CAMEL Ratings and Bank Financial Distress Risk: Evidence from 2019–2023

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ABSTRACT

This study investigates how CAMEL indicators influence financial distress among banks listed on the Indonesia Stock Exchange from 2019 to 2023. Employing a quantitative design, we estimate a structural equation model with AMOS 24 and supplement it with linear regression to trace the directional effects of each variable. A purposive sample of 40 banks forms the basis of the analysis. The findings reveal that the Capital Adequacy Ratio exerts a positive association with financial distress, whereas both Non-Performing Loans and the Net Profit Margin exhibit negative associations. Operating Expenses to Operating Income and the Loan-to-Deposit Ratio each display positive associations with distress risk. Taken together, the evidence suggests that CAMEL indicators alone do not exhaustively capture the onset of financial distress; additional, possibly more salient factors are likely at work.

Keywords: CAMEL Analysis; Financial Distress; Bank.

Pengaruh Analisis Camel terhadap Financial Distress di Sektor Perbankan Periode 2019-2023

ABSTRAK

Penelitian ini bertujuan mengevaluasi pengaruh analisis CAMEL terhadap financial distress pada sektor perbankan yang tercatat di Bursa Efek Indonesia (BEI) periode 2019–2023. Metode yang digunakan bersifat kuantitatif dengan pendekatan Structural Equation Modeling (SEM) menggunakan AMOS versi 24 serta regresi linier untuk melihat arah hubungan antar variabel. Sampel terdiri dari 40 bank yang dipilih melalui metode purposive sampling. Hasil penelitian menunjukkan bahwa Analisis CAMEL yang diukur menggunakan Capital Advequency Ratio (CAR) berpengaruh positif, Non Performing Loan (NPL) berpengaruh negatif, Net Proft Margin (NPM) berpengaruh negatif, Biaya Operasional terhadap Pendapatan Operaisonal (BOPO) berpengaruh positif dan Loan to Deposit Ratio (LDR) berpengaruh postif terhadap financial distress. Hasil penelitian ini mengindikasikan bahwa pendekatan CAMEL belum sepenuhnya mampu memprediksi financial distress secara menyeluruh dan faktor lain kemungkinan lebih dominan dalam memengaruhi kondisi tersebut.

Kata Kunci: Analisis CAMEL; Financial Distress; Bank.

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INTRODUCTION

Management accounting occupies a pivotal role in business and economic decision-making, particularly within the banking sector, which serves as the economy's principal financial intermediary. Effective financial management determines not only a bank's longevity but also the broader stability of the financial system (Scholtens & van't Klooster, 2019). Accordingly, rigorous analysis of financial performance has become an indispensable means of detecting and averting risks that may culminate in financial distress, and identifying the most informative indicators of bank soundness remains a central concern of contemporary management-accounting research (Ulpaija et al., 2024).

A series of high-profile crises underscores the importance of early detection. The 1997–1998 Asian banking collapse and the 2008 global financial crisis each illustrated how large-scale bank failures can trigger systemic instability (Prasetyantoko, 2009). Because banks perform a critical intermediation function, they are uniquely vulnerable to shocks that can propagate through the real economy (Gbadebo, 2024). When a bank enters financial distress, the consequences extend beyond shareholders and depositors to the wider financial architecture (Alamsjah, 2023) and (Suhartanto et al., 2022).

Recent regulatory and accounting developments have heightened both the complexity and the urgency of distress evaluation. The introduction of IFRS 9 and its Indonesian analogue, PSAK 71, shifted loss recognition toward an expected-credit-loss model, altering key health indicators and complicating risk management (Kusumastu & Sukma, 2023). Simultaneously, fintech innovations and the rapid expansion of digital banking have introduced new channels of both opportunity and vulnerability that must be incorporated into assessments of bank resilience (Rustandi & Arifin, 2024).

Against this backdrop, financial statements and ratio analysis remain the primary lenses through which analysts gauge bank health (Salsabila Aurora et al., 2024).Timely interpretation of those indicators offers an early-warning mechanism for impending distress (Klopotan et al., 2018). As credit demand grows, banks must preserve sound fundamentals to sustain effective intermediation; thus, understanding the determinants of bank performance is indispensable to regulators, investors, and other stakeholders (Pryangan & Payamata, 2020).

This study is situated within the domain of management accounting because it employs CAMEL—capital, assets, management, earnings, and liquidity—and RGEC—risk profile, good corporate governance, earnings, and capital—as diagnostic frameworks for assessing bank performance. These tools, rooted in management-accounting practice, support both performance evaluation and strategic decision-making (Pryangan & Payamata, 2020). Key ratios such as the Capital Adequacy Ratio (CAR), Non-Performing Loans (NPL), Net Profit Margin (NPM), Operating Expenses to Operating Income (BOPO), and the Loan-to-Deposit Ratio (LDR) serve to flag incipient financial difficulties and gauge efficiency and profitability (Mahesh et al., 2025). Accordingly, management accounting provides the information infrastructure for early detection and mitigation of financial risk, thereby informing the planning and control of banking strategy (Abdullah et al., 2023).

The analysis is equally pertinent to financial-management scholarship because it addresses risk mitigation and long-term stability. By examining how banks allocate resources, uphold capital adequacy, and sustain liquidity under economic stress, the study illuminates the interplay among profitability, operating efficiency, and credit risk—factors central to a bank's resilience in volatile markets (Ahmad Ramadani, 2025). Insights generated here can guide both practitioners and regulators in crafting policies that adapt to shifting business conditions.

The 2019–2023 window encapsulates the period immediately before, during, and after the Covid-19 pandemic, a sequence of shocks that tested the robustness of Indonesian banks. The crisis strained liquidity, eroded asset quality, and compressed profitability, forcing institutions to recalibrate risk-management practices (Shabir et al., 2023). To counter these pressures, Bank Indonesia and the government introduced measures such as rate cuts and broad credit-restructuring programs aimed at preserving systemic stability (Fadhilatul Jannah, 2023).

Empirical evidence underscores the pandemic's impact. (Amrina et al., 2021), employing a paired-sample t-test, document a 0.61-percentage-point decline in average Return on Assets and a 0.37-percentage-point drop in Net Interest Margin among Indonesian banks during the pandemic. These findings highlight the sector's vulnerability to exogenous shocks and reinforce the relevance of robust management-accounting tools for anticipating and navigating financial distress.

Undang-Undang No. 10 Tahun 1998, amending Undang-Undang No. 7 Tahun 1992, defines a bank as a business entity that gathers public funds through deposits and reallocates them as credit or other financial instruments to enhance social welfare (Undang Undang Nomor 10 Tahun 1998 Tentang Perubahan Atas UU Nomor 7 Tahun 1992, 1998). As guarantors of national financial stability, banks must maintain robust accounting systems that record transactions transparently and present reliable financial information (Jelita Santani & Maha Putra, 2024). These systems facilitate continuous monitoring of assets, liabilities, and equity through core statements—most notably the balance sheet and income statement—which underpin assessments of a bank's financial soundness (Bischof et al., 2021).

Despite extensive regulation, several recent incidents underscore the need for stricter oversight. In 2023, Bank Mandiri disclosed IDR 1.4 trillion in non-performing loans linked to collusion with SNP Finance, a development that eroded its Capital Adequacy Ratio and weakened its capital buffer (www.metronews.com). Likewise, Bank BTN reported a rise in its BOPO ratio from 86 percent to 86.10 percent in December 2023, signalling deteriorating operating efficiency and the prospect of reduced profitability and investor confidence (www.kontan.co.id).

These issues can be interpreted through agency theory, first articulated by Jensen and Meckling in 1976. The framework describes the relationship between principals, such as shareholders, and agents, namely management. Principals delegate decision-making authority to agents in the expectation that agents will further the principals' interests; yet, because each party pursues its own objectives, conflicts arise. Agents may adopt actions misaligned with shareholder goals, creating what is known as the agency problem (Jensen & Meckling, 2003).

Against this backdrop, the present study investigates how CAMEL indicators influence financial distress among banks listed on the Indonesia Stock

Exchange between 2019 and 2023. The analysis seeks to advance both scholarly understanding and practical insight into the factors driving financial distress, thereby helping stakeholders strengthen the stability and performance of Indonesia's banking sector.

H_1: Capital analysis exerts a positive effect on financial distress in the Indonesian banking sector during the 2019–2023 period.

Agency theory explains the relationship between principals (owners or shareholders) and agents (managers or company executives), who often face conflicts of interest due to differing objectives. In the context of banking, managers (agents) are responsible for a bank's financial management and should prioritise the interests of capital owners (principals), including maintaining financial stability and health to avoid financial distress. The hypothesis that capital analysis has a negative influence on financial distress implies that, although agents (bank managers) oversee the aspects measured by capital analysis, these efforts may not necessarily prevent or affect the likelihood of financial distress. Research by (Erdi et al., 2022), (Afroj, 2022), (Ginting & Wisnu, 2021), (Yuharsil et al., 2020), and (Suhartanto et al., 2022) reveals that capital analysis actually has a positive influence on financial distress. These studies also show that the components of capital analysis can collectively serve as an early-warning system for detecting potential financial difficulties in banking institutions.

H_2: Assets analysis has a positive effect on financial distress in the banking sector for the period 2019–2023.

Agency theory addresses the relationship between the principal (owner or shareholder) and the agent (management), a relationship that can generate conflicts of interest due to differing objectives. The principal expects the agent to run the company in ways that increase firm value, but the agent may make decisions based on personal interests. This hypothesis aligns with findings by (Afroj, 2022), (Pratiwi et al., 2022), (Ginting & Wisnu, 2021), (Yuharsil et al., 2020), (Pryangan & Payamata, 2020), and (Suot et al., 2020), which show that asset analysis has a positive influence on financial distress. These studies indicate that asset components can collectively serve as an early-warning system for identifying potential financial difficulties in banking institutions.

H_3: Management analysis has a positive effect on financial distress in the banking sector for the 2019–2023 period.

Agency theory describes the relationship between principals—owners or shareholders—and agents—managers—highlighting the potential for conflicts of interest when objectives diverge. While principals expect agents to enhance firm value, managers may pursue personal goals. Empirical evidence from (Afroj, 2022), (Ferdiansyah & Widyarti, 2022), (Pratiwi et al., 2022), (Yuharsil et al., 2020), (Pryangan & Payamata, 2020), and (Suot et al., 2020) shows that the management component of the CAMEL framework is positively associated with financial distress. Nonetheless, the same studies confirm that management indicators remain useful as early-warning signals for emerging problems in the banking sector.

H_4: Earnings analysis has a positive effect on financial distress in the banking sector for the 2019–2023 period.

Agency theory likewise underpins the earnings hypothesis. Principals seek value maximisation, yet agents may favour actions that serve their own interests, even at the expense of profitability. Findings by (Afroj, 2022), (Pratiwi et al., 2022), (Yuharsil et al., 2020), (Pryangan & Payamata, 2020), (Suot et al., 2020), and (Ginting & Wisnu, 2021) indicate that weaker earnings metrics within CAMEL are linked to a higher likelihood of financial distress. These earnings indicators therefore play a critical role in signalling impending difficulties.

H_5: Liquidity analysis has a positive effect on financial distress in the banking sector for the 2019–2023 period.

Finally, agency theory suggests that differing goals between principals and agents can also undermine liquidity management. Although the principal expects prudent stewardship, agents may adopt liquidity positions that heighten risk. Studies by (Afroj, 2022), (Pratiwi et al., 2022), (Ginting & Wisnu, 2021), (Yuharsil et al., 2020), (Pryangan & Payamata, 2020), and (Suot et al., 2020) report that the liquidity component of CAMEL does not consistently exhibit a positive link to financial distress. Even so, liquidity ratios continue to offer valuable early-warning insights into potential financial problems within the banking sector.

RESEACRH METHODS

This study adopts a quantitative approach. Quantitative research, grounded in positivist philosophy, seeks to describe phenomena and test predefined hypotheses by employing numerical data at every stage—from collection through processing to analysis—thereby yielding objective and statistically verifiable results (Sugiyono, 2018).

The empirical data are drawn from the financial statements of banks listed on the Indonesia Stock Exchange (IDX). These statements, accessible via the IDX website (www.idx.co.id), provide the financial indicators required for the present analysis.

The investigation centres on two variable types: the independent variables, represented by the CAMEL indicators, and the dependent variable, financial distress. To assess how each CAMEL component influences financial distress, the study employs multiple linear regression, enabling an evaluation of each indicator's contribution and the identification of significant linear relationships among the variables.

Table 1. Operational Variables

Variables	Definitions	Indicator	Scale
Financial Distress (Y)	Financial distress is a condition in which a company experiences significant financial pressure, making it unable to meet its financial obligations in a timely manner (Hermawan & Fajrina, 2017)	Model *Altman Z-Score* $Z = 1,2T^1 + 1,4T^2 + 3.3T^3 + 0,6T^4 + 0,995T^5$	Ratio
Analisis CAMEL (X)	CAMEL analysis is a factor that is very influential on the financial condition of the bank and plays a role in determining the health level of the bank (Bank Indonesia, 1999).	*Capital* (Modal) CAR = Capital/ Risk Weighted Assets (RWA) x 100% *Assets* (Aset) NPL = Non performing loans /total credit x 100% *Management (Manajemen)* NPM = Net Profit/Operating Income x 100% *Earnings* (Pendapatan) BOPO = Operating Expenses/Revenue x 100% *Lquidity* (Likuiditas) LDR = Total Credit/ Third-party funds x 100%	Ratio

Source: (Hermawan & Fajrina, 2017) and (Bank Indonesia, 1999)

The population for this study comprises all 47 banking firms listed on the Indonesia Stock Exchange, observed across five fiscal years—2019, 2020, 2021, 2022, and 2023. A purposive (judgment) sampling technique is adopted, selecting observations according to predefined criteria that align with the study's objectives. The sample criteria are as follows:

Table 2. Research Sample Determination

Sample Characteristics	Total
Banking companies listed as members of the Indonesia Stock Exchange (IDX)	47
Companies that publish financial reports for 5 (five) starting from 2019-2023	47
Companies that are not in sharia banking	43
Non-regionally owned companies	40
Number of Samples	40
Total Research Data: 40 Companies × 5 Years	200

Source: Research Data, 2024

The sample selection in this study follows specific criteria to ensure that the resulting data are relevant, homogeneous, and reliable. Only banking companies listed on the Indonesia Stock Exchange (IDX) are included, as publicly traded firms must publish transparent financial reports. Banks were selected if they consistently presented complete financial statements for the five consecutive years from 2019 to 2023, ensuring data continuity. Islamic banks were excluded because their operational systems differ from those of conventional banks (Mawardi et al., 2023), and regionally owned banks were omitted due to the distinctive influence of local-government involvement (Satyagraha et al., 2022). After applying these criteria, 40 companies remained, yielding 200 firm-year observations for analysis.

This study employs quantitative data-analysis techniques, specifically simple regression, with Structural Equation Modeling software AMOS 24.0 (Analysis of Moment Structure) used for data processing and evaluation.

RESULTS AND DISCUSSION

Based on the analysis, 49 observations were identified as outliers because they failed to satisfy the specified statistical threshold of $p \leq 0.001$ (Jiao & Pretis, 2022). Outliers, which differ markedly from the bulk of the data, can distort statistical tests and bias the results (Bhattacharya et al., 2023). Consequently, these observations were removed to enhance the accuracy and representativeness of the findings.

After this screening, 151 observations remained for subsequent analysis. Reducing the dataset in this manner helps ensure that the results reflect actual conditions rather than the influence of extreme values, thereby improving validity and reliability.

The cleaned data were then subjected to classical-assumption testing. For the CAMEL Analysis variable (X), normality was assessed with the Bollen–Stine statistic; data are considered normally distributed when the statistic falls below the absolute value of 2.58 (Ghozali & Ratmono, 2017). All CAMEL indicators satisfied this criterion ($0.109 < z < 2.58$), indicating both univariate and multivariate normality.

The same procedure was applied to the Financial Distress variable (Y). All indicators met the normality requirement ($0.264 < z < 2.58$), confirming that the distribution of Y is normal in both univariate and multivariate contexts.

Descriptive statistics—minimum, maximum, mean, and standard deviation—for each study variable are reported in Table 3.

Table 3. Descriptive Statistics

Variable	N	Min	Max	Mean	Standardized Values
Capital Adequacy Ratio (X.1)	40	13.85%	159.67%	38.28%	CAR ≥ 15%
Non Performing Loan (X.2)	40	0.74%	19.94%	4%	NPL ≤ 2%
Net Profit Margin (X.3)	40	3.65%	2.153.68%	149.74%	NPM ≥ 100%
BOPO (X.4)	40	44.22%	196.45%	93.10%	BOPO ≤ 85%
Loan to Deposit Ratio (X.5)	40	19.27%	296.64%	92%	LDR ≤ 75%
Financial Distress (Y)	40	2.85	6.63	4.64	FD ≥ 2.90

Source: Research Data, 2024

The first variable, the Capital Adequacy Ratio (CAR), records a minimum of 13.85 percent, a maximum of 159.67 percent, and an average of 38.28 percent. Given the regulatory benchmark of ≥ 15 percent, every bank in the sample exceeds the minimum requirement, suggesting substantial capacity to absorb unexpected losses and maintain stability. The Non-Performing Loan (NPL) ratio ranges from 0.74 percent to 19.94 percent, with a mean of 4 percent—double Bank Indonesia's ≤ 2 percent guideline—signalling that credit-risk management remains sub-optimal at many institutions. Net Profit Margin (NPM) spans 3.65 percent to an exceptionally high 2 153.68 percent, averaging 149.74 percent; with an ideal threshold of ≥ 100 percent, most banks demonstrate robust profitability and operational efficiency. For BOPO, the operational-efficiency ratio, values lie between 44.22 percent and 196.45 percent, averaging 93.10 percent; because an optimal BOPO is ≤ 85 percent, this outcome indicates generally high operating costs relative to income, which can erode net profit. The Loan-to-Deposit Ratio (LDR) ranges from 19.27 percent to 296.64 percent, averaging 92 percent. As the recommended upper limit is ≤ 75 percent, the results suggest an aggressive lending posture that, while potentially lucrative, heightens liquidity risk if short-term obligations outpace available reserves.

The Financial Distress variable, measured here with a Z-score, records a minimum of 2.85, a maximum of 6.63, and an average of 4.64. Because scores ≥ 2.90 generally denote financial health, the sample's mean implies that, overall, the banks are not under acute financial pressure and that bankruptcy risk is largely manageable.

Despite solid averages in capital strength (CAR), profitability (NPM), and overall financial condition (Z-score), the elevated figures for credit risk (NPL), operational inefficiency (BOPO), and liquidity exposure (LDR) underscore persistent vulnerabilities. These less-than-ideal CAMEL components may still magnify the likelihood of financial distress across the sector.

Within structural-equation-modelling (SEM) analysis, verifying that all variances are positive is essential: positive variances confirm stable, valid, and reliable distributions that underpin trustworthy model estimation. Negative variances, by contrast, signal potential data or specification problems—such as measurement error, misfit, or unmet assumptions—that can compromise analytical validity (Sugiyono, 2018).

Table 4. Descriptive Data: Overending Estimate Variance

	Estimate	S.E.	C.R.	P	Label
X	0.001	0.001	0.878	0.380	par_5
e1	0.025	0.003	8.409	***	par_6
e2	0.000	0.000	0.84	0.933	par_7
e3	0.183	0.021	8,658	***	par_8
e4	0.026	0.004	6.508	***	par_9
e5	0.107	0.013	8.396	***	par_10

Source: Research Data, 2024

The testing in this study employed Structural Equation Modeling (SEM) with AMOS version 24, which facilitates the analysis of causal relationships among latent variables within a predefined theoretical framework (Junaidi, 2021). SEM is

appropriate here because it simultaneously examines the effects of the CAMEL independent variables on the dependent variable—financial distress—both directly and indirectly, and it yields more precise parameter estimates by estimating the measurement and structural models concurrently.

According to the SEM results presented in Table 5, two of the five hypotheses were not supported. This conclusion is based on each variable's Critical Ratio (CR), which fell well below the minimum threshold of 1.600, and on probability (P) values that exceeded the 0.05 significance level.

Tabel 5. Tabel Ouput Hipotesis SEM AMOS

			Estimate	S.E.	C.R.	P	Label	Adverb
Y	<---	X.1	0.005	1.619	0.022	0.778	Significant
Y	<---	X.2	-0.260	0.490	-0.530	0.596	Not Significant
Y	<---	X.3	0.022	0.039	0.557	0.577	Not Significant
Y	<---	X.4	0.134	1.838	0.032	0.573	Significant
Y	<---	X.5	0.014	1.625	0.035	0.592	Significant

Source: Research Data (2024)

Based on the SEM–AMOS 24 results presented in Table 5, three hypotheses are significant and two are not. Significance is determined by a Critical Ratio (C.R.) exceeding the 1.600 threshold and a p-value below 0.05.

For the first hypothesis, the Capital Adequacy Ratio (CAR) yields a C.R. of 1.619 and a p-value of 0.022, indicating a positive effect on financial distress. This suggests that banks may strengthen their capital buffers in response to perceived risk (Ginting & Wisnu, 2021). The second hypothesis, assessing Non-Performing Loans (NPL), produces a C.R. of 0.490 and a p-value of 0.530; thus, high NPL levels do not exhibit a statistically significant impact on distress in this sample (Al Zaidanin, 2020).

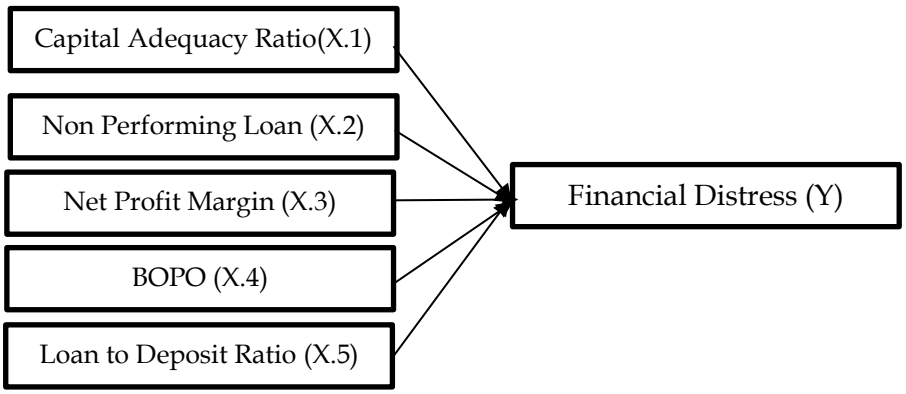
The third hypothesis, concerning Net Profit Margin (NPM), reports a C.R. of 0.039 and a p-value of 0.557, confirming that profitability did not significantly influence financial distress during the study period. By contrast, the fourth hypothesis finds that BOPO (Operating Costs to Operating Income) has a C.R. of 1.838 and a p-value of 0.032, signifying a positive relationship: higher BOPO—and therefore lower operational efficiency—raises the likelihood of distress (Kulshrestha & Srivastava, 2022).

The fifth hypothesis shows a similar pattern for the Loan-to-Deposit Ratio (LDR), with a C.R. of 1.625 and a p-value of 0.035, indicating that aggressive lending relative to deposits consistently predicts financial distress (Arif et al., 2024).

These findings reinforce agency theory. Conflicts between principals (owners) and agents (managers) can prompt opportunistic behaviour, particularly in managing CAMEL indicators such as CAR, BOPO, and LDR, all of which significantly heighten distress risk. Conversely, the insignificant effects of NPL and NPM may signal managerial efforts to disguise unfavourable conditions, thereby diminishing the predictive power of those measures.

The results align with earlier studies (Pratiwi et al., 2022), (Ginting & Wisnu, 2021), (Yuharsil et al., 2020), and (Pryangan & Payamata, 2020), which conclude that although CAMEL indicators are valuable for internal monitoring, they do not

uniformly predict financial distress. Nevertheless, they remain integral components of an effective early-warning system for long-term risk detection.



Picture 1. Hypothesis Test Output

Source: Research Data, 2024

The results of this research indicate that several CAMEL analysis indicators exert both positive and negative effects on financial distress in the banking sector listed on the Indonesia Stock Exchange (IDX) during the 2019–2023 period. This finding suggests that, although CAMEL analysis is a useful tool for assessing the financial health of banks, it cannot fully explain or predict the occurrence of financial distress.

This limitation highlights the importance of considering other factors that may contribute to financial distress in the banking sector. Although CAMEL analysis covers key aspects such as liquidity, profitability, and asset quality, external variables or broader macroeconomic conditions may also play a significant role in shaping banks' financial stability.

This observation aligns with the longitudinal analysis for 2019–2023 conducted by the researchers, which reveals an interesting inconsistency between CAMEL assessments and the financial-distress status of several Indonesian banks. The data show a contradictory pattern: some banks display healthy CAMEL indicators yet fall into the financial-distress "dark zone," while others record weaker CAMEL scores but remain stable.

Based on an evaluation of 2019 data, three banks—Bank Mestika Dharma (BBMD), Bank Negara Indonesia (BBNI), and Bank Rakyat Indonesia (BBRI)—were classified in the safe zone, with Z-Scores of 6.06, 3.98, and 8.08, respectively. These institutions also reported Capital Adequacy Ratios (CARs) of 38.60 %, 19.70 %, and 20.59 %, all within the "Very Healthy" range.

In 2020, significant anomalies emerged. Bank Jago (ARTO), which posted a "Very Healthy" Non-Performing Loan (NPL) ratio of 1.82 %, nevertheless entered the critical dark zone with a Z-Score of –14.63. Similar discrepancies appeared at Bank Raya Indonesia (AGRO), Bank Capital Indonesia (BACA), Bank KB Bukopin (BBKP), Bank Permata Indonesia (BNLI), Bank of India Indonesia (BSWD), Bank Oke Indonesia (DNAR), and Bank Artha Graha Internasional (INPC). Although aggregate CAMEL metrics indicated good health, financial-distress evaluations produced conflicting conclusions.

In 2021, Bank Ammar Indonesia (AMAR) became notable for falling into the dark zone even though its Net Profit Margin (NPM) stood at a very high 585.98 %, classified as "Very Healthy." Conversely, Bank BCA (BBCA), Allo Bank (BBHI), Bank BRI (BBRI), and Bank Negara Indonesia (BBNI) consistently remained in the safe zone, with Z-Scores of 9.20, 6.93, 6.01, and 4.85, respectively. This financial stability was supported by optimal Operating Cost-to-Operating Income (BOPO) ratios of 54.20 %, 74.30 %, and 29.90 %, all rated "Very Healthy."

The 2022 data reveal an escalation in the number of banks classified as financially distressed. Bank Amar Indonesia (AMAR), Bank India Indonesia (BSWD), and Bank Artha Graha Internasional (INPC) all entered the dark zone. Consistently, these institutions recorded sub-optimal Loan-to-Deposit Ratios (LDRs) of 220.31 %, 105.59 %, and 292.94 %, respectively, all in the "Unhealthy" category, indicating a fundamental imbalance between credit disbursement and third-party funding.

These findings align with the research of Sartika Pratiwi et al. (2022), which concludes that while CAMEL indicators significantly influence financial-distress conditions, their predictive effectiveness varies widely. Although these indicators are sensitive and relevant in detecting potential distress, their signals are often modulated by exogenous factors such as macroeconomic fluctuations, regulatory changes, and competitive market dynamics. This perspective underscores the limitations of using CAMEL as a standalone tool for evaluating bank health and highlights the need for complementary methodologies to achieve a more holistic assessment of financial stability.

The results also support the conclusions of Yuharsil et al. (2020), which note that certain CAMEL indicators—specifically CAR, BOPO, and LDR—show a positive influence on financial distress. However, Azaluddin (2023) reports contrasting findings, revealing a negative effect of CAMEL analysis on distress, thereby highlighting methodological differences across studies.

Viewed through the lens of Agency Theory, these results emphasize that CAMEL analysis may fail to accurately capture financial distress in Indonesian banks due to information asymmetry. Indicators such as CAR, BOPO, NPM, NPL, and LDR are designed to provide an overview of financial health, yet they do not always reflect the real, internal conditions banks face.

The core issue is that information available to outsiders—including investors and regulators—rarely offers a complete picture of a bank's internal challenges. A bank can appear strong based on CAMEL ratios—such as a high CAR or low NPL—yet still harbor unseen operational instability, risk-management failings, or liquidity problems known only to management. This information gap hampers the ability of CAMEL indicators to fully reflect risk and potential financial distress, as hidden issues are not integrated into these ratios.

CONCLUSION

The capital indicator, proxied by the Capital Adequacy Ratio (CAR), shows a positive association with financial distress, implying that banks tend to bolster their capital buffers in anticipation of heightened risk. Conversely, the asset indicator—Non-Performing Loans (NPL)—exhibits a negative relationship, suggesting that although elevated NPLs can undermine stability, their effect is not

statistically conclusive in this study. The management indicator, represented by Net Profit Margin (NPM), also has a negative effect, indicating that profitability does not materially influence vulnerable financial conditions. In contrast, the earnings indicator, measured by BOPO (Operating Costs to Operating Income), displays a strong positive relationship with distress. Likewise, the liquidity indicator, Loan-to-Deposit Ratio (LDR), exerts a positive effect, confirming that the proportion of credit to third-party funds is a consistent predictor of potential financial distress.

This study has several limitations that warrant consideration when interpreting the findings. First, the analysis relies solely on a quantitative approach using CAMEL ratios to represent banking performance. Although CAMEL is widely recognised, it cannot capture qualitative aspects and external factors that affect financial distress, such as corporate governance, ownership structure, market confidence, regulatory changes, and macroeconomic pressures (inflation, exchange rates, and interest rates). Future research should employ a more comprehensive model that incorporates macroeconomic variables, internal managerial factors, and market-based indicators (e.g., share-price movements or credit ratings) to gain a fuller understanding of the drivers of financial distress in the banking sector. A mixed-methods design or panel-data techniques—such as the Generalised Method of Moments (GMM)—could also be adopted to capture long-term effects and enhance the validity of the results.

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