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Integrated reporting: bibliometric landscape

Yuliia Serpeninova[1]

PhD, Associate Professor, Head of Accounting and Taxation Department,
Sumy State University

Abstract

The growing importance of non-financial disclosure and development of integrated reporting concept necessitates a formation of complex systematic theoretical background, in particular, by means of the bibliometric analysis. Use of special software (VOSviewer, SciVal, Publish or Perish, inbuilt database analysis tools in Scopus, Web of Science and Google Scholar; Google Trends and Google Books Ngram Viewer) expands the analytical capabilities of bibliometric analysis and helps to cover the entire array of existing papers on integrated reporting. In particular, this paper covers: the assessment of general dynamics of publications; systematisation of the chronological and regional specifics of publications; study of the thematic specifics of publications by analysing keywords, subject areas, and thematic clusters.

Keywords: integrated reporting; non-financial reporting; bibliometric analysis; bibliometric landscape; literature review.

1. Introduction

Nowadays world economy is functioning under the significant influence of globalization processes, the rapid spread of new means of communication and information technology, growing threats of global financial crises. There are also changes in the ideology of doing business in the direction of compliance with social, democratic, and ethical values. In such circumstances, it is important for businesses to have a reporting system that meets modern requirements, and the information needs of a wide range of stakeholders. In this regard, the world practice is actively implementing an integrated reporting approach, which combines financial and non-financial aspects of evaluating the activities of the enterprise, serving as a mean of additional disclosure of accounting information. The dynamic development of integrated reporting necessitates a formation of complex systematic theoretical background, in particular, through analysis of the bibliometric landscape of publications.

2. Literature review

Bibliometric analysis of integrated reporting is widely used in the research of Ukrainian and foreign scholars. Thus, among foreign scholars it is worth highlighting the works of such authors as Dumay J. et al. [5], Vitolla F. et al. [14], De Villiers, C. et al. [4], Manes-Rossi F. et al. [11], which are devoted to the literature review of research on integrated reporting. Among Ukrainian scholars, the interpretation of the economic essence of the concept of "integrated reporting" was carried out by such researchers as: Nesterenko O. [10], Bezverkhy K. [2], Zhuravka F. [15], Belova I. [1], Liutovaa G. [10], Legenchuk, S., Usatenko, O. [9] and other.

Nesterenko O. [10, c. 41] systematizes the main aspects in the interpretation of the definition of "integrated reporting". Bezverkhy K. [2, c. 52] summarizes approaches to the definition of the studied concept in the works of domestic scientists. Shigun M. et al. [12, c. 262] structure the authors' approaches to the elements of integrated reporting. Bibliometric analysis of

Corresponding author:

[1] *E-mail addresses: y.serpeninova@biem.sumdu.edu.ua*
ORCID ID: 0000-0002-4448-3484

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papers on integrated reporting was performed using modern software (VOSviewer) described in the articles of Ukrainian researchers Geek V. [1], Kostenko O. et al. [8].

3. The identification of previously unresolved issues and the formulation of research hypotheses

Despite the significant contribution of scientists to the development of categorical and conceptual analysis of the bibliometric landscape of publications on integrated reporting, there are still research gaps. Thus, most authors [10, 12, 1] analyze approaches to the definition of "integrated reporting", without analyzing the general trends of research in this area. In the publications of Geek V.[1], Kostenko O. et al. [8] bibliometric analysis was performed only on the basis of Scopus and Web of Science databases, missing the analysis of publications based on the Google Scholar database.

The main hypothesis of the study is that the use of modern bibliometric software will cover the entire array of existing publications on this topic to identify key trends in publishing activity on integrated reporting, in particular:

- to determine the general dynamics of publications;
- to systematize the chronological and regional specifics of publications;
- to study the thematic specifics of publications by analysing keywords, subject areas, and thematic clusters.

4. Research methodology and methods

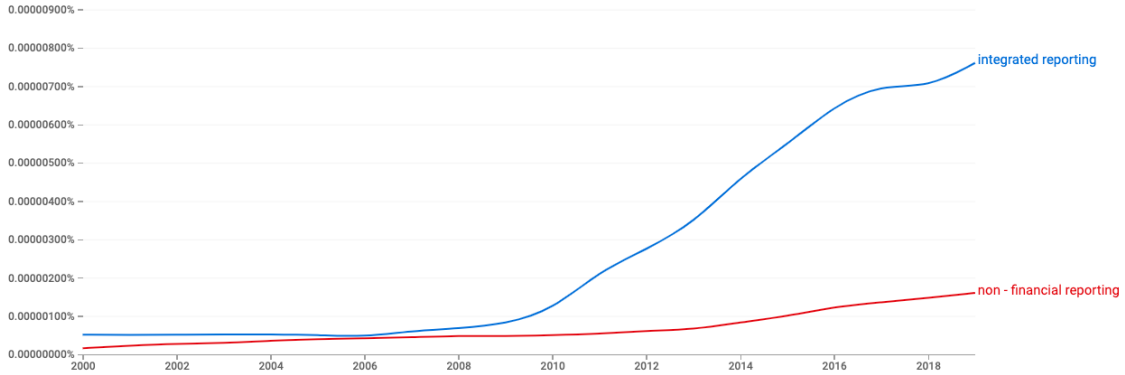
In order to expand the analytical capabilities of bibliometric analysis, we offer the use of special software: VOSviewer, SciVal, Publish or Perish, inbuilt database analysis tools in Scopus, Web of Science and Google Scholar; Google Trends and Google Books Ngram Viewer. Formalization of the methodology for the implementation of this scientific task is given in table 1.

Table 1
Methodology of bibliometric landscape analysis of integrated reporting research

Stage	Characteristic	Tools
1	Analysis of user and publishing activity dynamics	- inbuilt database analysis tools in Scopus, Web of Science and Google Scholar; - Google Trends; - Google Books Ngram Viewer;
2	Construction of bibliometric maps of the most cited authors	- VOSviewer; - Publish or Perish; - inbuilt database analysis tools in Scopus, Web of Science and Google Scholar;
3	Clustering of scientific publications by keywords	- VOSviewer;
4	Regional analysis of publishing activity	- SciVal;
5	Research of subject areas, topics and thematic clusters	- SciVal;

5. Main results

According to the proposed methodology, the first stage covers the dynamics analysis of publications on integrated reporting in Scopus, Web of Science and Google Scholar databases (Table 2, Fig. 3), as well as the dynamics of user demand by Google Trends (Fig. 1) And Google Books Ngram Viewer (Fig. 2), which allows to track the general trends of integrated reporting.

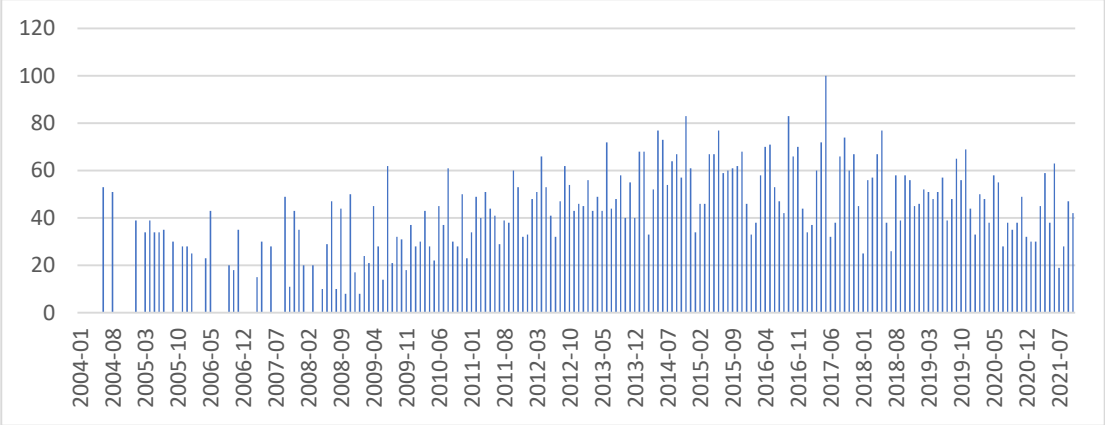


Source: Compiled by authors via Google Books Ngram: http://surl.li/bbcid

Fig. 1. Frequencies of mention of the phrase “integrated reporting”, “non-financial reporting” in the Google Books database

The dynamics of user demand determined by Google Books Ngram Viewer (Fig. 1) indicates a positive trend of increasing the frequency of mentioning the phrase "integrated reporting" in the collections of published printed sources collected in the Google Books service. Thus, the number of mentions of the term "integrated reporting" since 2010 began to grow rapidly, due to the publication of the book Eccles R. G., Krzus M. P. "One report: Integrated reporting for a sustainable strategy" [6] which became the first conceptual research on integrated reporting and has 1338 citations (as at 01.01.2022).

Slightly different dynamics can be traced by the frequency of mentioning the query "integrated reporting" obtained from the results of user queries in the Internet reflected in the graph built by Google Trends (Fig. 2).



Source: Compiled by authors via Google trends: http://surl.li/bbcig

Fig. 2. Dynamics of the number of user requests for "integrated reporting"

Fig. 2 shows an active growth of user queries on the keywords "integrated reporting" since 2009 with the achievement of maximum frequencies during 2013-2018. This is due to the significant development of regulatory regulation of integrated reporting, which took place during this period, in particular, the establishment in 2013 of The International Integrated Reporting Framework (IIRF). Regarding the regional distribution of user queries based on Google trends analysis, the largest number of them were from such countries as Mauritius and South Africa, which indicates a significant development of integrated reporting in the African region.

The analysis of the publishing activity dynamics on integrated reporting was carried out based on Scopus, Web of Science and Google Scholar databases for 2016-2021 years (Table 2).

Table 2
Dynamics of publishing activity on integrated reporting on Scopus, Web of Science and Google Scholar databases for 2016–2021 years

Database	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Google Scholar	2130	2670	3010	2740	3770	3570
Scopus	58	83	98	116	142	144
Web of Science	60	93	98	142	128	116

Table 2 indicates the growth of scientific interest in the topic of integrated reporting due to the growing number of publications during the selected period. The total number of publications on integrated reporting in the Scopus and Web of Science databases as of 01.01.2022 was 841 and 785 publications, respectively. Dynamics in terms of 2016-2021 is presented in Fig. 3

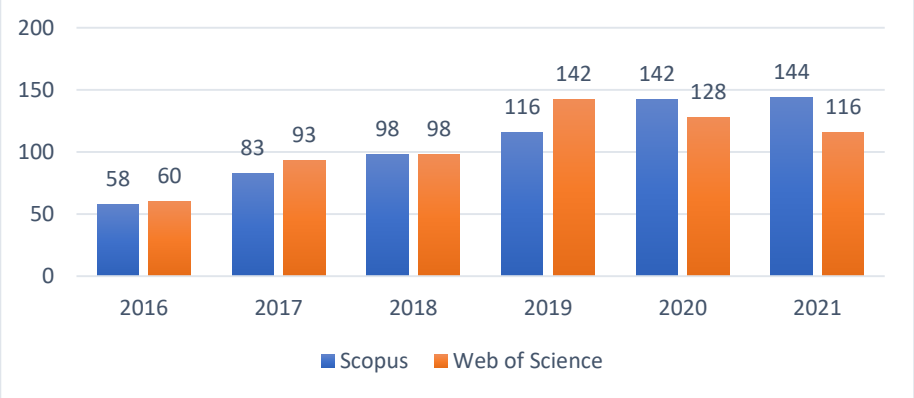


Fig. 3. Dynamics of publications on integrated reporting for 2016–2021 period according to Scopus and Web of Science databases

The total number of scientific papers on integrated reporting according to Google Scholar is about 27 thousand publications (as of 01.01.2022), which indicates a significant interest of scholars in this topic. At the same time, the publishing activity on the study of integrated reporting during 2016-2021, according to Google Scholar, is quite dynamic and has growing trends.

The next stage of analysis of the information and bibliometric landscape of publications on integrated reporting is the study of publishing activity in terms of the most cited authors, determining regional and chronological specifics of publications on selected topics.

For this purpose, publications were sorted by Scopus, Web of Science and Google Scholar databases (all publications as of 01.01.2022 without time lag) by keywords "integrated reporting" in titles, summaries and keywords. Through the inbuilt bibliographic analysis tools of the Scopus and Web of Science databases, as well as the Publish or Perish software (for the Google Scholar database), these publications were imported for further bibliometric analysis using VOSviewer.

In the table. 3 ranked the authors who studied integrated reporting by the amount of royalties.

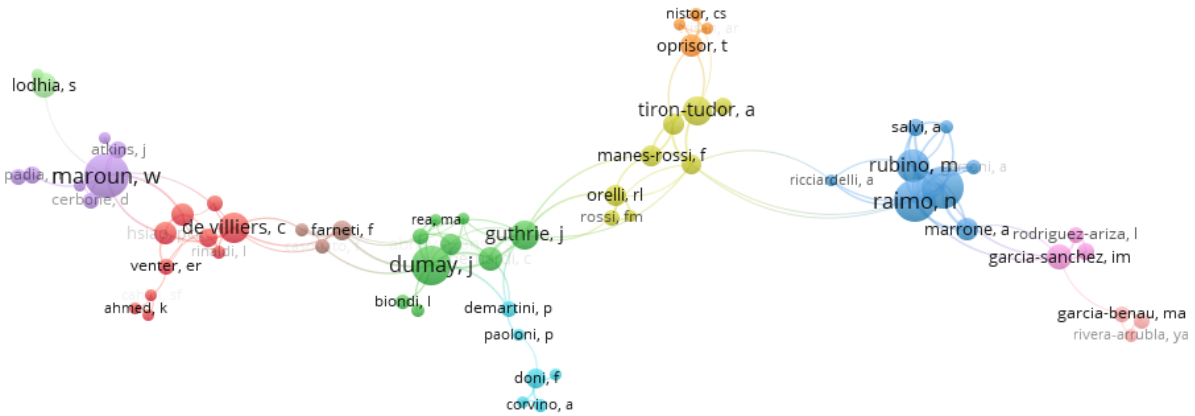
Table 3

Scholar's output on integrated reporting in Scopus, Web of Science and Google Scholar databases (as at 01.01.2022)

№	Google Scholar		Scopus		Web of Science	
	Author	Author output	Author	Author output	Author	Author output
1	Raimo N.	19	Maroun W.	26	Maroun W.	25
2	Maroun W.	18	Raimo N.	19	Raimo N.	19
3	Vitolla F.	17	Vitolla F.	19	Vitolla F.	19
4	Dumay J.	16	Dumay J.	18	Dumay J.	17
5	Villiers C. De	16	Villiers C. De	15	Villiers C. De	15
6	Eccles R. G.	14	Rubino M.	12	Rubino M.	12
7	Mio C.	11	Guthrie J.	10	Stacchezzini R.	12
8	Rubino M.	12	Stacchezzini R.	10	Dumitru M.	11
9	Tiron-Tudor A.	10	Mio C.	9	Lai A.	10
10	Kruz M. P.	10	Lai A.	8	Garcia-Sanchez I. M.	9

Source: Summarised by the authors via VOSviewer software

The data in Table 3 show that for all three analysed databases the greatest contribution to the study of integrated reporting was made by the following authors: Maroun W., Raimo N., Villiers C. De, Dumay J., Vitolla F. Based on the collected data was built bibliometric map of authors who are recognized leaders of scientific thought on integrated reporting (Fig. 4).



Source: Compiled by authors via VOSviewer software

Fig. 4. Bibliometric map of scholars according to Scopus, Web of Science and Google Scholar databases as of 01.01.2022

The construction of bibliometric maps allows to visualize the existing scientific schools and research networks affiliated with scientists with the greatest scientific output in the study of integrated reporting. Each author corresponds to a circle, the size of which indicates citation activity. The connection between the circles makes it possible to distinguish scientific schools formed by the relationship of joint citation. The analysis allows to state that the above-mentioned authors form the largest clusters, which characterizes the strength of their scientific contribution.

Table 4 key are presents clusters of scientific publications of Scopus, Web of Science and Google Scholar databases that form scientific schools for integrated reporting research.

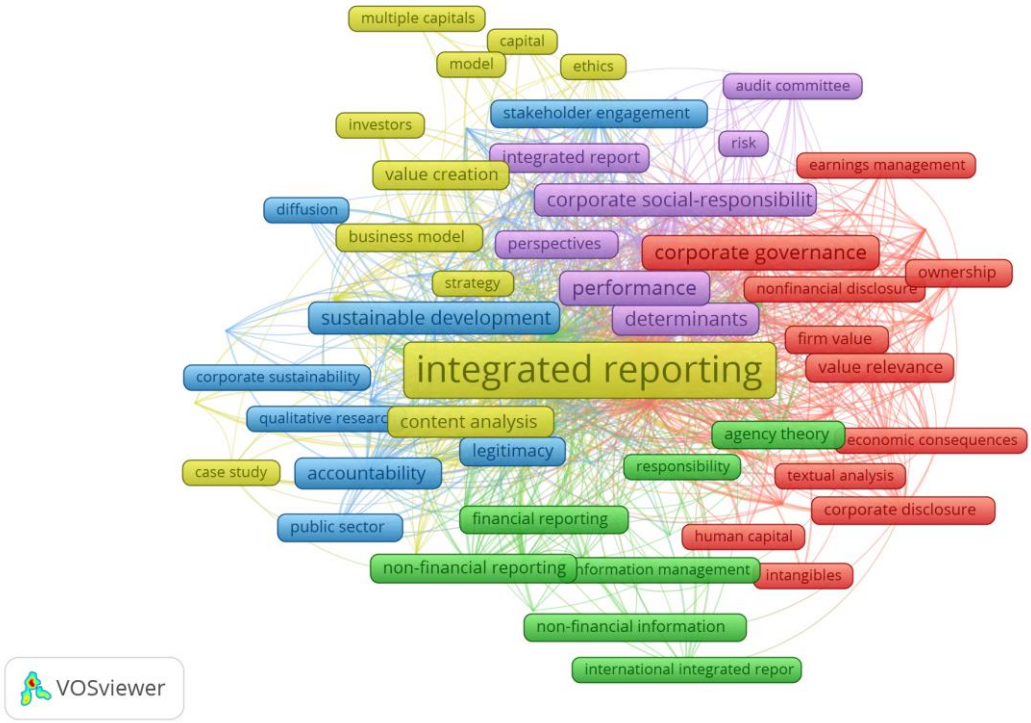
Table 4
Clusters of key authors studying integrated reporting (as at 01.01.2022)

№	Cluster	Key authors
1	Red	Villiers C. De, Unerman J., Hsiao PCK, Venter R., Rinaldi L.
2	Green	Dumay J., Guthrie J., Bernardi C.
3	Blue	Vitolla F., Raimo N., Rubino M., Marrone A.
4	Violet	Maroun W., Atkins J., Cerbone D.

Source: Compiled by authors via VOSviewer software

In order to systematize the thematic focus of publications on integrated reporting, it was conducted clustering of papers in terms of keywords. The bibliometric map of scientific publications of the Scopus and Web of Science databases on integrated reporting by keywords is shown in Fig. 5.

The frequency of using the key category "integrated reporting" is the highest and is 891 times, followed by the term "sustainability" (269) and "disclosure" (152).



Source: Compiled by authors via VOSviewer software

Fig. 5. Bibliometric map of scientific publications of Scopus databases, Web of Science on the study of integrated reporting by keywords (as at 01.01.2022)

Clustering of scientific publications of the Scopus database, Web of Science on the study of integrated reporting by keywords shows that they are represented by five clusters (Table 5).

Table 5
Clusters of scientific publications in the Scopus, Web of Science database on integrated reporting by keywords (as at 01.01.2022 in descending order of influence)

№	Cluster	Key words
1	Red	Corporate reporting, voluntary disclosure, corporate disclosure, board of directors, investor protection, firm value, determinants, accounting information, economic implications, etc.
2	Green	Sustainability reporting, non-financial reporting, financial reporting, environmental reporting, non-financial information, etc.
3	Bleu	Sustainable development, Sustainable development goals, accountability, materiality, stakeholders, etc.
4	Yellow	Integrated reporting, integrated approach, multiple capitals, stakeholder theory, institutional theory, value creation, ethics, etc.
5	Violet	Corporate social responsibility, efficiency, confidence, audit committee, integrated reporting quality, risks, etc.

Source: Compiled by authors via VOSviewer software

Clustering of scientific publications by keywords allows to track the most relevant areas of research on selected topics. Thus, the keywords in the context of the first cluster ("red") indicate the importance of integrated reporting in terms of corporate reporting as a means of presenting accounting information to protect the interests of investors, value formation etc. The second largest "green" cluster indicates the relationship of integrated reporting with other types of reporting: sustainable, non-financial, financial, and environmental reporting. The "blue" cluster tracks the importance of integrated reporting in terms of achieving the Sustainable Development Goals and engaging with a wide range of stakeholders. The "yellow" cluster includes publications on integrated reporting as a direct object of scientific research, as evidenced by such keywords as an integrated approach, multiple capitals, value creation, etc. The last "purple" cluster indicates the existence of a separate area of publications devoted to the study of the integrated reporting quality, in particular by confirming the results by the audit.

For the purpose of the comprehensive analysis scientific research tendencies in integrated reporting it is expedient to consider it from the regional aspect. The results of the distribution of publications on a regional basis are systematized in table 6.

Table 6

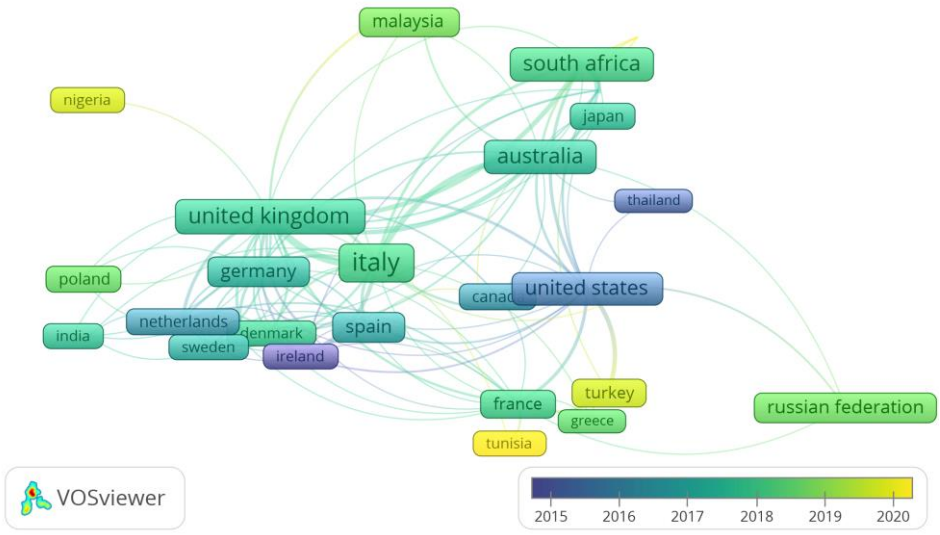
Regional distribution of publishing activity on the query "integrated reporting" in Scopus and Web of Science database as at 01.01.2022

Scopus				Web of Science			
№	Country/ region	Author output	%	№	Country/ region	Author output	%
1	Italy	157	18,7	1	Italy	137	17,5
2	Great Britain	99	11,8	2	South Africa	84	10,7
3	South Africa	89	10,6	3	Australia	82	10,5
4	Australia	88	10,5	4	Great Britain	79	10,1
5	USA	69	8,2	5	Romania	68	8,7
…				…			
17	Ukraine	14	1,6	14	Ukraine	20	2,6
Total		841	100	Total		785	100

Source: Compiled by the author using the inbuilt tools of bibliographic analysis of the Scopus and Web of Science databases

Table 6 shows that the greatest contribution to the study of integrated reporting was made by Italian scientists, whose share of author output is at about 18% according to the analysis of both databases. Among other countries there are South Africa, Australia, Great Britain. The author output of domestic scientists in the study of integrated reporting on the analysis of Scopus and Web of Science databases ranks 17th and 14th places respectively, which indicates an insufficient development of theoretical issues in the domestic scientific landscape and necessitates further research in this area.

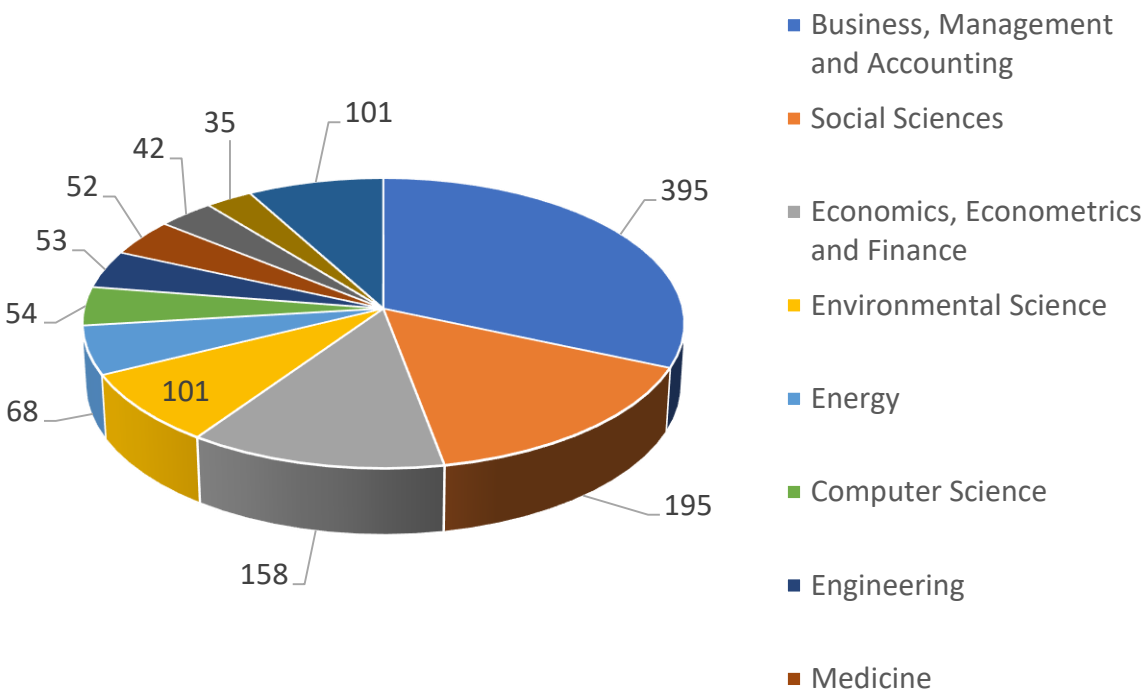
The bibliometric map of publishing activity according to the regional-chronological distribution of Scopus database publications (Fig. 6) confirms the above-mentioned theses concerning the leading countries. In terms of chronological perspective, most scientific publications in these countries were made during 2017–2019, while in recent years this topic has become more active in the scientific focus of such countries as Nigeria, Turkey, Tunisia.



Source: Compiled by authors via VOSviewer software

Fig. 6. Bibliometric map by regional and chronological distribution of Scopus database publications on integrated reporting (as at 01.01.2022)

The next step is the analysis of publications on integrated reporting in terms of subject areas. Fig. 7 shows the structure of publications in the Scopus database that were systematized using SciVal software.

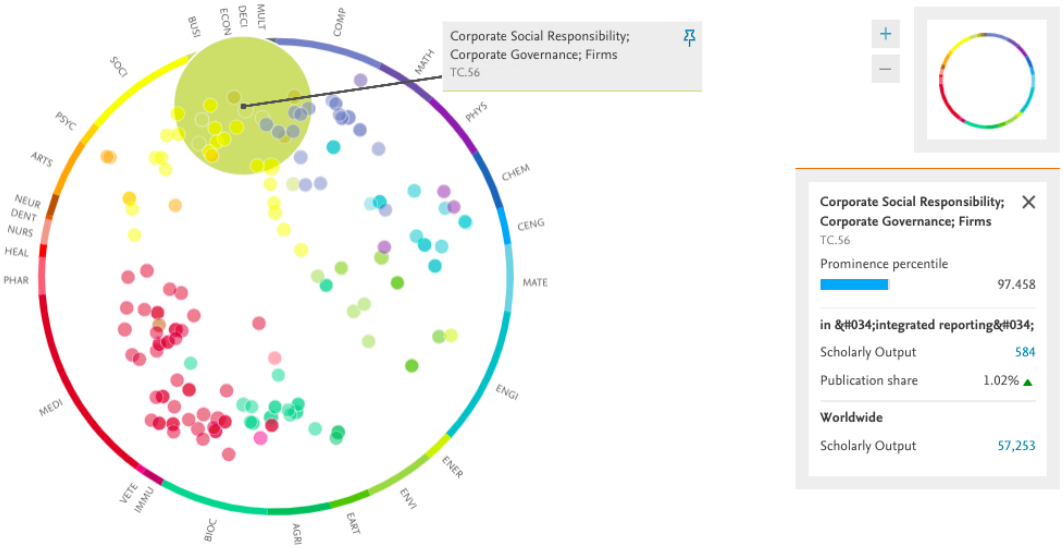


Source: Compiled by authors via SciVal

Fig. 7. Subject areas of publications on integrated reporting in the Scopus database for 2016–2021 period

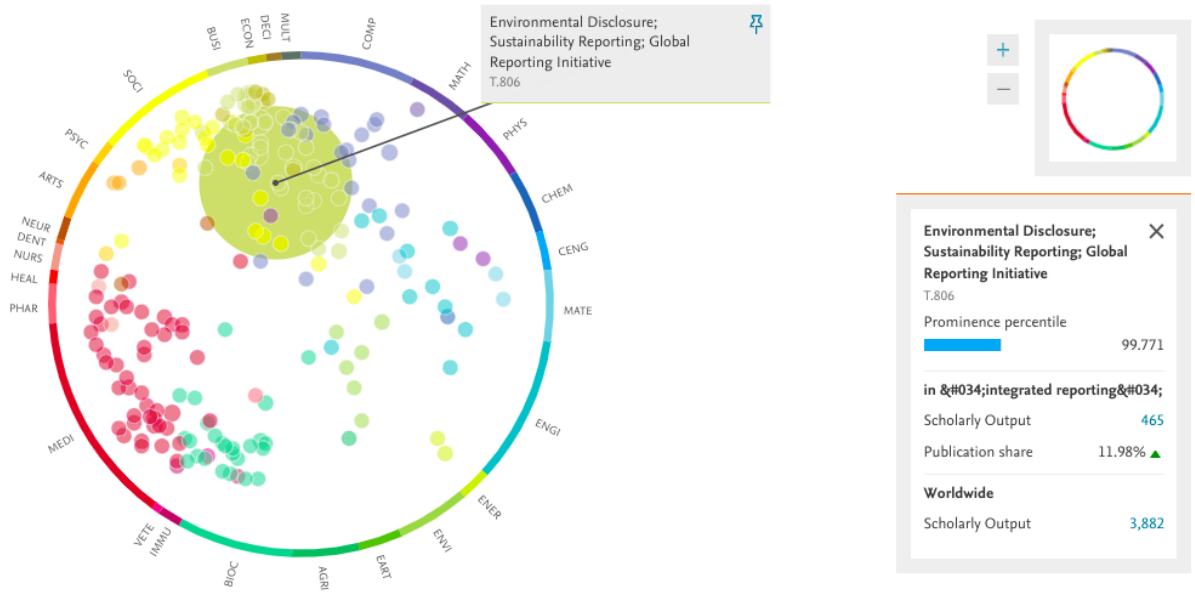
Thus, the largest share (32%) of publications belongs to the subject area "Business, Management and Accounting". Other areas include environmental science, energy, computer science, mechanical engineering, and medicine. The results of the analysis show the attention of scientists to integrated reporting as a means of providing information within the defined areas. This gives grounds to assert the need for further development of scientific, theoretical, methodological, and practical aspects of integrated reporting in areas that have the greatest impact on the environment (eg, mining, energy, engineering) and industries with growing public interest (medicine / health care).

Analysis of Scopus database publications by means of SciVal software for the query "integrated reporting" in terms of thematic clusters and topics includes 135 thematic clusters (Fig. 8) and 209 topics. (Fig. 9).



Source: Compiled by authors via SciVal

Fig. 8. Thematic clusters on the query "integrated reporting" based on the analysis of publications of the Scopus database for the period 2016–2021



Source: Compiled by authors via SciVal

Fig. 9. Topics on the query "integrated reporting" based on the analysis of Scopus database publications for the period 2016–2021

Decryption of subject areas abbreviations *

COMP	Computer Science	MEDI	Medicine
MATH	Mathematics	PHAR	Pharmacology, Toxicology and Pharmaceutics
PHYS	Physics and Astronomy	HEAL	Health Professions
CHEM	Chemistry	NURS	Nursing
CENG	Chemical Engineering	DENT	Dentistry
MATE	Materials Science	NEUR	Neuroscience
ENGI	Engineering	ARTS	Arts and Humanities
ENER	Energy	PSYC	Psychology
ENVI	Environmental Science	SOCI	Social Sciences
EART	Earth and Planetary Sciences	BUSI	Business, Management and Accounting
AGRI	Agricultural and Biological Sciences	ECON	Economics, Econometrics and Finance
BIOC	Biochemistry, Genetics and Molecular Biology	DECI	Decision Sciences
IMMU	Immunology and Microbiology	MULT	Multidisciplinary
VETE	Veterinary		

The size of the circle determines the degree of development of the outlined topic (or thematic cluster) by the share of author's output, and the number of circles determines the number of outlined topics and thematic clusters.

The presented visualization of the results shows that the largest thematic cluster of publications on integrated reporting is "Corporate social responsibility; Corporative management". This confirms the thesis that integrated reporting is an important tool for corporate social responsibility.

The bibliometric map of topics for the query "integrated reporting" shows that this concept is most studied in the topic "Disclosure of information on environmental impact; Sustainability reporting; Global Reporting Initiative".

6. Concluding remarks

According to the results, the largest number of topics and thematic clusters belongs to the following subject areas: environmental science; social sciences; computer science; engineering; biochemistry, genetics and molecular biology; medicine. The last two subject areas demonstrate the relevance of integrated reporting research in health care sphere. However, despite the large number of topics and thematic clusters in these subject areas, the size of the circles confirms the insufficient author's output to the development of research in these thematic areas, which necessitates further development of scientific research on integrated reporting, in particular, in the field of health care.

Thus, bibliometric analysis provides a wide range of means to identify the general tendencies and thematic preferences of the existing publications; available scientific schools; the most cited authors on the chosen subject; chronological and regional specifics of publishing activity on integrated reporting; guidelines for further research in the field of integrated reporting.

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