EDITORIAL

A Bibliometric Review of Big Data in Finance

AU1 ► Haitham Nobanee[1–3,*]

Abstract

The development of big data analytics is creating new opportunities to advance financial management, financial technology, insurance technology, wealth management technology, and investments. This special issue focuses on the applications of big data in finance. A bibliometric analysis method is employed in this editorial review to visualize and highlight the current trends and the future research agenda in this field, followed by highlighting the contribution of this special issue.

Keywords: big data; finance; bibliometric; data mining; financial markets

Introduction: Derivation and Structure of This Special Issue

Big data analytics and applications are no longer limited to the information technology industry, it is now spread across all industries and disciplines including business and financial management. The concept and applications of big data have developed recently and have attracted the research interests and attention of both academics and practitioners.[1] Big data analytics can be useful in supporting business management, financial decisions, global manufacturing, and supply chain management by creating data transparency that improves decision making and promoting innovative business and financial models.[2,3] Businesses are discovering the new potentials and possibilities of uncovering hidden knowledge, improving the decision-making process, and supporting their strategic planning from big data.[4] Big data are the next frontier for business and financial innovations, competition, and productivity.[5] This special issue is devoted to publishing high-quality research that involves theoretical and empirical research related to big data in finance.

The Relevance of the Topic

To highlight the development of the literature and contributions of big data in finance, we employed a bibliometric analysis method. The bibliometric analysis employs a quantitative method for the description, evaluation, mapping, visualizing, coupling, and monitoring of published research on a certain topic. The bibliometric analysis can facilitate the mapping and visualization of large volumes of scientific literature produced in a certain field of knowledge.[6,7] Moreover, it allows researchers to visualize their findings on aggregated bibliographic databases contributed by other researchers working in similar research areas who express their opinions through citations and collaborations.[8] The bibliometric method can be defined as the structured process of describing all documents that have been produced in a certain field in terms of volume, connection, citations, productivity, quality, and tracking the intellectual development and emerging trends in that field.[9] This study employed the combination of keywords of finance and big data, and have been used for searching the relevant documents in the Scopus database. The search, conducted on March 18, 2021, resulted in 2998 research documents, narrowing this down further to articles and reviews, and limiting the search to documents that are written in English, the final search results show 1059 document results. Figure 1 shows the number of documents related to ◄ F1 big data in finance by year. We can see that the number of publications has increased rapidly in the past 10 years.

Figure 2 presents top authors in the field of big data ◄ F2 in finance literature. Sun G. is the leading author with the highest number of documents of five published scientific research, followed by Cerchiello P., Fu S.,
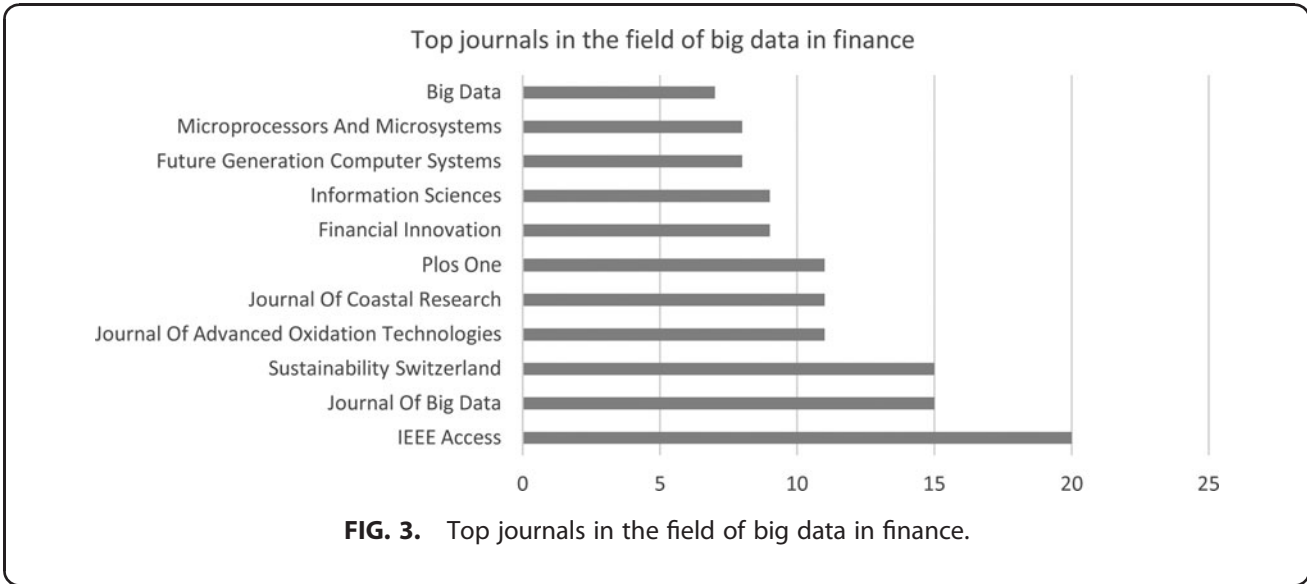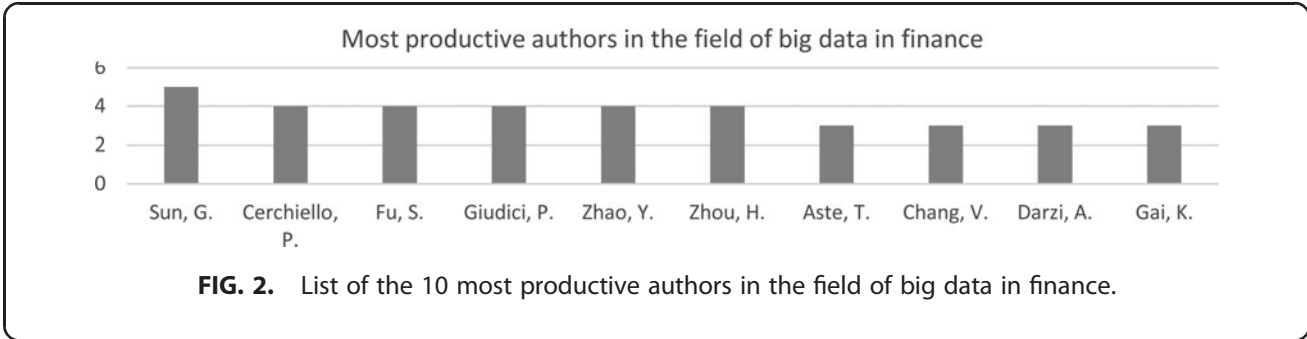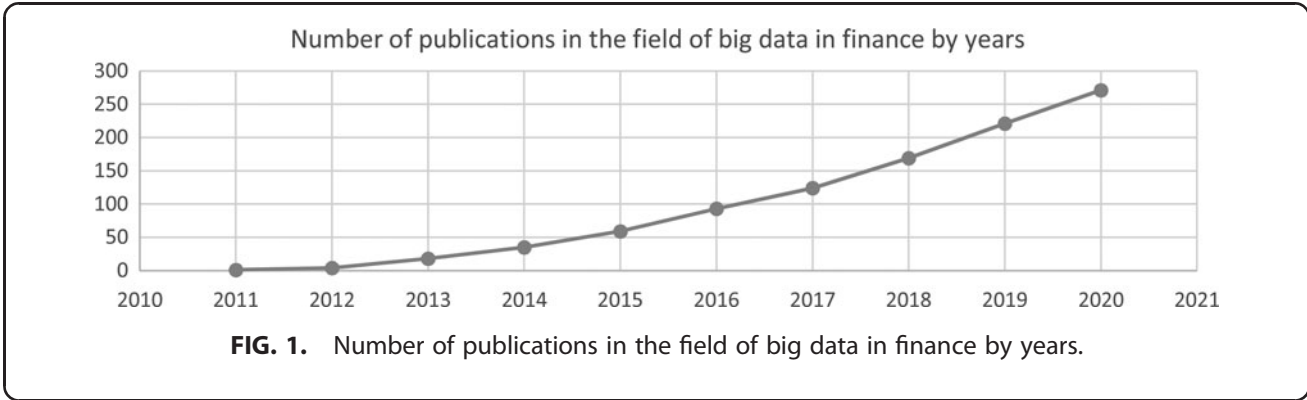
AU2 ► ¹*Abu Dhabi University*
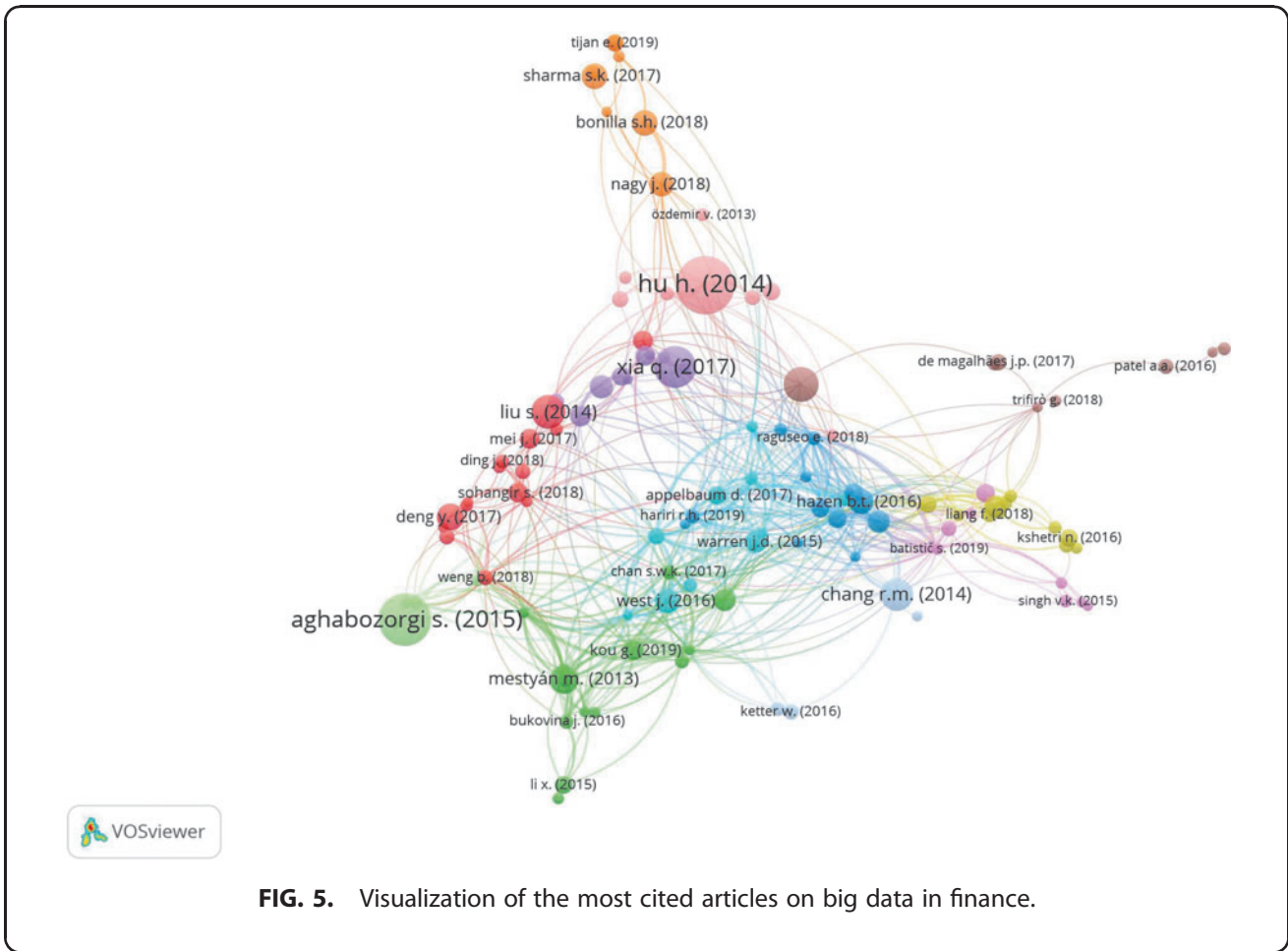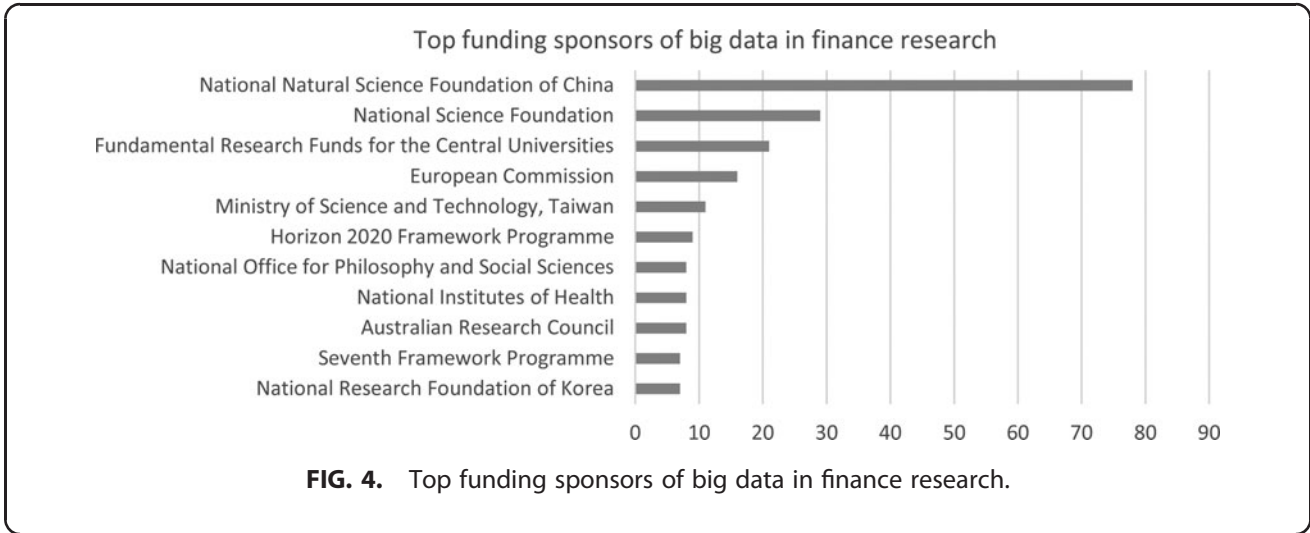²*The University of Oxford.*
³*The University of Liverpool*

AU3 ► *Address correspondence to: Haitham Nobanee,* E-mail: nobanee@gmail.com

Giudici P., Zhao Y., and Zhou H. who produced four documents, Aste T., Chang V. Darzi A., and Gai K. produced three documents, respectively.

F3 ▶   Figure 3 presents top journals that published documents in the field of big data in finance. The most influenced sources include "IEEE Access" with 20 publications, followed by "Journal of Big Data" and "Sustainability" with 15 publications each, "Journal of Advanced Oxidation Technologies," "Journal of Coastal Research, and "PLos One" with 11 publications, "Financial Innovation" and "Information Sciences" contributed 9 publications, "Future Generation Computer Systems" and "Microprocessors and Microsystems" produced 8 publications, and finally, "Big Data" that produced 7 documents.

FIG. 1.   Number of publications in the field of big data in finance by years.

FIG. 2.   List of the 10 most productive authors in the field of big data in finance.

FIG. 3.   Top journals in the field of big data in finance.

FIG. 4. Top funding sponsors of big data in finance research.

4C ▶

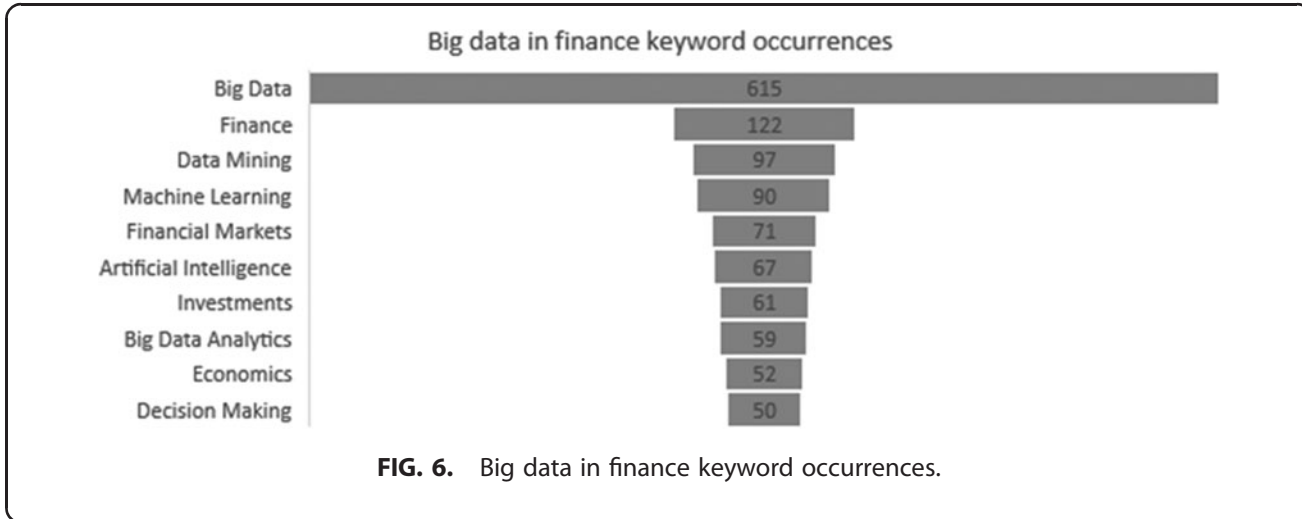**FIG. 5.** Visualization of the most cited articles on big data in finance.

FIG. 6.   Big data in finance keyword occurrences.

F4 ▶   Figure 4 shows the top funding sponsors of big data in finance research, the list includes 10 sponsors led by the "National Natural Science Foundation of China," which supported 78 research in big data in finance followed by the "National Science Foundation" with 29 research grants and the "Fundamental Research Funds for the Central Universities" that supported 21 projects of big data in finance, and the "European Commission" that supported 16 research projects.

F5 ▶   Figure 5 shows visualization and network mapping of the most cited articles on big data in finance. The document with the most citations is Hu et al.[10] with 619 citations, followed by Aghabozorgi et al.[11] with 509 citations, Xia et al.[12] with 316 citations, Imran et al.[13] with 252 citations, and Zhong et al.[14] with 230 citations. The majority of the most influential articles belong to the period 2014–2017.

F6 ▶   Figure 6 shows the most frequent keywords of big data in finance. The keyword with the most frequency is "big data" with 615 occurrences, followed by "finance" with 122 occurrences, "data mining" with 97 occurrences, "machine learning" with 90 occurrences, and the fifth most occurring keyword is "financial markets" with 71 occurrences.

Figure 7 shows the most productive countries in the ◀ F7 field of big data in finance. The countries with the highest number of documents are China with 287 documents, the United States with 261 articles, followed by the United Kingdom with 108 articles, India with 107 articles, and finally Italy with 51 documents.

Figure 8 shows the coauthorship productivity and ◀ F8 network cluster distribution of collaboration among authors who produced research in the field of big data in finance. The coauthorship analysis helps in structuring documents and the thematic clusters, Figure 8 shows six main clusters in the field of big data in finance, with each cluster associated with a unique color.
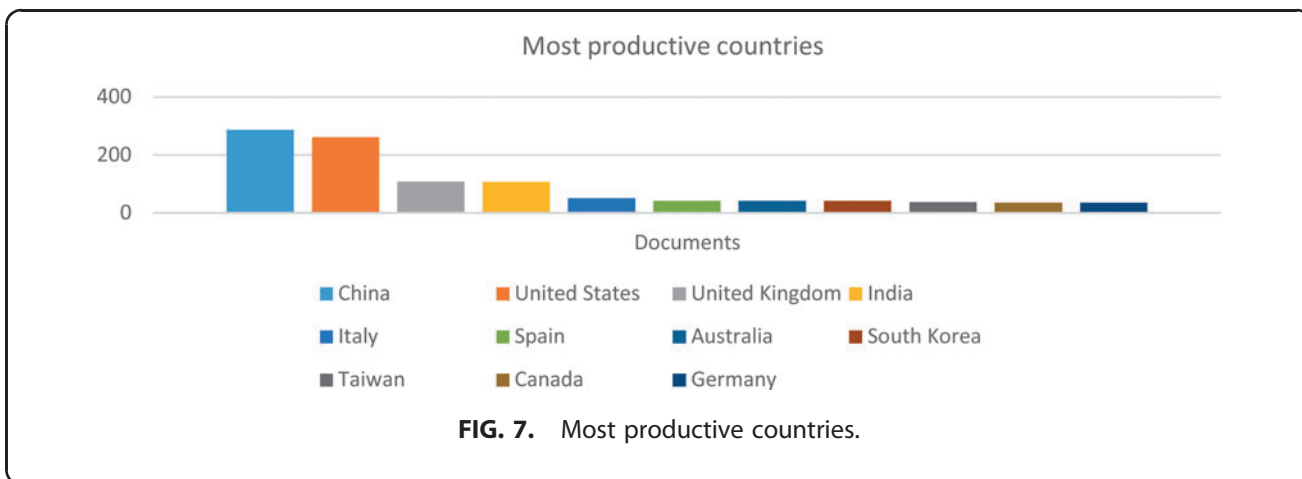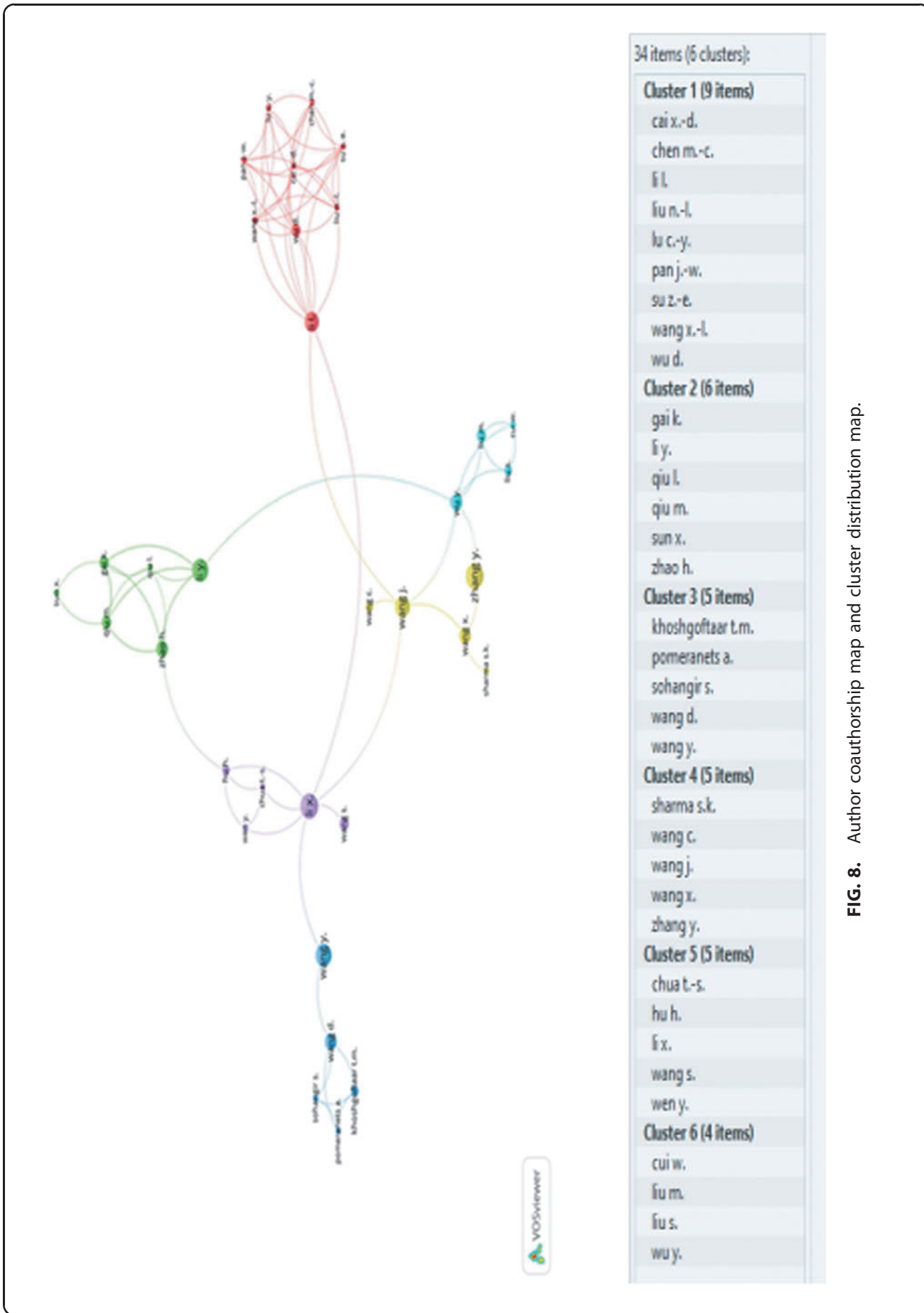

4C ▶

FIG. 7.   Most productive countries.

FIG. 8. Author coauthorship map and cluster distribution map.

Contributions

The response to our call for articles for this special issue of big data in finance was tremendous. We have rejected some good articles that were out of the scope of the special issue. All submissions have entered a screening process from the editor in chief and then by the guest editor, all screened articles had to go through an anonymous review process that required approval of a minimum of two reviewers, then approval from the guest editor is required, followed by the final approval of the editor in chief. After rejecting a considerable number of submissions that did not meet the quality set by the journal, and after several rounds of review and invitations to authors to revise and resubmit their articles, we accepted five articles in the areas of big data and patterns of failure in innovative startups, the analysis of the importance of broker identities in the limit order book through deep learning, financial crisis prediction using big data analysis, quantifying insurance agency channel dynamics, measuring customer similarity, and identifying cross-selling products by community detection.

Thank You Editorial Team and Reviewers

Finally, the guest editor expresses his sincere gratitude to the Editor-In-Chief, Prof. Zoran Obradovic, and the *Big Data* editorial office and production team: Benoit Meyrieux, Amanda Montes de Oca, Craig Ryan, T Karthikeyan, and Olegario Katrina for their encouragement and support throughout this special issue project.

References ◀AU4

1. Kuc-Czarnecka M, Olczyk M. How ethics combine with big data: A bibliometric analysis. Humanities Social Sci Commun 2020;7:1–9.
2. Manyika J, Chui M, Brown B, et al. Big data: The next frontier for innovation, competition, and productivity. McKinsey Global Institute 2011. ◀AU5
3. Tan KH, Ji G, Lim CP, Tseng ML. Using big data to make better decisions in the digital economy. Int J Prod Res 2017;55:4998–5000.
4. Chiang RH, Grover V, Liang TP, Zhang D. Strategic value of big data and business analytics. J Manage Inform Syst 2018;35:383–387.
5. Bai J, Fan J, Tsay R. Special issue on big data. J Bus Econ Stat 2016;34:487–488.
6. Nobanee H, Al Hamadi FY, Abdulaziz FA, et al. A bibliometric analysis of sustainability and risk management. Sustainability 2021;13:3277.
7. Huang Y, Glänzel W, Zhang L. Tracing the development of mapping knowledge domains. Scientometrics 2021:1–24. ◀AU6
8. Zupic I, Cater T. Bibliometric methods in management and organization. Organizational Res Methods 2015;18:429–472.
9. Khatib SF, Abdullah DF, Hendrawaty E, Elamer AA. A bibliometric analysis of cash holdings literature: Current status, development, and agenda for future research. Manage Rev Q 2021:1–38. ◀AU7
10. Hu H, Wen Y, Chua TS, Li X. Toward scalable systems for big data analytics: A technology tutorial. IEEE Access 2014;2:652–687.
11. Aghabozorgi S, Shirkhorshidi AS, Wah TY. Time-series clustering—A decade review. Inf Syst 2015;53:16–38.
12. Xia QI, Sifah EB, Asamoah KO, et al. MeDShare: Trust-less medical data sharing among cloud service providers via blockchain. IEEE Access 2017;5:14757–14767.
13. Imran A, Zoha A, Abu-Dayya A. Challenges in 5G: How to empower SON with big data for enabling 5G. IEEE Network 2014;28:27–33.
14. Zhong RY, Newman ST, Huang GQ, Lan S. Big Data for supply chain management in the service and manufacturing sectors: Challenges, opportunities, and future perspectives. Comput Ind Eng 2016;101:572–591.

AUTHOR QUERY FOR BIG-2021-29044-EDI-VER9-NOBANEE_1P

AU1: Please identify (highlight or circle) all authors' surnames for accurate indexing citations.
AU2: Please provide the department, city, state (if USA), and country in the affiliations.
AU3: Please provide department, university, and complete postal address with postal code in the address correspondence.
AU4: As per journal style, name–year references have been changed to numbered style. Please confirm.
AU5: Please provide complete details for Ref. 2.
AU6: Please provide volume number for Ref. 7.
AU7: Please provide volume number for Ref. 9.