

TAXONOMY OF FINANCIAL REPORTING IN THE CONTEXT OF DIGITALIZATION OF THE ECONOMY: DOMESTIC AND INTERNATIONAL ANALYSIS SCIENTIFIC RESEARCH

Oleh S. Vysochan*

Department of Accounting and Analysis, Lviv Lviv Polytechnic National University, Ukraine
E-mail: oleh.s.vysochan@lpnu.ua

Vasyl Hyk

Department of Accounting and Analysis, Lviv Lviv Polytechnic National University, Ukraine
E-mail: vasyl.v.hyk@lpnu.ua

Nataliya Mykytyuk

Department of Accounting and Analysis, Lviv Lviv Polytechnic National University, Ukraine
E-mail: nataliia.o.mykytyuk@lpnu.ua

Olha O. Vysochan

Department of Accounting and Analysis, Lviv Lviv Polytechnic National University, Ukraine
E-mail: olha.o.vysochan@lpnu.ua

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Abstract: A clear manifestation of the technological revolution 4.0 in the context of digitalization of the economy is the use of digital, electronic, or IT-oriented versions of financial reporting. Today, the harmonization of national accounting systems and the formation of financial statements around the world is carried out through the implementation of International Financial Reporting Standards by moving to the preparation of financial statements in a single electronic format – eXtensible Business Reporting Language (XBRL). The introduction of a new financial reporting system in XBRL format requires appropriate understanding and some practical adaptation. At the same time, the study of the use of the concept of “taxonomy financial reporting” in scientific works remains insufficiently developed. The article aims to study the quantitative and qualitative structure of the documentary flow of scientific periodicals on the keywords “taxonomy financial reporting”. The method of bibliometric analysis was used to conduct the study. The source of the bibliometric analysis of the documentary flow of scientific periodicals are publications from

* Corresponding author: Oleh S. Vysochan. *E-mail:* oleh.s.vysochan@lpnu.ua

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the scientometric database Scopus in the period between 2001-2021. As a result of the selection, data were obtained on scientific articles that were exported for processing into the computer program R (bibliometrics package). According to the results of quantitative analysis, 156 publications were received, the vast majority of which were scientific articles. It was found that the main areas of research on the taxonomy of financial reporting are: taxonomies, XBRL, financial reporting, and administrative data processing. The largest clusters appear around these keywords. It has been established that scientific cooperation on this topic is becoming closer, which contributes to the formation of geographical clusters, the three largest of which are united around the United States, Italy and the United Kingdom.

Keywords: taxonomy financial reporting; taxonomies; digital economy; information technologies; bibliometric analysis.

JEL CODES: M40, M41, C38.

1. Introduction

The continuous development of IT in the financial world, as well as the improvement of financial reporting for issuers, have led to the standardization of international reporting based on taxonomy. According to international standards, the taxonomy should be considered as a methodological complex in the format of specifications XBRL (eXtensible Business Reporting Language), which is the world's most common open standard for the exchange of financial information. The first users of XBRL reporting were US and EU regulators, which led to the spread of this standard worldwide. However, despite standardization, different countries are introducing their taxonomy format, ranging from translation into the state language and national characteristics for companies for which XBRL reporting is mandatory (Shishkov, 2021).

The XBRL taxonomy is developed by the international consortium XBRL International, which was founded in 1998 with the assistance of the American Institute of Certified Public Accountants and brings together more than 600 public and private organizations. It includes representatives of 23 countries (Belgium, Canada, China, Denmark, Finland, France, Germany, India, Ireland, Italy, Japan, Korea, Luxembourg, Netherlands, Russia, Africa, Spain, Sweden, Switzerland, Turkey, UAE, UK, USA), as well as the IFRS Committee.

The article is structured as follows: Section 2. The literature review describes the international and domestic experience in implementing the taxonomy of financial reporting and briefly describes previous bibliometric research related to this issue. Section 3 describes the methods used in this study, including bibliographic network analysis, clustering of k-means technology, modeling of interrelated topics, and analysis of historiographical citations. The results of the study are presented in

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Section 4, firstly, by showing and analyzing the evolution of topics in the study of the taxonomy of financial reporting, and secondly, by considering this issue based on qualitative analysis. The results are then summarized in the conclusions (section 5).

2. Literature review

2.1. The historical digression of the emergence of the taxonomy of financial reporting in the world and prospects for its implementation in Ukraine

The first international taxonomy XBRL US GAAP was developed in 2000 for commercial organizations and recommended by the US regulatory authority for financial reporting. The XBRL taxonomy for IFRS was developed in 2006. Morgan Stanley Dean Witter & Co, an international investment bank, was the first public company in the world to switch to XBRL financial reporting in 2000. Currently, the largest users of XBRL are the United States and the European Union. In the United States, for example, XBRL introduced the introduction of the EDGAR (Electronic Data Gathering, Analysis and Retrieval System) in 1993 by the Securities and Stock Market Commission. This system allowed investors to easily find all the information about the issuer on the Commission's website in the form of PDF files and greatly simplified its analysis. In 2009, to improve the procedure for analyzing the financial condition of taxpayers, the Commission announced the replacement of the EDGAR system with specialized software for electronic audit IDEA, based on XBRL. Initially, reporting in XBRL format was mandatory only for large taxpayers, and since 2012, for all others.

In 2001, the Australian Prudential Regulatory Authority and Japan, the National Security Agency and the Japan National Tax Agency, decided to introduce the XBRL format as a basis for preparing financial statements. In 2004, the stock exchanges of China, Singapore, Japan and South Korea identified XBRL as the financial reporting standard.

To date, more than 50 foreign organizations have implemented XBRL reporting for both internal exchange and financial reporting to supervisors, namely: national banks and supervisors (Austria, Belgium, Germany, Spain, France, India, Japan, Lithuania, Poland, South Korea, Luxembourg); fiscal authorities (Germany, Japan, Netherlands, Great Britain); Ministries of Finance and Treasury (Belgium, China, Spain, Singapore); stock exchanges (Belgium, China, Germany, Spain, India, Iran, Japan, South Korea, Poland) (Umantsiv and Polovyk, 2020).

Define the following basic conditions for submitting financial statements in XBRL format: 1) voluntary application (Sweden, Switzerland); 2) mandatory application (Canada, France, Germany, Italy, Japan, USA, Israel, Poland, Spain, etc.); 3) mandatory application subject to IFRS reporting (Australia, UK, Belgium); 4)

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mandatory application subject to IFRS reporting and the provision of an independent audit opinion (China, India, Denmark, Netherlands).

The works of many foreign scholars, including, in particular, Bonsón E., Chang C.J., Cortijo V., Debreceny R., d'Eri A., Farewell S.M., Gray G., Escobar T., Li S., Felden C., Gräning A., Janvrin D.J., No W.G., Nwaeze E.T., Peng J., Piechocki M., Rea A.M., Valentinetti D., Wu H., Zhu H. and others are devoted to the study of the preconditions and problems of XBRL implementation, including the impact on information disclosure systems in global financial markets.

Thus, Debreceny and Gray (2001) note that the widespread use of XBRL would mean that both accountants and agents could work with financial information disseminated on the Internet with a high degree of accuracy and reliability. The same view is shared by Hoffman and Egmond (2016), who note that digital financial reporting will change accounting practices in the coming years, and changes will be in data technologies, and accountants have no choice but to adapt to such changes using necessary, available methods and resources, and digital financial reporting is a new paradigm of financial reporting in the information society.

Valentinetti and Rea (2012) studied the taxonomy of IFRS and the practice of financial reporting on the example of Italian companies listed on the stock exchange. Researchers emphasize that the XBRL taxonomy plays a crucial role in digital financial reporting. Bonsón, et al. (2009) explored ways to implement XBRL globally using International Financial Reporting Standards (IFRS).

Significant attention to international experience, prospects and problems of implementation of financial reporting in Ukraine based on taxonomy was paid by domestic researchers: Boyko R.V., Gorodisky M.P., Grabchuk I.L., Kalitenko D.O., Malyshkin O., Polovyk E.V., Shulyarenko S., Solovyov B.S., Umantsiv G.V., Vakun O.V., Voronko R.M., Yarmolitska O. and others.

Thus, in particular, Malyshkin et al. (2020) write that the XBRL standard is widely recognized among the international business community and has many advantages in compiling and presenting financial statements in a "single window" format, which has become mandatory for some Ukrainian enterprises – public interest entities.

Kalitenko (2018), Vysochan et al. (2021a) believe that the result of the introduction of the taxonomy of financial reporting (a new technology for collecting and processing reports in electronic format XBRL) will ensure the proper preparation of financial statements, and facilitate the process of processing and analysis of information.

Umantsiv and Polovyk (2020) studied the implementation methodology and summarized the problems of reporting in XBRL format in Ukraine using world experience. Boyko and Voronko (2020) investigated the technology of presenting financial statements using the XBRL taxonomy. Vakun et al. (2020) studied the

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importance of XBRL in the processing of business information in the globalization of the world economy.

Implementing taxonomy-based financial reporting in XBRL format in Ukraine is a truly complex public task (Vysochan et al., 2021d). It should be noted that the task of implementing taxonomy-based reporting in XBRL format was provided in the Comprehensive Financial Sector Development Program until 2020 approved in 2015. In 2016, the EU received technical assistance to support and establish the UA IFRS Taxonomy of Ukraine. USAID joined the project. In 2017, amendments were made to the Law of Ukraine "On Accounting and Financial Reporting in Ukraine", which entered into force on January 1, 2018, and provided that certain categories of Ukrainian companies must prepare and submit financial statements based on taxonomy according to international standards in a single electronic format. The entry into force of this requirement has been postponed several times, but even now there are many questions about the ability of Ukrainian companies to generate, audit and submit financial statements through the Financial Reporting System established with the assistance of international donors.

In the scientific literature, there are several stages of implementation of the taxonomy of IFRS in Ukraine (Table 1).

Table 1 Stages of IFRS taxonomy implementation in Ukraine

Stage number	Year	Characteristic
1	2015 - 2016	1. The translation has been approved on the IFRS website. 2. Work has begun on the General Ukrainian Taxonomy of IFRS. 3. Implementation of the European Union project "Technical Assistance in Priority Areas of the Financial Sector", which will enable the regulator of non-banking financial services markets to introduce financial reporting standards according to XBRL taxonomies, which is the language of financial reporting for data used in Europe. Commission for State Regulation of Financial Services Markets, Order "On Approval of the Report on Implementation of the Work Plan for the Implementation of the European Union Project "Technical Assistance in Priority Areas of the EU-FINSTAR Financial Sector for 2015" of January 21, 2016, № 160).
2	2017	1. The translation of the 2017 IFRS fund has been approved 2. Work has begun on extensions for general taxonomy, for banks, for insurers. 3. General taxonomy testing was performed. 4. The emergence in the Law of Ukraine "On Accounting and Financial Reporting in Ukraine" of the concept of "taxonomy of financial reporting".

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		5. Memorandum № 102/15 dated 18.12.2017 "On mutual understanding on the development and implementation of the financial reporting system" was signed between financial sector regulators on the implementation of a single financial reporting system (Ministry of Finance of Ukraine, National Bank of Ukraine, National Securities Commission and stock market, National Commission for State Regulation of Financial Services Markets)
3	2018	1. Published versions of the General Ukrainian Taxonomy of IFRS and extended versions for banks and insurers (Order of the Ministry of Finance of Ukraine "On approval of the translation of the Taxonomy of Financial Statements according to International Financial Reporting Standards" № 983 of 07.12.2018). 2. Clarification on preparation and submission of financial statements based on taxonomy in a single electronic format by banks, Letter from the National Bank of Ukraine "Clarification on preparation and submission by banks of financial statements based on taxonomy in a single electronic format" dated 29.12.2018 № R / 60-0006 / 69684
4	2019	1. Approval of the translation of the Taxonomy of Financial Statements according to International Financial Reporting Standards (Order of the Ministry of Finance of Ukraine № 452 of October 25, 2019 "On Approval of the Translation of the Taxonomy of Financial Statements according to International Financial Reporting Standards"). 2. Provision of financing the taxonomy of financial reporting in the state budget for 2020 under budget program 6151050 "Operation of the center for collecting financial statements based on taxonomy according to international financial reporting standards in a single electronic format" (Law of Ukraine "On State Budget of Ukraine for 2020" from 14.11.2019 № 294-IX). 3. Approval of the taxonomy of financial reporting UA XBRL IFRS 2019 (National Commission on Securities and Stock Market, decision № 807 of 27.12.2019 "On approval of the taxonomy of financial reporting UA XBRL IFRS 2019")
5	2020	1. Approval of the procedure for using funds provided in the state budget for the operation of the center for collecting financial statements based on taxonomy according to international financial reporting standards in a single electronic format (National Commission on Securities and Stock Market, Order № 65 of 17.06.2020)

Source: Generalized on the basis of: Bezverkhyi (2020), Boyko and Voronko (2020), Hyk et al. (2021), Siryk et al. (2021)

It is clear that in parallel with the transitional stages of the introduction of taxonomy, Ukrainian scholars are increasingly researching international experience and the

expected benefits of taxonomy for capital market participants, options for IT adaptation of companies to such changes.

Thus, despite the rapid development of the process of the taxonomy of financial reporting today, insufficient attention is paid to the need for a systematic approach to the study of problems and the study of complex general theoretical principles of its construction.

2.2. Overview and delimitation with respect to previous reviews of literature

Today, the number of studies related to the taxonomy of financial reporting using the bibliometric method is quite insignificant and they have different directions. Thus, Ahmi and Mohd Herry (2019) reviewed published documents related to XBRL, based on data obtained from the Scopus database. A total of 370 documents were found and analyzed by scientists.

Erkus and Chiu (2014) conducted a study of eXtensible Business Reporting Language (XBRL) over the last decade using bibliometric analysis. Compared to other reviews in this article, a relatively small sample of 49 academic articles was used. Uyob et al. (2019) also described a relatively small sample of 46 XBRL-related articles that were removed from the Scopus and Google Scholar databases. Ansary and Oubrich (2016) based on the study of 113 scientific articles conclude that there is an evolution of publications in more than 60 countries.

Bartolacci et al. (2021) conducted a systematic review of the literature and bibliometric analysis of 142 articles, which identified 5 main areas of research. Their research differs from previous ones in that it offers a unique methodology – a combination of a bibliometric and systematic review.

Current trends and different characteristics of global XBRL studies using bibliometric analysis were conducted by Amirul et al. (2021). Researchers analyzed a total of 621 documents from the Scopus database and identified six major research clusters related to XBRL.

This study differs from previous bibliometric work primarily in volume and methods used. The time limits are chosen to be much broader and cover the current twenty-year period – from 2001 to 2021. This paper uses an approach of mixed methods, which provided a systematic quantitative and qualitative understanding of the role of the taxonomy of financial reporting in digitalization. Another important difference between the study and previous ones is the purification of the data set used in the analysis. This was done to obtain the best data quality and to ensure appropriate consistency during the analysis. To do this, duplicate documents were removed, keywords were deleted, and citations, copyright, and work-related metadata were homogenized throughout the dataset.

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Thus, this study aims to (1) expand previous qualitative research on the taxonomy of financial reporting and (2) provide a current understanding of the evolution and state of research in general through several new methods.

With this in mind, the article aims to investigate the conceptual significance of the taxonomy of financial reporting based on bibliometric analysis and visualization of the results.

To address this goal, we have formed the following questions:

RQ 1: What is the total number of publications on the taxonomy of financial reporting available in the Scopus scientometric database?

RQ 2: What keywords are most often used in conjunction with the taxonomy of financial reporting?

RQ 3: Which articles and authors have the highest citation index on the taxonomy of financial reporting?

RQ 4: What is the cooperation between countries on the taxonomy of financial reporting?

3. Methodology

Research on the taxonomy of financial reporting in the context of digitalization requires the use of numerous common and specific methods. Theoretical analysis of the basics of the concept is usually carried out using conceptual-categorical, decompositional and terminological analysis. Research methods such as selection, bibliographic characteristics, grouping and systematic content analysis of scientific publications were used. Cluster analysis was also used to divide a given sample of objects (situations) into subsets called clusters so that each cluster consisted of similar objects and the objects of different clusters differed significantly (Vysochan et al., 2021b).

In our opinion, it is advisable to use bibliometric analysis to better substantiate the research problem. This method is used, firstly, to analyze the effectiveness of research, and secondly, to map research (Hyk, 2021). The effectiveness of scientific work is aimed at evaluating the results of research and publications on individual keywords, authors, countries and sources (journals). Mapping is aimed at determining the structure and dynamics of scientific areas of research.

Bibliometric analysis is based on data that is usually formed using generally accepted international scientific databases. The most common to date for economic and social research is Scopus Elsevier, which was used in the work. The search query was made in February 2022, using the English term "taxonomy financial reporting" in the title, annotations and keywords. Accordingly, the following parameters (filters) were given in the database, given in table 2.

Table 2 Stages of information selection in Scopus

Search Steps	Query in Scopus	Description
1	TITLE-ABS-KEY	("taxonomy AND financial AND reporting")
2	OR LIMIT-TO PUBYEAR	(">= 2001 to <= 2021")

The resulting data was downloaded to the computer program R (bibliometrix package). Bibliometrix is a tool for quantitative research in scientometrics and bibliometrics, which includes all the main bibliometric methods of analysis (Aria and Cuccurullo, 2017).

4. Results

4.1. General characteristics of information

As a result of the content analysis for 2001-2021, 156 publications were found on the following types of documents: article – 98, conference paper – 32, conference review – 6, review – 12, book chapter – 7, short survey – 1. Generalized data on the number of publications are shown in Fig. 1.

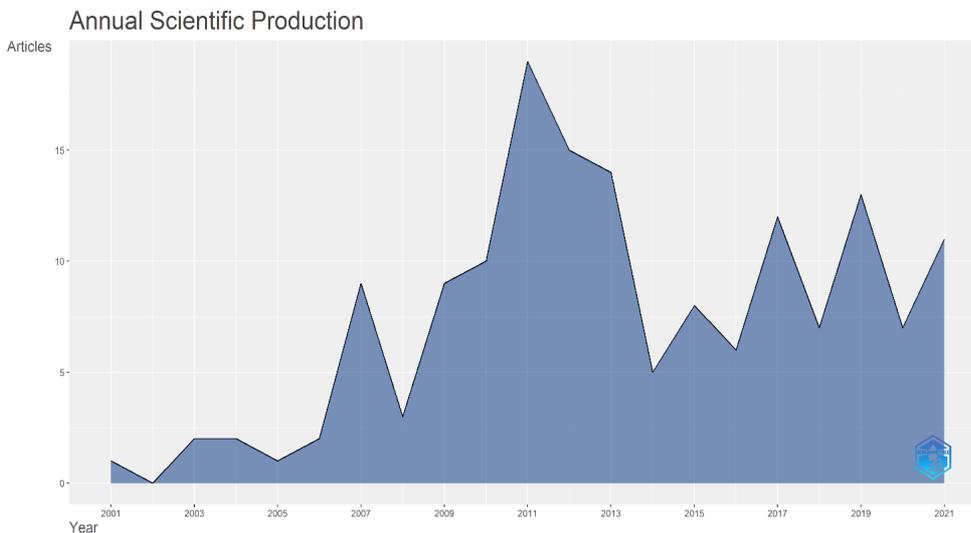


Figure 1 Number of publications by year
Source: formed by the authors using R software

From fig. 1 shows that the largest number of publications on the taxonomy of financial reporting was observed during 2011 (n = 19), 2012 (n = 15) and 2013 (n =

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14). Despite the decline in demand dynamics since 2013, the trend has remained stable in recent years. The scientific interest in this problem has not diminished over the last five years, as evidenced by the total number of publications (n = 50). To understand the current situation, we provide general information about the results of the study, which is given in table 3.

Table 3 General information obtained on request

Description	Results
Timespan	2001:2021
Sources	113
Documents	156
Author's Keywords	522
Average citations per documents	17.94
Authors	357
Author Appearances	429
Authors of single-authored documents	26
Authors of multi-authored documents	331
Single-authored documents	31
Documents per Author	0.261
Authors per Document	2.29
Co-Authors per Documents	2.75
Collaboration Index	2.65

Source: formed by the authors using R software

After analyzing table 3 established that on the topic of the taxonomy of financial statements for the period 2001-2021, 357 authors were mentioned 429 times. In total, the authors published 156 publications in 113 different types of documents (journals, conference proceedings, book chapters, etc.). The average citations per documents ratio was quite high, which was 17.94. A large number of publications have been co-authored by several authors (92.71%). The relative indicators of the number of authors per publication (2.29) and the number of co-authors per publication (2.75) are moderate. An important relative indicator for bibliometric analysis is the value of the Collaboration Index, which in our study was 2.65 and indicates a low level of cooperation.

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4.2. Analysis of the most common words in the documents

Quantitative analysis by keywords makes it possible to identify current issues and requests of scientists. The results of the obtained data on the frequency of use of keywords by authors in all publications are shown in fig. 2.

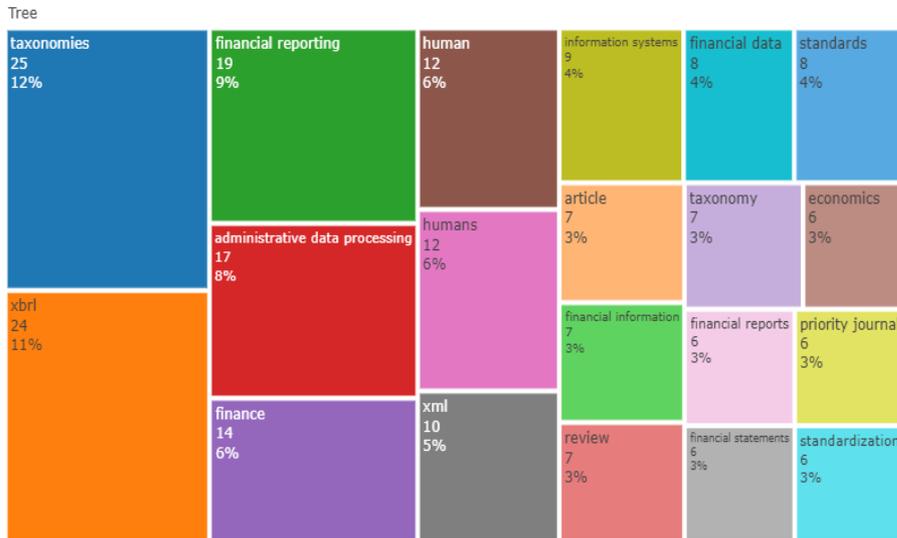


Figure 2 Frequency of using keywords in documents (top-20)

Source: formed by the authors using R software

According to the data obtained, the most researched articles on the taxonomy of financial reporting are problematic issues of IFRS financial reporting in electronic format iXBRL, the impact of “human factor” on reporting, information systems, automated data entry and software language based on XML.

Important for content analysis is the frequency of keyword use, which allows you to identify trending topics over the years. The frequency of use of keywords in terms of years is shown in fig. 3.

To establish trends in this topic for the analyzed period, we used the selection of keywords by filter – Word Minimum Frequency = 5, N. of Words per Year = 5. As a result of using these criteria, it was noticed that research topics such as taxonomies, XBRL, financial reporting, administrative data processing were of the greatest scientific interest among researchers. It has also been established that in recent years, problematic issues related to the terms taxonomy, cost-benefit analysis and financial

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information have been actively studied.

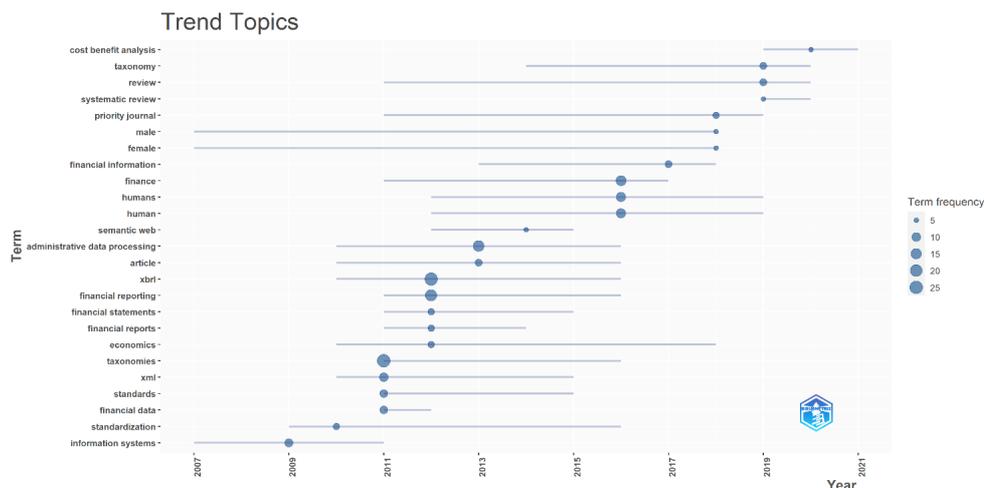


Figure 3 Trend Topic on the taxonomy of financial reporting

Source: formed by the authors using R software

4.3. The results of the analysis by the authors

One of the qualitative criteria of a scientific article is the number of citations. The most cited works of authors on this topic are given in table 4.

Table 4 Works of authors on the indicator Local and Global Citations (top-10)

Document	Article title	Local Citation (LC)	Global Citation (GC)	GC/LC ratio (%)
Debreceňy and Gray (2001)	The production and use of semantically rich accounting reports on the Internet: XML and XBRL	18	163	11.04
Debreceňy et al. (2006)	Flex or Break? Extensions in XBRL disclosures to the SEC	13	70	18.57
Bons3n et al. (2009)	Towards the global adoption of XBRL using International Financial Reporting Standards (IFRS)	7	69	10.14

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Li and Nwaeze (2015)	The association between extensions in XBRL disclosures and the financial information environment	4	25	16.00
Janvrin and No (2012)	XBRL Implementation: a field investigation to identify research opportunities	4	38	10.53
Valentinetti and Rea (2012)	IFRS Taxonomy and financial reporting practices: The case of Italian listed companies	4	27	14.81
Zhu and Wu (2011)	Quality of data standards: framework and illustration using XBRL taxonomy and instances	4	40	10.00
Zhu and Wu (2014)	Assessing the quality of large-scale data standards: A case of XBRL GAAP Taxonomy	3	20	15.00
Valentinetti and Rea (2011)	Adopting XBRL in Italy: Early evidence of fit between Italian GAAP Taxonomy and current reporting practices of non-listed companies	3	17	17.65
Peng and Chang (2010)	Applying XBRL in an accounting information system design using the REA approach: an instructional case	3	11	27.27

Source: formed by the authors using R software

Table 4 shows that according to Local Citation (LC) and Global Citation (GC) the first two positions are occupied by the works of prof. Roger S. Debreceeny of Shidler College of Business (Honolulu, United States). Also, two other documents characterize the authors who have in their work two publications – Diego Valentinetti in collaboration with Michele A. Rea (University of G. d'Annunzio Chieti and Pescara, Chieti, Italy) and Hongwei Zhu (University of Massachusetts Lowell, Lowell, United States) in collaboration with Harris David Wu (Old Dominion University, Norfolk, United States). According to GC/LC (%), the most important (27.27) is the article by Jacob Peng (Robert Morris University, Pittsburgh, United States) in collaboration with C. Janie Chang (San Diego State University, San Diego, United States).

The analysis of the above works shows the high relevance of the taxonomy of financial reporting in the context of the digitalization of processes and the use of information technology.

Another key indicator that is widely used around the world is to evaluate the work of researchers and research teams in the citation index. The values of the impact

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factor (IF) of the authors on the subject are given in table 5.

Table 5 Impact Factors of Top 10 Authors

Author	h-index	g-index	m-index	Total Citation	Number of Publications	Publication Year
Debreceeny R.	5	5	0.227	237	5	2001
Bonsón E.	3	5	0.214	148	5	2009
Felden C.	3	3	0.188	106	3	2007
Gräning A.	3	3	0.188	106	3	2007
Piechocki M.	3	3	0.188	106	3	2007
Rea M.A.	3	3	0.250	53	3	2011
Valentinetti D.	3	3	0.250	53	3	2011
Wu H.	3	4	0.231	74	4	2010
Zhu H.	3	4	0.231	74	4	2010
Babb J.S.	2	2	0.167	6	2	2011

Source: formed by the authors using R software

It should be noted that all these publications were published relatively long between 2001 and 2011 and managed to get a large number of citations. As can be seen from table 5 the most cited authors for the values of h-index = 5 and total citation = 237 are prof. Roger S. Debreceeny. A slightly smaller number of citations (n = 148) can be traced to Enrique Bonsón (Professor of Accounting at the University of Huelva, Spain). The next 3 authors – Carsten Felden (Technische Universität Bergakademie Freibergdisabled, Freiberg, Germany), André Gräning (Technische Universität Dresdendisabled, Dresden, Germany) and Maciej Piechocki (BearingPoint, Frankfurt am Main, Germany) – have absolutely enough in their work (n = 106).

4.4. Results of the analysis of cooperation between countries

The third stage is devoted to identifying trends and patterns in the publishing activities of scientists from different countries. For bibliometric analysis, the study of publications on the subject in different countries is of great importance. Generalized information on the results of publishing activity by country is given in table 6.

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Table 6 Number of Citations per Publication for Countries

Country	Total Citation	Average Article Citation	Articles	Single Country Publications	Multiple Country Publications	MCP Ratio
USA	614	25.58	24	20	4	0.167
Italy	273	39.00	7	4	3	0.429
United Kingdom	212	23.56	9	4	5	0.556
Spain	197	17.91	11	11	0	0.000
Singapore	163	163.00	1	0	1	1.000
Canada	60	20.00	3	3	0	0.000
Australia	47	7.83	6	3	3	0.500
Malaysia	45	22.50	2	1	1	0.500
Iran	25	25.00	1	1	0	0.000
China	21	2.10	10	10	0	0.000

Source: formed by the authors using R software

The data given in table 6 shows that the total number of citations with a gap of more than 2 times in the lead is USA (n = 614). Next in the ranking on this indicator are developed European countries – Italy (n = 273), the United Kingdom (n = 212) and Spain (n = 197). The number of publications was slightly different: 1) USA (n = 24), 2) Spain (n = 11) and China (n = 10). In Ukraine, according to the data obtained, the number of scientific papers in this field is insignificant – only one publication – Spilnyk, et al., 2020. The cooperation of authors from one or many countries is characterized by MCP Ratio, which was highest in Singapore (1,000), the United Kingdom (0.556), Australia (0.500) and Malaysia (0.500). For a better visual understanding, a network of cooperation in the geographical dimension is presented (Fig. 4).

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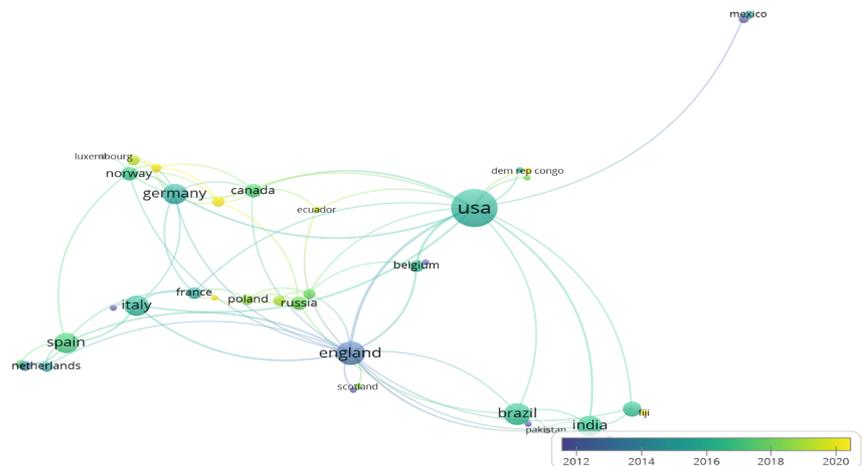


Figure 4 Visualization of the network of cooperation between countries on the taxonomy of financial reporting

Source: formed by the authors using R software

This map shows the frequency of publication activity of the country (size of the circle), the closeness of the links between them (the closer, the closer) and different variants of geographical combinations both within clusters and between them (Vysochan et al., 2021c). The obtained results allowed us to identify the largest clusters that unite key concepts by thematic proximity. From fig. 4 it is clear that the green cluster is dominated by the USA, and the blue – the United Kingdom (England).

Based on this, a country collaboration map was formed on this topic (setting the selection criterion - Min edges = 2) (Fig. 5).

Country Collaboration Map

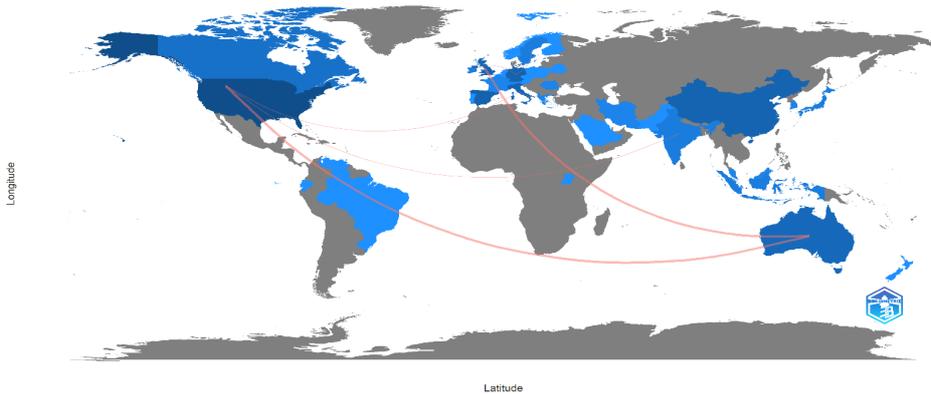


Figure 5 Map of cooperation between countries on the taxonomy of financial reporting

Source: formed by the authors using R software

From fig. 5 shows that cooperation between countries is mainly represented by English-speaking countries – the USA, the United Kingdom and Australia.

4.5. Sankey Diagrams: Three Field Plots

Sledge charts usually show the flow of data from one object (or node) to another. Charts are often used to visualize the analysis of material flows. The tripolar section in Biblioshiny is used to visually assess the relationship between sources, countries, affiliation, keywords, lead authors, cited sources, etc. (Kumar et al., 2021). The results of the analysis of the communication network between keywords, authors and journals in this field are shown in fig. 6.

In fig. 6 shows a rectangular diagram showing the relationship between the keyword (left), author (middle) and source (right). Scientists such as Wu H., Zhu H., Rea M.A. and Valentinetti D. mainly used the following keywords: XBRL, financial reporting, taxonomy, information and published in various types of documents: as in professional journals – Journal of Information System, International journal of digital accounting research, International Journal of Accounting Information System, and in conference proceedings – 18th American conference of information system (AMCIS-2012) and CEUR workshop proceedings.

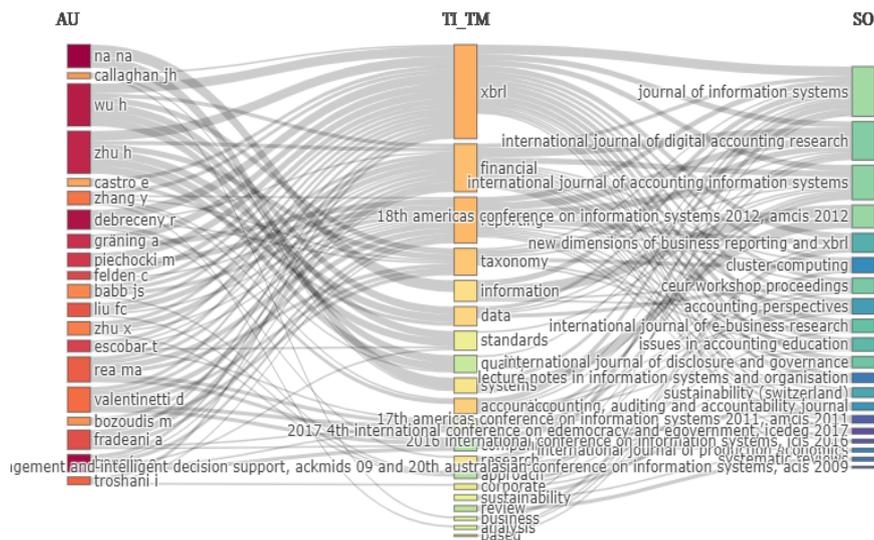


Figure 6 Three-fields plot (Titles – keywords – Cited sources)

Source: formed by the authors using R software

5. Conclusions

Summing up the study, the importance of bibliometric analysis should be emphasized. It allowed us to more fully identify the features of domestic and international experience in the development of a taxonomy of financial reporting to determine the temporal, geographical and other features. The paper mainly uses methods of quantitative analysis of documentary flow based on the international scientometric database Scopus from Elsevier. To do this, we analyzed the results of the search query “taxonomy of financial statements” for the period 2001-2021 using the computer program R (bibliometrics package).

As a result, there was an increase in scientific interest in the selected search query, which is manifested in an increase in the number of scientific papers, especially since 2010 and as of the end of 2021 amounted to 156 publications, of which articles predominated.

Elaboration of subject areas in the study of the taxonomy of financial reporting confirms the multidisciplinary nature of research that takes into account

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management, economic, communication and information areas. A more specific analysis of the most cited articles on this topic showed the emphasis of scientific attention on the taxonomy of financial reporting in the context of informatization and digitalization of the economy. According to the geographical structure of the authors who study the taxonomy of financial reporting, we should distinguish between English-speaking countries (United States, United Kingdom, Australia, Canada) and the European Union (Italy, Spain, Germany).

The use of the bibliometric method revealed the peculiarities of the quantitative dynamics of publications for the period, linguistic and authorial components, the number of individual and co-authored publications, thus demonstrating the possibilities of this method as a way to study the dynamic development of certain documentaries.

The study improves the understanding of the nature of the taxonomy of financial reporting, helps to identify strengths and weaknesses that need further detailed development. Subsequent research will focus on identifying and analyzing software products for the preparation and presentation of financial statements.

Thus, today the development and implementation by the Ministry of Finance of Ukraine of a system of preparation and submission of financial statements by IFRS in electronic format, based on the XBRL standard is a unique chance to create a basis for transparent and efficient work in the shortest possible time the financial sector and at the same time increase the efficiency of regulatory authorities in Ukraine.

Submission of financial statements in the XBRL taxonomy will open new perspectives for the Ukrainian financial market in the form of expanding opportunities for investors. Supervisors and regulators can expect to reduce the cost of reporting analysis and improve its quality for the reasons identified in the study. Providers of financial accounting in the future will receive several benefits: optimization of the audit procedure, reducing the cost of reporting, and the process of accounting and reporting will be the same.

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Author Contributions

O.S.V. and V.H. conceived the study and were responsible for the design and development of the data analysis. N.M. was responsible for data collection and analysis. V.H. was responsible for data interpretation. O.O.V. was responsible for the literature review section. O.S.V. and V.H. were responsible for the supervision and the work review.

Disclosure Statement

The authors have not any competing financial, professional, or personal interests from other parties.

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