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DO BANK SIZE AND AGE MODERATE THE EFFECT OF CREDIT RISK ON FINANCIAL SUSTAINABILITY IN INDONESIAN BANKS?

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ABSTRACT

This study examines the effects of credit risk, bank size, and bank age on financial sustainability and evaluates the moderating roles of bank size and age in Indonesian banks. The sample comprises 168 bank-year observations from 29 banks during 2017–2024. Credit risk is proxied by the gross Non-Performing Loan ratio, whereas financial sustainability is measured using the Financial Sustainability Ratio. The baseline analysis employs pooled moderated regression with bootstrapping, while panel-data analysis accounts for unobserved bank-specific heterogeneity. The bootstrap results show significant positive coefficients for credit risk and bank size and a significant negative interaction between credit risk and bank size. Bank age and the credit risk–age interaction are insignificant. Panel-model selection identifies fixed effects as the appropriate specification. Under fixed effects with bank-clustered robust standard errors, credit risk, bank size, and both interactions are insignificant, while bank age has a positive and marginally significant direct effect at the 10% level. The contrast indicates that the significant pooled relationships mainly reflect differences across banks rather than consistent within-bank changes. The findings demonstrate that conclusions about credit risk and financial sustainability are sensitive to the treatment of bank-specific heterogeneity.

Keywords: credit risk; financial sustainability; bank size; bank age; fixed effect

INTRODUCTION

Financial sustainability supports bank continuity, intermediation, and financial-system stability. It depends on the capacity to generate income, control operating costs, and manage financial risks; weaknesses in liquidity, efficiency, and risk management can undermine bank resilience (Judijanto, 2024; Laan et al., 2022; Sanditya & Marietza, 2023). The Financial Sustainability Ratio (FSR), calculated as financial income relative to financial expenses, captures the bank's ability to finance its operations from internally generated income (Nurhikmah & Rahim, 2021; Rustam, 2022; Sanfa & Ida, 2023).

Credit risk is central to this capacity because non-performing loans reduce interest income, require additional provisions, and may increase intermediation costs. Nevertheless, empirical evidence is not uniform: some studies report an adverse effect of credit risk on financial sustainability or performance, while others find weak or

context-dependent relationships, particularly when capital, liquidity, efficiency, and risk-management practices differ across banks (Ervina, 2021; Hardiyanti, 2023; Himawan & Pertiwi, 2022; Septiani & Murwaningsari, 2024; Sparta, 2022). This variation became especially relevant during the COVID-19 period, when restructuring policies could delay the financial consequences of deteriorating loan quality (Nugroho & Trinugroho, 2023).

Bank size and bank age may explain part of this heterogeneity. Larger banks generally possess broader funding access, diversified portfolios, stronger loss-absorption capacity, and more developed monitoring systems, but they may also face complex portfolios and larger nominal exposures (Alshouha et al., 2025; Arhinful et al., 2025; Bolívar et al., 2023). Older banks may benefit from accumulated institutional knowledge, reputation, and experience across economic cycles, although legacy systems and organizational rigidity may reduce adaptability (Firmansyah & Kartiko, 2024). Therefore, size and age may affect financial sustainability directly and may also alter the effect of credit risk.

Agency Theory provides the study's explanatory basis. Information asymmetry can encourage weak credit decisions or excessive risk-taking, whereas effective monitoring, provisioning, and resource allocation constrain managerial opportunism. Size can supply monitoring and risk-absorption resources, and age can represent accumulated institutional routines, but neither characteristic guarantee effective governance (Bencharles & Nwankwo, 2021; Mugambi et al., 2024; Ramadhanti et al., 2021).

This study examines the effect of credit risk on the financial sustainability of Indonesian listed banks, evaluates the direct effects of bank size and bank age, and tests whether both characteristics moderate the credit risk–financial sustainability relationship. It contributes by comparing pooled-bootstrap estimates with a fixed-effects panel specification, thereby distinguishing average cross-bank associations from changes occurring within the same bank over time.

LITERATURE REVIEW

High non-performing loans can weaken financial sustainability by reducing interest income, increasing impairment expenses, and requiring greater loss reserves. Although banks may temporarily absorb these pressures through income diversification, capital, or restructuring, higher credit risk is

generally expected to reduce the ability to cover financial expenses (Ervina, 2021; Hardiyanti, 2023; Sanfa & Ida, 2023; Velliscig et al., 2022).

H1: Credit risk negatively affects bank financial sustainability

Bank size reflects operating scale and access to financial and organizational resources. Larger banks may benefit from portfolio diversification, funding access, economies of scale, technology, and more developed risk-control systems. These advantages are expected to strengthen income generation and loss absorption, although the benefits of scale depend on the bank's business model and operating efficiency (Bolívar et al., 2023; Rustam, 2022; Salami et al., 2021).

H2: Bank size positively affects bank financial sustainability

Bank age represents accumulated institutional experience. Longer operating histories may provide knowledge of economic cycles, customer relationships, regulatory adjustment, and credit recovery. Although older banks may face rigid routines and legacy systems, accumulated experience is expected to support financial continuity when it is converted into adaptive organizational capabilities (Firmansyah & Kartiko, 2024).

H3: Bank age positively affects bank financial sustainability

Bank size may also change the effect of credit risk. Greater capital buffers, diversified portfolios, stronger provisioning capacity, and more advanced monitoring systems should enable larger banks to absorb credit deterioration more effectively. From an agency perspective, these resources strengthen borrower monitoring and risk control; therefore, the negative effect of credit risk is expected to be less severe in larger banks (Alshouha et al., 2025; Arhinful et al., 2025; Velliscig et al., 2022).

H4: Bank size weakens the negative effect of credit risk on bank financial sustainability

Bank age may provide experience in borrower selection, restructuring, recovery, provisioning, and crisis management. Established routines and reputational capital can support responses to deteriorating loan quality, although these advantages depend on continued organizational adaptability. Accordingly, older banks are expected to experience a weaker adverse effect of credit risk (Firmansyah & Kartiko, 2024).

H5: Bank age weakens the negative effect of credit risk on bank financial sustainability

RESEARCH METHOD

This explanatory quantitative study uses secondary data from annual financial statements and sustainability reports of banks listed on the Indonesia Stock Exchange. From an initial population of 47 banks, purposive sampling retained 29 banks with the information required for the 2017–2024 period, producing 168 bank-year observations. The resulting dataset is an unbalanced panel, and no missing-value imputation was applied.

Financial sustainability is measured using FSR, credit risk using gross NPL, bank size using the natural logarithm of total assets, and bank age as the observation year minus the year of establishment. Credit risk, size, and age were mean-centered before the interaction terms were constructed, allowing lower-order coefficients to be interpreted at the sample means. Table 1 summarizes the operational definitions.

Table 1. Operational Definitions of Variables

Variable	Role	Proxy / Formula	Definition	References
Financial Sustainability	Dependent	FSR = Financial Income / Financial Expenses × 100%	Capacity to cover financial expenses using internally generated financial income.	(Nurhikmah & Rahim, 2021; Rustam, 2022; Sanfa & Ida, 2023; Septiani & Murwaningsari, 2024)
Credit Risk	Independent	Gross NPL = Non-Performing Loans / Total Loans × 100%	Proportion of non-performing loans before impairment allowances; a higher value indicates weaker loan quality.	(Ervina, 2021; Hardiyanti, 2023; Velliscig et al., 2022)
Bank Size	Direct effect and moderator	Ln Total Assets	Scale of bank operations and resource availability.	(Alshouha et al., 2025; Arhinful et al., 2025; Bolívar et al., 2023)
Bank Age	Direct effect and moderator	Observation year − establishment year	Length of institutional and operational experience.	(Firmansyah & Kartiko, 2024)
Credit Risk × Size	Interaction	Centered NPL × centered Size	Tests on whether the effect of credit risk varies with bank size.	(Arhinful et al., 2025; Velliscig et al., 2022)
Credit Risk × Age	Interaction	Centered NPL × centered Age	Tests on whether the effect of credit risk varies with bank age.	(Firmansyah & Kartiko, 2024)

The analysis proceeded in three stages. First, descriptive statistics, Pearson correlations, and Variance Inflation Factors (VIFs) were examined. Second, pooled moderated regression with bootstrap standard errors was estimated as the baseline association. Third, panel moderated regression analysis (MRA) was estimated using the same specification. Common Effects, Fixed Effects, and

Random Effects were compared using the panel F-test (Chow test), Breusch–Pagan Lagrange Multiplier test, and Hausman test. The selected model used bank-clustered robust standard errors to address heteroskedasticity and within-bank residual dependence (Huang & Li, 2022; MacKinnon et al., 2023).

The empirical model is: $FSR_{it} = \alpha + \beta_1 NPL_{it} + \beta_2 SIZE_{it} + \beta_3 AGE_{it} + \beta_4 (NPL_{it} \times SIZE_{it}) + \beta_5 (NPL_{it} \times AGE_{it}) + \mu_i + \varepsilon_{it}$.

Here, μ_i represents unobserved bank-specific effects and ε_{it} is an idiosyncratic error. Pooled-bootstrap analysis was conducted in IBM SPSS Statistics, whereas panel estimation and model-selection tests were conducted in Stata 17. Statistical significance was evaluated at the 1%, 5%, and 10% levels.

RESULTS AND DISCUSSION

Table 2 shows that credit risk averages 2.9286%, with a maximum of 10.25%, indicating meaningful variation in loan quality. Financial sustainability averages 20.7505 and has a relatively large standard deviation of 17.04276, reflecting substantial differences across banks. The sample banks have an average age of 48.65 years and an average log asset value of 32.3544. Table 3 shows that the sample is dominated by medium-sized and middle-aged banks; these groupings are descriptive and are not used as substitutes for the continuous variables in the regression models.

Table 2. Descriptive Statistics

Variable	Min	Max	Mean	Standard Deviation
Credit Risk (NPL)	0.01	10.25	2.9286	1.89928
Financial Sustainability	0.11	68.30	20.7505	17.04276
Bank Age	6.00	83.00	48.6488	19.26653
Bank Size (Ln Assets)	28.58	35.32	32.3544	1.67081

Table 3. Grouping of Variables by Three Categories

Variable	Low / Small	Medium	High / Large
NPL	< 1.03 (2 banks)	1.03–4.83 (23 banks)	> 4.83 (4 banks)
Financial Sustainability	< 3.71 (3 banks)	3.71–37.79 (23 banks)	> 37.79 (3 banks)
Bank Age	< 29.38 (3 banks)	29.38–67.92 (23 banks)	> 67.92 (3 banks)
Bank Size	< 30.68 (10 banks)	30.68–34.03 (15 banks)	> 34.03 (4 banks)

The correlation and multicollinearity results are reported jointly in Table 4. Credit risk is weakly and negatively correlated with financial sustainability, whereas bank size and age are positively correlated with financial sustainability. The largest correlation among the explanatory variables is 0.4088 between size and age. VIF values range from 1.34 to 3.42, the mean VIF is 2.12, and all tolerance values exceed 0.10. Accordingly, the variables and interaction terms can be estimated together without evidence of serious multicollinearity.

Table 4. Correlation Matrix and Multicollinearity Diagnostics

Variable	1	2	3	4	VIF
1. Financial Sustainability	1.0000				—
2. Credit Risk	−0.0588	1.0000			1.77
3. Bank Size	0.1939**	−0.2487***	1.0000		1.39
4. Bank Age	0.1690**	−0.1651**	0.4088***	1.0000	1.34
Credit Risk × Bank Size	—	—	—	—	3.42
Credit Risk × Bank Age	—	—	—	—	2.66

Note: N = 168 bank-year observations. ***p < .001; **p < .05; *p < .10. Mean VIF = 2.12; all tolerance values exceed .10. Source: Processed secondary data.

Panel-model selection supports the Fixed Effects specification. The panel F-test rejects Common Effects in favor of Fixed Effects, the Lagrange Multiplier test favors Random Effects over Common Effects, and the Hausman test rejects Random Effects in favor of Fixed Effects. Table 5 summarizes these decisions, while Table 6 compares the pooled-bootstrap estimates with the selected Fixed Effects estimates.

Table 5. Panel Model Selection Results

Test	Model Comparison	Statistic	p-value	Decision
Panel F-test (Chow test)	Common vs. Fixed Effects	$F(28, 134) = 20.81$	< .001	Fixed Effects preferred
Breusch–Pagan LM	Common vs. Random Effects	$chibar^2 = 185.28$	< .001	Random Effects preferred
Hausman test	Fixed vs. Random Effects	$\chi^2(5) = 21.73$	.0006	Fixed Effects preferred

Table 6. Comparison of Pooled-Bootstrap and Fixed-Effects Estimates

Variable	Pooled β (Bootstrap SE)	p-value	Fixed Effects β (Robust SE)	p-value
Constant	−173.059 (54.644)	.003	21.196 (0.353)	< .001
Credit Risk	48.054 (21.599)	.028	0.951 (0.857)	.277
Bank Size	5.938 (1.791)	.003	−0.256 (6.187)	.967
Bank Age	0.143 (0.150)	.344	1.700 (0.934)	.080
Credit Risk × Bank Size	−1.542 (0.731)	.037	0.653 (0.690)	.352
Credit Risk × Bank Age	−0.008 (0.057)	.888	−0.011 (0.060)	.855

Note: Pooled model: $F = 5.095$, $p < .001$, adjusted $R^2 = .109$. Fixed Effects model: $F(5, 28) = 2.89$, $p = .0317$, within $R^2 = .1880$, rho = .9535. N = 168 observations from 29 banks. Variables were mean-centered before constructing the interactions. Source: Processed secondary data using IBM SPSS Statistics and Stata 17.

In the pooled-bootstrap model, credit risk has a significant positive coefficient (β = 48.054; p = .028), contrary to H1. This coefficient should not be read as evidence that non-performing loans improve sustainability. The 2017–2024 period includes the pandemic and recovery, when restructuring, provisioning, capital support, and continued intermediation income could delay or absorb the immediate financial consequences of impaired loans (Himawan & Pertiwi, 2022; Mahendra & Usman, 2024; Nugroho & Trinugroho, 2023; Velliscig et al., 2022). Thus, the pooled result is consistent with a context in which some banks maintained financial income despite elevated credit exposure.

Bank size is positive and significant in the pooled model (β = 5.938; p = .003), supporting H2 only at the baseline stage. Larger banks may benefit from diversified income, stronger funding access, and greater investment in risk-management infrastructure (Bolívar et al., 2023; Rustam, 2022; Salami et al., 2021). Bank age is positive but insignificant (β = 0.143; p = .344), so H3 is not supported in the pooled model. Institutional experience may be offset by legacy systems or limited adaptability (Firmansyah & Kartiko, 2024).

The pooled interaction between credit risk and bank size is significant and negative (β = −1.542; p = .037). Although statistically significant, its direction does not support H4's predicted buffering effect. The result implies that the marginal effect of credit risk becomes less favorable as bank size increases. Scale may provide diversification and capital, but it can also produce portfolio complexity, larger nominal exposures, and higher provisioning or regulatory costs when loan quality deteriorates (Arhinful et al., 2025; Bolívar et al., 2023). The credit risk–age interaction is insignificant (β = −0.008; p = .888), providing no support for H5.

The Fixed Effects results materially alter the interpretation. Credit risk becomes positive but insignificant (β = 0.951; p = .277), and bank size becomes negative and insignificant (β = −0.256; p = .967). Consequently, the significant pooled coefficients appear to reflect differences between banks more than consistent changes within the same bank. In particular, an increase in the size of a given bank does not necessarily improve its financial sustainability when time-invariant bank characteristics are controlled.

Bank age is positive and marginally significant under Fixed Effects (β = 1.700; p = .080), providing only weak support for H3. The result suggests that additional years of institutional operation may support sustainability through accumulated knowledge, customer relationships, and experience with regulatory and economic cycles. However, the evidence remains fragile because it is significant only at the 10% level and does not appear in the pooled model (Firmansyah & Kartiko, 2024).

Neither moderating effect is robust under Fixed Effects. The credit risk–size interaction becomes positive and insignificant (β = 0.653; p = .352), while the credit risk–age interaction remains negative and insignificant (β = −0.011; p = .855). H4 and H5 are therefore unsupported. These results indicate that size and age alone do not systematically determine how changes in credit risk affect financial sustainability within a bank.

The contrast between the models is the study's central finding. Pooled regression combines cross-bank and within-bank variation, whereas Fixed Effects isolate within-bank changes after controlling stable characteristics. The high rho value (.9535) further indicates that unobserved bank-specific factors account for a substantial portion of the variation. From an Agency Theory perspective, size

and age are imperfect proxies for monitoring quality: resources and experience improve sustainability only when accompanied by prudent incentives, borrower screening, provisioning, governance, and effective allocation (Bencharles & Nwankwo, 2021; Mugambi et al., 2024; Ramadhanti et al., 2021).

Overall, H1, H4, and H5 are not supported. H2 is supported only by the pooled-bootstrap estimate and is not robust, while H3 receives weak support only in the Fixed Effects model. Financial sustainability therefore appears to depend more on bank-specific managerial and risk-control capabilities than on asset scale or institutional age alone.

Regarding moderator type, bank size qualifies as a quasi-moderator only in the pooled-bootstrap model because both its direct effect and its interaction with credit risk are significant. However, the interaction direction contradicts H4, and this classification is not robust under the preferred fixed-effects model. Bank age is not a moderator in either specification because its interaction with credit risk is insignificant; under fixed effects, it functions only as a marginal direct predictor. A pure moderator pattern—an insignificant direct effect combined with a significant interaction—is therefore not observed.

For bank management, asset growth and longevity should not be treated as automatic guarantees of sustainability. Banks should strengthen borrower screening, portfolio monitoring, provisions, capital buffers, operating efficiency, income diversification, and digital risk processes. Larger banks must ensure that expansion is matched by adequate controls, while older banks need to convert experience into adaptive capabilities. These priorities are consistent with evidence emphasizing capital adequacy, efficiency, and financial-risk management as determinants of sustainable bank performance (Sanjaya & Badjuri, 2024; Septiani & Murwaningsari, 2024; Sparta, 2022).

For regulators, the dominance of bank-specific effects supports differentiated risk-based supervision. NPL levels, size, and age should be assessed together with capital strength, provisioning quality, portfolio concentration, governance, operating efficiency, and the capacity to respond to changing economic conditions.

CONCLUSION

This study examines the direct and moderating roles of credit risk, bank size,

and bank age in the financial sustainability of 29 Indonesian listed banks using 168 bank-year observations from 2017–2024. The pooled-bootstrap model shows significant positive coefficients for credit risk and bank size and a significant negative credit risk–size interaction. However, the direction of the credit-risk coefficient contradicts H1, and the negative interaction does not represent the buffering effect predicted by H4. Bank age and the credit risk–age interaction are insignificant in the baseline model.

Panel-model selection identifies Fixed Effects as the appropriate specification. After bank-specific heterogeneity is controlled, credit risk, bank size, and both interactions are insignificant. Bank age is positive and marginally significant at the 10% level, providing limited support for H3. Accordingly, H1, H4, and H5 are not supported; H2 is supported only in the pooled model and is not robust; and H3 receives weak support only under Fixed Effects. The significant pooled relationships therefore appear to be driven mainly by differences across banks rather than consistent changes within banks.

The study is limited to publicly listed banks, an unbalanced panel, gross NPL as the sole credit-risk indicator, and a financial income-to-expense measure of sustainability. Bank age also rises mechanically with time and may partly reflect common trends because year effects are not included, while potential reverse causality remains unresolved. Future research should extend the sample, incorporate net NPL, expected credit losses, credit costs, capital, liquidity, efficiency, governance, ownership, digital capability, and macroeconomic controls, and apply dynamic panel, instrumental-variable, or correlated random-effects approaches.

REFERENCES

Alshouha, L., Khasawneh, O., Alshannag, F., & Al Tanbour, K. (2025). Nexus between fintech innovations and liquidity risk in GCC banks: The moderating role of bank size. *Journal of Risk and Financial Management, 18*(5), 226. https://doi.org/10.3390/jrfm18050226

Arhinful, R., Mensah, L., Gyamfi, B. A., & Obeng, H. A. (2025). The impact of non-performing loans on bank growth: The moderating roles of bank size and capital adequacy ratio—Evidence from U.S. banks. International Journal of Financial Studies, 13(3), 165. https://doi.org/10.3390/ijfs13030165

Bencharles, O. K., & Nwankwo, D. C. (2021). Credit risk management and deposit money banks stability in Nigeria: Does good corporate governance matter? Research Journal of Finance and Accounting, 12(16). https://doi.org/10.7176/rjfa/12-16-01

Bolívar, F., Duran, M. A., & Lozano-

Vivas, A. (2023). Bank business models, size, and profitability. Finance Research Letters, 53, 103605. https://doi.org/10.1016/j.frl.2022.103605

Ervina, V. N. F. (2021). Pengaruh credit risk management pada financial performance bank konvensional yang terdaftar di BEI. Jurnal Ekonomi, 26(3). https://doi.org/10.24912/je.v26i3.801

Firmansyah, A., & Kartiko, N. D. (2024). Exploring the association of green banking disclosure and corporate sustainable growth: The moderating role of firm size and firm age. *Cogent Business & Management, 11*(1), 2312967. https://doi.org/10.1080/23311975.2024.2312967

Hardiyanti, S. E. (2023). Detection of determinants bank sustainability performance. Journal of Economic Research & Reviews, 3(4), 363–372. https://doi.org/10.33140/jerr.03.04.09

Himawan, A. F., & Pertiwi, I. F. P. (2022). The influence of inflation, exchange rate, non performing financing (NPF) and financing to deposit ratio (FDR) to financial sustainability ratio with return on aset (ROA) as mediation. Accounting and Finance Studies, 2(3), 95–113. https://doi.org/10.47153/afs23.3802022

Huang, F. L., & Li, X. (2022). Using cluster-robust standard errors when analyzing group-randomized trials with few clusters. *Behavior Research Methods, 54*, 1181–1199. https://doi.org/10.3758/s13428-021-01627-0

Judijanto, L. (2024). Analisis efisiensi operasional, manajemen risiko, dan pengelolaan sumber daya terhadap keberlanjutan kinerja keuangan perusahaan di Indonesia. Jurnal Akuntansi Dan Keuangan West Science, 3(03), 254–264. https://doi.org/10.58812/jakws.v3i03.1601

Laan, T. I., Ndoen, W. M., & Jati, H. (2022). Pengaruh risiko keuangan terhadapa kinerja keuangan pada perbankan Indonesia. Journal of Management: Small and Medium Enterprises (SMEs), 15(1), 117–135. https://doi.org/10.35508/jom.v15i1.6356

MacKinnon, J. G., Nielsen, M. Ø., & Webb, M. D. (2023). Cluster-robust inference: A guide to empirical practice. Journal of Econometrics, 232(2), 272–299. https://doi.org/10.1016/j.jeconom.2022.04.001

Mahendra, B. A., & Usman, B. (2024). Pengaruh variabel spesifik bank dan spesifik industri terhadap kinerja keuangan pada perbankan konvensional yang terdaftar di Bursa Efek Indonesia. Jurnal Ekonomi Trisakti, 4(1). https://doi.org/10.25105/jet.v4i1.18784

Mugambi, J., Kariuki, P. W., & Matanda, J. (2024). Credit risk management practices and asset quality of deposit taking savings and credit co-operative societies in Kenya. Asian Journal of Economics, Business and Accounting, 24(11). https://doi.org/10.9734/ajeba/2024/v24i111553

Nugroho, S. P., & Trinugroho, I. (2023). Restrukturisasi pembiayaan nasabah terdampak COVID-19 terhadap kinerja

dan risiko pembiayaan Bank Pembiayaan Rakyat Syariah (BPRS). *Nisbah: Jurnal Perbankan Syariah*, *9*(1). https://doi.org/10.30997/jn.v9i1.9513

Nurhikmah, S., & Rahim, R. (2021). Pengaruh faktor keuangan dan non keuangan terhadap financial sustainability ratio perbankan. *Journal of Management and Business Review*, *18*(1), 25–47. https://doi.org/10.34149/jmbr.v18i1.214

Ramadhanti, J., Butar, I. D. B., & Pangaribuan, C. H. (2021). The analysis of corporate governance on non-performing loans: Evidence from Indonesia. *Journal of Business Management and Social Studies*, *1*(1). https://doi.org/10.53748/jbms.v1i1.5

Rustam, M. A. A. (2022). Financial sustainability ratio and aspects that affect it. *Jurnal Akuntansi*, *26*(1). https://doi.org/10.24912/ja.v26i1.822

Salami, A. A., Uthman, A. B., & Sanni, M. (2021). Bank-specific variables and banks' financial soundness: Empirical evidence from Nigeria. *Zagreb International Review of Economics and Business*, *24*(1). https://doi.org/10.2478/zireb-2021-0003

Sanditya, N., & Marietza, F. (2023). Pengaruh kesulitan keuangan terhadap likuiditas bank yang dimoderasi oleh sentimen investor. *Reslaj: Religion Education Social Laa Roiba Journal*, *6*(3), 1777–1792. https://doi.org/10.47467/reslaj.v6i3.5695

Sanfa, A. S., & Ida, I. (2023). Financial ratios predictors of financial sustainability of the banking sector in Indonesia. *Financial: Jurnal Akuntansi*, *9*(1), 1–17. https://doi.org/10.37403/financial.v9i1.491

Sanjaya, S. A. K., & Badjuri, A. (2024). Pengaruh tingkat kecukupan modal dan efisiensi operasional terhadap profitabilitas bank dengan risiko kredit sebagai variabel moderasi pada perusahaan perbankan yang terdaftar di Bursa Efek Indonesia tahun 2019-2022. *Jurnal Ilmiah Manajemen Ekonomi & Akuntansi (MEA)*, *8*(1), 1861–1880. https://doi.org/10.31955/mea.v8i1.3754

Septiani, V., & Murwaningsari, E. (2024). Pengaruh kecukupan modal, efisiensi operasional dan diversifikasi pendapatan terhadap financial sustainability. *JAATB*, *3*(1), 129–145. https://doi.org/10.59806/jaatb.v3i1.331

Sparta. (2022). Cash flow risk management practices dan sustainable financial performance pada industri perbankan di Indonesia. *Jurnal Liabilitas*, *7*(1), 55–69. https://doi.org/10.54964/liabilitas.v7i1.184

Velliscig, G., Floreani, J., & Polato, M. (2022). Capital and asset quality implications for bank resilience and performance in the light of NPLs' regulation: A focus on the Texas Ratio. *Journal of Banking Regulation*, *24*(1), 66–88. https://doi.org/10.1057/s41261-021-00184-y