The State of the Art of Academic Research on Non-performing Loans: A Structured Literature Review

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Abstract

This study aims to conduct a Structured Literature Review (SLR) on Non-Performing Loans (NPLs), defined as distressed credits or deteriorated loans, to explore their historical developments and prospects. NPLs played a prominent role in the global financial landscape post the 2007 economic crisis and, nowadays, their volume is managed thanks to regulatory intervention. However, academic research on this topic is limited and sparse, particularly in relation to market volume and prices trend, as well as emerging management strategies and sustainability's perspective. Therefore, our objective is to fill this gap and observe how the academic literature has responded to the development of this instrument. The SLR, and its associated bibliometric analysis, conducted using the Biblioshny package available on R-Studio, were performed on a sample of 1.236 academic documents (Articles, Book Chapters and Conference Papers) available on Scopus and published from 2010 to 2023. The sample, selected through a rigorous and validated screening procedure, was then studied across variables defined in the Analytical Framework: Topics, Research Methods, Research Area and Geographical Area. Based on this analysis, as explicitly stated in the findings section, we observe specific trending topics and geographical areas of study related to NPLs. This study not only helps fill a significant gap in academic literature concerning NPLs, but also provides important implications for financial practice and economic policy conducted by professionals, aiding in a better understanding of how to address and manage NPLs in various economic and geographical contexts. The originality of this research lies in its structured approach and use of bibliometric analysis, to examine a wide range of academic publications over an extended period, serving as a potential base for further insights and future studies.

Keywords: non-performing loans, finance, European Union, structured literature review, bibliometric analysis

Paper type: Research Paper

1. Introduction

Financial stability is a state in which an individual, an organization or economy can maintain a steady and healthy financial condition (Crockett, 1996; Gadanecz & Jayaram, 2008; Adrian et al., 2015). Specifically, financial stability is constituted by a balance between income and expenses, such that debt is managed responsibly and a financial cushion is available for unforeseen events (Adrian et al., 2015). In accordance with the literature reviewed, a high level of NPLs in the financial system may indicate instability, putting a strain on banks and, consequently, on the overall financial stability of the economy (Curak et al., 2013; Messai & Jouini, 2013).

An NPLs is defined as a bank loan that has not been repaid within the timeframes specified in the loan contract, usually for more than 90 days. This type of loan is considered "deteriorated" because the borrower is unable to make the agreed-upon payments of both principal and interest. NPLs represent a significant risk for banks as they increase the likelihood of financial losses. As we will see during this study, banks must manage and reduce NPLs through strategies such as debt restructuring, selling the non-performing loans to third parties or recovering the collateral. A high amount of NPLs, in fact, can compromise the capital structures of a bank and the financial system.

The evolution of tools for managing NPLs has followed the increasing complexity and quantity of bad-quality loans on bank balance sheets, especially after the financial crises of 2007-2012. While NPLs are a widespread issue worldwide, EU made significant efforts to regulate its own countries. Initially, European banks tried to manage NPLs internally through debt restructuring and intensified recovery actions. Subsequently, with the adoption of stricter

regulations by authorities such as the European Central Bank (ECB) and the European Banking Authority (EBA), more sophisticated tools were developed, such as the securitization of bad-quality loans, which allows banks to transfer the risk to external investors. Moreover, advanced digital platforms for managing Non-Performing Loans are arising gradually in Europe, significantly enhancing recovery efficiency and streamlining the sale of these loans. These platforms leverage sophisticated technology to automate processes, improve data accuracy, and provide better transparency for both buyers and sellers, thus facilitating more efficient transactions in the NPL market. State guarantees and tax incentives have further supported the process of offloading NPLs, making the European NPLs market more dynamic and liquid. These tools and regulations have helped reduce the burden of NPLs on European bank balance sheets, enhancing the overall financial stability. For this reason, as we will see in the theoretical background section, the EU could be considered the clearer scenario to understand the impact of NPLs.

In support of this assertion, we will present some data collected regarding the NPE (Non-Performing Exposure) of banks classified as systemic by the EBA, at the European level (Banca Ifis S.p.A., 2024). It is significant to note that the gross NPE ratio (the ratio between the value of non-performing loans and the stock of loans) of significant European banks reached a peak of 6,68% in 2015. Since then, this ratio has progressively decreased, reaching its minimum in 2022 with a value of 1,8%. This result is confirmed by the prospective data for 2024 and 2025, derived from a multivariate regression analysis, which rule out the possibility of a significant increase. In monetary terms, the gross amount of NPE (expressed in billions of euros) has followed a decreasing trend over the period considered, from 996 billion euros in 2015 to 357 billion euros in 2022 (Note 1).

These data show a constant trend of reduction in non-performing exposures, reflecting an improvement in credit quality and more effective risk management by European systemic banks. At the same time, however, they highlight how central the NPL market has been in the "old continent" over the past ten years.

The academic exploration of NPLs remains relatively underdeveloped. Moreover, there is a notable absence of studies utilizing structured literature reviews to trace the evolution of this topic. This methodological approach offers a systematic and replicable framework for analyzing existing literature, potentially yielding a deeper and more comprehensive understanding of developments and trends in NPL management. This could enhance the identification of best practices and effective strategies to address this global issue. To facilitate this aim, our study is guided by the following research questions (*RQs*):

RQ1: What is the state of the art of the academic literature on NPLs?

RQ2: Which geographic areas are most proactive in NPLs academic research?

RQ3: What possible future research/dissemination scenarios could be related to NPLs?

To address the *RQs*, we employed the SLR technique for its rigorous and transparent methodological framework in systematically examining the extensive literature on NPLs. This approach allowed us to critically identify existing knowledge, analyze geographical differences in academic focus, and pinpoint future perspectives for research and information dissemination in this critical field of international finance. Our findings, detailed explained in the dedicated sections of this study, clearly demonstrate the emergence of key trends and themes in the literature on NPLs. Keywords and trending topics proved significant in SLRs, with critical terms such as Banking, Financial Crisis, Macroeconomics and Regression Analysis. Methodologically, our investigation revealed a shift from predominantly quantitative approaches in early studies (2010-2014), to a predominance of qualitative methodologies in subsequent phases, with mixed methods being less utilized. Regarding research areas settled in *Scopus*, categories "*Economics, Econometrics and Finance*" and "*Business, Management and Accounting*" arisen as central in academic contributions. Geographically, Asian countries emerged as leaders in academic production on NPLs, with the tendency among Asian authors to collaborate less with international peers, potentially limiting diverse perspectives in the literature.

The roadmap of this study is divided in the following structure. Firstly, we addressed a theoretical background that, at the European exemplificative level, could highlight the regulatory and financial complexity of the NPLs instrument (Paragraph 2). Subsequently, in Paragraph 3, we explained the research methodology focusing on the following factors: a clear section dedicated to SLR in the academic context (Sub-paragraph 3.1); a detailed explanation of the Extraction and Sorting procedure underlying sample definition (Sub-paragraph 3.2); the methodology related to Bibliometric Analysis (Sub-paragraph 3.3); the various components of the Analytical Framework (Sub-paragraph 3.4). In Section 4, we presented the Findings, further discussed in Section 5 (Discussion and Conclusions). In Section 6, we conclude our work by discussing its limitations and suggesting ideas for future research.

2. Theoretical Background

In Europe, the issue of NPLs is closely monitored at the community level by central banks, which follow the regulatory framework of the EBA on "forbearance" and "non-performing exposures". It is important to clarify that the EBA is an EU agency, established in 2011, tasked with supervising and harmonizing the community banking market to ensure financial stability. The ECB, on the other hand, is the central bank of the EU countries; it not only issues currency, but also ensures price stability, supervises banks, guarantees the functioning of financial infrastructures and monitors and preserves the financial stability of community markets. Both the EBA and the ECB monitor and track the trends of NPLs.

Following the crises that characterized the years 2007-2012, the loans subject to write-downs in the balance sheets of Eurozone banks progressively increased, reaching almost 120% of the sum of tangible capital and loss reserves in the "significant" banks of the countries most affected by the recession (Cyprus, Greece, Ireland, Italy, Portugal, Slovenia and Spain) in 2012, and about 40% of the same aggregate in other EU countries (Velliscig et al., 2023). Concerning the total amount of loans, the percentage of deteriorated loans peaked in the countries most affected by the crisis in 2014, with a value of about 13%, while the peak for other countries was in 2012, with a percentage just under 4% (Climent-Serrano, 2019).

Considering the described situation, in 2017, the EBA issued the "Guidelines - EBA/GL/2018/06" aimed at inviting banks to develop a realistic strategy for managing and progressively reducing NPLs (European Banking Authority, 2018). Specifically, credit institutions were required to set quantitative targets to be achieved within a time frame they set (from 1 to 3 years) and to draft an operational plan for their management and reduction, approved and subsequently monitored by the Board of Directors. The Guidelines represent a real programmatic document of the ECB, with which the EBA outlines: the methods for developing the banks' strategy concerning non-performing positions, integrated at all organizational levels; the drafting of the operational plan and information flows with the supervisory authority; guidance action, the operational model, the control system, recovery activities and early warning systems; the drafting of a regulation to make "forbearance measures" sustainable, i.e., actions aimed at returning non-performing positions to performing status and preventing the deterioration of performing loans; the identification of NPLs and their potential write-off; the assessment of write-downs and real estate guarantees.

The ECB's 2017 provision was determined by the progressive increase in non-performing positions of banks that occurred in the years following the crises of 2007-2012. In July of the same year, the Council of the European Union not only invited the ECB, in collaboration with the supervisory authorities of individual EU countries, to implement the mentioned Guidelines for significant banks, but also urged the EBA to issue, by the following year, guidelines for all community banks on the identification, monitoring and internal management of NPLs (European Council of the European Union, 2017). In the Guidelines issued in October 2018, to specify "good risk management practices" for non-performing positions, the EBA suggests that intermediaries choose a combination of strategies for managing NPLs in the short, medium and long term, based on factors such as the intermediary's operating model and the characteristics of the credits in question as debtors; average exposure amount; existence of real guarantees, etc. (European Banking Authority, 2018):

- retaining on balance sheet, intensifying recovery actions, and evaluating the opportunity of forbearance measures (Guidelines for banks on non-performing loans, p. 43);
- reducing the portfolio through sales, securitizations or write-offs;
- enforcing or substituting guarantees and converting debt into shares or assets (Dello Strologo & Paoloni, 2023);
- taking legal actions (judicial or extrajudicial).

The EBA document applies to credit institutions with NPL ratios of no less than 5% at the consolidated level. From the above, it can be inferred that the strategies banks can appropriately balance are essentially two: an "internal" strategy and an "external" one.

Internal actions consist of retaining ownership of the loans, which can be restructured and collected directly by the intermediary or outsourced to a servicing company, controlled by the bank or independent of its group. The dynamics of sales show that the internal solution has been chosen only marginally. With the external strategy, NPLs are transferred to specialized "asset management" companies or securitization vehicles. In any case, the ECB's regulations aimed to provide a series of operational guidelines concerning: inviting the drafting of operational plans for strategy implementation; indicating the tasks of the Board of Directors; explaining forbearance measures; defining criteria for loan classification, value adjustments and loss recognition; requesting adequate real estate guarantee assessments; demanding a suitable IT infrastructure.

The actions undertaken by banks to fully respond to the ECB's requests and the policy conducted by European and individual community country banking supervision authorities, combined with the economic situation, have achieved the desired effects (Leone et al., 2019). In addition, to exerting moral suasion through the described Guidelines, the authorities facilitated the disposal of NPLs through various initiatives, such as guarantees for the securitization of bad-quality loans or tax incentives on banking Mergers and Acquisitions (M&As) (Note 2).

3. Methodology

The aim of this paper is to conduct an overview with respect to the instrument of NPLs in the academic literature. Given the importance, as well as the steady growth of this financial instrument, there are many sources available for its analysis and understanding. Some authors, in line with our objectives just expressed, have already applied the literature review tool on this topic (Manz, 2019; Chawla & Rani, 2021; Khairi et al., 2021). Based on this assumption, therefore, we apply a model already recognized and used in the international academic background to the topic of NPLs. However, to the best of our knowledge, there is a gap in the literature with respect to a structured, timely and current academic overview of NPLs. Indeed, not many studies perform a structured and up-to-date literature review on this financial instrument.

3.1 SLR

To fill this gap, we used the SLR technique (Tranfield et al., 2003). Due to its characteristics, SLR is now also a widely used tool in the world of accounting and management research (Massaro et al., 2016; Williams et al., 2021). According to Tranfield et al. (2003), this qualitative analysis allows the specific investigation of academic literature related to a research topic. Its main feature rests on a strict protocol of source selection and analysis (Marcos-Pablos & Garc á-Pe ñalvo, 2018). The first procedure is to set the extraction in composing the search string of the selected database. The extraction of scientific articles was carried out thanks to *Scopus*. This database, in fact, offers a very wide range of scientific articles and contributions in addition to being internationally recognized as a reliable and authoritative platform (de Moya et al., 2007).

Next, in accordance with the literature reviewed, SLR provides a timely, systematic and rigorous source screening procedure. Each step, which limits the starting sources by adding exclusion parameters, must be meticulously explained and justified (Marcos-Pablos & Garc á-Pe ñalvo, 2018).

Compared to traditional qualitative research methods, due to the characteristics just reported, SLR provides several advantages:

- allows a large number of sources to be selected and reviewed in a timely and systematic manner (Danese et al., 2018);
- offers the ability to map sources against multiple factors (e.g., topic, research area, geographic area and research methods) (Kauppi et al., 2018);
- minimizes the possibility of error in the study (Dada, 2018);
- allows the research to be replicated because of the detailed dissemination of the source selection process. This allows for an easier review process to attest to its validity, as well as making the research replicable for other scholars (Jesson & Lacey, 2006; Nofal, 2018).

Once we selected the research methodology consisting of the SLR, we followed the protocol as presented by Massaro et al. (2016) to ensure its replicability.

3.2 Extraction and Sorting Process

Next, we defined the extraction and sorting process, as we show in Figure 1. Specifically, in reference to extraction, we set the search string to Scopus. By entering in the search bar: (TITLE-ABS-KEY (non-performing AND loans) OR TITLE-ABS-KEY (non-performing AND loans*)), we received a total of 1.700 documents.

In reference to the screening procedure, however, we decided to apply four sequential steps. As a first step (1), we limited the year of publication from 2010 to 2023, taking the new total to 1.519 academic sources referring to NPLs. From the sources collected to this point, however, not all of them referred to our study area. To remedy this problem (2), therefore, we set up three study areas given by *Scopus: Economics, Econometrics and Finance; Business, Management and Accounting and Social Sciences.* Our new sample, after the limits set on the areas, was reduced to 1.307 sources. The next screening procedure (3) referred to the nature of the sources. Since, in line with what was expressed in our study, it was our desire to search for academic sources on NPLs, we filtered: Article; *Book Chapter and Conference Paper.* After applying these filters, the total dropped to 1.260 articles. In conclusion (4), to give

international relevance to our study and make the search applicable to all, we decided to apply a final filter on the language of the papers: *English*. Our sample, at this point, turns out to be 1.236 articles (Figure 1).

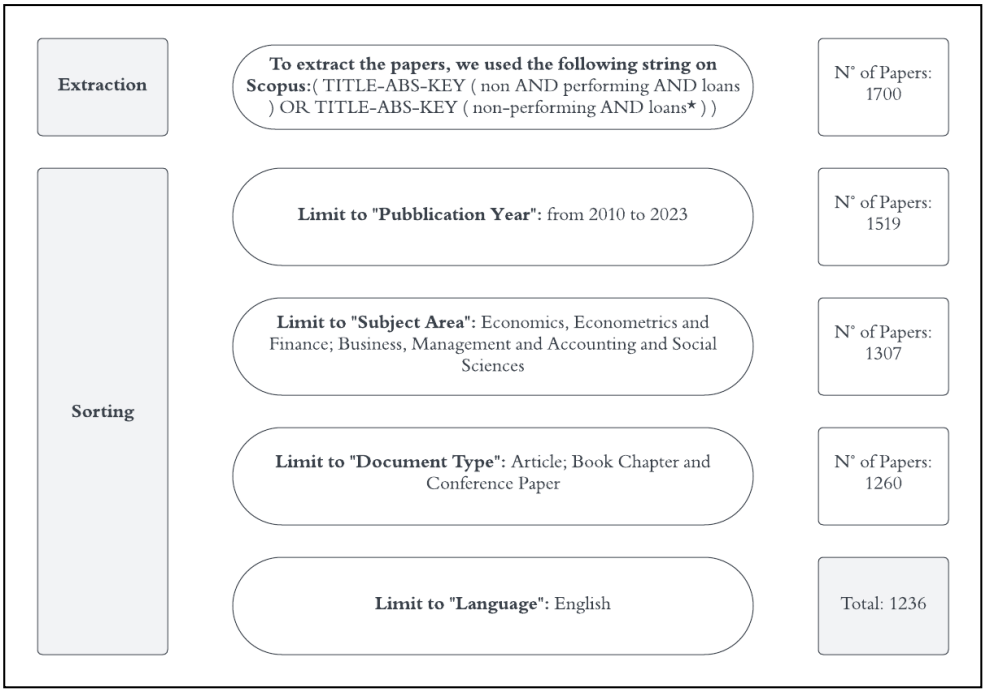


Figure 1. Extraction and sorting process

Source: Authors

The scheme summarized graphically in Figure 1, as well as explained in detail in this section, allowed us to select the final number of sources under study. The sample of 1.236 scientific papers, then, was deepened and studied according to what we report in the Analytical Framework (3.4).

3.3 Bibliometric Analysis

As a data processing tool, we made use of the *Biblioshiny* package offered by the *R-Studio* program. Among its various applications, this program can provide an accurate and powerful reading of countless analysis factors (Derviş, 2019). In accordance with the literature, in fact, bibliometric analysis constitutes one of the most widely used and efficient tools for identifying the state of the art of scholarly dissemination, concerning a specific topic on the date of extraction (Xie et al., 2020). For this reason, many scholars used the bibliometric analysis powered by *Biblioshiny* connected to the SLR (Linnenluecke el al., 2020; Donthu et al., 2021).

To do this, we followed the classic *Biblioshiny* coding process (Derviş, 2019). First, we exported the 1.236 sources under analysis (Figure 1) into a "BibTex" file. Next, compiling the write string directly in *R-Studio*, we opened the *Biblioshiny* package to load the file extracted from *Scopus*. Once our database was loaded, it was possible to begin the process of extracting the information of our interest, which we summarize in the next section (3.4 Analytical Framework).

3.4 Analytical Framework

Table 1. Analytical Framework

A - Topics
• A1. Most Relevant Words (keywords) • A2. Trend Topics
B - Research Methods
• B1. Qualitative • B2. Quantitative • B3. Mixed Methods
C - Research Area
• C1. Economics, Econometrics and Finance • C2. Business, Management and Accounting • C3. Social Science
D - Geographical Area
• D1. Geographical Area of Author's Affiliation/ N° of Documents • D2. Correspondig Author's Native Countries/ N° of Documents • D3. Most Cited Countries

Following the graphical representation in Table 1, we explicate points *A, B, C* and *D*:

A – Topics

A1: keyword research is among the most widely used tools in SLR (Massaro et al., 2016; Williams et al., 2021). Indeed, this type of analysis can help researchers find relevant articles that can expand on existing topics in each field. However, while keyword search is effective and efficient, accurate reading parameters must be selected. In fact, as Cronin et al. (2008, p. 40) state: "keywords require careful consideration in order to select the terms that will generate the searched data". Therefore, to make our research more comprehensive, we decided to tie keywords to another important parameter: trend topics (*A2*).

A2: numerous scholars have delved into the concepts expressed by keywords by associating them with trend topics (Lu et al., 2021; Huang et al., 2022). Often, in fact, one of the most frequently used methods of generating trend topics is precisely through keyword frequency analysis (Calof et al., 2022). Comparative reading of these two types of information can generate major considerations. If, in fact, reading keywords alone can be considered "sterile", associating them with trend topics can complete the analysis of representing when and with what intensity the most relevant topics were addressed.

B – Research Methods

To continuously increase the degree of depth of our SLR, we have extracted data referring to research methods. This category, facts, helps us observe under which research methods NPLs are studied over time.

C – Research Area

This category of analysis of the SLR allows us to observe, as well as to delve into, the research areas of interest on a given topic. In this study, specifically, we decided to apply the filters explicit in categories *C1*, *C2* and *C3* (provided by *Scopus*) to perform an extraction more inherent to our field of study. Thanks to this, it was then possible to perform the considerations pertaining to scientific production by individual area as stand-alone data and over time.

D – Geographical Area

Among the highlights of an SLR there is certainly the analysis of the geographical area of the sources. This category can be approached from numerous points of analysis. In our case, we decided to focus on three main categories: *D1*, *D2* and *D3*. This choice, in our opinion, allows an overview of the areas covered by scientific production.

4. Findings

4.1 Most Relevant Words (Keywords)

The first extraction process we decided to perform from *Biblioshiny* is regarding the most frequent keywords. In fact, the classes we made explicit in Section 3.4 correspond to the ten most cited keywords from the processed database (from 2010 to 2023). In this logic, the graph in Figure 2 expresses their distribution (number of citations) by a single class.

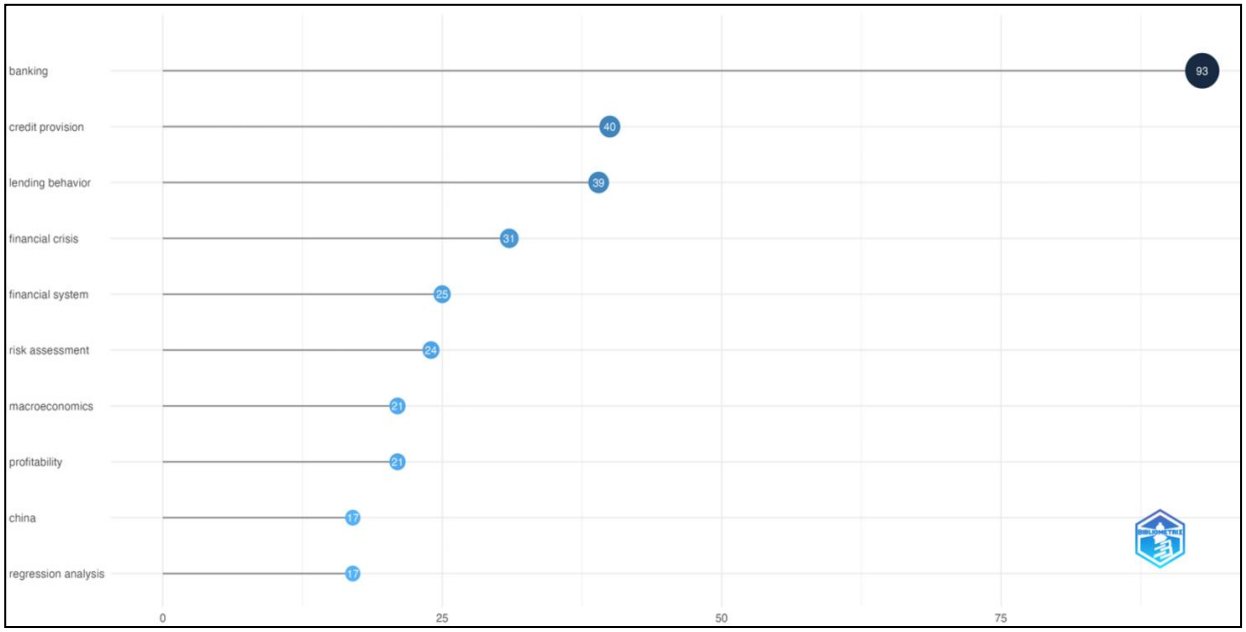


Figure 2. Most Relevant Words (keywords)

Source: Authors

Once we had extrapolated the list of relevant keywords by usage from the sample, we decided to study whether some of them coincided with trend topics present in the abstracts of the papers (Figure 3). Our combined search of these two fields of observation (keywords and topics), made possible by the special function of the *Biblioshiny* package, was successful. All keywords, in fact, constituted or constitute trend topics in the literature.

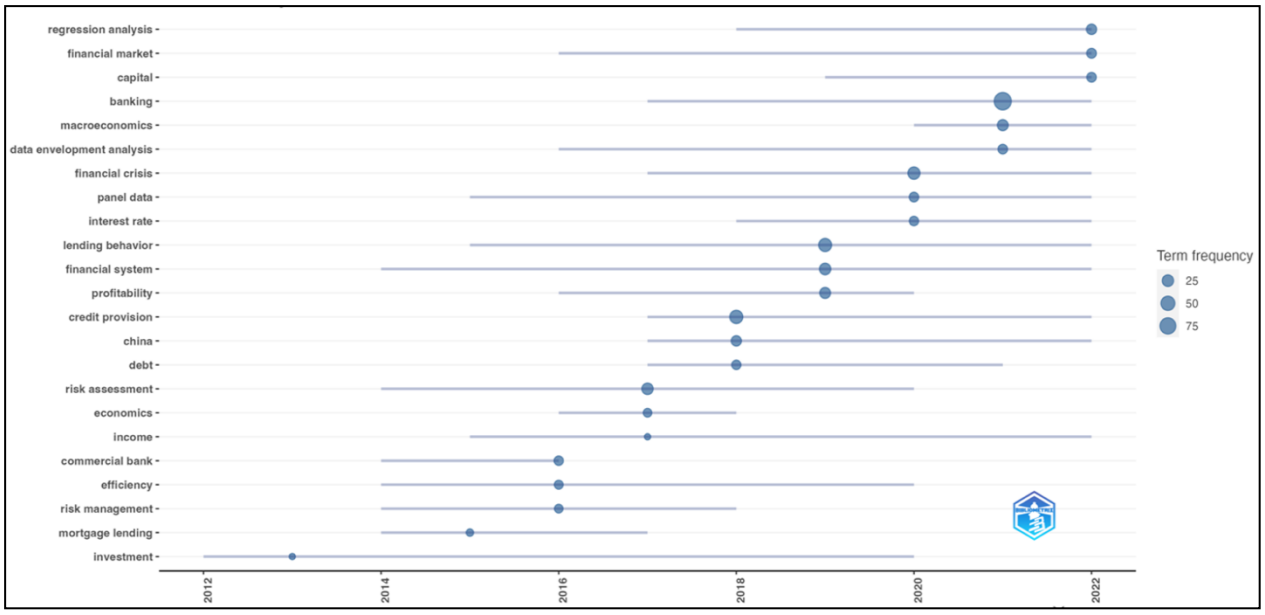


Figure 3. Trend Topics

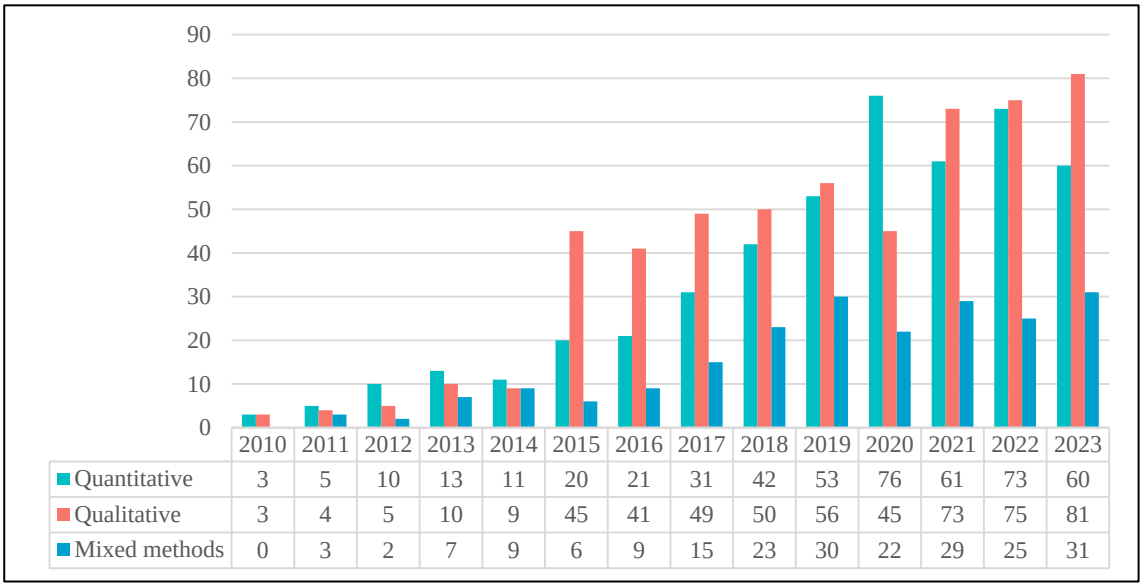
Source: Authors

Looking at the results in Figure 3, none of the relevant topics on NPLs start from 2010 (the year our source extraction began). Trend topics data for 2023, instead, since our extraction is prior to the close of the year, are not yet available. After these reflections, comparing the popularity ranking of keywords, their relationship with trend topics reflects an interesting pattern:

- banking. This is a trending topic detected since 2017 that peaked in 2021 with a peak frequency of 75 terms;
- credit provision. The topic of credit provision, also relevant since 2017, appears to be a more obsolete trend topic. In fact, its peak of use, albeit with a frequency index of 50, is reported as far back as 2018;
- lending behavior. The same applies to this topic as the previous class (A2), with a minimal difference in the topic's temporal extent. Its use, in fact, starts in 2015 and reaches its peak frequency (50 terms) in 2019;
- financial crisis. Its relevance started in 2017 and reached its peak (50 terms) in 2020;
- financial system. This topic is among those that have distributed their relevance the longest over time. In fact, its time span begins in 2014 and ends in 2022, with a peak of 25 terms reached in 2019;
- risk assessment. This topic began to be relevant in 2014, reaching its peak of 25 terms in 2017;
- macroeconomics. This topic, with reference to our sample, is the youngest observed in the sample. In fact, it starts in 2020 and reaches its peak of 25 terms the following year;
- profitability. The profitability term related to NPLs gains relevance in the 2016-2020 time frame. It peaks in 2019 at a frequency of 25 terms;
- China. This topic weighs a medium to long time horizon of relevance 2017-2022, with a peak frequency of 25 terms (2018);
- regression analysis. Among the identified keywords is the only trend topic that reaches its peak of relevance (frequency of 25) in 2022.

4.2 Research Methods

This part of the descriptive statistics of the sample was certainly the most laborious and complex. Specifically, to compose the histogram in Figure 4, instead of uploading the "BibTex" file to *Biblioshiny*, we exported it to Excel. The operation was functional to read in text format all the individual titles/abstracts/keywords in the sample (1.236). Following the reading, our subjective judgment took over in determining which contributions could be placed in the categories: *B1*, *B2* and *B3*. As is evident from the graph, we repeated this study for all reference years 2010-2023.



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Quantitative	3	5	10	13	11	20	21	31	42	53	76	61	73	60
Qualitative	3	4	5	10	9	45	41	49	50	56	45	73	75	81
Mixed methods	0	3	2	7	9	6	9	15	23	30	22	29	25	31

Figure 4. Research Methods

Source: Authors

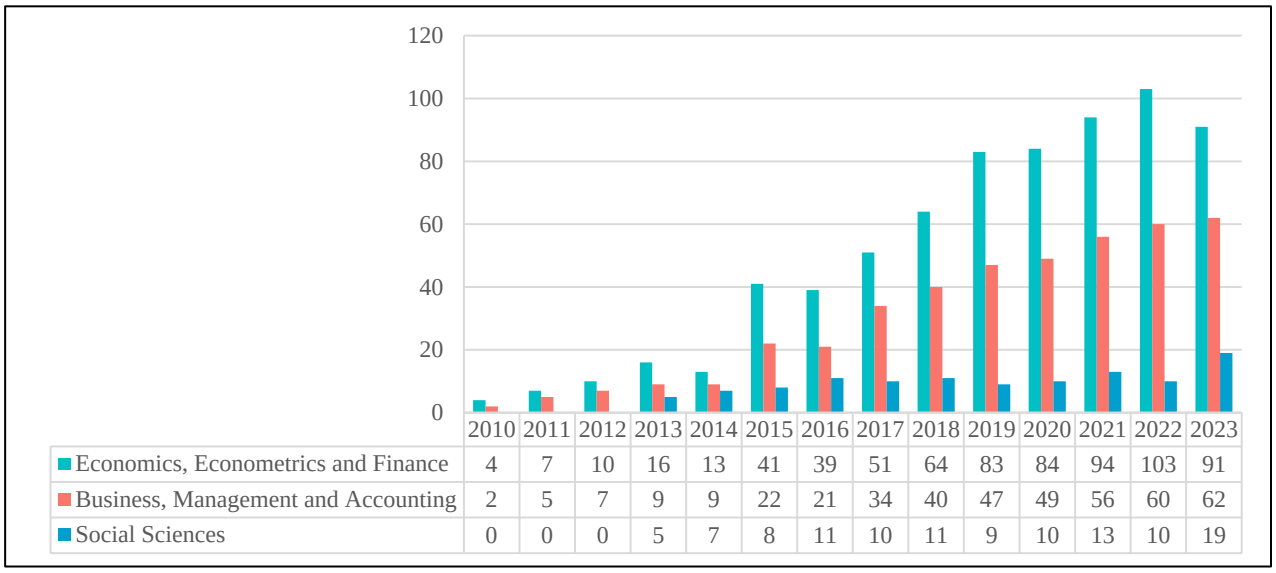
Several observations can be drawn from Figure 4. The first salient element is that in the initial stage of literature development on NPLs (2010-2014), there was a stable division of *B1* and *B2* categories with one exception in 2012, which recorded twice as many quantitative contributions as qualitative ones. Compared to the stage of literature development, in the 2011-2014 period, we recorded a higher utilization of quantitative research methods than the *B2* category. This condition, except for 2020, will no longer be verified in the entirety of the analysis period.

In opposition, in the "maturity" phase of NPLs, the nature of contributions saw the prevalence in class *B2* over *B1*. Specifically, the qualitative method outperformed the quantitative method with 65% utilization as an average over the three-year period 2015-2017. Analogous situation in 2023 where qualitative methods recorded 57% utilization compared to quantitative methods. As for the other years (2018, 2019, 2021 and 2022), however, we record a minimal difference in utilization between categories *B1* and *B2*.

The mixed methodology (*B3*) was the least used. In fact, as expressed by the histograms in Figure 4, it has never resulted in a viable alternative to replace categories *B1* and *B2*. From the evidence we report, the *B3* category has never exceeded 25% (2010-2023), except for the year 2014 where it peaked at 31%.

4.3 Research Area

With reference to the Research Area, thanks to the special filter function applied on *Scopus*, we were able to observe the number of contributions published annually for each of the three areas of our interest. By applying the year-by-year filter, we were able to annotate on Excel their distribution, as shown in the legend in Figure 5. The histograms in the graph (Figure 5), in fact, show through a chromatic division the breakdown of the total number of contributions in the sample (1.236) from 2010 to 2023.



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Economics, Econometrics and Finance	4	7	10	16	13	41	39	51	64	83	84	94	103	91
Business, Management and Accounting	2	5	7	9	9	22	21	34	40	47	49	56	60	62
Social Sciences	0	0	0	5	7	8	11	10	11	9	10	13	10	19

Figure 5. N °of Contributions/Research Area

Source: Authors

The graphic evidence helps us to draw some conclusions regarding the research areas. The first category "Economics, Econometrics and Finance" (*C1*) is the category that collects the most contributions (56,63% of the sample). The next category "Business, Management and Accounting" (*C2*), on the other hand, collects 34,22% and then comes to the last class "Social Science" (*C3*) with only 9,14% of contributions.

The trend of the first of classes is similar and follows an upward trend. The only exception is the number of contributions from class *C1* in 2023 with a number of 91 papers. This figure, in fact, read with that of the previous year (103) marks a slight decrease, albeit not significant, which could be attributed to our date of extraction. Classes *C1* and *C2* demonstrate how the topic of NPLs is growing steadily with reference to these classes of research. Category *C3*, on the other hand, is an outsider in this discourse. This is due both to the number of contributions, which is small compared to *C1* and *C2*, and regarding a trend of publications that is fluctuating and not growing steadily.

4.4 Geographical Area

The study section we present, with reference to geographic area, consists of 3 subsections and is articulated with the tools provided by *Scopus* filters (Figure 6), as well as those provided by *Biblioshiny* (Figures 7 and 8).

As a first part of the study, through the application of *Scopus* filters, we identified the ten countries that collect the largest number of documents on NPLs. The premise we make, in contrast to what we study in the subsequent graphs, is that the reference countries in Figure 6 refer to the Geographical Area of Author's Affiliation.

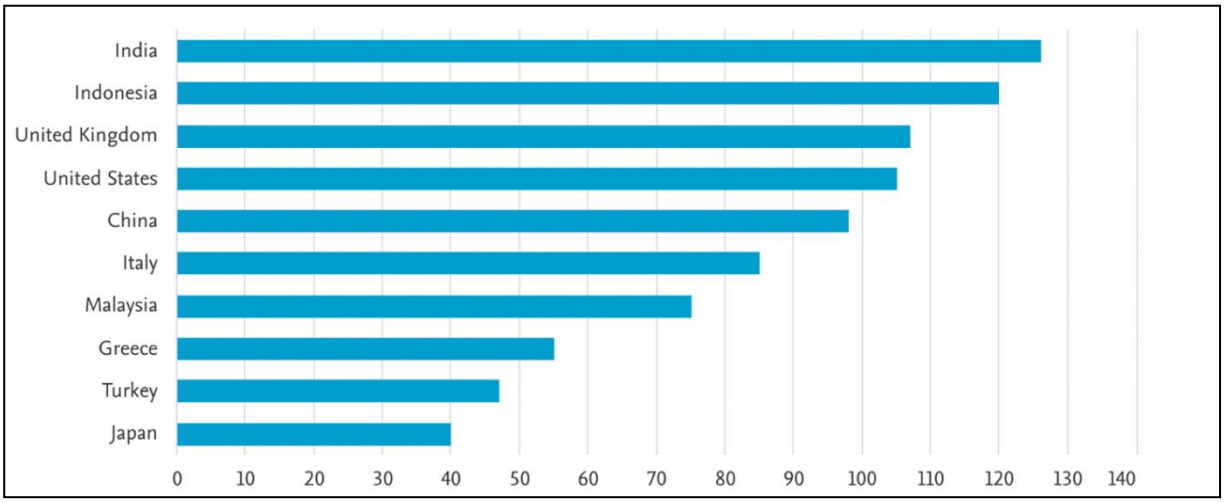


Figure 6. Geographical Area of Author's Affiliation/ N °of Documents

Source: Authors

Using data extracted from *Scopus* for the Geographical Area of Author's Affiliation/ N °of Documents, the following global picture of the top ten countries by number of academic papers produced on NPLs was drawn. From the evidence found, and summarized in Figure 6, the Asian continent is the leading continent for academic literature in this field of research. Countries such as: India, Indonesia, China, Malaysia, Turkey and Japan gather, in fact, 40,69% of the sample (out of the 1.236 papers studied). This is followed by the European continent (UK, Italy and Greece) with 20% of the sample and, finally, the U.S. with 8,5%. The rest of the papers, 30,81% of the sample, is highly fragmented and widely distributed in the international context.

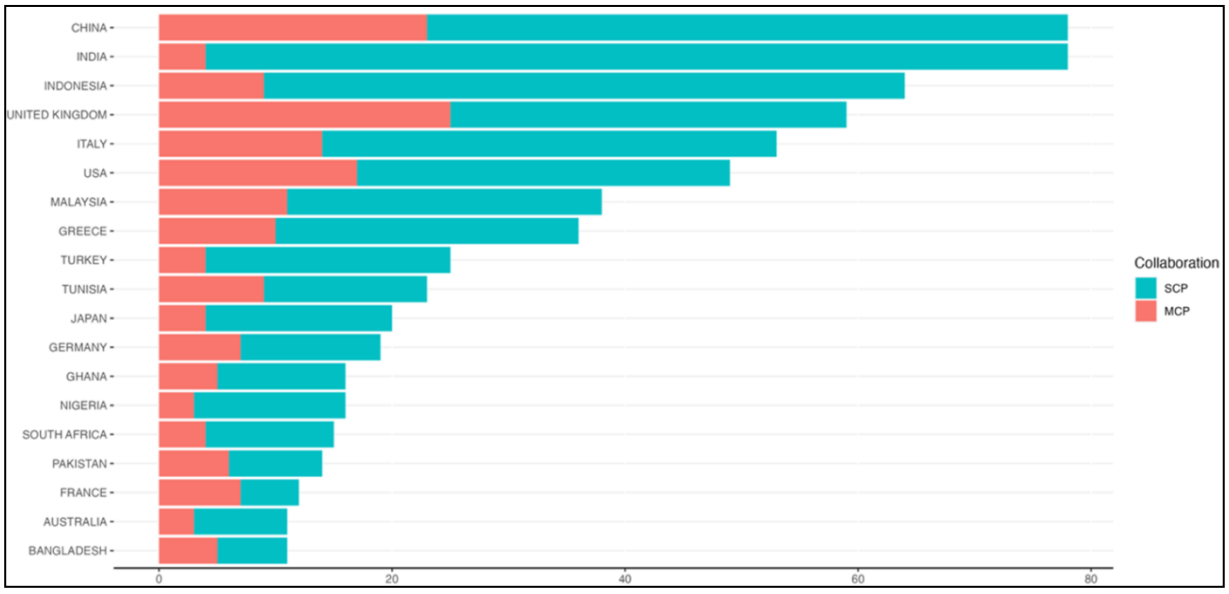


Figure 7. Corresponding Author's Native Countries

Legenda:

- *SCP: Single Country Publications;*
- *MCP: Multiple Country Publications.*

Source: Authors

Following the study of the distribution of publications by Geographical Area of Author's Affiliation, we focused our attention on the country of origin of authors of scholarly contributions (Figure 7). To do this, we queried the database with the appropriate tools provided by *Biblioshiny*. The valuable contribution of this specific function of the program is that, as we indicate in the legend, it was possible to split *Single Country Publications (SCP)* from *Multiple Country Publications (MCP)*.

Based on the evidence provided by the graph (Figure 7), publications tend to be referred to *SCPs* in greater numbers than *MCPs*. Only France, compared to the 19 countries sampled, appears to have more international collaborative works than purely domestic ones. In conclusion, the clear evidence is that on NPLs, international academic collaboration appears to be low compared to other research topics.

In the final analysis, to complete the descriptive statistics analysis conducted by Geographic Area, we decided to measure through *Biblioshiny* the academic relevance of the countries globally most cited in reference to NPLs (Figure 8).

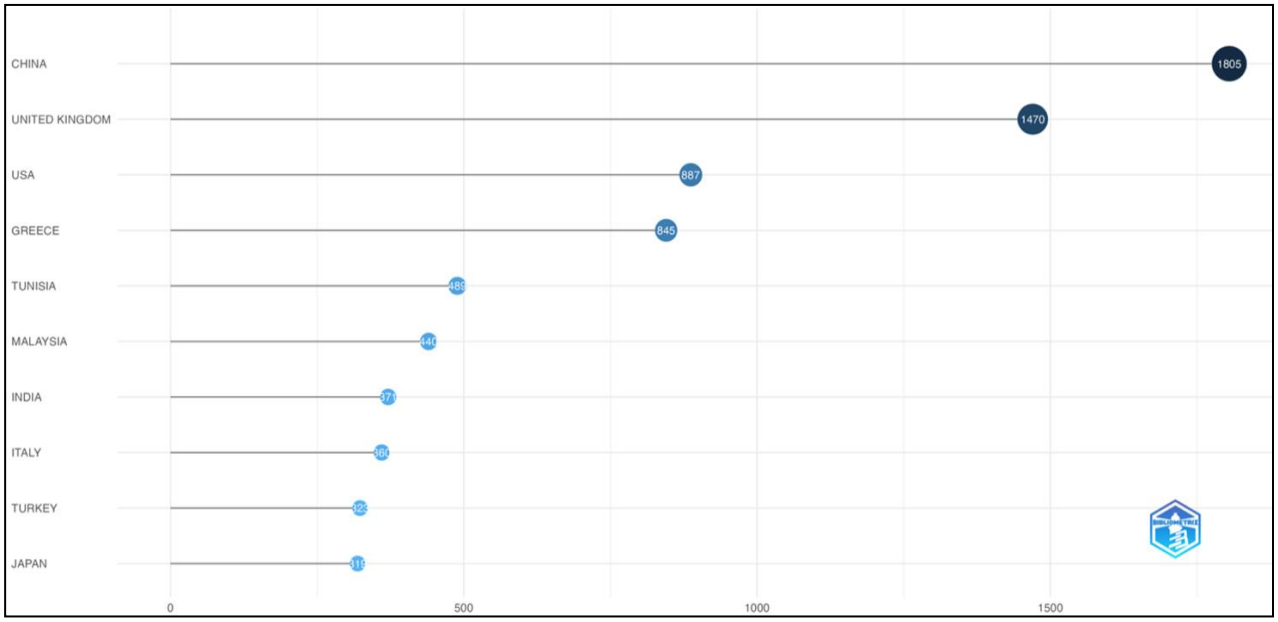


Figure 8. Most Cited Countries

Source: Authors

Interestingly, the ten most cited countries (Figure 8) are the same countries studied in Figure 6, where Geographical Area of Author's Affiliation/ N ° of Documents was studied. However, according to the database processing it is possible to see in Figure 8 a different distribution of the sample analyzed in Figure 6 as they do not follow the same order. The academic relevance of the literature on NPLs confirms the central role played by Asia in this category. Following the pattern already expressed, also in terms of the number of citations, the European continent classifies in second position and then gives way to the USA.

In conclusion, thanks to the graph in Figure 8, it is possible to say that the greatest scientific relevance is linked to the Asian context. If we read this figure by comparing it with the evidence expressed in Figure 7, this could also be due to a choice of the authors to work with colleagues from the same country rather than collaborate internationally on the topic of NPLs.

5. Discussion and Conclusions

Connected to the evidence gathered in the descriptive statistics presented in the previous section, we respond to the *RQs* we had set as cornerstones of our SLR. Specifically:

RQ1: What is the state of the art of the academic literature on NPLs?

RQ2: Which geographic areas are most proactive in NPLs academic research?

RQ3: What possible future research/dissemination scenarios could be related to NPLs?

The first part of our discussion concerns the keywords and trend topics observed in the literature on NPLs. Indeed, in accordance with the literature, these two parameters are among the most widely used and reliable in SLR settings. Specifically, answering *RQ1* it is possible to state, combining the information provided and summarized graphically by Figures *2* and *3*, that there are relevant keywords and trend topics in the international academic context. Some keywords (Figure 2), in fact, may simultaneously constitute relevant topic in the literature (and vice versa). From the processing of the database through *Biblioshiny*, we identified four of them: *Banking*, *Financial Crisis*, *Profitability* and *Macroeconomics*. It is interesting to note that while the first three keywords are closely related to the topic of NPLs, the last one (*Macroeconomics*) refers to the current research trend in doctrine. It means that academia, as a result of scientific publications related to NPLs, analyze this asset from a macroeconomic perspective, disregarding many other microeconomic features, such as their impact on banks' financial reporting or on the wealth of households and vulnerable families. With reference to the academic literature on the topic, in fact, these keywords are the ones that are most relevant, as well as constituting current and growing trend topics. The information that emerges from this specific database query is useful in understanding under which topics NPLs are analyzed. This specific focus, then, makes it possible to complete the discourse on the topic by going to perform a topic-specific focus, or alternatively, by creating an interdisciplinary thread with the main trends related to the topic.

To complete the analysis of the extracted sample, we focused on the research methods (*B1*, *B2* and *B3*). From the histograms in Figure 4 we observed that at an early stage the literature on NPLs (2010-2014), was predominantly quantitative. In the "maturity" stage of NPLs, however, the nature of the contributions saw the prevalence of the qualitative class over quantitative and mixed methods. Finally, the mixed methodology (*B3*) was the least used compared to its two classes (*B1* and *B2*).

In response to our *RQ1*, we ultimately focused on Research Areas. The three categories analyzed, as we explicitly indicated in the preceding paragraphs, coincide with the labels assigned by *SCOPUS* with reference to our disciplinary area. The other labels, since they are not inherent to our research area were excluded. Thanks to Figure 5, we have graphically represented the number of articles by individual area. The state of the art of the literature on NPLs seems to converge in an almost total attribution of scientific contributions in *C1* and *C2* categories. In this sense, the steady and gradually growing trend does not portend a sudden change of Research Areas on the topic.

Subsequently, we shifted our attention to the geographic areas most active in the academic production of NPLs (*RQ2*). In line with the most common items addressed in an SLR, the geographic area of the sources produced is indeed among the most relevant information. To bring descriptive statistics evidence to this section, we used the analysis filters made available by *Scopus* and, in parallel, queried the database with the codes entered on *Biblioshiny* (Figures 6, 7 and 8). The comparative reading of Figures 6, 7 and 8 leaves no room for interpretation. Indeed, the graphical representation of the fields of analysis confirms that the Asian continent is the leading continent in the academic literature on NPLs. This converse is true for both affiliation and origin (country of birth) of the authors (Figures 6 and 7). In addition to this, we found that Asian academic authors (over the analysis period 2010-2023) seem to avoid the possibility of working synergistically with their foreign colleagues (Figure 7). In our opinion, this finding could bias the literature on the topic by implying a limited and absent view of "academic contamination" resulting from international studies. As the last study element of our *RQ2*, we focused on the reliability of academic sources sorted by geographic area. Among the main tools that enable this type of reflection is the source citation parameter (Massaro et al., 2016; Tahamtan et al., 2016). Also, in reference to this topic, Asia is the continent that leads in number of citations. This, clearly, could be due not only to the quality of contributions, but also to the tendency of academics from the same country to work with each other. This, in fact, could discourage the use of foreign sources, contributing to limiting the discourse on NPLs.

To address the research question *RQ3*, the findings from the SLR suggest several potential avenues for future research and dissemination. First of all, future studies could benefit from an interdisciplinary approach that integrates insights from economics, finance, management and other relevant fields. Given the keywords and trending topics identified, such as *Banking*, *Financial Crisis*, *Macroeconomics* and *Regression Analysis*, interdisciplinary research could provide a more holistic understanding of NPLs and their impact on various economic sectors. This approach could also foster innovative methodologies and theoretical frameworks to analyze NPLs more comprehensively. In addition, the current literature indicates a strong geographical focus on Asian countries, with less international collaboration. Future research could explore NPLs in under-researched regions, such as Africa and South America, to provide a more global perspective. As we know, fostering international collaboration could enhance the diversity of perspectives and methodologies, leading to richer and more generalizable findings. Encouraging joint research

projects and comparative studies across different countries could help in understanding the global dynamics of NPLs. In more technical perspective, while early studies predominantly employed quantitative methods, there is a growing trend towards qualitative research. According to that, future research could further explore mixed methods to combine the depth of qualitative insights with the generalizability of quantitative findings. This approach could provide a more nuanced understanding of the factors driving NPLs and the effectiveness of various management strategies. Specifically, case studies, interviews and ethnographic studies could uncover the contextual factors influencing NPLs in different economic environments. Moreover, knowledge of trends in non-European markets can enable significant growth for operators investing in the NPL market or handling the collection of bad quality debts, either on their behalf or for third parties. To delve deeper into the discussion on possible future research scenarios, we expand on the answer to *RQ3* in the next section of this study, where we consider the limitations of our research and possible ways to overcome them.

6. Limitations and Future Research

We are aware that our work has limitations that could be addressed by future studies. The biggest limitation of our study is that it provides a theoretical scenario heavily focused on Europe. In our opinion, the role of international regulatory frameworks and policies in managing NPLs presents a significant area for future research. Future studies can examine whether, at the non-European level, there have been policies and initiatives to mitigate the impact of NPLs on banks, as has been done in Europe by the ECB and EBA. This line of research could offer valuable insights for policymakers and financial institutions in designing effective strategies to handle NPLs in the global markets in the future.

Another limitation of our research is the exclusive use of the *Scopus* database for sourcing academic references. While this search engine is among the most authoritative and widely used globally, it does not cover all international publications on the topic. Future research could address this by cross-referencing our findings with other databases from different search engines.

In conclusion, since this study is a SLR and, therefore, a retrospective analysis, it does not allow for any examination of future market trends, including transaction volumes and prices trend of distressed assets.

As a final point in this paragraph, we would like to suggest two research topics related to NPLs that will be relevant in the future academic context. First, it will be interesting to consider how new technologies such as big data analytics, machine learning and artificial intelligence impact the management of NPLs. This could be a promising area for future research to understand the future developments of this tool. Studies could explore how these technologies can improve the identification, monitoring and resolution of NPLs, starting from the insights just expressed. Research could also investigate the challenges and opportunities associated with implementing these technologies in different financial systems. This could provide practical implications for financial institutions seeking to leverage technology to enhance their NPL management processes.

Secondly, it could be interesting to connect the topic of NPLs to the "social sustainability" of the activities of banks and financial intermediaries. This topic could be connected to the observation of their ability to facilitate the "rehabilitation" of the debtor, their "education" in managing cash flows (capital and interest) derived from debt, and reducing the risk of incurring debts beyond their repayment capacity (Arduini, 2023). In this scenario, recent empirical research has shown that financial inclusion in an industrialized country, such as Italy, is a useful tool to help low-income families emerge from poverty and to prevent the risk of poverty among vulnerable families (Bettin et al., 2023). Furthermore, this risk is significantly influenced not only by the income and monetary resources of families, but also by their level of existing debt (Loschiavo et al., 2024). For this reason, the tool of NPLs offers an interesting perspective for studying the sustainability and ethical sphere connected to banks' management.

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Authors' contributions

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No additional data are available.

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Notes

Note 1. According to Banca Ifis S.p.A. (2024) market survey the volume of the NPE transactions, during the last eight years, was the following: in 2015, 996 billion euros; in 2016, 914 billion euros; in 2017, 754 billion euros; in 2018, 603 billion euros; in 2019, 528 billion euros; in 2020, 468 billion euros; in 2021, 391 billion euros; in 2022, 357 billion euros.

Note 2. Tax incentives on M&As, unlike other initiatives described, had the effect of reducing the level of NPLs only in the rare cases where the entire assets of the seller were transferred. Conversely, especially in rescue operations, where the buyer was engaged in "cherry-picking", just selecting the "healthy" assets of the acquired bank, the tax incentive did not achieve the desired effects, as the distressed loans were sometimes transferred to a NPLs' servicer and sometimes remained in the compulsory liquidated bank, while a new the bridge bank was inheriting the "healthy" assets.