RESEARCH STATUS AND TREND OF FAMILY FINANCE-BASED ON VISUAL ANALYSIS OF JOURNAL PAPERS FROM CNKI AND WOS

Xiaoshu SONG

Research Status and Trend of Family Finance-Based on Visual Analysis of Journal Papers from CNKI and WOS

Xiaoshu SONG[1]

Abstract

With the sustained economic growth, the importance of family finance has become increasingly prominent. In this research, the papers collected by Chinese National Knowledge Infrastructure (CNKI) and Web of Science (WOS) were visually analyzed via CiteSpace software, and a knowledge map for the field of family finance was constructed, which displayed the current situation, hotspots, and trends of family finance research from multiple angles in an all-round way. The results show that the number of published Chinese and English papers is increasing year by year, among which English papers are mainly contributed by American scholars, with relatively little cooperation and exchange between countries. In Chinese literature, the cooperation between authors and institutions is also limited. At present, the research in the field of family finance is ushering in a stage of rapid development, and the research hotspots mainly focus on financial literacy, financial knowledge, risk finance, and inclusive finance. Given this, the future research should focus on the cooperation among authors, institutions, and disciplines, and meanwhile, increase in-depth research on digital finance, and digital divide. These efforts will promote the further development of research in the field of family finance in China.

Keywords: family finance; CiteSpace; financial literacy; asset allocation; digital finance.

[1] Woosuk University, Jeonju, REPUBLIC OF KOREA;
 E-mail: 1357791202@qq.com

Introduction

With the continuous improvement of the financial market and the continuous innovation of financial products, families have wider choices of financial assets (Aikman, 2021). In this complicated and changeable financial environment, how to correctly grasp opportunities, avoid risks, and maximize family wealth has become a major challenge that every family needs to face and solve. In 2006, Campbell put forward the concept of family finance on the annual meeting of American Finance Association (AFA) for the first time, pointing out that "family finance means how families use financial tools to maximize their goals" (Campbell, 2006). In the meanwhile, he thinks that family finance is as important as asset pricing and corporate finance (Campbell, 2006; Tufano, 2009). However, families have unique characteristics, which are different from other economies (Guiso & Sodini, 2013; Campbell, 2006; Gomes *et al.*, 2021; Beshears *et al.*, 2018).

Family finance has become complicated because of the uniqueness of families, which is mainly reflected in the fact that each family must weigh in the long-term financial planning (Ahmed, 2016; Braunstein *et al.*, 2002). Every family possesses untradeable assets, such as labor income and human capital (Giraldi, 1993; Randl, 2018; Grande *et al.*, 2002). Every family owns illiquid assets like real estates (Bayer, 2019; Krainer *et al.*, 2002). Due to the differences in financial knowledge and investment experience between families, there are huge differences in asset allocation among families (Stephens & Ward-Batts, 2004; Yin, Song & Wu, 2014). Many families do not participate in stock investment (Yamori & Ueyama, 2020; Merkoulova & Veld, 2022; Haliassos & Bertaut, 1995;), nor do they participate in high-risk financial assets investment (Jacoby *et al.*, 2023; Ge *et al.*, 2023; Li & Liu, 2021). And those families joining in the stock market or other high-risk assets investments have different asset portfolios (Ioannides, 1992; Lu, 2020; Bertocchi, 2011; Bricker, 2019). In addition, different families face various credit restrictions (Lehnert, 2004; Grant, 2007; Dong, Xu & Tan, 2012).

What accounts for the above differences? Chinese and foreign scholars have launched a series of studies from different perspectives and different research methods in combination with financial markets. The existing research focuses on the analysis of the factors affecting the allocation of family financial assets in China from the economic characteristics, demographic characteristics, and background characteristics of families. As revealed by empirical results, family income shows a significantly positive correlation with the participation in the risk financial asset market (Calvet & Sodini, 2014). The financial asset holding of families is a long-term asset portfolio, which will not change with the change of family income or wealth (Brunnermeier & Nagel, 2004). In America, the proportion of stock investments increases with the age of financial decision makers in families (Cardak & Wilkins, 2009). There is a significant negative correlation between the age and the proportion of risk financial assets in families (Bodie & Crane, 1997). With the improvement of human capital level, it is easier to understand that stocks

participate in financial markets at a lower cost (Rosen & Wu, 2004; Guiso *et al.*, 2008). The increase of financial knowledge has significantly promoted the family participation in financial markets and the allocation of risk financial assets (Yin *et al.*, 2014). It is found that families with mental health problems will reduce their investment in the risk financial market (Bogan & Fertig, 2013). Family location and residents' trust in and satisfaction with society have significant effects on residents' financial asset allocation (Wei, 2014). In the vast ocean of literature, however, how to find the research contribution, research deficiency, and research gaps of the existing research is very difficult. In order to solve this problem, literature data were statistically collected through bibliometrics and analyzed via data visualization software CiteSpace to intuitively master the research status and development trend of the field of family finance.

This research aims to figure out the research status and trends in the field of family finance by analyzing the number of papers published, research authors, research institutions, research countries, keywords, burst terms, and highly cited papers in China and abroad, so as to provide research reference for the follow-up research.

Methodology

Based on a comprehensive review of the existing research, the emphasis of this research is laid on the following questions:

Question 1. What is the research status of family finance in China and abroad?

Question 2. What is the research topic of family finance in China and abroad?

Question 3. What is the future research direction of family finance in China and abroad?

Data sources

The research data derived from the core databases - China National Knowledge Infrastructure (CNKI) and Web of Science (WOS). In CNKI, the papers were retrieved with the theme of "family finance" and literature type of Chinese Social Sciences Citation Index (CSSCI). In WOS, retrieval was performed using "TS= household finance OR household assets OR household portfolios OR family finance" as the theme. Given that the concept of family finance was formally proposed by Campbell for the first time in 2006, the time span was set to 2006-2023, and retrieval was carried out on September 25, 2023. Finally, a total of 1651 English papers and 830 Chinese papers were obtained after papers published online and invalid papers unrelated to the subject, such as meeting notices, soliciting notices, manually deleted titles, keywords, abstracts, and main bodies, were deleted.

Research tools

In this research, data processing was implemented via the econometric analysis software Citespace, a visual scientometric analysis tool developed by Professor Chaomei Chen from Drexel University, USA, in 2003. Citespace is capable of the bibliometric analysis of papers in specific research fields, so as to explore into the key paths and turning points for the knowledge evolution of these disciplines. Since the scientific knowledge structure, laws, and distribution are presented visually, the visual graphs obtained through this method are referred to as "mapping knowledge domains". In this research, CiteSpace ver.6.1. R6 was mainly used for the analysis.

Results

With regard to the current research situation in the field of family finance in China, the number of papers published in China and abroad, the distribution and cooperation of countries, scientific research authors, scientific research institutions, key words, burst terms, and highly cited papers were deeply analyzed and summarized in this research.

Statistical analysis of the number of papers published in China and abroad

The distribution of published papers is an important index to measure the development status of a certain field (Zhao & Guo, 2016). The research and development status in this field can be comprehensively mastered through the statistics of published papers. A total of 2481 papers were analyzed in this research, including 1651 English papers and 830 Chinese papers. The number of both Chinese and English papers published showed a growth trend, as shown in Figure 1.

Figure 1. Trend Chart of Published Papers in Chinese and English

Distribution of countries and cooperation network analysis

"Country" in "Node Type" of CiteSpace was chosen to analyze the distribution and cooperation of countries. From the whole map structure as shown in Figure 2, the nodes represent countries, the node size denotes the number of papers published in a country, and a larger node size stands for the larger number of papers published. In the map, the connecting line between nodes represents the cooperative relationship between countries, and a greater number of lines indicates much cooperation and exchange between institutions (Feng, 2023). The line thickness denotes the cooperative intensity between countries.

The nodes marked by purple circles indicate their high centrality. Centrality is a quantitative index to measure the importance of papers at such nodes in the CiteSpace map. The higher the centrality, the more the papers at the nodes, and the stronger the influence of these papers at the nodes. CiteSpace regards the papers with centrality greater than 0.10 as the high-centrality papers (Liu, Wang & Chen, 2009). Based on the analysis of English papers, papers regarding family finance were published in totally 97 countries, among which the number of papers published in America and China was the largest, accounting for 47.84% of the total output. The countries ranking top 10 in the number of published papers accounted for 90% of the total number of published papers. Strong centrality was observed in America, Britain, Germany, and Australia (>0.1). The first 10 countries with a lot of family finance-related English papers are listed in Table 1, and the cooperation network of countries with family finance-related English papers is displayed in Figure 2.

Table 1. Top 10 Countries by Number of Publications in English-Language Papers (n=1651)

Country	Number of publications	Proportion	Centrality
USA	553	33.49%	0.48
CHINA	237	14.35%	0.04
ENGLAND	179	10.84%	0.25
ITALY	98	5.94%	0.04
CANADA	98	5.94%	0.04
GERMANY	98	5.94%	0.11
AUSTRALIA	91	5.51%	0.11
SPAIN	75	4.54%	0.07
FRANCE	58	3.51%	0.11
INDIA	49	2.97%	0.02

Figure 2. Network of International Collaborations in English-Language Papers

Distribution of research institutions and their cooperation network analysis

Research institutions are usually important institutions in academic circles, such as universities, research institutes, and research centers, which undertake various research projects and promote academic progress and knowledge innovation (Liu & Gong, 2015). Through in-depth analysis of the papers published by these institutions and their cooperation maps with other institutions, the research focus, research level, and partnership of these institutions in specific fields can be understood.

"Institution" in "Node Type" of CiteSpace was selected to analyze the distribution of research institutions and their cooperation. It can be known from the whole map structure in Figures 3 and 4, the nodes represent institutions, the node size stands for the number of papers published by an institution, and a larger node size indicates the greater number of published papers. In the map, the connecting line between nodes denotes the cooperative relationship between institutions, a greater number of lines accounts for much cooperation and exchange between institutions, and a greater line thickness stands for the higher cooperation intensity between institutions.

It was found through statistics that a total of 476 institutions published family finance-associated English papers and 316 ones published family finance-related Chinese papers. The institutions ranking top 10 in the number of published Chinese and English papers is respectively listed in Tables 2 and 3. The cooperation network of institutions publishing Chinese and English papers is respectively exhibited in Figures 3 and 4.

Table 2. Top 10 institutions in terms of the number of publications in English-language papers (n=476)

Agencies	Number of papers	Component ratio
Southwestern Univ. Finance & Econ	32	6.72%
Australian National Univ.	19	3.99%
NBER	18	3.78%
Renmin Univ. China	15	3.15%
Brigham Young Univ.	14	2.94%
Peking Univ.	14	2.94%
Chinese Univ Hong Kong	13	2.73%
Duke Univ.	12	2.52%
CEPR	12	2.52%
Univ. Arizona	11	2.31%

Table 3. Top 10 institutions in terms of the number of publications in Chinese-language papers (n=316)

Agencies	Number of papers	Component ratio
School of Finance, Capital University of Economics and Business	43	13.61%
School of Finance, Southwestern University of Finance and Economics	30	9.49%
China Family Finance Survey and Research Center, Southwestern University of Finance and Economics	28	8.86%
Research Institute of Economics and Management, Southwestern University of Finance and Economics	25	7.91%

School of Economics and Management, Southwest University	12	3.80%
School of Economics, Southwestern University of Finance and Economics	7	2.22%
School of Insurance, Southwestern University of Finance and Economics	7	2.22%
Western China Economic Research Center, Southwestern University of Finance and Economics	4	1.27%
Institute of Social Development, Southwestern University of Finance and Economics	2	0.63%
Southwestern University of Finance and Economics China Financial Research Center	2	0.63%

Figure 3. Network of Institutional Collaborations in English-Language Papers

Figure 4. Network of Institutional Collaborations in Chinese-Language Papers

Cooperation map analysis of research authors

Scientific research authors are the main body boosting the development of disciplines, which is of great significance to research (Qiu, Yang & Zhou, 2009). By analyzing the cooperation map of scientific research authors, the core authors dedicated to family finance research can be sorted out, and moreover, the academic exchange and cooperation in this field can be found out.

"Author" in "Node Type" of CiteSpace was selected to analyze the cooperation between authors. From the whole map structure in Figure 6, the nodes represent authors, the node size indicates the number of papers published by an author, a larger node size means the greater number of papers published, the connecting line between nodes is the cooperative relationship between authors, and the line thickness denotes the cooperation intensity between authors.

It could be observed from Figures 5 and 6, 494 authors published English papers on family finance, and 410 authors published Chinese papers on family finance.

Le Baron and Ashley B (8 papers) published the largest number of English papers and kept close cooperation with Marks, Loren D (5 papers) and Hill, E Jeffrey (5 papers). Yin Z C (53 papers) published the largest number of Chinese papers and kept close cooperation with Wu Y (17 papers) and Zhou L (8 papers). The core authors ranking top 10 in the number of Chinese and English papers published is respectively listed in Tables 4 and 5, and the cooperation network diagram of authors publishing Chinese and English papers is respectively exhibited in Figures 5 and 6.

Table 4. Top 10 Authors by Number of Publications in English-Language Papers (n=1651)

Author	Work unit	Number of papers
Lebaron, Ashley B	Brigham Young University	8
Marks, Loren D	Brigham Young University	5
Hill, E Jeffrey	Professor of Family Life, Brigham Young University	5
Lu, Xiaomeng	Fudan University	4
Brown, Sarah	Adjunct Professor, USC, Australia	4
Bucciol, Alessandro	University of Verona	3
Courbage, Christophe	Haute ecole de gestion (HES-SO)	3
Apergis, Nicholas	University of Piraeus	3
Ali, Shoaib	Air University	3
Koropp, Christian	University of St. Gallen	2

Table 5. Top 10 Authors by Number of Publications in Chinese-Language Papers (n=1651)

Author	Work unit	Number of papers
Yin Zhichao	Capital University of Economics and Business	53
Wu Weixing	University of International Business and Economics	28
Wu Yu	Southwestern University of Finance and Economics	17
Yi Xingjian	Guangdong University of Finance	13
Lu Yajuan	Nanjing Audit University	12
Wang Cong	Jinan University	10

Hu Zhen	Northwest A&F University	9
Yang Biyun	Guangdong University of Foreign Studies	9
Zhou Li	Guangdong University of Foreign Studies	8
Zhang Lingshuang	Southwestern University of Finance and Economics	7
Wu Kun	Southwestern University of Finance and Economics	7

Figure 5. Network of Author Collaborations in English-Language Papers

Figure 6. Network of Author Collaborations in Chinese-Language Papers

Keyword analysis

The keyword is the refinement and concentration of the content of papers and the concentrated reflection of research themes (Yan *et al.*, 2022). The frequency of keyword occurrence is positively correlated with the research popularity.

"Keyword" in "Node Type" of CiteSpace was selected to analyze the keyword situation. It can be seen from the whole map structure in Figures 7 and 8 that the nodes represent keywords, the node size indicates the frequency of keyword occurrence, and a larger node size represents the higher occurrence frequency. The connecting line between nodes stands for the cooccurrence relation between two keywords, and a thicker line means the higher cooccurrence degree. The nodes marked by purple circles reflects the high centrality of this node. It could be known from Figures 7 and 8 that among English papers, the keywords "family", "ownership", "risk", "agency cost", "finance", "consumption", "investment",

"health", and "education" occurred frequently and kept close relations with other nodes. In Chinese papers, the keywords "family finance", "financial literacy", "asset allocation", "financial knowledge", "financial assets", "digital finance", "family consumption", "inclusive finance", "rural family", and "commercial insurance" were also closely correlated with other nodes. From the keywords of Chinese and English papers, the knowledge map of keywords covered multiple aspects of family finance, indicating the diversity and universality of family finance research. The high-frequency keywords in Chinese and English papers are as shown in Figures 7 and 8.

Figure 7. Network of High-Frequency Keywords in English-Language Papers
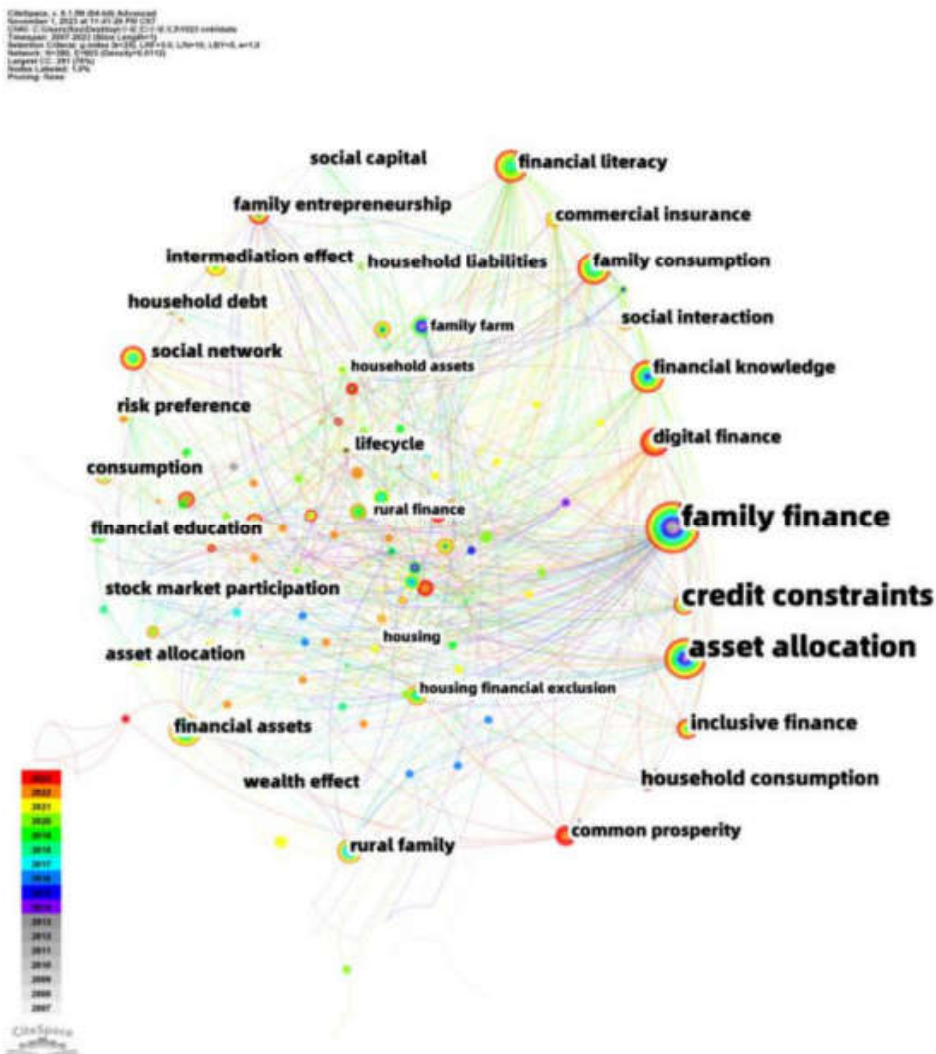
Figure 8. Network of High-Frequency Keywords in Chinese-Language Papers

Keyword bursting analysis

Burst term refers to a keyword with a sudden increase in frequency in a certain period of time, which shows the strength, decline, or rise of a keyword (Peng, Kong &Wang, 2022).

The intensity of a burst term is represented by three different colors. Light blue means that there are no keywords in this period, dark blue means that keywords

appear in this period but the intensity is low, and red means that keywords appear most frequently in this period.

In the burst map of English papers as shown in Figure 9, the 25 keywords with high burst intensity (γ=0.1) were analyzed, and the keywords of high duration were "marriage" and "labor". The keywords with high burst intensity were "family ownership", "financial socialization", and "family finance".

As shown in Figure 10, 25 keywords (γ=0.1) with high burst intensity were analyzed in the burst map of Chinese papers, and the keywords with long duration were "participation in stock market", "investment portfolio", "financial assets", "rural family", and "financial constraint". The high-intensity keywords were "risk preference", "mediating effect", "real estates", and "asset selection". The current research hotspots were mainly digital finance, digital divide, etc.

Top 25 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	2006 - 2023
market	2006	3.49	2006	2008	
investor protection	2007	3.07	2007	2010	
household portfolio	2009	4.15	2009	2012	
family ownership	2008	5.19	2010	2013	
firm value	2011	4.68	2011	2014	
marriage	2008	4.5	2014	2018	
labor	2008	4.29	2014	2018	
health	2008	3.21	2015	2016	
accumulation	2006	3.25	2016	2017	
financial socialization	2018	5.13	2018	2020	
family finance	2018	4.74	2018	2020	
financial education	2018	3.95	2018	2020	
strategy	2014	3.55	2018	2019	
emerging adult	2018	3.55	2018	2020	
women	2011	3.28	2018	2019	
access	2011	3.03	2018	2019	
adoption	2018	2.94	2018	2021	
poverty	2011	4.33	2019	2020	
parent	2016	3.07	2019	2020	
impact	2006	3.75	2020	2021	
price	2012	3.61	2020	2021	
personal finance	2020	3.5	2020	2023	
innovation	2019	4.47	2021	2023	
opportunity	2021	3.05	2021	2023	
risk taking	2021	3.05	2021	2023	

Figure 9. Network Graph of High-Frequency Bursting Keywords in English-Language Papers

Top 25 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	2007 - 2023
household debt	2009	1.88	2009	2012	
property	2012	2.84	2012	2015	
consumer finance	2010	2.42	2010	2012	
investment portfolio	2010	2.13	2010	2015	
savings	2010	1.9	2010	2012	
human capital	2011	1.86	2011	2012	
household finance	2008	3.64	2013	2018	
household farm	2008	3.25	2013	2015	
asset selection	2014	3.25	2014	2018	
financial assets	2008	2.26	2013	2018	
stock market participation	2014	2.19	2014	2021	
lifecycle	2014	2.04	2014	2015	
rural household	2008	1.92	2013	2018	
financial constraints	2013	1.9	2013	2018	
financial support	2013	1.77	2013	2015	
risk preference	2018	4.03	2018	2021	
financial education	2016	2.86	2016	2021	
social capital	2017	2.59	2017	2021	
household liabilities	2012	2.21	2016	2018	
household wealth	2012	1.96	2016	2021	
financial market	2016	1.94	2016	2018	
rural finance	2015	1.84	2016	2021	
intermediation effect	2019	4.39	2019	2023	
digital divide	2021	2.18	2021	2023	
credit constraints	2014	2.12	2019	2021	

Figure 10. Network Graph of High-Frequency Bursting Keywords in Chinese-Language Papers

Analysis of highly cited papers

Highly cited papers refer to research papers with high citation frequency in academic circles. According to the statistics of WOS literature, the papers with citation frequency ranking top 5 are shown in Table 6. *Household Finance* published by Campbell in *Journal of Finance* in 2006 was cited at the highest frequency, by totally 998 times. In this paper, the concept and characteristics of family finance were systematically expounded for the first time, the challenges faced by family finance were comprehensively discussed, and the complexity of family financial decision and the deviation between actual behavior and optimal decision were highlighted. Then, the suggestions on family financial education, improvement of financial products, and enaction of laws and regulations affecting consumers were put forward (Campbell, 2006). In the second highly cited paper, it was suggested that the families affected by the deviation of exponential growth were more inclined to more borrowings and less savings and preferred short-term financial products (Stango & Zinman, 2009).

The research results of the third highly cited paper showed that digital finance was the key to solving the low household consumption rate in China, because it could alleviate liquidity constraints, reduce information asymmetry and transaction costs, and improve the availability of financial services (Li *et al.*, 2020).

The fourth highly cited document revealed the differences of different structures within family enterprise groups and how these structures affected the financing advantages and valuation of companies. These findings are of great significance for understanding the role of family enterprise groups in the financial field and the internal operation mechanism of enterprise groups (Masulis *et al.*, 2011).

The fifth highly cited document focused on the wrong investment behavior caused by the excessive concentration of investment portfolio and emphasized the importance of financial knowledge and professional investment suggestions in family decision-making. It was found that families with financial knowledge or relying on professional suggestions could usually acquire reasonable investment results, while those families with low financial knowledge but relying on independent decision-making had an average expected loss of about 50 basis points (Gaudecker, 2015).

Table 6. Top 5 most cited articles in English-language papers

Title	Author (Yr.)	Published Journals	Times Cited, WoS Core*
Household finance	Campbell, John Y. (2006)	Journal of Finance	998
Exponential growth bias and household finance	Stango, Victor; Zinman, Jonathan (2009)	Journal of Finance	309
The impact of digital finance on household consumption: Evidence from China	Li, Jie; Wu, Yu; Xiao, Jing Jian (2020)	Econonic Modelling	251
Family business groups around the world: Financing advantages, control motivations, and organizational choices	Masulis, Ronald W.; Peter Kien Pham; Zein, Jason (2011)	Review of Financial Studies	239
How does household portfolio diversification vary with financial literacy and financial advice?	Von Gaudecker, Hans-Martin (2015)	Journal of Finance	208
* WOS (web of science. com) site provided.			

Through the statistics of papers in CNKI, the papers ranking top 5 in the citation frequency are listed in Table 7.

Table 7. Top 5 most cited articles in Chinese-language papers

Title	Author (Yr.)	Published Journals	No. of Citations*
Does digital financial inclusion significantly influence household consumption? Evidence from household survey data in China	YI Xingjian, Zhou Li (2018)	Journal of Financial Research	1650
Financial literacy, trading experience and household portfolio choice	Yin Zhichao, Song Quanyun, Wu Yu (2014)	Economic Research Journal	1548
Financial availability, financial market participation and household portfolio choice	Yin Zhichao, Wu Yu, Gan Li (2015)	Economic Research Journal	712
Financial literacy, entrepreneurial decision-making and entrepreneurial motivation	Yin Zhichao, Song Quanyun, Wu Yu, Peng Changyan (2015)	Journal of Management World	648
Analysis of household assets and housing demand in China	Gan li,Yin Zhichao,Jia Nan,Xu Shu,Ma Shuang (2013)	Journal of Financial Research	599
* CNKI (Chinese National Knowledge Infrastructure, cnki. net) site provided.			

Among Chinese papers, the most frequently cited paper was "Does the development of digital inclusive finance significantly affect residents' consumption - micro-evidence from Chinese families" published by Yi Y J in *Financial Research* in 2018. The results showed that the development of digital inclusive finance had significantly promoted residents' consumption (Yi & Zhou, 2018). It was found in the second highly cited paper that the increase of financial knowledge would promote families to participate in the financial market and increase the allocation of risk assets, especially stock assets (Yin, Song & Wu, 2014). According to the third highly cited paper, the improvement of financial availability would promote families to participate more in the formal financial market and allocate assets, and meanwhile, reduce their participation and asset allocation in the informal financial market (Yin, Wu & Gan, 2015). As revealed by the fourth highly cited paper,

the improvement of financial knowledge could significantly promote families to participate in entrepreneurial activities and significantly promote families to start their own businesses (Yi *et al.*, 2015). In the fifth highly cited paper, the asset status and housing demand of families in China were comprehensively analyzed, and the downward trend of house prices in the future were finally predicted (Gan *et al.*, 2013).

Discussion

In this research, 2,481 articles on family finance collected by WOS and CNKI from 2006 to 2023 were taken as the research object and analyzed by visualization software CiteSpace, showing the research status, research hotspots, and research frontiers in the field of family finance in the form of a knowledge map.

Comparison of domestic and foreign research status

In recent years, the number of published papers on family finance has shown an upward trend at home and abroad. Compared with international research, however, family finance research started late in China, with a certain lag and a specific gap with international research hotspots and frontiers, but it also has a large development space (Wang & Fan, 2021). Judging from the distribution and cooperation between researchers and institutions, foreign research institutions are mainly research universities, focusing on interdisciplinary and practical research in related fields; nevertheless, institutions in China are mainly institutions of higher learning, which focus on the research on family financial situation under the specific background of China despite their good scientific research resources. In addition, the research content is relatively limited, and no large-scale cross-regional and interdisciplinary academic research teams have been formed yet. China has a vast territory, and there are great differences in economic, social, and financial conditions in different regions. The data acquisition and information flow are relatively difficult in underdeveloped regions, leading to the challenges of data deficiencies and inconsistency faced by cross-regional research (Xie & Xie, 2022).

Compared with other developed countries, some families in China lack sufficient financial knowledge and financial literacy, making it difficult for families to obtain diversified financial products and services, and thus they are mainly partial to low-risk and low-yield savings. In developed countries, the financial risk management system is relatively sound, including insurance, pension, and other multi-level risk management tools. In China, especially in rural areas, the financial risk management system is relatively weak, and families are poorly protected in face of diseases, accidents, and other risks. At present, with the rapid development of China's economy, the financial information system is constantly improving, but the relevant financial supervision system and the rule of law system are not perfect

enough, so it is difficult to effectively protect the rights and interests of investors in the financial market (Fang, 2023).

Analysis of research hotspots

By analyzing the network diagram of keywords and burst terms at home and abroad, it could be found that the keywords in the field of family finance covered many aspects, highlighting the diversity and extensiveness of family finance research. Further classified by the research themes, the hotspots of family finance research at home and abroad were mainly financial literacy and inclusive finance.

Financial literacy refers to the ability to use knowledge and skills to effectively manage financial resources and achieve lifelong financial happiness (Huston, 2010). Through literature review, it was found that the research on financial literacy mainly focused on the influence of financial literacy on financial behavior. Some studies have shown that the increase of financial literacy will promote families to participate in the financial market and increase the allocation of family stock assets (Yin, Song & Wu, 2014). Financial literacy can significantly increase the proportion of consumers' precautionary savings (Anderson *et al.*, 2017). Families with high financial literacy can usually get reasonable investment results, while those with low financial literacy and relying on independent decision-making have an average expected loss of about 50 basis points (Gaudecker,2015). The groups possessing low financial literacy use high-cost loans to obtain funds (Chatterjee, 2013). The improvement of financial literacy is conducive to enhancing the entrepreneurial enthusiasm of farmers (Song, Wu & Yin, 2020). In addition, the consumption structure can be improved by enhancing financial literacy. Families with higher financial literacy can make family pension plans in advance and participate in social pension insurance to ensure the quality of life of the elderly (Jappelli, Padula, 2013).

Inclusive Finance is usually referred to as finance of inclusiveness internationally (Guo *et al.*, 2017). Inclusive finance means a financial system that can effectively and comprehensively provide services for all social classes and groups (Hasan *et al.*, 2021). It has been found that the growth of economic strength is a strong driving force to boost inclusive finance. For every 1% increase in per capita national income in both developed and developing countries, the inclusive finance index can increase by more than 0.4% (Guo & Ding, 2015). Moreover, inclusive finance is a key tool to push the economy onto the track of sustainable growth (Corrado, 2017). Inclusive finance can effectively promote families' use of financial services, improve their level of coping with risk shocks, and reduce the vulnerability of family finance (Choudhury, 2014). The development of inclusive finance can effectively promote family members to invest in their own human capital (Chen, Zhang & Xiong, 2022). In addition, inclusive finance can directly lower the threshold for families to enter the financial market and provide them

with the financial services or hedging tools they need, thus reducing their financial vulnerability (Urrea & Maldonado, 2011).

To sum up, the current research on family finance mainly focuses on how to build a financial system to popularize financial services and improve the level of family financial literacy, so as to promote the financial inclusion and sustainable development of a wider range of people in society.

Analysis of research trends and frontiers

It was found through the previously mentioned research papers that researchers recognized digital finance and digital divide as the two key topics for discussion in the current field of family finance by analyzing the social demand, economic development trend, realistic challenges, and policy environment. Therefore, the future research will focus on these two aspects, expecting to solve the difficulties in the popularization of digital finance and promote the sustainable development of digital finance.

Digital finance refers to a new type of financial service that deeply integrates various digital technologies such as mobile internet, big data, cloud computing, blockchain, and artificial intelligence with traditional financial service formats, such as mobile payment and internet financial management (Huang & Huang, 2018). At the macro level, the development of digital finance can enhance the competitiveness of financial markets and promote regional economic growth (Bauer,2018), which can promote farmers' common prosperity (Sun & Zhao, 2023). At the micro level, the development of digital finance has an impact on the financing of small and micro enterprises, residents' entrepreneurship, and household consumption (Zhang *et al.*, 2020). Digital finance enhances financial inclusiveness through convenient payment, flexible savings, and effective credit (Zhou & Chen, 2021). The development of digital finance is conducive to making up for the shortage of rural financial supply and narrowing the financial availability gap between urban and rural families. What's more, digital finance can effectively solve the problem of "difficult and expensive financing" of enterprises (Liang & Liu, 2019).

On the whole, the development of digital finance has brought positive influence to countries and society. Behind the rapid development of digital finance, however, the inequality of regional economy is prominent, and different individuals and organizations have asymmetry in obtaining information, which further aggravates the gap in digital finance literacy and forms a digital divide.

The digital divide refers to the differences in the use of the Internet among different social classes (Zhu,2001), which is mainly manifested in the following aspects: First, there are differences in the coverage of digital equipment access and use, and second, differences are also found in the serviceability of digital equipment (Li & Xu, 2022). The digital divide brings new inequality of opportunities, making it impossible for residents to enjoy the dividends brought by the rapid development

of the Internet industry equally (He, Zhang & Wan, 2020). Furthermore, digital finance further leads to the widening gap between the rich and the poor and the rising incidence of poverty (Chen & Wu, 2021). In the era of digital finance, some vulnerable groups may fall behind the mainstream society due to the lack of knowledge and skills on digital technology and even produce the Matthew effect (Zhang, 2022). There is a big digital gap between the eastern and western regions in China, and the gap of family wealth has been expanded by digital technology (Jin & Li, 2016). The unbalanced development of information technology has caused a nationwide digital divide (Li & Han, 2021), which has affected social efficiency and fairness (Zhang *et al.*, 2019). The positive influence of the Internet use on the degree of psychological depression of the elderly is mainly reflected in the elderly in urban areas (Jin & Zhao, 2019). The use of the Internet has a positive impact on the health of the elderly, too. Because the elderly in urban areas use the Internet more than those in rural areas do, the health level of the former has been significantly improved (Ran & Hu, 2022).

On the whole, researchers not only explore how to promote the all-round development of digital finance but also concern about the challenges brought by digital barriers. These studies can provide conclusive data and scientific suggestions for policy makers, ensure that digital financial technology benefits all levels of society more widely and fairly, and facilitate the financial system to develop in a more inclusive and sustainable direction.

Conclusion

With the acceleration of economic growth, the financial market has become increasingly complex and diversified, providing families with a large number of choices in investment, savings, and insurance. Therefore, it is imperative to study family financial decision-making and investment behaviors. The research results show that the research papers on family finance are on the rise worldwide. Domestic research emphasizes improving family financial knowledge and literacy, while international scholars put risk management and long-term financial planning in the first place. Referring to the international research trends, it is very important to emphasize the cooperation and exchange among researchers, institutions, and disciplines in the future research. Efforts should be made to deeply study the application of digital finance and digital divide in family financial decision-making, so as to expand the in-depth understanding of their relationships. If succeeding, these efforts can provide more comprehensive and scientific solutions to family financial management and supply more feasible financial planning and decision support to families.

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