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RESEARCH MAPPING ON CREDIT RISK IN ISLAMIC AND CONVENTIONAL BANKING

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Abstract

This study aims to determine the development of research around credit risk in Islamic and Conventional Financial Institutions. The research was conducted from 1975 to 2022 by searching national and international journals indexed by Google Scholar, Sinta, and Scopus via the Perish/Harzing application with the keyword "Credit Risk." Based on the search results, there were 1139 research articles, then inputted into the VOSviewer application and analyzed descriptively through a literature review study. The results showed that the number of publications had increased significantly every year. Furthermore, based on the results detected using the VOSviewer application, research related to credit risk is divided into 5 clusters. Meanwhile, based on the results of a literature review study, there are 13 main themes related to credit risk in Islamic and Conventional Banking.

Keywords: *Credit Risk, Bibliometrics, VOSviewer, Literature Review, Islamic and Conventional Banking*
JEL Classification: *G2, G21*

1. INTRODUCTION

Risk management in banking has increased in line with developments in the financial industry (Kunz, 2021). In recent years, banks have begun to understand the importance of risk management to maintain business stability and continuity. This can be seen from the existence of regulations from the Financial Services Authority (OJK) which regulate the management of risk exposure and effective corporate governance (Kulinska-Sadtocha, 2022). Risks that exist in the financial sector must be identified and controlled by estimating the potential that might occur in the future, not after the risk has occurred. Therefore, a methodology for modeling risks that may occur in the future is very important to do so that those who make decisions can prepare strategies to deal with future risks (Oyewo, 2022). One of the risks that occur in the financial industry is credit risk. Credit risk management involves identifying, assessing, controlling, and monitoring these risks over time to ensure that the Bank remains stable and maintains its reputation.

In previous research, credit provision activities, both for business and consumption purposes, have the potential for debtors to be unable to fulfill their obligations to the Bank. This can be caused by business failure, the nature of the debtor who is not responsible, or errors in the credit application process from the Bank (Naili, 2022). Credit risk is also present in treasury activities. In this case, credit risk can occur when a bank places funds with another bank. Usually, the limit for placement of funds with other banks is "clean," not requiring the submission of guarantees from the receiving Bank. Therefore, credit risk will occur if the receiving Bank cannot fulfill its obligation to return the funds at maturity to the funding bank (Amalia, 2019; Ali *et al,* 2019). There are ways to determine credit risk on commercial loans and consumer loans. The method of measuring credit risk at a bank or financial institution will take several factors into consideration, including the ability to pay, creditor reputation, quality of the collateral, business environment, policies, and regulations. Once these factors are taken into consideration, the Bank or financial institution will provide a credit score or rating to the lender. This score or rating indicates the level of risk associated with credit and can be used to decide whether credit should be given, under what terms, and at what interest rate, meanwhile, for consumption credit (Alabi, 2021). Currently, productive assets in national banks are dominated by loans received, while the largest source of funds comes from third parties. If there is a significant increase in credit risk at a bank, this can make it difficult for banks to pay for sources of funds. This can reduce people's trust in keeping their money in the Bank (Zaslavska, 2020; Devi and Firmansyah, 2018).

Based on the problems above, it is necessary to map credit risk management topics to identify, measure and control risks that will occur. This can meet the needs of human resources in charge of risk management who have the knowledge, skills, and attitude to work according to the needs of the Bank. So, the purpose of this research is to map research topics around credit risk in Islamic and Conventional Banking by using: (1) the bibliometric VOSviewer method to analyze and study maps of the development of literature in the publication of a scientific field by making metadata network maps; and (2) literature review studies to analyze, identify and review articles from indexed international journals and accredited national journals.

2. LITERATURE REVIEW

Credit risk in banking is the risk that arises when the party receiving the credit from the Bank fails to fulfill its obligations, such as failing to repay a loan or not paying interest. This causes losses for the Bank. This credit risk can originate from a variety of bank business activities, such as acceptances, interbank transactions, lending, trade financing transactions, commitments and contingencies, bonds and exchange rates, and derivative transactions (Hassan *et al,* 2019).

Bibliometric studies is a branch of science that analyzes and evaluates scientific publications and related information. It involves the use of statistical and informatics methodologies to assess the production, citation, and dissemination of knowledge in the scientific literature. Bibliometric studies can be used to measure the performance and contribution of individuals, institutions, and disciplines, as well as to understand interactions and relationships between disciplines and publications. It can also assist in the identification and evaluation of trends and issues in the scientific literature. Some applications of bibliometric studies include citation network analysis, cluster analysis, and visibility analysis. Results from bibliometric studies can be used by researchers, government, and industry to understand developments and contributions to the field of knowledge and to determine future research directions (Dubyna *et al*, 2022).

VOSvieweris a bibliometric software used for visualization and analysis of scientific publication data. It allows users to visualize data citation, co-citation, and co-word analysis in the form of graphs and diagrams that are intuitive and easy to accept. VOSviewer can assist researchers and analysts in conducting citation network analysis, discovering relationships between disciplines, and understanding trends and issues in the scientific literature. It also helps in determining future research directions and gaining insights into the performance and contribution of individuals, institutions, and disciplines. VOSviewer has an easy-to-use user interface that can be used in conjunction with data from various sources, such as Scopus, Web of Science, and Google Scholar (Van Eck NJ, 2022).

A literature review study is a process that includes the identification, evaluation, and synthesis of the results of previous research on a specific topic. It aims to provide an overview of trends, issues, and advances in a related field and assists in understanding how previous research influences future research developments and directions. Literature review studies are usually conducted as part of the research process to ensure that the researcher understands the existing research environment and produces non-duplicate results. It also helps in defining problems and gaps in the existing literature and aids in the formulation of hypotheses and understanding of specific research areas. Literature review studies can be carried out by accessing scientific publication databases, such as Scopus, Web of Science, and Google Scholar. Researchers can also perform manual searches through scientific journals and related books. Literature review studies must be carried out with a systematic and objective methodology to ensure that the results are accurate and valid (El-Halaby *et al*, 2021).

3. METHODOLOGY

This study uses research methods with a mix-method approach, namely quantitative methods in bibliometric studies and qualitative methods in literature review studies. The object of research is credit risk. The type of data used is secondary data. The scope of the data used is research journal articles on credit risk in Islamic and conventional banking.

Sources of data collection come from searches of national and international journals indexed by Google Scholar, Sinta, and Scopus through the Perish/Harzing application. Data analysis tools use Microsoft Excel, Mendeley Desktop, and VOSviewer software. Data collection techniques include: (1) opening the Perish/Harzing software, then searching for journals based on the category of title words saying the keyword "Credit Risk" over the entire year (1975-2022); (2) collecting journal-title data in Microsoft Excel, and identify duplicate journal titles; (3) downloading files in RIS (Research Information Systems) and PDF (Portable Document Format) formats from all journals whose data has been collected; and (4) enter the RIS data file into the Mendeley Desktop software.

Data analysis techniques include (1) mapping RIS data files on Mendeley Desktop based on the order of year, author, and publisher; (2) mapping the results of the visualization of the bibliometric network and the trend of scientific publications using the VOSviewer (Visualization of Similarities) algorithm software based on the number of clusters and their items; and (3) mapping research topics based on literature review studies (Budianto & Dewi, 2022).

4. RESULT AND DISCUSSION

4.1. Mapping the Distribution of Scientific Publications Regarding Credit Risk in Sharia and Conventional Banking

There are 1139 international and national journals based on the results of data collection originating from the Perish/Harzing application during the period 1975 to 2022. There are 682 Scopus-indexed international journals. And there are 457 national and international journals indexed by Sinta on credit risk research.

Table 1. Journal publication data regarding Credit Risk by year

Year	Number of Publications	Year	Number of Publications	Year	Number of Publications	Year	Number of Publications
1975-1999	15	2005	8	2011	40	2017	77
2000	4	2006	18	2012	42	2018	96
2001	3	2007	11	2013	36	2019	109
2002	6	2008	15	2014	48	2020	123
2003	1	2009	28	2015	55	2021	155
2004	4	2010	22	2016	64	2022	159

4.2. Bibliometric Mapping Research Regarding Credit Risk in Islamic and Conventional Banking

There are several things that need to be considered in knowing the bibliometric results with VOSviewer software, namely: first, the software interface, namely the VOSviewer interface, displays diagrams and graphs that visualize publication data. Users can open and explore these charts and graphs by clicking on certain items or zooming in on certain parts of the diagram. Second, visual components, namely several visual components that may appear in the VOSviewer bibliometric results, include nodes (representation of publications), lines (representation of citation relationships), and colors (representation of categories or topics). Third, citation network analysis, namely citation network analysis, helps in determining the relationship between publications and understanding how publications are related to one another. The larger nodes in the diagram represent the publications that are more heavily logged, and the relationships between the nodes can help in understanding how publications are related. Fourth, cluster analysis, namely cluster analysis, helps in determining the relationship between topics or fields of knowledge and understanding how publications are related to a particular topic or field of knowledge. The colors in the chart represent categories or topics and help in understanding how the publication relates to different topics or fields of knowledge. Fifth, citation analysis, namely citation analysis, helps in determining the most recorded publications and understanding how publications are related to one another. The larger nodes in the diagram represent the publications that are more heavily logged and help in understanding how the publications relate to one another.

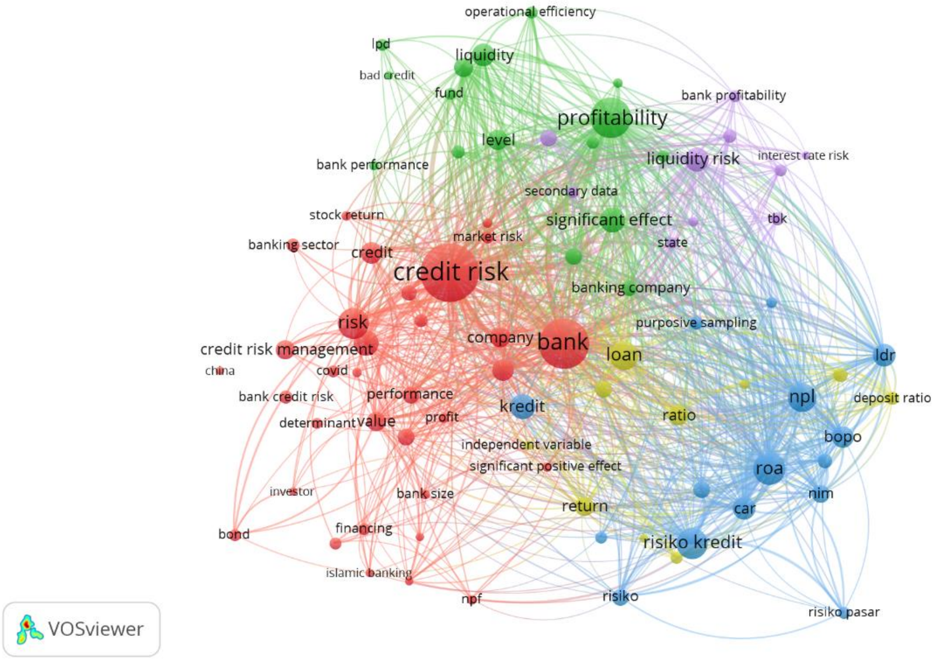

Figure 1. Network visualization map of research developments around Credit Risk

Analysis of the results of the visualization of the VOSViewer software regarding credit risk in Islamic and Conventional Banking, there are 5 clusters and 84 topic items in the mapping, including the following:

- Cluster 1 consists of 33 topic items, namely: Bank, bank credit risk, bank size, banking, banking sector, bond, china, commercial Bank, company, conventional Bank, covid, credit, credit risk, credit risk management, determinant, efficiency, financial performance, financing, good corporate governance, inflation, intellectual capital, investors, Islamic banks, Islamic banking market risk, npf, performance, profit, risk, significant influence, significant positive effect, stock return, value.
- Cluster 2 consists of 16 topic items, namely: bad credit, bank performance, banking company, capital adequacy, fund, IDX, Indonesia stock exchange, interest rate, level, liquidity, lpd, multiple linear regression, operational efficiency, profitability, sampling technique, significant effect.
- Cluster 3, consisting of 15 topic items, namely: bopo, Indonesia stock exchange, car, capital adequacy, credit, ldr, net interest margin, nim, NPL, the influence of credit risk, purposive sampling, risk, credit risk, market risk, roa.
- Cluster 4 consists of 10 topic items, namely: non-performing loans, returns, capital adequacy ratios, equity, independent variables, loans, performing loans, ratios, deposit ratios, and roe.
- Cluster 5 consists of 10 topic items, namely: bank profitability, BPR, capital, financial statements, interest risk, liquidity risk, operational risk, secondary data, state, and Tbk.

4.3. Literature Review Mapping of The Definition and Purpose of Credit Risk

There are 2 findings in the research topic regarding credit risk at a glance, namely:

First, the definition of credit risk. Based on the findings in various research topics that discuss the definition of credit risk, it is concluded that credit risk is the potential loss arising from the failure of the debtor or other parties to fulfill obligations received from the Bank. This can happen for various reasons, such as the inability to repay a loan or investment or because of changes in economic conditions that affect the debtor's ability to meet obligations. This credit risk can come from various banking business activities such as lending, exchange rate transactions, and other financial instruments.

Second, credit risk management objectives. Based on findings on various research topics around the main objectives of credit risk management, it is concluded that the main objectives include: (1) minimizing potential losses associated with extending credit and increasing the stability and continuity of the Bank's business, which is carried out by identifying, assessing, and controlling credit risk through implementing good risk management practices and following proper procedures; (2) ensure that the Bank has adequate reserves to cover potential losses and ensure that the Bank meets the applicable regulatory requirements so that credit risk management plays an important role in maintaining the stability and continuity of the banking business.

4.4. Literature Review Mapping of Supervision, Human Resources and Credit Risk Management Organizations

There are 4 findings in the research topic regarding credit risk monitoring, namely: First, authorities and responsibilities of the Board of Commissioners, among others: (1) Provide views and directions to the Board of Directors regarding credit risk management; (2) Monitor and ensure that the Board of Directors carries out their duties and responsibilities properly in terms of credit risk management; (3) Ensuring that there are adequate systems and procedures to manage credit risk; and (4) Provide recommendations to the General Meeting of Shareholders (GMS) regarding the implementation of credit risk management.

Second, the authorities and responsibilities of the Board of Directors, among others: (1) Develop and implement a credit risk management strategy; (2) Supervise and control credit risk; (3) Ensure the existence of effective and efficient systems and procedures in managing credit risk; (4) Ensuring that there are adequate systems and procedures to assess and monitor credit risk; and (5) Provide reports on credit risk management to the Board of Commissioners and GMS.

Third, Human Resources. The human resources available to manage credit risk in banking are very important to ensure success in managing credit risk. There are several tasks that can be carried out by human resources in managing credit risk. To carry out these tasks, banking requires human resources who have analytical skills, problem-solving skills, and an understanding of the market and industry. Human resources with experience and education in finance can also assist in managing credit risk.

Third, Credit Risk Management Organization. Members of the Credit Committee consist of several important positions, including the chairman, deputy chairman, secretary, and senior members of the credit risk, finance, and operations departments. In the context of implementing Risk Management for Credit Risk, there are several related units as follows:

1. This business unit is responsible for ensuring that lending or financing activities are carried out in accordance with bank policies and standards and that credit risk can be identified and managed effectively;
2. The credit recovery unit (Credit Recovery Unit) is part of a bank that is responsible

for dealing with problem credit problems. The aim of this unit is to find solutions to recover problem loans so that banks can minimize losses that arise. This unit usually works by monitoring problem loans and working with customers to find suitable solutions. This includes recovering collateral, renegotiating payment conditions, and equitable distribution of capital between banks and customers. In some cases, the credit recovery unit may also decide to sell the bad credit to the bad credit buyer; And

3. The Risk Management Unit is part of a bank that is responsible for assessing and monitoring the risks associated with banking activities. In this case, the Risk Management Unit is specifically responsible for monitoring Credit Risk, namely the risk that a bank is unable to obtain payments received from its credit customers. To monitor credit risk, the Risk Management Unit evaluates the Bank's credit portfolio and analyzes the factors that affect credit risk, such as general economic conditions, industrial sector, and customers' financial conditions. This unit also monitors existing credit performance and takes preventive measures if there are signs of increased credit risk. The Risk Management Unit is also responsible for determining the level of risk that is acceptable to the Bank and ensuring that banking policies and procedures comply with applicable regulatory and regulatory standards. By monitoring and managing credit risk, the Risk Management Unit assists banks in minimizing potential losses and ensuring the stability and soundness of the Bank's finances.

4.5. Literature Review Mapping of Strategy, Risk Level, and Credit Risk Limits

First, risk management strategy. There are seven findings in this topic, namely: (1) Banks must conduct a thorough credit analysis on prospective borrowers before providing credit, including considering factors such as the ability to pay, income stability, and credit history; (2) Banks must diversify their credit portfolios, by expanding market segments and types of credit products, so that they are not too dependent on certain segments or products; (3) Banks must regularly monitor credit performance and make an evaluation of each loan granted. This helps in determining if there are any potential signs of credit risk and making appropriate actions to address them; (4) Banks must consider potential credit risk when making credit decisions, and ensure that the level of risk taken is in accordance with the Bank's risk tolerance level; (5) Banks must apply collective management to the credit portfolio, which involves jointly assessing and monitoring the credit risks arising from the entire credit portfolio; (6) Banks must utilize technology to assist in credit risk management, including credit information systems and data analysis tools to assist in making more informed and accurate credit decisions; and (7) Banks must build a strong risk culture throughout the organization, by ensuring that all employees understand the importance of managing credit risk and have the necessary skills and tools to do so effectively, which involves jointly assessing and monitoring credit risk arising from the entire credit portfolio; (6) Banks must utilize technology to assist in credit risk management, including credit information systems and data analysis tools to assist in making more informed and accurate credit decisions; and (7) Banks must build a strong risk culture throughout the organization, by ensuring that all employees understand the importance of managing credit risk and have the necessary skills and tools to do so effectively. which involves jointly assessing and monitoring credit risk arising from the entire credit portfolio; (6) Banks must utilize technology to assist in credit risk management, including credit information systems and data analysis tools to assist in making more informed and accurate credit decisions; and (7) Banks must build a strong risk culture throughout the organization, by ensuring that all employees understand the importance of managing credit risk and have the necessary skills and tools to do so effectively. Including credit information systems and data analysis tools to assist in making more informed and accurate credit decisions; and (7) Banks must build a strong risk culture throughout the organization by ensuring that all employees understand the importance of managing credit risk and have the necessary skills and tools to do so effectively. Including credit information systems and data analysis tools to assist in making more informed and accurate credit decisions; and (7) Banks must build a strong risk culture throughout the organization by ensuring that all employees understand the importance of managing credit risk and have the necessary skills and tools to do so effectively.

Second, the level of credit risk to be taken (Risk Appetite) and credit risk tolerance (Risk Tolerance). Risk appetite and credit risk tolerance are important concepts for banking. Risk appetite refers to the extent to which banks are willing to take risks in their credit activities, while risk tolerance refers to the maximum acceptable risk limit for banks. Risk appetite is determined by factors such as business strategy, financial objectives, risk profile, and current market conditions. For example, a bank with aggressive financial objectives may have a higher risk appetite than a bank with conservative financial objectives. Risk tolerance, on the other hand, is the maximum risk that banks can accept in their credit activities. This can be determined by factors such as capital capacity, liquidity, and regulation. Banks must ensure that they have sufficient capital and liquidity to overcome potential losses from the credit risks taken.

Third, limits. There are three findings on this topic, namely:

1. Credit risk limits are limits or quotas set by banks to limit the amount of credit that can be given to one customer or group of customers. This can be used to ensure that banks are not overly exposed to risks from a particular customer or group of customers;
2. Credit risk limits are usually determined based on factors such as the customer's risk profile, type of business activity, and the number of assets owned by the customer. Banking may also consider other factors such as regulations and current market risk levels in determining credit risk limits; And
3. The use of credit risk limits can also help banks to ensure that they have the capacity to overcome potential losses from credit risk. It can also help banks to ensure that they meet regulatory requirements and comply with good industry practices in conducting credit activities.

4.6. Literature Review Mapping of Credit Risk Policies and Procedures

There are 3 findings in research topics regarding credit risk policies and procedures in banking, namely: First, there is a sound funding provision framework and policy, including procedures to control credit concentration risk. A sound funding provision framework and policy is a set of procedures and policies used by banks to manage credit risk effectively and ensure financial stability. Sound funding frameworks and policies are essential for banks to manage their credit risk and ensure that they meet regulatory requirements and comply with good industry practices. It also helps banks to ensure that they have the capacity to deal with potential losses from credit risk.

Second, banks must ensure that all provision of funds is carried out in a controlled manner (at arm's length). In credit risk management, banks must ensure that they understand customers' risk profiles and have a good understanding of the potential risks of each credit application. Policies and procedures implemented by banks to manage credit risk must ensure that banks limit the amount of credit that can be extended to certain customers or customer groups, monitor and monitor credit risk regularly, and have procedures for recovering bad debts and taking appropriate control measures to minimize losses.

Third, Banks must have procedures to identify credit concentration risks. The risk of credit concentration occurs when banks have a large concentration of credit in certain sectors or customers, which can increase the potential for losses if problems occur in that sector or customer. To identify credit concentration risk, banks must have clear and systematic procedures.

4.7. Literature Review Mapping of Credit Risk Identification

There are 5 findings in the research topic regarding the identification of credit risk in banking, namely: First, analysis of the economic sector, in which banks conduct analysis to determine which economic sector is most vulnerable to credit risk. This includes assessing factors such as economic conditions, unemployment rates, inflation rates, and other factors that may affect sector stability. A second analysis of the credit portfolio is in which banks analyze their credit portfolios to determine how much credit is concentrated in certain sectors or customers. Third, regular monitoring, namely banks regularly monitor their credit portfolios to ensure that they understand and monitor credit risk. Fourth, credit risk assessment, banking conducts a credit risk assessment for each potential customer by assessing factors such as credit history, financial stability, and business prospects. Fifth, the scoring model, namely that banks can use a scoring model to ensure that they understand credit risk at the customer level. This model uses data collected from customers to determine a credit risk score.

4.8. Literature Review Mapping of Credit Risk Measurement

There are 3 findings in the research topic regarding the measurement of credit risk in banking, namely: First, Banks must have written systems and procedures that measure risk. This ensures that the Bank understands the risks involved in every credit decision-making and can manage these risks properly. These systems and procedures include several stages. Banks must adopt a consistent and systematic approach to measuring credit risk so as to identify potential problems early and take the necessary actions to address them. Tools and techniques such as credit analysis, credit scoring, and early warning can also be used by banks to assist in measuring and managing credit risk. This helps banks make wise credit decisions and reduce the risk of loss.

Second, considerations in the credit risk measurement system.

1. Quality of Information: Banks must ensure that the information used to measure credit risk is of high quality and accurate. This ensures that credit risk can be properly assessed and credit decisions made are accountable.
2. Methodology: Banks must have a clear and consistent methodology for measuring credit risk. This ensures that banks take a consistent and systematic approach to assessing credit risk and making sound credit decisions.
3. Relevance: The credit risk measurement system must be relevant and in accordance with the banking risk profile and applicable regulations. This ensures that the Bank understands the risks involved in every credit decision-making and can manage these risks properly.

4. Flexibility: The credit risk measurement system must be flexible and adaptable to changes in the environment and market conditions. This ensures that banks can cope with dynamic changes in credit risk and make informed credit decisions.
5. Monitoring and Control: The credit risk measurement system must be equipped with adequate monitoring and control mechanisms to monitor and ensure that credit risk is managed properly.

Third, there are 31 credit risk measurement methods, namely: (1) Advanced Internal Rating Based/AIRB Model LGD; (2) Decision Tree Algorithm C4.5 using Adaptive Boosting/Adaboost; (3) C5.0 Decision Tree Algorithm; (4) J.48 Decision Tree Algorithm; (5) Decision Tree Classification and Regression Trees/CART Algorithm; (6) Chi-Squared Automatic Interaction Detection/CHAID Decision Tree Algorithm; (7) k-Nearest Neighbor/k-NN Algorithm with Modefield Particle Swarm Optimization; (8) Backpropagation; (9) Bank-Level Panel Data; (10) Creditmetrics; (11) Creditrisk+; (12) Credit Value at Risk/CVaR; (13) Extended Cox Models; (14) Four Eyes Principle; (15) Fisher Discriminant Analysis; (16) First Passage Time; (17) science and technology; (18) Loss Given Default/LGD; (19) Macroprudential Stress-Testing; (20) Macroeconomic Stress-Test; (21) Merton Model KMV; (22) Multilayer Perceptrons; (23) Naïve Bayes Based Particle Swarm Optimization; (24) Neural Network Model Based on Backpropagation Algorithm; (25) Probability of Default/PD; (26) Radial Basis Function; (27) Rating Transition Stochastic Matrix; (28) Risk Profile, Good Corporate Governance, Earning Capital/RGEC; (29) Support Vector Machines/SVM; (30) Sustainability Criteria into Credit Risk Management; dam (31) Value at Risk/VaR.

4.9. Literature Review Mapping of Credit Risk Monitoring

There are 3 findings in the research topic regarding credit risk monitoring in banking, namely: First, Banks must have comprehensive and integrated information systems and procedures to monitor the condition of each debtor or counterparty in the Bank's entire credit portfolio. The system must be in accordance with the characteristics, size, and complexity of the Bank's portfolio. Second, monitoring procedures must be able to identify problematic assets or transactions and provide more attention, including rescue actions and the formation of adequate reserves.

Third, an effective credit monitoring system will enable the Bank to: (1) Reduce credit risk, namely an effective credit monitoring system assists banks to identify and address credit risk early, thus minimizing potential losses that may occur; (2) Improving the quality of the credit portfolio, namely an effective credit monitoring system that helps banks to monitor customer performance on a regular basis and ensure the quality of their credit portfolio; (3) Ensuring compliance with regulations, namely an effective credit monitoring system ensuring that banks fulfill regulatory obligations and ensure that their credit practices comply with established standards; (4) Increasing customer trust, namely an effective credit monitoring system that helps banks to build and maintain customer trust, because customers can be sure that banks have a good system to monitor and address credit risk; and (5) Facilitating decision making, namely an effective credit monitoring system that facilitates banks in making decisions regarding lending, because it provides accurate and up-to-date information on customer performance.

4.10. Literature Review Mapping of Credit Risk Control

There are 3 findings in the research topic in the context of controlling Credit Risk, namely: First, banks must ensure that work units related to lending and experiencing credit risk work properly and credit risk exposure is always consistent with specified limits and meets prudential standards. Second, credit risk can be controlled through a number of methods, such as portfolio diversification, collateral requirements, control and monitoring, credit and policy risk assessment, and procedures. Third, the Bank must have an effective system for identifying credit problems. Separation of functions in dealing with credit problems and deciding on credit distribution is also very important.

4.11. Literature Review Mapping of Credit Risk Internal Control

There are 7 findings in the research topic regarding internal control of credit risk in banking covering a series of actions and procedures carried out by the bank itself to minimize credit risk that may arise, including: First, risk assessment, by ensuring that the Bank understands the credit risk associated with each loan through appropriate evaluation and assessment. Second, credit policies, by ensuring that banks have clear and continuously updated credit policies and procedures. Third, supervision, by providing strict supervision and monitoring of credit activities to ensure consistency with bank policies and procedures. Fourth, documentation, by ensuring that information about each credit is well documented and easily accessible if needed. Fifth, portfolio analysis, by conducting periodic analysis of the credit portfolio to ensure that the Bank understands the associated credit risks and takes the necessary actions. Sixth, training and education, by providing training and education to bank staff to ensure that they understand credit risk and have the necessary skills to manage this risk. Seventh, monitoring, by ensuring that banks have an effective monitoring system to monitor and manage credit risk in real-time.

4.12. Literature Review Mapping of Credit Risk Management Information Systems

There are 3 findings in the research topic regarding the Credit Risk Management Information System (CRMIS) in banking, namely: First, a system is used to assist in the process of identifying, evaluating, monitoring, and controlling credit risk. Second, CRMIS utilizes information technology to collect, analyze, and store data about clients, industry, economy, and other factors that affect credit risk, which is then used by management to make decisions about granting credit and controlling credit risk effectively. Third, this system also assists in reporting and monitoring credit risk in real time so that management can take appropriate actions in a timely manner to address risks.

4.13. Literature Review Mapping of Credit Risk Determinants

There are 88 research topics surrounding the determinants of credit risk in banking, namely: (1) Acquisitions; (2) Asset structure; (3) Asset Liquid Ratio/ALR; (4) Company age; (5) Competition between banks; (6) Bank inefficiency; (7) Bank size; (8) Bank ownership; (9) Type of bank; (10) BI Rate; (11) Diversity of the Supervisory Board; (12) Composition of the Board of Directors; (13) Board of Commissioners; (14) (14) Politics; (15) Capital Adequacy Ratio/CAR; (16) Capital Ratio; (17) Capital requirements; (18) Collateral Value; (19) Company Operational Scope; (20) compliance level; (21) Corporate governance; (22) Covid-19; (23) Cost Inefficiency; (24) Cost to Income Ratio/CIR; (25) Compensation; (26) Unsecured Credit; (27) Credit Risk Diversification; (28) Credit Growth; (29) Evaluation Credits; (30) Credit Control.

Next: (31) Credit Allocation; (32) Equity to Total Assets/ETA; (33) Currency Exchange Rates; (34) Expected Profit; (35) Economic Growth; (36) Export; (37)

Financing; (38) Financing to Deposit Ratio/FDR; (39) Financial Crisis; (40) Fintech; (41) Penetration of Foreign Banks; (42) Good Corporate Governance/GCG; (43) Gross Domestic Product/GDP; (44) Gross Regional Domestic Product/GRDP; (45) Human Resources; (46) Inflation; (47) Insurance Risk; (48) Intellectual Capital; (49) Consumer Credit Interest Rate; (50) Interest Rates; (51) Capital/Debt Loans; (52) Loan Structure; (53) Liquidity Ratio; (54) Loan Growth; (55) Loan Loss Reserves to Capital; (56) Loan Loss Reserves to Total Loans; (57) Loan to Asset/LTA; (58) Loan to Deposit Ratio/LDR; (59) Loan to Value/LTV; (60) Loan Loss Provision Ratio/LLR.

Next: (61) Loan to Asset Ratio/LAR; (62) Credit Portfolio Diversification; (63) Market Risk; (64) Macroeconomic Stress Testing; (65) Mergers; (66) Money Supply; (67)Micro Business Credit;(68) Net Loan to Total Assets/NLTA; (69) Net Profit Margin/NPM; (70)*Net*Interest Margin/NIM;(71) Non Performing Financing/NPF; (72) Non Performing Loans/NPLs; (73) Off-Balance Sheet; (74) Operational Efficiency Ratio/OER; (75) Operating Expenses against Operating Income/BOPO; (76) Foreign Ownership, Institutions, Families; (77) Receivables; (78) Regional Macroeconomics; (79) Return On Assets/ROA; (80) Return On Equity/ROE; (81) Reinsurance Ratio; (82) SBI Interest Rate; (83) Tax Amnesty; (84) Technical Reserve Ratio; (85) Total Assets; (86) Unemployment; (87) Value at Risk/VaR; and (88) Work Stress.

4.14. Literature Review Mapping of the Influence of Credit Risk

There are 29 research topics surrounding the influence of credit risk on banking, namely:(1) Abnormal Returns; (2) Bank Stability; (3) Bond Rating; (4) Capital Adequacy Ratio/CAR; (5)Cost Efficiency;(6)Credit Distribution;(7) Financial Distress; (8) Financial Sustainability; (9) Financing; (10) Corporate Value; (11) Income; (12) International Bonds; (13) Liquidity; (14) Liquidity Creation; (15) Liquidity Risk; (16) Micro Banking; (17) Net Interest Margin/NIM; (18)*Non Performing Loans*/NPL;(19)Operating Expenses to Operating Income/BOPO;(20) Productive Credit; (21) Profit Growth; (22) Price to Book Value/PBV; (23) Return On Assets/ROA; (24) Return On Equity/ROE; (25) Systematic Risk; (26) Share Price; (27) Stock Returns; (28) Third Party Funds/DPK; and (29) Credit Volume.

4.15. Literature Review Mapping of Credit Risk Mitigation

There are 21 research topics surrounding credit risk mitigation in banking, namely: (1) 4P/Personality, Purpose, Prospect, Payment; (2) 5C/Character, Capacity, Capital, Collateral, Condition of Economy; (3) 3R/Returns, Repayment, Risk Bearing Ability; (4)Loan Rating; (5) Basel; (6) Credit Derivatives; (7) Credit Insurance; (8) Credit Granting Policy; (9) Customary Sanctions; (10) Implementation of Digital Marketing; (11) Infrastructure; (12) Evaluation of the Internal Control System; (12) Liquidity Facility; (13) Macroprudential Policy; (14) Computational Science-based mitigation model; (15) Monetary Policy; (16) Prudential Banking; (17) Payment Capacity; (18) Responsibility and Commitment; (19) Resources; (20) Risk Management Policy; and (21) Socialization of the National Economic Stimulus Policy.

5. CONCLUSION AND RECOMMENDATION

Based on the results of the discussion above, it can be concluded as follows: (i) The number of research publications on credit risk in Sharia and Conventional Banking from 1975 to 2022 shows a significant increase from year to year. The total number of publications is 1139 research journals. There are 682 international journals indexed by Scopus, and there are 457 international and national journals indexed by Sinta. In the mapping visualization using VOSviewer, research developments around credit risk in Islamic and Conventional Banking are divided into 5 clusters and 84 topics. Cluster 1 consists of 33 topics, cluster 2 consists of 16 topics, cluster 3 consists of 15 topics, cluster 4 consists of 10 topics, and cluster 5 consists of 10 topics. (ii) Based on a literature review, there are 13 main research themes around credit risk in Islamic and conventional banking, namely: (1) Definition and Objectives; (2) Active Supervision by the Board of Commissioners and Board of Directors; (3) Strategy, Risk Level and Limits; (4) Policies and Procedures; (5) Risk Identification; (6) Risk measurement; (7) Risk Monitoring; (8) Risk Control; (9) Risk Internal Control; (10) Information System; (11) Risk Determinants; (12) Effect of Risk; and (13) Risk Mitigation.

Further research is recommended to use more data samples, so that it can explain a broader research mapping, given the limitations of the sample data in this study and can add a longer research data timeframe so that the following research results can be obtained: (i) It is expected that the results of the mapping show a higher and broader level of generalization; (ii) The results of the literature review study can be explained in a more complex manner.

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