European Journal of Accounting, Auditing and Finance Research
Vol.13, No. 5, pp.,64-72, 2025
Print ISSN: 2053-4086(Print),
Online ISSN: 2053-4094(Online)
Website: https://www.eajournals.org/
Publication of the European Centre for Research Training and Development-UK

Assessing Credit Concentration Risk Using the Herfindahl-Hirschman Index and Its Impact On Bank Loan Quality

Hadeer Khayoon Ashour [1], Noor S. Alramadan[2], Asmaa Hadi Neamah[3], Ameer Ali Khaleel[4]

University of Kerbala, College of Administration and Economics, Department of Financial and Banking Sciences, Iraq
noor.salah@uokerbala.edu.iq

doi: https://doi.org/10.37745/ejaafr.2013/vol13n56472 Published May 16, 2025

Citation: Ashour H.K., Alramadan N.S., Neamah A.H., and Khaleel A.A. (2025) Assessing Credit Concentration Risk Using the Herfindahl-Hirschman Index and Its Impact On Bank Loan Quality, *European Journal of Accounting, Auditing and Finance Research,* Vol.13, No. 5, pp.,64-72

Abstract: *The purpose of this research is to evaluate the relationship between bank loan quality and credit concentration risk, which is measured by the Herfindahl-Hirschman Index. We investigate the relationship between concentration risk and non-performing loan indicators using descriptive statistics and simple linear regression for the years 2017–2023. Although there are probably other variables at play, the study indicates that worse loan quality tends to be associated with greater concentration risk. To effectively manage credit risk, banks are advised to diversify their portfolios even further and use a comprehensive multivariate modelling methodology that takes macroeconomic and policy factors into account.*

Keywords: loan quality, NPL, HH Index, credit concentration risk

INTRODUCTION

In the banking as well as financial sector the risk associated with credit concentration is consistently growing and lighting the issues faced by the industry. Credit concentration is a situation when a portfolio of financial institutions or bank loans is highly dependent on specific regions, borrowers or sectors which simultaneously increases the vulnerabilities and risks to financial health (Davis and Singh, 2024). To measure the credit concentration Herfindahl-Hirschman Index (HHI) is used which helps in quantifying the associated risk on the portfolios of

European Journal of Accounting, Auditing and Finance Research
Vol.13, No. 5, pp.,64-72, 2025
Print ISSN: 2053-4086(Print),
Online ISSN: 2053-4094(Online)
Website: https://www.eajournals.org/
Publication of the European Centre for Research Training and Development-UK

banks and financial institutions (Johan and Vania, 2022). When the level of concentration is high it indicates the level of HHI as high resulting in a High possibility of loan defaults, over instability and poor quality loans. The research proposal will examine the impact of credit concentration risk on bank loan quality using the Herfindahl-Hirschman Index.

Aim and Objective

Aim

To examine the influence credit concentration risk has on the bank loan quality with the effective application of the Herfindahl-Hirschman Index.

Objectives

1. To identify the relationship between credit concentration and loan quality using the HHI tool.
2. To examine the influence loan portfolio diversification has on default rates.
3. To identify the influence of high credit concentration on loan quality and performance concerning diversified portfolios.
4. To understand the effectiveness of the regulatory framework in credit concentration risk.

Research Questions

1. What is the relationship between credit concentration and loan quality using the HHI tool?
2. Examine the influence loan portfolio diversification has on default rates.
3. How the influence of high credit concentration on loan quality and performance concerning diversified portfolios.
4. What is the effectiveness of the regulatory framework in credit concentration risk?

Rationale of the Study

The chosen study is very important as the risk of credit concentration is one of the major issues that has been witnessed across the globe which has an adverse impact on the portfolios of bank loans. Increasing attention by regulatory authorities on the banks and financial institutions to understand the dynamics between risk associated with credit concentration and its impact on loan performance is evident these days. The studies helpful in understanding diversity are speculated to financial stability and risk management practises required to be taken into consideration by banks and financial institutes. Also, the Herfindahl-Hirschman Index is a beneficial measure that helps in understanding and developing insight for the readers about its application and benefits (Johan and Vania, 2022).

European Journal of Accounting, Auditing and Finance Research
Vol.13, No. 5, pp.,64-72, 2025
Print ISSN: 2053-4086(Print),
Online ISSN: 2053-4094(Online)
Website: https://www.eajournals.org/
Publication of the European Centre for Research Training and Development-UK

LITERATURE REVIEW

Credit Concentration and Loan Quality: Herfindahl-Hirschman Index

According to Naili and Lahrichi (2022), credit concentration and loan quality have significant interconnection with each other in the banking and financial institutes. The risk associated with credit concentration when measured through the Herfindahl-Hirschman Index will help in indicating the determination bank loan portfolio has from a specific board over, industry or sector. As opined by Halim et al. (2023), if the HHI rate is higher then it reflects a higher concentration which as a result increases the loan default risk, particularly during economic instability. It has been witnessed that bank which has hi value of HHI have been experiencing high loan default rates.

Huynh and Dang (2021), concentrated portfolios of bank loans are at high risk if it is focusing specifically on one or few industries. For instance, the decline in the energy sector or real estate has a direct influence on banks' loan performance demonstrating negative signs. Contrary if the portfolios are diversified then the risk is comparatively low as it diversifies and spreads the influence on various borrowers and sectors resulting in stabilised loan quality.

Impact of Diversified Portfolios on Loan Default Rates

As asserted by Gafrej and Boujelbéne (2022), a diversified portfolio has a significant contribution to the bank loans portfolio as diversification is one of the techniques used to manage risk. Measuring the credit concentration rate based on the high and low scores of HHI will help in identifying the level of risk and loan defaults. When the HHI value is low it helps in minimising financial institutes and banks' exposure to limited borrowers and industries resulting in low loan default rates and increasing the diversified loan portfolio options. On the other hand, when the HHI value is high it indicates that the credit concentration is only on specific fields, areas and borrowers limiting the option of diversification and increasing the chance of high default rates (Gafrej and Boujelbéne, 2022).

Risks of High Credit Concentration

As per the research of Shekhar (2025), a significant increase is witnessed when high credit concentration is recorded and as a result, it showcases the risk of high defaults and poor loan quality and performance. If a high credit concentration is found in the bank or any financial institute, then there is a very high chance of vulnerabilities faced by the entity. The chance of high loan defaults and recovering the loan amount from the specific sector and borrowers also becomes complex, especially during economic downturns. According to Omowole et al., (2024), concentrated portfolios are at risk of instability in their financial performance because the prime target of these financial institutes is only limited to single borrowers. The chances of default and financial losses henceforth are very high contrary to banks and financial institutes having diversified portfolios.

Effectiveness of Regulatory Frameworks

As asserted by Mujtaba et al. (2022), regulatory frameworks are highly involved in mitigating the risk associated with credit concentration and making sure that financial institutes and banks are in a stabilised position. According to a regulatory framework Basel capital requirement the prime focus has to be made on capital buffering so that banks can be able to absorb all the losses that have been incurred due to concentrated portfolios. Kashyap (2024), argues that it is important for banks and financial institutions to continuously monitor and perform HHI measurement timely so that diversification of the loan portfolios can be assisted and guided by regulators. Further, HHI will help in knowing the risk level based on credit concentration so that the risk associated with it can be negotiated smartly.

METHODOLOGY

Research Method

The research method is a systematic presentation of an investigation process which is highly dependent on the nature of the subjective topic. Based on the current research the best suitable methodology is the quantitative research approach where the utilisation of statistical techniques will play a significant part in meeting the coma objective and research question associated with credit concentration risk and loan quality. The quantitative research method will help imprecisely measure the objective as well as facilitate to development insight of into variations contributing to credit concentration and influencing the performance of loans (Ghanad, 2023). Effectively leveraging the statistical and numerical facts and information reliability of this study will be increased and an undependable outcome will be drawn out.

Research Design

The research design is important as it helps in strategizing the method to carry out an investigation systematically. For the current study, a correlational research design will be used as it is effective and suitable to examine the relationship between credit concentration risk and its impact on loan quality (Taherdoost, 2022). Correlational research design is suitable because it helps in analysing the variation taking place in the credit concentration and the way it is impacting the performance of the loan.

Data Collection

The data collection in the current study will emphasise the secondary data collection method which will rely on information that is already available on different accessible platforms. The focus will be on accessing data which are related to the banking and financial sector which discusses credit concentration risk. Papers from government institutions, market research, scholarly journals, peer-reviewed investigations, reports, authorised websites, and industrial platforms will all be used as sources for secondary information (Baldwin et al., 2022). Access to current and trustworthy knowledge is possible by utilizing the existing performed study, which will assist in the achievement of the aims and targets. Data from the previous ten years will be reviewed to ensure performance.

Data Analysis

The data analysis of the current study will be carried out using a quantitative method where regression analysis will be performed (Bhangu et al., 2023). This will help in identifying the relationship between credit concentration using "HHI" and loan quality. With the help of this statistical method, the analysis of HHI values can be identified, which is associated with default rates as well as ineffective loan quality.

Table (1) Developments in the Iraqi banking sector regarding research variables

variables	2017	2018	2019	2020	2021	2022	2023
Total bank credit (trillion Iraqi dinars)	65.6	63.82	67.32	75.26	80.62	90.96	95.65
Volume of non-performing loans (trillion Iraqi dinars)	6.46	6.53	6.64	6.72	7.10	6.54	5.99
Bank Loan Quality Index NPL Ratio = (NPL Volume / Total Credit)	10.84%	10.23%	9.86%	8.93%	8.81%	7.19%	6.26%
Herfindahl-Hirschman Index (HHI) of Bank Credit Concentration	2,132	2,060	2,029	2,197	2,037	1,861	1954

Source: Financial Stability Reports issued by the Central Bank of Iraq

Based on data from 2017 to 2023, the following is a financial and statistical examination of the link between credit concentration risk (HHI) and the loan quality index (Loan Quality Index):

Trend Analysis (2017–2023)

The overall HHI index declined from 2,132 in 2017 to its lowest level of 1,861 in 2022 and then gradually increased to 1,954 in 2023. Figure 1 illustrates the almost continuous decline in the index, indicating that the Central Bank of Iraq's policy of reducing concentration risk has contributed to reducing credit concentration.

European Journal of Accounting, Auditing and Finance Research
Vol.13, No. 5, pp.,64-72, 2025
Print ISSN: 2053-4086(Print),
Online ISSN: 2053-4094(Online)
Website: https://www.eajournals.org/
Publication of the European Centre for Research Training and Development-UK

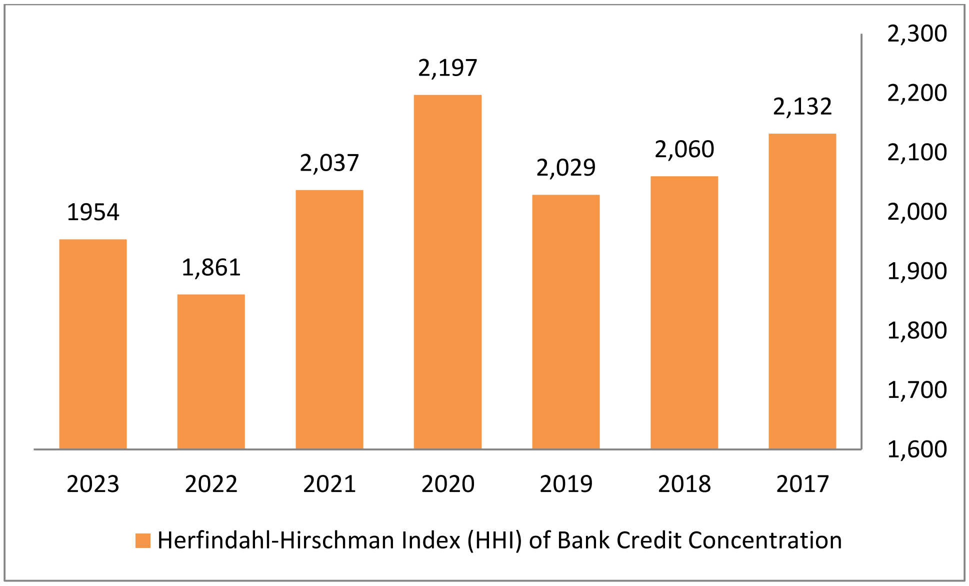

Figure (1) : HHI index 2017-2023

Figure (2) illustrates how the non-performing loan ratio declined alongside the steady rise in the loan quality index. In 2023, it reached 6.26%, up from 9.84% in 2017.

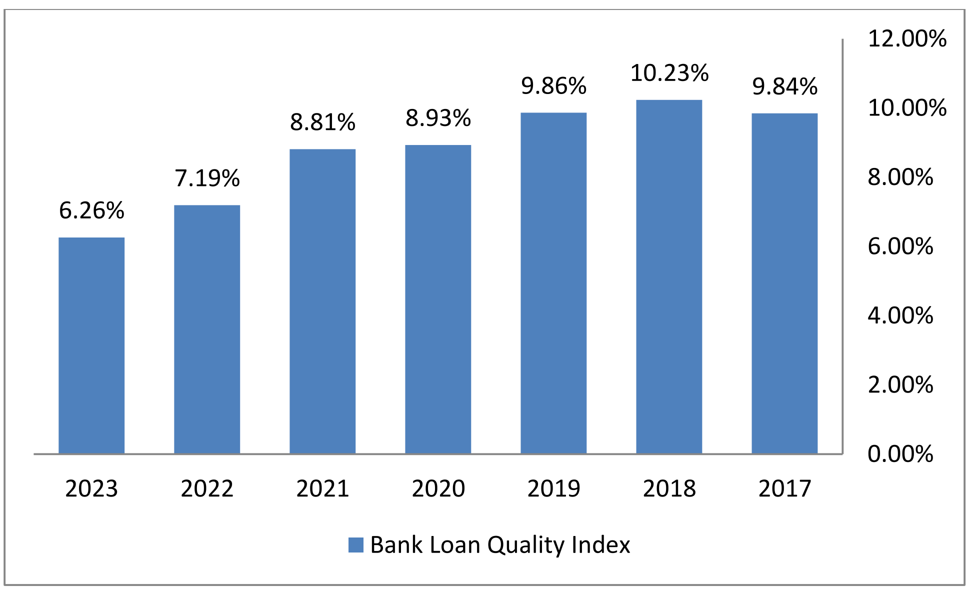

Figure (2) : Non-Performing Loan Ratio 2017-2023

European Journal of Accounting, Auditing and Finance Research
Vol.13, No. 5, pp.,64-72, 2025
Print ISSN: 2053-4086(Print),
Online ISSN: 2053-4094(Online)
Website: https://www.eajournals.org/
Publication of the European Centre for Research Training and Development-UK

Simple Linear Regression
Prior to initiating the statistical analysis, it is essential to assess the normal distribution of the data. The test is presented in Table 2. The results from the Kolmogorov–Smirnov and Shapiro–Wilk tests for HHI and NPL indicate that all significance values are above $\alpha = 0.05$ (HHI: K–S p = 0.200, S–W p = 0.963; NPL: K–S p = 0.200, S–W p = 0.258). Given that all p-values exceed 0.05, we do not reject the null hypothesis of normality. The HHI and NPL series exhibit characteristics consistent with a normal distribution when evaluated at the 5% significance level.

Table 2: Normal Distribution Test

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
HHI	.180	7	.200*	.981	7	.963
NPL	.234	7	.200*	.887	7	.258

Source: Utilising SPSS with the data presented in Table 1

Table 3 shows the results of the regression analysis according to the following estimated equation:

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.587	1	5.587	3.633	.115[b]
	Residual	7.690	5	1.538		
	Total	13.278	6			

a. Dependent Variable: NPL

b. Predictors: (Constant), HHI

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-9.095-	9.365		-.971-	.376	-33.169-	14.978
	HHI	.009	.005	.649	1.906	.115	-.003-	.021

a. Dependent Variable: NPL

Estimated model:

$$\textbf{Loan Quality Index} = -9.095 + 0.009 \times \textbf{HHI}$$

The following can be seen from the above regression equation:

- Slope (0.009): The Loan Quality Index goes up by 0.9 percentage points for every 100 points rise in the HHI. This means that the loans are no longer as good.
- The slope's P-value is about 0.115, which is greater than 0.05, which means that the association is not statistically significant at the 5% level.
- $R^2 = 0.42$: HHI explains about 42% of the difference in loan quality. Other factors are also big.

The findings indicate the nullification of the study hypothesis, which posits a statistically significant correlation between the Heinrichfelder Healthcare Index and the quality of bank loans. The data's limited timeframe may explain the trend in both variables, as it is only available in the Central Bank of Iraq's reports.

Ethical Consideration

The research here will emphasise complying with all the ethical considerations and standards while carrying out the investigation process. The research will ensure that the information is accessed which are easily available publicly and is cited accurately. Further, this study will also ensure to maintenance of integrity while presenting findings and results with transparency to enhance readers' understanding (Taherdoost, 2021). Confidentiality and data privacy will be prioritised where the access to the research will only be done by the authorised members.

CONCLUSIONS & RECOMMENDATIONS

According to the findings of the research, a positive correlation exists between a reduced credit concentration risk (a lower HHI) and a better loan quality (a lower NPL ratio). To reduce the danger of concentration, it is suggested that the credit portfolio be diversified, and it is also suggested that a multivariate model be constructed to better explain fluctuations in loan quality.

REFERENCES

Davis, E.P. and Singh, S., 2024. Bank Risk, Capital Adequacy and Banking Market Concentration–A Global Study.

Naili, M. and Lahrichi, Y., 2022. The determinants of banks' credit risk: Review of the literature and future research agenda. International Journal of Finance & Economics, 27(1), pp.334-360.

Halim, M.A., Moudud-Ul-Huq, S., Sobhani, F.A., Karim, Z. and Nesa, Z., 2023. The nexus of banks' competition, ownership structure, and economic growth on credit risk and financial stability. Economies, 11(8), p.203.

Huynh, J. and Dang, V.D., 2021. Loan portfolio diversification and bank returns: Do business models and market power matter?. Cogent Economics & Finance, 9(1), p.1891709.

Gafrej, O. and Boujelbéne, M., 2022. The impact of performance, liquidity and credit risks on banking diversification in a context of financial stress. International Journal of Islamic and Middle Eastern Finance and Management, 15(1), pp.66-82.

Shekhar, C., 2025. Bank Deposit Franchise, Interest Rate Risk, and Default Risk: An In-Depth Analysis.

Omowole, B.M., Urefe, O., Mokogwu, C. and Ewim, S.E., 2024. Strategic approaches to enhancing credit risk management in microfinance institutions. International Journal of Frontline Research in Multidisciplinary Studies, 4(1), pp.053-062.

Mujtaba, G., Akhtar, Y., Ashfaq, S., Abbas Jadoon, I. and Mahlaqa Hina, S., 2022. The nexus between Basel capital requirements, risk taking and profitability: what about emerging economies?. Economic research-Ekonomska istraživanja, 35(1), pp.230-251.

Kashyap, R., 2024. The Concentration Risk Indicator: Raising the Bar for Financial Stability and Portfolio Performance Measurement. arXiv preprint arXiv:2408.07271.

Ghanad, A., 2023. An overview of quantitative research methods. International journal of multidisciplinary research and analysis, 6(08), pp.3794-3803.

Taherdoost, H., 2022. What are different research approaches? Comprehensive review of qualitative, quantitative, and mixed method research, their applications, types, and limitations. Journal of Management Science & Engineering Research, 5(1), pp.53-63.

Baldwin, J.R., Pingault, J.B., Schoeler, T., Sallis, H.M. and Munafò, M.R., 2022. Protecting against researcher bias in secondary data analysis: challenges and potential solutions. European Journal of Epidemiology, 37(1), pp.1-10.

Bhangu, S., Provost, F. and Caduff, C., 2023. Introduction to qualitative research methods–Part I. Perspectives in clinical research, 14(1), pp.39-42.

Johan, S. and Vania, I., 2022, May. The Application of Herfindahl-Hirschman Index in Measuring the Concentration Level of Financial-Technology Industry. In Tenth International Conference on Entrepreneurship and Business Management 2021 (ICEBM 2021) (pp. 8-11). Atlantis Press.