibliometric review method is the most appropriate approach for the study we conducted, as it helps in the identification of key works on this topic. Furthermore, it is going to help in illustrating the linkages between publications, facilitate meta-analytics evaluation, the formation and identification of significant research streams, and the development of basic theoretical objectives [22]–[26]; compared to other approaches, which are confined to offering merely a literature review on the topic [16].

METHODOLOGY

In order to provide an exhaustive depiction of the knowledge structure in the field of study, data extraction for the bibliometric analysis was conducted through the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol, as updated by [27], which presents organized and rigorous instructions for examining studies employing criteria for research and includes four phases: identification, screening, eligibility, and inclusion [28], [29]. The PRISMA method has several distinctive characteristics, including a precise, rigorous, and well-described checklist that assists researchers and academics in improving the manner in which they perform bibliometric analysis, systematic review reporting, and meta-analyses [9], [30]. Figure 1 presents the PRISMA flowchart protocol used in this study.

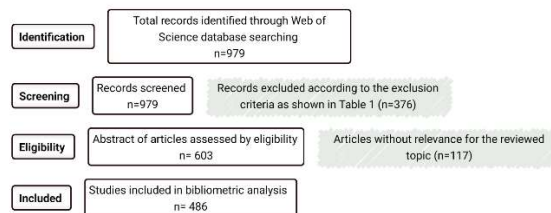


Figure 1 - PRISMA flowchart protocol for the researched topic

Source: Created by the authors based on Page et al. (2021)

The starting point required to choose the database and establish the publication criteria for selection [31], [32]. The information was collected from the Web of Science database, which was chosen due to the fact that it provides high-quality papers and is a trustworthy source for indexing highly ranked journals [9], [33], [34]. The results were refined using the Web of Science criteria as well as MS Excel. Following that, we used VOSviewer and Biblioshiny [14], a shiny app that provides a web-interface for the Bibliometrix R-Package to examine the studies using illustrations and visualization in order to better understand the context and development trends in specific fields. The findings are presented in accordance with the unit of analysis under consideration, such as articles, authors, journals, and research themes.

Search strategy and data extraction

Table 1-Description of the search procedure

Phase	Description	No. of remaining articles
Search string used in the Web of Science database	("crime*" or "fraud*" and "Forensic* accounting") and ("Sustainable Development* Goal*" or "SDG*" or "Sustainable Development*" or "Development* Goal*" or "sustainability")	979
Refinement by research areas	Excluding research areas that are not relevant (ex. Medicine, Toxicology, Sport Science, Optics and others)	603
Manual refinement	The titles and abstracts of the papers that resulted were reviewed, and irrelevant materials were removed	486
Final sample	The total number of papers that remained after manual refining and that were used in the research	486

Source: created by the authors

As presented in Table 1, the search string ("crime*" or "fraud*" and "Forensic* accounting") and ("Sustainable Development* Goal*" or "SDG*" or "Sustainable Development*" or "Development* Goal*" or "sustainability") has resulted in 979 documents on the day of analysis (24 July 2023). These documents were then refined by taking into account only the relevant study areas and excluding medicine, toxicology, sport science, optics and others. Following that, 603 papers were chosen and another screening was performed manually to remove unrelated documents through reading the titles and the abstracts in a Microsoft Excel spreadsheet as recommended by Brereton et al. (2007). After that, 489 documents were chosen for the following phase of analysis, and bibliometric information for all of the records included in the sample was downloaded. The generated file was utilized as input for bibliometric analysis using Biblioshiny [14] and the VOSviewer software [36].

Results and discussions

The study of bibliographic data necessitates the use of two approaches: performance analysis and science mapping [9], [14], [21]. This study was conducted using both methods in order to offer an in-depth comprehension of the literature about the investigated topic. This study is based on 486

papers that address the topics of economic and financial crime, forensic accounting, and sustainable development, as shown in Table 1 and Figure 2. Articles covering the issue of sustainable development goals in a broad sense were also maintained in order to have a complete picture about the interaction of topics in this study, not just those proposed by the United Nations [1]. As consequence, the time span studied ranges from 2000 to 2023, with 1251 authors, 275 sources, 1812 author's keywords, and 22680 references. The number of publications on this issue continues to grow, with a 16.57% annual growth rate. The average citations per document are 6.031 and the average age of a document is 4.43, showing that the topic is new and is developing.



Figure 2 - General information about the sample

Source: Created by the authors using Biblioshiny

Figure 3 depicts the evolution of the number of publications over time, and it can be seen that publications increased significantly starting from 2015. The years with highest number of publications are 2020 and 2022, with 75 and 71, respectively. There were fewer publications in 2023, however that year was not fully represented in the sample, as the analysis only covered papers published up to July 2023. This result strongly supports the view that the area of research that includes economic and financial crime, forensic accounting, and the Sustainable Development Goals is expanding and attracting interest among researchers, particularly in light of countries' intentions to reduce criminality and achieve sustainable development.

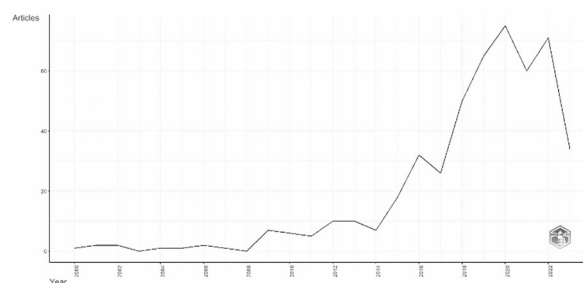


Figure 3 - Annual Scientific Production

Source: Created by the author using Biblioshiny

Figure 4 and Figure 5 show the performance evaluation of the sources. Figure 4 illustrates the most relevant sources within the study's subject, organized by the number of publications. Sustainability ranks first with 112 publications, followed by Marine Policy with 13 publications and Entrepreneurship and Sustainability Issues with 12 publications. Figure 5 depicts the most often

cited local sources. Local citations quantify the number of times a source in the set has been cited by writers from other sources in the entire set [14]. Sustainability receives the most local citations, followed by Criminology and Landscape Urban Plan.

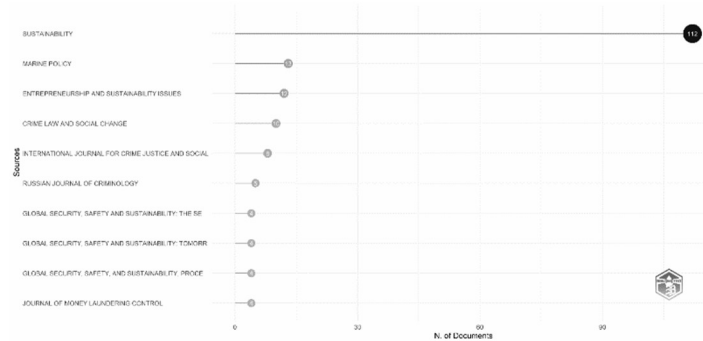


Figure 4 - Most relevant sources
Source: Created by the authors using Biblioshiny

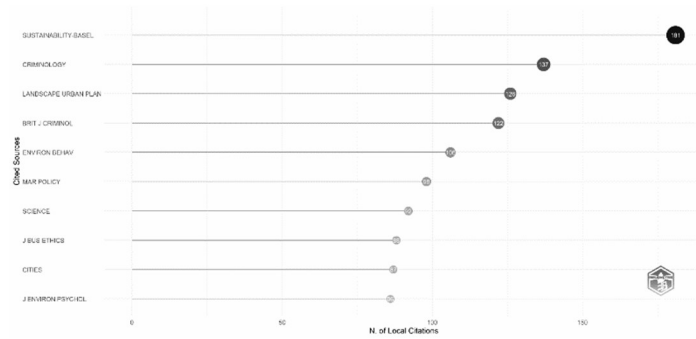


Figure 5 - Most Local Cited Sources
Source: Created by the authors using Biblioshiny

Figure 6 highlights the most significant affiliations. The Ministry of Education and Science of Ukraine ranks first with 17 documents, followed by the University of Cincinnati, the University System of Ohio, and Vi Vernadsky Crimean Federal University, all of which have 9 articles.

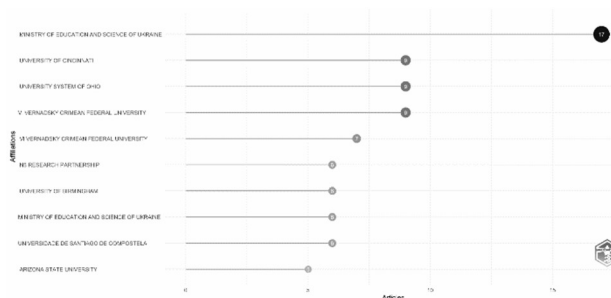


Figure 6 - Most Relevant Affiliations
Source: Created by the author using Biblioshiny

Figure 7 shows the country's scientific productivity, which is calculated by counting the number of authors entries by national affiliations. Multiple shades of blue show varying levels of productivity, ranging from dark blue, which suggests high production; to grey, which signifies no publications. The United States, China, and the United Kingdom lead the way in terms of interest in this topic. These are all charter members of the United Nations and members of the Security Council's five permanent members. Figure 8 depicts the nation of origin of the corresponding author. MCP stands for Multiple Countries Publication, and it indicates the total amount of articles in which at least one co-author comes from a different country from another author, in other words, it reflects the degree of a country's international collaboration [37]. SCP is an abbreviation for Single Countries Publication, which has only one Country related to all authors [37]. The United States, China, and Australia have the largest number of collaborations between authors from different countries. Figure 9 depicts the countries' partnership in further detail.

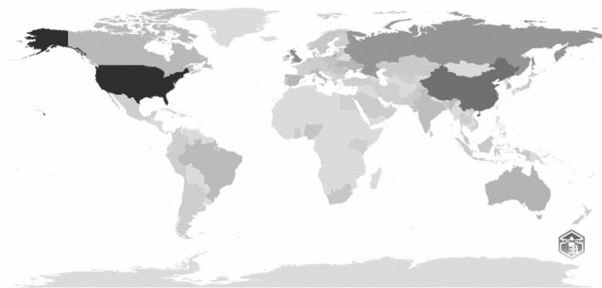


Figure 7 - Country Scientific Production
 Source: Created by the authors using Biblioshiny

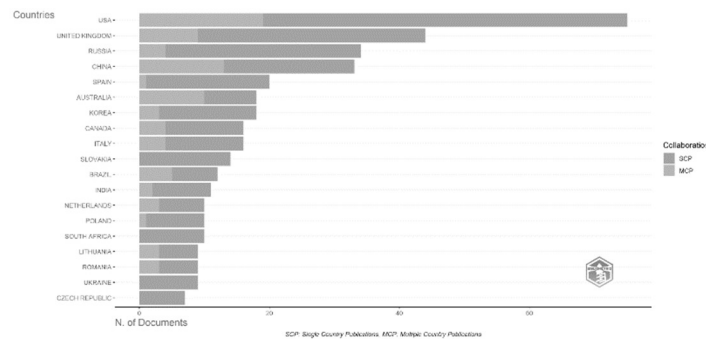


Figure 8 - Corresponding Author's Countries
 Source: Created by the author using Biblioshiny



Figure 9 - Country Collaboration Science Map

Source: Created by the authors using Biblioshiny

The number of articles co-authored by researchers and research institutions is called co-authorship analysis and is used to determine the intellectual cooperation among researchers and research organizations [9]. Table 2 shows the top ten authors ranked by the total link strength of their co-authorship.

Table 2-Top 10 most collaborative researchers that studied the topics of economic and financial crime, forensic accounting, and sustainable development

Author	Documents	Citations	Total link strength
Liu, Lin	4	54	8
Blaustein, Jarrett	4	15	7
Pino, Nathan W.	5	30	7
Jing, Fengrui	2	25	5
Long, Dongping	2	28	5
Zhou, Suhong	2	25	5
Centes, Jozef	3	9	4
Chodor, Tom	2	2	4
Krajcovic, Michal	2	2	4
Mrva, Michal	2	2	4

Source: created by the author based on the VOSviewer results

Two papers are co-cited if a third publication references both of them [38], [39]. The greater the number of articles in which two publications are co-cited, the more significant the co-citation relationship [36]. Co-citation analysis involves evaluating the references mentioned by the scientific works included in the dataset that was chosen as well as examining the relationships between referenced publications in order to more thoroughly comprehend the development of basic themes in a particular research domain [9]. The co-citation network diagram of cited references about economic and financial crime, forensic accounting, and sustainable development can be seen in Figure 10. There are 5 clusters, with the largest cluster (red) having 12 citations, the second cluster (green) comprising 8 citations, the third cluster (blue) with 7 citations, the fourth cluster (yellow) containing 6 citations, and the last cluster (violet) including 5 citations.

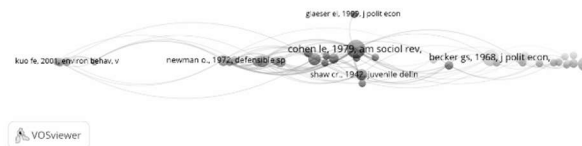


Figure 10 - The co-citation network diagram of cited references

Source: created by the authors using VOSviewer

The inverse of co-citation is bibliographic coupling. If a third publication is cited by both publications, two publications are bibliographically coupled [40]. The higher the number of references shared between two publications, the stronger the bibliographic coupling that exists between the publications [36]. Bibliographic coupling enables the examination of relationships between publications, revealing the importance of articles in the data set being studied in terms of their networking positioning.

Regarding the results of the bibliographic coupling analysis of journals, the final sample includes 42 journals that met the minimal requirement of two documents per journal. Table 3 lists the top ten journals by link strength. Proceeding the procedure of bibliographic coupling with the authors' context, the resulting sample was represented by 47 authors who met the minimum requirement of two articles per author. Table 4 shows the authors having the highest identified bibliographic coupling connection strength based on the total of bibliographic coupling link strength. It's interesting to note that the first four places, namely Liu Lin, Blaustein Jarrett, Pino Nathan W., and Jing, Fengrui, are also the most collaborative researchers on economic and financial crime, forensic accounting, and sustainable development. The maximum strength of bibliographic coupling relationships indicates that these writers are more influential in the citation network and are actively participating in discussions [33]. Figure 11 and Figure 12 show the bibliographic coupling network diagram of the sources and of the authors correspondingly.

Table 3-Top 10 journals in terms of bibliographic coupling link strength

Source	Documents	Citations	Total link strength
Sustainability	112	816	382
Plos one	4	359	87
Crime law and social change	10	88	76
Social sciences-Basel	4	30	69
Marine policy	13	82	66
Policing-a journal of policy and practice	2	5	59
Critical criminology	2	2	58
Journal of contemporary criminal justice	2	18	55
Crime & delinquency	2	27	54
International journal for crime justice and social democracy	8	15	50

Source: created by the author based on the VOSviewer results

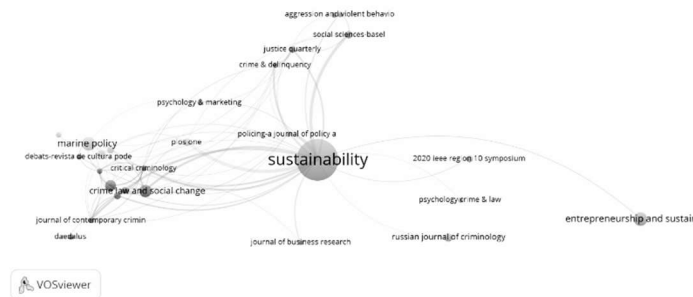


Figure 11 - The bibliographic coupling network diagram of the sources
 Source: created by the authors using VOSviewer

Table 4-Top 10 authors in terms of bibliographic coupling link strength

Author	Documents	Citations	Total link strength
Liu, Lin	4	54	704
Blaustein, Jarrett	4	15	656

Pino, Nathan W.	5	30	656
Jing, Fengrui	2	25	424
Zhou, Suhong	2	25	424
White, Rob	4	57	393
Long, Dongping	2	28	380
Chodor, Tom	2	2	351
Lan, Minxuan	2	29	300
Lis, Aleksandra	2	34	283

Source: created by the authors based on the VOSviewer results

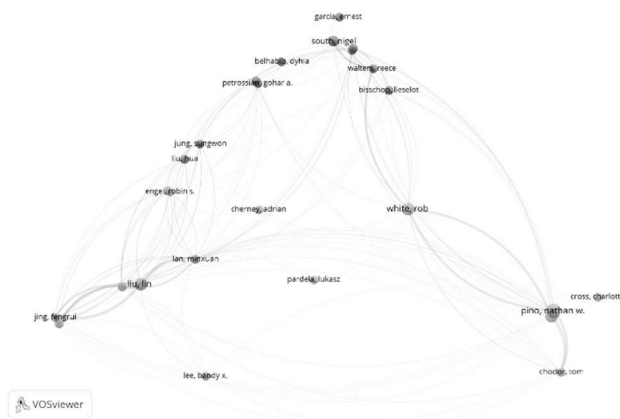


Figure 12 - The bibliographic coupling network diagram of the authors

Source: created by the authors using VOSviewer

The quantity of co-occurrences of two keywords is represented by the number of publications in which both of the keywords appear together in the title, abstract, or keyword list [36]. The primary goal of keyword co-occurrence examination is to offer a type of content analysis that enables the determination of associations among keywords in a sample of documents. Through this analysis it is possible to establish thematic areas organized into clusters so that the primary theoretical or basic topics of the field of study may be identified [9], [41]. Keywords can be obtained from a publication's title and abstract, or they can be taken from the keyword list supplied from the author. Moreover, they can be individual words in certain circumstances, particularly in older texts, but they can also encompass concepts composed of more than one word [36]. In our analysis, 91 keywords have been identified by taking into consideration the co-occurrence of all keywords for

the selected sample about economic and financial crime, forensic accounting, and sustainable development, and using a minimum threshold for the occurrence of keywords of 5. For the sample considered in this study, the three most common terms were crime (104 occurrences and 255 total link strength), sustainability (50 occurrences and 90 total link strength), and effect (25 occurrences and 67 total link strength). Figure 13 depicts the keywords overlay presentation, which enables an analysis of the temporal distribution of the keywords. In this kind of visualization, the colors of keywords are determined based on a score calculated according to the average year of occurrence of a keyword and they change from blue indicating the oldest years to green, then to yellow, which represents the most recent years [9]. It can be observed that there are many words that indicate economic and financial crime, such as money laundering (light green), corruption (green), and tax evasion (blue); additionally, the term forensic accounting is present in a blue-purple color; and finally, the concept of sustainable development goals is present in light green, indicating that it has recently developed. As a result, all of the parts of the topic addressed in this study are present in the bibliometric mapping analysis, implying that there is a link in the literature between the concepts of economic crime, forensic accounting, and the Sustainable Development Goals. Figure 14 depicts the cluster density visualization of high-frequency keywords to provide a more in-depth knowledge of keyword co-occurrence.

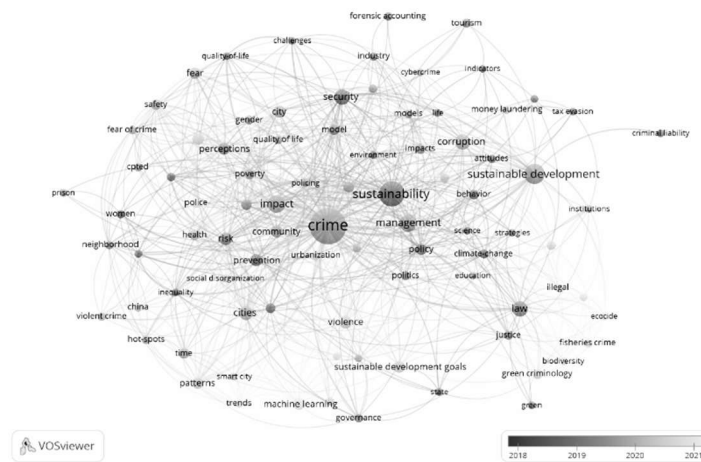


Figure 13 - The co-occurrence of keywords overlay visualization map

Source: created by the authors using VOSviewer

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