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## Article

# Recent trends in business financial risk: A bibliometric analysis

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## FINANCIAL ECONOMICS | REVIEW ARTICLE

# Recent trends in business financial risk – A bibliometric analysis

Ali Murad Syed<sup>1\*</sup> and Hana Saeed Bawazir<sup>1</sup>

**Abstract:** The finance literature is giving more attention to financial risk aspects. However, in literature, only a fragmented comprehension is known about the contextual influence of financial risk aspects of businesses. In this article, we contribute by carving out the intersections between Finance and Risk and analyze the production as well as visualize the evolution and trends of this field. In our research approach we use bibliometric technique to analyze 10 years of publications in Web of Science (WoS) database and present a comprehensive contextual picture of financial risk research. We analyzed 3024 publications by identifying the most prominent journals, authors, articles, countries and collaboration among authors and countries. Moreover, a co-occurrence analysis between authors, keywords and journal was done along as well as cluster analysis and thematic analysis is also performed to find the evolutionary trends. Our results showed that credit risk is the most trend topic over the last 10 years and performance and risk taking are two most inter-connected words using co-occurrence citation analysis. Our analysis showed that the corporate governance, financial crisis, financial innovation, and entrepreneurship are evolving themes and their occurrence is increasing and become more prominent in the in the domain of financial risk.

**Subjects:** Corporate Finance; Financial Management; Risk Management

**Keywords:** Financial risk; financial crisis; Risk; h-index; co-occurrence analysis; thematic analysis; trend analysis

## 1. Introduction

Risk management in any organization involves techniques to manage various internal and external risks including operational risk, credit risk, foreign exchange risk, liquidity risk, market risk, business risk, legal risk, reputational risk, technological risk, etc. Some risks are more harmful to an

## ABOUT THE AUTHORS

Ali Murad Syed is an Assistant Professor in College of Business Administration at University of Bahrain, Bahrain. His research focuses on financial risk management and corporate finance and has published several research papers on these topics. The current paper will help to forecast the future trends in the domain of financial risk.

Hana Saeed Bawazir is the head of economics and finance department and an Assistant Professor in College of Business Administration at University of Bahrain, Bahrain. Her research focuses on financial markets and institutions, risk management and Insurance.

## PUBLIC INTEREST STATEMENT

The study utilizes bibliometric analysis to show the recent trends and major themes in the domain of financial risk which is very important from academic and policy makers' perspective. By analyzing various documents from a large number of sources, we obtain key knowledge that can help us to draw a clear picture of this subject matter. Based on the results of this study we forecast that studies on corporate governance and financial innovation will dominate this domain in future.

organization's health than other risks. Therefore, risk should be categorized, and a priority should be given within every organization like banks need to be more cautious of credit, and liquidity risks and various techniques should be used to analyze the risk and then subsequent actions can be taken to manage those risks.

Financial risk terminology is applicable to businesses, financial markets, and the individuals and is the danger or possibility that shareholders, investors, or other stakeholders will lose money. We can define financial risk as anything that relates to money flowing in and out of the business or the risk of any financial loss to a company. It includes market risk, credit risk, liquidity risk, operational risk, and legal risk.

Financial risk (FR) management may be defined as a process of recognizing and managing the financial risks that are biggest threat to the business. Various companies manage their financial risk in different ways. Financial risk management has been transformed over the past decade and the concepts and models of financial risk management change significantly in the domain of present scenario of globalization. Financial regulation and the introduction of technology is the main cause for this transformation. Various financial risk management strategies are being used by different companies. Bodnar et al. (1998) discussed that use of derivatives is not very popular financial risk management strategy among the US non-financial firms with foreign currency derivatives are the most used. Christoffersen et al. (2000) showed that volatility forecasts are very relevant for short horizon (ten to twenty days) financial risk management while Marshall et al. (1996) discussed the role of superior knowledge management in financial risk management. Two widely tools are Value at risk (VaR) and expected shortfall in financial risk management but Acerbi, Nordio and Sirtori (2001) argued that expected Shortfall appears as an alternative to VaR which cannot distinguishes between portfolios with different riskiness. Meyer et al. (2017) discussed that Index based insurance contracts offer a tool for mitigating the risk by hydropower producers on the Great Lakes. Srinivasan and Kamalakannan (2018) proposed a multi-objective genetic algorithm (MOGA) which is used for financial data analysis, risk analysis and prediction for financial institutions. Yang et al. (2019) proposed a mixed integer linear programming (MILP) formulation which maximizes the supply chain expected net present value while simultaneously minimizing the associated financial risk. Fisher and Yao (2017) discussed the gender differences in financial risk tolerance and mentioned that income uncertainty and net worth are the major variables that effects the relationship between gender and some risk tolerance

The quantitative study of science is directed at the advancement of our knowledge and the bibliometric analysis play an important role in this field of research (Van Raan, 2004). The term statistical bibliography seems to have been first used by E. Wyndham Hulme in 1922 while delivering lectures (Pritchard, 1969) and then they were published as a book (Hulme, 1923). Bibliometric analysis is the quantitative study of scientific terms, production, growth, collaboration, and utilization of scientific publications. In recent times bibliometric analysis has emerged as an important method for assessing and analyzing the output of scientists, cooperation among authors and the institutes, comparing the output, the most cited outputs, co-citations analysis, etc. Ellegaard and Wallin (2015) mentioned that bibliometric analysis is an essential element of research evaluation methodology particularly in the scientific and applied fields. Skute et al. (2019) explained the use of bibliometric analysis for collaboration among industries and universities. Bibliometrics consist of all quantitative features of the science studied by means of statistical and mathematical methods (Broadus, 1987). Cobo et al. (2011) showed that bibliometric mapping is a three-dimensional representation of relation of disciplines, fields, areas, and individual publications or authors.

There are very less empirical studies have attempted to analyze the financial risk bibliometric analysis. In this study we gain a better insight of the financial risk which will ultimately help better comprehend financial risk management as domain of financial risk management is truly relevant to today's economic and financial system. The research work will contribute to academic literature by shedding light on the domain of financial risk by finding the major trends in this domain by visualizing and interpreting these trends. As per author's knowledge, there is no bibliometric

analysis done on financial risk management by the banks and this will be the new study to analysis this domain by filling this gap.

Financial risks (FR) in business sector are related to but not limited to financial assets including bonds, stocks, commodities, interest rates, derivative products etc. These risks are encountered by financial institutions including banks and the organizations. When any company does not manage its financial risk effectively it will be impossible to meet its obligations and liabilities.

### 1.1. Data and methodology

Bibliometric studies of any domain include various methods, but the most popular methods include considering the number of publications and the number of citations. We used Web of Science (WoS) database for analysis in this paper. WoS is the main and the most authentic academic databases for analyzing research contributions and comprises of more than 15,000 journals and 50,000,000 articles. Torraco (2005) mentioned that authors of review articles should identify an appropriate topic or issue for the review with a proper justification of why a literature review is the suitable way of addressing the topic.

A keyword search is used in this research with the words: “Financial” AND “Risk” AND “Business”. Similar bibliometric approaches were performed by other scholars in the domain of management and entrepreneurship by Díez-Vial and Montoro-Sánchez (2017); Kraus et al. (2014) used a similar approach for bibliometric analysis in the field of management. Our data set consists of articles, conference proceedings reviews and editorial materials. By using this procedure from year 2010 until 2020, 3024 results were found across six different publication categories and were grouped as follows: articles (2,155); articles, early access (45); articles, proceeding papers (36); reviews (38); proceedings papers (36) and editorial materials (6) The results are included from 6 WoS categories as follows: Economics (1282); Business Finance (1073); Management (848); Business (790) and Operations Research Management Science (170). All remaining categories are excluded as they are not relevant to the domain of Business and this study.

Hirsch (2005) discussed that the publication record and the citation record contains useful information and h-index is a valuable approach to illustrate the output of any researcher. The author argued that h-index gives an important, significant and a wider impact of a scientist’s cumulative research contributions. Egghe (2006) introduced g-index through which the global citation performance of a set of articles is measured. Author argued that it is an improvement of h-index and gives additional weight to highly cited papers. Anderson et al. (2008) proposed tapered h-index which covers all cites. Alonso et al. (2009) discussed some drawbacks of h-index and mentioned that various indicators have been formed to knock out the drawbacks of it. Alonso et al. (2010) introduced hg-index to explain the scientific output of researchers which is founded on both h and g indices and have advantages of both measures with minimization of disadvantages for both indices. The authors also showed that h-index is quite dependent on the database that it is used.

Many tools are available to do the bibliometric analysis which include a number of softwares. Moral-Muñoz et al. (2020) compared various bibliometric softwares and showed that Bibliometrix comprises of comprehensive set of techniques through Biblioshiny. The present study used Biblioshiny app (Bibliometrix R tool) for financial risk bibliometric analysis as most of the analysis developed by the previous software tools have been incorporated in bibliometrix/biblioshiny. Ekundayo and Okoh (2018) analyzed the data of Plesiomonas related research papers using Rstudio with bibliometrix R-package by importing into RStudio and converting the data into a bibliographic data frame and normalized the data for duplicate marching. Bibliometrix and Biblioshiny is used in the bibliometric analysis of many domains (Arfaoui et al., 2019; Hafeez et al., 2019; Mishra & Muhuri, 2020; Moral-Muñoz et al., 2020; Patil, 2020).

If any two documents are cited by one document, the two documents are known as co-cited. If the co-citations received by the documents are high, the higher will be their co-citation strength,

**Table 1. Main information**

Description	Results	Document types	Results
Documents	3024	Article	2155
Sources (Journals, Books, etc.)	1128	Article, Early Access	45
Keywords Plus (ID)	3238	Article, Proceedings Paper	36
Author's Keywords (DE)	7768	Editorial Material	6
Period	2010–2020	Proceedings Paper	732
Average citations per documents	7.43	Review	50
Authors	6348		
Author Appearances	7247		
Authors of single-authored documents	691		
Authors of multi-authored documents	5657		
Single-authored documents	732		
Documents per Author	0.476		
Authors per Document	2.1		
Co-Authors per Documents	2.4		
Collaboration Index	2.47		

and will have more chances to be semantically related. Co-citation analysis is recognized as similarity content measurement of two documents. This methodology is influential in identifying groupings of authors, topics, or themes (Ramos-Rodríguez & Ruiz-Navarro, 2004). Shiau et al. (2015) discussed that core and significant issues can be identified using co-citation and factor analysis in management information system (MIS) journals. Shiau et al. (2017) used co-citation analysis and factor analysis and confirmed the main factors regarding social networks.

### 1.2. Analysis and results

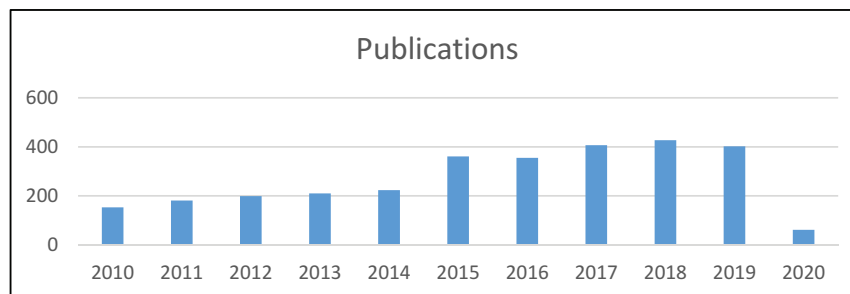
This section represents the bibliometric results for “Business Financial Risks (FR)” found in Web of Science for the articles dating between 2010 and 2020.

Table 1 shows the main information of data analysis. Table 1 shows that total number of documents analyzed are 3024 which are extracted from 1128 sources. A high number of sources shows the importance and relevance of domain of “Financial Risk in Business”. The average citation per document is 7.43 and the number of authors who contribute to this domain are 6348 which is also high number. Table 1 also shows that there is strong collaboration among the authors and 5657 authors shared the documents published in this domain. The table also shows that majority of the documents are published papers (2155) followed by conference proceeding papers (732).

### 2.3. Growth of publications

The scholarly production distribution of FR over the time is shown in Table 2 and Figure 1. Figure 1 shows that the number of publications which are related to FR gradually increased over the last ten years and they increased to 402 publications in 2019 which were 153 in 2010. Figure 1 also shows that the increase is consistent in every year. The increase of publications in 10 years is almost 163% or 16% annual which shows that the concept of FR has been gathering attention among the scholars. The increased pool of researchers globally and the WoS database expansion in 2015 also had a positive impact on the increased number of publications (Merigó et al., 2015).

**Figure 1. Growth of publications.**

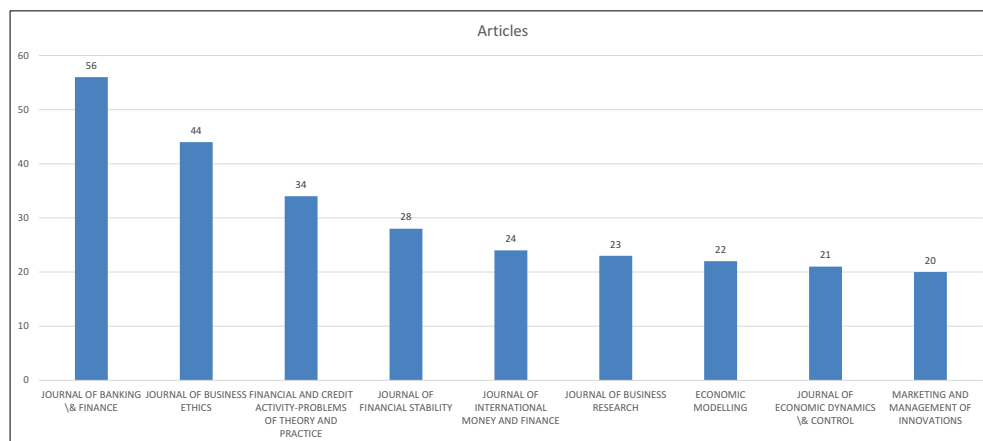


**Table 2. Growth of publications**

.	No. of Publications	Mean TC per Article	Mean TC per Year
2010	153	21.673	2.167
2011	181	17.840	1.982
2012	199	14.347	1.793
2013	210	15.695	2.242
2014	223	12.453	2.075
2015	361	7.061	1.412
2016	355	4.485	1.121
2017	407	3.990	1.330
2018	427	2.288	1.144
2019	402	0.580	0.580
2020	61	0.262	

TC – Total Citations

**Fig. 2 Ten most productive sources.**



Till 2017, the Web of Science (WoS) comprises of 12,000 high impact journals and 160,000 conference proceedings (Reuters, 2016) from multidisciplinary domains.

## 2. Most productive sources

The most relative and prominent journals which publish articles in the domain of FR have been explored. Figure 2 shows the ranking of 10 most productive sources in the domain of ER indexed in



the core collection of the Web of Science (WoS) database. [Figure 2](#) shows that three most important productive journals for domain of FR are Journal of Banking and Finance, Journal of Business Ethics, and journal of Financial and Credit Activity-Problems of Theory and Practice.

Egghe (2006) concluded that g-index is considered as an extension of the h-index and is used for assessment of the global citation performance of a number of articles. For assessment of selective scientists g-index is comparatively more sensitive than h-index and the main reason for this more sensitiveness is because the scientist type are shown in average a higher g-index/h-index ratio and a better position in g-index rankings than in the h-index ones (Costas & Bordons, 2008).

[Table 3](#) shows the list of most important sources arranged in the decreasing order of h-index and having value of h-index>5. The shows that there are 29 journals having h-index of more than 5 value. The Journal of Banking and Finance has the highest h-index of 18 while Journal of Business Ethics has h-index of 14 and Journal of Expert Systems with Applications has h-index of 12. [Table 3](#) also shows that Journal of Banking and Finance has the highest number of total citations (1196) while Journal of Business Ethics has 706 total number of citations followed by Journal of Expert Systems with Applications having 449 total citations. The table also shows that although Journal of Banking and Finance has 12 more publications (total 56) than Journal of Business Ethics (Total 44 Publications), but their total citations (total 1196) are almost 500 more than Journal of business Ethics (Total 706).

A very interesting feature is that in the domain of FR, Journal of Financial and Credit Activity-Problems of Theory and Practice is the third most productive journal having total number of productions as 34 but its h-index is too low to be included in the [Table 3](#). In fact, its both h-index and g-index are having value of 1.

### 2.1. Most cited documents

[Figure 3](#) shows the list of 10 most cited documents based on the number of total citations. The document by Jiang et al. (2010) is the most cited document in the domain of Financial Risk while article by Beck et al. (2010) is the second most cited document. The individual citation of these documents is more than 350 for each of these two articles. Article by Brunnermeier and Sannikov (2014) is the third most cited document with total 290 number of citations. Tahamtan et al. (2016) discussed that a large number of factors affect the number of citations which includes the quality of paper, journal impact factor, number of coauthors of a paper, visibility of paper and international cooperation among authors/institutions are most important predictors for citations of any paper. Praus (2019) discussed that publications quality indicator which is known as high-ranked citations percentage (HCP) is based on the concept that more citations will be for good papers. Leonidou et al. (2010) discussed that the minimum limit should be 25 citations per article to have the influence of an article in any comparable domain. An adherence to the reporting guidelines also increases the number of citations of any paper and citations increases if a methodologist is included in the editorial process and peer-review (Vilaró et al., 2019).

### 3. 10 Most productive countries

[Table 4](#) shows the list of top 10 countries who contributed most to the domain of Financial Risk (FR) in business. [Table 4](#) indicated that the US is the most productive country in domain of FR and its total production is 1097 publications followed by China which has 473 which is followed by the UK which has 422 total number of productions. Out of 10 countries 8 countries are from developed world and only Ukraine and Romania are developing countries.

[Figure 4](#) shows the production of various countries in the domain of Financial Risk (FR). The figure shows that most countries of western Europe, China and the US are having the highest production. [Figure 5](#) shows the collaboration of various countries in the domain of FR. [Figure 5](#) shows that US is having a collaboration with almost all productive countries, but the US is having the highest collaboration with the Western European countries.



Table 3. Most important sources

S. No	Source	h_index	g_index	m_index	TC	NP	PY_start
1	Journal of Banking & Finance	18	34	1.636	1196	56	2010
2	Journal of Business Ethics	14	25	1.273	706	44	2010
3	Expert Systems with Applications	12	17	1.091	449	17	2010
4	Journal of Financial Stability	11	23	1.000	535	28	2010
5	Journal of International Business Studies	11	15	1.000	490	15	2010
6	Journal of Financial Economics	9	13	0.818	819	13	2010
7	Journal of International Money and Finance	8	16	0.889	269	24	2012
8	Journal of Business Research	8	13	0.727	204	23	2010
9	Auditing-A Journal of Practice& Theory	8	13	0.727	192	19	2010
10	Review of Financial Studies	8	9	0.727	758	9	2010
11	Economic Modelling	7	12	0.700	161	22	2011
12	Journal of Economic Dynamics& Control	7	14	0.636	222	21	2010
13	Journal of International Financial Markets Institutions& Money	7	11	0.778	132	18	2012
14	Journal of Monetary Economics	7	11	0.636	381	11	2010

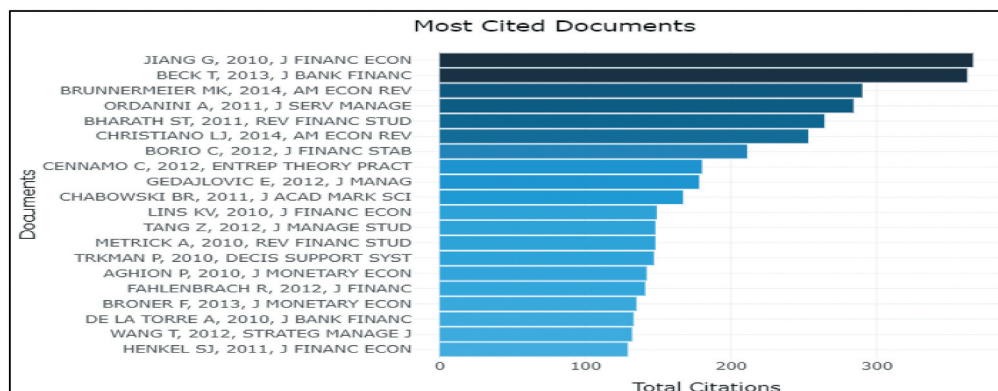
(Continued)

Table 3. (Continued)

S. No	Source	h_index	g_index	m_index	TC	NP	PY_start
15	Journal of Business Venturing	7	9	0.636	490	9	2010
16	Strategic Management Journal	7	9		324	9	
17	Corporate Governance-An International Review	7	8	0.636	211	8	2010
18	Journal of Finance	7	8		504	8	2011
19	Decision Support Systems	7	7	0.636	363	7	2010
20	Business Horizons	6	7	0.545	71	18	2010
21	International Review of Financial Analysis	6	11	0.667	143	15	2012
22	Insurance Mathematics& Economics	6	12	0.750	168	12	2013
23	Inzinerine Ekonomika-Engineering Economics	6	7	0.545	65	11	2010
24	Journal of Corporate Finance	6	10	0.545	183	10	2010
25	Contemporary Accounting Research	6	9	0.750	162	9	2013
26	International Journal of Production Economics	6	8	0.667	134	8	2012
27	Journal of Financial Intermediation	6	8	0.600	182	8	2011
28	American Economic Review	6	7	0.857	631	7	2014
29	Industrial Marketing Management	6	7	0.667	76	7	2012

TC – Total Citations; NP – Number of Productions

**Fig. 3 Ten most global cited documents.**



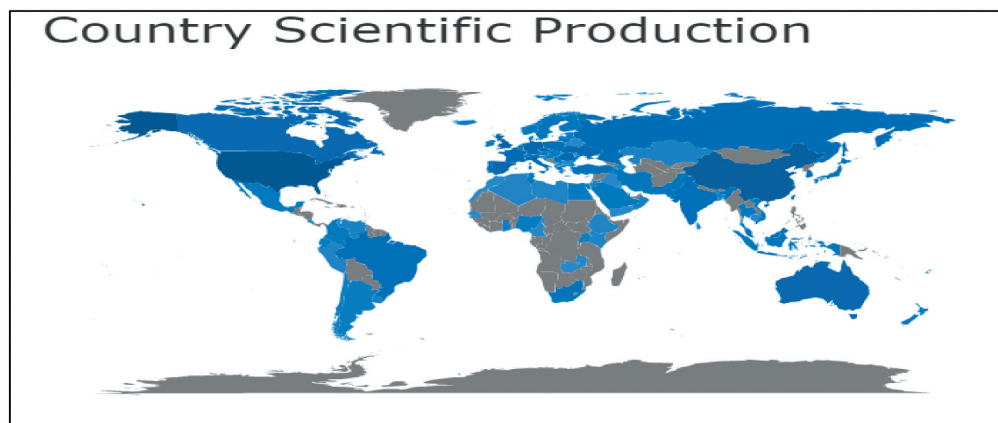
**Table 4. 10 Most productive countries**

S. No.	Country	Frequency of Production
1	USA	1097
2	China	473
3	UK	422
4	Germany	247
5	Italy	218
6	Australia	206
7	Spain	188
8	Canada	182
9	Ukraine	181
10	Romania	171

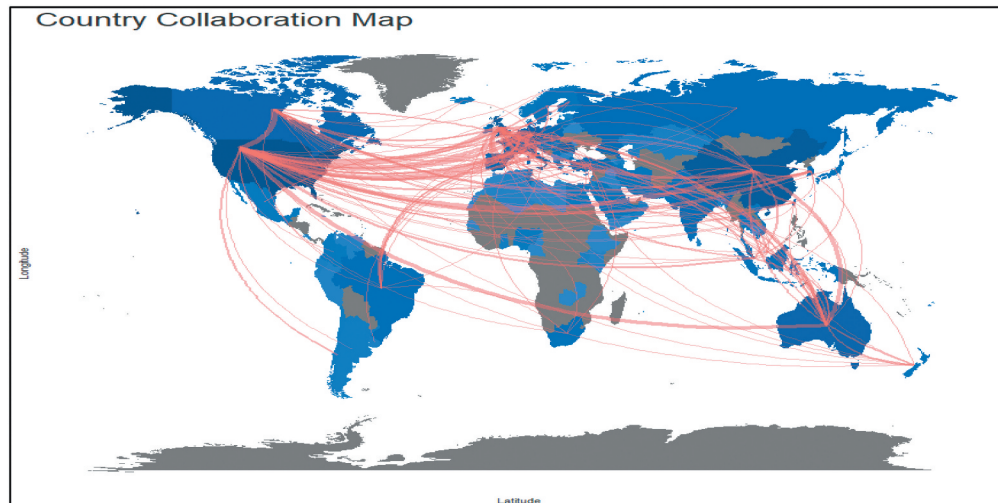
### 3.1. Author Impact

If we focus on authors, the selection criterion is to select the top 10 authors having the highest number of publications as well as the highest h-index. The author with the largest number of published articles is Belas J, followed by Kljuckikov A, followed by Kozubikova, L.as shown in Table 5.

**Figure 4. Country specific production.**



**Figure 5. Collaborative network of countries.**



### 3.2. Most Frequent Author Keywords

The Word Cloud is generated by selecting author keywords as shown in Figure 6. The selection of author keywords provides insight into main topics and research trends of Financial Risk domain. Table 7 shows the list of most frequently author keywords having frequency of more than 100. The Table 6 shows that there are 10 keywords which have a frequency of more than 100. The keyword “risk” is the most frequency keyword following by “performance” which is followed by “determinants”. Figure 6 shows the visualization of most frequent keywords.

### 3.3. Co-occurrence analysis

Laengle et al. (2017) described that the patterns of relationships among articles, journals or authors can be depicted and recognized by the co-occurrence analysis as it calculates the most common. Figure 7 shows the co-occurrence data map based on the “Author Keywords” in titles and abstracts of publications. We used same the methodology of co-occurrence analysis which is used by (Bornmann

**Table 5. Author impact**

S.No.	Author	h_index	g_index	m_index	TC	NP	PY_start
1	Belas J	7	9	1.167	215	9	2015
2	Kljucnikov A	5	7	0.833	119	7	2015
3	Kozubikova L	5	6	0.833	143	6	2015
4	Kliestik T	4	6	0.500	115	6	2013
5	Sun X	4	5		59	5	
6	Michalski G	3	6	0.375	40	8	2013
7	Chen J	3	6	0.273	43	6	2010
8	Xu Y	3	6		100	6	
9	Chen L	3	5	0.273	56	5	2010
10	Li J	3	4	0.429	22	5	2014

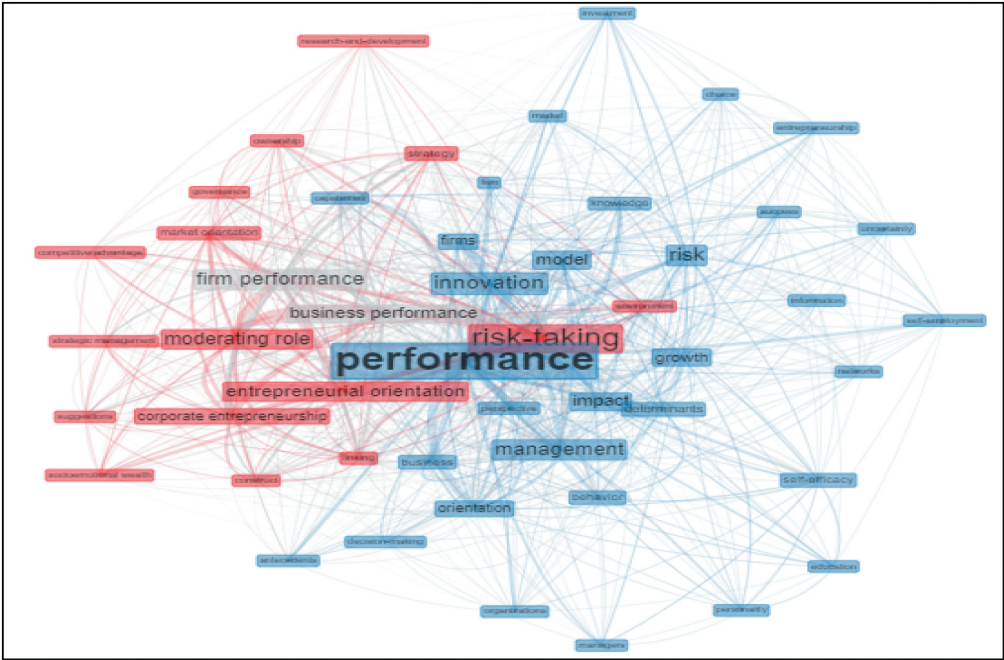
TC – Total Citations, NP – No. of Publications

S.No.	Word	Word Frequency
1	Risk	438
2	Performance	263
3	Determinants	205
4	Impact	184
5	Management	184
6	Model	175
7	Business	162
8	Information	145
9	Market	130
10	Investment	115
	$N \geq 100, N = \text{Word Frequency}$	

We used Bibliometrix R-package for our analysis which allows using the conceptual Structure function for performing multiple correspondence analysis (MCA). It is an important tool for handling complex and big datasets, Complex data may include the high-dimensional categorical data which forms a conceptual structure of the field and K-means clustering for recognizing various clusters of the documents having common concepts (Greenacre & Blasius, 2006). Generalization of principal component analysis can be called MCA when the variables are categorical variable instead of quantitative in the analysis (Abdi & Williams, 2010).

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Fig. 7 Co-occurrence citation analysis by keywords.



map the distance between category points and the origin determines the variable quality. Figure 8 shows the first and bigger cluster (red color) consists of various elements of financial risk including liquidity risk, credit, corporate risk, etc. while our second cluster (blue color) consists of various dimensions of audit risk and firmly firms. The similarity is measure by the distance between any row points or column points. Cluster 1 shows that gender, entrepreneurship, and performance are three variables which are close to each other are quite similar. Similarly, profitability and bank-ruptcy are also close and are on the same side of plot origin. In the second cluster (blue color) the variable is distant from each other which shows that there is less similarity among the variables of this cluster.

Figure 8. Cluster analysis.

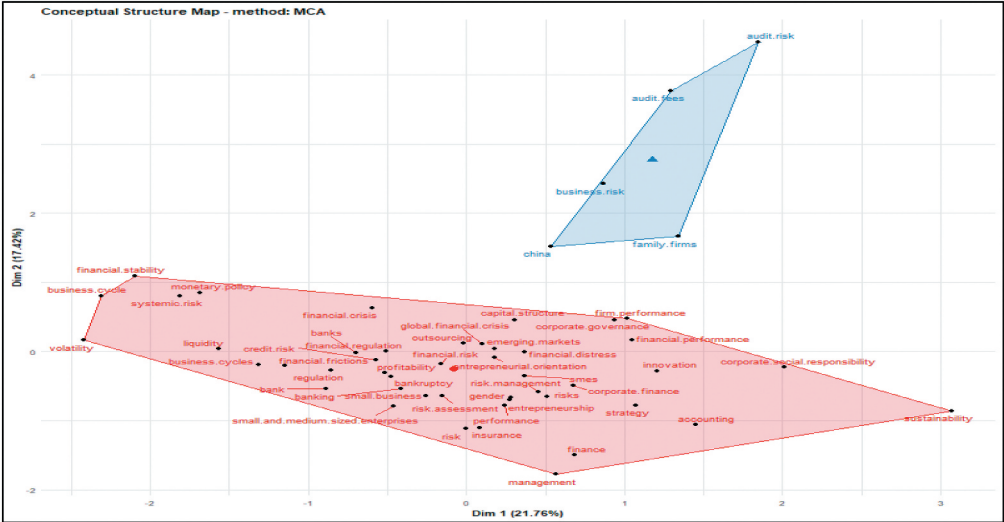
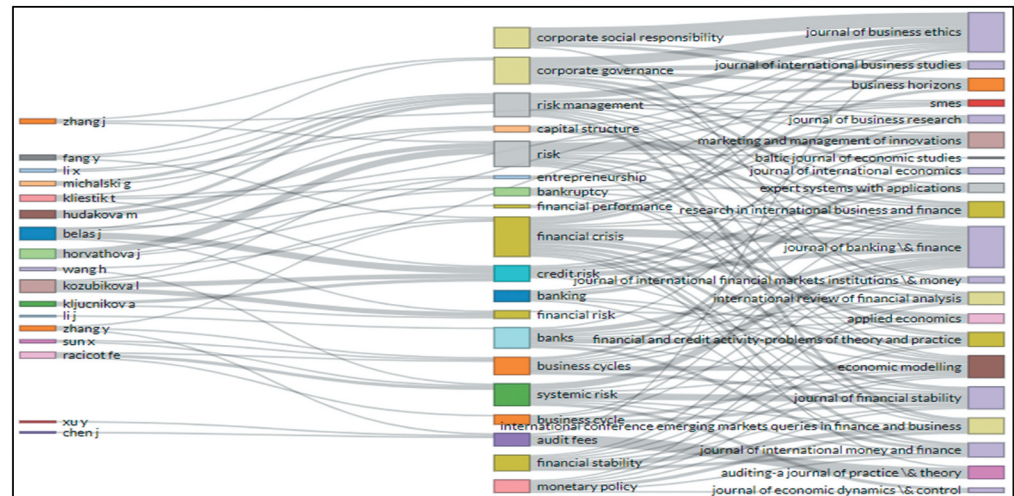




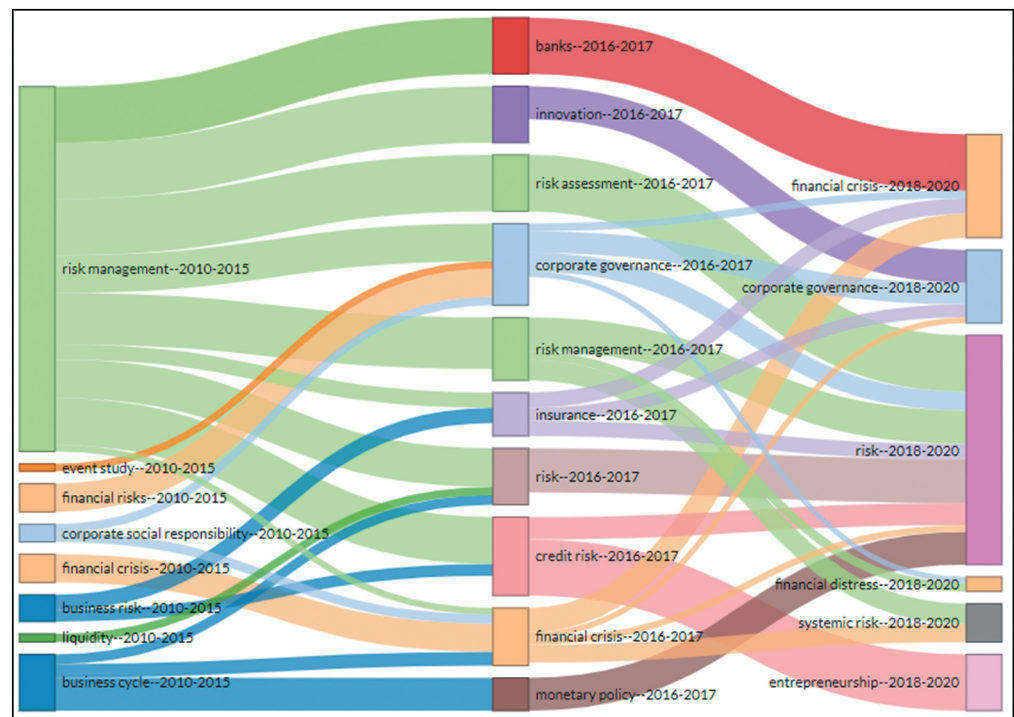
Figure 9. Three field plot.



### 3.4. Three Plots Field

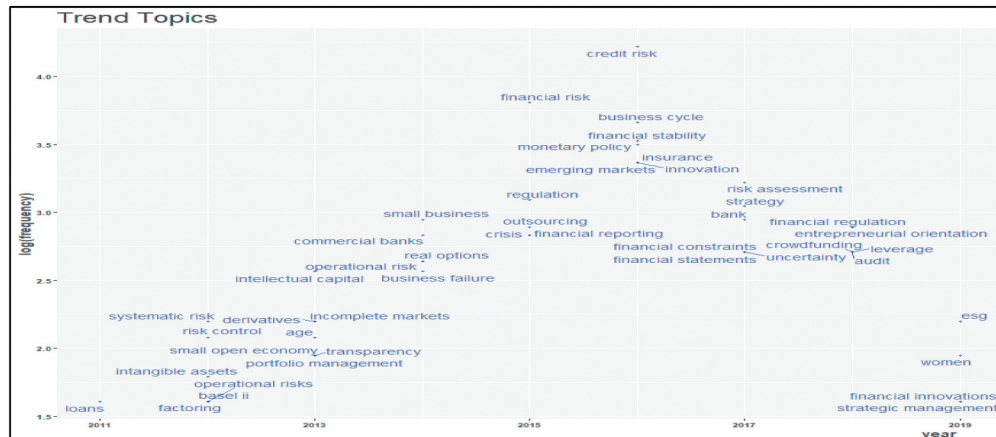
In Figure 9 the main items of three fields (e.g., authors, keywords, journals) and their relations can be visualized through a Sankey diagram in which the width of the arrows is proportional to the flow rate. Three plots field is formed for top 20 authors, keywords, and the sources. The three-field plot give us a picture that “financial crisis” was having a biggest node followed by “corporate governance” which is followed by “banks”.

Figure 10. Thematic analysis.





**Figure 11. Trend topics.**



### 3.5. Thematic Analysis

Figure 10 shows the thematic analysis in the domain of FR from 2010 to 2020. Tennekes (2018) mentioned that the theme refers to the phenomena which involves demographical, social, cultural, or economic issues and thematic maps are formed by stacking layers, in which data per each layer is plotted to one or more aesthetics. The thematic evolution analysis is a way to find the evolutionary relationships among evolution paths, and trends which evolved over a period. The thematic analysis used inclusion index weightage by word occurrence having minimum cluster frequency of 5 while minimum weight index is 0.1. It also shows various structure that form over a period and the strength of those structures.

In Figure 10, each node represents a topic, and the size of node is proportional to the number of keywords which are a part of the theme. Figure shows that in 2015 “corporate governance” and “credit risk” were having the major themes. In 2020 the biggest node is of “risk” followed by “financial crisis” and “corporate governance”.

### 3.6. Trend topics

Figure 11 shows the trend topics in various years which were published in various years in the domain of FR and having highest frequency. The figure shows that in 2012 the highest trend topic was systemic risk while it was “commercial banks” in 2013 and “small business” in 2014. In 2015 and 2016 “financial risk” and “credit risk” were having the highest frequency whereas in 2019 and 2020 “financial regulation” and “ESG” got the highest frequency.

### 3.7. Final discussion and conclusion

In this study, we conducted the bibliometric analysis of financial risk in the Web of Science Core Collection. This research provides a general outline of the studies appearing in financial risk and the main objective of this study is to discuss the most frequent keywords, highly impact authors and the sources, most cited authors and articles, co-citation, co-authorship, and the thematic analysis since 2010. The global exploration of this study made it possible to recognize both contributions and the key contributors in expanding knowledge about the financial risk across more than 10 years of research.

Our study showed a continuous growth of articles and citations in the domain of financial risk. The results are in line with the study of Chun-Hao et al. (2012) who also reported substantial and exponential growth of articles from 1970 to 2009. Our results also indicated that US is the most productive country in the domain of financial risk and similar results are obtained by Chun-Hao et al. (2012). A similar kind of result is also obtained by Bui et al. (2020) while conducting bibliometric analysis for sustainable finance. Journal of banking and finance is having the highest h-index and g-index as per our results and similar result were obtained by Chun-Hao et al. (2012). Our risk also

indicated that “risk” and “performance” are two most frequently used author keywords which are in line with the various risk and return models including capital asset pricing model and arbitrage pricing model (Roll & Ross, 1980; Sharpe, 1963) and still dominate the domain of financial risk.

Although bibliometric analysis in the domain of finance was conducted in previous studies but no study was found that analyzed co-occurrence and thematic analysis for financial risk. Based on the H-index and the number of publications our results showed that five most important authors in the field of FR are Belas J, Kljucnikov A, Kozubikova L, Klietnik T and Sun X.

The cluster analysis on articles showed that there exist two prominent clusters in domain of FR. The biggest cluster contains various aspects of FR including financial crisis, capital structure, monetary policy, etc. while the second cluster is a smaller one. The smaller cluster includes audit and family firms. A similar kind of clusters are found by Lopatta et al. (2017) while doing bibliometric analysis of family firms and found risk taking cluster as the biggest one.

Three plot fields are done among authors, keywords, and the sources. The results of three plot fields showed that the keyword “financial crisis” is used in most of the sources of FR domain. Another interesting result is that the keyword “risk management” is used by most of the authors in this domain. The results of trend analysis showed that “ESG” is the most frequent trend in 2019–2020 with the highest frequency while “credit risk” has the highest frequency during the period of 10 years. As there is an outgrowth in financial risk literature in recent years, many emerging themes are observable in our study, in addition to those mapped in cluster analysis and two most prominent themes are “financial crisis” and “corporate governance” in the recent years along with “entrepreneurship”. The results of trend analysis and thematic analysis are evidenced in the literature by looking at the numerous recent studies that have discussed the ESG, risk and financial performance (Cornell, 2021; Giese et al., 2019; Maiti & Investment, 2020; Pollard et al., 2018). Our results are in line with the recent study of Bannier et al. (2019) who showed that increasing ESG activities reduces the firm risk in the US and Europe. Another trend topic visible from our results is financial innovation which are in line with the study of Chen and Peng (2019) who indicated a huge increase of researches in this domain in recent years.

Investigating the domain of financial risk continues to be an important issue in academic circles as well as in the policy-making circles. The study utilizes bibliometric analysis to show the recent trends and major themes in the domain of financial risk. By analyzing 3024 documents over a period of 10 years from 1128 different sources, we obtain key knowledge that can help us to draw a clear picture of this subject matter. Overall, our results show emerging topics, recent trends which are witnessed and evidenced by various research papers in the domain of finance.

The future research based on our results may be directed towards corporate governance, ESG and entrepreneurship. Another direction of future research will be directed towards financial innovation and regulation. Our first limitation is that the information presented in this research is restricted to the WoS database only and other databases are not considered. Another limitation of our paper is that we used h-index for the prominence of authors and citation explorations and clustering approach for co-citations and other indexes are not used.

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