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Investigating the Impact of Financial Ratios, Good Corporate Governance and Digital Technology on Financial Distress in Banking Amid Inflation in the Digital Age

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Abstract

This study examines the influence of financial ratios, good corporate governance (GCG), and digital advancement on financial distress in Indonesia's banking sector, with inflation as a moderating variable. This research employs a quantitative methodology and panel-data regression analysis to examine 185 observations from 37 active banks over 2020-2024. The analytical methods include descriptive statistics and panel-data regression with a fixed-effects model. The model selection is based on Chow and Hausman tests, which indicate that the fixed-effect model is more appropriate for the data under analysis.

The analysis indicates a strong fit of the regression model, evidenced by an R-squared of 86.85% and statistically significant findings at the 1% level. The primary findings indicate that the Loan to Deposit Ratio (LDR) positively affects financial stability, whereas the operational cost-to-operational income ratio (BOPO) negatively affects financial stability. Inflation further intensifies the adverse impacts of non-performing loans (NPL) on financial distress. This study underscores the significance of operational efficiency and meticulous risk management in sustaining financial stability in the digital age.

The findings underscore the imperative of operational efficiency, judicious credit risk management, and responsiveness to macroeconomic conditions to maintain financial stability in the banking sector in the digital era. This study offers critical insights for banking sector stakeholders to understand the determinants of financial distress and implement strategic measures to improve bank financial stability amid evolving economic circumstances.

Keywords: Loan to Deposit Ratio, BOPO, Non-Performing Loans, Financial Stability, Financial Distress

INTRODUCTION

The banking sector is a component of a nation's economy. Within the Indonesian economy, the banking sector is crucial to facilitating sustainable economic development. As in other industries, the banking industry faces challenges that may jeopardize its financial stability, including financial hardship driven by internal and external factors. Key internal elements encompass financial ratios, the execution of Good Corporate Governance (GCG), and technological innovations.

Financial ratios in banking include critical measures such as the Capital Adequacy Ratio (CAR), the Loan-to-Deposit Ratio (LDR),

liquidity, and profitability. Discrepancies in these ratios may signify financial trouble. Inadequate execution of GCG, imprudent decision-making, and insufficient supervision might heighten the risk of financial issues resulting in hardship.

Digital innovations in banking significantly impact the sector, encompassing not just online banking services but also application-based digital payment solutions to improve client service. This technical advancement has hurdles and significant economic effects, including inflation. Elevated inflation will diminish consumer purchasing power, thereby influencing the demand for financial products. When

inflation increases, banks must modify their monetary policies and operations to preserve economic stability.

To tackle these difficulties, banks in Indonesia can facilitate equitable and sustainable digital transformation while adjusting to an increasingly intricate economy. Financial ratios in banking encompass critical metrics such as capital adequacy, loan ratios, and profitability and liquidity ratios. These ratios provide insights into financial performance and the bank's capacity to meet both short- and long-term obligations. Imbalances, such as highly elevated debt ratios or insufficient capital, may present a danger of financial distress.

The adoption of GCG in banking management is crucial for preventing financial hardship. Effective governance and control ensure openness, accountability, and efficient oversight of banking operations. Poor governance and control can result in inadequate management and insufficient oversight, leading to financial difficulties and hardship. Gunawan et al. (2023); Damayanti, Kumalasari, & Sholihah (2021); Salsabila, Putri, & Rahmatika (2024)

The advancement of digital technology significantly affects banks' financial performance. By leveraging digital technology, banks can improve operational efficiency and expand their market presence. A bank's failure to respond to digital transformations and to leverage technology effectively may diminish its competitiveness, escalate costs, and deteriorate its financial condition. (Johri et al., 2024; Bhasin & Gulati, 2021; Xi & Wang, 2023)

Besides the internal factors noted, macroeconomic conditions, such as inflation, significantly influence banking performance and may temper the relationships among financial ratios, corporate governance, and technological improvements regarding financial distress. Elevated inflation may lead to higher operational expenses, diminished consumer purchasing power, and fluctuations in interest rates, thereby affecting a bank's ability to manage credit and liquidity risks. (Ainiyah & Ilmiddaviq, 2025; Maulida & Arfiansyah, 2024)

High inflation poses challenges for banks in adjusting monetary policy, such as interest rates on loans and deposits, thereby affecting profit margins and financial stability. Afonso and Blanco-Arana (2022); Parmankulova et al. (2022); Valerio and Villamonte (2022)

In the context of banking amid inflation in the digital age, several key factors emerge that influence how banks can avoid financial distress. Author investigates how financial ratios impact the stability or deterioration of banks' financial conditions. Author also assesses the significance of governance practices in mitigating financial risk and examine how best practices in governance can help banks withstand economic challenges. Additionally, the use of digital technology becomes increasingly important in this era. We aim to identify how digital innovations impact the financial resilience of banks, especially when inflation pressures their profitability and operations. Finally, we need to explore whether significant interactions exist among financial ratios, good corporate

governance, and the application of digital technology that may influence the overall financial performance of banks.

LITERATURE REVIEW

Handoko & Handoyo (2021) assert that agency theory emerges from the distinct functional responsibilities of principals and management, or agents. Agents bear multiple obligations to the principals, including the execution and reporting of acts via financial statements, which function as standards for evaluating the company's financial status.

The signaling theory transmits signals from information sources to recipients. In this environment, informed persons seek to convey significant information to ensure that the recipients appreciate its significance. This aids in assessing whether a corporation is undergoing financial distress, as the correlation between signaling theory and economic challenges relies on the company's financial data. This information facilitates an assessment of the company's financial capacity and condition (Ayem et al., 2023).

Good Corporate Governance (GCG) practices are frameworks, methodologies, and strategies used by organizations to generate sustainable value while balancing the interests of multiple stakeholders, in alignment with regulations, cultural standards, norms, and ethical principles (Prasetya Fernando, 2023). Various elements, including management and institutional ownership, are utilized to evaluate the quality of corporate governance inside a corporation or organization. A report by the

Forum for Corporate Management in Indonesia, authored by Zatira, Sunaryo, and Dwicandra (2023), defines Good Corporate Governance (GCG) as the regulations that oversee and manage the rights and obligations of stakeholders, along with the systems that regulate and direct corporations (Systematic Literature Review: The Impact of Liquidity and GCG Implementation on Financial Distress).

The advancement of information and communication technology has significantly transformed several elements of human life in the modern era. The banking sector is among the most affected. The digital revolution has transformed banking operations, especially with customer service and financial administration. Two significant advancements arising from this technical growth are internet banking and mobile banking. At present, most banks operate in a highly dynamic environment (Li Feng et al., 2021).

In recent years, banking client behavior has undergone a substantial transformation. Customers are increasingly favoring online banking services over visiting physical branches. This transition can lower banks' operational expenses by decreasing the necessity for extensive physical branches and personnel. Nonetheless, there are expenses associated with the development and maintenance of internet and mobile banking services. Consequently, it is vital to understand how changes in customer behavior affect banking financial performance.

Financial distress in a company indicates the necessity for modifications, as its operational cash flow is inadequate to meet short-term liabilities such as accounts payable or interest expenses (Alexandra et al., 2022). The phrase "financial distress" is frequently used in corporate finance to denote circumstances in which an individual or a corporation encounters difficulties fulfilling its obligations, especially loan repayments to creditors. Research by Sucipto (2021) reveals that financial distress is of adverse initial phase financial circumstances, which may culminate in default or liquidation. This transpires when a corporation neglects to meet its obligations, particularly in the absence of short-term liquidity and solvency.

Anggita & Pohan (2022) assert that financial difficulty signifies a phase preceding corporate bankruptcy. This indicates that not all financially distressed enterprises will face insolvency. Financial distress refers to a condition in which a corporation encounters financial challenges, characterized by its incapacity to fulfill obligations, which may lead to bankruptcy or liquidation. According to Jati, Kholmi, and Jannah (2023), financial challenges stem from economic hardship, industry recessions, and inadequate management. Inadequate governance may result in financial difficulties stemming from operational mismanagement.

Financial distress may arise from both internal and external reasons. The Altman Z-Score, a metric derived from evaluating creditworthiness, can be used for measurement under the Altman Z-Score model. This model evaluates multiple financial dimensions of a corporation, including working capital, retained earnings, Earnings Before Interest and Taxes

(EBIT), market equity value, sales, total assets, and liabilities.

The elevated inflation rate adversely affects corporate performance by diminishing sales volume, thereby reducing operational profits. Signaling Theory posits that high inflation signals to investors that macroeconomic conditions are unstable, whereas low inflation signals a favorable investment environment.

This transmission mechanism affects investor behavior: economic uncertainty diminishes investment interest, putting downward pressure on stock prices and ultimately reducing the company's value. During periods of elevated inflation, companies may encounter diminishing sales and, as a result, reduced earnings. This circumstance may influence investors' judgments on investment in the company.

A decline in demand for the company's shares may lead to lower stock prices. Rising interest rates may incentivize capital owners to invest in particular enterprises in anticipation of increased profits. Nevertheless, should deposit interest rates continue to rise, investors are inclined to reallocate their assets to deposits rather than engage in the capital market, as they recognize diminished profit potential and elevated risks therein. (Safitri, Sudarmaji, & Astuti, 2023)

METHOD

This research uses quantitative analysis. Quantitative analysis resolves issues by quantifying research findings to generate the requisite information for analysis. This study

utilizes descriptive statistics and panel data regression analysis as its analytical techniques. Descriptive statistics provide a summary of data using metrics such as mean, standard deviation, variance, maximum, minimum, total, range, kurtosis, and skewness (a measure of asymmetry in the distribution). This research employs descriptive statistics, including the mean, median, maximum, minimum, and standard deviation. The data analysis is performed using Eviews 9.

Panel data integrates both time-series and cross-sectional data (individual). It possesses both spatial and temporal dimensions. The benefits of employing this analysis include facilitating more extensive data collection by integrating time-series and cross-sectional data, thereby increasing degrees of freedom. Integrating time-series and cross-sectional data might mitigate problems associated with omitted variables.

The Eviews 9 application provides three estimating techniques: Common Effect, Fixed Effect, and Random Effect. The Fixed Effect denotes the application of ordinary least squares (OLS), whereas the Random Effect signifies the utilization of generalized least squares (GLS). Chow and Hausman tests are necessary to determine the appropriate estimation approach. If the estimation results indicate a random-effects model, conventional assumption testing is unnecessary. If the results suggest a fixed-effects model, classical assumption testing is necessary. This aligns with the assertion of Gujarati and

Porter (2009) that only equations that meet classical assumptions should be analyzed using the Generalized Least Squares (GLS) approach; thus, if the equation employs Ordinary Least Squares (OLS), testing for classical assumptions remains necessary.

This research uses purposive sampling to collect data from banks that meet predetermined criteria. The requirements encompass companies that have filed comprehensive financial statements to Bank Indonesia over the past five years (2020 to 2024) and have published annual banking financial reports on the Indonesia Stock Exchange (BEI). The selected banks must not have merged during the research period, remain operational, and have made profits throughout the study.

The examined variables include financial measures such as ROE, ROA, NPL, NIM, and LDR, as well as GCG, digital advancement, financial distress, and inflation. Before data testing, the researcher uses selection tests to estimate and model the data. The analysis employs classical assumptions and panel-data methodologies in EViews 9, yielding more useful data with greater variation. This method mitigates multicollinearity and increases degrees of freedom, resulting in more efficient estimation.

RESULTS AND DISCUSSION

First Model Regression

Dependent Variable: ZSCORE Method: Panel Least Squares Date: 08/22/25 Time: 07:10 Sample: 2020 2024 Periods included: 5 Cross-sections included: 37 Total panel (balanced) observations: 185

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Variable	Coefficient	Std. Error	t-Statistic	Prob.		
С	6.295794	0.299601	21.01396	0.0000		
ROE	-0.004265	0.005652	-0.754712	0.4517		
ROA	0.098764	0.074045	1.333833	0.1844		
NPL	-0.020872	0.111745	-0.186784	0.8521		
NIM	-0.071251	0.082992	-0.858530	0.3921		
LDR	0.014941	0.005479	2.727069	0.0072		
GCG	0.070937	0.402025	0.176450	0.8602		
CIR	-0.012596	0.006797	-1.853226	0.0660		
CAR	-0.010490	0.005917	-1.772764	0.0785		
ВОРО	-0.006284	0.002837	-2.215026	0.0284		
Effects Specification						
Cross-section fixed (dummy variables)						
R-squared	0.868497	Mean dependent var		5.818504		
Adjusted R-squared	0.825924	S.D. dependent var		1.722458		
S.É. of regression	0.718650	Akaike info criterion		2.388531		
Sum squared resid	71.78767	Schwarz criterion		3.189268		
Log likelihood	-174.9391	Hannan-Quinn criter.		2.713050		
F-statistic	20.40026	Durbin-Watson stat		1.471889		
Prob(F-statistic)	0.000000					

The panel regression findings using the fixed-effects technique with ZSCORE as the dependent variable indicate robust explanatory power for the model. The R-squared value of 0.8685 signifies that roughly 86.85% of the variation in ZSCORE is accounted for by the independent variables incorporated in the model. The Prob(F-statistic) value of 0.0000 indicates that the model is statistically significant, rendering it appropriate for further study.

From the viewpoint of the independent factors, several significant conclusions appeared. The Loan to Deposit Ratio (LDR) exerts a positive and substantial influence on ZSCORE, evidenced by a coefficient of 0.0149 and a p-value of 0.0072. This suggests that an elevated credit-to-deposit ratio is associated with improved financial health, as shown by ZSCORE. In contrast, the BOPO (Operational Costs to Operational Income) variable exhibits a notable negative impact on ZSCORE, with a coefficient of -0.0063 and a p-value of 0.0284. A

higher ratio of operational expenditures to income leads to diminished financial health. Additional variables, including the Cost to Income Ratio (CIR) and the Capital Adequacy Ratio (CAR), exhibit marginal significance (p-values of 0.0660 and 0.0785, respectively), suggesting that operational efficiency and capital adequacy may affect ZSCORE, albeit with insufficient statistical power in this model. Conversely, factors such as ROE, ROA, NPL, NIM, and GCG demonstrate negligible effects, indicating they have little influence on ZSCORE across the examined period and sample.

Second Model Regression

Dependent Variable: ZSCORE Method: Panel Least Squares Date: 08/22/25 Time: 07:15 Sample: 2020 2024 Periods included: 5 Cross-sections included: 37 Total panel (balanced) observations: 185

Variable	Coefficient	Std. Error	t-Statistic	Prob.
С			18.26111124 489361	
ВОРО		0.004944962	1.277367808 768506	
CAR			0.738708143 9063512	
CIR			2.421319686 966465	83444817
GCG			2.410156689 225048	36249923
LDR	0.01862444 913386789	0.008375346 459652985	2.223722830 283914	25839135
NIM			0.865031136 244679	91022334
NPL			0.494497126 315909	17335906
ROE	102434064	010220374	0.901063809 6103568	72296558 6
ROA			0.833151616 397534	
INFLASI		72192352	0.482661286 1374671	04326829
INFLASI_X_BOPO		472021953	0.355830703 72881	
INFLASI_X_CAR		888798471	0.034383273 7370998	
INFLASI_X_CIR			0.536479573 1696835	
INFLASI_X_LDR		0.002626584	0.886470867 9755264	
INFLASI_X_GCG			2.607190345 145234	47758809
INFLASI_X_NPL			0.846391909 1442042	20381628 3
INFLASI_X_NIM			0.365339422	

The regression model has an exceptional goodness-of-fit, evidenced by an R-squared value of 86.85% and an adjusted R-squared of 83.35%, both statistically significant at the 1% level (Prob(F-statistic) = 0.0000). The Loan to Deposit Ratio (LDR) demonstrates a substantial beneficial impact on the Z-Score, suggesting that efficient credit allocation can improve financial

stability. Conversely, the BOPO (operating expenses to operating income) ratio shows a substantial negative impact, indicating that diminished operational efficiency increases the likelihood of financial trouble. Other factors, including CIR and CAR, are also significant, although ROE, ROA, NPL, NIM, and GCG do not have significant effects in the first model.

The second model, which treats inflation as a moderating variable, shows that the interaction between non-performing loans (NPL) and inflation has a significant positive effect on financial hardship, suggesting that inflationary pressure intensifies the adverse effects of NPLs. The relationship between LDR and inflation shows a substantial negative impact, suggesting that higher inflation increases the risk of financial failure due to liquidity disruptions associated with high leverage. The model shows no significant autocorrelation, as evidenced by a Durbin-Watson statistic of 1.46. The findings highlight the significance of operational efficiency, meticulous credit risk management, and responsiveness to macroeconomic conditions in sustaining financial stability within the banking industry during digital transformation.

CONCLUSION

This research indicates that the regression model has a strong fit, evidenced by an R-squared value of 86.85% and an adjusted R-squared of 83.35%. The substantial statistical significance at the 1% level (Prob(F-statistic) = 0.0000) underscores the robustness of the model within the study's framework. The Loan to Deposit Ratio (LDR) positively and significantly affects the Z-Score, indicating that higher LDRs signify more efficient credit allocation, enhancing interest revenue and the bank's financial stability. The BOPO variable exerts a negative and significant influence on the outcomes, as diminished operational efficiency may increase the risk of

financial difficulty, hence potentially undermining profitability and consumer trust. Moreover, the Cost-to-Income Ratio (CIR) and Capital Adequacy Ratio (CAR) substantially affect the results. However, ROE, ROA, NPL, NIM, and GCG do not have a significant impact on the first model. The second model demonstrates that the relationship between NPL and inflation has a positive, significant impact on financial distress, suggesting that elevated inflation may exacerbate it. The relationship between LDR and inflation adversely and significantly affects outcomes, indicating that under high inflation, elevated leverage may heighten liquidity risk. This model suggests the absence of significant autocorrelation, as evidenced by a Durbin-Watson value of 1.46, underscoring the critical role of operational efficiency and risk management in preserving the bank's financial stability in an unpredictable digital age.

Reccomendation

The research findings yield various strategic implications for bank management, regulators, and future researchers. Banks must prioritize operational efficiency through cost control, digitalization of services, and business process automation to improve profitability and financial resiliency. Secondly, sustaining efficient credit distribution is crucial, particularly since the Loan to Deposit Ratio (LDR) enhances financial stability; however, this requires robust credit risk management to avert rising non-performing loans (NPL) amid elevated inflation. Third, maintaining sufficient capital ratios is essential for reducing financial distress risk, while

improving credit monitoring systems is vital for responding to macroeconomic conditions. Moreover, banks must formulate adaptable liquidity strategies to counter the adverse effects of inflation on the Loan-to-Deposit Ratio (LDR) and, in forthcoming research, use supplementary factors, such as digital banking indices or fintech integration, to deliver a more thorough examination of the banking sector.

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