Development of Smart Financial Management Research in Shared Perspective: A CiteSpace-Based Analysis Review

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Abstract—At a time when information technology is advancing by leaps and bounds, smart financial management is becoming a hotspot of common concern in both academic and practical circles. The purpose of this paper is to systematically sort out the research development trend of smart financial management under the shared vision through the CiteSpace bibliometric analysis method. We select the relevant literature in the Web of Science database during the 10 years from 2014 to 2023 as the research object, set reasonable queer values and time slices, and conduct in-depth analyses of keyword co-occurrence, author cooperation network, keyword clustering, mutant keywords, and time interval, etc., and analyze the research hotspots and evolutionary paths of the smart financial management research under the shared vision, using the data as a renewable basis. Evolutionary path. After the study, it is found that the research in this field presents more obvious stage characteristics, influenced by technological progress, industry demand, and social change, and can be divided into five stages according to the development curve: the construction of the basic framework, the development of the model system, the change of behavioral patterns, personalized recommendations and risks, and the depth of the role of the Internet. As an emerging research field, as research scholars dig deeper into the theoretical logic, the deepening of interdisciplinary research, and the application of emerging technologies, it provides a new impetus and a new direction for intelligent financial management to make financial management more healthy and sustainable development.

Keywords—Smart finance; financial management; financial sharing; bibliometrics; CiteSpace

I. INTRODUCTION

With the rapid development of information technology, the field of financial management is experiencing unprecedented changes. Intelligent financial management, as a product of the deep integration of financial management and modern information technology, which involves the application of cutting-edge technologies such as big data, cloud computing, artificial intelligence, and other cutting-edge technologies in financial management, is gradually becoming a key force in promoting the innovation and transformation of corporate finance. It has not only changed the way of collecting, processing, and analyzing financial data but also had a far-reaching impact on the enterprise's decision support, risk control, and value creation [1]. Under the impetus of the sharing economy, information sharing and resource integration among enterprises are becoming more and more frequent, and the importance of intelligent financial management is becoming more and more prominent. As a result, the research and practice of smart financial management are showing new development trends and characteristics.

However, the current research on smart financial management is still in its infancy, and the research results are relatively scattered, lacking systematic sorting and analysis. In order to comprehensively understand the research status and development trend of intelligent financial management, this paper, through systematic search, screening and analysis of domestic and international related literature in the Global Academic Citation Index indexing database (Web of Science), selects the relevant literature in the Web of Science database during the 10-year period of 2014-2023 as the research object, sets reasonable queue values and Time slicing, in-depth analysis of keyword co-occurrence, author cooperation network, keyword clustering, mutant keywords, and time interval, etc. found that the research in this field presents more obvious stage characteristics, affected by technological advances, industry needs and social changes, according to the development curve can be divided into the construction of the basic framework, the development of the model system, the change of behavioral patterns, personalized recommendation and risk, and the role of the Internet The depth of these five stages [2]. This study aims to use CiteSpace software to construct a knowledge map in the field of intelligent financial management, reveal its research hotspots and evolution paths, and provide reference and inspiration for future research.

II. RESEARCH DESIGN

A. Research Methodology

In this paper, the CiteSpace bibliometric analysis tool is used to show the current research status and development trend in the field of smart financial management through visualization [3]. The tool can reveal the research hotspots, evolutionary paths, and collaborative networks in the research field by visualizing keyword co-occurrence networks and author collaboration networks in the scientific literature. CiteSpace software has become one of the most commonly used tools in the current bibliometric analysis due to its powerful data visualization capabilities. In this study, the software will be used to visualize

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and analyze the literature data collected during the last 10 years to reveal the current research status and development trend in the field of smart financial management.

B. Data Collection

Data collection is a key step in research design, and to ensure the comprehensiveness and representativeness of the study, the data in this paper mainly come from the relevant literature in the global academic citation index database Web of Science (Wos), which covers a wealth of international academic literature resources [4]. The keywords for searching the data include "Intelligent Financial Management", "Financial Management", "Shared Vision" and so on. Shared Vision", etc. To ensure the timeliness and cutting edge of the study, the time frame of the study was set as the period of 2014-2023.

Based on the above set conditions, a total of 1398 initial documents were retrieved, and to ensure the accuracy of the analysis, multiple rounds of screening were subsequently conducted on the initial literature data to exclude a series of documents unrelated to the topic of smart finance research such as news conferences, interview reports, and solicited wasted articles, and to obtain a core literature of 817 articles, which is used as a core sample for the study of this paper.

C. Data Processing

Based on the core literature data samples obtained from multiple big data and manual screening, the data information, including authors, publication year, journal name, keywords, etc., was further extracted and exported, which was used as the input data required for analysis by CiteSpace software. At the same time, by setting appropriate parameters for CiteSpace 6.3.R1, such as time slicing, keyword co-occurrence thresholds, clustering thresholds, etc., the data were further processed and analyzed, and the clustering knowledge graphs, such as bibliometrics, scholars' institutional cooperation network mapping, word frequency co-occurrence network, word frequency clustering network, etc., were constructed, and the timeline view was applied for further analysis to achieve the intuitive identification of the wisdom of The purpose of the hot topics and evolution path of financial management research [5].

III. ANALYSIS OF RESULTS

A. Literature Analysis

1) Period of distribution of literature: By organizing and counting the number of literature releases between 2014 and 2023, a corresponding annual literature release trend chart is produced. The growth of the number of literature releases in a research field usually means that the research in the field attracts more attention and participation of scholars, reflecting the academic research level and development speed of the research field in Fig. 1.

The statistical and quantitative distribution of the number of literature releases shows a significant curvilinear growth trend in the number of literature releases in the field in the above-mentioned years, which is broadly categorized into four phases according to the rate of growth:
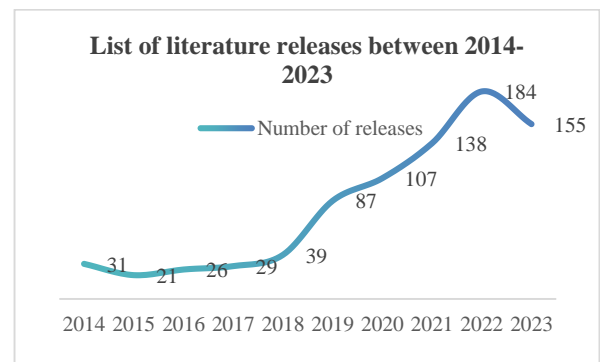

Fig. 1. Summary of the number of literature releases during 2014-2023.

Initial Growth Phase (2014-2017): Between 2014 and 2017, the number of research literature published in this field was relatively low and the average annual growth rate was relatively flat. This phase can be regarded as the initial growth phase of research in this field. During this period, smart financial management, as an emerging field, is still in its infancy as research scholars are still in the process of recognizing and exploring it [6]. 31 publications in 2014 marked the initial interest in the field, followed by slow growth in the following years, as research scholars are gradually exploring and accumulating the knowledge base [7].

Accelerated Growth Phase (2018-2019): There has been a significant increase in the number of literature publications starting from 2018 and this trend continued in 2019 [8]. The growth rate in this phase was significantly higher than in the previous phase, indicating that research in this area is beginning to receive more attention.39 publications in 2018 almost doubled compared to the previous year, showing that research interest in this area is growing rapidly among research scholars.

Rapid Growth Phase (2020-2021): The research in this field has entered into a rapid growth phase as we enter the year 2020.107 publications in the year 2020 and 138 publications in the year 2021 show the activity of the research in this field. The growth in this phase may be related to the changes in the global economic environment, the increasing demand for smart financial management in organizations, and the rapid development of related technologies.

Peak period (2022-2023): The number of literature releases peaked in 2022 and 2023 at 184 and 155 respectively, which accounted for a larger proportion of the total literature. The high growth rate in this period indicates that smart financial management has become a hot topic in the field of financial management [9]. Research scholars have explored the theory and practice of this field in depth and published a large number of high-quality research results.

2) Main published journals: Journals with high publication volume usually represent a high degree of recognition of their content quality and academic contributions by the academic community [10]. Literature published in these journals is often highly specialized and rigorous and can provide a solid theoretical foundation and empirical support for research in related fields [11]. In this study, data statistics and classification screening were carried out on the included journals of the core

literature sample and the number of articles published in the journals, and a total of 416 included journals were obtained after sorting. The list of journals with a high publication volume of literature release was produced with the cut-off point of 10 total publications in the literature (Table I).

TABLE I.   LIST OF HIGH-VOLUME JOURNALS PUBLISHED IN LITERATURE

No.	Journal Name	Volume Of Publications
1	Executive Systems with Applications (ESWA)	41
2	Sustainability	41
3	IEEE Access	35
4	Computational Income and Neuroscience	18
5	Journal of Intelligent Fuzzy Systems (JIFS)	17
6	Journal of Intelligent Fuzzy Systems Applications in Engineering and Technology	17
7	Mobile Information Systems	17
8	Wireless Communications and Mobile Computing	16
9	Wireless Communications and Mobile Computing	15
10	Energies	14
11	Mathematical Problems in Engineering	14

It is found that the top three key journals are ESWA, Sustainability, and IEEE Access, which are significantly ahead of other journals in terms of the number of publications. Among them, ESWA and Sustainability are published by Elsevier, and both of them have 41 publications. These two journals have higher requirements for manuscript submission and long reviewing periods, but they have become the authoritative journals in the field due to their stable impact factor [12]. The third-ranked IEEE Access has 35 journals, which is more inclusive than the first two journals, and is a journal that covers multidisciplinary fields and supports open access, providing a channel for researchers in various fields to quickly share their research results and is welcomed by many scholars because of its fast review and publication process [13].

The fourth-ranked Computational Intelligence and Neuroscience, and the fifth-ranked JIFS, these two journals are more inclined to the research direction in the combination of theoretical logic and application [14]. It is easy to see that these key journals ranked in the top 10 not only provide a high-quality publication platform for research in the field across all disciplinary areas but also ensure the quality and academic level of the published literature through their high-standard peer review process [15]. By publishing their research results in these journals with stable impact factors, scholars can share and exchange the latest research findings with their peers around the world, thus promoting the academic development and practical application of the field.

B. Collaborative Network of Scholars and Research Institutions

1) Scholarly research networks: Research Scholar Collaboration Network Mapping can visualize the collaborative relationships among research scholars, and at the same time show the dynamics of major research scholars in the field [16]. In this paper, we constructed a collaborative network graph of research scholars in this field through the co-occurrence function of the software CiteSpace 6.3.R1. The graph consists of 284 nodes and 151 connecting lines, where the nodes represent research scholars, and the connecting lines between the nodes indicate the collaborative relationship and social network structure among research scholars in Fig. 2.

When producing the research scholars' cooperative network mapping, the co-occurrence threshold of research scholars was set to 2 to show the social network structure among research scholars in this field, thus obtaining the above cooperative network. Although this network consists of many nodes, the network density is only 0.0038, and this low-density value indicates that there are relatively few connections in the network and the overall network structure is very loose [17]. This loose network structure implies that there is a lack of close collaborative clusters among research scholars in this field, which are mostly carried out on an individual basis and have not yet formed a large-scale, organized collaborative network.

Fig. 2.   Collaborative network mapping of smart financial management research scholars.

To gain a deeper understanding of the research dynamics of research scholars over the past 10 years, this paper statistically analyzes the number of research scholars' publications in the field during the period 2014-2023. The statistical results show that a total of 284 research scholars published research results during this time interval [18]. Notably, 18.7% of the research scholars published 2 research results, while 81.3% published only 1. This suggests that although research participation within the field is extensive, most research scholars have a shallow level of participation and lack a sustained output of research results [19].

According to Price's law, this paper calculates that the number of publications of highly productive authors is 1. This is inconsistent with the definition of and fact of prolific authors in Price's law, which side by side proves that the research in this field is still in the early stage of development, and the leading role of prolific academic authors is still not formed [20]. Based on experience, this paper classifies the research scholars with 2 publications as high-yield authors (Table II).

The table lists 53 prolific authors in no particular order. In terms of the number of publications, these research scholars are more uniform in the number of publications. Combined with the time of publication, the findings of these research scholars still focus on logical theory, mainly exploring the knowledge framework and theoretical filling of this research field, and do not carry out a more in-depth study of this field, perhaps this has to do with the fact that this field is an emerging field of research, and the research scholars are still in the beginning stage of recognizing and exploring it [21].

2) Collaborative network of research institutions: In this paper, we use CiteSpace 6.3.R1 software to set the nodes as institutions, filter the research institutions with a high frequency of posting, and the threshold is set to 2 to get a research institution cooperation network mapping. The size of the nodes in the graph represents the frequency of the institution's posting, and the thickness of the connecting line between the nodes represents the strength of the cooperation [22]. The larger the nodes are, the higher the number of messages sent. The thicker the connecting lines, the greater the intensity of cooperation in Fig. 3.

TABLE II. Summary Statistics of Publications by Scholars in Smart Financial Management Research

No.	Research Scholar	Volume of Publications	Serial Number	Research Scholar	Volume of Publications
1	Alkhamees, Nora	2	28	Li, Shaoshuai	2
2	Aloud, Monira Essa	2	29	Liu, Chichang	2
3	Ammirato, Salvatore	2	30	Liu, Hao	2
4	Balland, Pierre-Alexandre	2	31	Liu, Weihua	2
5	Bhattacharya, Pronaya	2	32	Liu, Xiaolei	2
6	Bodendorf, Frank	2	33	Liu, Zonghua	2
7	Broekel, Tom	2	34	Long, Shangsong	2
8	Cao, Jie	2	35	Lu, S-Y	2
9	Cerna, Fernando V	2	36	Ma, Qiongxu	2
10	Chen, Chien-Ming	2	37	O'clery, Neave	2
11	Chen, Ruey-Shun	2	38	Rabelo, Ricardo A L	2
12	Chen, Yeh-Cheng	2	39	Raso, Cinzia	2
13	Contreras, Javier	2	40	Rigby, David	2
14	Deng, Shangkun	2	41	Rodrigues, Joel J P C	2
15	Diodato, Dario	2	42	Sofo, Francesco	2
16	Felicetti, Alberto Michele	2	43	Tanwar, Sudeep	2
17	Franke, Joerg	2	44	Tian, Guixian	2
18	Giuliani, Elisa	2	45	Wang, Fei-Yue	2
19	Guo, Naicheng	2	46	Wang, Shuai	2
20	Guo, Xiaobo	2	47	Xiao, Yingyuan	2
21	Hausmann, Ricardo	2	48	Xiong, Naixue	2
22	Honarmand, Masoud	2	49	Zakariazadeh, Alireza	2
23	Hsu, Ching-Hsien	2	50	Zhang, Wenyuan	2
24	Huang, Szu-Hao	2	51	Zheng, Wenguang	2
25	Jadid, Shahram	2	52	Zhou, MengChu	2
26	Li, Jing	2	53	Zhu, Yingke	2
27	Li, Qing	2			

From the results in the figure, the network mapping of research institutions contains 263 nodes and 216 connecting lines, and the density of the network is only 0.0063. This indicates that a total of 263 research institutions have carried out research in the field of intelligent financial management related to the analysis of the research found that the higher volume of published articles will be enough, mainly for the universities, followed by the relevant research institutions and knowledge bases [23]. In this paper, only the top 10 research organizations are intercepted in Table III.

The top three institutions are the Chinese Academy of Sciences, Tianjin University, and Islamic Azad University, with 17, 12, and 8 articles, respectively [24]. Chinese Academy of Sciences ranks first with 17 articles, showing its leadership in this field of research. Tianjin University followed with 12

articles and also showed strong research strength [25]. It is worth noting that the node intermediary centrality of the institution is small, indicating that although the institution has a high number of publications, the cooperation with other institutions is not close enough, and it is necessary to increase the cooperation between institutions to play a real leading role in the research field, thus promoting the research of the whole field of intelligent financial management [26].

Several international institutions and research organizations, such as Islamic Azad University, King Saud University, and Egyptian Knowledge Bank, EKB (Egyptian Knowledge Bank), have also demonstrated significant research activity in this field, which at the same time reflects the fact that this field of study is a global academic research area that requires cross-border collaboration to advance together [27].
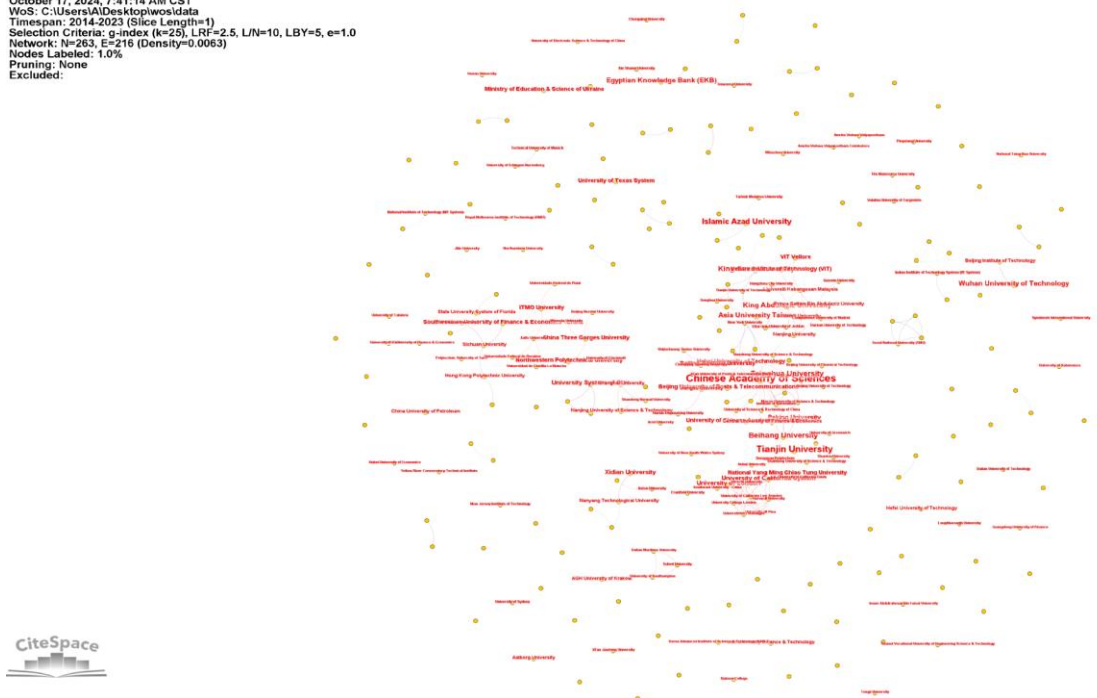

Fig. 3.   Collaborative network mapping of smart financial management research organizations.

TABLE III.   LIST OF STATISTICS OF RESEARCH ORGANIZATIONS ON INTELLIGENT FINANCIAL MANAGEMENT

No.	Research Organization	Number Of Communications
1	Chinese Academy of Sciences	17
2	Tianjin University	12
3	Islamic Azad University	8
4	Beihang University	7
5	Tsinghua University	7
6	King Saud University	7
7	Asia University Taiwan	6
8	Wuhan University of Technology	6
9	King Abdulaziz University	6
10	Egyptian Knowledge Bank (EKB)	6

The data also hint at potential structures in collaborative networks, for example, institutions with a high number of publications may occupy a central position in the network, advancing knowledge through collaboration with other institutions. At the same time, institutions with a lower number of publications may play a bridging role in the network, connecting different research communities.

IV. RESEARCH HOT SPOTS

A. Keyword Co-Occurrence

Keywords, as a refined expression of the research topic of an academic paper, are used to show the research hotspots and research trends in the research field in an intuitive and precise way. In this study, the keyword co-occurrence network mapping was constructed by CiteSpace software, where N=352 represents the total number of nodes in the network, i.e., the number of identified keywords; E=1316 represents the total number of connecting lines between nodes, i.e., the number of keyword co-occurring relationships. The network density is 0.0213, a value that is low but, compared to previous analyses, proves that there is a certain degree of interconnection between the research hotspots in this field in Fig. 4.

The size of the 352 node count indicates that smart financial management is a multidimensional research area covering a wide range of topics from logical theories, and technology applications to management strategies. Each node represents a keyword, and the size of the node is usually proportional to its frequency of occurrence, highlighting the hot topics in research [28]. For example, nodes related to "Big Data Analytics", "Cloud Computing" and "Artificial Intelligence" are likely to be large, indicating that these technologies are the focus of current research. 1316 high values for the number of lines, on the other hand, indicate that the keyword is not a keyword. The high value of 1316 lines shows the complex relationship between the keywords. Each line represents two keywords appearing in the same document, reflecting the intersection and integration of

research topics [29]. These lines reveal how different research themes are interrelated; for example, "risk management" may be closely linked to "internal control," suggesting that researchers often consider the framework of internal control when exploring risk management strategies.

The network density value is only 0.0213, indicating a relatively low percentage of co-occurring relationships observed among all possible keyword combinations. This reflects the wide and diverse range of research topics in the field on the one hand, and on the other hand, suggests that many potential research combinations have not yet been fully explored. This sparser network density provides room for new research and encourages scholars to explore new combinations of existing research topics or develop entirely new research areas.

B. Keyword Clustering

The keyword clustering map reveals the research topics and subfields of the field. In this paper, we adopt the clustering method of keyword clustering module Q value>0.3 and keyword clustering average profile value S>0.5 to cluster the keywords scientifically and provide a scientific quantitative basis for the development of this research field [30]. After carefully analyzing each cluster, we can gain insight into the research themes, research hotspots, and research directions behind these keywords [31]. Based on extracting the keywords from the literature, the keyword co-occurrence network was further clustered and analyzed using the operations of LSI and LLR, with a Q-value of 0.4755 and an R-value of 0.7832, and the clustering labels numbered from 0 to 8, totaling 9, were obtained. They are, #0 blockchain technology, #1 mediating role, #2 shareholder value, #3 assisting investor, #4 directional change, #5 directional change, and #6 directional change. directional change, #5 deep learning algorithm, #6 economic complexity, #7 electric vehicle, #8 consideration. The smaller the numerical label of the cluster label, the higher the number of keywords it contains. The sub-clusters in this cluster are closely related in Fig. 5.
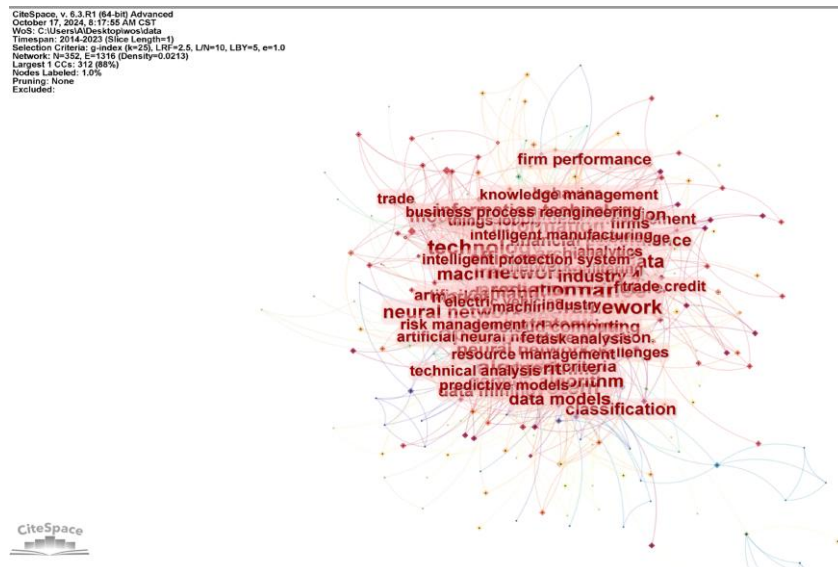

Fig. 4. Keyword co-occurrence network mapping for smart financial management research.
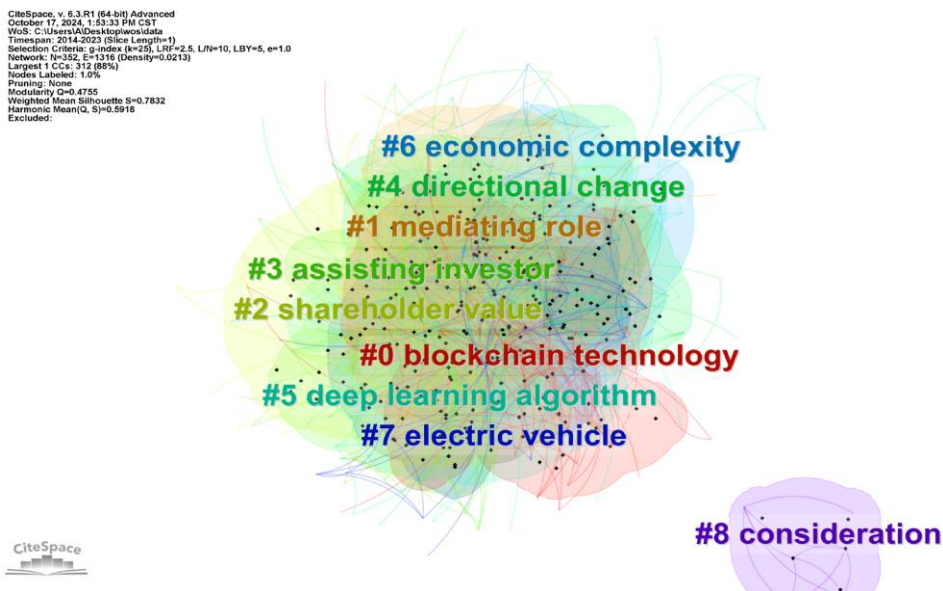
Fig. 5. Clustering mapping of keywords for smart financial management research.

This area of research is an emerging and dynamic area of financial research, and keyword clustering mapping paints a colorful picture of the research field. A deeper exploration of the keywords within each cluster, using centroid value numerical analysis, reveals the intrinsic connections and interactions between different research topics within the field. In this paper, the intrinsic connectedness and influence values, clustering the nine keywords again, find four important research directions within the field [32]. They are: technology-driven, strategic decision-making, value efficiency, and industry-specific.

In the technology-driven research direction, the main clusters are #0 blockchain technology and #5 deep learning algorithm, which are two new Internet big data technologies. In

the blockchain technology cluster, it is "blockchain technology" and "energy efficiency", revealing the potential of this emerging technology to optimize energy management and improve transparency in the industry [33]. The study focuses on how blockchain can be used to ensure the transparent distribution of government subsidies and support the development of new energy vehicle enterprises. In the clustering of deep learning algorithms, "deep learning algorithms" intersect with "cybersecurity," highlighting the importance of maintaining data security in the fintech sector. These studies explore the application of deep learning in predicting financial risks and detecting abnormal trading behaviors, providing strong technical support for this research area.
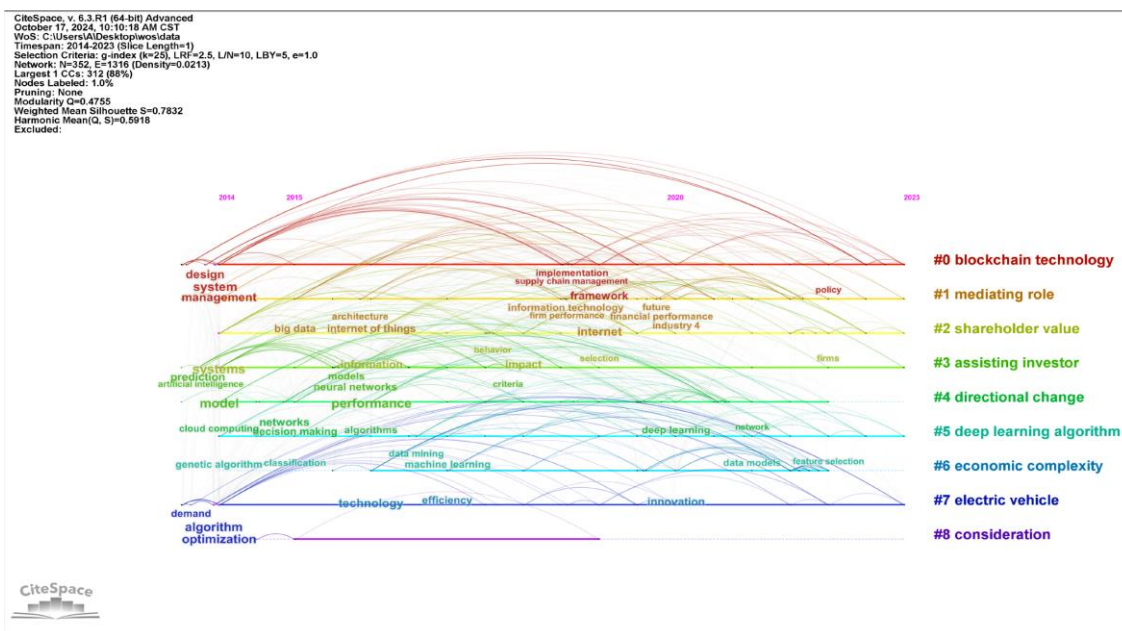

Fig. 6. Mapping of keyword research development paths.

In the strategic decision-making research direction, the clustering of decision-making and strategy is focused, including #1 mediating role and #3 assisting investors. In the mediating role clustering, "Big Data" interacts with "Organizational Learning", highlighting the central role of Big Data in facilitating knowledge transfer and decision optimization within organizations. The study demonstrates how big data can contribute to the growth of the smart manufacturing industry and enhance the ability of organizations to adapt to future trends. In the case of investor assistance clustering, the combination of "neural networks" and "portfolio management" provides investors with more accurate tools for market analysis and enhances their decision-making capabilities in complex markets.

In the value efficiency research direction, the interaction between #2 shareholder value and #6 economic complexity is explored. The clustering of shareholder value is complemented by the clustering of 'shareholder value' and 'smart logistics policies', reflecting how this research area can enhance corporate value through optimized logistics and supply chain management. Meanwhile, the discussion of "regional innovation capacity" highlights the importance of innovation in enhancing corporate competitiveness and shareholder returns [34]. The clustering of economic complexity, where "economic complexity" interacts with "knowledge-based transformation", explores how firms are responding to changing economic environments through intelligent upgrades and how these transformations are affecting financial strategies and industry practices.

In the sector-specific research, researchers focused on sustainable industries, primarily in the areas of #7 electric vehicle and #8 consideration. In the electric vehicle cluster, the combination of "electric vehicles" and "smart parking" demonstrates the role of this area in supporting emerging industries. The research focuses on how smart technologies can improve the efficiency of electric vehicle charging and parking and promote a sustainable industry. In the clustering of considerations, "decision support systems" are intertwined with "carbon footprint," emphasizing the importance of considering environmental impacts in engineering decisions, such as bridge maintenance, which demonstrates the potential of this research area to promote environmental sustainability.

From technology application to decision optimization to industry-specific problem solving, these research hotspots at different levels not only provide a deep understanding of the current state of development of research in the field but also offer new directions and ideas for future research.

C. Deduction of Research Development Paths

The keywords carry out all levels of this research field, and this paper uses the timeline function of the CiteSpace software tool and the mutation keyword query function to filter and sort the keywords appearing in the research and obtain the research development of this research field in different periods from 2014 to 2023 through the years of appearance and disappearance of mutation keywords in this research field in Fig. 6.

Over the 10 years from 2014 to 2023, research in the field has undergone an extremely significant evolution, with research

priorities and trends profoundly influenced by Internet technologies, industry needs, and societal changes.

2014-2015: Construction of the foundational framework

In the early years of research in this area, from 2014 to 2015, research focused primarily on building its foundational framework, the "system". Research during this period laid the groundwork for subsequent technology integration and application, emphasizing the importance of systems thinking in financial management transformation. Subsequently, research began to delve into more complex models and systems, exploring how information technology could be used to improve financial management. Researchers and scholars began to realize that achieving and improving efficiency and accuracy in financial management through integrated systems is a more important direction for the future, especially in terms of automation and real-time data processing.

2016-2018: Development of modeling systems

As we move into 2016, research is beginning to shift to more complex models and systems as understanding of the underlying frameworks grows. Researchers and scholars worked to develop and test a wide range of financial models that improve the accuracy of decision-making through algorithms and data analysis. Research during this period began to involve more advanced mathematical and statistical methods, as well as emerging information technologies such as big data analytics and cloud computing [35]. Research in integrated systems began to show its potential in financial management, especially in automation and real-time data processing. These researches have pushed financial management to higher levels of automation and intelligence, providing faster and more accurate financial reporting and analysis for organizations.

2018-2020: Behavioral patterns of concern

Beginning in 2018, research shifted to "behavior," or patterns of behavior in financial decision-making. This change in research direction reflects a deeper understanding of the factors that influence individual and organizational behavior, and how this understanding can be used to optimize financial strategies. And how these understandings can be used to optimize financial strategies. Researchers and scholars are beginning to explore how human behavior interacts with financial management systems and how to design intelligent systems that are more responsive to user behavior. Research in this phase not only focuses on the technical aspects of the system but also begins to focus on the human factor and how understanding the behavior of financial decision-makers can improve the design of the system and the quality of decision-making.

2020-2021: Personalized recommendations and risk

By 2020, the focus of research has shifted to "recommender systems" and "risk management". Recommender systems research focuses on how machine learning algorithms can be used to provide personalized financial advice, while risk management research focuses on how to identify and mitigate financial risks, especially in a market environment of increasing uncertainty. During the same period, the role of the Internet became increasingly important in the field. Research has begun

to explore how Internet technologies, including cloud computing and big data analytics, can be utilized to improve the efficiency and effectiveness of financial management so that investors and financial decision-makers can make more informed investment choices in a complex market environment. These studies emphasize the critical role of the Internet in connecting financial decision-makers, providing real-time market information, and supporting complex calculations, advancing the field's use in risk control and decision support to provide companies with more robust financial strategies.

2021-2023: Deepening the role of the Internet

Since 2021, the Internet has become increasingly important in the practical application of financial management. Research is beginning to explore how Internet technologies, including cloud computing and big data analytics, can be utilized to improve the efficiency and effectiveness of financial management. These studies emphasized the critical role of the Internet in connecting financial decision-makers, providing real-time market information, and supporting complex calculations. As Internet technologies evolve, financial management is beginning to migrate to the cloud, leveraging the Internet's extensive connectivity and powerful data processing capabilities to provide organizations with more flexible and efficient financial management solutions.

During the same period, some researchers and scholars began to turn to the in-depth exploration of the shared vision and the application of technology. The research hotspots not only focus on the deepening application of technology but also the innovation of big data-driven decision support and financial sharing models. With the advancement of technology, the sharing concept and the idea of intelligent financial management have been generally recognized, and enterprises have gradually popularized the adoption of advanced management systems, the level of intelligence has steadily increased, and the number of technological applications has increased by nearly 10% on average, and the rate of technological adoption has also increased. Financial sharing has become a key factor in promoting the level of construction in this field, and most enterprises have promoted the goals of financial standardization, improving the level of financial intelligence, and facilitating the transformation of financial functions through financial sharing centers. At the same time, the widespread application of mature technologies such as electronic invoices, mobile Internet, mobile payments, and digital signatures has accelerated the transformation of smart financial construction.

It should be noted that the construction of the system in this field is affected by the industry category and enterprise scale, and the significance of differences is amplified. Different enterprises have different motivations and demands for the construction of smart finance due to the existence of differences in industry, revenue scale, personnel scale, and informatization level, which leads to large differences in the application of artificial intelligence and other technologies and the level of intelligence. Under the shared vision, the study began to focus on cutting-edge trends such as data governance and smart sharing. Data governance ensures the quality and security of data and provides a reliable basis for corporate decision-making, while smart sharing emphasizes the importance of achieving information sharing and collaborative cooperation in the digital era, thereby enhancing the competitiveness and innovation of enterprises.

D. Projections of Future Trends

Research in the area of smart financial management will continue to develop along the path of technology convergence and innovation. As industry applications deepen, research in the field will become more relevant to practical needs, and environmental sustainability concerns will continue to grow. Interdisciplinary research will continue to grow, and innovations in research methodologies will continue to emerge, bringing new perspectives and solutions to the field. In the process, research scholars will continue to explore the application of technologies such as big data, artificial intelligence, and blockchain in financial management, and will also pay more attention to how these technologies affect financial decision-making, risk management, and corporate value creation. As technology continues to advance, research in this field will continue to expand into new areas, providing practitioners with more theoretical support and practical guidance.

In addition, with the continuous development of globalization and market economy, research in this field will also pay more attention to financial management issues in multinational corporations and multi-currency environments. Researchers and scholars will explore how intelligent financial management tools can be used to optimize the financial structure of firms and improve their international competitiveness in a changing global economic environment. Research in this area will also focus more on sustainability and social impact. With society's increasing emphasis on environmental protection and social responsibility, companies need to consider more environmental and social factors in their financial management. Researchers and scholars will explore how to promote the sustainable development of enterprises through intelligent management systems and realize the dual goals of economic and social benefits.

As technology continues to advance, research in this field will continue to expand into new areas, such as the application of emerging technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), and Blockchain in financial management.

In conclusion, research on smart financial management has made significant progress over the past decade, and future research will continue to evolve along the path of technological convergence and innovation to provide enterprises with more efficient and smarter financial management solutions. As research continues, the field will play an increasingly important role in the global economy, helping companies achieve more efficient and sustainable growth.

V. CONCLUSION

In the field of intelligent financial management, this paper, through CiteSpace6.3.R1 software, systematically combed the research dynamics during the 10 years from 2014 to 2023, and analyzed the development trend of the research field from different levels and perspectives by doing the distribution of the literature, the key journals loaded with publications, the network mapping of the collaborators, the keyword clustering mapping,

as well as the timeline, and through the in-depth understanding of the content, predicted the possible future research hotspots and research directions.

In the data statistics on the number of publications in the literature and the number of issues contained in the key journals, it is observed that this research field has shown a clear stage characteristic in the past 10 years. At the beginning of the research, it focused on the construction of the basic framework, followed by a gradual overshoot into the transforming direction of behavioral patterns, recommender systems, risk management, and the application of Internet technologies. Advances in the technology of Internet big data and the development of big data, artificial intelligence, blockchain, and other technologies have provided new impetus and direction for the field while deepening research scholars' deeper understanding and exploration of the field.

Although this paper provides a comprehensive analysis of the research dynamics in the field, there are some limitations. First, it may fail to cover all relevant research in the field as the collection of research data is limited to a specific period. Second, the analysis in this paper is mainly based on bibliometric methods, which may fail to fully capture the depth and quality of the research content. The analysis of smart financial management practices characterized by different regions and industries needs to be further deepened.

Future research can dig deeper into the following aspects. First, with the continuous progress of technology, the application of emerging technologies such as the Internet of Things and 5G communication in smart financial management deserves further research. Second, the deepening of interdisciplinary research, such as combining psychological and sociological theories with smart financial management, may reveal more about the deeper factors of financial decision-making behavior. In addition, case studies of smart financial management practices in enterprises of different sizes and industries may provide richer empirical data to help understand the applicability and effectiveness of smart financial management in different environments. Finally, with the development of globalization, the application of smart financial management in multinational corporations and its impact on the global financial market is also a research direction that deserves attention.

In summary, research in the field of smart financial management under the shared vision is in a stage of rapid development, and future research will show greater potential and value in terms of technology integration, practical application, and interdisciplinary exploration. With the continuous deepening of the research work and the accumulation of practice, it is expected to bring more efficient and smarter financial management strategies to enterprises, and thus promote the sustainable and healthy development of enterprises and the entire economic system. In the subsequent research, the author plans to expand the scope of the sample database, closely track the latest research progress and results in this field, and think deeply about how to promote the development of intelligent financial management under the guidance of the sharing concept, to provide guidance and direction for the wide application of this field.

REFERENCES

[1] Sengupta A, Jana P, Dutta P N, et al. Optimal stock allocation for an automated portfolio recommender system in the perspective of maximum fund utilization[J]. Expert Systems with Applications, 2024, 242: 122857.

[2] Aboelmaged, M., Alhashmi, S. M., Hashem, G., Battour, M., Ahmad, I., & Ali, I.. Unveiling the path to sustainability: Two decades of knowledge management in the sustainable supply chain – a scientometric analysis and visualization journey[J]. Benchmarking: An International Journal, 2023, ahead-of-print(ahead-of-print).

[3] Hu X, Kang S, Ren L, et al. Interactive preference analysis: a reinforcement learning framework[J]. European Journal of Operational Research, 2024, 319(3): 983-998.

[4] Krause, J., Myroshnychenko, I., Tiutiunyk, S., & Latysh, D. Financial Instruments of the Green Energy Transition: Research Landscape Analysis[J]. Financial Markets, Institutions and Risks, 2024 8(2), 198–212.

[5] Leung M F, Jawaid A, Ip S W, et al. A portfolio recommendation system based on machine learning and big data analytics[J]. Data Science in Finance and Economics, 2023, 3(2): 152-165.

[6] Liu, X., Chau, K.-Y., Liu, X., & Wan, Y. The Progress of Smart Elderly Care Research: A Scientometric Analysis Based on CNKI and WOS[J]. International Journal of Environmental Research and Public Health, 2023 20(2), Article 2.

[7] Javadi S, Hashemi S M. Designing a Risk-Aware Recommender System for Providing Personalized Optimal Stock Portfolios: the Case of S&P 500[J]. Available at SSRN 4916445.

[8] Ma, T., Liu, Y., & Han, M. Visualization Analysis of Organizational Resilience Research Based on CiteSpace From 1990–2022[J]. IEEE Access, 2022 10(10), 65854–65872. IEEE Access.

[9] Yue X. Application of AI technology in a personalized recommendation system for financial services[J]. Applied Mathematics and Nonlinear Sciences, 2023, 9(1).

[10] Mathew, L., Govindan, V. M., Jayakumar, A., Unnikrishnan, U., & Jose, J. The evolution of financial technology: A comprehensive bibliometric review of robo-advisors[J]. Multidisciplinary Reviews, 2024 7(11), 2024274–2024274.

[11]]Jang J, Seong N Y. Deep reinforcement learning for stock portfolio optimization by connecting with modern portfolio theory[J]. Expert Systems with Applications, 2023, 218: 119556.

[12] Mikheev, A. V. Scientometric analysis of research trends and frontiers on global energy transition. AIP Conference Proceedings, 2023 2552(1), 080017.

[13] Asemi A. A Novel Combined Investment Recommender System Using Adaptive Neuro-Fuzzy Inference System [D]. Budapesti Corvinus Egyetem, 2023.

[14] Rong, K., Li, J., Huang, Q., & Zhu, G. Citespace-Based Analysis of System Resilience Research Hotspots and Trends[J]. 2022 12(11), 23–34.

[15] Umadevi B, Sundar D. Building Wealth in Stock Market: The Comprehensive Guide to Intelligent Portfolio Theory and Trading[J].

[16] Shen, Y., Huang, L., & Wu, X. Visualization analysis on the research topic and hotspot of online learning by using CiteSpace—Based on the Web of Science core collection (2004–2022) [J]. Frontiers in Psychology, 2022 13(34), 12–22.

[17] Asemi A, Asemi A, Ko A. Investment Recommender System Model Based on the Potential Investors' Key Decision Factors[J]. Big Data, 2023.

[18] Su, X., Wang, S., & Yu, R. A bibliometric analysis of blockchain development in industrial digital transformation using CiteSpace[J]. Peer-to-Peer Networking and Applications, 2024 17(2), 739–755.

[19] Ai H, Liu C, Lin P. Robust returns ranking prediction and portfolio optimization for M6[J]. International Journal of Forecasting, 2024.

[20] Sun, Y., Ma, Z., Chi, X., Duan, J., Li, M., & Khan, A. U. Decoding the Developmental Trajectory of Energy Trading in Power Markets through Bibliometric and Visual Analytics[J]. Energies, 2024 17(15), Article 15.

[21] Guan Z, Zhao Y. Optimizing stock market volatility predictions based on the SMVF-ANP approach[J]. International Review of Economics & Finance, 2024, 95: 103502.

[22] Wang, J., Wang, B., Jiang, X., Huang, Y., & Yang, J. Research on Hot Topics of Building and Developing Student Organizations—CiteSpace Based Visual Analysis[J]. Open Journal of Social Sciences, 2023 11(6), Article 6.

[23] Behera J, Pasayat A K, Behera H, et al. Prediction-based mean-value-at-risk portfolio optimization using machine learning regression algorithms for multi-national stock markets[J]. Engineering Applications of Artificial Intelligence, 2023, 120: 105843.

[24] Yang, D., Wu, X., Liu, J., & Zhou, J. CiteSpace-based global science, technology, engineering, and mathematics education knowledge mapping analysis[J]. Frontiers in Psychology, 2023 13(13), 34–44.

[25] Cui T, Du N, Yang X, et al. Multi-period portfolio optimization using a deep reinforcement learning hyper-heuristic approach[J]. Technological Forecasting and Social Change, 2024, 198: 122944.

[26] Zhang, J., Wang, Q., Xia, Y., & Furuya, K. Knowledge Map of Spatial Planning and Sustainable Development: A Visual Analysis Using CiteSpace[J]. Land, 2022 11(3), Article 3.

[27] Li J, Zhang Y, Yang X, et al. Online portfolio management via deep reinforcement learning with high-frequency data[J]. Information Processing & Management, 2023, 60(3): 103247.

[28] Zhang, L. Environmental hotspots, frontiers and analytical framework of Blue Carbon research: A quantitative analysis of knowledge map based on CiteSpace[J]. Frontiers in Environmental Science, 2024 12(24), 131456.

[29] Ali Mohamad T, Bastone A, Bernhard F, et al. How artificial intelligence impacts the competitive position of healthcare organizations[J]. Journal of Organizational Change Management, 2023, 36(8): 49-70.

[30] Zhang, Y., Zhao, D., Liu, H., Huang, X., Deng, J., Jia, R., He, X., Tahir, M. N., & Lan, Y. Research hotspots and frontiers in agricultural multispectral technology: Bibliometrics and scientometrics analysis of the Web of Science[J]. Frontiers in Plant Science, 2022 13, 1–10.

[31] Ala A, Simic V, Pamucar D, et al. Enhancing patient information performance in the internet of things-based smart healthcare system: hybrid artificial intelligence and optimization approaches[J]. Engineering Applications of Artificial Intelligence, 2024, 131: 107889.

[32] Sahni N, Stein G, Zemmel R, et al. The potential impact of artificial intelligence on healthcare spending [R]. Cambridge, MA, USA: National Bureau of Economic Research, 2023.

[33] Kumar K, Kumar P, Deb D, et al. Artificial intelligence and machine learning based intervention in medical infrastructure: a review and future trends[C]//Healthcare. mdpi, 2023, 11(2): 207.

[34] Ahmed S K, Ali R M, Lashin M M, et al. Designing a new fast solution to control isolation rooms in hospitals depending on artificial intelligence decision[J]. Biomedical Signal Processing and Control, 2023, 79: 104100.

[35] Chen X, Xie H, Li Z, et al. Information fusion and artificial intelligence for smart healthcare: a bibliometric study[J]. Information Processing & Management, 2023, 60(1): 103113.