Exploring the Research Fronts of Fintech: A Scientometric Analysis

Zhichao Xu[1,2] Han-Teng Liao[1,2,*] Chung-Lien Pan[3] Wenjun Mo[2]

[1]New Media Research Centre, Sun Yat-sen University Nanfang College, Guangzhou, Guangdong, 510970, China

[2]School of Literatures and Communications, Sun Yat-sen University Nanfang College, Guangzhou, Guangdong, 510970, China

[3]School of Accounting, Sun Yat-sen University Nanfang College, Guangzhou, Guangdong, 510970, China

[*]Corresponding author. Email: h.liao@oxon.org

Keywords: fintech, financial services, bibliographic coupling, regtech, inclusive finance, green finance

ABSTRACT. Financial technology (fintech), or digital innovations in the financial sector, is expected to enhance access to financial services and promote innovations for more inclusive and sustainable futures. To provide an up-to-date discussion on FinTech, the paper aims to map out the main countries, publications, institutions, and topics of the related research based on the Web of Science (WoS) database. The findings based on the 494 articles show that publications have experienced rapid growth since 2015 and that fintech research has involved several disciplines, such as e-commerce, finance, sustainability studies, information management, economics, business, organization law, etc. Also, several U.S., Chinese, U.K., and Australian institutions have been shown to be prominent in hosting such interdisciplinary work. In addition, five main research clusters include (a) digitization- or even ecosystem-based innovations, (b) internet finance and its regulation, (c) cryptocurrencies and blockchains, (d) financial inclusion and trust, and (e) AI and regulation technologies (or regtech). By showing the research fronts of fintech, the scientometric analysis also highlights the research gap at the intersections of green finance and smart finance.

1. INTRODUCTION

Defined as "[d]igitally enabled innovation in the financial sector" by the United Nations 2019 Financing for Sustainable Development Report (FSDR), financial technology (fintech) have the potentials in enhancing financial access and narrowing financial gaps for many people and small- and medium-sized enterprises (SMEs), if such potentials can be balanced by the need for consumer protection, integrity and stability[1].

Expected by policy makers such as EU[2] to lower national barriers and increase competition in domains such as online banking, payment, fund transfer, peer-to-peer lending, and personal investment services, over 80 percent of main global banks have begun some partnerships with fintech[1]. Fintech promises digital transformation of the financial sector [12].

Innovations in fintech may be beneficial for more inclusive and sustainable development. For instance, Internet fintech platforms Ant Financial launched a blockchain remittance app for migrant workers to transfer money from Hong Kong to the Philippines, promising to lower waiting times, exchange rate, and transaction fees [3]. For another, in India, by linking its digital identity (Aadhaar), government-sponsored bank accounts (Jan Dhan), and mobile numbers, the JAM (Jan Dhan, Aadhaar, Mobile) initiative has successfully created a low-cost access to financial services that are otherwise out of reach for many Indians [1]. Nevertheless, these innovations also raise concerns regarding personal data ownership and possible misuse [1].

The discussions on Fintech appears to be growing, and some literature review articles do exist [4–9]. However, most of them focused on one aspect or one element of fintech, such as financial service, crowdfunding, blockchain, regulatory environment, underlying risks, information technology

services, etc. Little has been done to provide a comprehensive and systematic review. To provide an up-to-date discussion on FinTech, the paper aims to map out the main countries, publications, institutions, and topics of the related research based on the Web of Science (WoS) database.

2. Data and Methods

To capture the relevant literature on the topic of fintech, this scientometric analysis starts with the Web of Science (WoS) "Advanced Search" query designed as below:

• TS = ("Fintech" OR "Financial computing" OR "Digital finance*" OR "RegTech" OR "Internet finance*" OR "financial technolog*")

A total of 494 articles were collected on December 24, 2019 (including SCI-EXPANDED, SSCI, A&HCI, ESCI). VOSviewer was used for analyzing and visualizing results.

3. Research Findings

To explore how Fintech research has been conducted so far, the following findings have been presented, covering main countries, publications, institutions, and topics.

3.1. Trends and main contributing countries

Figure 1 shows that since 2015, the annual publication counts have been risen rapidly. Since top contributing countries include the U.S., China and England, Figure 2 shows China has overtaken the U.S. in 2019.

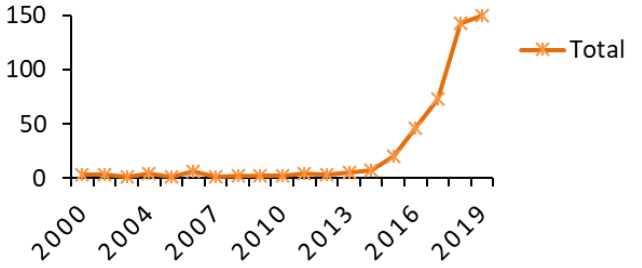

Figure 1 The number of publications

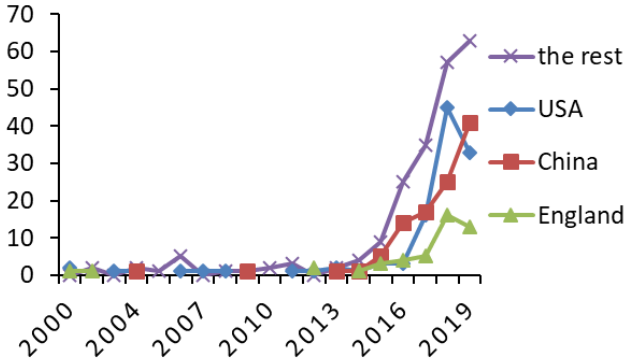

Figure 2 The number of publications: top countries

3.2. Main institutions and publications

Providing more detailed information beyond countries, Table 1 lists the top 10 institutions, indicating not only the strong presence of U.S., Chinese, and U.K. institutions such as MIT, NYU, Peking University, Zhejiang University of Finance Economics, University of London, etc., but also the Australian one such as the University of New South Wales. Table 2 shows the top 10 publication outlets, indicating the nature of interdisciplinarity of Fintech research, covering the related main disciplines such as e-commerce, finance, sustainability studies, information management, economics, business, organization law, etc.

Table 1 Top 10 institutions

Institutions	No.
Peking University	10
University of New South Wales Sydney	10
Massachusetts Institute of Technology (MIT)	8
New York University (NYU)	8
University of London	8
Zhejiang University of Finance Economics	8
Federal Reserve System USA	7
State University System of Florida	7
Pennsylvania Commonwealth System of Higher Education	6
University of Hong Kong	6

Table 2 Top 10 publication outlets

Publication Outlets	No.
Electronic Commerce Research and Applications	11
Financial Innovation	10
Sustainability	10
Journal of Management Information Systems	9
Emerging Markets Finance and Trade	8
China Economic Journal	6
Electronic Markets	6
Journal of Economics and Business	5
European Business Organization Law Review	5
Financial and Credit Activity-Problems of Theory and Practice	5

To show how top countries and publication outlets constitute research fronts [10], both Figure 3 and Figure 4 further visualizes the bibliographic coupling networks of the top 20 institutions and publication outlets, respectively.

Figure 3 shows the central position of the top institutions, along with their hosted countries, whereas Figure 4 the central positions of the top 5 journals. In particular, Figure 4 illustrates that the main central cluster include journals such as *Electronic Commerce Research and Applications*, *Electronic Markets*, *Financial Innovation*, *Industrial Management & Data Systems*, *Journal of Economics and Business*, Journal of Management Information Systems, *Review of Financial Studies*, and *Sustainability*.

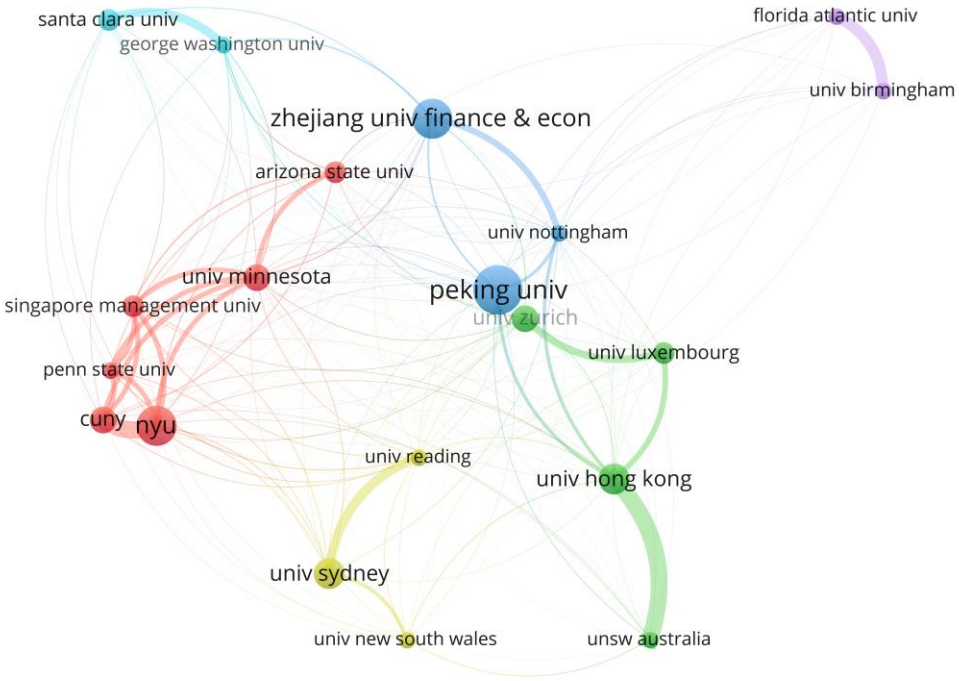

Figure 3 Top 20 institutions: a bibliographic coupling network visualization

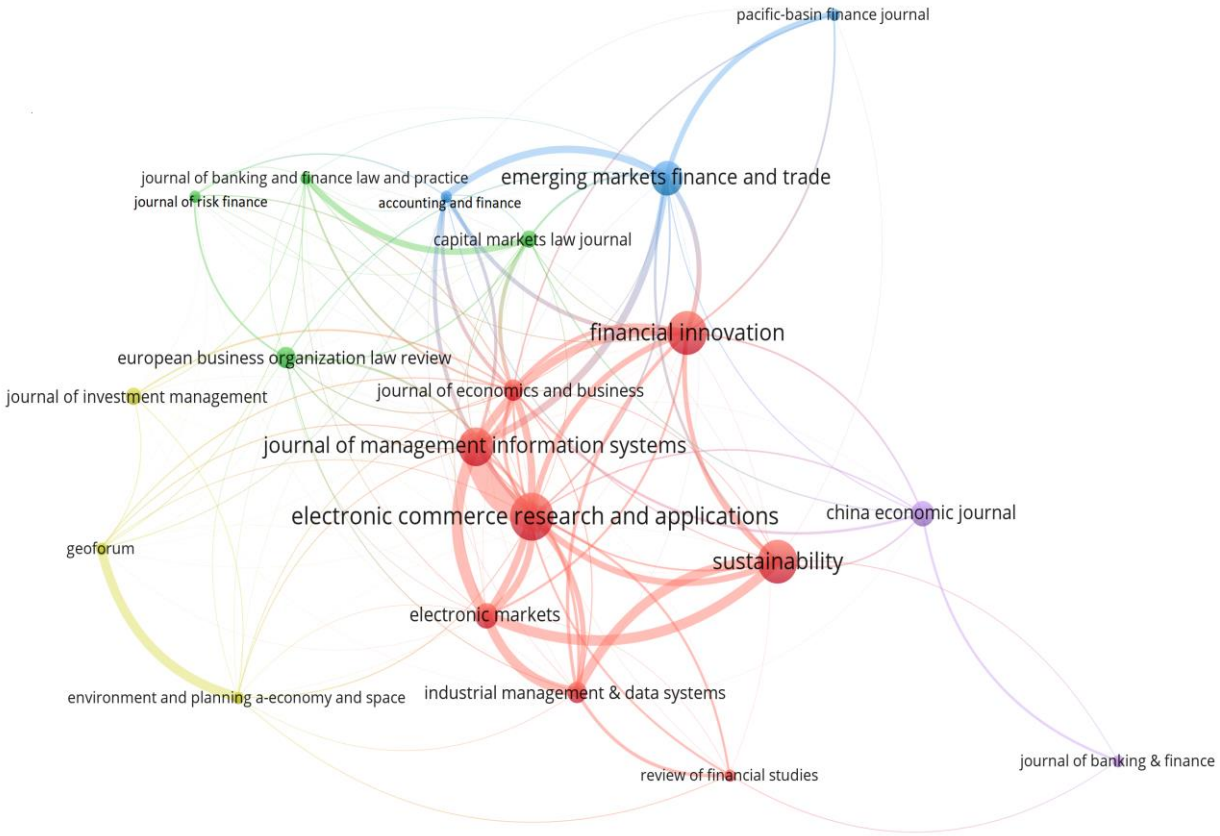

Figure 4 Top 20 publication outlets: a bibliographic coupling network visualization

3.3. Analysis of author keywords

To explore how the latest research concerns and topics correlate to one another, Figure 5 shows the co-occurrence network based on top 32 author keywords except for the most frequently-occurring

keyword “fintech”. The omission of the term “fintech” is warranted because such omission helps distinguish 5 clusters of research topics.

The first cluster of digitization-based innovations (in red color) appears to be about technical innovations about financial services such as banking[11], payments, etc., with discussions on business models[12] and ecosystems. The second cluster of internet finance and regulation (in green color), consists of topics such as P2P lending, big data, China, financial markets, etc. [9,13], with discussions on Fintech and internet platform regulation to maintain financial stability [1,14]. The third cluster of cryptocurrencies and blockchains (in blue color) focuses on blockchain and cryptocurrency technologies, including the innovations to leverage their values [12]. The fourth cluster of financial inclusion (in olive color) contains topic of financial inclusion, in relation to trust[5,15]. The fifth cluster of AI and regulation technologies (in color purple) appears to be at the intersections of financial regulation and regulatory technologies (RegTech), which concerns the digitization of reporting and compliance processes[16].

4. Conclusion

The literature review has shown the following development on Fintech research: (1) the United States and China have significant presence in the rapidly-risen publications since 2015; (2) main institutions include Chinese, American and Australian institutions; (3) main publication outlets demonstrate the interdisciplinary nature of Fintech research; and (4) main research concerns include (a) digitization- or even ecosystem-based innovations, (b) internet finance and its regulation, (c) cryptocurrencies and blockchains, (d) financial inclusion and trust, and (e) AI and regulation technologies (or Regtech).

Overall, although the notion of financial inclusion has emerged, the current research institutions and concerns are predominantly those of developed countries. Thus, research topics such as green finance or sustainable finance have been overlooked. Future research and policy work should fill such an important gap. In particular, as financial and technological instruments have become important components of our everyday life, it is imperative for both researchers and policy-makers to explore the ways in which these instruments can facilitate systematic social and technical changes. For instance, future work can explore how Fintech can contribute to the prior work on sustainable production, consumption, and livelihoods[17].

Indeed, as the demand for more inclusive and sustainable systems of profits, people and planet rises, any financial innovations should consider more than just digital transformation of e-commerce, financial markets, related regulations, etc., but also whether and how such transformation can be green and sustainable. More attention should be paid on the development of sustainable finance [1,15], exploring the meaningful and innovative intersections between “green finance” and “smart finance”, so as to advance systemic change through effective system thinking of financial services [18].

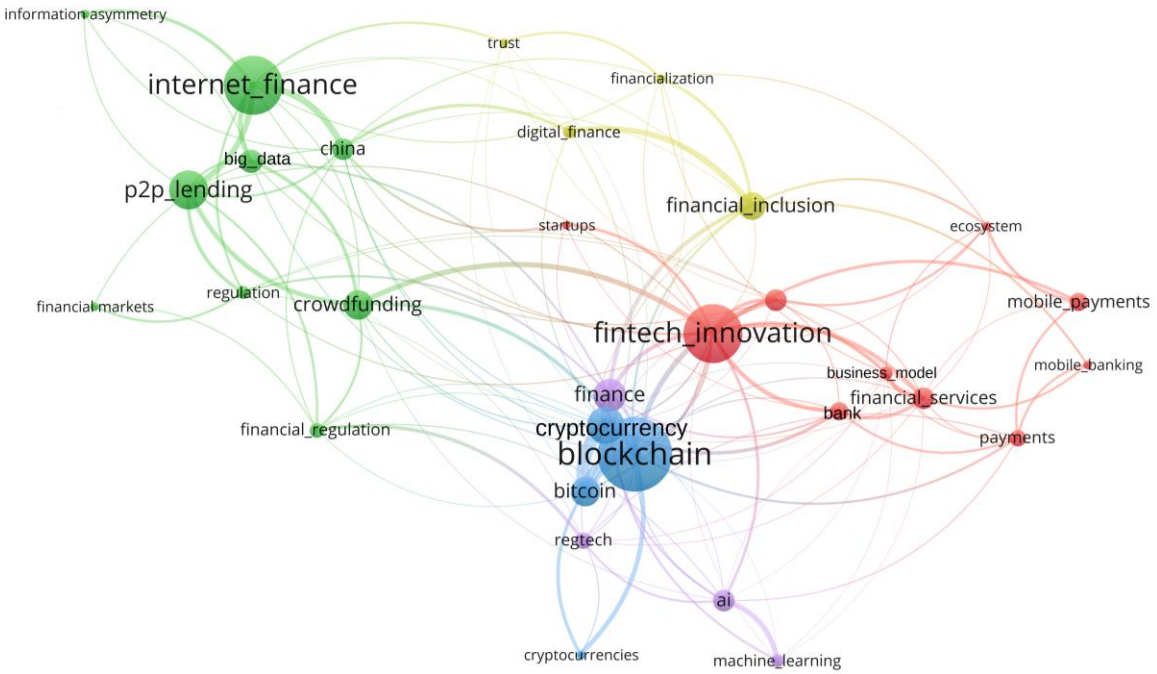

Figure 5 A map based on author keyword co-occurrence network: clustered outcomes

Acknowledgment

The research is supported by the Application-oriented Curriculum Development Projects of "API, Machine Learning and Artificial Intelligence" (NFU 02-40248), under the Guangdong Province Department of Education 2018 "Innovation-Strengthening Higher Education Program" Grants.

References

[1] United Nations, Inter-agency Task Force on Financing for Development, Financing for Sustainable Development Report, United Nations, New York, 2019. https://developmentfinance.un.org/fsdr2019 (accessed January 4, 2020).

[2] EC, FinTech, European Commission (EC) Website. (2019). https://ec.europa.eu/info/business-economy-euro/banking-and-finance/fintech_en (accessed January 4, 2020).

[3] AlipayHK, GCash, Ant Financial, To make it easy to do business anywhere, 2018. https://www.businesswire.com/news/home/20180625005561/en/AlipayHK-GCash-Launch-Cross-Border-Remittance-Service-Powered.

[4] K. Gai, M. Qiu, X. Sun, A survey on FinTech, Journal of Network and Computer Applications. 103 (2018) 262–273. https://doi.org/10.1016/j.jnca.2017.10.011.

[5] C.W. Cai, Disruption of financial intermediation by FinTech: a review on crowdfunding and blockchain, Accounting & Finance. 58 (2018) 965–992. https://doi.org/10.1111/acfi.12405.

[6] A.W. Ng, B.K.B. Kwok, Emergence of Fintech and cybersecurity in a global financial centre: Strategic approach by a regulator, Journal of Financial Regulation and Compliance. 25 (2017) 422–434. https://doi.org/10.1108/JFRC-01-2017-0013.

[7] C. Mera Macias, I.A. Alonso, Review of Proposals for the Construction and Management of the Catalog of Information Technology Services, IEEE Access. 6 (2018) 45335–45346. https://doi.org/10.1109/ACCESS.2018.2865470.

[8] M. Xu, X. Chen, G. Kou, A systematic review of blockchain, Financ Innov. 5 (2019) 27. https://doi.org/10.1186/s40854-019-0147-z.

[9] C. Martínez-Climent, A. Zorio-Grima, D. Ribeiro-Soriano, Financial return crowdfunding: literature review and bibliometric analysis, Int Entrep Manag J. 14 (2018) 527–553. https://doi.org/10.1007/s11365-018-0511-x.

[10] O. Persson, The intellectual base and research fronts of JASIS 1986–1990, Journal of the American Society for Information Science. 45 (1994) 31–38. https://doi.org/10.1002/(SICI)1097-4571(199401)45:1<31:AID-ASI4>3.0.CO;2-G.

[11] Z. Chen, Y. Li, Y. Wu, J. Luo, The transition from traditional banking to mobile internet finance: an organizational innovation perspective - a comparative study of Citibank and ICBC, Financial Innovation. 3 (2017) 12. https://doi.org/10.1186/s40854-017-0062-0.

[12] P. Gomber, R.J. Kauffman, C. Parker, B.W. Weber, On the fintech revolution: interpreting the forces of innovation, disruption, and transformation in financial services, Journal of Management Information Systems. 35 (2018) 220–265.

[13] J. Yan, W. Yu, J.L. Zhao, How signaling and search costs affect information asymmetry in P2P lending: the economics of big data, Financial Innovation. 1 (2015) 19. https://doi.org/10.1186/s40854-015-0018-1.

[14] A.S.M. Irwin, C. Dawson, Following the cyber money trail: Global challenges when investigating ransomware attacks and how regulation can help, Journal of Money Laundering Control. 22 (2019) 110–131. https://doi.org/10.1108/JMLC-08-2017-0041.

[15] S.-G. United Nations, Task Force on Digital Financing of Sustainable Development Goals, United Nations, New York, 2018. https://www.un.org/sg/en/content/sg/personnel-appointments/2018-11-29/task-force-digital-financing-sustainable-development (accessed January 4, 2020).

[16] D.W. Arner, J. Barberis, R.P. Buckey, FinTech, RegTech, and the Reconceptualization of Financial Regulation, Nw. J. Int'l L. & Bus. 37 (2016) 371.

[17] P. Vergragt, L. Akenji, P. Dewick, Sustainable production, consumption, and livelihoods: global and regional research perspectives, Journal of Cleaner Production. 63 (2014) 1–12. https://doi.org/10.1016/j.jclepro.2013.09.028.

[18] Z. Xu, C.-L. Pan, Aligning Capital and Technologies with Values: Advancing Internet Eco-systems of Smart Sustainable Finance, Guangzhou, 2019.