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A BIBLIOMETRIC ANALYSIS ON FINANCIALIZATION: CURRENT STATUS AND FUTURE DIRECTIONS

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Abstract *With growing interest in integrating financial markets and financial instruments worldwide, financialization has attracted the attention of researchers in recent literature. Moreover, with repeated periods of financial crises such as the global financial crisis, COVID-19 and the Ukraine-Russia war that changed the dynamics of the supply chain around the world, the relevance of this phenomenon is growing substantially. However, to date, no bibliographic publication has identified the evolution and direction of the study on this phenomenon. Therefore, this study provides a bibliometric analysis of the literature available in the SCOPUS database. This study outlines the literature on financialization and suggests areas for future research. Data selection was performed following the Preferred Reporting Items for Systematic Reviews process. Bibliometric analysis was conducted using VOS viewer software, which allows for scientific analysis based on citation and co-occurrence. Citation analysis was conducted based on the authors, countries, journals and documents with the most citations. Bibliographic mapping was also employed during the co-occurrence analysis to determine the current research themes. It is observed that financialization gains importance during and after a financial crisis. Furthermore, most studies have been conducted in developed economies. However, at present, the focus has shifted to developing economies. Moreover, the theme analysis indicates that the current research focus is on energy and agricultural commodity derivatives. To the best of our knowledge, this is the first attempt to present a bibliometric analysis of the literature on financialization.*

Keywords: *Bibliometric Analysis, Financialization, Financial Crisis, VOS Viewer, Style Investing, Risk Spillover*

JEL Classification: *C63, G01, G12, G13, G14, G4*

INTRODUCTION

Prior to the global financial crisis (GFC) of 2007–09, the spillover effect was an underrated phenomenon (Adams et al., 2014). The GFC triggered immense turmoil in economic activities, and the global economy and financial markets were forced into recession (Edey, 2009). Hence, after the GFC, the financial markets witnessed a fundamental change in the pattern of investors in the futures markets[1]. The investors started using commodities, bonds and other instruments as asset classes for diversification benefits (Cheng & Xiong, 2014).

The tendency to use asset classes to allocate funds is known as style investing (Adams & Gluck, 2015). Styles generate some common factors in the assets that are entirely uncorrelated otherwise. Therefore, it forms an association between different assets, independent of fundamental factors reflected in the demand and supply of underlying assets (Barberis & Shleifer, 2003). This has led to the integration of financial markets, spurring complex relationships and spillovers in both returns and volatilities of different markets (Dawar & Maitra, 2019), which is known as financialization (Domanski & Heath, 2007). Therefore, financialization is the increased use of financial activity for making profits or the increasing role of finance in the overall economy (Casey, 2011). Similar market dynamics were also reported after the shock to international financial markets during COVID-19. The consequences of financialization can be harmful because it can force an artificial spike in prices of commodities such as agricultural commodities, metals, etc., which are not intended for trading and are used as a hedging tool to protect sellers against adverse price movements.

[1] Please see Domanski and Heath (2007), Adams et al. (2015) and Dawar and Maitra (2019).

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A plenitude of studies have discussed the phenomenon of financialization around the world[2] and after the period of financial crisis, an increasing trend of similar market behaviour is observed (Shen et al., 2020). Gerlach et al. (2006) observed that Asia-Pacific real estate markets were not integrated before the period of the Asian Financial Crisis 1997; however, they were integrated afterwards. Similarly, Büyüksahin et al. (2009) also observed significant spillover across financial markets after the period of the GFC of 2008. The significant evidence of cross-market linkages is also available in the studies of Cheng and Xiong (2014); Kang et al. (2019); Chatziantoniou et al. (2021) and Khan et al. (2022). Kang and Lee (2019) observed that the integration of global financial markets is largely contributed by the chain of investor's reactions during and after the financial crisis period.

Likewise, the impact of negative investor sentiment on stock markets was also evident during the period of COVID-19 (Mirza et al., 2020). Supply shock was exacerbated by the measures taken to stop the spread of disease, and offices and industries were completely closed to prevent employees from contracting an infection (Liu et al., 2020). The global economy was severely harmed by it; as a result, equity markets suffered and this health crisis also caused a financial and economic crisis (Sahoo, 2021).

Financialization is observed across asset classes as well as markets. Adjasi et al. (2008); Agrawal et al. (2010); Mlambo et al. (2013) and Maitra and Dawar (2019) observed some relationship between exchange rates and stock market returns. In addition, Büyüksahin and Robe (2014) observed that institutional investors identified the commodity futures market as an asset class and started investing in it for the purpose of portfolio hedging. Therefore, commodity futures started moving in the direction of financial markets, thereby reducing the benefit of diversification. Adams and Gluck (2015) observed that spillover across asset classes was observed around 2004, 2005 and during the period of the GFC.

On the other hand, Boubaker et al. (2021) observed significant spillover from developed markets like the United States of America (US) to developing markets in Asia-Pacific markets. Moreover, Manu et al. (2022) observed that markets in the Asia-Pacific region are positively correlated to each other and this relationship is time-varying in nature. Therefore, financialization can happen across asset classes, institutions and markets as well.

There is a growing interest in studies related to financialization (Kang et al., 2019), which is also observed in Fig. 2. The number of research articles on this issue has almost reached 20 per year, which was very low from 2008 to 2012. Furthermore, COVID-19, a health crisis, that translated into an economic and financial crisis due to lockdowns, started in 2019 and spread rapidly around the world in 2020. As shown in Fig. 2, the maximum studies on this issue have been conducted around that period, which validates the fact that financialization gains importance during periods of financial crisis. Also, the research theme primarily focuses on the commodity area, with agricultural and energy commodities now being studied (Fig. 5).

A bibliographic study can help researchers identify the trends and direction of research (Cavalcante et al., 2021). Bibliometric analysis is a statistical method that quantitatively analyses the research on a particular topic using mathematical tools (Yu et al., 2020), however, to the best of our knowledge, there is no bibliographic study available on this phenomenon to date. Therefore, this study makes the first attempt to plug this gap and presents a bibliometric analysis of the literature available on financialization.

The current study is structured as follows: Section 2 presents the methodology and process used to conduct bibliometric analysis. It is followed by Section 3, in which the results of the study are presented. Section 4 concludes the study, and Section 5 presents the future scope of research.

MATERIAL AND METHODS

Techniques

In the present study, bibliometric analysis is conducted using VOS viewer software. Pan et al. (2018) observed an upward trend in the use of VOS viewer for conducting bibliometric analysis compared to HistCite and CiteSpace. With VOS viewer, one can utilise a broad range of bibliographic networks, such as analysis based on journals, countries, keywords, authors and co-citations (Shah et al., 2019).

In this study, analysis based on co-occurrence and citation is done. In co-occurrence analysis, the examination is based on the keywords provided by the authors. Furthermore, in citation analysis, data is analysed based on the authors, countries, journals and documents with the highest citations. Bibliographic mapping is also employed for keyword analysis and shows the number of publications and the year, which studies two keywords. Detailed information on each analysis of the VOS viewer is available in the user manual (Van et al., 2013).

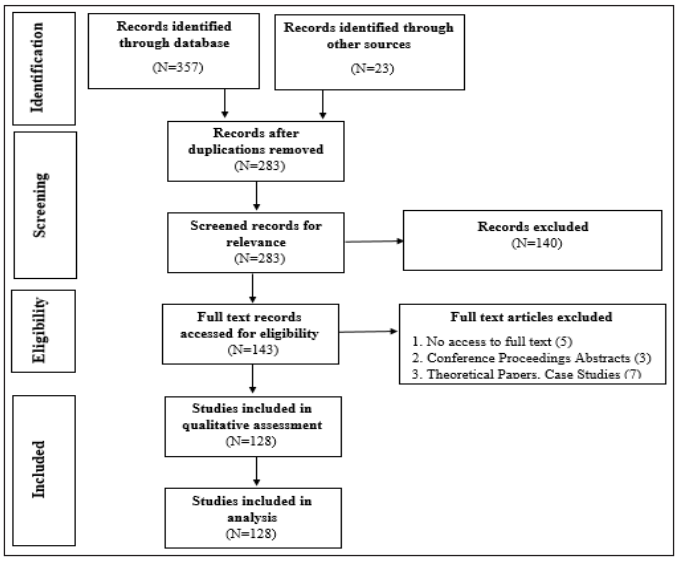
Sources of Data

For bibliometric analysis, data is primarily extracted from the SCOPUS database. The keyword used to extract data from the database is 'Financialization.' In addition, some studies are located through Google Scholar as well.

[2] Please see Kutty (2010), Büyüksahin and Robe (2014), Adams and Gluck (2015), Kang et al. (2019) and Chatziantoniou et al. (2021).

Data Selection Process

The data selection is made through the Preferred Reporting Items for Systematic Reviews (PRISMA) process. PRISMA is a statement that emphasises the methods that authors can use to ensure transparent reporting of systematic literature reviews (Liberati et al., 2009). This study makes use of this checklist to report the complete data selection and cleaning process. The flow chart of PRISMA is reported in Fig. 1.



Source: Compiled by author.

Fig. 1: PRISMA Framework for Data Screening

As explained in Fig. 1, an initial search through the SCOPUS database returned 357 articles, the oldest being from the year 2010 and the latest from 2022. In addition, we could locate 23 more articles through Google Scholar. Data were extracted in February 2022. Afterwards, the data screening stage was initiated, during which we removed 97 entries found in the list twice. Subsequently, 143 articles were removed because they were not relevant to the field of our study, that is, finance and economics. They were mainly related to the field of political science and sociology.

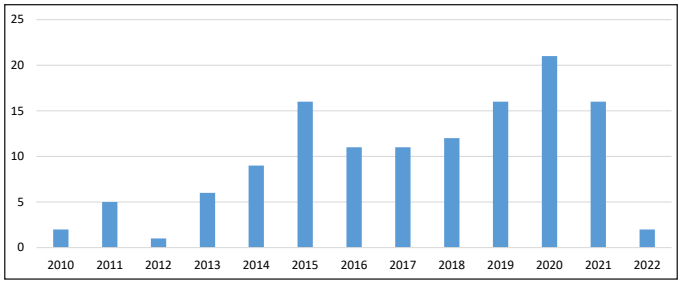
After that, when the record was accessed for eligibility, we could not have full access to five articles, while the other 10 articles were case studies, conference proceedings and abstracts only, which do not form part of our study. Therefore, 15 articles were removed at this stage, and we were left with 128 articles that formed part of our bibliometric analysis. The data were converted to CSV (Comma Delimited) format. This converted file has been analysed through VOS viewer software.

RESULTS AND DISCUSSIONS

The following results were obtained by analysis based on data extracted from the SCOPUS database:

Research Trend

Fig. 2 exhibits the progress of research articles published in the SCOPUS database on financialization from 2010 to 2022. The first study was published in the 2010. However, there has been an increasing trend in publications. A significant increase of 77% can be seen in publications from 2014–2015. The largest number of studies were reported in the year 2020, which was a period of a health crisis due to COVID-19 that translated into a financial crisis (Sahoo, 2021) because policies adopted by governments to control the spread of disease led to supply shocks (Liu et al., 2020). Consequently, equity markets around the world crashed. In 2021, again, 16 studies were reported, which means that after the period of a financial crisis, researchers tend to explore the changing dynamics of financial markets around the world. In 2022, two studies were already reported in the first two months. This shows the growing interest in this particular issue among researchers and academicians worldwide.



Source: Based on data extracted from SCOPUS database.

Fig. 2: Research Trend of Studies on Financialization

Research Outlets

The 128 publications we got through our analysis are dispersed across more than 20 journals. We are reporting the top 10 journals with the highest number of documents in Table 1.

Table 1: Research Outlets

Source	Documents	Citations	Average Citations per Document	Total Link Strength
Energy Economics	15	569	37.9	20
Journal of Futures Markets	9	96	10.7	24

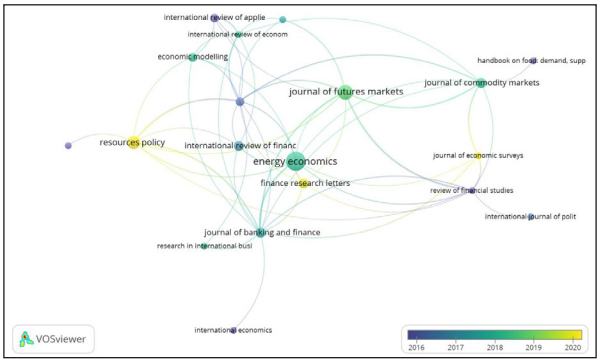
Source	Documents	Citations	Average Citations per Document	Total Link Strength
Resources Policy	7	44	6.3	17
Finance Research Letters	4	37	9.3	8
International Review of Financial Analysis	4	94	23.5	7
Journal of Banking And Finance	4	211	52.8	28
Journal of Commodity Markets	4	53	13.3	15
Economic Modelling	3	42	14.0	7
International Review of Applied Economics	3	31	10.3	6
Journal of International Money and Finance	3	264	88.0	24

Source: Based on author's calculations.

As shown in Table 1, the top 10 journals have published 56 papers, with a maximum of 15 in 'Energy Economics', a journal enlisted in the Australian Business Dean Council (ABDC) list of journals with a ranking 'A*'. It is followed by the 'Journal of Futures Market,' which has nine documents and is another journal listed in the ABDC list of journals with a ranking of 'A.' Furthermore, there are other prominent journals in the list, such as 'Resource Policy' (7 documents), a renowned journal of Elsevier, and 'Finance Research Letters', also an 'A' category journal in the ABDC list. This indicates that this field occupies a prominent position in management and business research journals.

When analysed citation-wise, the 'Journal of International Money and Finance' occupies a prominent position with an average of 88 citations per document, followed by the 'Journal of Banking and Finance' with approximately 53 average citations per document. However, the most citations still lie with the 'Energy Economics' journal, with 569 citations overall.

An overlay visualisation map has also been created for these journals, as shown in Fig. 3, which shows the development of research over time. As evident from the Figure, most recent research work in this area is getting published in journals, that is, Finance Research Letters, Resource Policy and Journal of Economic Surveys. Most of Energy Economics and the Journal of Futures Market work was published in 2018–2019. Other journals published a few research articles, mostly in 2016–17.



Source: Based on network overlay visualisation analysis of SCOPUS database through VOS viewer software.

Fig. 3: Research Outlets

Country-Wise Research Analysis

The country-wise analysis results for the top 10 countries are reported in Table 2. A maximum number of research articles are from the United States, which accounts for 33 articles, followed by the United Kingdom, which accounts for 24 articles. China, France, Germany, Canada, Australia, India, Italy and Turkey are the other countries on the top 10 list.

Furthermore, when analysed citation-wise, the country with the highest average citation rate is the United States, with 56 average citations per document. Australia follows it with an average of 55 citations per document and China is the third most prominent country on the list with an average of 45 citations per document.

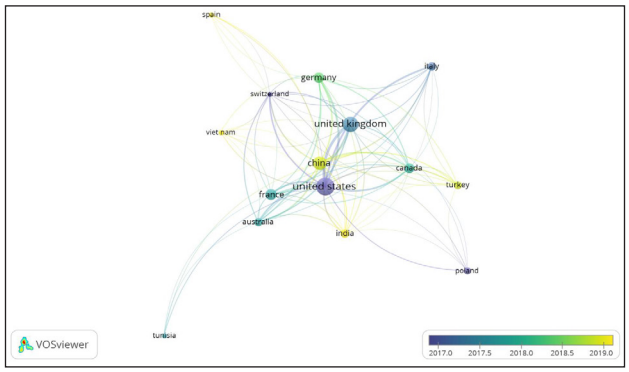
Table 2: Country-Wise Analysis

Country	Documents	Citations	Average Citations per Document	Total Link Strength
United States	33	1852	56.12	288
United Kingdom	24	563	23.46	137
China	18	816	45.33	184
France	12	456	38.00	80
Germany	11	244	22.18	94
Canada	10	379	37.90	72
Australia	7	385	55.00	88

Country	Documents	Citations	Average Citations per Document	Total Link Strength
India	7	33	4.71	48
Italy	7	50	7.14	57
Turkey	6	107	17.83	38

Source: Based on author's calculations.

In addition, the overlay visualisation map (Fig. 4) exhibits the countries in which current research in this area is focused. These countries are India, China, Turkey, Vietnam and Spain. The studies based on countries such as the United States, United Kingdom, Poland and Switzerland were conducted in 2017.



Source: Based on network overlay visualisation analysis of SCOPUS database through VOS viewer software.

Fig. 4: Country-Wise Analysis

Keyword Analysis

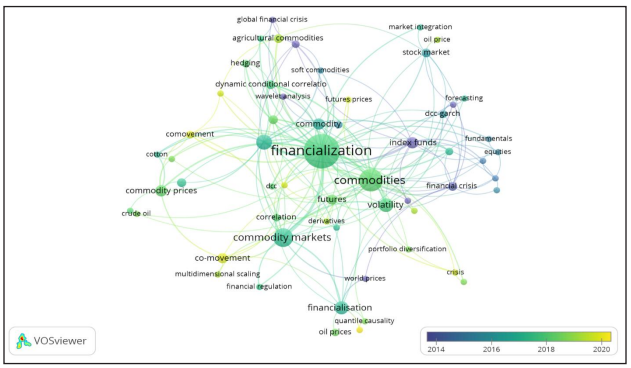
The keyword analysis represents themes of research articles (Comerio & Strozzi, 2019). In this article, analysis is done based on keywords used by the author. A total of 345 keywords are used in 128 articles. Table 3 shows the important keywords used by different authors in the studies.

Table 3: Keyword Analysis

Keyword	Occurrences	Total Link Strength
Financialization	62	72
Commodities	24	31
Commodity Markets	17	23
Speculation	11	20
Volatility	9	16

Source: Based on author's calculations.

As shown, 'Financialization' is the most frequently used keyword in research articles with 62 occurrences, which indicates that this is the most crucial term in the whole discussion about co-movement or association in different asset classes. Other essential keywords that authors use are 'Commodities' (24 occurrences), 'Commodity Markets' (17 occurrences) and 'Speculation' (11 occurrences). It also indicates that most studies are available only on the commodity market.



Source: Based on network overlay visualization analysis of SCOPUS database through VOS viewer software.

Fig. 5: Theme Analysis

As shown in the overlay visualisation map (Fig. 5), financialization gained importance around 2015, which is mainly connected with commodities and commodity markets. Furthermore, it is also evident that current research revolves around checking co-movement during a financial crisis. The commodities studied in the present research are oil and agricultural commodities. In addition, derivatives and futures markets are important markets under study. Therefore, theme analysis indicates that current important research commodities are energy and agriculture and the derivatives market is being studied in relation to the financial crisis period.

Author-Wise Analysis

An author-wise analysis is done to check the authors with the highest citations. Table 4 shows that Xiong and Tang are the two most cited authors on this phenomenon. Xiong leads in overall citations with 854 citations, followed by Tang with 614 citations. On the basis of average citations per article, Xiong leads other authors with 427 citations, followed by Tang with 307 citations per article, which indicates the quality of their research. Other authors are on the list, such as Buyuksahin, Robe, Irwin, Sanders and Adams. However,

the citation count for each other is below 300. Link strength is also highest for Xiong with 49 and is followed by Tang with a link strength of 34. Therefore, it indicates that Xiong and Tang have contributed the most to this topic.

Table 4: Author-Wise Analysis

Author	Documents	Citations	Average Citations per Document	Total Link Strength
Xiong W.	2	854	427	49
Tang K.	2	614	307	34
Buyuksahin B.	2	263	131.5	20
Robe M.A.	2	263	131.5	20
Irwin S.H.	2	222	111	12
Sanders D.R.	2	222	111	12
Adams Z.	2	168	84	27
Chevallier J.	2	76	38	13
Guesmi K.	2	64	32	5
Han L.	2	37	18.5	13

Source: Based on author's calculations.

Most Cited Articles

Table 5 presents the list of the most cited financialization articles from 2010 to 2022. The highest cited article Tang and Xiong co-authored as per the SCOPUS database is 'Index Investment and Financialization of Commodities,' co-authored by Tang and Xiong in 2012 and published in the 'Financial Analysts Journal.' It has 601 citations and 44 link strengths. It is followed by an article co-authored by Silvennoinen and Thorp titled 'Financialization, Crisis and Commodity Correlation Dynamics' in 2013, published in the 'Journal of International Financial Markets, Institutions and Money' and having 308 citations. These two articles are followed by articles written by Creti, Cheng, Buyuksahin, Irwin, Basak, Adams and others, details of which are available in Table 5.

Table 5: Most Cited Articles

Authors	Title	Citations	Total Link Strength
Tang and Xiong (2012)	Index Investment and Financialization of Commodities	601	44
Silvennoinen and Thorp (2013)	Financialization, Crisis and Commodity Correlation Dynamics	308	26
Creti et al., (2013)	On the Links Between Stock and Commodity Markets' Volatility	267	8
Cheng and Xiong (2014)	Financialization Of Commodity Markets	253	20
Buyuksahin and Robe (2014)	Speculators, Commodities and Cross-Market Linkages	234	18
Irwin and Sanders (2011)	Index Funds, Financialization, and Commodity Futures Markets	212	15
Basak and Pavlova (2016)	A Model of Financialization of Commodities	203	21
Adams (2015)	Financialization in Commodity Markets: A Passing Trend or the New Normal?	150	17
Henderson et al., (2015)	New Evidence on the Financialization of Commodity Markets	148	10
Juvenal and Petrella (2015)	Speculation in the Oil Market	111	7

Source: Based on author's calculations.

CONCLUSION

The current study presents a bibliometric analysis of the literature available on 'Financialization,' which has not been conducted in the literature to date. The data used for analysis is extracted from the SCOPUS database and Google Scholar. Data cleaning is done through the PRISMA framework to ensure transparency. Thereafter, data is analysed through VOS viewer software. Broadly, co-occurrence and citation analysis of the data is done. Afterwards, different techniques available in citation analysis, such as theme-wise analysis, country-wise analysis, author-wise analysis, document-wise analysis and journal-wise analysis, are applied to analyse the data. It is shown that there is a growing interest in the phenomenon of 'Financialization.' In addition, currently, researchers focus on derivatives and futures markets and the impact of a financial crisis period is being examined on energy and agricultural commodities.

In addition, country-wise analysis indicates that most studies have been conducted in developed economies, with the largest number of studies coming from the United States. However, currently, the focus has shifted to developing world economies. Furthermore, 'Financialization' is the most important keyword with the most occurrences. Xiong and Tang are the most cited authors in this area of study. A research article co-authored by both titled 'Index Investment and Financialization of Commodities' is the most cited article on this topic. Therefore, the work of Xiong and Tang is popular among researchers examining 'Financialization.'

FUTURE SCOPE OF RESEARCH

'Financialization' has a lot of scope in the context of contributions to methodology, theoretical development and studying the impact of a financial crisis on developing economies. Furthermore, most studies examine the financialization of commodities only, whereas studies can also focus on other asset classes such as currency, cryptocurrencies and debt, etc. In addition, literature examines the impact of a financial crisis on the dynamics of different asset classes or financial markets. However, one can also study the impact of changing business models in this context. Moreover, one can also examine if financialization is a temporary phenomenon or a permanent change in the behaviour of asset classes or financial markets.

DECLARATIONS OF INTEREST

The authors declare that there is no conflict of interest.

DATA AVAILABILITY

Available on demand.

FUNDING STATEMENT

No funding is received to conduct this study.

ETHICAL COMPLIANCE

All ethical guidelines have been complied with.

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