

Article

A Bibliometric Analysis of Risk Management in Foreign Direct Investment: Insights and Implications

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Abstract: Aiming to identify the intellectual structure of risk management in foreign direct investment and its evolving trends, this paper introduces bibliometric analysis to systematically review the 1231 articles published between 1995 and 2022. Through the analysis of publication trends, influential indicators, cooperative networks, and citations, we draw the following important conclusions. From 1995 to 2021, the average annual growth rate of scientific production in the field reached 21.4%, with scholars from the United States and China contributing the most. Regarding the cooperation network, its structure is relatively dispersed, and the deep cooperation among a wide range of researchers has not yet been formed. As for research topics, the popularity of interest in environmental protection, carbon dioxide emissions, energy consumption, and climate change has increased significantly in recent years. Moreover, this paper points out that future research directions include new risks and challenges posed by the COVID-19 pandemic and the effects of climate risks on foreign direct investment. These results are helpful for scholars to systematically understand the current research status, research frontiers, and future trends of risk management in foreign direct investment.

Keywords: risk management; foreign direct investment; bibliometric analysis; collaboration network; research topic



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1. Introduction

With the increasingly complex international environment, foreign investment of multinational enterprises is faced with more risks. For example, political violence, geopolitical risk, and terrorism in host countries directly threaten the property security of multinational enterprises [1–3]; natural disasters in host countries can raise the production costs [4]; the outbreak of a pandemic may hamper the transport of production materials [5]; and unstable fiscal and monetary policies may disrupt payment and settlement process [6]. Risk identification and avoidance are essential to the success of transnational investment activities.

Risk management in foreign direct investment (FDI) is becoming more and more important, attracting the attention of researchers, policymakers, and investors [7]. Scholars have listed the risks in FDI from political, economic, social, technological, financial, and other dimensions [8,9]. For example, Gonchar and Greve [10] focused on the impact of political risk on FDI. Based on the plant-level data for Russia, they claimed that the multinational companies are particularly sensitive to the political risk in the host country. Kellard et al. [11] evaluated the effects of financial system risk on FDI and found that the banking risk of the host country has an impact on FDI choices.

Research studies focus on various countries and regions. For example, Nguyen et al. [12] evaluated the impact of geopolitical risk on FDI inflows in 18 emerging economies, as they have become important FDI inflow countries, and argued that geopolitical risk has a significant negative impact on FDI. Dimitrova et al. [3] focused on the influence of

terrorism on FDI inflows to 15 countries in the Middle East and North Africa due to the frequent violent conflicts in this region and found that hybrid political regimes strengthen the negative effects of terrorism on FDI. Given the rapid growth of FDI outflow from China, Dreger et al. [13] and Pan et al. [14] focused on the determinants of overseas investment by Chinese enterprises, and their results demonstrated that market size is an important factor to attract China's FDI. The above are just a few examples of the work that has been published. It is important to identify the research progress in this field, particularly highlighting the amount and type of work that has been carried out, as well as the countries and institutions that have made the greatest contribution to the development of this research.

Some scholars have conducted bibliometric analyses for the research on FDI. Pandya [15] reviewed research on the political economy of FDI over the past 20 years and found that FDI's rapid growth has inspired a thoughtful and varied body of political economy research. Bretas et al. [16] reviewed the 499 articles concerning FDI attractiveness factors between 1994 and 2021 and revealed the five research categories: structure for FDI, market conditions, entry conditions, institutional framework, and resource offers. With 1075 over the past 30 years, Wang et al. [17] conducted a bibliometric analysis on the research of foreign direct investment and economic growth and summarized research categories: the technology and firm performance, research modeling, and theoretical inquiry. Bahoo et al. [18] systematically reviewed the literature on corruption in the international business field from 1992 to 2019 and found that the impact of corruption risk on FDI is an important research direction. Existing reviews either review the FDI papers on particular risk types or focus on the risks of FDI of specific countries. The diversity of relevant studies calls for the formation of a comprehensive knowledge structure to understand the risk management in FDI.

To resolve this documentation gap, this paper introduces bibliometric analysis to systematically review the articles related to risk management and FDI. Aiming to help researchers better and more effectively understand the knowledge structure of risk management in FDI, this study attempts to address the following three questions. (1) What is the annual publishing trend of risk management in FDI? What are the most influential authors, journals, and institutions? (2) What is the network of collaboration and citation in this field? (3) How do the research themes evolve with the change of research contexts in the existing literature? Our review makes several unique contributions. First, this paper adopts a quantitative approach to supplement the existing review of FDI and risk management. The content of our study includes the latest data up to 2022, which allows us to track the latest research progress and better predict future research trends. Second, we identify important authors and papers to guide researchers entering this field. Third, we outline the trajectory of the evolution of the research themes on risk management in FDI. We specify research gaps that provide directions for future research.

The following content will be structured as follows: Section 2 proposes the research structure and analysis framework and describes the data source data screening principles and descriptive statistics; Section 3 shows the bibliometric analysis results and reveals the main characteristics of the research on risks management in FDI; Section 4 makes the discussions; Section 5 concludes.

2. Research Framework and Data Source

2.1. Research Framework

Bibliometric analysis is a quantitative analysis tool for knowledge discovery and knowledge management [19]. Different from traditional literature reviews that construct the research framework based on authors' subjective experiences, it makes the analysis based on objective scientific data [20,21]. Focusing on the relevant literature during a specific period, it applies a series of methods such as statistical analysis and text mining to reveal the evolutionary patterns and knowledge structure of the theme in a holistic way [22,23]. Bibliometric analysis has been widely applied to various fields and achieved

effective analytical results, such as Goerlandt and Li [24], Xue et al. [25], Zhang et al. [26], and Li et al. [27].

Figure 1 shows the research framework in this paper. After identifying the research subject, we first need to collect scientific data from the database and clean up the data. Then, these data are comprehensively analyzed to generate the knowledge structure and evolutionary patterns based on key indicators such as the publication frequency, influential indicators, cooperation network, and citations. The bibliometric analysis not only includes descriptive statistics that identify the distribution of publication year, high-frequency authors, high-frequency topics, and highly cited literature but also explores the network structure, core elements, and evolutionary characteristics of the subject's knowledge map.

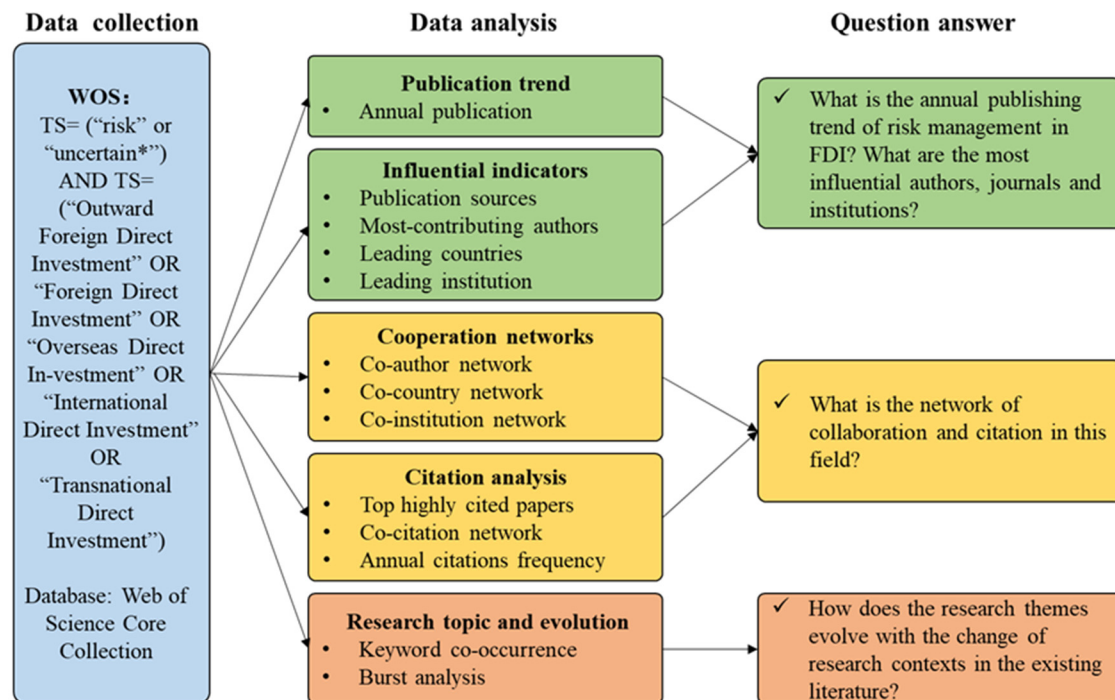


Figure 1. Research framework. * is a wildcard character used to ensure that root variants can be searched.

Three key questions can be answered on the ground of the results of the data analysis. Among them, the publication trend and influential indicators correspond to the first question, cooperative networks, and citation analysis can answer the second question, and research topics and evolution are suitable for the third question.

2.2. Data Descriptions

Scientific databases commonly used in the bibliometric analysis include the Web of Science (WoS) database, Scopus database, and PubMed database. The data of this paper were extracted from the WoS scientific literature database, which is the largest authoritative indexing database in the world. It covers nearly 9000 high-impact academic journals in the fields of natural science, social science, economy and finance, engineering technology, and arts and humanities.

Since "foreign direct investment" (FDI) is also known as "overseas direct investment", "international direct investment", "overseas direct investment", and "transnational direct investment", and risk is closely related to uncertainty, we set the search principles as TS = ("risk" or "uncertain*") AND TS = ("Outward Foreign Direct Investment" OR "Foreign Direct Investment" OR "Overseas Direct Investment" OR "International Direct Investment" OR "Transnational Direct Investment") in WoS core database collection.

A total of 1231 initial bibliometric records from 1995 to 2022 were retrieved. As shown in Figure 2, seven types of literature constitute the sample data, including 1144 articles, 76 proceedings papers, 40 early access, 40 review articles, 6 editorial materials, 3 book

chapters, and 1 editorial material. Table 1 displays the main information of the data set in terms of basic count, citation, and author. A total of 2888 authors have published articles on the theme of risk management in FDI. The total citation amount of articles in this field reached 32,114, with an average of 26.09 citations per article.

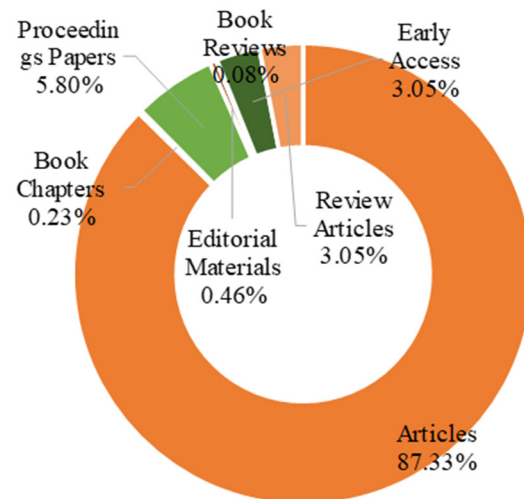


Figure 2. Distribution of the publication type.

Table 1. Main information of the data.

| Class | Main Information | Results |
|-------------|---------------------------------|-----------|
| Basic count | Timespan | 1995:2022 |
| | Documents | 1231 |
| | Sources (journals, books, etc.) | 467 |
| Citation | Total citations | 32,114 |
| | Average citations per document | 26.09 |
| | Average citations per year | 1147 |
| Author | Authors | 2299 |
| | Author Appearances | 2888 |
| | Co-Authors per document | 2.34 |

The basic information of each bibliometric record contains title, author, publication date, journal name, index identifier, references, author keywords, keywords plus, etc. Information such as country, institution, and citation could be directly extracted from WoS, while some descriptive statistics, co-word analysis, and co-citation analysis were based on the software CiteSpace 6.1 R1 (64-bit) and the bibliometrix package in R. In the data preprocessing stage, we checked author names, keywords, organization names, etc., and combined synonyms, acronyms, same authors, etc., such as the US and USA, Buckley PJ and Peter J Buckley, and Mehmet Demirbag and Demirbag M.

3. Bibliometric Analysis

3.1. Publication Trend

Figure 3 displays the evolution of scientific production in this field. The annual and cumulative publications demonstrate that the first paper concerning risk management in FDI appeared in 1995. Since 2000, the number of annual publications has exceeded 10, and then it experienced relatively slow growth between 2002 and 2006. After 2015, global attention has been paid to this research subject, and the number of publications has been rising quickly in a volatile manner, which shows a trend of exponential growth. In 2021, the annual publication number reached 125. The record for 2022 shows a decline due to incomplete data. The average growth rate in cumulative publications from 1996 to 2021 reached 21.4%, indicating an increasing research interest in this topic.

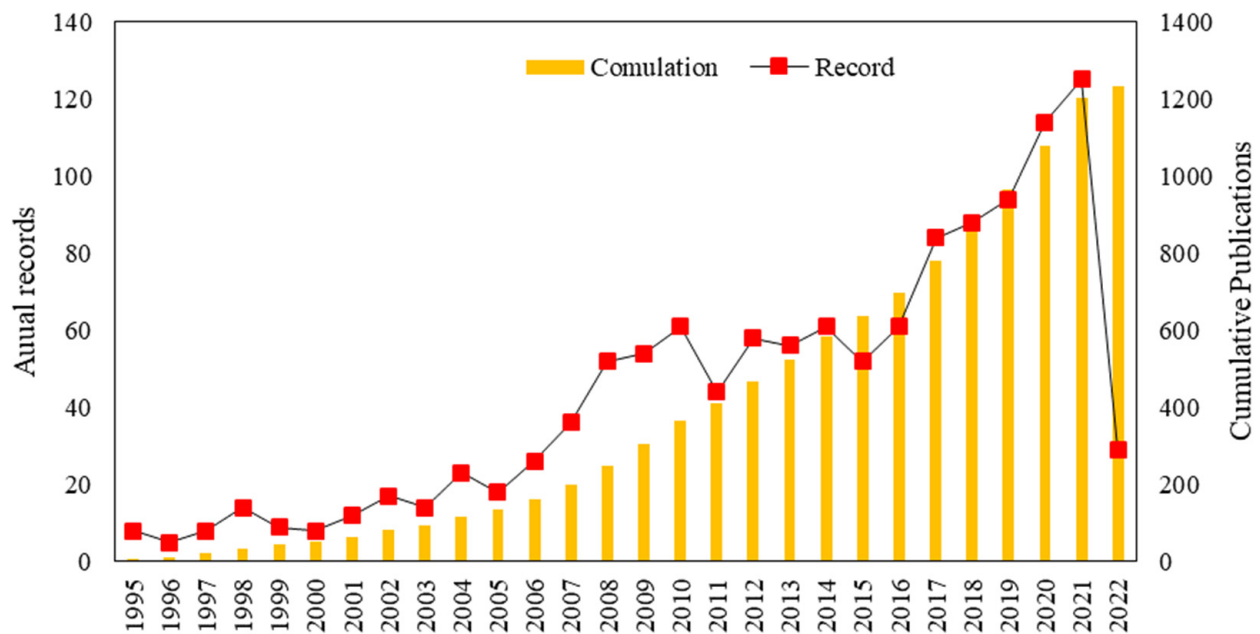


Figure 3. Annual publications and citations.

3.2. Influential Indicators

3.2.1. Publication Sources and Most Contributing Authors

Table 2 shows the information about the top 10 journals with the highest number of publications, including the journal name, the number of articles published, the ratio (%) to the overall publications, and the five-year impact factors of the journals. Among them, the journals with leading publication frequency include *Journal of International Business Studies*, *International Business Review*, *Management International Review*, *Journal of World Business*, and *Sustainability*. Some journals are highly influential, among which the five-year impact factors of *Journal of International Business Studies*, *Journal of World Business*, *International Business Review*, and *Journal of Business Research* are higher than 8.

Table 2. Top 10 journals with the most publications.

| Rank | Journal | Frequency | Ratio (%) | Impact Factors |
|------|---|-----------|-----------|----------------|
| 1 | JOURNAL OF INTERNATIONAL BUSINESS STUDIES | 51 | 4.143 | 13.555 |
| 2 | INTERNATIONAL BUSINESS REVIEW | 36 | 2.924 | 6.753 |
| 3 | MANAGEMENT INTERNATIONAL REVIEW | 25 | 2.031 | 5.062 |
| 4 | JOURNAL OF WORLD BUSINESS | 23 | 1.868 | 9.965 |
| 5 | SUSTAINABILITY | 21 | 1.706 | 3.473 |
| 6 | JOURNAL OF BUSINESS RESEARCH | 18 | 1.462 | 8.488 |
| 7 | APPLIED ECONOMICS | 17 | 1.381 | 1.88 |
| 8 | ECONOMIC MODELLING | 17 | 1.381 | 3.412 |
| 9 | INTERNATIONAL INTERACTIONS | 17 | 1.381 | 2.132 |
| 10 | JOURNAL OF INTERNATIONAL MANAGEMENT | 16 | 1.3 | 5.117 |

As many as 2888 authors have contributed to the research on this subject. Figure 4 displays the annual publications and citations of the 20 most productive authors. Biglaiser G is the most productive author in this field, publishing a series of papers between 2006 and 2021. Jimenez A, Quer D, and Rienda L are scholars who have been more active since 2011. In terms of period, Delios A and Aizenman J have continued to work in this research field for more than 20 years. It is pointed out that the majority of articles by top productive authors were published after 2010, indicating that this field has been receiving academic attention over the past decade.

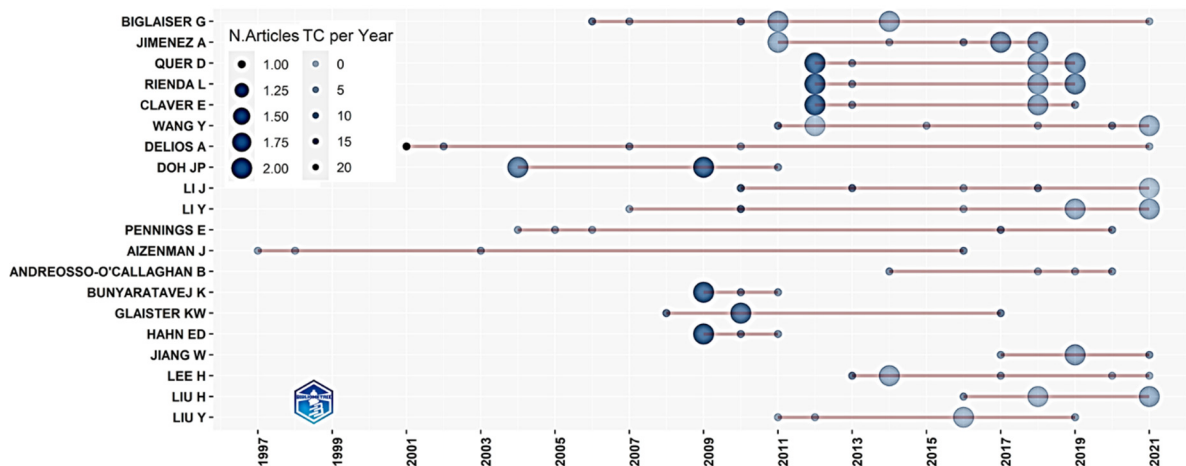


Figure 4. Top authors' production over time.

3.2.2. Leading Countries and Institutions

To find the leading countries in the research field, this paper lists the most productive and cited countries in Figures 5 and 6. According to Figure 5, the two countries with the largest publication numbers are the United States (USA) and China, with 1004 and 730 records, respectively. British scholars have also made important contributions to the research on this subject, ranking third in the number of publications. The order of cited countries shown in Figure 6 is basically in line with productivity. American scholars received the highest number of citations, followed by Chinese and British scholars. It is worth noting that Singapore ranks 15th in production, but it is the 7th most cited country. Similarly, Norway is the 21st most productive country, but the 9th most productive country.

Table 3 displays the top institutions with the most publications. It is shown that the main research institutions in this subject include world-renowned universities and research institutions, such as the University of Michigan System, Texas Tech University System, League of European Research Universities, University of London, and University of California System. Among them, except for Australian National University, other universities and research institutions are from the US and Europe, which are leading in economic development and scientific research.

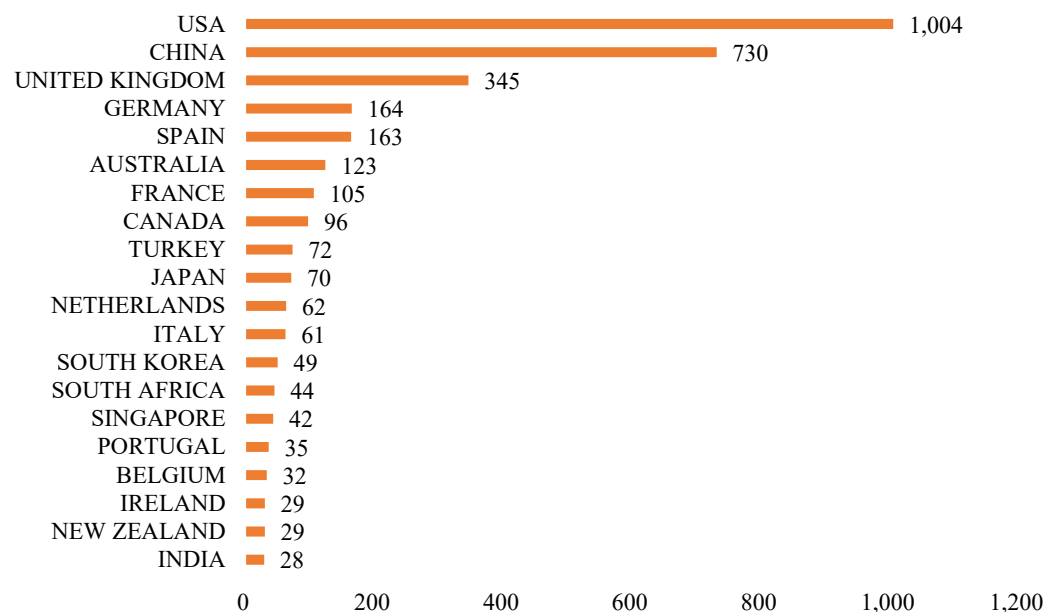


Figure 5. Scientific production by country.

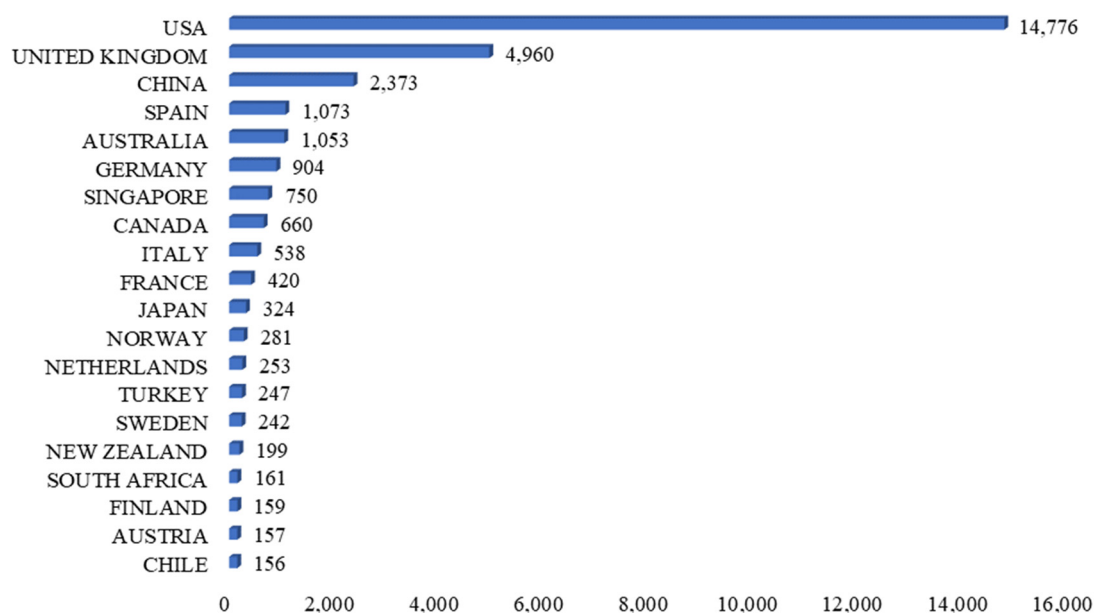


Figure 6. Most cited countries.

Table 3. Top 10 institutions with the most publications.

| Rank | Institution | Frequency | Ratio (%) |
|------|---|-----------|-----------|
| 1 | UNIVERSITY OF MICHIGAN SYSTEM | 32 | 2.6 |
| 2 | TEXAS TECH UNIVERSITY SYSTEM | 30 | 2.438 |
| 3 | LEAGUE OF EUROPEAN RESEARCH UNIVERSITIES LERU | 30 | 2.437 |
| 4 | UNIVERSITY OF LONDON | 26 | 2.112 |
| 5 | UNIVERSITY OF CALIFORNIA SYSTEM | 24 | 1.95 |
| 6 | UNIVERSITY OF TEXAS SYSTEM | 21 | 1.706 |
| 7 | NATIONAL BUREAU OF ECONOMIC RESEARCH | 20 | 1.625 |
| 8 | AUSTRALIAN NATIONAL UNIVERSITY | 18 | 1.462 |
| 9 | UNIVERSITY OF NOTTINGHAM | 15 | 1.219 |
| 10 | UNIVERSITY OF LEEDS | 14 | 1.137 |

3.3. Collaboration Network

Collaboration is essential for the development of research in this field. From the perspective of social networks, the mapping and analysis of cooperative networks help to discover the characteristics of scientific collaboration and the status of institutions and individuals. Figures 7–9, respectively, show the micro, meso, and macro scientific cooperation networks. Among them, the size of each node in the network shows the publication number of different authors, institutions, and countries (regions); the thickness of the links between nodes is proportional to their co-occurrence frequencies; and the color of the links represents the time when the cooperation occurs. Due to the limitations of CiteSpace software, the names of authors and countries (regions) are expressed in capital letters.

It can be observed from Figure 7 that there are several sub-cooperative groups in the author collaboration network. Three cooperative subnetworks were formed before 2015: Biglaiser G, Staats J L, and Lee H published co-authored papers in *Social Science Quarterly*, *International Organization*, *Foreign Policy Analysis*, *Political Research Quarterly*, and *International Interactions* from 2006 to 2014; Demirbag M and Glaister KW published co-authored articles in *Journal of Management Studies*, *Management International Review*, and *Management International Review* between 2008 and 2010; Bunyaratavej K, Hahn ED, and Doh JP published co-authored articles in *MIS Quarterly*, *Management International Review*, *Journal of International Business Studies*, and *Journal Of Operations Management* between 2009 and 2011. After 2015, Buckley PJ, Voss H, and Chen L published co-authored articles in

Journal of World Business, Journal of International Business Studies, Journal of International Management, etc. The sub-cooperative network of Jiang WL, Chen C, Hosseini MR, and Martek I as the core began to publish articles in *Journal of Asian Economics, Journal of Business Research, Management International Review, etc.* Moreover, Jimenez A is a prolific author and has collaborated extensively with many scholars.

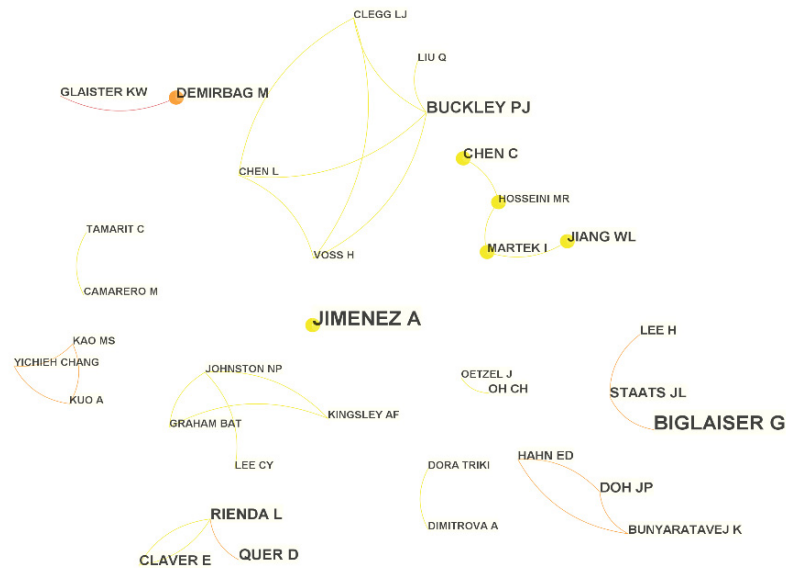


Figure 7. Author collaboration network of the research field.

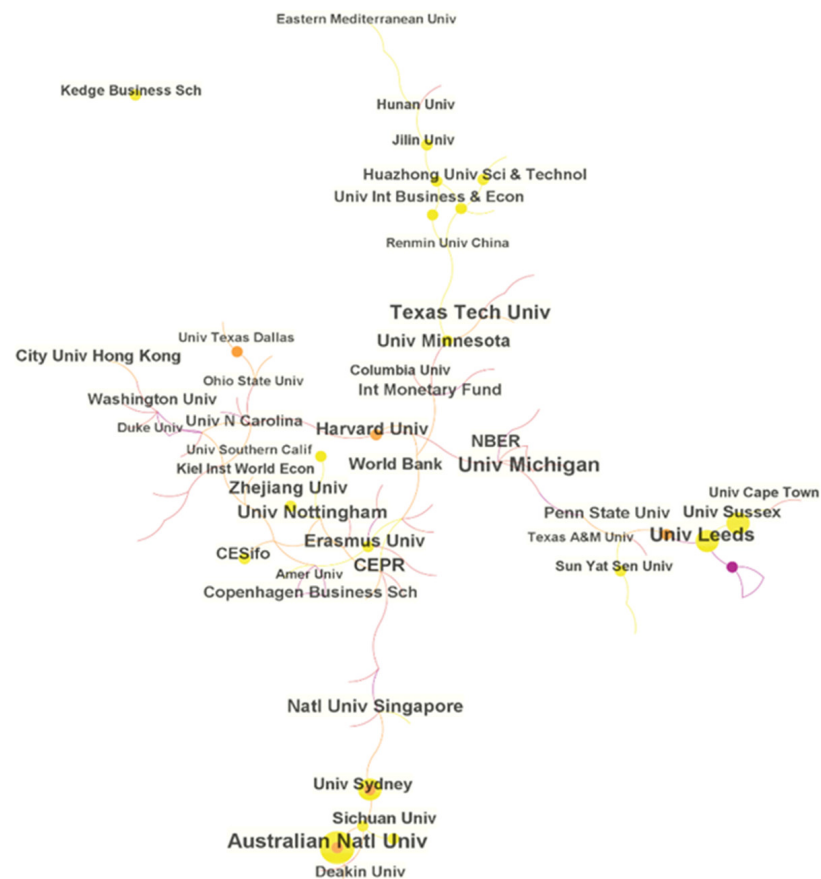


Figure 8. Institution collaboration network of the research field.

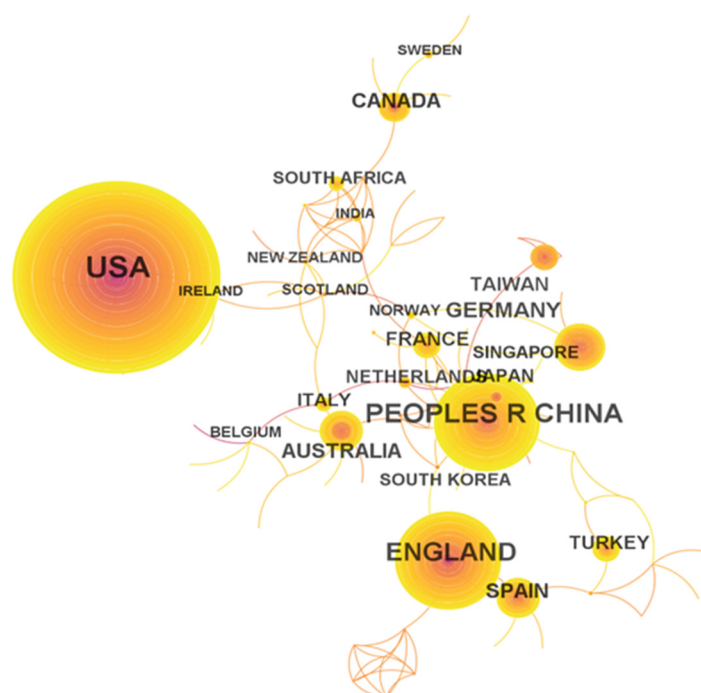


Figure 9. Country (region) collaboration network of the research field.

Figure 8 shows a relatively dispersed institution collaboration network. Although many institutions have participated in the research of risk management in FDI, no in-depth cooperative relation has been formed. In institution collaboration networks, *CEPR*, *University of Michigan*, *World Bank*, *National Bureau of Economic Research*, *Erasmus Universiteit Rotterdam*, and *Harvard University* are the central nodes and play key roles in connection. In addition, most of the inter-institutional cooperation takes place within countries. For example, the *Australian National University*, *Deakin University*, and the *University of Sydney in Australia* are closely connected in the network, while the *University of Leeds* and *Sussex University* in the UK are tightly linked; China's *Hunan University*, *Jilin University*, *Renmin University of China*, and *Huazhong University of Science and Technology* are close in the network.

Figure 9 describes the country (region) collaboration. When both countries appear in the address field, they are considered to have a cooperative relationship. The US, China, England, Australia, and Germany are the top five countries (regions) with the largest number of publications. England is closely linked to European countries such as Spain, Portugal, Denmark, and Turkey. In addition to Asian countries such as Singapore, Japan, and South Korea, China is also linked with European countries such as the Netherlands. The United States has extensive cooperation in the Americas, Europe, Africa, and other countries.

Among the top three countries with the largest number of publications, the UK and China both cooperate with the US. Moreover, the UK has also cooperated with countries like Turkey and the Netherlands, while Pakistan has close cooperation with China. It is worth noting that over the last five years, a wide range of cooperation networks have been formed among countries (regions) such as Thailand, Belgium, Brazil, Romania, Spain, India, South Africa, Tunisia, and France, indicating that this subject has gradually become a research field arousing global concerns. The Netherlands, Singapore, France, and Australia are closely linked with other important countries.

3.4. Citation Analysis

The development trends of the annual and cumulative citations were extracted from the Citation Report created by the WoS platform. As shown in Figure 10, the first citation on this subject appeared in 1995. Since 2006, the annual citation frequency has shown an exponential growth trend, and it began to exceed 1000 times in 2011. In 2021, the

annual citation frequency has reached 5151 times, which demonstrates that the academic community shows constantly increasing attention to this subject.

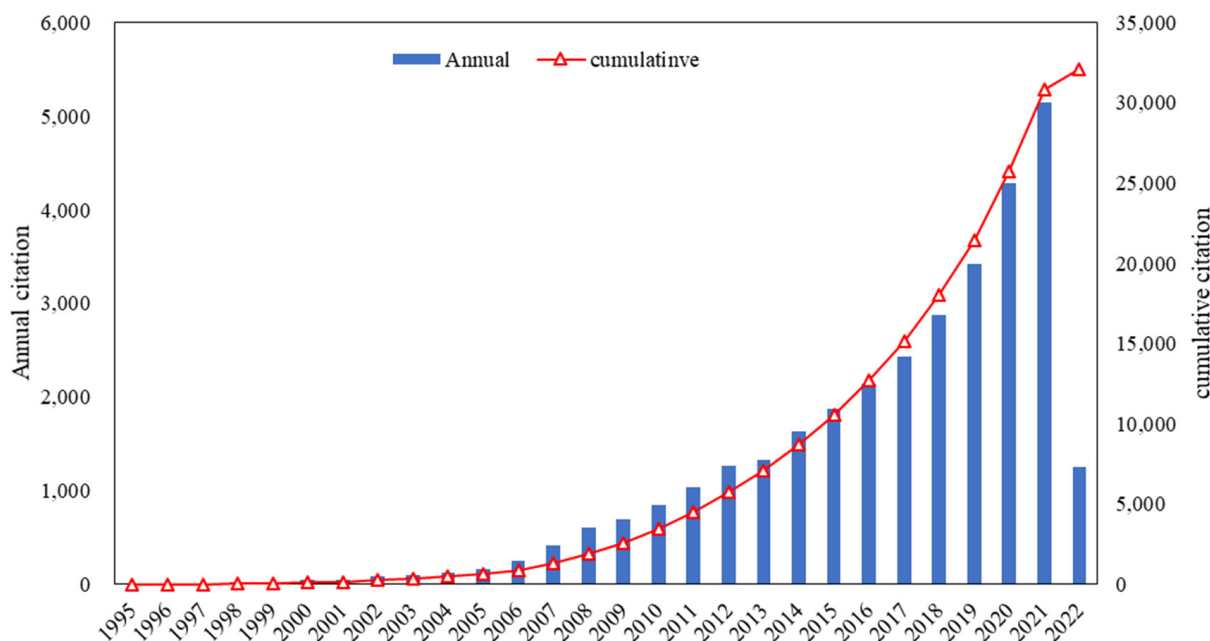


Figure 10. Development of annual and cumulative citations of the research field.

Table 4 shows the information about the top 10 articles with the highest total citation frequency, including the title, authors, journal, publication year, and average annual citation frequency. Among these articles, Buckley et al. [28] obtain both the highest total citation frequency and average annual citation frequency, with 1296 times and 81 times/year. Its frequencies are far more than those of other articles, indicating its important role in the research field. Buckley et al. [28] applied econometric analysis to explore the determinants of Chinese outward FDI and pointed out that political risk in host countries is an important factor. Holburn and Zelner [29] is one of these articles with the latest publication year, ranks ninth considering the total citation frequency, and its average annual citation frequency ranks second. Holburn and Zelner [29] explored the impact of political risk on FDI in the power industry and indicated that the response of multinational enterprises to political risk in the host country is related to the political capacity of the home country.

Among the top 10 cited articles, Asiedu [30], Buckley et al. [28], Li and Resnick [31], Neumayer and Spess [32], and Witt and Lewin [33] conducted research on developing countries or emerging economies, since these countries are important host countries of FDI. Asiedu [30] found that some of the factors that promote FDI, such as better infrastructure, may not work in sub-Saharan Africa. Buckley et al. [28] indicated that China's OFDI is related to the host country's political risk, market size, natural resource endowment, and other factors. Li and Resnick [31] revealed that democracy-related property rights protection promotes FDI inflows, while democracy reduces FDI inflows after controlling for the positive effects of property rights protection. Neumayer and Spess [32] provided an important empirical finding that bilateral investment increases FDI inflows to developing countries. Bevan and Estrin [34] analyzed the determinants of FDI in European economies and found that important factors include labor costs and market size. Henisz and Delios [35] investigated the impact of uncertainty on the location selection of Japanese multinational corporations and concluded that firm-specific uncertainty magnifies imitative strategies. Hawkes [36] focused on the possible linkage between FDI and the risk of obesity and other diseases.

Table 4. Top 10 articles with the highest citation frequency.

| Rank | Title | Journal | Authors | Publication Year | Total Citation | Average Citation per Year | Refs. |
|------|--|---|-------------------------------------|------------------|----------------|---------------------------|-------|
| 1 | The determinants of Chinese outward foreign direct investment | Journal of International Business Studies | Buckley Peter J. et al. | 2007 | 1296 | 81 | [28] |
| 2 | On the determinants of foreign direct investment to developing countries: Is Africa different? | World Development | Asiedu E | 2002 | 504 | 24 | [30] |
| 3 | Uncertainty, imitation, and plant location: Japanese multinational corporations, 1990–1996 | Administrative Science Quarterly | Henisz WJ; Delios A | 2001 | 490 | 22.27 | [35] |
| 4 | Democratic governance and multinational corporations: Political regimes and inflows of foreign direct investment | International Organization | Jensen NM | 2003 | 482 | 24.1 | [37] |
| 5 | Reversal of fortunes: Democratic institutions and foreign direct investment inflows to developing countries | International Organization | Li Q; Resnick A | 2003 | 473 | 23.65 | [31] |
| 6 | Uneven dietary development: linking the policies and processes of globalization with the nutrition transition, obesity and diet-related chronic diseases | Globalization And Health | Hawkes Corinna | 2006 | 417 | 24.53 | [36] |
| 7 | Outward foreign direct investment as escape response to home country institutional constraints | Journal of International Business Studies | Witt Michael A.; Lewin Arie Y. | 2007 | 415 | 25.94 | [33] |
| 8 | The determinants of foreign direct investment into European transition economies | Journal Of Comparative Economics | Bevan AA; Estrin S | 2004 | 390 | 20.53 | [34] |
| 9 | Political capabilities, policy risk, and international investment strategy: evidence from the global electric power generation industry | Strategic Management Journal | Holburn Guy L. F.; Zelner Bennet A. | 2010 | 360 | 27.69 | [29] |
| 10 | Do bilateral investment treaties increase foreign direct investment to developing countries? | World Development | Neumayer E; Spess L | 2005 | 306 | 17 | [32] |

Figure 11 shows the co-citation network with 432 nodes and 580 links. Each node represents an article and is marked with “author (year of publication)”. The size of the node is proportional to the number of citations. The link between the two nodes represents the relationship between the two articles, and the color of the link represents the time when the co-citation occurred. From orange to bright yellow, the co-citation year is from far to near. The network density is 0.0062, and the network structure is relatively loose.

In the co-citation network, the three nodes with the largest degree before 2010 are Jensen [38], Quan [39], and Busse and Hefeker [40]. Among them, Jensen [38] is a book about the political risk on FDI, which discusses in detail the impact of democracy and non-democracy, political federation, and fiscal federation, as well as whether to accept IMF loans on FDI investment decisions; Quan [39] analyzed the differences between democratic and autocratic countries in the possibility of expropriation of FDI assets; Busse and Hefeker [40] explored the linkages among political risk, institutions, and foreign direct investment inflows in developing countries. The above highlights that the research on the impact of political risk on FDI between 2006 and 2007 has laid a good foundation for the later research. Nodes with the largest degree after 2010 are Baker et al. [41], Julio and Yook [42], Gulen and Ion [43], etc. Baker et al. [41] proposed the widely popular and influential economic policy uncertainty (EPU) index, which shows that uncertainty is also concerned in the FDI research. Julio and Yook [42] examined the effects of political uncertainty on FDI flows; based on the EPU index, Gulen and Ion [43] explored the influence of political uncertainty on corporate investment.

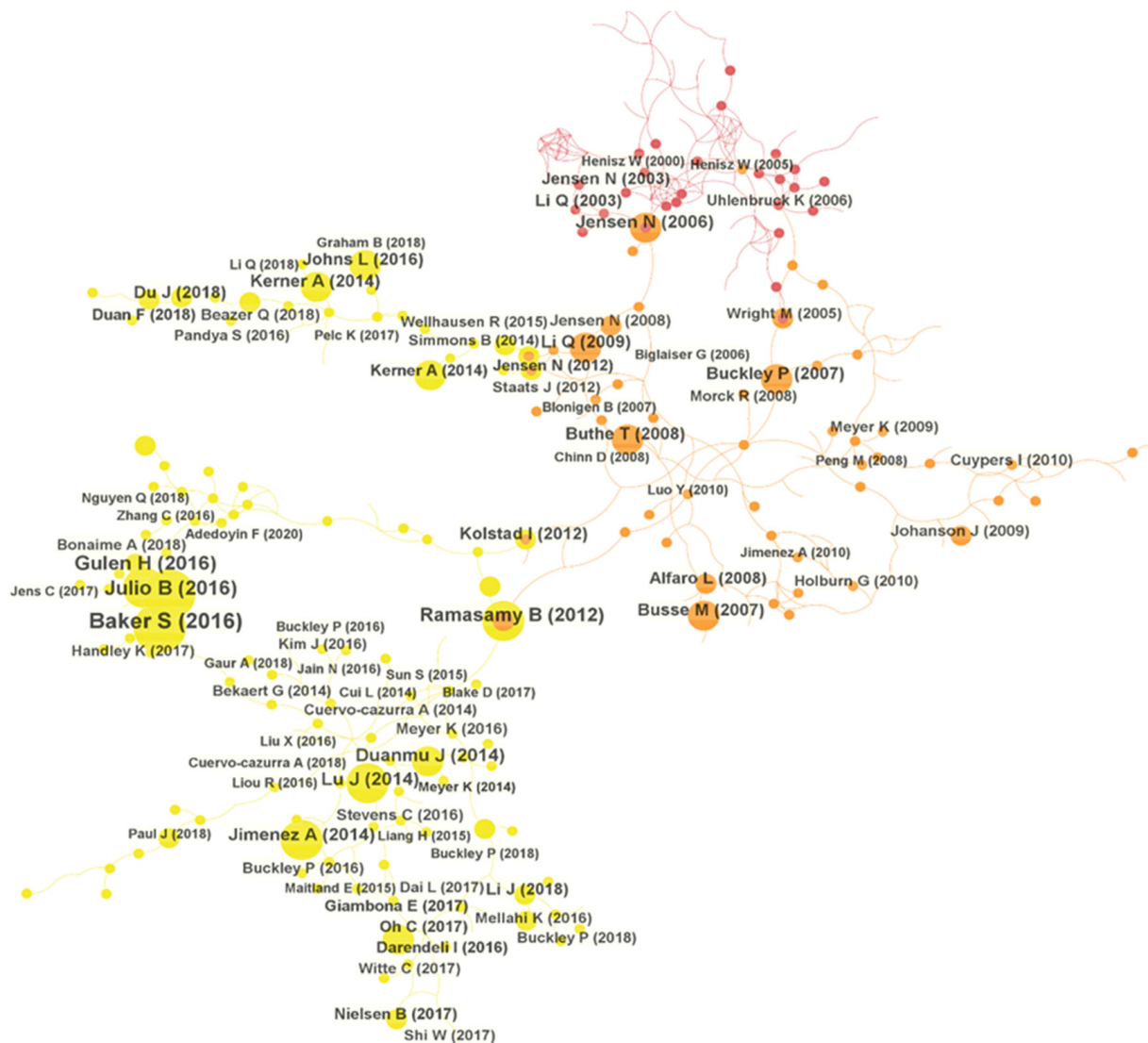


Figure 11. Co-citation network of the research field.

3.5. Research Topic and Evolution

Co-word analysis can help to extract the research hotspots. As FDI, risk, and uncertainty are indexing words that add limited value to the analysis, they were eliminated from the results. Moreover, the acronyms (such as FDI and foreign direct investment) were harmonized.

The keyword co-occurrence network of the research on risk management and FDI are shown in Figure 12. In the network, each node represents a keyword, with the node size proportional to the frequency of keywords in the sample data. The link between any two nodes represents the correlation strength, and the thicker the link, the closer the connection between the two keywords. The color spectrum indicates the year of co-occurrence links from the earliest in purple to the latest in yellow. *Determinant* is the largest node, which means that it appears most frequently with other keywords in the sample data, and the other high-frequency keywords in the figure are *firm*, *trade*, *impact*, *performance*, *United States*, *market*, and *political risk*. These high-frequency keywords are also located at the center of the network, with the strongest links and relatively dark colors of the links, indicating that these topics have long been the focus of the research.

We also drew the word clouds of keyword plus at four different periods to show the distribution and evolution of research topics. As shown in Figure 14, the font size of the keywords reflects the frequency of occurrence. In Periods 1 and 2, prominent keywords in the figures are the *United States*, *determinants*, *firm*, *trade*, *joint ventures*, etc., which reveals that the FDI of American enterprises is the hot topic in the research before 2008. In Periods 3 and 4, *determinants* become the most obvious word. The *United States* became smaller, while *China* and *developing countries* began to emerge, which indicates that FDI research turned to more developing countries.

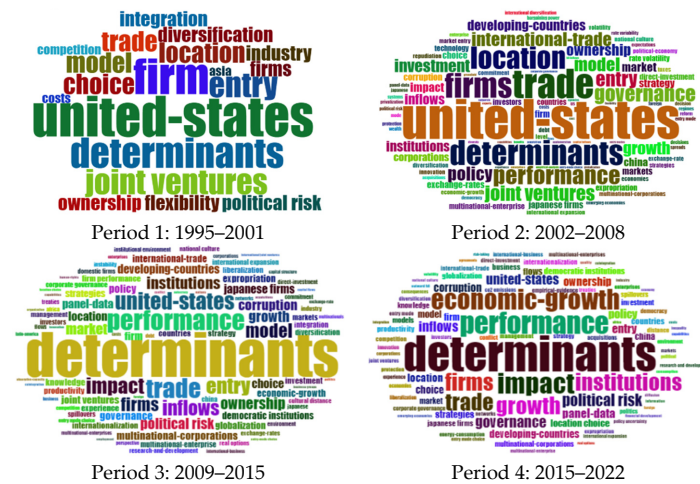


Figure 14. Word clouds of Keywords Plus in four periods.

Burst analysis can reveal the important change in the research topic in the field of risk management in FDI. As shown in Figure 15, the *United States* earned the highest burst value (7.03) from 1995 to 2008. According to the duration time of keywords, the research evolution on risk management in FDI can be divided into three stages. Before 2008, research keywords concentrated on the *United States*, *exchange rate*, *international expansion*, *expropriation*, *corporation*, and *investor*. Based on the previous stage, the research topic in this field was expanded to *political risk*, *cultural distance*, *domestic firm*, *liberalization*, *real option*, and *industry* between 2009 and 2015. From 2016 to 2022, the research topics changed to *economic policy uncertainty*, *CO₂ emissions*, *energy consumption*, *environment*, and *networks*. In addition, *political risk* has been an important keyword since 2009.

| Keywords | Year | Strength | Begin | End |
|-----------------------------|------|----------|-------|------|
| united states | 1995 | 7.03 | 1995 | 2008 |
| exchange rate | 1995 | 5.75 | 2002 | 2015 |
| international expansion | 1995 | 4.45 | 2002 | 2015 |
| expropriation | 1995 | 3.94 | 2002 | 2015 |
| corporation | 1995 | 3.89 | 2002 | 2008 |
| investor | 1995 | 3.54 | 2002 | 2015 |
| political risk | 1995 | 4.6 | 2009 | 2022 |
| firm performance | 1995 | 4.59 | 2009 | 2015 |
| experience | 1995 | 4.59 | 2009 | 2015 |
| research and development | 1995 | 3.87 | 2009 | 2015 |
| cultural distance | 1995 | 3.77 | 2009 | 2015 |
| domestic firm | 1995 | 3.77 | 2009 | 2015 |
| liberalization | 1995 | 3.53 | 2009 | 2015 |
| real option | 1995 | 3.44 | 2009 | 2015 |
| industry | 1995 | 3.38 | 2009 | 2015 |
| location choice | 1995 | 9.28 | 2016 | 2022 |
| economic policy uncertainty | 1995 | 7.32 | 2016 | 2022 |
| economic growth | 1995 | 6.97 | 2016 | 2022 |
| impact | 1995 | 6.58 | 2016 | 2022 |
| co2 emission | 1995 | 5.52 | 2016 | 2022 |
| growth | 1995 | 5.43 | 2016 | 2022 |
| empirical evidence | 1995 | 4.75 | 2016 | 2022 |
| energy consumption | 1995 | 4.58 | 2016 | 2022 |
| environment | 1995 | 4.24 | 2016 | 2022 |
| network | 1995 | 4.2 | 2016 | 2022 |
| flow | 1995 | 4.09 | 2016 | 2022 |
| business | 1995 | 3.78 | 2016 | 2022 |

Figure 15. Top 27 keywords with the strongest citation burst.

4. Discussions

Based on the above analysis, we first give answers to the three questions mentioned in the introduction. Then, the future research direction of risk management in FDI is discussed.

4.1. Current Research Status

The research on risk management in FDI has been a concern and articles have been published since 1995. The number of articles published annually has increased rapidly, with the average annual growth rate reaching 21.4% from 1995 to 2021.

In terms of influential authors, Biglaiser G and Jimenez A have been working in this field since 2006, with far more publications and citations than other authors. Biglaiser G and his collaborators Staats JL and Derouen K have published a series of articles in high-quality journals, while Jimenez A has a wider collaboration network. In recent years, the influence of the cooperation group with Jiang WL and Martek I as the core has gradually shown their influence. As for journals, *Journal of International Business Studies*, *International Business Review*, *Management International Review*, *Journal of World Business* and *Sustainability* are the Top 5 sources of research in this field. Among them, *Journal of International Business Studies* has the highest number of posts, citations, and impact factors. In addition, some American and European institutions, such as the *University of Michigan System*, *Texas Tech University System*, and *League of European Research Universities* are leading in this research field.

Author, institution, and country (region) collaboration networks, as well as co-citation networks, are relatively dispersed. In the author collaboration network, several small cooperation subnetworks appeared, but most of the authors did not form a wide and deep cooperative relationship. In the institution collaboration network, the institutions within the same country are closer in the network, while the institutions in different countries are less connected. In the co-citation network, a few highly cited articles are highlighted, such as Jensen [38], Quan [39], Busse and Hefeker [40], Gulen and Ion [43], etc.

According to the result of co-word analysis, the most frequently emerging keywords in the field include *determinant*, *firm*, *trade*, *impact*, *performance*, *United States*, *economic growth*, and *institution*. All of these keywords are centered on the main research issues of risk management in FDI, namely the determinants of location choice of multinational enterprises, the influence of political/economic risk on FDI, etc. However, the research themes have been evolving. Transnational investment of American enterprises was an important research topic before 2008, but developing countries began to be concerned after 2008; much attention was paid to exchange rate risk before 2008, while sovereign risk and political risk also began to receive attention in FDI later. Moreover, the research on CO₂ emissions, energy consumption, and environment has increased since 2016.

4.2. Future Research Directions

Given the COVID-19 pandemic, geopolitical conflicts, climate change, and other social challenges, we propose several future research directions in the field of FDI risk management as follows.

The COVID-19 pandemic has disrupted normal cross-border trade and global value chains, which has led to economic downturns, high global debt levels, and even changes in the institutional environment [44–46]. OECD [47] noted that the COVID-19 may lead multinational firms to change the geographical distribution of their overseas operations in the long run, such as shortening global value chains and diversifying geographical locations. Fang et al. [5] analyzed the past development of China's OFDI before the outbreak of COVID-19 and pointed out the risks and challenges brought by COVID-19 to China's OFDI. Therefore, future research can study the structural changes and risk factors of FDI after the pandemic under a new paradigm.

Another research hotspot in the field is likely to be climate risk. According to the Global Risks Report 2022, climate change is one of the most likely long-term risks in the 5–10-year horizon. In recent years, climate economists and professional economists have

widely discussed the impact of climate change on economic growth and FDI [48]. Central banks are also increasingly paying attention to climate change and climate policies, as these could affect their ability to meet their monetary and financial stability objectives. However, there is little research on how climate risk is incorporated into the overseas investment decisions of multinational companies. Li and Gallagher [49] assessed the risk exposure of climate change to FDI. Wall et al. [50] evaluated the impact of climate policies such as carbon tax and emissions trading on FDI. The impacts of the host country's environmental regulations and climate change transition risks on FDI need to be further investigated in future research.

In addition, research on risk management in FDI may also benefit from advanced research techniques, such as fuzzy set methods, machine learning, and text mining techniques. Machine learning and optimization algorithms can find the optimal solution between a series of risk factors and FDI inflow to assist enterprises in making investment decisions [51–53]. The risk identification method based on text mining technology can help identify more risk factors [54–57].

5. Conclusions

This paper systematically reviewed 1231 articles related to risk management in FDI by bibliometric methods. Through the analysis of publication trends, important indicators, cooperation networks, citations, and research topics, we summarized the research status and development trend in this field. The main findings of this paper are summarized below. (1) Research on this field has attracted increasing attention, with the average annual production growth rate reaching 21.4% and the most significant contributors from the United States and China. (2) Although the collaboration networks in this field are relatively dispersed, some small cooperation groups of authors are forming. In addition, most of the collaboration takes place within one country, with less transnational cooperation. (3) Research topics are evolving, and research interest in environmental protection, CO₂ emissions, energy consumption, and climate change has increased significantly in recent years.

Some limitations also exist. First, this study only collected articles from the WoS database. The use of multiple database sources always gives a higher coverage to the primary information of the study. Therefore, more databases such as SCOPUS should be considered in the future. Second, due to the author's limitations in reading articles in languages other than English, articles in other languages have not been fully studied. Future studies may include other languages to broaden the research findings.

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