



Oguntuase, O.J., & Ajibare, A.O. (2024). Quo Vadis Climate Transition Risk? A Literature Review and Recommendations. Copernican Journal of Finance & Accounting, 13(2), 63–87. <http://dx.doi.org/10.12775/CJFA.2024.008>

OLUWASEUN J. OGUNTUASE*

Zenith Bank PLC

ADEDAYO O. AJIBARE**

Lagos State University

QUO VADIS CLIMATE TRANSITION RISK? A LITERATURE REVIEW AND RECOMMENDATIONS

Keywords: climate change, transition risk, interconnectedness, systemic risk, financial stability.

J E L Classification: D53, G32, Q54.

Abstract: This paper examines the academic research on climate transition risk. The objective of this study is to provide descriptive characteristics of research trends in the field of climate transition risk and make recommendations based on major bibliometric data such as authors, journals, citation figures, methodology, geographical focus and author's location. The systematic literature review methodology was used to obtain information on publications and intellectual structure related to climate transition risk from the Scopus bibliographic database until November 2023. A search strategy was developed to screen the title for eligibility, using the abstract and full text where needed. The review showed that annual evolution has increased significantly in recent years. Findings revealed a marked European and Chinese dominance with

Date of submission: March 19, 2024; date of acceptance: July 4, 2024.

* Contact information: oluwaseunoguntuase@gmail.com, Zenith Bank PLC, Lagos, Nigeria 101243, phone: +23 48 03522823; ORCID ID: <https://orcid.org/0000-0003-2225-7766>.

** Contact information: adedayoajibare@gmail.com, Department of Accounting, Lagos State University, Lagos, Nigeria 102101, phone: +44 74 40738491; ORCID ID: <https://orcid.org/0000-0002-0249-1857>.

little contribution from Global South in this research field with limited contributions from Global South in terms of focus and authors and organizations contributions. The predominant data source is data-set indices, with limited methodological diversity in climate transition risk research. Findings also showed that authors from universities, research institutes and central banks are contributing to climate transition risk literature. The main themes in climate transition risk research are banking, climate policy, stock market, and asset price and performance. The impacts of climate change on interconnectedness, systemic risk and financial stability were widely covered in overlapping publications.

■■■ INTRODUCTION

Climate change is rapidly proceeding, and climate-related risks are being exacerbated. Climate change mitigation has attracted a lot of attention globally since the ratification of the Paris Agreement in December 2015 to limit the rise in average global temperatures to less than 2 °C over pre-industrial levels. Previous studies have drawn attention to the paucity of scholarly research on climate transition risk that has been published in reputable journals (see: Diaz-Rainey, Robertson & Wilson, 2017; Kouwenberg & Zheng, 2023; Nguyen, Diaz-Rainey & Kuruppuarachchi, 2023), hence the need to conduct a systematic review of academic publications to analyze and synthesize the existing research work in the field of climate transition risk for academics, practitioners and the financial sector for heightened scrutiny and enhanced climate mitigation efforts.

The objective of this study is to provide descriptive characteristics of research trends in the field of climate transition risk and make recommendations based on major bibliometric data such as authors, journals, citation figures, methodology, geographical focus and author's location.

LITERATURE REVIEW

Financial institutions are not only exposed to the climate-related risks, but they are also actively exacerbating those risks by continuing to provide substantial financing to fossil fuel industry. Transition risks and physical risks are the two main financial risks associated with accelerating climate crisis. The physical risks are linked to the actual or predicted economic effects of more frequent extreme events due to human-induced climate change. The transition risks relate to the revaluation of carbon-intensive assets as a result of policy and tech-

nological changes necessary to achieve a low-carbon economy (Dafermos, Nikolaidi & Galanis, 2018; Dunz, Naqvi & Monasterolo, 2021). As economies shift towards carbon neutrality to execute the low-carbon transition and meet the climate targets, transition risks are linked to uncertainty in the policy environment and transition pathways for climate change, including changes in public regulations, technologies, investors and consumers preferences (Stolbova, Monasterolo & Battiston, 2018; Monasterolo, Roventini & Foxon, 2019; Oguntuase, 2020; Jermain, Ren, Foster, Pilcher & Berardi, 2022; Ren, Li, He & Lucey, 2023).

A major transition risk is that carbon-sensitive financial assets could rapidly lose value and become stranded as result of low-carbon technological advancements as more ambitious climate policies are implemented worldwide (Sen & Von Schickfus, 2020; Shimbar, 2021; Xiao & Liu, 2023; Wang, Wang, Yunis & Kchouri, 2023). Systemic risk will be introduced into the financial system and financial stability will be impacted by an abrupt revaluation of financial contracts, instruments, and portfolios in response to the haphazard introduction of policies for climate action (Dunz et al., 2021; Zhang, Zhang & Lu, 2022; Magacho, Espagne, Godin, Mantes & Yilmaz, 2023; Wu, Bai, Qi, Lu, Yang & Taghizadeh-Hesary, 2023).

A mature financial system's inherent interconnectedness exposes it to systemic risk. Interconnectedness of financial institutions – banks and other financial agents – increases systemic risk (Campos-Martins & Hendry, 2023; Collender, Gan, Nikitopoulos, Richards & Ryan, 2023; Hanif, Teplova, Rodina, Alomari & Mensi, 2023; Rao, Lucey & Kumar, 2023). Systemic risk is the potential that a threat or hazard will cause losses or disruptions to components of an interconnected system (Mao, Wei & Ren 2023). Climate-related risks are becoming a major systemic risk issue and one of the most important challenges facing global financial stability (Dong & Liu, 2023; Rao et al., 2023; Wu et al., 2023). In an interconnected financial system, systemic risks could result from negative impact of stranded carbon-intensive assets on the value of other financial instruments, thereby destabilizing the normal functioning of the real economy (Diallo, Bah & Ndiaye, 2023; Hanif et al., 2023; Le, Pham & Do, 2023). The negative consequences of the destabilization could have a severe impact on systemically important financial institutions and broader financial markets to financial instability (Dafermos et al., 2018; Battiston, Dafermos & Monasterolo, 2021; Roncoroni, Battiston, Escobar-Farfán & Martinez-Jaramillo, 2021; Curcio, Gianfrancesco & Vioto, 2023).

RESEARCH METHODOLOGY AND RESEARCH PROCESS

The systematic literature review (SLR) approach is suitable for collecting, organizing, evaluating and synthesizing all the available empirical evidence regarding a subject of interest within a defined period of time (Solarte-Montufar, Zарtha-Sossa & Osorio-Mora, 2021). This study used the Elsevier’s Scopus bibliographic database as its search engine because it is widely regarded as a credible database by academics (Khurana, Ganesan, Kumar & Sharma, 2022; Kumupalainen & Seppänen, 2022; Thelwall & Sud, 2022).

Articles in the scientific production indexed in the Scopus bibliographic database were consulted, analyzing the articles and the emerging trends in research in articles published till November 14, 2023. In order to increase the search’s focus, the term “transition risk” was combined with other keywords rather than being searched alone. Using four distinct approaches to climate transition risk, four search equations were employed in the timeless search till November 14, 2023. The screening protocol from Nasreen and Baker (2022) was adapted to suit the study objective to make recommendations on climate transition research based on major bibliometric data.

Equation (1): TITLE-ABS-KEY (climate “transition risk” AND “interconnectedness”) (1)

Equation (2): TITLE-ABS-KEY (climate “transition risk” AND “connectedness”) (2)

Equation (3): TITLE-ABS-KEY (climate “transition risk” AND “systemic risk”) (3)

Equation (4): TITLE-ABS-KEY (climate “transition risk” AND “financial stability”) (4)

RESULTS

Data normalization

The search equations retrieved a total of 403 records as shown in Table 1. Manual normalization of the records was performed. Of the 403 publications, there were 104 overlapping publications, while 67 publications were excluded for not meeting the study’s predetermined criteria. A final of total of 232 publications were selected for analysis.

Table 1. Document selection process

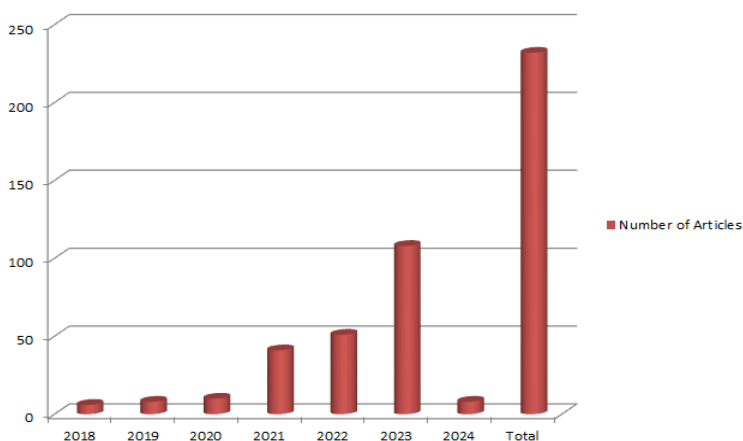
Search equation	No of publications
Climate “transition risk” AND “interconnectedness”	33
Climate “transition risk” AND “connectedness”	119
Climate “transition risk” AND “systemic risk”	89
Climate “transition risk” AND “financial stability”	162
Total	403

Source : authors’ compilation.

Dynamics of yearly publications in climate transition risk

The climate transition risk publication-year distribution shows an increasing trend over the five consecutive years with a remarkable increase in publications between the year 2020 and 2021 and 2022 and 2023 to date. The number of publications from 2018 to November 13 2023 can be seen in Figure 1.

Figure 1. Annual distribution of publications



Source : authors’ compilation.

Top journals in climate risk transition

Table 2 shows the top journals with climate transition risk publications. The journal with the highest number of articles is the Energy Economics with 19 publications. The journals CiteScore and CiteScore Percentile are also presented.

Table 2. Top journals that publish climate transition risk research

Journal	Cite score	Highest percentile (%)	Articles
Energy Economics	14.7	98	19
Journal of Financial Stability	5.6	91	15
Ecological Economics	11.0	95	14
International Review of Financial Analysis	9.1	94	14
Reference Module in Social Sciences	N/A	N/A	11
Journal of Cleaner Production	18.5	99	8
Energy Research and Social Science	11.9	98	7
Energy Policy	15.2	97	6
Climate Risk Management	6.7	88	6
Research in International Business and Finance	9.1	95	6
Finance Research Letters	10.8	96	5
International Review of Economics and Finance	5.7	85	5
One Earth	13.6	98	5
Renewable and Sustainable Energy Reviews	26.3	96	5
Technological Forecasting and Social Change	17.2	98	5
Economics Letters	2.6	57	4
International Economics	5.7	91	4
Journal of Environmental Management	13.4	96	4
Resources Policy	11.3	99	4
Global Environmental Change	16.5	99	3
International Journal of Disaster Risk Reduction	7.4	94	3

Table 2. Top journals...

Journal	Cite score	Highest percentile (%)	Articles
Journal of Climate Finance	N/A	N/A	3
Journal of Environmental Economics and Management	9.0	93	3
Journal of International Money and Finance	4.0	75	3
Latin American Journal of Central Banking	N/A	N/A	3

Source: authors' compilation.

Most-cited publications in climate transition risk

Referencing is a critical factor in evaluating the works of authors and journals. Table 3 displays the top 20 publications with over 70 citations. Eight (40%) of the 20 publications have also been published as working paper, discussion paper or policy brief. In all about 21% of the total 232 publications analyzed in this study have been published as working paper, discussion paper or policy brief of research institutes, central banks, etc as shown in Figure 2.

Table 3. Most-cited publications in climate transition risk

Authors	Title	Year	Total Citation	Journal	Corresponding working paper	Themes
Yannis Dafermos, Maria Nikolaidi, Giorgos Galanis	Climate change, financial stability and monetary policy	2018	272	Ecological Economics	Post Keynesian Economics Society Working Paper	Financial stability
Juan C. Reboredo, Andrea Ugolini, Fernando Antonio Lucena Aiube	Network connectedness of green bonds and asset classes	2020	167	Energy Economics		Interconnectedness Financial stability
Simon Dikau, Ulrich Volz	Central bank mandates, sustainability objectives and the promotion of green finance	2021	161	Ecological Economics	The School of Oriental and African Studies Working Paper	Systemic risk Financial stability

Table 3. Most-cited...

Authors	Title	Year	Total Citation	Journal	Corresponding working paper	Themes
Sarah Hafner, Aled Jones, Annela Anger-Kraavi, Jan Pohl	Closing the green finance gap - a systems perspective	2020	137	Environmental Innovation and Societal Transitions		Interconnectedness Systemic risk Financial stability
Paola D'Orazio, Lilit Popoyan	Fostering green investments and tackling climate-related financial risks: which role for macroprudential policies?	2019	134	Ecological Economics	Laboratory of Economics and Management (LEM) Working Paper Series	Interconnectedness Systemic risk Financial stability
Irene Monasterolo, Luca de Angelis	Blind to carbon risk? An analysis of stock market reaction to the Paris Agreement	2020	133	Ecological Economics		Interconnectedness Financial stability
Irene Monasterolo, Marco Raberto	The EIRIN flow-of-funds behavioural model of green fiscal policies and green sovereign bonds	2018	129	Ecological Economics		Systemic risk Financial stability
Serena Fatica, Roberto Panzica, Michela Rancan	The pricing of green bonds: are financial institutions special?	2021	116	Journal of Financial Stability	The EU Joint Research Council Working Papers	Financial stability
Robyn Clark, James Reed, Terry Sunderland	Bridging funding gaps for climate and sustainable development: pitfalls, progress and potential of private finance	2018	109	Land Use Policy	Center for International Forestry Research (CIFOR) Policy Brief	Financial stability
Giusy Capasso, Gianfranco Gianfrate, Marco Spinelli	Climate change and credit risk	2020	106	Journal of Cleaner Production	EDHEC-Risk Institute Working Paper	Systemic risk Financial stability
Stefano Battiston, Yannis Dafermos, Irene Monasterolo	Climate risk and financial stability		105	Journal of Financial Stability		Interconnectedness Financial stability

Table 3. Most-cited...

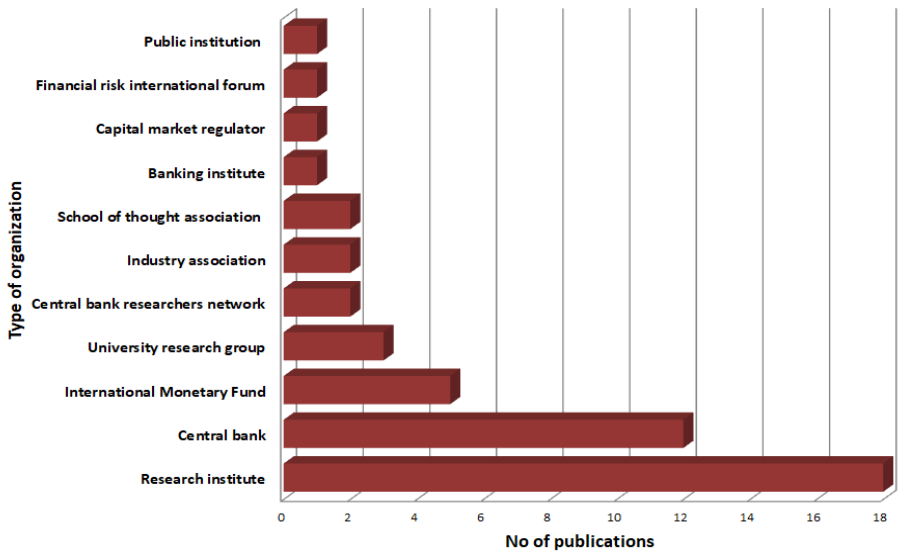
Authors	Title	Year	Total Citation	Journal	Corresponding working paper	Themes
Johannes Stroebel, Jeffrey Wurgler	What do you think about climate finance?	2021	102	Journal of Financial Economics	National Bureau of Economic Research (NBER) Working Paper	Systemic risk
Siamak Javadi, Abdullah-Al Masum	The impact of climate change on the cost of bank loans	2021	92	Journal of Corporate Finance		Interconnectedness
Veronika Stolbova, Irene Monasterolo, Stefano Battiston	A financial macro-network approach to climate policy evaluation	2021	85	Ecological Economics		Interconnectedness Systemic risk
Solveig Glomsrød, Taoyuan Wei	Business as unusual: the implications of fossil divestment and green bonds for financial flows, economic growth and energy market	2018	84	Energy for Sustainable Development	Centre for International Climate and Environmental Research, Oslo (CICERO) Working Paper	Financial stability
Joe Curtin, Celine McNerney, Brain O. Gallachoir, Conor Hickey, Paul Deane, Peter Deeney	Quantifying stranding risk for fossil fuel assets and implications for renewable energy investment: a review of literature	2018	80	Renewable and Sustainable Energy Reviews		Systemic risk financial stability
Hugues Chenet, Josh Ryan-Collins, Frank van Lerven	Finance, climate change and radical uncertainty: towards a precautionary approach to financial policy	2019	80	Ecological Economics		Systemic risk Financial stability
Alan Roncoroni, Stefano Battiston, Luis O.L. Escobar-Farfán, Serafin Martinez-Jaramillo	Climate risk and financial stability in the network of banks and investment funds	2021	75	Journal of Financial Stability		Interconnectedness Systemic risk Financial stability

Table 3. Most-cited...

Authors	Title	Year	Total Citation	Journal	Corresponding working paper	Themes
George Goddard, Megan A. Farrelly	Just transition management - balancing just outcomes with just processes in Australian renewable energy transitions	2021	70	Applied Energy		Interconnectedness
Hua Jiang, Tomiwa Sunday Adebayo, Abraham Ayobamiji Awosusi, Asif Razzaq	A symmetric effects of high-tech industry and renewable energy on consumption-based carbon emissions in MINT countries	2018	70	Renewable Energy		Interconnectedness

Source: authors' compilation.

Figure 2. Distribution of other publishing organizations



Source: authors' compilation.

Prolific authors in climate transition risk

Table 4 contains the results of the most frequent publishers on climate transition risk. It shows Irene Monasterolo with 10 publications, Brian Lucey with 5 publications, and Olaf Weber, Emanuele Campiglio and Paola D’Orazio, each with 4 publications. Irene Monasterolo was also the most cited author with 612 citations as shown in Table 5.

Table 4. Prolific authors in climate transition risk

No	Author	No of articles	Citations
1	Irene Monasterolo	10	612
2	Brian Lucey	5	26
3	Olaf Weber	4	15
4	Emanuele Campiglio	4	56
5	Paola D’Orazio	4	167
6	Kun Guo	3	27
7	Oguzhan Cepni	3	8
8	Qiang Ji	3	10
9	Roberto Panzica	3	183
10	Serhan Cevik	3	37
11	Xiaohang Ren	3	156
12	Yannis Dafermos	3	417
13	Stefano Battiston	3	182

Source: authors’ compilation.

Table 5. Top cited authors in climate transition risk

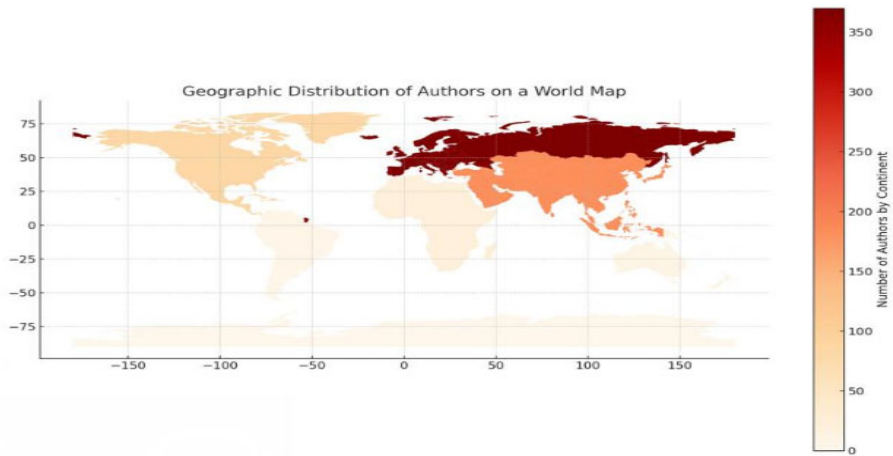
No	Author	Citations	No of articles
1	Irene Monasterolo	612	10
2	Yannis Dafermos	417	3
3	Maria Nikolaidi	312	2
4	Giorgos Galanis	272	1
5	Stefano Battiston	265	3
6	Ulrich Volz	195	2
7	Roberto Panzica	183	3
8	Sarah Hafner	172	2
9	Andrea Ugolini	167	1
10	Fernando Antonio Lucena Aiube	167	1
11	Juan C. Reboredo	167	1
12	Paola D'Orazio	167	1

Source: authors' compilation.

Geographical distribution of publications on climate transition risk

Authors contributing to the climate transition risk studies are resident in several countries. Figure 3 and Table 6 portray the spatial distribution of the authors across continents and countries. Europe leads with 370 authors, then Asia with 183 authors. Relatively few publications in the climate transition risk literature have an author from Africa or Latin America. China tops the productive countries with 107 authors. The United Kingdom comes second with 88 authors, while the USA follows with 63 authors. Other European nations such as Italy, France and Germany are among the best performing countries with 61, 35 and 35 pieces, respectively.

Figure 3. Author’s location by continent



Source: authors’ compilation.

Table 6. Author’s location by country

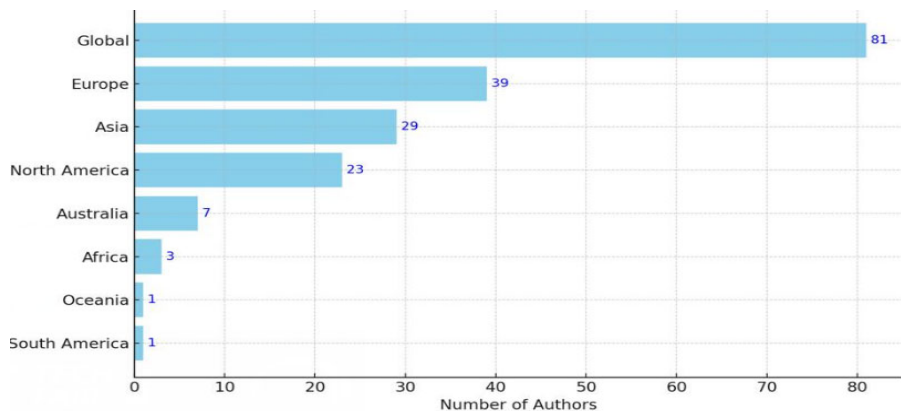
No of authors	Countries
107	China
88	United Kingdom
63	USA
61	Italy
35	France
35	Germany
34	Australia
32	The Netherlands
20	Spain
19	Canada
15	Austria, Switzerland
13	India
12	South Africa
11	Norway, Taiwan

Table 6. Author's...

No of authors	Countries
9	Ireland, Russia
8	Sweden
7	Japan
6	Hong Kong, Pakistan, Turkey, Vietnam
5	Brazil, Greece, New Zealand
4	Bangladesh, Denmark, Lebanon, Nigeria
3	Belgium, Finland, Philippines, Portugal
2	Cyprus, Egypt, Indonesia, Mexico, Poland, Romania, Saudi Arabia, Senegal, Singapore, Tunisia, UAE
1	Bulgaria, Cote d'Ivoire, Fiji, Jordan, Lithuania, Malaysia, Rep of Korea, Serbia, Slovenia

Source: authors' compilation.

The research geographical focus of the publications was also investigated. Forty eight publications are general reviews without specific geographical focus. Out of the remaining 184 publications, 81 have global focus. A publication is defined to have global focus in the context of this study if its focus consists of minimum of two countries in different continent. Figure 4 shows the publications distribution across the continents.

Figure 4. Geographical focus of the publications

Source: authors' compilation.

Contributions of organizations to climate transition risk publications

The study also investigated the most productive organizations. The top financial institutions are listed in Table 7. Two United Nations’ institutions – the World Bank and the International Monetary Fund - are the most productive financial institutions. The top central banks are Banco de Espana and Hong Kong Monetary Authority, each with 5 publications, followed by European Central Bank with 4 publications.

Table 7. The most productive financial institutions

Organizations	No of Publications
World Bank	7
International Monetary Fund	7
De Nederlandsche Bank	6
Banco de Espana	5
Hong Kong Monetary Authority	5
European Central Bank	4
Bangko Sentral ng Pilipinas	3
Deutsche Bundesbank	3
Caisse Centrale de Reassurance	2
Bank of Canada	2
Bank of England	2
Bank of Italy	2
Bank of Russia	2
Asian Development Bank	1

Source: authors’ compilation.

Similarly, the contributions of universities were investigated. With 14 publications, the University of Chinese Academy of Sciences in China was ranked first. Vienna University in Austria and University of London in the United Kingdom came in second and third, respectively, with 13 and 12 publications. University

of Bologna in the USA and Southwestern University in China tied with nine publications apiece (see Table 8).

Table 8. The most productive universities

No of Publications	University	Country
14	University of Chinese Academy of Sciences	China
13	Vienna University	Austria
12	University of London	United Kingdom
9	Southwestern University	China
9	University of Bologna	Italy
8	Boston University	USA
8	Stanford University	USA
8	University of Adelaide	Australia
7	Swiss Federal Institute of Technology Zurich	Switzerland
7	National Central University	Taiwan
7	Shandong University	China
7	Imperial College London	United Kingdom
6	Imperial College London	United Kingdom
6	University of Technology Sydney	Australia
6	University College Cork	Ireland

Source: authors' compilation.

Research institutes, consulting and advisory firms, asset and investment managers, and a plethora of other institutions have contributed to the literature on climate transition risk, as indicated in Table 9. With six publications each, the Joint Research Centre of the European Commission and the research institute Fondazione Eni Enrico Mattei, both in Italy, ranked first. Five publications were contributed to by three organisations: the Centre for International Climate Research in Norway, the Agence Francaise de Developpement in France, and the Potsdam Institute of Climate Impact Research in Germany. Climate Bonds Initiative and Arab Youth Climate Movement, two non-governmental organizations focused on climate change, are each involved in three and two publications respectively.

Table 9. Contribution of other organizations to climate transition risk literature

No of Publications	Organization	Country	Type of organization
6	Fondazione Eni Enrico Mattei	Italy	Research institute
6	Joint Research Centre, European Commission	Italy	Regional body
5	Potsdam Institute of Climate Impact Research	Germany	Research institute
5	Agence Francaise de Developpement	France	Public institution
5	Center for International Climate Research - CICERO	Norway	Research institute
4	Stockholm Environmental Institute	Germany	Research institute
3	Deltares	The Netherlands	Research institute
3	Mercator Research Institute on Global Commons and Climate Change	Germany	Research institute
3	Centre for Systems Solutions	Poland	Research institute
3	Joint Vienna Institute	Austria	Higher institution
3	auctus ESG	India	Consulting and advisory Firm
3	ICATALIST S.L.	Spain	Consulting and advisory Firm
3	Climate Bonds Initiative	UK	Climate NGO
2	World Health Organization	Switzerland	UN organization
2	Halle Institute for Economic Research	Germany	Research institute
2	International Institute for Applied Systems Analysis	Austria	Research institute
2	Wageningen Environmental Research	Netherlands	Research institute
2	Centre for Econometrics and Applied Research	Nigeria	Research center
2	Ardea Investment Management	Australia	Investment manager
2	ECDPM -The European Centre for Development Policy Management	Belgium	International independent think and do tank
2	Finnish Environmental Institute	Finland	Government institution
2	Climate Adaptation Services	Netherlands	Consulting and advisory Firm
2	Climate Finance Advisors	USA	Consulting and advisory Firm
2	Four Twenty Seven	USA	Consulting and advisory Firm
2	Arab Youth Climate Movement	Qatar	Climate advocacy movement

Source: authors' compilation.

Major themes

Themes in climate transition risk research were investigated and the findings presented in Table 10. Findings showed that the major themes are banks, climate policy, central banking, stock market, and asset price and performance.

Table 10. Main themes in climate transition risk research

Focus	No of Publications
Banks	35
Climate policy	34
Central banking	26
Stock markets	25
Asset prices and performance	22
Energy assets and investments	13
Corporate strategy	12
General	12
Energy policy	11
Sovereign risk	9
Microeconomic	9
Perception	7
Risk assessment	5
Firm credit risk	5
Insurance	4
Real estate & mortgages property	4
Climate –resilient infrastructure	4
Climate activism	1
Energy justice	1
Climate finance	1

Source : authors' compilation.

Methodology diversity

Dataset-based indices with 43.97% in 102 publications were the dominant methodology, followed by literature review as adopted by 58 publications (see Table 11).

Table 11. Methodological approaches in climate transition risk literature

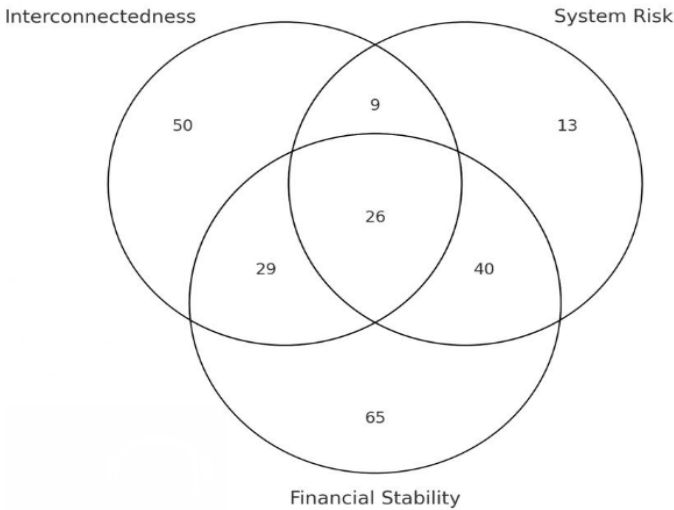
Methodology	No of articles	Share of publication
Dataset-based indices	102	43.97
Review	58	25.00
Multi-method investigation	15	6.47
Scenario stimulation	13	5.60
Model simulation	11	4.74
Survey	7	3.02
Case study	6	2.59
Text-based indices	6	2.59
Event study	4	1.72
Commentary	3	1.29
Cluster analysis	2	0.86
Interview	2	0.86
Delphi study	1	0.43
Network and sensitivity analysis	1	0.43
Participatory workshops	1	0.43
Total	232	100.00

Source: authors' compilation.

Impact analysis

A three-field plot analysis was conducted to reveal of climate transition risk publications on impact of climate change on interconnectedness, systemic risk and financial stability. 100 out of the total 232 publications analyzed in this study overlap with 11% overlapping across the three areas considered as shown in Figure 5.

Figure 5. Impact analysis



Source: authors' compilation.

DISCUSSION AND CONCLUSION

Climate transition risk publications have increased noticeably in recent years to keep up with 'the climate curve'. The implementation of the Paris Agreement and global central banks' initiatives are probably the main causes of this increase (Chen, Pan, Huang & Bleischwitz, 2021; Dikau & Volz, 2021). Climate transition risk is a multidisciplinary topic, as the literature is published in finance, economics, environmental science, and energy related, as well as interdisciplinary journals. It has also featured in Scopus' high ranking journals with *Energy Economics* atop the journal list.

Europe and Chinese dominance was established with limited contributions from Global South in terms of focus and authors and organizations contributions. The clear dominance of China and European countries, mainly Western Europe, regarding contribution to the field of climate transition risk is not surprising due to their longstanding normative pro-climate leadership (Milani & Chaves, 2022; Von Lucke, 2023). Findings showed that authors from Europe, majorly Western European countries and China contributed more than other regions to literature on climate transition risk. The dominance is also reflected in the geographical focus of the publications with few studies centered on Africa, Oceania and South America.

The leading universities are from Europe, Asia and the USA. In addition to two United Nations financial institutions, Asian and European central banks are the leading contributors. In relation to contribution from outside universities and central banks, European research institutes have more publications in a list which also include the World Health Organization, consulting and advisory firms and climate NGOs. The large gap in climate transition risk research between Western Europe and the United States is likely caused by differences in public and political support for climate change mitigation policies (Kouwenberg & Zheng, 2023).

Climate transition risk publications largely focused on banks, climate policy, central banking, stock market and asset performance. Findings revealed limited methodological diversity in climate transition risk research. However, impacts of climate change on interconnectedness, systemic risk and financial stability were widely covered with overlapping publications.

Meaningful action to understand and address the impacts of climate change on the financial system requires the engagement of the brightest minds in academics as well as the attention of the leading journals that define the agendas in their respective disciplines. Understanding the situation is the first step towards improving the state of the literature on climate transition risk. This study represents a catalyst to get academics interested in financial opportunities and risks associated with climate change in general and climate transition risk in particular.

Better collaboration between academics and practitioners in financial institutions, as well as across geographic regions, can be beneficial for climate transition risk literature. This will contribute to the advancement of the knowledge, methodology and capabilities needed to tackle climate change in the upcoming years and decades. Moreover, since the climate is a global commons, the Global South cannot be ignored.

REFERENCES

- Battiston, S., Dafermos, Y., & Monasterolo, I. (2021). Climate risks and financial stability. *Journal of Financial Stability*, 54, 100867. <https://dx.doi.org/10.1016/j.jfs.2021.100867>.
- Campos-Martins, S., & Hendry, D.F. (2023). Common volatility shocks driven by the global carbon transition. *Journal of Econometrics*, 105472. <https://dx.doi.org/10.1016/j.jeconom.2023.05.008>.
- Capasso, G., Gianfrate, G., & Spinelli, M. (2020). Climate change and credit risk. *Journal of Cleaner Production*, 266, 121634. <http://dx.doi.org/10.1016/j.jclepro.2020.121634>.
- Chen, C., Pan, D., Huang, Z., & Bleischwitz, R. (2021). Engaging central banks in climate change? The mix of monetary and climate policy. *Energy Economics*, 103, 105531. <https://dx.doi.org/10.1016/j.eneco.2021.105531>.
- Chenet, H., Ryan-Collins, J., & Van Lerven, F. (2021). Finance, climate-change and radical uncertainty: Towards a precautionary approach to financial policy. *Ecological Economics*, 183, 106957. <http://dx.doi.org/10.1016/j.ecolecon.2021.106957>.
- Clark, R., Reed, J., & Sunderland, T. (2018). Bridging funding gaps for climate and sustainable development: Pitfalls, progress and potential of private finance. *Land Use Policy*, 71, 335-346. <http://dx.doi.org/10.1016/j.landusepol.2017.12.013>.
- Collender, S., Gan, B., Nikitopoulos, C.S., Richards, K.A., & Ryan, L. (2023). Climate transition risk in sovereign bond markets. *Global Finance Journal*, 57, 100868. <https://dx.doi.org/10.1016/j.gfj.2023.100868>.
- Curcio, D., Gianfrancesco, I., & Vioto, D. (2023). Climate change and financial systemic risk: Evidence from US banks and insurers. *Journal of Financial Stability*, 66, 101132. <https://dx.doi.org/10.1016/j.jfs.2023.101132>.
- Curtin, J., McInerney, C., Gallachóir, B.Ó., Hickey, C., Deane, P., & Deeney, P. (2019). Quantifying stranding risk for fossil fuel assets and implications for renewable energy investment: a review of the literature. *Renewable and Sustainable Energy Reviews*, 116, 109402. <http://dx.doi.org/10.1016/j.rser.2019.109402>.
- D'Orazio, P., & Popoyan, L. (2019). Fostering green investments and tackling climate-related financial risks: Which role for macroprudential policies? *Ecological Economics*, 160, 25-37. <http://dx.doi.org/10.1016/j.ecolecon.2019.01.029>.
- Dafermos, Y., Nikolaidi, M., & Galanis, G. (2018). Climate change, financial stability and monetary policy. *Ecological Economics*, 152, 219-234. <https://dx.doi.org/10.1016/j.ecolecon.2018.05.011>.
- Diallo, M.N., Bah, M.M., & Ndiaye, S.N. (2023). Climate risk and financial stress in ECOWAS. *Journal of Climate Finance*, 5, 100025. <https://dx.doi.org/10.1016/j.jclimf.2023.100025>.
- Diaz-Rainey, I., Robertson, B., & Wilson, C. (2017). Stranded research? Leading finance journals are silent on climate change. *Climatic Change*, 143, 243-260. <https://dx.doi.org/10.1007/s10584-017-1985-1>.

- Dikau, S., & Volz, U. (2021). Central bank mandates, sustainability objectives and the promotion of green finance. *Ecological Economics*, 184, 107022. <https://dx.doi.org/10.1016/j.ecolecon.2021.107022>.
- Dong, X., & Liu, L. (2023). Climate risk and future stock price crash: Evidence from US firms. *Journal of Climate Finance*, 3, 100012. <https://dx.doi.org/10.1016/j.jclimf.2023.100012>.
- Du, L., Jiang, H., Adebayo, T. S., Awosusi, A. A., & Razzaq, A. (2022). Asymmetric effects of high-tech industry and renewable energy on consumption-based carbon emissions in MINT countries. *Renewable Energy*, 196, 1269-1280. <http://dx.doi.org/10.1016/j.renene.2022.07.028>.
- Dunz, N., Naqvi, A., & Monasterolo, I. (2021). Climate sentiments, transition risk, and financial stability in a stock-flow consistent model. *Journal of Financial Stability*, 54, 100872. <https://dx.doi.org/10.1016/j.jfs.2021.100872>.
- Fatica, S., Panzica, R., & Rancan, M. (2021). The pricing of green bonds: Are financial institutions special? *Journal of Financial Stability*, 54, 100873. <http://dx.doi.org/10.1016/j.jfs.2021.100873>.
- Glomsrød, S., & Wei, T. (2018). Business as unusual: The implications of fossil divestment and green bonds for financial flows, economic growth and energy market. *Energy for Sustainable Development*, 44, 1-10. <http://dx.doi.org/10.1016/j.esd.2018.02.005>.
- Goddard, G., & Farrelly, M. A. (2018). Just transition management: Balancing just outcomes with just processes in Australian renewable energy transitions. *Applied Energy*, 225, 110-123. <http://dx.doi.org/10.1016/j.apenergy.2018.05.025>.
- Hafner, S., Jones, A., Anger-Kraavi, A., & Pohl, J. (2020). Closing the green finance gap - A systems perspective. *Environmental Innovation and Societal Transitions*, 34, 26-60. <http://dx.doi.org/10.1016/j.eist.2019.11.007>.
- Hanif, W., Teplova, T., Rodina, V., Alomari, M., & Mensi, W. (2023). Volatility spillovers and frequency dependence between oil price shocks and green stock markets. *Resources Policy*, 85, 103860. <https://dx.doi.org/10.1016/j.resourpol.2023.103860>.
- Javadi, S., & Masum, A. A. (2021). The impact of climate change on the cost of bank loans. *Journal of Corporate Finance*, 69, 102019. <http://dx.doi.org/10.1016/j.jcorpfin.2021.102019>.
- Jermain, D. O., Ren, Z. J., Foster, S. B., Pilcher, R. C., & Berardi, E. J. (2022). Coal in the 21st century: Integrating policy with practice for just transitions. *The Electricity Journal*, 35(10), 107220. <https://dx.doi.org/10.1016/j.tej.2022.107220>.
- Khurana, P., Ganesan, G., Kumar, G., & Sharma, K. (2022). A comparative analysis of unified informetrics with scopus and Web of science. *Journal of Scientometric Research*, 11(2), 146-154. <https://dx.doi.org/10.5530/jscires.11.2.16>.
- Kouwenberg, R., & Zheng, C. (2023). A review of the global climate finance literature. *Sustainability*, 15(2), 1255. <https://dx.doi.org/10.3390/su15021255>.
- Kumpulainen, M., & Seppänen, M. (2022). Combining Web of Science and Scopus datasets in citation-based literature study. *Scientometrics*, 127(10), 5613-5631. <https://dx.doi.org/10.1007/s11192-022-04475-7>.

- Le, T.H., Pham, L., & Do, H.X. (2023). Price risk transmissions in the water-energy-food nexus: Impacts of climate risks and portfolio implications. *Energy Economics*, 106787. <https://dx.doi.org/10.1016/j.eneco.2023.106787>.
- Magacho, G., Espagne, E., Godin, A., Mantes, A., & Yilmaz, D. (2023). Macroeconomic exposure of developing economies to low-carbon transition. *World Development*, 167, 106231. <https://dx.doi.org/10.1016/j.worlddev.2023.106231>.
- Mao, X., Wei, P., & Ren, X. (2023). Climate risk and financial systems: a nonlinear network connectedness analysis. *Journal of Environmental Management*, 340, 117878. <https://dx.doi.org/10.1016/j.jenvman.2023.117878>.
- Milani, C.R., & Chaves, L.N. (2022). How and why European and Chinese pro-climate leadership may be challenged by their strategic economic interests in Brazil. *Asia Europe Journal*, 20(4), 403-422. <https://dx.doi.org/10.1007/s10308-021-00645-z>.
- Monasterolo, I., & De Angelis, L. (2020). Blind to carbon risk? An analysis of stock market reaction to the Paris Agreement. *Ecological Economics*, 170, 106571. <http://dx.doi.org/10.1016/j.ecolecon.2019.106571>.
- Monasterolo, I., & Raberto, M. (2018). The EIRIN flow-of-funds behavioural model of green fiscal policies and green sovereign bonds. *Ecological Economics*, 144, 228-243. <http://dx.doi.org/10.1016/j.ecolecon.2017.07.029>.
- Monasterolo, I., Roventini, A., & Foxon, T.J. (2019). Uncertainty of climate policies and implications for economics and finance: an evolutionary economics approach. *Ecological Economics*, 163, 177-182. <https://dx.doi.org/10.1016/j.ecolecon.2019.05.012>.
- Nasreen, T., & Baker, R. (2022). Canadian government accounting: a systematic review. *Copernican Journal of Finance & Accounting*, 11(2), 71-97. <https://dx.doi.org/10.12775/CJFA.2022.009>.
- Nguyen, Q., Diaz-Rainey, I., & Kurupparachchi, D. (2023). In search of climate distress risk. *International Review of Financial Analysis*, 85, 102444. <https://dx.doi.org/10.1016/j.irfa.2022.102444>.
- Oguntuase, O.J. (2020). Climate change, credit risk and financial stability. In R. Haron, M.M. Husin, M. Murg (Eds.). *Banking and Finance*. London: IntechOpen. <https://dx.doi.org/10.5772/intechopen.93304>.
- Rao, A., Lucey, B., & Kumar, S. (2023). Climate risk and carbon emissions: Examining their impact on key energy markets through asymmetric spillovers. *Energy Economics*, 126, 106970. <https://dx.doi.org/10.1016/j.eneco.2023.106970>.
- Reboredo, J.C., Ugolini, A., & Aiube, F.A.L. (2020). Network connectedness of green bonds and asset classes. *Energy Economics*, 86, 104629. <http://dx.doi.org/10.1016/j.eneco.2019.104629>.
- Ren, X., Li, J., He, F., & Lucey, B. (2023). Impact of climate policy uncertainty on traditional energy and green markets: Evidence from time-varying granger tests. *Renewable and Sustainable Energy Reviews*, 173, 113058. <https://dx.doi.org/10.1016/j.rser.2022.113058>.
- Roncoroni, A., Battiston, S., Escobar-Farfán, L.O., & Martinez-Jaramillo, S. (2021). Climate risk and financial stability in the network of banks and investment funds. *Journal of Financial Stability*, 54, 100870. <https://dx.doi.org/10.1016/j.jfs.2021.100870>.

- Sen, S., & Von Schickfus, M.T. (2020). Climate policy, stranded assets, and investors' expectations. *Journal of Environmental Economics and Management*, 100, 102277. <https://dx.doi.org/10.1016/j.jeem.2019.102277>.
- Shimbar, A. (2021). Environment-related stranded assets: an agenda for research into value destruction within carbon-intensive sectors in response to environmental concerns. *Renewable and Sustainable Energy Reviews*, 144, 111010. <https://dx.doi.org/10.1016/j.rser.2021.111010>.
- Solarte-Montufar, J.G., Zartha-Sossa, J.W., & Osorio-Mora, O. (2021). Open innovation in the agri-food sector: Perspectives from a systematic literature review and a structured Survey in MSMEs. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(2), 161. <https://dx.doi.org/10.3390/joitmc7020161>.
- Stolbova, V., Monasterolo, I., & Battiston, S. (2018). A financial macro-network approach to climate policy evaluation. *Ecological Economics*, 149, 239-253. <https://dx.doi.org/10.1016/j.ecolecon.2018.03.013>.
- Stroebel, J., & Wurgler, J. (2021). What do you think about climate finance? *Journal of Financial Economics*, 142(2), 487-498. <http://dx.doi.org/10.1016/j.jfineco.2021.08.004>.
- Thelwall, M., & Sud, P. (2022). Scopus 1900–2020: Growth in articles, abstracts, countries, fields, and journals. *Quantitative Science Studies*, 3(1), 37-50. https://dx.doi.org/10.1162/qss_a_00177.
- Von Lucke, F. (2023). The EU and China in the climate regime: exploring different pathways towards climate justice. *Asia Europe Journal*, 1-7. <https://dx.doi.org/10.1007/s10308-022-00654-6>.
- Wang, K.H., Wang, Z.S., Yunis, M., & Kchouri, B. (2023). Spillovers and connectedness among climate policy uncertainty, energy, green bond and carbon markets: a global perspective. *Energy Economics*, 107170. <https://dx.doi.org/10.1016/j.eneco.2023.107170>.
- Wu, X., Bai, X., Qi, H., Lu, L., Yang, M., & Taghizadeh-Hesary, F. (2023). The impact of climate change on banking systemic risk. *Economic Analysis and Policy*, 78, 419-437. <https://dx.doi.org/10.1016/j.eap.2023.03.012>.
- Xiao, J., & Liu, H. (2023). The time-varying impact of uncertainty on oil market fear: Does climate policy uncertainty matter? *Resources Policy*, 82, 103533. <https://dx.doi.org/10.1016/j.resourpol.2023.103533>.
- Zhang, X., Zhang, S., & Lu, L. (2022). The banking instability and climate change: Evidence from China. *Energy Economics*, 106, 105787. <https://dx.doi.org/10.1016/j.eneco.2021.105787>.