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Article

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A dynamic bibliometric analysis of financial inclusion and happiness with CiteSpace

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ABSTRACT

Financial inclusion facilitates the exchange of information, reduces transaction costs, and lowers the barriers to the access of financial services. However, how this affects happiness remains unknown. The purpose of this study is to make bibliometric analysis between financial inclusion and happiness by using CiteSpace and find frontiers in the future by reviewing the literature at CiteSpace. In this study, 335 samples spanning from 2003 to 2023 were selected from the database of Web of Science. By using CiteSpace software and bibliometric methods, in this study, we can draw a map of author cooperation, institutional cooperation, keyword co-occurrence analysis, cluster analysis, and emergent word analysis in this field. Future research should focus on the influence of financial behavior on the relationship between financial inclusion and happiness. Digital financial inclusion may be a crucial factor in future research worldwide. These findings may be used as a reference for governments in policymaking.

IMPACT STATEMENT

This study explores the relationship between financial inclusion and happiness using a bibliometric analysis over the past 20 years. By mapping global research trends, it highlights how financial inclusion, especially digital financial services, influences well-being. The findings are useful for policymakers, researchers, and financial institutions to better understand the benefits and risks of financial inclusion, ensuring that access to financial services leads to improved happiness and financial well-being. This study also suggests the need for future research to focus on financial literacy and cross-country comparisons to enhance policy effectiveness.

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1. Introduction

Financial inclusion is a financial system that makes financial services easily accessible to low-income and less-developed population groups. To achieve financial inclusion, the majority of the population must have simple access to various financial services, including risk management, credit, savings, and payments (Chen & Yuan, 2021; Ozturk & Ullah, 2022). Financial inclusion can promote common prosperity (Zhang et al., 2022) and considerable attention has been paid to it in recent years (Naumenkova et al., 2019). Financial inclusion has developed into digital financial inclusion when individuals and groups have access to enough varieties of financial products and services that are acceptable, accessible, and widely available through information and communication technology (Gallego-Losada et al., 2023).

Policymakers and researchers have paid much attention to financial inclusion because it is a crucial tool for reducing poverty and fostering the expansion of financial inclusion (Aziz & Naima, 2021). However, due to ordinary people's lack of access to formal financial services and products, the level of people's happiness and social defense of citizens was lowered (Naumenkova et al., 2019). To date, bibliometric analysis between financial inclusion and happiness has not been made in any study. Digital finance has been

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demonstrated to negatively affect happiness by increasing the debt burden and excessive spending (Meng & Xiao, 2022). Xu and Sun (2022) indicated that financial inclusion had a detrimental effect on happiness by increasing residents' investment participation. Besides, financial inclusion can promote sustainable macroeconomic growth, which has been a key policy objective of governments around the world (Chavriya et al., 2024). As in a previous study, much work has been done on the topic of happiness in the context of the local environment (Bonasia et al., 2022; Lee et al., 2022; Zheng et al., 2022), drinking water (Alfiah et al., 2019), green infrastructure (Navarrete-Hernandez & Laffan, 2019), transportation systems (Cloutier et al., 2017) and the Internet (Feng, 2022; Xu & Huang, 2021; Zhang et al., 2020). Despite of these observations, there is a noticeable gap regarding bibliometric analysis between financial inclusion and happiness in the literature. Thus, in this study, a bibliometric analysis was made by using CiteSpace to provide an overview of the correlation between financial inclusion and happiness.

There is growing recognition that happiness and well-being are important outcomes of development. The United Nations launched the Global Happiness Tracking and reported happiness by country in the annual World Happiness Report in 2011 (Steinmetz, 2022). To this end, in this study, several research papers were selected from the Database of Web of Science and various research questions were identified. The CiteSpace program (Chen, 2004) was the instrument of choice for the literature data analysis in this study. How financial inclusion affected people's degree of happiness over the past 20 years, from 2003 to 2023, was examined using bibliometric and scientific knowledge graph approaches in this study. Specifically, in this study, we seek to answer the following research questions: (1) How has the quantity of publications about financial inclusion on happiness changed from 2003 to 2023? (2) What are the main research countries and institutions and why? (3) What are the main areas of focus for the research in this field? (4) What are the trends and focal points of research shifting and development?

2. Literature review

The themes of 'happiness' and 'financial inclusion' were selected as the focal points of this literature review based on their growing significance in both academic research and policy discussions. Happiness is increasingly recognized as a key indicator of social and economic development. Its role in individual well-being and societal progress has been demonstrated in substantial research (Ribeiro & Santos, 2019). Similarly, financial inclusion has gained prominence as a critical factor in reducing poverty, promoting economic stability, and ensuring that all segments of society have access to financial services (Aziz & Naima, 2021).

These themes were derived from an extensive review of existing literature that highlighted the intersection between economic policies and social outcomes. Specifically, happiness has been studied in the context of various social determinants, including income, social infrastructure, and healthcare, which are directly related to financial inclusion. Sufficient bibliometric analysis between these two themes has not been made, particularly in the context of digital financial inclusion and its impact on well-being, which is the gap this study aims to address.

The focus on happiness and financial inclusion is justified by the increasing emphasis on these concepts in global development agendas, such as the United Nations' Sustainable Development Goals (SDGs), in which both well-being and financial accessibility are prioritized. By providing a bibliometric analysis on the literature on these two interconnected themes, in this study, we aim to uncover how financial inclusion influences happiness and identify areas where future research can contribute to a deeper understanding of this relationship.

2.1. Happiness

The fundamental purpose of social and economic development is to improve well-being and happiness. Research on happiness began in the 1980s, especially due to the work of sociologist Veenhoven (1984), which has led to so much research on happiness. Thus, a database and scientific journals have been created to discuss the topic (Ribeiro & Santos, 2019). Happiness has become a goal for local councils in the UK since the 2004 Care Act and the UK has long been at the forefront of well-being policymaking (Frijters et al., 2020). After we enter the 21st century, as an important index measuring the government's work, 'happiness economics' arise at the historic moment (Yin et al., 2021).

Further research has shown that a high level of subjective well-being may be good for all older adults regardless of their characteristics (Zhu et al., 2023). Regarding the definition and the measurement of happiness, Veenhoven (2013) believes that happiness is often used interchangeably with 'subjective well-being' (SWB). Much work has been done on the topic of happiness, especially during the COVID-19 pandemic. Millions of lives have been lost, and billions of others have been shaken to their core because of COVID-19. Overall, life assessment and happiness rankings were remarkably steady, despite a notable rising of average levels of concern and despair (Helliwell et al., 2021). However, the impact was different in different groups. After analyzing a sample of university students in UAE, Alradaideh (2022) found that COVID-19 led to a lower happiness level and women tended to be happier than men. This interpretation differed from that of Lepinteur et al. (2022), who argued that women's well-being was more than that of men during the pandemic. However, Pimpawatin and Witvorapong (2022) found that health-related services and pathways were associated with happiness. Therefore, medical services have had a great influence on households' happiness, and much work has been done on happiness and medical services. In contrast, some people hold that illness does not affect their happiness and show indifferent attitudes toward their illness (Wu et al., 2022).

In contrast, happiness is positively associated with social infrastructure (Tsuruta et al., 2019). Social infrastructure organizes and shapes daily life in cities and helps improve the emotional well-being of cities (Kim & Im, 2020). Social cohesiveness can be achieved, and issues such as food insecurity, loneliness, crime, and climate change can be resolved by increasing the amount and caliber of the social infrastructure (Klinenberg, 2018). For instance, Kim and Im (2020) revealed that a shorter average distance between kindergartens, primary schools, nurseries, pharmacies, and residential areas tended to boost residents' happiness. In addition, citizens' happiness is related to the supply of drinking water (Alfiah et al., 2019), green infrastructure (Navarrete-Hernandez & Laffan, 2019), and transportation systems (Cloutier et al., 2017).

Jain (2019) proposed the concept of a happy city and highlighted that effective infrastructure was key to happy cities. Better urban infrastructure is more essential for improving well-being than technological products, and smart city performance has been linked to happier cities (Chen, 2023). The charging infrastructure is becoming increasingly important as a new field of development. Chen et al. (2020) concentrated on the development of electric vehicle charging infrastructure in the UK, while Funke et al. (2019) examined the number of charging infrastructure required by electric vehicles.

2.2. Financial inclusion

Financial inclusion laws and trends are revealed by financial repression and financial liberalization, which emphasize the significance of digital financial inclusion (Loizos, 2018). Scholars and policymakers have debated about financial repression and financial liberalization since the early 1970s (Loizos, 2018). Government involvement in finance was criticized as the efficient market hypothesis gained traction (Marchionne et al., 2022). Banks can get around regulations designed to decrease risk by restricting their exposure to riskier assets, which ultimately leads to an increase in risk (Marchionne et al., 2022). The theory of financial repression was derived from the research of McKinnon and Shaw, who indicated that most governments, especially in developing countries, imposed restrictions on competition in the financial sector through government intervention and regulation (Xu, 2018). Before the 1980s, the financial sector was one of the most visible areas of state intervention in both developing and developed countries, and several countries experienced financial crises (Abiad et al., 2010). By examining how India's production has been affected by financial liberalization, Xu and Pal (2022) found that financial liberalization greatly improved manufacturing productivity.

On the other hand, greater capital regulatory requirements reduce bank fragility and improve bank development (Lee & Lu, 2015). In contrast, Shi (2022) investigated the impact of financial liberalization on the real estate market in China. This showed that a more financially liberalized city had a more volatile price trend and experienced more severe price depreciation during the financial crisis (Shi, 2022). According to Escolano et al. (2017), the primary cause of the negative interest rate growth differential in emerging and developing economies is the real interest rates, which are significantly below market equilibrium levels due to financial repression and distorted markets. Income catch-up processes played a minor role. Financial repression and liberalization can be used to explain the promotion of the development of digital financial inclusion.

The concept of inclusive financing was presented by the UN for the first time in 2005. It refers to offering appropriate and efficient financial services to all social classes and organizations in need of financial services, such as small and micro businesses, farmers, and low-income urban groups, at a reasonable cost. Its primary service focus is vulnerable groups. Although the international community has achieved certain results in developing financial inclusion, there are still shortcomings. According to the World Bank (2022), forward progress has been made toward financial inclusion. 1.2 billion adults worldwide were accounted for from 2011 to 2017. However, in 2017, approximately one-third of adults – approximately 1.7 billion adults – were still unable to enjoy the most basic financial services. Financial literacy has a positive impact on financial inclusion (Akpene Akakpo et al., 2022). However, the low level of financial literacy discouraged countries to adopt digital financial services (Azeez & Akhtar, 2021; Ozili, 2018; Tay et al., 2022).

According to a large body of research, financial development significantly and favorably affects economic growth (Bist, 2018; Marcelin et al., 2022; Valickova et al., 2015). Digital financial inclusion has emerged as a result of the rapid expansion of the Internet, fusion of digital and financial technology, and acceptance of financial technology based on financial inclusion (Lee et al., 2023). Numerous academics have done pertinent research on the relationship between digital finance and poverty reduction. In various nations, poverty reduction is significantly affected by digital financial inclusion (Lee et al., 2023; Omar & Inaba, 2020; Polloni-Silva et al., 2021).

The World Bank (2023) stated that an obvious link between financial inclusion and the prosperity of women, microenterprises, low-income households, and other excluded groups had not been yet established through empirical research, as measured by income, consumption, or escape from poverty, while financial inclusion was generally positively correlated with employment and economic growth overall. Indicators of financial inclusion and economic growth are positively correlated at the national level; however, there are still significant gaps in the data regarding how financial inclusion affects the income, consumption, and escape from the poverty of micro-enterprises, low-income households, women, and other marginalized groups.

2.3. Financial inclusion and happiness

In existing studies, a positive association between money and happiness has been demonstrated (Cuong, 2021). According to report, people with higher income still have higher levels of life satisfaction compared with the general population after five years or more (Luo, 2021). Income mediates the influence of education on happiness through an intermediary mechanism (Yang et al., 2022). Specifically, happiness cannot be improved by increasing income, while an increase in absolute income can make people happy, and people's happiness is also related to average income (Tsui, 2014). On the contrary, in a few studies, it has been found that income might not even have a positive relationship with happiness. For instance, when the pain of earning more is considered, higher incomes cannot be expected to make people happier in general (Rötheli, 2021). Happiness and income can affect each other, although this relationship seems to be strongly affected by an individual's stress level (Demenech et al., 2022). Furthermore, there is significant variation in the correlation between happiness and age with respect to relative income levels (Toshkov, 2022). According to Xiao and Xin (2022), financial literacy is a stronger predictor of happiness than income, and income does not act as a moderator or mediator between financial literacy and happiness.

Remarkably, in a recent study, a favorable link between income and digital financial inclusion was discovered. Using the geographical Durbin model, Li et al. (2022) examined sample data from 30 provinces in the Chinese mainland from 2011 to 2019. In this study, it was found that farmers' income could increase dramatically when digital financial inclusion was implemented. According to Zou et al. (2021), the digital financial inclusion index positively affects the impact of financial cognition on rural household income. Shen et al. (2022) investigated how Chinese families invested in hazardous financial assets and discovered that digital finance could encourage households to engage in riskier financial asset investments through mechanism analysis by raising household income. Furthermore, residents' income was affected by the growth of digital financial services, which, in turn, had a positive and significant effect on residents' income (Wang & Ji, 2022).

According to Li et al. (2022), digital financial inclusion can greatly help to narrow the income gap between regions. Similarly, Ji et al. (2021) found that the theory of financial exclusion could be used to

analyze the spread of digital financial inclusion and concluded that it might narrow the income gap between urban and rural residents. Peng (2022) highlighted that the narrowing of income disparity between urban and rural populations could be greatly facilitated by the development of digital financial inclusion.

After we analyzed existing research, we found that digital financial inclusion had an effect on income, which in turn played a crucial role when we determined a household's level of happiness. However, there is currently no paper in which how financial inclusion affects people's happiness is analyzed by reviewing the literature at CiteSpace.

2.4. Summary

The research objectives were derived based on the gaps identified in the existing literature on financial inclusion and happiness. In the literature review, it is highlighted that there is a noticeable gap in studies in which financial inclusion and happiness are considered while significant research has been done on the impact of financial inclusion on economic growth and poverty reduction (e.g. Lee et al., 2023; Omar & Inaba, 2020; Polloni-Silva et al., 2021). Previous research has demonstrated mixed results regarding the relationship between financial inclusion, income, and happiness. Some studies suggest that digital financial inclusion can both positively and negatively affect well-being (Meng & Xiao, 2022; Xu & Sun, 2022).

Due to these inconsistencies and the lack of comprehensive reviews on the topic, we need to provide bibliometric analysis for financial inclusion and happiness. Thus, the research objectives were formulated to address this gap by focusing on the following: (1) the evolution of research on financial inclusion and happiness in the last 20 years, (2) the identification of leading research countries and institutions, (3) the main areas of focus in this field, and (4) emerging research trends and focal points.

3. Data sources and method

In this study, the sample period of the last 20 years from 2003 to 2023 was considered. This study focuses on the period from 2003 to 2023 for several reasons. First, in 2003, digital financial inclusion began gaining traction due to advancements in information and communication technologies. In this period, people became more and more interested in happiness research. There were more studies and data on the topic.

By starting in 2003, we captured the early developments in both financial inclusion and happiness research. In this way, we could analyze trends and shifts in 20 years, which was an important period. 2023, Last year provided the most recent data, ensuring that the study reflects current research and developments in the field. These years were chosen to provide a comprehensive view of how financial inclusion and happiness have evolved and how they intersect over time.

Then, in this study, the bibliometric analysis was applied to achieve the main objective of this study. Bibliometric analysis is a comprehensive technique for discovering and analyzing a large amount of scientific data so that people can study the evolutionary complexity of specific topics and gain insight into new areas of research (Sharma et al., 2024). The Web of Science Core Collection, an internationally renowned database that represents the caliber of scientific research and is our search source, was the resource used to gather sample data in this study. The choice of keywords is crucial for obtaining a comprehensive and representative sample. Regarding the definition and the measurement of happiness, Veenhoven (2013) holds that happiness is often used interchangeably with 'subjective well-being' (SWB). Therefore, in this study, pertinent terms were used to search systematically, including 'financial inclusion', as well as subject headings such as 'happiness' or 'subjective well-being'. Initially, 67 and 268 records were identified by searching for two sets of keywords. Then, the two sets of data were combined to collect 335 records. By utilizing the CiteSpace software to process 335 pieces of literature gathered, in this study, seven duplicates and three editorial materials were identified, resulting in 325 valid papers. Furthermore, CiteSpace was employed for co-citation analysis of the sample literature using 3 as the Year Per Slice parameter and Pathfinder as the pruning method for subsequent analysis. A variety of literature categories were found among the 325 items analyzed. These included, among other things,

papers (195), reviews (97), and conference proceedings (6). These publications appear in 250 journals, enriching the discourse on the dynamic equilibrium between financial inclusion and happiness.

To make a bibliometric analysis, the methods used in this study include author cooperation, institutional cooperation, keyword co-occurrence, emergent words, and cluster analysis in this field. In knowledge graph analysis, citation, co-citation, clustering, and word frequency analysis are mainly used to dig deeply into the development process, research hotspots, and frontier trends in certain research fields. CiteSpace provides a time-sharing, dynamic, and diversified information visualization analysis by drawing a scientific knowledge map. In the form of a knowledge graph, it can reflect the research hot spot and development trend of a certain discipline or a specific field of the discipline in a certain period.

4. Descriptive analysis

In this study, a thorough analysis of the literature on financial inclusion and happiness was made. Important discoveries, such as the annual publication count and ranking of the top 10 journals, were brought to life through data visualization. In this study, a variety of bibliometric methodologies were used, including the co-authorship analysis of authors, institutions, and nations, and the visual analytic application CiteSpace was used. The descriptive analysis serves as a foundation for understanding of the research landscape in the last 20 years, which is crucial for several reasons.

First, by analyzing the evolution of scientific output, in this study, research trends can be tracked and the growing interest in the topics of financial inclusion and happiness can be identified. This is directly consistent with the study's objective to explore how the quantity of publications has changed over time, indicating the importance and development of these research areas. Additionally, key contributors can be identified through descriptive analysis, such as countries, institutions, and authors who have significantly affected this field. By understanding who the main contributors are and where the research is concentrated, we can address the objective of identifying the leading research countries and institutions.

Furthermore, through this analysis, we can map how the focus of research has shifted over time, providing insights into current trends and future directions in the study of financial inclusion and happiness. This is directly related to the objective of identifying the main areas of focus in this field. Overall, the descriptive analysis is not merely a background section. It is essential for achieving the research objectives of the study by laying the groundwork for deeper exploration and interpretation of the data.

4.1. Analysis of the evolution of scientific output

An increasing number of publications shows the dynamic evolution of scientific knowledge. Hence, we should comprehensively analyze this trend and investigate the underlying causes. Figure 1 shows the annual distribution of publications. Overall, the number of publications on the topic increased from

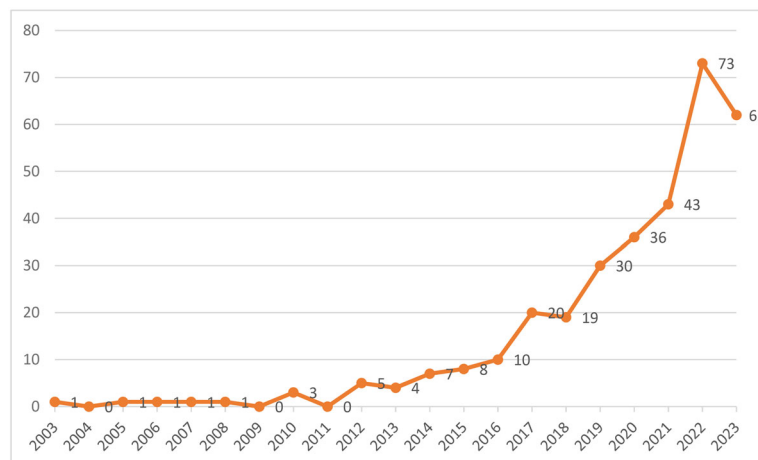


Figure 1. Statistical line chart of the number of literatures from 2003 to 2023.

2003 to 2023. According to Frijters et al. (2020), happiness has become a goal for local councils in the UK since the Care Act 2004, and the UK is always leading in terms of well-being policymaking. Sociologist Veenhoven's (1984) work caused a wave of research on happiness in the 1980s, so that a database and scholarly magazine focusing on this subject was created (Ribeiro & Santos, 2019). In Figure 1, in the last 20 years, there has been an overall trend of increase of the number of literary publications. As time goes by, especially since 2017, many countries have launched policies to improve financial services. Digital financial inclusion has developed rapidly in the last few years, and the number of papers published in this field has increased significantly. In 2014, only seven publications were noted. After that, the number of publications fluctuated from year after year, which was up to 20 in 2017. It decreased to 19 in 2018, and then increased rapidly again. In 2022, the largest number of papers were published, which was 73. In 2023, it slightly decreased to 62. This trend indicates that the overall degree of research and attention in this field is becoming higher. This indicates that financial inclusion and happiness have been paid more and more attention to. The connection between financial inclusion and happiness is worth exploring.

4.2. Co-authorship analysis of authors

According to Price law, $M = 0.749 \times \sqrt{N}$ max (N is the maximum number of papers published by the author and M is the minimum number of papers published by core authors). Xiao Jingjian was the author publishing the most papers, who published three papers. The minimum number of papers published by core authors in this field was 1.297. Rounding to an integer, authors who wrote more than two papers were regarded as the core authors in this discipline. There are 71 authors who have published more than two papers. This indicates that a core group of authors has not yet been formed, and the research perspective is scattered.

Co-authorship analysis has revealed knowledge area research trends in the field (Junjia et al., 2023). Figure 2 illustrates the co-authorship network of the key authors. The co-author network consists of all the main authors in the dataset. There are a total of 237 nodes and 520 links. Each node represents an author, whereas the links denote direct collaborations formed through co-authorship in the papers. As shown in Figure 2, three relatively large collaborative teams are displayed. Abbasi-Kangevari, Mohsen, Abbafati, Cristiana, Abbas, and Kaja M are the core of the teams.

Overall, the authors have established a certain network of cooperation based on their respective institutions, which has effectively promoted the development of financial inclusion and happiness research. However, there are problems such as quantity more important than cooperation. Most of these scholars have been confined within the national boundaries. In the future, social and economic problems

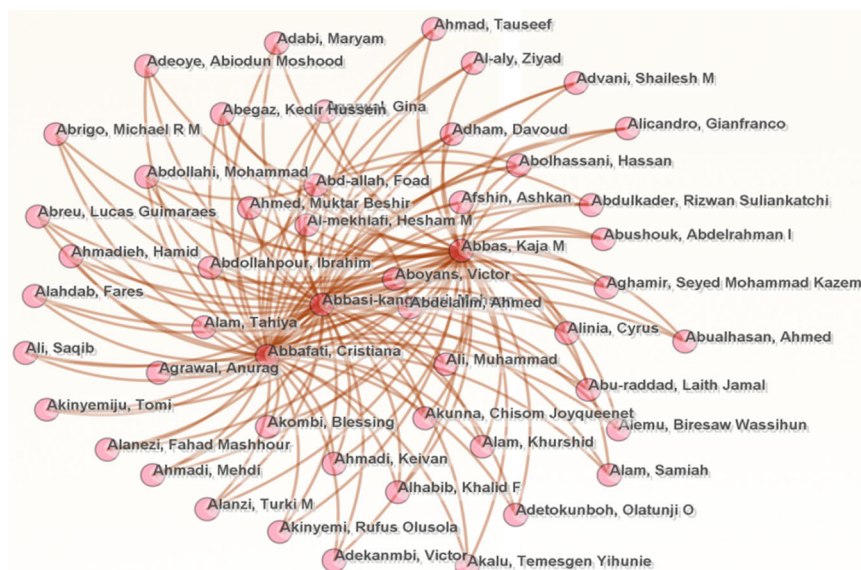


Figure 2. Map of the author co-authorship network.

worldwide cannot be confined to domestic problems and analysis should be made from new and broad perspectives to solve them. On the premise of giving full play to their core advantages, cooperation and communication with other authors should be enhanced to promote research and development.

The co-authorship analysis of authors is essential for achieving the objective of the study, which is to identify the main research contributors and understand how collaboration networks affect the development of the field. By identifying core authors and analyzing their collaborative networks, this section helps to reveal how knowledge is shared and developed in the field of financial inclusion and happiness. The identification of scattered research perspectives and the lack of a group of core authors indicates that the field is still emerging and there are opportunities for further consolidation and focused research. This directly supports the objective of understanding the current state of research and identifying areas where increased collaboration could strengthen the field.

4.3. Co-authorship analysis of institutions

It is important to illustrate the collaborative relationships among institutions related to financial inclusion and happiness with CiteSpace. By analyzing the current situation and cooperation of different research institutions in this field, we can grasp the future direction of institutional cooperation and do in-depth research in this field. The University of London has the most papers (20), followed by the University College London (14) and Harvard University (13). Mediation centrality indicates the significance of the network nodes. Based on Figure 3, Anglia Ruskin University, Western Sydney University, McMaster University, University of Warwick, and Harvard University were identified as the three most influential academic institutions, whose collaborative relationships were far greater than those of other universities. They are leaders of international cooperation. However, it is important to note that the cooperation among institutions with more publications has not decreased. In the future, institutions with stronger strengths should strengthen cooperation, exchange about theoretical frontiers, and promote the long-term development of research.

Similarly, the co-authorship analysis of institutions is consistent with the objective of identifying key research hubs and understanding the role of institutional collaboration in advancement of the study of

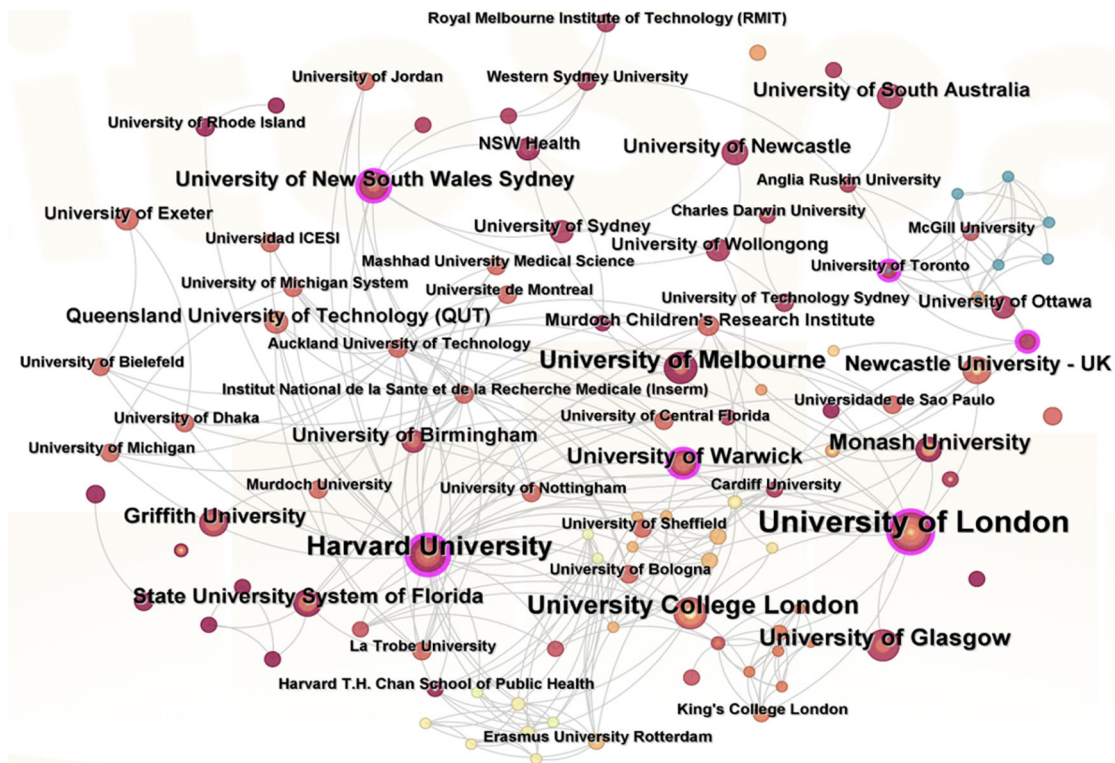


Figure 3. Map of the institutional collaboration.

financial inclusion and happiness. By mapping out the institutions that are leading in terms of publication output and collaboration, this section illustrates where the most significant research contributions come from and how these institutions are connected. By identifying leading institutions and their collaboration networks, insights into the future direction of research are provided and the potential for stronger international cooperation is highlighted, which is crucial for tackling global social and economic issues. This supports the objective of identifying trends and focal points in institutional collaboration that can drive the field forward.

4.4. Co-authorship analysis of country

In this era of globalization, it is crucial to understand the state of research on happiness and financial inclusion in different countries. In this study, publishing countries were further evaluated. In Table 1, the top 11 countries in terms of number of published papers is listed. Among them, England (75), Australia (72), the USA (54), Canada (34), and China (28) have the biggest number of published papers. This indicates that these countries focus on research on financial inclusion and happiness.

Through co-country analysis, the spatial distribution of papers can be quantified. A network with 103 nodes and 433 links, including the important contributing countries, is shown in Figure 4. Mediation centrality indicates the importance of the network nodes. Argentina and Croatia had the highest centralities, followed by Wales, Switzerland, the USA, and the Netherlands. They are leaders in international cooperation.

The 'Co-authorship Analysis of Country' has important significance for understanding the global landscape of research on financial inclusion and happiness, which directly supports the objective of this paper. One of the key objectives of this study is to identify the major contributors of the field and understand how collaboration among different countries affects the development and dissemination of knowledge.

By analyzing co-authorship networks at the country level, this section reveals which countries are leading in research output and collaboration. It also highlights the extent of international cooperation, which is crucial for addressing global issues such as financial inclusion and happiness. By understanding these networks, we can identify which countries are at the forefront of research, which are emerging as key players, and which countries may have opportunities for enhanced collaboration.

Furthermore, this analysis supports the objective of identifying research trends by showing how collaboration patterns have evolved over time. Countries that collaborate extensively may be driving innovation and setting research agendas, which can have a significant impact on the direction of future studies. Therefore, the 'Co-authorship Analysis of Country' is not just a descriptive exercise but a critical component of understanding how global research networks influence the field and contribute to the achieving of the overall goals of the study.

5. Research hotspot and frontiers

Through the study of emerging terms, keyword clusters, and keyword co-occurrence, hotspots in this field were determined. Research hotspots can be defined and the major points of the entire study report can be summarized using keywords. Cheng et al. (2022) claimed that keywords could help us quickly assimilate the main ideas of a paper.

Table 1. Top 11 countries by frequency and centrality.

No	Country	Frequency	Country	Centrality
1	England	75	Argentina	0.23
2	Australia	72	Croatia	0.23
3	USA	54	Wales	0.17
4	Canada	34	Switzerland	0.13
5	People's Republic of China	28	USA	0.1
6	Scotland	28	Netherlands	0.1
7	Italy	21	Scotland	0.09
8	Spain	17	England	0.07
9	India	17	Canada	0.07
10	Netherlands	16	Sweden	0.07
11	France	13	Czech Republic	0.07



Figure 4. Map of the country collaboration.

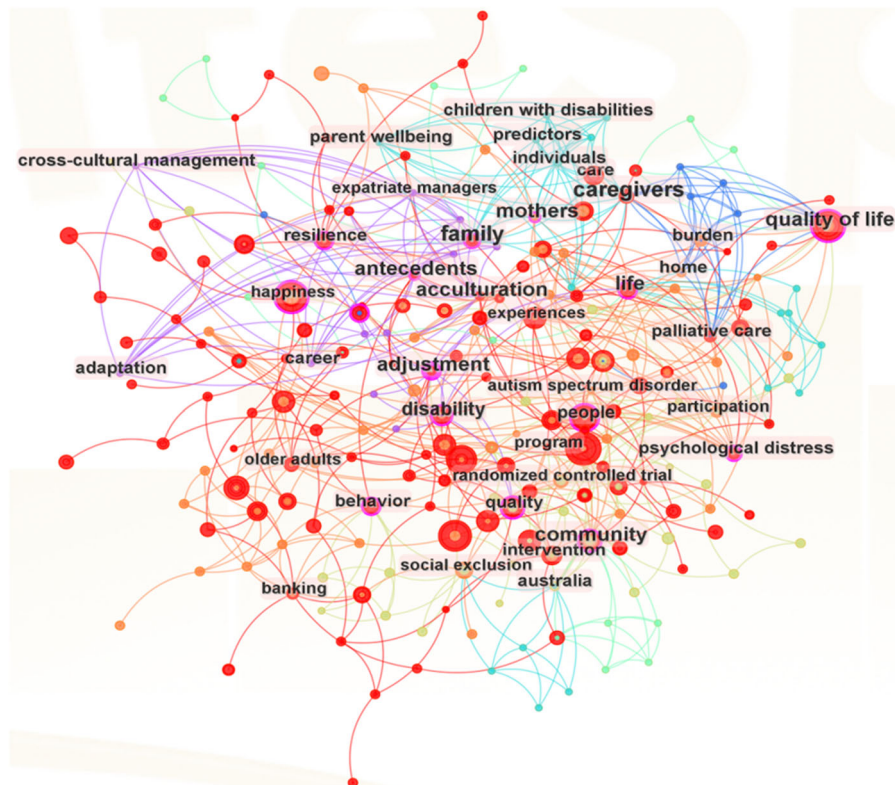


Figure 5. The co-occurrence network of keywords.

5.1. Keyword co-occurrence analysis

Through longitudinal observation, a knowledge graph depicting keyword co-occurrence can illustrate the prevailing topics in a specific field (Cheng et al., 2022). According to Figure 5, in this study, a co-occurrence network of keywords of constructed. Figure 5 shows the keyword co-occurrence graph

with 234 nodes and 590 links generated by CiteSpace, which illustrates the current research hotspots. 'Health' and 'mental health' are the two keywords with the highest occurrence frequency, followed by 'impact', 'quality of life', 'happiness', 'financial inclusion', 'people', and 'life'. As shown in Figure 5, among these keywords, the centrality of 'adjustment' is the highest, indicating that 'adjustment' occupied a key position in financial inclusion and happiness research and was closely related to other keywords. Other keywords with less centrality, including 'life', 'happiness', 'family', 'behavior', 'community', and 'psychological distress', illustrated the most popular research content in the field to a certain extent.

5.2. Keyword cluster analysis

In the keyword co-occurrence map, there are many keyword connections, which makes it difficult to visually display the main framework of the research. Keyword cluster analysis can reflect hot topic research better. Keywords with high occurrence frequency reflected research hotspots in the field of financial inclusion and happiness. CiteSpace was used for keyword cluster analysis and a keyword cluster network diagram was obtained, as shown in Figure 6. In the co-cited network map, the modularity index of the network (Q) is equal to 0.6718 (>0.3), clearly showing a clustering pattern. Additionally, each cluster appeared to be highly homogeneous based on the mean silhouette indication. Silhouette = 0.8523 (>0.5). The main research directions in the field from 2003 to 2023 are represented by eight automatic clusters, which are summarized in this study. These clusters are composed of 11 or more nodes in the graph. Interestingly, each node's silhouette was greater than 0.7, demonstrating outstanding uniformity in these clusters.

The 11 cluster identifiers were social inclusion, financial inclusion, palliative care, autism spectrum disorder, quality, subjective well-being, child welfare, working hours, adolescence, social exclusion, and workplace, respectively. The basic information for the first 11 keywords covered by the clustering derived from the LLR algorithm is presented in Table 2. They can be subdivided into different subfields by research direction. #0 cluster is related to social inclusion and focuses on financial inclusion, quality of life, dementia, and occupational stress. #1 is related to financial inclusion. How financial inclusion helps reduce poverty is analyzed. Item #5 is related to subjective well-being. It is a popular topic in China. China's financial inclusion has changed rapidly. China has become a global Fintech leader in the last few years (Hasan et al., 2020). Many Chinese researchers focus on the relationship between digital finance, financial literacy, digital financial inclusion, and subjective well-being. For example, Meng and Xiao (2022) found that digital finance negatively affected happiness by increasing debt burden and excessive consumption behavior.

5.3. Emergent words analysis

The abrupt appearance and metamorphosis of keywords may indicate the change of the hotspot in a particular study field (Chen et al., 2022). Thus, by using the burst detection function provided by CiteSpace, Figure 7 lists the top 14 emergent words for detecting the explosion intensity. Refer to Figure 7. In this study, the three main research hotspots in financial inclusion and happiness research are summarized as follows:

In the first 15 years (2003–2018), most studies focused on the research objects in the field of financial inclusion and happiness, such as family, community, and consumers. Many scholars attempted to use randomized controlled trials in the research field of financial inclusion and happiness. This illustrated how varied and dispersed scientific interests were at that time. As stated by Yin et al. (2021), early literature on happiness mainly focuses on philosophy, psychology, and sociology. Frey (2018) indicated that some factors affecting happiness included genetic inheritance, socio-demographic impacts, physical and psychological health, economic factors, cultural differences, religion, and democracy and political decentralization. At that time, researchers analyzed financial inclusion and happiness from the perspective of social exclusion. As social support is a multifaceted concept with multiple definitions, it can be divided into different forms and categories (French et al., 2018). For example, according to research of Tsuruta et al. (2019), happiness and social infrastructure are positively correlated.

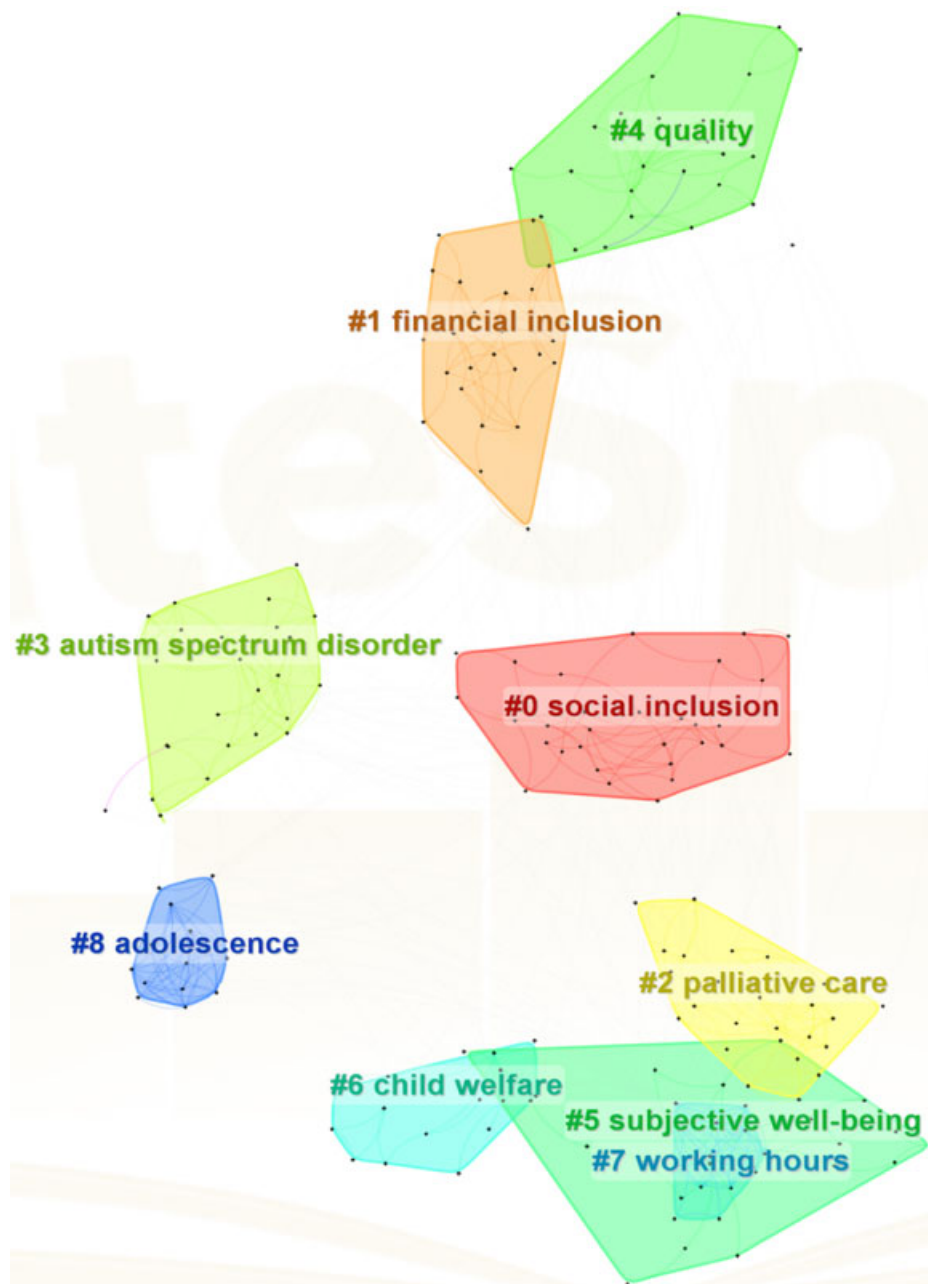


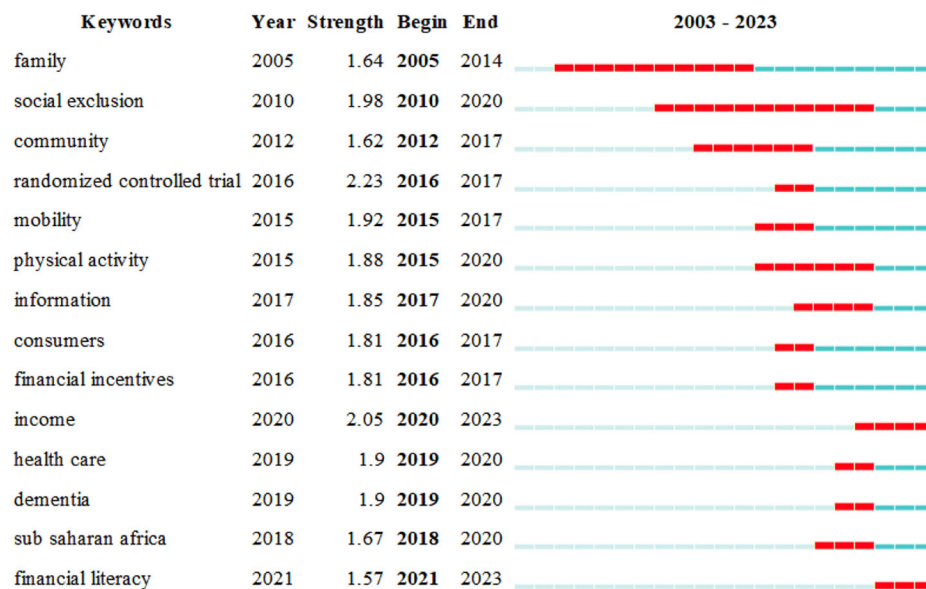
Figure 6. Keyword clustering network.

The clustering keywords appearing in 2019, such as 'health care' and 'dementia', highlight the recent focus of the academic community on fitness. However, from 2018 to 2020, the keyword 'Sub-Saharan Africa' frequently appeared. Sub-Saharan Africa began to analyze financial inclusion and happiness in 2018. From 2004 to 2019, Kouladoum et al. (2022) investigated the relationship between digital technology and financial inclusion in forty-three Sub-Saharan African countries. Their research results show that the degree of financial inclusion in sub-Saharan Africa has become higher as digital technologies advance.

Since 2020, the terms 'income' and 'financial literacy' are often used until 2023. This reflects the recent shift in research interest toward whether financial inclusion will increase income and ultimately have an impact on people's happiness. Moreover, many scholars have attempted to understand the role that financial literacy plays in financial inclusion and happiness. These directions are likely to be the focus of future research in this field.

Table 2. Top 5 clusters of keywords in the field of financial inclusion and happiness.

Clustering	Number of nodes	Silhouette	Cluster identifier	Label (LLR, <i>p</i> -value)	Mean (year)
0	30	0.741	Social inclusion	① Social inclusion (7.81, 0.01). ② Financial inclusion (4.68, 0.05). ③ Quality of life (4.68, 0.05). ④ Dementia (4.03, 0.05). ⑤ Occupational stress (4.03, 0.05).	2018
1	26	0.927	Financial inclusion	① Financial inclusion (27.1, 1.0E-4). ② Poverty (14.43, 0.001). ③ Financial resilience (9.72, 0.005). ④ Financial well-being (9.72, 0.005). ⑤ Qualitative interviews (9.72, 0.005)	2019
2	25	0.752	Palliative care	① Palliative care (8.87, 0.005). ② Quality of life (6.08, 0.05). ③ Risk of falls (4.43, 0.05). ④ Prevention (4.43, 0.05). ⑤ AI (4.43, 0.05)	2013
3	24	0.858	Autism spectrum disorder	① Autism spectrum disorder (5.53, 0.05). ② Scoping review (5.53, 0.05). ③ Mental health (4.59, 0.05). ④ Financial inclusion (4.39, 0.05). ⑤ Community-based (3.87, 0.05).	2015
4	23	0.897	Quality	① Quality (7.1, 0.01). ② Services (7.1, 0.01). ③ Young people (7.1, 0.01). ④ Disability (5.79, 0.05). ⑤ Mental health (4.86, 0.05)	2012
5	21	0.832	Subjective well-being	① Subjective well-being (16.01, 1.0E-4). ② Digital finance (15.6, 1.0E-4). ③ Financial literacy (13.52, 0.001). ④ Digital financial inclusion (6.71, 0.01). ⑤ China (6.71, 0.01)	2018

**Figure 7.** Top 14 keywords with the strongest citation bursts.

6. Discussion

In this study, a scientometric examination of the literature found in the Web of Science Core Collection on financial inclusion and happiness was made. According to the analysis in the preceding chapters, the following exploration approaches for future research on happiness and financial inclusion are proposed in this paper.

1. The number of papers on financial inclusion and happiness has also increased. The annual growth trend of the total number of publications is consistent with the development trend of financial inclusion. There were three different phases in this process: the initial phase started from 2003,

when research interests were diverse and fragmented; it was the rapid growth period from 2018 to 2020, and it was the maturity period after 2020. The United States, United Kingdom, Canada, and institutions in these countries are very active in the areas of financial inclusion and happiness. In fact, in the 1980s, sociologist Veenhoven (1984) caused a wave of research on happiness so that a database and scholarly magazine focusing on this subject was created (Ribeiro & Santos, 2019). The original paper focuses on happiness. However, with the development of world finance, financial inclusion has become an important topic in this field, which has received increasing attention from the academic community, and progress has been made.

2. According to Demirgüç-Kunt and Klapper (2012), one in four people in Africa has an account of a formal financial institution, and the formal financial system is inadequate for firms that have room to grow. However, from 2018 to 2020, the keyword 'sub-Saharan Africa' frequently appeared. Financial inclusion is a core goal in many developing countries. Therefore, many research findings have indicated a direct link between financial exclusion and widespread poverty in developing countries. For instance, Inoue (2019) suggested that we could synergistically contribute to poverty reduction in India by expanding the scope and improving the efficiency of public sector banks. However, substantial progress in developing countries has been limited and there are only a few preliminary exploratory studies. Research in the area of financial inclusion and well-being in developing countries, especially in Africa, is still limited compared to that in North America and EU countries and needs more attention and development.
3. Keyword 'adjustment' had the highest centrality, which revealed that 'adjustment' occupied a key position in the financial inclusion and happiness research and was closely related to other keywords. Another keyword 'behavior' also occupied a position to some extent, which revealed that it was noted in much research that financial inclusion would affect people's behaviors and happiness. For example, digital finance negatively affects happiness by increasing debt burden and excessive consumption (Meng & Xiao, 2022). Future studies should focus on these frontiers.
4. Without the widespread use of digital technologies, cell phones, and social media, digital financial inclusion cannot be advanced. Information and communication technologies have great potential for facilitating financial inclusion and realizing digital financial inclusion. Financial inclusion is the process in which individuals and groups have access to a sufficient range of financial products and services on an affordable, adequate, and broad basis (Gallego-Losada et al., 2023). From 2020, the keywords 'subject well-being', 'digital finance', and 'digital financial inclusion' appeared in large numbers and continued to appear frequently until 2023. This reflects a shift in the research interest toward digital financial inclusion and happiness. Numerous Chinese scholars have examined the connections between subjective well-being, digital financial inclusion, financial literacy, and digital finance. In the near future, China may make great progress and occupy a key position in the field of research on happiness and digital financial inclusion worldwide. This may be an important area for future study.

7. Future research directions and critical analysis

Future research on the relationship between financial inclusion and happiness should focus on several key areas. One significant gap in the current literature is the limited attention given to the role of digital financial literacy. While financial inclusion can lead to positive outcomes such as improved access to services and poverty reduction (Omar & Inaba, 2020), it can also have negative effects, especially when individuals are not well-versed in managing digital financial tools. Some studies have found that the widespread use of digital financial services can increase debt burdens and financial stress, which negatively impact happiness (Meng & Xiao, 2022). More research is needed to understand how enhancing digital financial literacy can help mitigate these risks. Future studies could explore the impact of financial education programs aimed at improving individuals' ability to manage their finances effectively in a digital context. By focusing on education, financial institutions and policymakers can better support individuals in making informed financial decisions that promote both financial well-being and overall happiness (Xiao & Xin, 2022).

Another important direction for future research is to conduct cross-country comparisons of financial inclusion and its impact on happiness. The existing literature shows that different countries experience varying levels of success in implementing financial inclusion strategies (Demirgüç-Kunt & Klapper, 2012).

While developed nations like the United States and the United Kingdom have established systems that support financial inclusion, developing countries, particularly in regions like Sub-Saharan Africa, face significant challenges (Kouladoun et al., 2022). Comparative studies could shed light on the factors that influence the effectiveness of financial inclusion policies across different regions. For example, future research could investigate how factors such as regulatory frameworks, access to technology, and local economic conditions affect the success of financial inclusion initiatives and their impact on well-being. These comparative analyses would provide valuable insights into best practices that can be adapted to different contexts, ensuring that financial inclusion efforts are more effective in improving happiness globally (Omar & Inaba, 2020).

A third area for future research involves understanding the role of digital financial services in developing countries. In many developing regions, digital financial services are seen as a critical tool for overcoming financial exclusion (Ozili, 2018), but the research on how these services impact happiness remains limited. More studies are needed to investigate how digital financial inclusion can be optimized to enhance well-being in these areas (Lee et al., 2023). This could include examining the role of mobile banking, digital payment systems, and government-led financial inclusion programs in improving happiness among underserved populations (Li et al., 2022). As digital financial services continue to expand in developing countries, it will be important to assess both the positive and negative effects of these services, especially in communities with low financial literacy. Future research should aim to identify strategies for minimizing potential risks, such as over-indebtedness, while maximizing the benefits of digital financial inclusion (Wang & Ji, 2022).

In addition, future research should explore the behavioral impact of financial inclusion on individuals' financial decision-making. The current literature suggests that financial inclusion can significantly influence financial behaviors, such as saving, spending, and investment habits (Shen et al., 2022). However, the link between these behaviors and happiness has not been fully explored. Studies could focus on how different financial inclusion strategies affect people's behaviors and how these behaviors, in turn, contribute to their overall well-being (Xiao & Xin, 2022). For instance, research could investigate whether individuals who have access to a wider range of financial services are more likely to engage in responsible financial behaviors, such as saving for the future or avoiding high-risk investments (Li et al., 2021). Understanding these behavioral patterns would provide important insights into how financial inclusion can be structured to improve not only economic outcomes but also happiness.

Another important consideration for future research is the demographic differences in how financial inclusion affects happiness. The existing literature indicates that factors such as gender, age, and income level can play a significant role in determining the impact of financial inclusion on well-being (Alradaideh, 2022; Lepinteur et al., 2022). For example, some studies suggest that women may experience greater benefits from financial inclusion because it increases their financial independence (Toshkov, 2022). Meanwhile, younger individuals may be more vulnerable to the negative effects of digital financial services, such as over-borrowing or impulsive spending (Meng & Xiao, 2022). Future research should explore these demographic factors in more detail, focusing on how financial inclusion initiatives can be tailored to meet the specific needs of different population groups. This could involve investigating how gender-specific financial products or youth-focused financial education programs can enhance the positive effects of financial inclusion on happiness (Peng, 2022).

Longitudinal studies are also needed to better understand the long-term effects of financial inclusion on happiness. Much of the current research is cross-sectional, meaning it provides a snapshot of trends and relationships at specific points in time (Xu & Sun, 2022). However, the relationship between financial inclusion and happiness is likely to evolve as digital financial services become more widespread and as people's financial behaviors change over time. Longitudinal research could track these changes, providing a more comprehensive view of how financial inclusion affects well-being over the long term (Demenech et al., 2022). These studies would be particularly valuable for understanding whether the initial positive impacts of financial inclusion are sustained over time or whether negative effects, such as increased financial stress, become more pronounced as individuals become more deeply involved in digital financial services (Cuong, 2021).

Finally, future research should consider the potential risks associated with financial inclusion, particularly in developing countries. While financial inclusion has the potential to reduce poverty and improve well-

being (Omar & Inaba, 2020), it can also lead to unintended negative outcomes, such as increased debt and financial vulnerability (Ozili, 2018). This is particularly true in regions where financial literacy is low and individuals may not fully understand the risks associated with certain financial products or services (Azeez & Akhtar, 2021). Future studies should focus on identifying strategies for balancing the benefits of financial inclusion with the need to protect individuals from financial harm (Lee & Lu, 2015). This could include examining the role of regulatory frameworks in preventing predatory lending practices or developing financial products that are better suited to the needs and capabilities of low-income populations.

By focusing on these areas, future research can provide a more nuanced understanding of the complex relationship between financial inclusion and happiness. Through cross-country comparisons, behavioral studies, and long-term analyses, researchers can help to ensure that financial inclusion initiatives are designed in ways that not only improve access to financial services but also enhance overall well-being. At the same time, it is important to remain aware of the potential risks associated with financial inclusion and to develop strategies for mitigating these risks, particularly in vulnerable populations.

8. Conclusions

This study provides a perspective on emerging trends in financial inclusion and happiness. Then, in this study, bibliometric analysis was made between financial inclusion and happiness by using CiteSpace. In this study, we drew several conclusions and got inspirations from perspectives such as descriptive analysis, keyword co-occurrence analysis, keyword cluster analysis, and emergent word analysis by using CiteSpace. (1) Research on financial inclusion and happiness is relatively mature. Both developed and developing countries focus on this area, and the scale of research is still expanding. The analysis of co-authorship networks in different countries indicates that international collaboration is crucial for advancing research on financial inclusion and happiness. Policymakers should support international research partnerships and data-sharing agreements and develop a collaborative global approach to address financial inclusion and its impact on well-being. (2) Most scholars were confined within the national boundaries. The authors and institutions in the field are scattered and only form a few collaborative networks. In addition, there is a lack of academically influential authors and institutions. (3) Due to the growth of global finance, financial inclusion has become a crucial subject in this area, which has been paid more attention to by the academic circle and has made some progress. (4) Research in the field of financial inclusion and happiness in developing countries, especially Africa, requires more attention and development. (5) In future studies in other countries, we may find that digital financial inclusion is a critical component. (6) Future studies could concentrate on how financial practices affect the relationship between financial inclusion and happiness. To some degree, CiteSpace can serve as a software tool for visualizing and analyzing networks to delve into research frontiers and hotspots. However, in future studies, more extensive and rigorous investigations are required. We should improve the search strategies and expand the scope of the database for further research.

In this study, a novel and comprehensive bibliometric analysis between financial inclusion and happiness is made, which distinguishes it from previous studies. While the economic impacts of financial inclusion are focused on or happiness is explored as an independent concept in previous research, these two fields are uniquely integrated using a bibliometric approach and CiteSpace in this study. By reviewing literature in the last 20 years, this paper not only identifies the trends and key contributors in the field but also uncovers emerging research frontiers. Unlike other studies that may focus on a specific region or financial inclusion, this paper provides a global perspective, mapping out the collaboration networks among countries, institutions, and authors. This approach highlights the importance of international cooperation in enhancing the understanding of how financial inclusion affects well-being.

Additionally, this study is one of the first studies in which bibliometric methods are used to analyze the intersection of financial inclusion and happiness, offering new insights into how these two areas are linked. This paper also contributes to the literature by offering a comprehensive and globally focused analysis that not only explores the positive aspects of financial inclusion but also addresses its potential risks, providing a balanced perspective that can provide information for policymaking. This study provides valuable insights into the link between financial inclusion and happiness, which has direct implications for both researchers and the financial industry. For policymakers and financial institutions, the

findings suggest that increasing access to digital financial services alone may not always lead to better outcomes. There is a need to consider the potential risks, such as debt accumulation, that can negatively impact well-being. This research implies that financial institutions should pair digital financial inclusion efforts with financial literacy programs to ensure that users can make informed financial decisions. For the industry, the study highlights the growing importance of understanding customer well-being as part of financial service offerings. Banks and financial service providers can use these insights to design products that not only focus on accessibility but also on improving the overall financial health and happiness of their customers. This could involve offering personalized financial advice, promoting responsible financial behaviors, and creating tools to help users better manage their finances.

However, there are some gaps that require additional exploration, such as the adverse effects of digital financial inclusion. This study indicates that digital financial inclusion can enhance financial accessibility, although it may also result in increased debt burdens and precarious financial behaviors. Future study should rigorously assess the equilibrium between the advantages and disadvantages of digital finance, particularly in developing nations with lesser financial literacy. Understanding how to reduce these negative effects while increasing the positive aspects of financial inclusion is important for creating sustainable financial policies. Another key research direction lies in the cross-country comparison of financial inclusion policies. The findings from this study indicate that countries differ significantly in their approaches to financial inclusion and its impact on well-being. Future studies should focus on comparative analyses between countries, particularly those with varying levels of financial inclusion and development. This would provide valuable insights into the best practices for financial inclusion that can be adapted to local contexts. Moreover, such comparisons can shed light on the cultural and socio-economic factors that influence the effectiveness of financial inclusion policies.

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Author contributions

Linghui Yang: conceptualization, methodology, data analysis and writing of initial draft; Hamdan Amer Ali Al-Jaifi: introduction, interpretation, comments, and suggestions; Kelvin Lee Yong Ming: data collection, data curation, conclusion and policy implications. All authors have read and agreed to the published version of the manuscripts.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Data availability statement

The data that support the findings of this study are available upon reasonable request from the authors.

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