Trends And Patterns In Bankruptcy Prediction: A Scopus-Based Bibliometric Review

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ARTICLE INFO	ABSTRACT
	The study comprehensively examines and presents an overview of the literature on bankruptcy prediction. The systematic literature review clarifies the structure, evolution, and conceptual content of bankruptcy prediction. Also, the bibliometric analysis explains the research trend by investigating the geographical distribution, relevancy of sources, co-citation analysis, co-occurrence analysis and address the relationship between the authors (co-authorship). The study presents an in-depth analysis of past literature by implementing a systematic literature Review and Bibliometric analysis using Scopus database for the period 1969 to 2023. The findings present a steep rise in the number of articles published from 2008 to 2022 accounting for more than 80% of the total analysed articles. Further, the results reveal that the United States has come out to be the leading country when compared with others in terms of publications, citations, and link strength. The study's findings add value to the existing research and largely benefit the researchers exploring the field by guiding them to build a firm base to correctly identify the emerging trend in bankruptcy prediction. **Keywords** – Bibliometric Analysis, Financial Distress, Insolvency, Default Firm, Bankruptcy Prediction.

1.Introduction

Financial distress has been a major challenge for various developed and emerging economies as it may lead to the unusual exit of firms which further impacts the balance sheet of the lending institution. This spillover of financial burn poses a threat to the smooth functioning of economic activities and stability of financial system in the economy. The major factors such as corporate governance, ownership structure and ownership concentration were attributed to Asian financial crisis of 1997 (Rajan and Zingales, 1997; and Prowse, 1998). Further, after the global financial crisis of 2008, the level of financial distress and corporate failure during the global financial crisis has made the investors and policymakers to rethink upon the widely believed concept of "too big to fail" (Altman and Hotchkiss, 2010). In the aftermath of financial crisis, corporate governance and bankruptcy prediction gained prominence and remained a crucial factor in credit risk identification and assessment. The concept of Bankruptcy and its prediction is widely discussed and analysed globally. Various studies have extensively addressed this topic in different parts of the world implying its relevance in the market dynamics of the corporate world. In financial literature, most of the studies have focused on macroeconomic factors including managers ability to acquire credit and its role in investment behavior (Liu et al., 2010). At the micro level, various studies have worked towards building financial model to analyse and predict financial distress and bankruptcy. The evolution of these financial model can be traced with gradual improvement in methodology and identification of critical variables resulting in development of alternative predictive models for financial distress, Managerial opportunism often weakens the corporate governance as firms' top management, directors or shareholders make individual centric decisions favoring themselves than the company negatively impacting firm's performance. Such managerial opportunism leads to conflict of interest and may also prompt financial distress, thus escalating the need of strong corporate governance and structure. The failure of corporates such as WorldCom, Enrol and Xerox are examples of weak corporate governance.

The study uses bibliographic data to analyse the development of studies linked to company failure for the period 1969 to 2023. The study implements bibliometric analysis as a quantitative approach to evaluate and analyse bibliographic data to identify the trend, relationships and development of academic literature focused on financial distress and bankruptcy prediction.

The study has the following research questions:

RQ1: Which studies on the prediction of financial distress and insolvency have been undertaken for the period of 1969 to 2023?

RQ 2: What are bibliometric trends of financial distress and bankruptcy prediction?

RQ 3: What are the emerging keywords paving the way for future research opportunities in bankruptcy prediction?

2.Literature Review

Financial distress refers to a situation in which a business is at a risk of being unable to satisfy its debt commitments when they fall due (Geng et al., 2015). Corporates and the business world frequently experience financial distress and bankruptcy (Pindado et al., 2008; and Manzaneque et al., 2016). There are various factors contributing to financial distress and bankruptcy, however, these factors vary with different countries and economic period (Habib et al., 2018). Various studies reported a significant influence of corporate governance and structure on financial distress and bankruptcy (Opler and Titman, 1994; Kahl, 2002; and Mariano et al., 2020). A weak corporate governance and structure may lead to financial downturns, further inducing significant financial distress or even bankruptcy (Dibra, 2016). While an effective corporate governance can significantly avoid conflict of interest and improve financial performance of the firm and reduce firms' exposure to the risk of financial distress (Black et al., 2006; and Reddy et al., 2010). Further, Board of Directors (BoD) has the responsibility to monitor and evaluate senior management of the company which is a crucial element for an effective corporate governance system. BoD remain objective and independent to safeguard interest of various stakeholders as they direct corporates' strategic decisions and improve firms' performance (Westphal and Fredrickson, 2001; Friday and Sirman, 1998). Fama and Jensen (1983) state that within the corporate governance framework, the Board of Directors holds the utmost authority to oversee and keep track of the choices made by the senior management. Kren and Kerr (1997) argued that BoD with significant stockholdings in the firm have higher control of management and closely relate to firms' performance.

Board of Directors are responsible to hire qualified chief executive officer (CEO) and plays a pivotal role in directing and evaluating the strategic decisions of the firm (Boland and Hofstrand, 2009) especially financial decisions. Financial reporting is extremely important in corporate governance, determining a significant association between the membership of the board and the firm's value (Cohen et al., 2004; and Hermalin et al., 2001). Corporate governance has a vital role in enhancing financial reporting quality (Fama and Jensen, 1983). External auditors play an important role in corporate governance by ensuring accountability by validating accounting statements and maintaining their credibility (Lin and Liu, 2009). Abbott et al., (2000) argue that a company with robust corporate governance ensures attainment of high audit quality. Investors depend upon financial statements to retrieve useful information for investment decisions (Chang et al., 2009). However, if external auditors fail to fulfil their responsibility of delivering quality audits, it leads to shaken trust and pluming confidence of investors consequently having a significantly negative impact on financial market and the economy (Prada, 2007). External auditors also mitigate the conflict of interest among various stakeholders (Chow, 1982).

Several studies argue in favor considering separation of ownership in boards composition and maintain high ratio of independent directors from outside the organization for effective monitoring and control (Jensen & Meckling, 1976; Fama, 1980; and Vance, 1983). When there is a concentrated ownership structure, the likelihood of financial distress increases, demonstrating the presence of an adverse link between ownership composition and financial well-being (Claessens et al., 2002; and Alhares, 2019). A dispersed ownership structure with significant shareholders fosters increased motivation for improving performance and good leadership within the organisation. (Shleifer and Vishny, 1986). He et al. (2016), discovered a favourable association between a firm's financial position and its ownership by state and foreign entities, leading him to conclude that state and foreign ownership have a good impact on the firm's financial health.

To mitigate the risk of financial distress, various literature has also focused to predict financial distress (Lugovskaya, 2010; Udin et al., 2017; and Yousaf et al., 2020). Over the years, there has been a continuous development in the methodology used for bankruptcy prediction making it more rigorous (Kahl, 2002; and Khoja et al., 2019). The initially developed prediction models such as Z-Score (Altman, 1968), and ZETA model (Altman et al., 1977) relied on discriminant analytical method. Altman, (1968) in his study, used multiple discriminant analysis to fill the shortcomings of univariate analysis. Further, Ohlson, (1980) and Zmijewski, (1984) introduced conditional logistic and probit model respectively, contributing to the effectiveness and efficiency of bankruptcy prediction models. Joining the thread of methodological improvement, advance discrete choice model popularly known as mixed logit model (Jones and Hensher, 2004) and panel logit model (Pindado et al., 2008) were developed paving way for enhanced bankruptcy prediction and strategic counter measures. Another method used in the corporate insolvency prediction field primarily over the last two decades

is neural networks (NNs). Neural Networks are computer programmes that can be "taught" to resolve issues or recognize specific patterns. Various studies used neural networks in their study and demonstrated that it produced better results, an overall classifying accuracy of 83% one year prior to the collapse period (Neophytou & Charitou, 2004; K. Tam, 1991; Wilson & Sharda, 1994; and Fletcher & Goss, 1993) . Among the various models, the logit model gained much prominence and various studies used logit models in their study for bankruptcy prediction (Tserng et al., 2014 ; Sun et al., 2014; and Nair & Sachdeva, 2018).
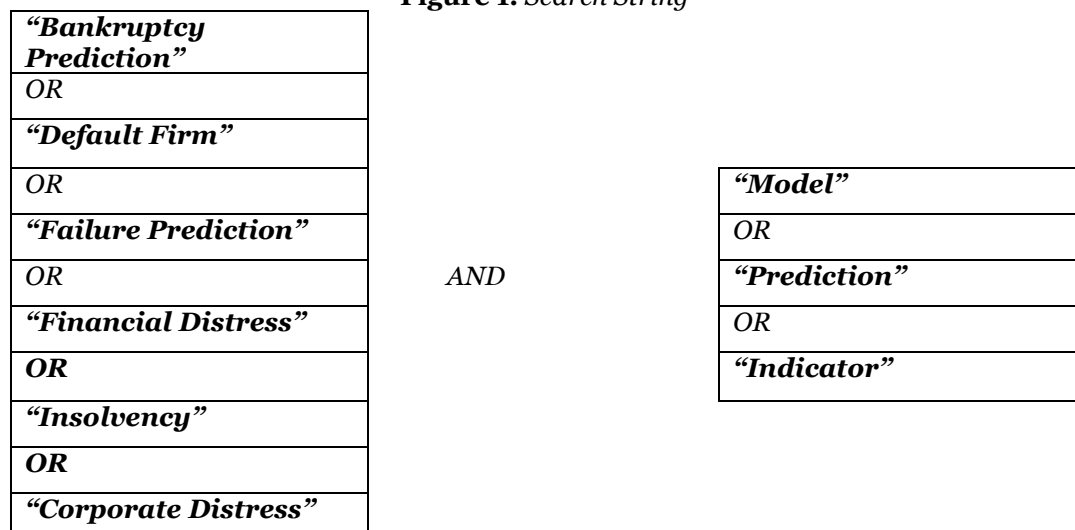
3. Research Methodology

The study undertakes a thorough examination of the literature and employs bibliometric analysis using the Scopus database. It attempts to explore and gain insights into the research field's development and evolution, with a total of 1,909 papers chosen for bibliometric analysis (Cobo et al., 2012) using Biblioshiny and VOSviewer. The period taken for bibliometric analysis is from 1969 to 2023.

Table 1. *Description of the Data*
Source- Created by Author

S.no	Particulars	Including
1	Database	Scopus
2	Language	English
3	Period	1969 to 2023
4	Document Type	Article
5	No. of Articles	1909
6	Keywords	"Bankruptcy Prediction", "Default Firm", "Failure Prediction", "Financial Distress", "Insolvency", "Corporate Distress", and "Prediction".
7	Tools Used	Biblioshiny and VOSviewer
	Literature Review Approach	
1	Literature Review	An extensive literature review was done to comprehensively analyze the development of studies that focused on predicting financial difficulty and bankruptcy between 1969 and 2023
2	Bibliometric Analysis	Bibliometric analysis is used to analyse the bibliometric trends and find the future research opportunities of financial distress and bankruptcy prediction.

Initially, a combination of keywords is used to identify academic papers in the research domain. The keywords for the study were identified based on review of past literature (Altman, 1968; Langford et al., 1993 ; Dimitras et al., 1996; Altman & Hotchkiss, 2010.; Lepetit & Strobel, 2013; Hernandez Tinoco & Wilson, 2013; Mselmi et al., 2017 ; Geng et al., 2015; Gupta, 2017; and Huang et al., 2017; and Shi and Li, 2019). The study has used Bankruptcy, Financial Distress, Default Firm, and Corporate Distress as proxy for Company Failure. This study has used the following string to identify the articles from Scopus Database.

Figure 1. *Search String*

"Bankruptcy Prediction"		
OR		
"Default Firm"		*"Model"*
OR		*OR*
"Failure Prediction"		*"Prediction"*
OR	*AND*	*OR*
"Financial Distress"		*"Indicator"*
OR		
"Insolvency"		
OR		
"Corporate Distress"		

Source- Created by Author.

4. Results and Discussion

4.1 Annual Scientific Production.

Figure 2 provides a graphic representation of the 1,909 scientific publications produced annually over the research period, from 1969 to 2023. Notably, an enormous spike in the number of annual scientific production can be observed from 2008 to 2022, accounting for more than 80% of the total analysed articles. The considerable increase in research articles denotes a major change in the academic environment with reference to the subject of the study. There has been a noticeable rise in interest and focus among scholars during the past 20 years, indicating a time when the topic attained significant significance.

Figure 2. *Annual Scientific Production*
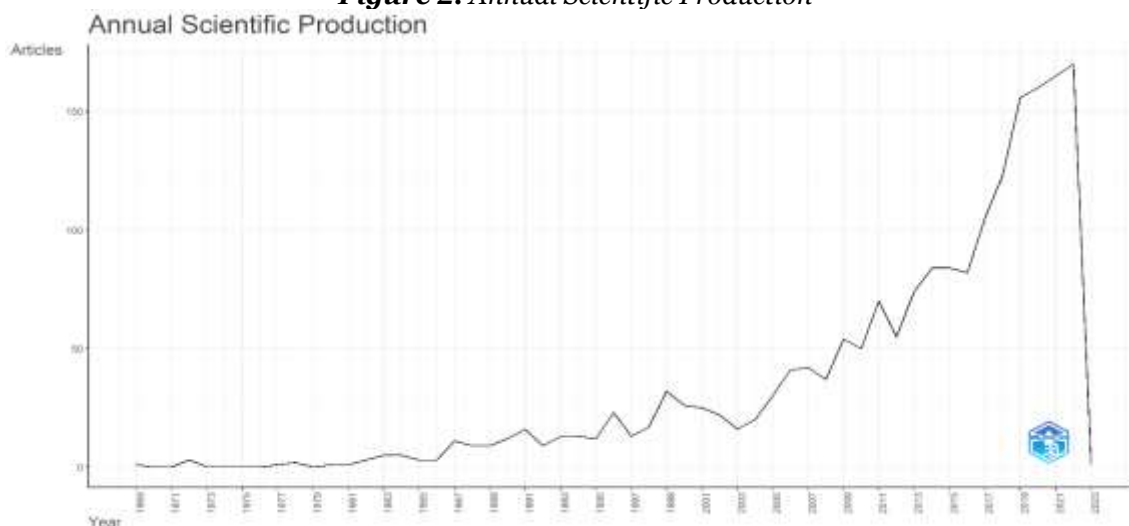
Source- Biblioshiny

The 2008 global financial crisis served as a significant trigger for the increase in research activities. Following this crisis, research on financial distress and bankruptcy prediction has become increasingly popular. This field of study attracted researchers from many academic institutions and backgrounds, which resulted in an explosive growth in the number of scholarly publications. The increasing number of research papers, especially in the years following 2008, demonstrates writers' passion and attention to advancing knowledge and understanding in the field of financial crisis and bankruptcy prediction.

4.2 Most Relevant Sources

Top ten most relevant sources with highest number of publications are shown in the Table 2. The Journal of Banking and Finance is at the top of the list, with an astonishing 50 publications to its credit. The International Insolvency Review comes in second place with a total of 43 publications.

Table 2. *Top Ten most Relevant Source*

S. No	Sources	No. of Articles
1	Journal of Banking and Finance	50
2	International Insolvency Review	43
3	Managerial Finance	22
4	Investment Management and Financial Innovations	20
5	Expert Systems with Applications	19
6	Journal of Risk and Finance	17
7	Review of Quantitative Finance and Accounting	17
8	Computational Economics	15
9	International Review of Financial Analysis	15
10	Journal of Financial Stability	15

Source- Author's Calculation

The Figure 3 offers a comprehensive view of source relevance as assessed by an analysis performed with VOSviewer. The examination involved assessment of number of published documents, received citations, and total link strength for a range of sources. To fulfil the stated criterion, each source had to meet specific criteria of at least 5 papers and 500 citations. Only 15 sources out of a vast pool of 828 met these stringent criteria. The colour intensity (hue) at each point on the item density visualisation represents the density of objects in that location. The Journal of Banking and Finance has the highest density, with 50 documents, 3015 citations, and a total link strength of 37. The Journal of Finance is ranked second, with 8 documents, 2929 citations, and a total link strength of 12. Expert System with Applications is ranked third, with 19 documents, 2509 citations, and a total link strength of 16. The findings shed light on the significance and significance of various sources within the analysed dataset.

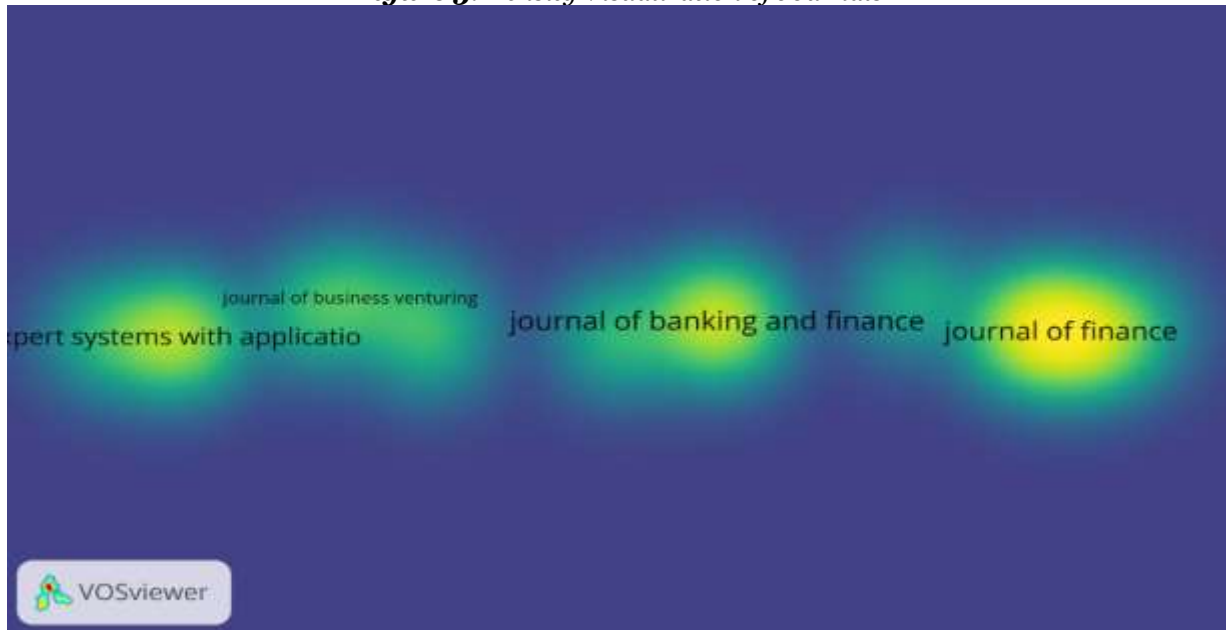**Figure 3.** *Density Visualization of Journals*

Table 3. *Ten most-cited papers globally*

S.no	Author Name	Title	Year	Citations
1	Wen – Tsao Pan	A new Fruit Fly Optimization Algorithm: Taking the financial distress model as an example	2012	1299
2	John Y. Campbell, Jens Hilscher, Jan Szilagyi	In search of Distress Risk	2008	922
3	Kar Yan Tam, Melody Y. Kiang	Managerial Applications of Neural Networks: The Case of Bank Failure Predictions	1992	740
4	Toni M. Whited	Debt, Liquidity Constraints, and Corporate Investment: Evidence from Panel Data	1992	706
5	Jae H. Min, Young-Chan Lee	Bankruptcy prediction using support vector machine with optimal choice of kernel function parameters	2005	626
6	Stephen A. Hillegeist, Elizabeth K. Keating, Donald P. Cram & Kyle G. Lundstedt	Assessing the Probability of Bankruptcy	2004	610
7	Edward I. Altman, Giancarlo Marco, Franco Varetto	Corporate distress Diagnosis: Comparisons using linear discriminant analysis and neural networks (the Italian experience)	1994	560
8	Douglas W. Diamond, Raghuram G. Rajan	A Theory of Bank Capital	2000	545
9	Xavier Freixas, Bruno M. Parigi and Jean – Charles Rochet	Systematic Risk, Interbank Relations, and liquidity Provision by the central Bank	2000	534
10	H Hooputra, H Gese, H Dell & H Werner	A comprehensive failure model for crashworthiness simulation of aluminium extrusions	2004	509

Source- Author's Calculation

The Table 3 present the list of papers with highest impact in the area of Bankruptcy prediction which have been identified based on citations from Biblioshiny. Among the ten most cited papers, three were published during 1992-1994, five were published during 2000-2005, and two were published during 2008-2012. The most cited paper titled "A new Fruit Fly Optimization Algorithm: Taking the financial distress model as an example" was authored by Wen – Tsao Pan with 1299 citations in the year 2012. W.-T. Pan, (2012), in his study aimed to predict financial distress and used Fruit fly Optimization Algorithm to develop the prediction model. The second-ranked paper with 922 citations is authored by (Campbell et al., 2008). The study used marketing and accounting variables in their study to predict financial distress by employing logit models. The third-ranked paper with 740 citations is authored by (K. Y. Tam & Kiang, 1992). They focused on Neural Net approach to predict Bankruptcy in Banks.

4.3 Geographical distribution

The Table 4 below presents the geographical distribution across world in terms of number of publications on bankruptcy prediction along with citations and total link strength. The United States has the maximum number of documents published and Citations. The number of documents from the United States is 474, followed by 156 documents from United Kingdom, 124 from China, 104 documents from India, 98 documents from Australia, 95 documents from Italy, 88 from Spain ,77 from Germany ,62 from Taiwan, and 61 from France. The number of publications between the United States (474 documents) and United Kingdom (156 documents) varies significantly and the number of publications from United Kingdom are 67 % less to that of the United States Publications.

Table 4. *Geographical Distribution*

| Country	Documents	Citations	Total Link Strength
United States	474	1891	7864
United Kingdom	156	4163	398
China	124	2506	315
India	104	564	171
Australia	98	1828	225
Italy	95	2011	220
Spain	88	2179	277
Germany	77	1797	661
Taiwan	62	2195	144
France	61	1424	147

Source- Author's Calculation

4.4 Co-authorship analysis

Co-authorship analysis looks at how researchers connect with one another. Co-authorship is another crucial parameter which gives the insight to the academic collaboration, and explains the inter-linkage of academics within a field including associated author traits like affiliated institutions and nations (Cisneros et al., 2018). Association between Scholars are becoming widespread due to the statistical and theoretical complication of research (Acedo et al., 2006). The scholarly association can result in strengthened research; contributions from many scholars can result in contributions with more depth and nuance (Tahamtan et al., 2016).

4.4.1 Individual Co-authorship Analysis
Figure 4. Individual Co-authorship Network
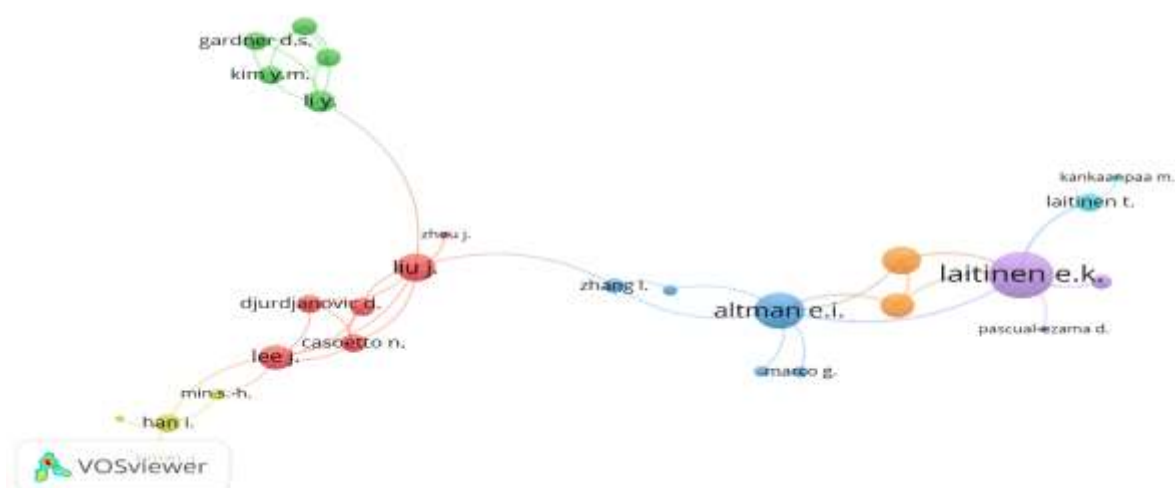
VOSviewer was used to create an Individual Co-authorship network, and certain threshold criteria for this authorship map were constructed. A minimum of 50 citations and at least one document from the author was required to meet the criteria. As a result, 477 authors out of the initial 3,966 met these requirements. The largest cluster of associated items in this network compromised 27 items. Each node in this visualisation represents individual author, and the links between them are represented by lines of varied lengths. The distance between two nodes indicates the strength of their link; when nodes are in close proximity, it indicates a stronger bond. Authors with a higher citations and a prolific publication record are represented by larger nodes, indicating their stronger influence within the network. The lines or ties between writers show collaborative partnerships developed when they collaborate on research projects together. Each link has a different strength, which indicates the number of co-authored publications shared by two scholars (van Eck & Waltman, 2010). This link strength quantifies the relationship between two items (Pinto et al., 2014).

Author Kliestik t., for instance, has the highest link strength of 15, with 466 citations and 7 documents. Following closely after, Author Laitinen e.k has a link strength of 14, backed up by 673 citations and an extensive record of 78 publications. This co-authorship network study provides useful insights into collaborative dynamics and individual author prominence within the research community.

4.4.2 Country co-authorship analysis

This analysis is critical in displaying the relationships between countries in the specific topic of research, highlighting those nations with major influence (Liao et al., 2018). Figure 5 depicts an overlay visualisation of the Country Co-Authorship Network which is based on average year of publication. Countries had to have a minimum of 10 documents and some citations to be considered for inclusion in this analysis. Only 43 of the 139 countries that were evaluated matched these criteria. The size of each node in this visual representation corresponds to the number of articles associated with that country. Notably, the United States, United Kingdom, China, India, France, Italy, and Germany have a considerable body of articles. The United States has the most publications (474) and the highest total link strength (171), showing considerable interconnectedness and cross-continental collaboration.

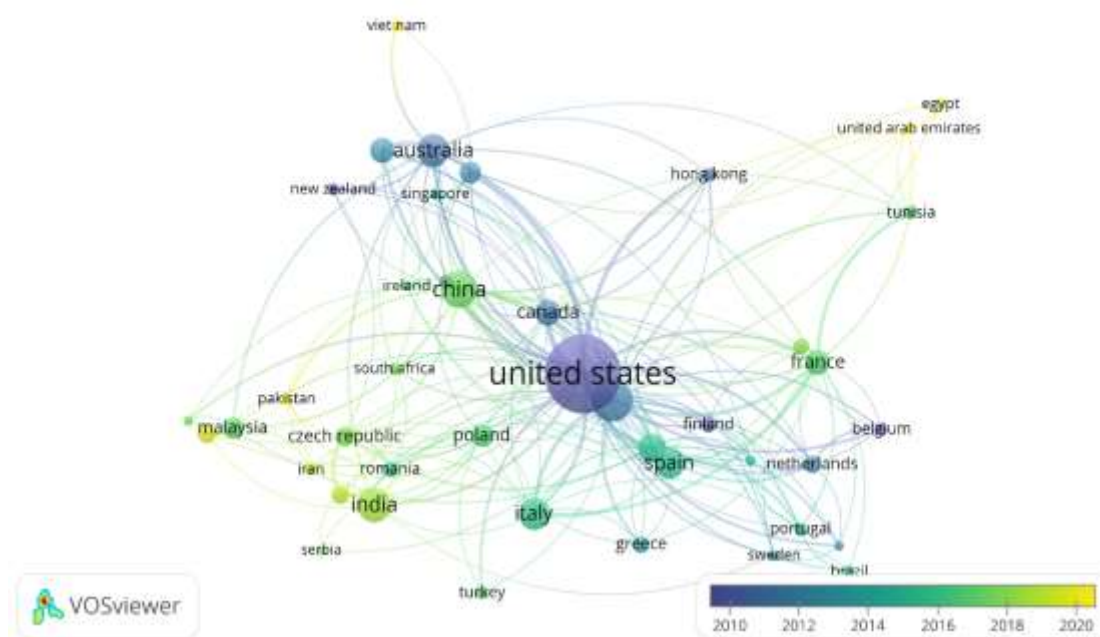**Figure 5.** *Country Co- Authorship Network*

Figure 5 provides useful information about the publication trends in several countries. Countries such as India, Pakistan, Indonesia, Egypt, Vietnam, and Iran (shown in yellow) have had a large increase in publications since 2018, indicating a recent surge in academic interest in this topic. In contrast, the United States (shown in blue) reached its high in terms of publications between 2010 and 2012. This research accurately depicts the changing landscape of academic contributions across countries, revealing historical trends as well as developing fields.

4.5 Co-citation analysis

This mapping technique is based on the concept that the publications that are frequently cited together have similar ideas, providing a way for disclosing the intellectual structure of the discipline (Hjørland, 2013). It provides insights into the domain's core ideas and themes (Liu et al., 2015; and Rossetto et al., 2018). Co-citation analysis is a method that creates a network based on references in research articles. Business

researchers can easily find influential articles as well as theme clusters by employing co-citation analysis. The listed papers serve as the foundation for these thematic groups (Donthu et al., 2021).

4.5.1 Reference Co-citation analysis

A reference co-citation occurs when two or more articles quote the same external source (reference) within their own reference lists (Small, 1973). It counts the frequency of two papers being cited together in multiple texts. The generated map comprises of edges reflecting the co-citation of publications and nodes representing articles in the research paper's reference list (Fahimnia et al., 2015). In Figure 6, VOSviewer is used to create the reference co-citation map.

Figure 6. *Reference Co-Citation Network*
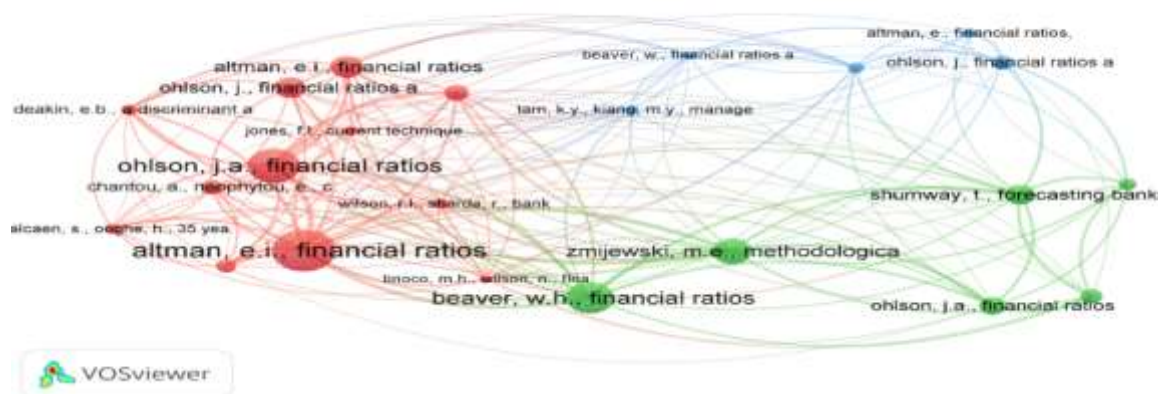
The analysis used a minimum of 20 citations for each author's referred work, and it found only 23 out of a total of 70,829 cited references that matched this condition. The resulting network visualisation shows three separate clusters, each having 23 nodes connected by 181 links with a total link strength of 940. The largest node in Figure 6 corresponds to the crucial study of (Altman, 1968), "Financial Ratios, Discriminant Analysis, and Prediction of Corporate Bankruptcy." Altman introduced the Z-Score in this groundbreaking study, which used multiple discriminant analysis for the first time. Notably, this node has the network's highest total link strength. The study of (Ohlson, 1980) has the second largest node. Ohlson proposed the O-Score as a substitute for Altman's Z-Score for failure prediction. While the second and third-ranked publications have lower link strength and citations, their co-citation impact is still significant. Furthermore, Beaver's 1966 study is credited with the third largest node. This study used analysed the prediction ability of financial measures using univariate analysis in discriminating between non-failed and failed firms. Despite having fewer citations and link strength than the top-ranked paper, its network co-citation impact is noteworthy.

4.5.2 Journal Co-Citation Analysis

The discipline of finding and analysing relationships between academic journals based on their patterns of being mentioned together in scholarly works is referred to as journal co-citation. It is a bibliometric technique used to comprehend the intellectual structure and relationships inside a certain academic subject or discipline. Co-citation Analysis shows the attributes and overall structure of the journal (Liao et al., 2018). In the visualisation, the proximity of the two journals is explained by the approximate length or space between the two journals through co-citation linkages. Academic journals are represented as nodes in a network or graph, while co-citation relationships between journals are represented as edges or links connecting the nodes. So, in case the two journals are geographically close to one another, they are strongly related in terms of co-citation. Lines are used to depict the co-citation relationships between journals that are the strongest (van Eck & Waltman, 2010) .

A minimum citation criterion of 200 was determined in Figure 7, which depicts the network of journal co-citations. 27 journals out of a total of 24,304 sources matched this condition, resulting in a network visualisation with 27 nodes, 4 clusters, 314 linkages, and a total link strength of 133,388. The proximity of nodes in this visualisation represents the frequency of co-citations, with shorter distances suggesting more frequent co-citation patterns. Furthermore, the size of each node indicates the journal's activeness.

Figure 7. *Journal Co-Citation Network*
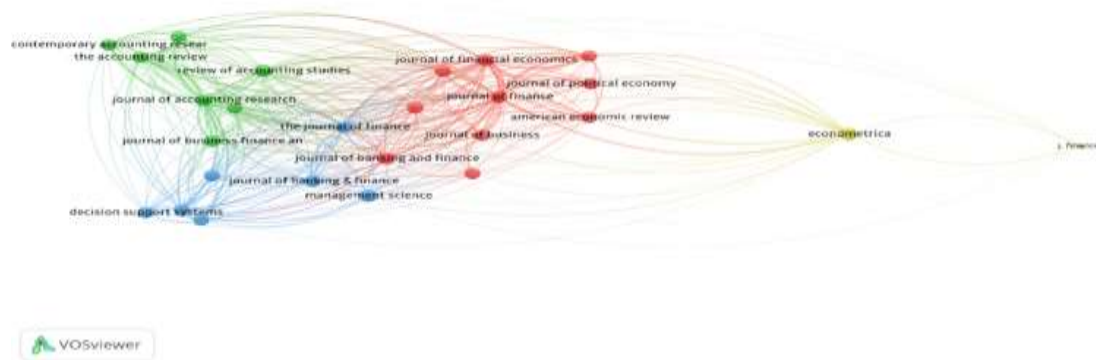
For instance, the Journal that ranks highest in this analysis is Journal of Finance, which has received 2313 co-citations. Co-citations arise when one work references both the "Journal of Finance" and another journal in its references. The network is further subdivided into four separate clusters, each with its own colour. Cluster 1 is indicated in red and has ten nodes, whereas Cluster 2 is shown in green and contains seven nodes. Cluster 3 is shown in blue and has seven nodes, while Cluster 4 is shown in yellow and has three nodes. These clusters are mostly concerned with management, accounting, finance, and decision sciences. The top journal is Journal of Finance, a management and finance journal, according to the rating based on overall link strength and citations.

Table 5. *Total link strength of top 10 journals (as per co-citation frequency)*

S.no	Source	Citations	Total Link Strength
1	Journal of Finance	2313	36964
2	Journal of Financial Economics	1500	27996
3	Journal of Accounting Research	1802	27190
4	Journal of Banking and Finance	1164	15850
5	The Journal of Finance	1099	15027
6	The Accounting Review	588	12463
7	Review of Financial Studies	484	11468
8	Expert System with Applications	1009	11252
9	Journal of Financial and Quantitative Analysis	423	9652
10	European Journal of Operational Research	687	9478

Source- Author's Calculation

The data shown here provides a glimpse of the influence and significance of several academic journals, as measured by citation counts and total link strength. Notably, the "Journal of Finance" stands out with 2,313 citations and an exceptional overall link strength of 36,964, indicating that it occupies a central and highly recognised position in the area. Similarly, with 1,500 and 1,802 citations, respectively, the "Journal of Financial Economics" and "Journal of Accounting Research" garner significant attention within the academic world. The "Journal of Banking and Finance" and "The Journal of Finance" are similarly well-known, with over 1,000 citations apiece. These figures together show the scientific impact and influence of these Journals. In addition, journals from other fields, such as "Expert System with Applications" and "European Journal of Operational Research," are included in the data, demonstrating the interdisciplinary character of the research and their significant contributions to the area.

4.6 Co-Occurrence Analysis

Co-Occurrence analysis undertakes "All Keywords" as the unit for analysing the data. To put it another way, the Co-Occurrence analysis looks at the original text of the article itself. When author keywords are not available, notable words can also be retrieved for the analysis from "article titles," "abstracts," and "full texts." Author keywords are frequently used to generate the words in co-word analyses (Donthu et al., 2021).

Figure 8. *Co- Occurrence Analysis*

The minimum number of occurrences for a term is 20. Out of 4496 total keywords, 19 keywords meet the requirement and are represented as 25 nodes. The term "Financial Distress" is most frequently used with 253 Occurrences and has the link strength of 192. Other terms with a high frequency include "Bankruptcy" with 175 occurrences and link strength of 162, "Bankruptcy Prediction" with 144 Occurrences and link strength of 133, "Financial Ratios" with 64 Occurrences and link strength of 86. The Financial Distress node has thick connections with other nodes such as bankruptcy, financial ratios, and machine learning, neural networks and others. It has 24 linkages and the most occurrences among others.

4.7 Trend Topics
The table below shows a trend analysis of numerous themes, as well as the years in which they were most prevalent. The analysis emphasises the changing nature of research interests in this area. It emphasises both enduring themes and rising trends, reflecting the changing research landscape and academics' ability to meet modern challenges and possibilities.

Figure 9. *Trend Topics*
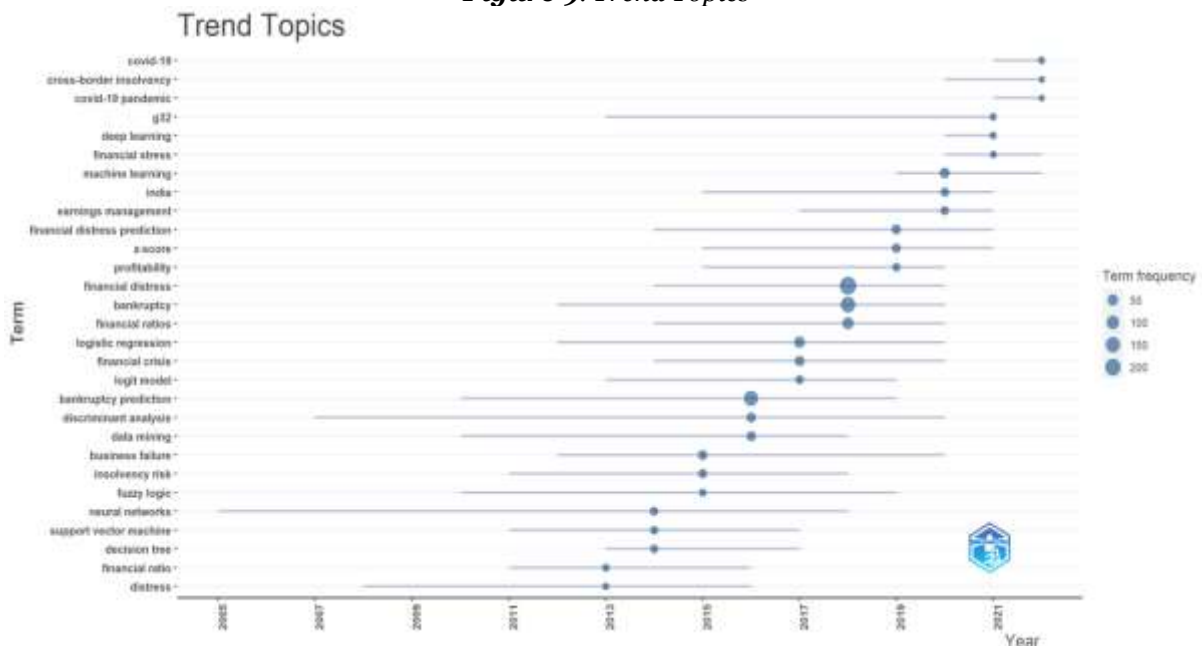
Some topics such as "financial distress," "bankruptcy," and "financial ratios," have been at the forefront on a regular basis, with high frequencies spanning many years (2014-2020). These are most likely long-standing concerns and areas of ongoing inquiry.

Certain issues, on the other hand, have emerged more lately. For example, the terms "cross-border insolvency", "machine learning" and "deep learning" have increased significantly in frequency since 2019, showing the growing interest in harnessing new computational tools in this area. There has been a shift towards more data-driven and machine-learning approaches, as words like "neural networks," "support vector machine," and "data mining" have acquired importance in the second half of the provided years. Notably, the global impact of the COVID-19 pandemic has pushed linked terms to the forefront, showcasing researchers' versatility to solve modern concerns.

5. Conclusion

The study primarily aimed to examine the historical pattern and trend of published academic literature by implementing a detailed review and bibliometric analysis focused on financial distress and bankruptcy prediction. The study uses Scopus database for collecting data for the period 1969 to 2023. The study assesses annual scientific production, co-authorship mapping, geographical (country) co-authorship network, co-citation (reference and journal) mapping and co-occurrence analysis.

Initially, a slow growth can be observed in the annual scientific production from 1969 to 2008 which significantly increased 2008 to 2017. Further, post 2016, the area received much research interest around the globe and the annual scientific production increased sharply between 2017-2019 and the trend in the production continued till 2022. The increasing research trend in the area can be attributed to various financial crisis that the world economies faced i.e., the global financial crisis of 2008, followed by European debt crisis of 2009 and the Covid-19 pandemic recently which shook the stability of various economies around the world. This attracted the attention of policymakers and researchers towards the financial distress and bankruptcy prediction. In the scientific production, the "Journal of Banking and Finance" and "International Insolvency Review" are the top two most relevant sources which published fifty and forty-three articles respectively.

In the field the paper titled "A new Fruit Fly Optimization Algorithm: Taking the financial distress model as an example" authored by Wen – Tsao Pan and the paper titled "In Search of Distress Risk" authored by John Y. Campbell, Jens Hilscher and Jan Szilagyi are the most notable research articles with 1299 and 922 citations respectively. Also, the most productive countries in the area are United States with 474 documents, 18917 citations and 864 total link strength, followed by United Kingdom with 156 documents, 4163 citations and 398 total link strength. Although United Kingdom ranks second in the list, but a huge gap can be observed in total documents published to that of United States.

Further, in the co-authorship mapping, the study observes a weak collaboration among the authors in this area of research and the key author is Laitinen e.k. with a total link strength of 14. It can also be concluded that the leading authors in the area hardly collaborate with each other groups. Also, United States is the pivotal country followed by United Kingdom, China, and India in terms of publication. The emerging economies like India, Pakistan, Indonesia, Egypt, and Vietnam have shifted their focus on research in financial distress and bankruptcy prediction post 2020.

The study conducts the structured review of literatures significantly contributing to the development of predictive models. The review concludes that a factor identified as significant after a financial crisis can be redundant for another, thus a continuous exploration and development of predictive model is required. Logit model as the most prominent model used for predictive analysis. Further, Machine Learning, Neural Network, and data mining as the emerging topics of research for development of predictive models.

6.Practical Implication, Limitation and Future Direction

This study accomplished three major goals in order to streamline its implications. Objective 1 entailed investigating studies on the prediction of financial difficulty and insolvency conducted between 1969 and 2023. The second objective required a thorough examination of bibliometric trends in financial hardship and bankruptcy prediction. Finally, Objective 3 sought to identify emerging keywords that could potentially pave the way for future research opportunities in bankruptcy prediction.

The attainment of these objectives has provided a significant contribution to our understanding of the subject area's evolution, as well as the predominant themes and ideas that have impacted its development over time. The manuscript furnishes a compendious study on bankruptcy prediction allowing researchers to refer and gain insights of past literature enabling them to identify the prominent literatures, keywords and research trend. The study also guides the researchers to identify the future research trend and build a firm base for future investigation in a structured manner. However, it is important to acknowledge significant limitations that may have influenced our findings. The fundamental constraint of this study is the selection of database. The data is limited to Scopus Database. The Researchers can undertake the future research by widening the scope by including data from other databases.

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