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Review

Banking Profitability: Evolution and Research Trends

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Abstract

This study aims to map the scientific knowledge of bank profitability and its determinants. It identifies trends and gaps in existing research through a bibliometric analysis. To this end, 634 documents published in the Web of Science database over the last 54 years were analyzed using the bibliometric package. The results indicate an increase in the volume of publications following the 2008 financial crisis, focusing on analyzing the factors influencing bank profitability and economic growth. The Journal of Banking and Finance is the preeminent publication in this field. The literature reviewed shows that bank profitability depends on internal factors (size, credit risk, liquidity, efficiency, and management) and external factors (such as GDP, inflation, interest rates, and unemployment). In addition to the traditional determinants, the recent literature highlights the importance of innovation and technological factors such as digitalization, mobile banking, and electronic payments as relevant to bank profitability. ESG (environmental, social, and governance) and governance indicators, which are still emerging but have been extensively researched in companies, indicate a need for evidence in this area. This paper also provides relevant insights for the formulation of monetary policy and the strategic formulation of banks, helping managers and owners to improve bank performance. It also provides directions for future empirical studies and research collaborations in this field.

Keywords: profitability; determinants; banks; bibliometric; RStudio

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1. Introduction

The banking industry plays a pivotal role in the functioning of modern economies, directly influencing their stability, development, and economic growth. Economic growth leads to this economic development, through which financial services provide the necessary capital. Bank profitability is a crucial indicator of the financial health of institutions and the system as a whole. It is widely recognized as one of the critical determinants in the effectiveness of banking operations and in formulating public policies to ensure financial resilience and stability (Batten & Vo, 2019; Tarawneh et al., 2024).

The importance of this study derives from the need to understand the factors that drive or limit bank profitability and efficiency, especially in a global context marked by financial and economic crises, such as the subprime crisis, the sovereign debt crisis, the COVID-19 pandemic, and more recently the ongoing conflict between Russia and Ukraine. Authors such as Athari and Bahreini (2023), and Dietrich and Wanzenried (2011), argue that, given the fundamental role of banks in financing private investment and economic

growth, which is crucial for the overall health of the economy, it is crucial to identify and have a clear understanding of the main factors that affect their profitability.

Understanding the determinants of bank profitability is key to both the effective governance of the financial institutions as well as to ensure overall economic stability. Research has shown a growing interest in the effectiveness, productivity, and profitability of banking institutions, particularly in the wake of the 2007–2008 global financial crisis. This period witnessed a series of significant bankruptcies and challenges to the profitability of major international banking institutions, such as the collapse of Lehman Brothers and Washington Mutual in 2008, and more recently, the bankruptcy of Silicon Valley Bank and the sale of Credit Suisse in 2023. These events emphasize the complexity of the global financial environment and highlight the importance of analyzing bank profitability for the local and international economies.

The use of bibliometric methods emerges as an appropriate tool for examining the volume and growth of scientific production, allowing for a quantitative approach that identifies publication patterns, collaboration between authors, and key research themes over time. This technique has been widely used to identify emerging trends and map the "intellectual construct" of the subject, thereby guiding future research planning and funding (Almeida, 2023; Kushairi & Ahmi, 2021).

In this context, the present study proposes a bibliometric analysis of the literature on bank profitability, with the aim of mapping its evolution, identifying publication patterns, and highlighting recent trends in this field. This approach is justified by the increasing complexity and volume of scientific output on the topic, which makes a rigorous systematization essential in order to understand how knowledge has been constructed and disseminated over time.

The research adopts a well-established methodological framework based on three foundational bibliometric laws: (i) Bradford's Law, which identifies the core journals that publish the most influential research by measuring journal productivity; (ii) Lotka's Law, which assesses author productivity and enables the identification of the most influential researchers in the field; and (iii) Zipf's Law, which examines word frequency in published articles, offering insight into the most recurrent and thematically significant concepts in the literature. This methodological structure is supported by previous reference studies, notably Almeida (2023) and Kushairi and Ahmi (2021), which reinforce the validity of the adopted framework.

The relevance of this work lies in the fact that, to date, no comprehensive and up-to-date bibliometric analysis of the literature on bank profitability exists that covers such an extended time frame with a representative sample of publications indexed in the Web of Science. By adopting a quantitative perspective on scientific output, this study innovates by systematically revealing publication patterns, citation and co-authorship networks, as well as collaborations between authors, institutions, and countries. In parallel, it identifies gaps in the existing literature and emerging areas of research, thus providing a solid basis for future studies.

To accomplish this study's objectives, this paper is divided into four sections: Section 1 is the introduction, which is followed by a description of the methodology and the formulation of the research questions in Section 2. Section 3 analyzes and discusses the results, and the fourth chapter presents the main conclusions of this study, as well as the limitations and future investigation paths.

2. Analytical Framework for Bibliometric Research

To analyze a large set of data effectively and quantitatively study scientific production over time, a bibliometric analysis was carried out along the lines of Almeida and Vieira (2023), Arslan et al. (2022), and Shamsul Alam et al. (2021). According to the authors, bibliometrics is proliferating in use in scientific research, and the increasing adoption of this methodology should not be seen as a simple trend but rather as a reflection of its relevance to producing impactful studies, especially when it comes to processing large volumes of scientific data.

The bibliometric analysis is a research technique that focuses on the quantitative analysis of the available literature in a given field of study, with the main objective of identifying, analyzing, and synthesizing the trends, patterns, and gaps in the scientific literature in a given topic, in this case, banking profitability. The main purpose of including this methodology is to identify the current state of knowledge on the subject as well as its relevance by mapping the historical evolution of research, analyzing the geographical distribution of scientific production, and identifying authors, institutions, and countries that are leaders in the field of research. This methodology also makes it possible to observe collaboration patterns between researchers and institutions, assess the frequency of citations of specific works, and identify gaps in existing research and areas that need further investigation.

The analysis was carried out using the Bibliometrix package and the Biblioshiny function of the RStudio 9.4 software. The papers, which were selected using the keyword "bank profitability" and taken from the WoS (Web of Science) database, were inserted. The analysis was conducted based on three key bibliometric laws: Bradford's Law, which measures journal productivity by identifying central and dispersed areas within a specific topic; Lotka's Law, which measures authors' productivity based on a size-frequency distribution model; and Zipf's Law, which measures word frequency in papers (Almeida & Vieira, 2023; Kushairi & Ahmi, 2021).

In short, a bibliometric review provides a complete overview of the available literature on a given topic, allowing researchers to gain a deeper understanding of the context in which they operate, identify areas of interest, and consequently, contribute to the development and advancement of knowledge in their field of study. Based on this framework (Figure 1), We formulated the following research questions:

Q.1—What has been the trend and the relevance of the research over the years?

Q.2—Which journals, authors, and articles have had the most influence on this topic?

Q.3—Which countries have contributed the most to the research on this topic?

Q.4—What are the most important keywords and the most frequent topics in the research on bank profitability?

Following the exportation of bibliographic records and the application of filters as outlined in Figure 1, a thorough data cleaning procedure was conducted, including the removal of duplicate entries, to ensure the consistency and reliability of the results and to minimize potential biases in subsequent analyses. The final sample comprised 634 records covering a time span from 1969 to 2023, encompassing 54 complete years. Data coding and analysis were performed using two specialized software tools, VOSviewer in version 1.5.5 and Bibliometrix 5.1.0 (implemented in R), which facilitated an in-depth bibliometric analysis encompassing both descriptive and relational dimensions, thereby enabling the identification of significant patterns and connections within the dataset.

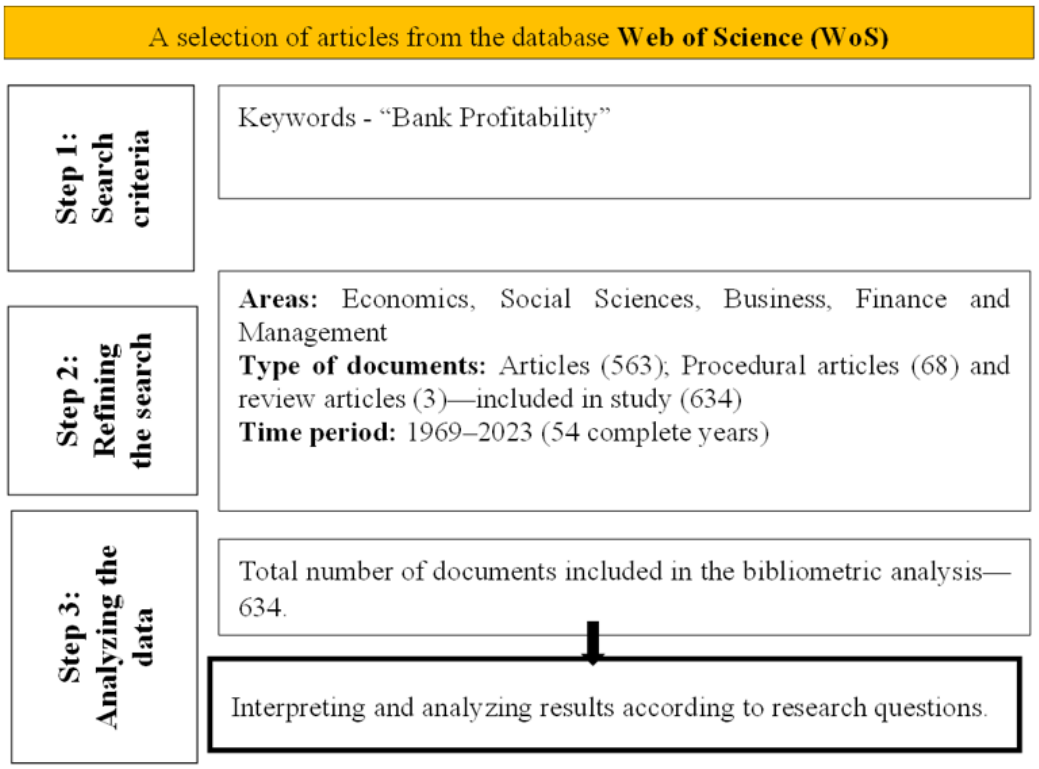


Figure 1. Research scheme. Source: created by the authors.

3. Analysis and Discussion of Results

3.1. Research Trends

Monitoring the temporal evolution of scientific production makes it possible to identify the trend of research on the subject, providing an insight into the dynamism of the research area. These trends also make it possible to identify the research and academic literature in the area under study is interesting and prominent, allowing researchers to keep track of the field's interest, trends, and relevance. The number of publications and the average number of citations per year are illustrated by Figure 2, which shows their evolution between 1969 and 2023, analyzing the last 54 complete years of research.

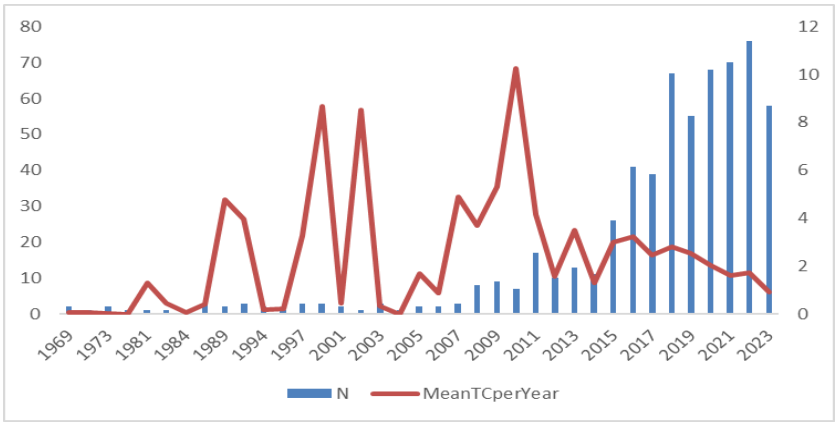


Figure 2. The total number of publications and the average number of citations per year.

Up until 2007, there were only a relatively small number of publications (40), with an upward trend from 2008 onwards, coinciding with the start of the subprime crisis in the USA. The number of publications and research has seen a significant increase, with an average growth of 14% per year over the last 15 years. The year 2022 saw the highest

number of papers published (76), and by the second-last quarter of 2023, 56 papers had been published on the Web of Science (WoS).

The exponential increase in the number of publications, particularly after periods of crisis, demonstrates the importance given to this field of research in the last decade and a half, thus playing a fundamental role in understanding the overall functioning of the economy and the banking system.

The average number of annual citations showed an upward trend between 2005 and 2010, with a subsequent average decrease in the number of publications indicating fewer articles are being cited. The fluctuation in the average number of citations can be attributed to the extensive research activity. The ongoing growth of the research field is reducing the impact of more recent work and contributing to a fall in citations. According to Almeida (2023), although some recent contributions have merit and relevance, others may lack originality and importance in the scientific literature. As a result, the number of citations decreases as researchers mainly seek to cite the works with the greatest impact and relevance.

3.2. Performance Analysis

The performance analysis assesses academic research contributions to a specific discipline using descriptive methods common among bibliometric researchers. This section presents the analysis of the performance of journals, authors, papers, and countries through the quantity of publications and citations. The former measures productivity, while the latter indicates impact. The h-index and citations per document are used to evaluate a paper's performance.

3.2.1. Journals

The number of publications and citations measures the productivity of journals (Ahmad et al., 2020) and authors through the h and g impact indexes. The h-index measures the academic quality and productivity of a researcher or work, considering the balance between publications and citations (Hirsch, 2005). The g index represents the largest number of publications with a total number of citations equal to or greater than g2 as described by (Egghe, 2006). These indicators make it possible to measure the relevance and academic impact of publications, authors, and scientific journals. As highlighted by Bi (2023), the use of the Hirsch index (h-index) presents several limitations: (1) it attributes full credit to each individual in multi-authored publications regardless of actual contribution; (2) it inflates citation counts; (3) it creates unfairness in evaluating individual research contributions; and (4) it fosters ethically questionable practices, such as gift authorship.

In terms of journal distribution, a total of 296 different scientific journals were identified as publishing 634 articles on the subject, with 10% of these articles appearing in the four most relevant journals. Table 1 shows the 15 most influential and impactful journals, as measured by their h-index, g-index, total number of citations (TCs) and total number of publications (NP).

With an h-index of 21 and a g-index of 27, the 'Journal of Banking and Finance' is the most relevant academic journal in the field, in addition to its status as the most frequent publisher of articles in this area (27) and the journal with the highest number of citations (2776). The International Journal of Financial Studies ranks second in terms of relevance, according to the h index (8) and the g index (13), with 174 citations. Despite publishing fewer articles (14) than Cogent Economics and Finance and the Journal of Risk and Financial Management (both with 15 publications), it has a higher academic impact. Finance Research Letters is positioned at the lowest rank in the table, with 82 citations, 10 publications, and Hirsch and Egghe index values of 4 and 9.

Table 1. Most relevant journals.

Journal	h_index	g_index	TCs	NP
Journal of Banking and Finance	21	27	2776	27
International Journal of Financial Studies	8	13	174	14
Cogent Economics and Finance	7	11	143	15
Journal of Risk and Financial Management	7	11	143	15
Research in International Business and Finance	6	8	143	8
International Journal of Financial and Economics	6	8	112	8
Journal of Financial Stability	6	7	466	7
Journal of Money Credit and and Banking	6	6	468	6
Applied Economics	5	9	179	9
Quarterly Review of Economics and Finance	5	7	59	10
North American Journal of Economics and Finance	5	7	87	7
Sustainability	5	7	59	8
International Journal of Emerging Markets	5	7	58	8
Journal of Financial Services Research	5	6	148	6
Finance Research Letters	4	9	82	10

Source: created by the authors.

3.2.2. Authors

The outputs of our research show 1363 authors across 634 publications. Similarly to the previous analysis, the productivity and academic impact of the authors are evaluated using the Hirsch and Egghe indexes, citations, and the number of publications, as described in Table 2.

Table 2. Most relevant authors.

Authors	h_index	g_index	TCs	NP
Tan	7	8	354	8
Haris	5	7	42	3
Ozili	4	6	139	6
Lee	4	5	78	5
Gambacorta	4	4	392	4
Tariq	4	4	116	4
Molyneux	3	4	494	4
Le	3	4	39	4
Yao	3	3	73	3
Sufian	3	3	62	3
Kumar	3	3	42	3
Agbloyor	3	3	28	3
Abbas	2	3	50	3
Bolarinwa	2	3	29	3
Acharya	2	2	37	2

Source: created by the authors.

In this field of research, Yong Tan is the most productive and impactful author, with 354 citations distributed across eight articles, the h-index is seven and the g-index is eight. Haris follows with an h-index of five and a g-index of seven. Subsequently, there is a group of four authors with an h-index of 4, a group of six authors is represented by a Hirsch index of 3, and the remainder with an h-index of 2. Upon examination of the table, one author, Molyneux, is particularly noteworthy. He has 494 citations distributed across four publications and is rated with an h-index and a g-index of 3 and 4, respectively.

Figure 3 below shows the scientific output over time of the ten authors with the most publications. This analysis shows the longevity of the author's relevance in this area of research and the evolution of the keywords used over the years.

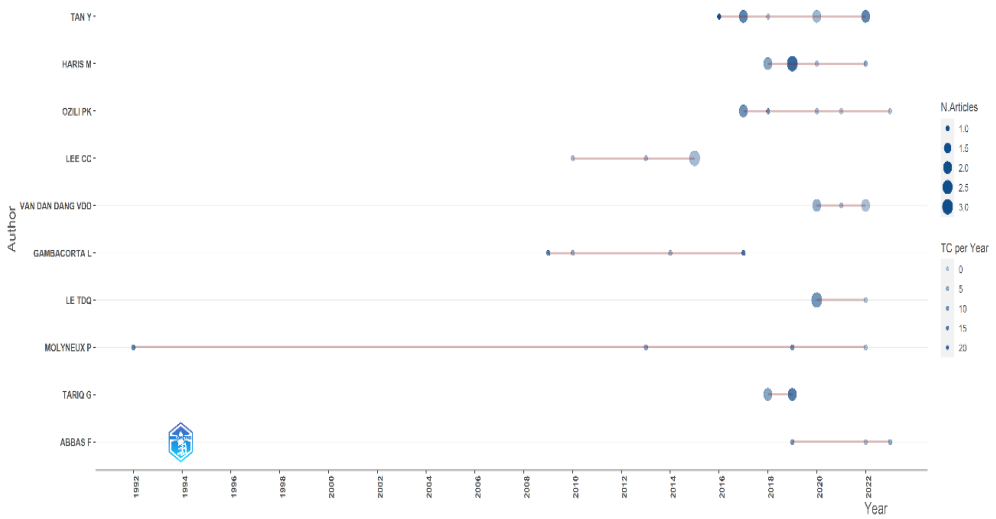


Figure 3. Authors' output overtime. Source: created by the authors.

The concentration of publications shows that it was mainly after 2008 that the authors showed a greater interest in the subject under study. It is worth emphasizing that among the top 10 published authors, only Molyneux had published on the subject before 2008. This could reflect the fact that the subprime crisis sparked a new interest in understanding more about this subject. On the other hand, the lack of contributions from other authors suggests that, initially, the academic approach and scientific production regarding this issue were limited, thus highlighting the inability to manage/prevent the outlines of the crisis. This finding not only reinforces the crucial relevance of grasping this subject but also illustrates a turning point in the academic contribution to the development of knowledge in this specific field.

Molyneux is the author with the longest research record on the subject, with 4 publications between 1992 and 2022 (30 years). In 1992, the year of his first publication, he looked at the determinants of bank profitability in Europe. With a sample of 18 European countries between 1986 and 1989.

In 2013, he published again, raising the question of the possibility of convergence of bank profits, "Do Bank Profits Converge?", with research on 8 European Union countries between 1992 and 2007. The paper focuses on the determinants and the convergence of bank profitability using a dynamic panel, considering variables such as competition, persistence, and integration into the European Union as the main variables behind bank profitability. In 2019, his attention turned to the profit margins of banking institutions in a period marked by negative interest rates. Molyneux investigated the influence of the negative interest rate policy on bank profit margins for 7359 banks in 33 OECD member countries between 2012 and 2016.

Lastly, and 30 years after his first research on the subject under, Molyneux published the article "Interest rate risk and monetary policy normalization in the euro area", focusing on interest rate risk and monetary policy normalization in the euro area, with a sample of 81 banks in the euro area between the last quarter of 2014 and the first quarter of 2018. The main objective of the article was to identify how the specific characteristics of each bank manage to provoke a positive shock in interest rates.

As such, Molyneux's research trajectory over three decades of research reflects a significant evolution in the perception and understanding of the determinants of bank

profitability and its importance over the years, ranging from the determinants of bank profitability in Europe in 1992 to contemporary issues such as the impact of negative interest rates on bank profit margins and interest rate risk in the eurozone in 2019 and 2022, respectively.

3.2.3. Papers

Table 3 highlights the 12 most relevant papers in our sample. Publications were measured by the total number of citations received, but also by the average number of citations per year. This approach allows researchers to identify the most cited papers and those that have remained relevant over time, making a significant contribution to academic research.

Table 3. Most relevant papers.

1st Author	Title	TCs	TCs per Year
Demirgüç-Kunt and Huizinga (1999)	Determinants of Commercial Bank Interest Margins and Profitability: Some international Evidence	649	25.96
Houston et al. (2010)	Creditor rights, information sharing, and bank risk taking	421	30.07
Molyneux and Thornton (1992)	Determinants of European bank profitability: A note	377	11.78
Dietrich and Wanzenried (2011)	Determinants of bank profitability before and during the crisis: Evidence from Switzerland	352	27.08
Bourke (1989)	Concentration and other determinants of bank profitability in Europe, North America and Australia	333	9.51
García-Herrero et al. (2009)	What explains the low profitability of Chinese banks?	263	18.79
Foos et al. (2010)	Loan growth and riskiness of banks	243	17.36
Agarwal and Taffler (2008)	Comparing the performance of market-based and accounting-based bankruptcy prediction models	237	14.81
Tan (2016)	The impacts of risk and competition on bank profitability in China.	193	24.13
Vennet (2002)	Cost and profit efficiency of financial conglomerates and universal banks in Europe	187	8.5
Naceur and Omran (2011)	The effects of bank regulations, competition, and financial reforms on banks' performance	182	14

Source: created by the authors.

The publication by Demirgüç-Kunt and Huizinga (1999) stands out as the most referenced paper (649 citations) out of the 634 analyzed. The number of citations, together with the year of publication, at a time when only 23 articles had been published on the subject, underlines the relevance of this work, establishing it as a point of reference for the remainder of the studies carried out until today. This publication focuses on the underlying determinants of bank profitability and interest margins. Through a sample of banking data from 80 countries between 1988 and 1995, the paper reveals that many macro and microeconomic variables intrinsically influence the discrepancies observed in interest margins and profitability in the sector. The findings point out that a higher ratio of bank assets to Gross Domestic Product (GDP) and lower market concentration is correlated with lower profit margins. Furthermore, the researchers also found evidence that the overall tax imposed on banking institutions is entirely reflected in their clients.

The second most cited article (421), and also the publication with the highest number of average citations per year (30), is the work by Houston et al. (2010) entitled "Creditor Rights,

information sharing, and bank risk-taking." The article addresses the relationship between creditor rights and bank risk-taking behavior in a sample covering some 2400 banks from 69 countries. The results indicate that stronger creditor rights tend to promote greater risk-taking by banks, also resulting in a greater likelihood of financial crises. On the other hand, stronger rights are associated with higher economic growth. Also, the paper shows that sharing information leads to increased bank profitability, reduced risk, and a decreased chance of economic crises, leading to stable economic growth.

As the third most relevant article in the sample, Molyneux and Thornton (1992), analyzed the profitability of European banks between 1986 and 1989, using a pooled time series approach to estimate a linear equation in which bank performance measurements were regressed as a function of various internal determinants, such as personnel expenses, capital ratios and liquidity, and external determinants, such as market concentration, government ownership, interest rates, market growth, and inflation. The main findings of this study show that market concentration has a positive and statistically significant correlation with bank profitability, in line with the structure-conduct-performance paradigm. Moreover, the study suggests that government ownership has a positive relationship with profitability, challenging the notion that state-owned banks are less profitable. Variables such as personnel costs and money supply growth did not play a major role in the study's conclusions.

Dietrich and Wanzenried's (2011) study, using the generalized method of moments (GMM), analyses the profitability of 372 commercial banks in Switzerland between 1999 and 2009 to determine the impact of the years of the economic crisis in the region's banking sector (1999–2006). The study results show that banking efficiency, loan growth, financing costs, and the business model mostly explain bank profitability. Bank efficiency, loan growth, and business model positively affect profitability, whereas financing costs result in lower profitability.

In contrast, Bourke's study (1989) presents a total of 333 citations. It aims to analyze the determinants of bank profitability, focusing mainly on theories of expense preference behavior, namely the Edwards-Heggestad-Mingo hypothesis. The study sampled European, North American, and Australian banks between 1973 and 1981. Some of the main determinants analyzed were internal factors, such as the management of sources and uses of funds, liquidity, loan loss expenses, and the relationship between loans and deposits, which are central to banks' financial efficiency. External factors included regulation, bank size, scale economies, market concentration, interest rates, and government ownership. The conclusions indicate that market concentration can reduce risk and support the hypothesis that banks with greater market power tend to hold less risky assets. However, the theory of expense preference was not robustly supported, suggesting that the relationship between market concentration and profitability is more complex than anticipated. The study also points to the importance of a balanced analysis between internal and external factors in understanding bank profitability internationally, particularly between different continents.

The sixth most relevant article comes from García-Herrero et al. (2009) entitled "What explains the low profitability of Chinese banks?" which empirically studied the reasons for the low profitability of Chinese banks between 1997 and 2004. The results of the study suggest that banks with better capitalization tend to be more profitable and that a less concentrated banking system increases the profitability of banks. This reflected the fact that the country's four main banks, all state-owned, were the main obstacle to the profitability of the system. On the other hand, the more market-oriented banks tended to be more profitable, indicating the influence of government intervention in the industry's performance.

3.2.4. Most Active Countries in the Field of Research

Countries' research performance and the relationship networks among the sample were analyzed. As such, this analysis aims to understand the collaborative dynamics underlying scientific production, offering a more comprehensive perspective on who is doing the most research and investing in comprehension of the subject, and how the international collaborations can offer different perspectives and directions for future collaborations.

The number of articles from the 21 countries with the highest number of articles is shown in Figure 4, along with the number of collaborations from both internal and international sources. Please note that 'SCP' refers to Single Country Publications, while 'MCP' stands for Multiple Country Publications.

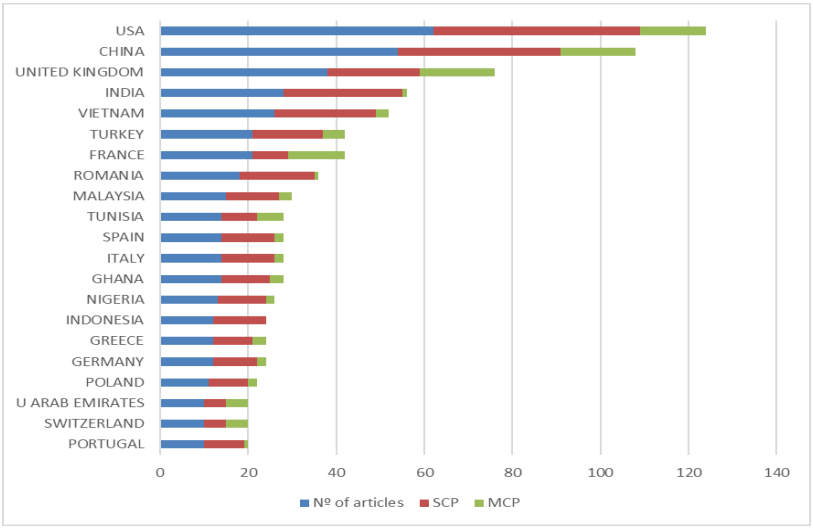


Figure 4. Number of articles and collaborations by country. Source: created by the authors.

The figure shows countries from four continents: Europe (11), Asia (7), Africa (2), and North America (1). The United States has the largest volume of publications (62), out of which 47 came from collaborations between American authors, and 15 resulted from partnerships involving other nationalities. This was closely followed by China (57), the United Kingdom (38), India (28), and Vietnam (26). Despite not being on the list, Portugal comes 21st on the list with 10 publications on the subject, 9 only by Portuguese authors, and 1 in collaboration with authors from other countries.

Collaborations and international relations can be better identified in Figure 5 below.

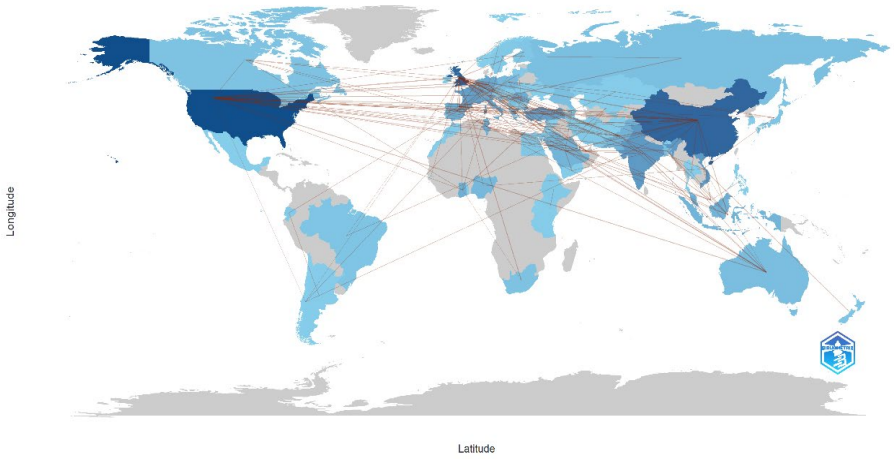


Figure 5. Collaborations map. Source: created by the authors.

The country collaboration map, based on scientific co-authorships, provides a visual representation of the intensity of international research partnerships. Darker shades of blue indicate countries with higher volumes of joint publications, reflecting stronger integration within global research networks, whereas progressively lighter shades denote decreasing levels of collaboration.

Globally, authors from the United Kingdom and China stand out as the most prominent in international collaborations, leading Multi-Country Publications (17). In specific terms of frequency, the most frequent collaborations were between the United States and the United Kingdom (frequency = 9), followed by the United States and China (frequency = 7), and China and the United Kingdom (frequency = 6). This scenario highlights the scope of cross-border collaborations and the importance of specific partnerships in the scientific sphere.

3.3. Main Topics and Keywords

The Word Cloud is a graphical representation of the frequency of a text's most commonly used words. The figure below (Figure 6) shows the 50 keywords most frequently used by the authors of the publication sample under study.



Figure 6. Word Cloud. Source: created by the authors.

This analysis allows us to immediately identify the most popular keywords, such as 'determinants,' 'performance,' 'efficiency', and 'risk.'

According to Almeida and Vieira (2023), the Word Cloud should be analyzed in conjunction with the co-occurrence network since the latter provides a deeper analytical approach, offering an analysis of the collective interconnection of terms based on their paired presence in the sample under study, allowing us to identify relationships between terms, but also providing a summary of the way knowledge is organized in a particular field.

Callon (1984) developed co-occurrence analysis, is a content analysis technique used to identify the strength of associations between keywords in textual data. This approach investigates the intrinsic content of documents, making it possible to map relevant literature based on the keywords shared between scientific articles. This analysis assumes that certain words appear recurrently in clusters, thus indicating patterns of association between terms.

Figure 7 shows the map of co-occurrences of keywords used in the sample under study.

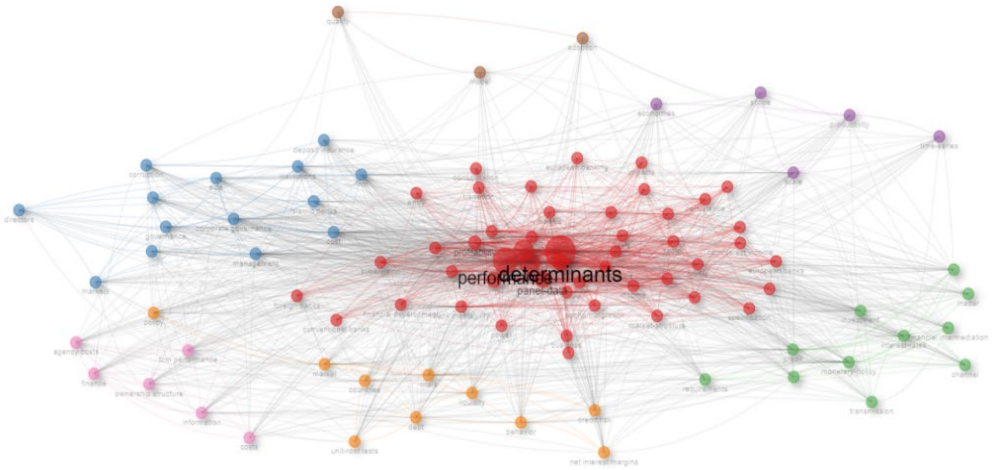


Figure 7. Keyword co-occurrence map. Source: created by the authors.

Bornmann et al. (2008) and Laengle et al. (2017) argue that the relationship patterns Co-occurrence analysis can be used to represent and recognize relationships between articles, journals or authors, since it calculates the most frequent occurrences.

In the co-occurrence map, it is possible to identify a central cluster (red) which contains the main keywords of the topic under study, and 6 other outlying clusters (green, purple, orange, pink, blue, and brown), which represent topics with less relevance. The red cluster stands out as the epicenter of this research field. The majority of the studies are empirical and make use of panel data to identify the determinants of profitability and performance in the banking sector.

The brown cluster highlights keywords such as "quality", "model", and "adoption", leading to papers such as those by Abu Alrub et al. (2020), Jiang and Ji (2023), and Mirza et al. (2023), which focus specifically on the quality of management and the methods and models adopted by banking institutions, thus providing a more in-depth analysis of the qualities of different governance practices. The purple cluster, on the other hand, focuses on studies based on keywords like productivity and scale economies, using methodological time series approaches. Chhaidar et al. (2023) and Wang (2023) explore how banking institutions can optimize their productivity, identifying patterns over time and assessing the implications of these patterns for strategic decisions.

The green cluster explores topics such as credit, investment, interest rates, and the requirements imposed by monetary policies and their transmission. The studies by Martynova et al. (2020), Ozili and Arun (2023), and Thorbecke (2021) aim to understand the interconnections between policy and the other keywords in bank profitability. Whereas studies such as El-Chaarani et al. (2023), Olmo et al. (2021), and Sahyouni and Wang (2019) in the orange cluster put the spotlight on market risks and behaviors, liquidity and profit margins, and internal policies, providing an understanding of the market challenges faced by banking institutions.

The pink cluster's primary research keywords are costs, finances, and organizational structure, with publications such as Ali and Puah (2019), Migliardo and Forgione (2018), and Ozili and Uadiale (2017) providing a deeper understanding of operating costs, financial efficiency, and organizational structure. Lastly, the blue cluster addresses issues such as corruption, governance, and size, with Andries et al. (2018), Asteriou et al. (2021), and Hasan and Ashfaq (2021) seeking to identify how these keywords influence the integrity and performance of banking institutions.

After analyzing the most frequent words using Word Cloud and the co-occurrence map, similar to the authors (Almeida, 2023; Syed & Bawazir, 2021), a thematic map was used, refer to Figure 8 for further information. Thematic mapping is an emerging way of

charting scientific data. knowledge output, which could lead to new directions, promoting improvements in the quality of the scientific output by analyzing the grouping of themes that indicate research trends.

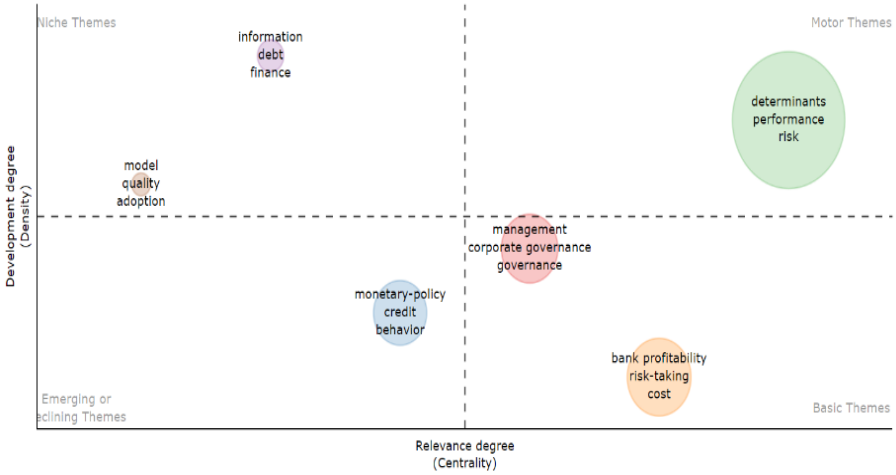


Figure 8. Thematic map. Source: created by the authors.

The authors claim that the upper right quadrant represents the driving themes, i.e., the most important themes that are fully explored and essential to the field of research. The lower right quadrant contains basic themes that are not fully developed, but which play a very important role in understanding the subject.

Emerging or declining themes are represented in the lower left quadrant and are underdeveloped and secondary themes in the research field. Finally, in the upper left quadrant are very specialized or niche topics, i.e., topics with despite their development, they have had limited impact on the field.

Emerging or declining themes are represented in the lower left quadrant and are underdeveloped and residual themes in the research field. Lastly, in the upper left quadrant are very specialized or niche themes, i.e., themes with limited influence in the field, despite their development. This categorization provides a visually clear approach to understanding the dynamics and relative relevance of the various topics covered, making it easier to interpret and understand prevailing trends.

Within the motor themes quadrant, we find, among others, the works by Dietrich and Wanzenried (2011), García-Herrero et al. (2009), Ozili and Uadiale (2017), and Tan (2016) in which the authors focus on the determinants, performance, and risk of banking institutions. Meanwhile, the studies by Demirgüç-Kunt and Huizinga (1999), and Molyneux et al. (2022) deal with topics such as bank profitability and risk-taking, which are included in the basic themes, as well as papers linked to banking institutions' management and governance, such as those by Gurol and Lagasio (2023), Jiang and Ji (2023), and Milojević et al. (2023).

Among the emerging or declining quadrant are found papers addressing credit, institutional behavior, and also the effect of monetary policy on bank profitability, such as Al-Matari (2023), Martynova et al. (2020), and Present et al. (2023). Lastly, in the niche quadrant, specific research such as Jigeer and Koroleva (2023) and Mirza et al. (2023) addresses issues such as the banking model, debt, and financial data.

The bibliometric analysis offered a panoramic view of current research on the topic in question, highlighting trends and relevance, the main authors and journals, the most significant contributions to the field of research, and the countries that attach the most importance to understanding this issue. This analysis underlines the ongoing role of academic research and discussion in furthering awareness and knowledge in one of the most important areas for global economic health.

4. Discussion of Results

The analysis of bank profitability is fundamental both for the internal management of banks and for the development of regulatory policy, as well as for the analysis and support of investor decisions. The literature suggests that bank profitability results from an interaction between internal and external factors.

4.1. Internal Factors

The early literature identified cost control as the primary determinant of profitability. Molyneux and Thornton (1992) were the first to find a positive relationship between the quality of management decisions and profitability across 18 European countries. Bourke (1989), Molyneux and Thornton (1992), and Zimmerman (1996) emphasize market concentration as a factor positively correlated with profitability. Zimmerman (1996) also reports a positive impact of management decisions on credit concentration and banking performance.

Bank size is frequently included in studies analyzing economies of scale, as larger banks theoretically have lower capital raising and information processing costs. Along with capital ratios, bank size has shown a positive relationship with profitability, suggesting that larger, better-capitalized banks tend to be more profitable (e.g., Menicucci & Paolucci, 2016; Molyneux & Thornton, 1992). In contrast to these findings, Grose et al. (2021) highlight a negative relationship between bank size and profitability in the UK.

Another key determinant discussed in the literature is credit risk, which does not show a universal consensus regarding its relationship with bank profitability. Positive relationships have been observed for Palestinian and Malaysian banks (Saleh & Paz, 2023), while a negative relationship was found for Nepalese banks (Shrestha, 2022). Non-performing loans (NPLs), considered a credit risk indicator, are shown to reduce bank profitability (e.g., Figlewski et al., 2012; Kumar et al., 2022; Mirović et al., 2024).

Cost efficiency is another factor highlighted in the literature. Measured by the cost-income ratio, it negatively affects profitability, with inefficiencies reducing financial performance (e.g., Căpraru & Ihnatov, 2014; Horvat et al., 2023).

Effective asset management is crucial for banking stability and security, ensuring adequate reserves and financing strategies to cope with potential liquidity pressures. Therefore, asset management and operational efficiency, specifically, the quality of asset management and operational efficiency, are critical factors determining bank profitability. Banks with better asset management and higher operational efficiency tend to be more profitable (e.g., Al-Matari, 2023; Horvat et al., 2023; Almeida & Sousa, 2025).

Authors such as Dietrich and Wanzenried (2011) and Jigeer and Koroleva (2023) consider efficiency as the ratio between operational costs and total revenue, pointing to a negative relationship between operational costs and banking profitability.

The relationship between liquidity and profitability is commonly found in the literature, though it remains a critical area of study in financial management. While some studies show a positive correlation (e.g., Gržeta et al., 2023; Duan & Niu, 2020; Thinh et al., 2022), other research suggests that banks creating more liquidity tend to generate lower profits (e.g., Abdelaziz et al., 2020; Tran et al., 2016). Authors argue that this difference depends on factors such as bank size, economic conditions, and the regulatory environment, which significantly shape the relationship. Understanding how these factors interact can help banks optimize their financial strategies and ensure sustainable growth.

Pointed to cost control as the main determinant of profitability, and Molyneux and Thornton (1992) were the first to find a positive relationship between the quality of management decisions and profitability in 18 European countries. Bourke (1989), Molyneux and Thornton (1992) and Zimmerman (1996) highlight market concentration as a factor

with a positive relationship with profitability. Zimmerman (1996) reports a positive impact of management decisions on loan concentration on bank performance.

4.2. External Factors

Early studies by Short (1979) and Bourke (1989) highlighted the structure of financial markets and entry barriers as the main drivers of bank profitability. These studies paid little attention to bank-specific factors and did not consider macroeconomic influences. The "structure-conduct-performance" hypothesis has been widely applied in later work, suggesting that high market power generates monopolistic profits. Market concentration in the banking sector reduces competition and allows for higher profit margins (e.g., Bourke, 1989; Molyneux & Thornton, 1992; Nguyen et al., 2022; Zimmerman, 1996).

Other macroeconomic factors more frequently highlighted in the literature include GDP, inflation, interest rates, and unemployment as determinants of bank profitability. Economic growth promotes credit, unexpected inflation can increase costs, and unemployment hinders household income. The interest rate margin, the spread between lending and deposit rates, constitutes a key determinant of banking profitability, reflecting both the efficiency of financial intermediation and the degree of competition in an increasingly globalized banking sector.

GDP growth fosters the increase of loans and interest rates, improving bank profitability (Ali & Puah, 2019; Al-Matari, 2023; Batten & Vo, 2019; Zhao et al., 2022). Inflation, in turn, may have a positive or mixed impact, depending on the bank's ability to adjust its rates, directly affecting sector revenues and expenses (Nguyen et al., 2022; Haddad & Hornuf, 2023). GDP growth is considered the most robust factor, as it drives banking activity and increases profitability (e.g., Argimon et al., 2023; Athari & Bahreini, 2023; Belcaid & Al-Faryan, 2024; Chukwuogor et al., 2021; Heitmann et al., 2023; Jigeer & Koroleva, 2023). Conversely, the impact of inflation on profitability is ambiguous, potentially being either positive or negative depending on location and the profitability measure used. Studies by Gržeta et al. (2023), Hossain and Ahamed (2021), and Jigeer and Koroleva (2023) suggest a negative relationship between inflation rates and bank profitability, while research by Tan and Floros (2012), Athari and Bahreini (2023), Belcaid and Al-Faryan (2024), and Chukwuogor et al. (2021) suggest a positive relationship.

Unemployment rates are another external determinant explored in the literature. Several studies examine how changes in unemployment rates can impact banks' financial performance, often focusing on different regions and methodologies. An increase in local unemployment rates generally leads to a decrease in bank profitability, primarily due to a reduction in net interest income, which is significantly affected by local labor market conditions (e.g., Swanson & Zanzalari, 2020; Horobet et al., 2021; Chukwuogor et al., 2021).

International studies have shown that lower interest rates tend to reduce net interest margins and banks' overall profitability. The specific impact of these rates varies depending on each bank's characteristics and the country's economic structure, such as the prevalence of fixed interest rates and the level of competition (e.g., Cantú et al., 2022; Campmas, 2020; Molyneux et al., 2019). Understanding these mechanisms is crucial for effective monetary policies and banks' strategic adaptation.

4.3. Future Directions

The recent literature on bank profitability has focused on integrating traditional determinants with analyzing the impact of emerging factors, particularly fintech technologies. The interaction between technological innovations and classical bank management factors, such as bank size, asset quality, and leverage, remains a central axis in bank profitability research. Fintech technologies have played a transformative role in the financial sector.

They are often analyzed through indicators such as digitalization, mobile banking, and electronic payments, which have been associated with improvements in bank profitability (e.g., Ben Bouheni et al., 2024; Chhaidar et al., 2023). However, more research is needed to explore how these technologies affect operational efficiency, risk management, and customer experience (Murinde et al., 2022), as well as how economies of scale in large banks interact with these technological innovations to affect bank stability and liquidity (Cornelli et al., 2023; Katsiampa et al., 2022).

At the same time, environmental, social, and governance (ESG) factors have emerged as relevant issues in analyzing corporate and banking profitability. Although they have been extensively studied in other business contexts, focusing on their impact on financial performance, applying these factors to the banking sector is still limited. Authors such as Agnese et al. (2024) and Serkbayeva et al. (2024) have found a positive relationship between ESG practices and indicators such as bank returns. However, in the banking context, assessing the specific impact of these factors requires more in-depth empirical studies to understand their contribution to the profitability and stability of financial institutions.

Despite recent progress in the study of new dynamics in bank profitability, there is still a need for more detailed research on the integrated impact of these emerging factors. This represents an important opportunity for future academic contributions, allowing for a more holistic understanding of financial sector profitability and resilience determinants.

5. Conclusions

This study aimed to map scientific knowledge on banking profitability and its determinants through a bibliometric analysis. Findings reveal that most articles were published after the 2008 international financial crisis, focusing primarily on empirical studies with panel data on banking profitability determinants (Q1). Regarding the relevance of journals, authors, and articles, the Journal of Banking and Finance is the most prominent journal, with 27 publications and 2776 citations in this area. The most influential author is Tan, with Hirsch and Egghe indices of 7 and 8, respectively. At the same time, the most cited article, "Determinants of Commercial Bank Interest Margin and Profitability: Some International Evidence" by Demirgüç-Kunt and Huizinga (1999), has accumulated 649 citations to date (Q2). Geographically, the United States, China, and the United Kingdom lead in research output and international collaboration (Q3).

A growing body of research focuses on the impact of monetary policy on banking profitability. The bibliometric analysis revealed clear trends, such as the post-crisis increase in publications, the predominance of empirical studies with panel data, and the relevance of keywords like "determinants," "performance," "efficiency," and "risk." Nevertheless, gaps remain, including the need for greater geographic diversity, deeper exploration of emerging topics like credit and institutional behavior, and the growing focus on monetary policy impacts on banking profitability (Q4).

These findings offer academics and future researchers insights into potential research avenues, partnerships, and methodological improvements. Banking profitability results from a complex interplay of internal factors, such as operational efficiency and asset management, and external factors, including economic growth and interest rates. Internally, determinants like cost control, management quality, and bank size are crucial: Banks that balance costs and revenues effectively and implement efficient asset management generally achieve better financial outcomes. Larger banks may also benefit from economies of scale, although this relationship varies depending on institutional and economic contexts. Conversely, credit risk and non-performing loans (NPLs) pose challenges, reducing profitability due to the higher operational costs associated with defaults.

Externally, bank profitability is sensitive to macroeconomic factors. GDP growth stimulates lending and interest rates, boosting profitability, while inflation effects vary depending on banks' ability to adjust rates to local economic conditions. Unemployment tends to reduce profitability by limiting households' financial capacity, and low interest rates can compress profit margins. Recent literature emphasizes the positive impact of Fintech technologies, such as digitalization and electronic payments, on efficiency and profitability, while traditional factors like operational costs, asset quality, and leverage remain central. ESG factors (environmental, social, and governance) are also emerging as relevant, though further studies are needed to assess their impact fully. These insights are valuable for policymakers and bank strategists, pointing toward pathways for enhancing profitability and strengthening the banking system's resilience.

This study has limitations, primarily due to the exclusive use of the WOS database, which may restrict the scope of the literature analyzed. Future research should incorporate other databases like Scopus for a more comprehensive and representative analysis. Furthermore, the selection of keywords, while essential for a focused analysis, may have overlooked newer terms, potentially limiting the identification of emerging topics like digitalization and innovations in artificial intelligence (AI) within the banking sector. These technological transformations reshape the industry, directly impacting bank profitability and operational efficiency. Another limitation of the present study concerns the relatively limited analysis of the literature on specific research methods, as well as the omission of the peer effect in the assessment of bank profitability. These aspects will be addressed in future research to further deepen the understanding of these phenomena.

In this context, future research should investigate the impact of AI and other technologies further and consider the rising importance of ESG factors in the stability and financial performance of banking institutions. Combining bibliometric methods with qualitative approaches may also allow for a more comprehensive assessment of the research's practical and theoretical impact in this area.

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