

DOES FINANCIAL STATEMENT FRAUD MODERATE THE INFLUENCE OF CREDIT RISK AND CAPITAL ADEQUACY ON FINANCIAL DISTRESS

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ABSTRACT

In Indonesia's banking sector, altering or tampering with financial statements is a common practice aimed at portraying better company performance. Nevertheless, this behavior often signals underlying financial struggles or distress within the banks. This study evaluates whether Financial Statement Fraud moderates the linkage between Credit Risk, Capital Adequacy, and Financial Distress. The observation includes banking entities listed on the Indonesia Stock Exchange within the 2019 to 2023 period. Hypotheses were examined using Moderated Regression Analysis (MRA). Empirical evidence reveals that elevated Credit Risk significantly elevates the probability of Financial Distress in banks. Conversely, robust Capital Adequacy serves as a primary safeguard to maintain the fiscal stability of the firm. Financial Statement Fraud proves to exacerbate the detrimental impact of asset risks, obscuring financial distortion signals for investors. These revelations underscore the urgency of reporting integrity and strict compliance with government regulations to prevent insolvency. Maintaining high transparency in financial statements is essential for mitigating future Financial Distress risks.

ABSTRAK

Di sektor perbankan Indonesia, pengubahan atau pemalsuan laporan keuangan sudah menjadi praktik yang umum dilakukan dengan tujuan untuk menunjukkan kinerja perusahaan yang lebih baik. Namun, kenyataannya, tindakan ini sering kali menandakan adanya permasalahan keuangan atau financial distress yang dialami oleh bank. Penelitian ini menganalisis peran *Financial Statement Fraud* dalam memoderasi keterkaitan antara *Credit Risk*, *Capital Adequacy*, dan *Financial Distress*. Data observasi mencakup entitas perbankan di Bursa Efek Indonesia dengan rentang waktu pengamatan dari tahun 2019 hingga 2023. Pengujian hipotesis dilakukan menggunakan metode *Moderated Regression Analysis* (MRA). Bukti empiris mengungkap bahwa peningkatan *Credit Risk* secara signifikan mempercepat kondisi *Financial Distress* pada sektor perbankan. Sebaliknya, penguatan *Capital Adequacy* terbukti memberikan proteksi terhadap potensi kegagalan keuangan yang mungkin dialami perusahaan. Temuan menunjukkan bahwa *Financial Statement Fraud* memperparah dampak buruk risiko aset terhadap stabilitas ekonomi perbankan. Optimalisasi tata kelola tersebut krusial guna memitigasi potensi *Financial Distress* pada institusi perbankan di masa depan.

INTRODUCTION

Financial statements are required to be free from fraudulent practices carried out by management, particularly in the form of material misstatements, as these actions may harm investors, customers, and the national economy. However, in practice, fraud still frequently occurs. Based on the 2019 Indonesia Fraud Survey, fraud within the financial and banking sectors has the most substantial impact, contributing to losses of 41.4%. Furthermore, the 2018 ACFE Indonesia survey reveals critical insights into domestic fraudulent trends. According to their 2020 report, financial institutions represent the most common environment for deceptive practices, which can further complicate the early detection of Financial Distress.

A recent case of financial statement modification has emerged at PT Bank Bukopin Tbk. The bank, with the stock ticker BBKP, has corrected its financial statements for the past three years, specifically for 2015–2017. In this case, there are allegations of using credit card data.

The unauthorized modification of credit card data at Bukopin originated over five years ago. This incident involved a massive volume of records, exceeding 100,000 individual credit cards. Consequently, these discrepancies led to an artificial inflation of the bank's credit and interest income. As a result, Bukopin adjusted its net profit for 2016 downward from Rp1.08 trillion to Rp183.56 billion. The most significant reduction was seen in the income and expense category, especially within the credit card payment segment, which dropped from Rp1.06 trillion to Rp317.88 billion. Besides changes related to credit card issuance, adjustments were also made concerning the investment in Bukopin Syariah Bank (BSB), involving additional deposits linked to the reduction of certain debtors. Consequently, the allowance for financial impairment was increased from Rp649.05 billion to Rp797.65 billion, causing the company's expenses to rise by Rp148.6 billion. (Haryanto, 2018).

According to Green & Reinstein (2004) research, financial fraud has changed over time and now typically involves hiding actual information rather than fabricating false information. The amount of each fraud incident has decreased over time, despite the fact that the frequency of fraud has not changed considerably. The two writers also speculate that laws and public monitoring might have a negligible effect on how frequently fraud happens.

Fraudulent activity involving financial statements can distort the actual financial position of a bank and may lead to financial distress (Johnson, William C., Wenjuan Xie, 2014); (Sekarwulan and Umur, 2021); (Aviantara, 2021). Financial distress can be defined as financial difficulties observed in the structure of cash flow and the strategic financial statements of the company (Outechva, 2007, Kortweg, 2007, Ally and Bwana, 2021, Putri and Rachmawati, 2019).

Malau and Murwaningsari (2018) explain that companies experiencing financial distress tend to manipulate financial statements, thereby reducing their integrity. Commonly, such entities struggle when their EBITDA fails to cover interest and tax obligations for two consecutive years. This fiscal deficit prevents the generation of sufficient operational cash flow to settle outstanding debts. Second, the market value decreases between two successive time periods. According to (Pindado, Rodrigues and de la Torre, 2008), a corporation is considered to be in financial trouble in the year that follows the occurrence of these two occurrences. Financial institutions are under pressure from insolvency, liquidation, and defaulting on debts, according to (Betz *et al.*, 2014).

Financial distress can really be identified far in advance of a company's bankruptcy (Chandra, 2008, Malau & Murwaningsari, 2018). Abou-El-Sood (2015) explains that the primary objective of banking regulations is to minimize systemic risks that arise from the failure of banks, thus protecting depositor interests and maintaining overall financial system stability.

During the period from 2006 to 2021, the Deposit Insurance Corporation (Lembaga Penjamin Simpanan, LPS) has wound up a total of 117 banks. In 2021 alone, LPS carried out the liquidation of eight

rural banks (BPR/BPRS). Out of this number, in 2021 alone, LPS liquidated eight rural banks (BPR/BPRS). This means that 116 rural banks have been dissolved between 2006 and 2021. During this period, IFI was one of the commercial banks that was dissolved, while Bank Century was a commercial bank that was rescued. Financial distress was a factor contributing to the banking bankruptcies (Rastogi & Kanoujiya, 2022).

The oversight of Indonesia's banking sector is shared between Bank Indonesia and the Financial Services Authority (OJK). This regulatory framework also incorporates specific mandates from the Deposit Insurance Corporation (LPS) and national tax authorities. As a result, compliance with prudential standards is enforced, enabling effective banking supervision. Efforts to minimize bank failures include the enforcement of Bank Indonesia (BI) Regulation No. 6/10/PBI/2004. This policy establishes a comprehensive framework for assessing commercial bank soundness, with a primary focus on credit risk. Furthermore, capital adequacy requirements are mandated under Bank Indonesia Regulation No. 10/15/PBI/2008 to maintain institutional solvency.

Credit risk remains a significant challenge and plays a crucial role because it influences the long-term sustainability and survival of the banking industry (Serwadda, 2018, Msomi, 2022). Two aspects of credit risk are specific bank variables and macroeconomic considerations. A typical feature of all financial crises is high credit risk, which is at or close to the verge of default. Research already in existence recognizes that rising credit risk hurts banks' bottom lines, restricts loan growth, and impedes the post-crisis recovery process (Ari, et al, 2021) and (Nasir, et al, 2022).

Non-performing loans (NPL) have the potential to reduce credit risk. Early in 2022, Indonesian banks' non-performing loans (NPL) remained at high levels. As stated by Databoks (2022), the Financial Services Authority (OJK) Banking Statistics show that in January 2022, the total amount of NPL in banks was IDR 176.93 trillion. The NPL ratio of the aggregate loan value was 3.1%, equivalent to IDR 5.71 quadrillion. Compared to December 2021, this ratio increased by 3%. Unlike before the pandemic in January 2020, the value of banking NPLs increased by IDR 24.78 trillion (16.28%). In addition, the NPL ratio increased by 33 basis points (bps) from the same time last year, when it was just 2.77% (Santosa, 2023).

Buchdadi et al. (2020) discovered a positive relationship between financial distress and credit risk, with credit risk being measured by non-performing loans (NPLs). Similarly, Imbierowicz and Rauch (2014) emphasized that the combination of liquidity and credit risk, along with a bank's overall risk profile, determines the likelihood of bank default. Research by Ghenimi et al. (2017) also supports these findings, showing that both credit risk and liquidity risk influence the stability of banks. Moreover, Huljak et al. (2022) found that during the COVID-19 pandemic, non-performing loans had an adverse effect on the financial stability of banks.

The idea of capital adequacy pertains to the rules and regulations governing how banks and financial institutions manage their capital resources. To ensure sufficient capital in banks, there are specific regulations like the Capital Adequacy Ratio (CAR) designed to evaluate their capital adequacy. One of the basic ratios that can be used to determine the strength of capital is CAR (Almaqtari et al., 2018). CAR is regarded as an indicator used to assess the degree of risk in banking. This ratio should be implemented following international standards to assist banks in mitigating financial uncertainties and ensuring the security of customers utilizing banking facilities (Sang, 2021). Customers may take into account the security measures in place and the bank's capacity to reimburse funds. If bank regulations operate effectively, unexpected losses should be able to be absorbed by the depository institution (Nugroho, et al, 2021).

In May 2023, the average Capital Adequacy Ratio (CAR) in Indonesian banking was 26.07% (Krisabella, 2023). This certainly demonstrates the strong resilience of the banking sector, indicating that banks are not experiencing financial difficulties. Financial stability may be improved by commercial banks'

growth in CAR. But there's also the fact that when CAR is excessively high, banks use existing capital resources inefficiently, which lowers profitability and raises the risk of financial instability (Sang, 2021).

Buchdadi *et al.*, (2020) CAR has an impact on financial distress. During their research period, Sang (2021) found a favorable association between CAR and the financial stability of commercial banks in Vietnam. Statistical revelations from Abou-El-Sood (2016) involve an analysis of 560 American banking groups between 2003 and 2009. The outcomes suggest that Tier 1 capital ratio aligns with bank insolvency specifically when falling beneath a 6% boundary. Federal authorities employ this particular metric to categorize undercapitalized financial entities. During the peak 2007-2009 economic downturn, this association strengthened as benchmarks ascended to 8% or higher. Furthermore, market-based risk indicators demonstrated superior predictive accuracy regarding failures compared to conventional capital measurements. The framework of Capital Adequacy governs the systematic management and preservation of internal reserves within these institutions.

Banking institutions must ensure their financial disclosures accurately represent their actual fiscal health. This research evaluates the prevalence of deceptive reporting and insolvency risks within the Indonesian banking sector. Specifically, the analysis focuses on the interplay between Credit Risk and Capital Adequacy.

The primary novelty of this work involves utilizing Financial Statement Fraud as a moderating factor. This specific interaction remains insufficiently explored in existing academic literature. We hypothesize that fraudulent practices significantly exacerbate the onset of Financial Distress. Furthermore, robust organizational foundations should remain transparent without any artificial manipulation of records. Such deceitful efforts typically aim to mask deteriorating stability and core financial metrics. To ensure statistical precision, this study incorporates Liquidity Ratio, Firm Size, and Firm Age as control variables. These parameters help mitigate estimation bias while clarifying the functional links between the primary variables. Consequently, this approach yields a more rigorous and comprehensive empirical model for the banking industry.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Signal theory developed by Ross (1977), posits that companies will provide strong signals of positive information to external parties through the disclosure of financial statements. Signal theory was developed by Ross (1977). These signals are provided to minimize the effects of unequal information regarding the company. Company executives strive to attract investment by disclosing sensitive information to external parties. This is done to attract investors to make significant investments in the company. Company executives hope that by voluntarily providing financial statement information, it can be associated with a positive signal to external parties.

Financial distress has a relationship with signaling theory, where financial statements showing sustained positive profits over time imply that the company is performing well and has strong financial conditions (Mahaningrum and Merkusiwati, 2020). This is relevant to the distribution of dividends to shareholders. Furthermore, this stability is evident through the substantial scale of the company's operational cash receipts. A sustained large cash inflow indicates that the company's obligations to creditors can be settled. Conversely, when the financial statements indicate a negative profit, they transmit an adverse signal suggesting that the company is experiencing financial distress.

Financial reports are designed to reassure investors about the company's capacity to pay dividends. If financial statements reveal a decline in profit or cash flow with negligible value, this will trigger investor skepticism about the potential financial pressure within the company. The dissemination of financial statement information is carried out by management, acting as intermediaries for users of the statements.

Hendriksen (2001) identified agency theory as the theoretical framework that describes the relationship between principals and agents. An agent performs tasks assigned by the principal, helping to manage authority in making corporate decisions, and the principal rewards the agent accordingly. Agency theory plays a crucial role in identifying corporate stakeholders to achieve corporate goals, especially in explaining the company's conditions through financial reports to external parties. Lack of transparency in financial reporting can lead to new agency problems for the company (Sa'diah & Utomo, 2021).

Agency theory describes the dynamic interaction connecting the principal as the owner and the agent as the manager. The decisions of a manager are influenced by the ownership of investments. Agency theory predicts that while principals or owners have the initiative to fulfill the company's interests, agents (managers) may initiate cost-cutting measures, leading to conflicts with the principal. Principals also have the motivation to increase income with the goal of achieving large funds through substantial profits. On the other hand, agents are motivated to obtain rewards and desire significant funds, often leading to minimal expenditures for the company, thereby creating agency conflicts.

Due to these motivations, agents sometimes act opportunistically to conceal actual financial difficulties (financial distress) by committing fraud or financial misreporting. Financial statement fraud has been committed by Bukopin and Bank Lippo, resulting in financial reports that do not reflect the true conditions.

Credit Risk and Financial Distress

Financial institutions within the banking sector serve as a fundamental foundation for national investment. Strong economic growth is observed when a country possesses an efficient and effective banking system (Zhang *et al.*, 2016). Financial difficulties in banks are different from problems in other companies. In banking institutions, the funds exposed to risk are those of depositors rather than investors (Hodgman, 1961). This distinction might explain why government authorities become engaged when news arises regarding a bank's financial troubles (Lin, Chang and Chen, 2018). However, this has both positive and negative impacts. It is good that the bank was eventually rescued or protected. However, strict standards and compliance still cause disruptions (Pasiouras, et al 2009). A primary driver of banking instability is the high frequency of non-performing loans involving overdue obligations. Studies show that elevated credit risk can destabilize a bank's balance sheet, slow down credit expansion, and obstruct the recovery process following a crisis (Ari, et al, 2021). The findings of Buchdadi *et al.* (2020) state that credit risk has a negative influence on financial distress. Nugroho et al. (2021) demonstrate that the non-performing loan (NPL) ratio significantly impacts a bank's capital reserves. According Imbierowicz & Rauch (2014), the combined impact of liquidity risk and credit risk on a bank's likelihood of default varies according to the bank's total risk profile. The study results (Huljak, et al, 2022) indicate that non-performing loans adversely affected the financial stability of banks throughout the COVID-19 pandemic. In accordance with the explanation presented above, the following hypothesis is proposed:

H1: Credit Risk negatively affects Financial Distress

Capital Adequacy and Financial Distress

The Capital Adequacy Ratio (CAR) framework serves as a regulatory mechanism to evaluate the sufficiency of institutional reserves. One of the basic ratios that can be used to determine the strength of the capital is CAR (Almaqtari *et al.*, 2019). The CAR serves as a vital metric for evaluating the overall risk exposure within banking institutions. Banks must implement this ratio following internationally recognized standards to shield themselves from financial disturbances and to ensure the protection of customers who rely on banking services (Sang, 2021). Customers evaluate a bank's stability based on its capacity to

guarantee deposit withdrawals and overall security. If banking regulations are effectively implemented, unforeseen losses should be absorbed by the deposit-taking institution (Nugroho, et al, 2021).

According to Buchdadi *et al.*, (2020), The level of capital adequacy which measured by the Capital Adequacy Ratio (CAR) plays a crucial role in the likelihood of financial distress. Sang (2021) explained that throughout the examined period, there was a positive correlation between CAR and the financial stability of Vietnamese commercial banks. Involving 560 American banking groups from 2003–2009, Abou-El-Sood (2016) noted that capital ratios only impact failure below a 6% valuation.

In light of the discussion above, the research hypotheses are structured as follows:

H2: Capital Adequacy positively affects Financial Distress

Credit Risk and Capital Adequacy in Financial Distress Moderated by Financial Statement Fraud

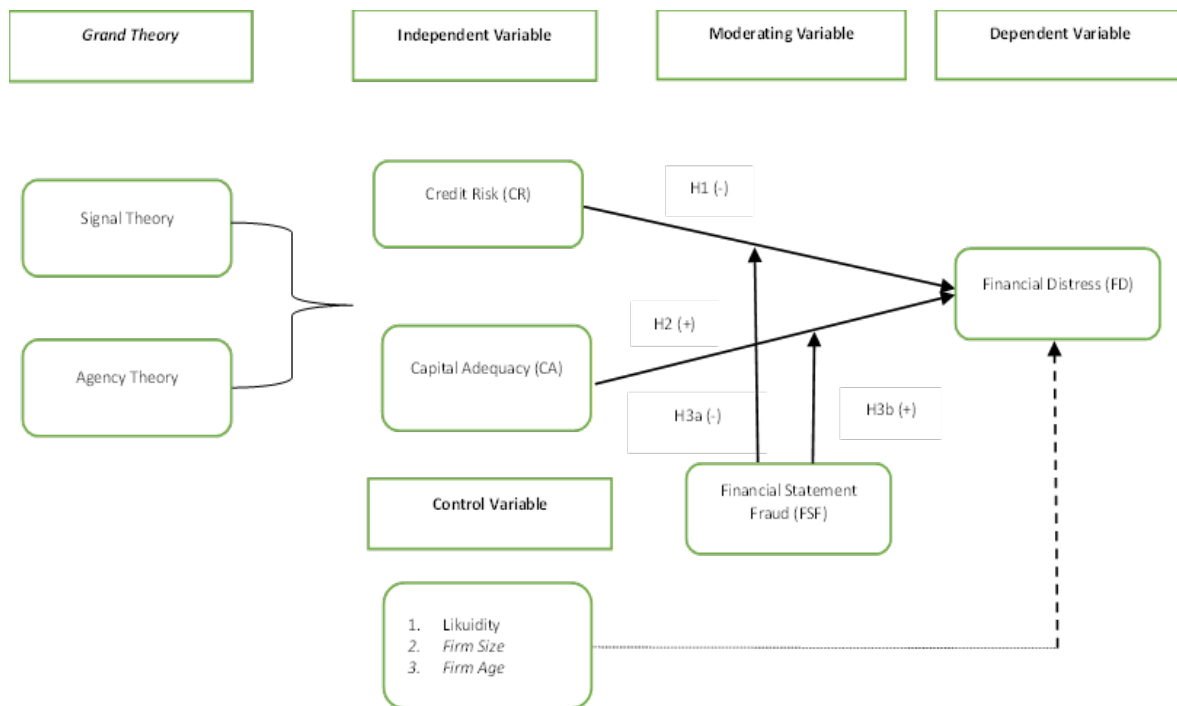
Management-presented financial statements are used by stakeholders for decision-making. Beyond credit metrics, the Capital Adequacy Ratio (CAR) functions as an essential barometer for fund sufficiency that institutions must report to demonstrate fiscal stability. According to Signal Theory, these indicators serve as signals of a bank's health; however, the presence of financial statement fraud can distort these signals, creating significant information asymmetry (Smaili et al., 2022).

When a bank faces high credit risk or capital pressure, Agency Theory suggests that managers may have an incentive to manipulate financial reports to mask the true extent of financial instability and protect their own interests (Aviantara, 2023). Such fraudulent practices, specifically material misrepresentation errors, could detrimentally impact customers, investors, and the national economy by delaying necessary corrective actions. Consequently, this distortion makes it difficult for stakeholders to accurately assess whether a bank is in a financially healthy position or facing imminent financial distress. Drawing from this discussion, the hypothesis can be stated in the following way:

H3a: Financial Statement Fraud intensifies the negative effect of Credit Risk on Financial Distress.

H3b: Financial Statement Fraud intensifies the positive effect of Capital Adequacy on Financial Distress.

Here is the research framework as shown in the following image:

**Picture1. Research Framework**

Source: Processed by the Author (2023)

RESEARCH METHOD

This study utilizes a verificative design through an explanatory survey to validate the proposed hypotheses. The primary aim is to interpret specific phenomena by analyzing the interplay between distinct variables. Specifically, the research investigates how credit risk and capital adequacy, as the main predictors, influence the occurrence of financial distress. Additionally, the framework evaluates the role of financial statement fraud as a moderating element within these relationships. To enhance the accuracy of the empirical results, the model integrates liquidity, firm scale, and firm age as control parameters.

To achieve the stated research goals, this study prioritizes high generalizability through rigorous statistical inference. The analytical focus centers on banking entities registered with the Indonesia Stock Exchange (IDX) over a five-year window, specifically from 2018 to 2022.

The selection of representative companies follows a purposive approach based on these requirements: 1) Active listing on the IDX throughout the 2018–2022 observation window without experiencing delisting; 2) Consistent publication of audited financial reports verified by independent auditors as of year-end (December 31st); and 3) Continuous availability of market share price data for each banking issuer during the entire study period.

Regarding data acquisition, this quantitative research utilizes secondary sources gathered through digital documentation. Financial records were retrieved from the official Indonesia Stock Exchange portal (www.idx.co.id) and supplemented by data from individual corporate websites.

To evaluate institutional performance and integrity, this research employs several core financial metrics. Credit Risk (CR–X1) is quantified through the Non-Performing Loan (NPL) ratio, determined by assessing the volume of defaulted credits relative to the entire loan portfolio. Additionally, Capital Adequacy (CA–X2) is measured using the Capital Adequacy Ratio (CAR). This specific indicator evaluates the sufficiency of a bank's capital reserves by benchmarking them against its total risk-weighted assets.

This metric is presented as a percentage, calculated by benchmarking institutional capital against total risk-weighted assets. To identify potential Financial Statement Fraud (FSF–Y1), this study implements the Beneish M-Score framework to detect instances of earnings distortion. Following the methodology by Beneish (1999), the model integrates weighted indices designed to flag reporting irregularities. For instance, the Days Sales in Receivables Index (DSRI) evaluates the year-on-year shift in the receivables-to-revenue ratio; this parameter assists in identifying artificial revenue growth through inflated accounts. Similarly, the Gross Margin Index (GMI) compares prior profitability levels to current margins, where an ascending value may signal a higher probability of accounting deception. Collectively, these variables within the M-Score provide a rigorous assessment of credit stability, capital health, and the integrity of banking disclosures.

Gross profit is determined by subtracting the ratio of direct operational expenditures from total revenue. Within a banking framework, these expenditures represent the institution's primary operational costs. The GMI utilizes this measure to capture situations where a declining gross profit margin may weaken the company's ability to manipulate profits legitimately. To scrutinize asset disclosures, the AQI compares the ratio of PPE and current holdings against total assets across consecutive periods. An increase in AQI may indicate excessive capitalization of expenditures, thus pointing to possible distortions in asset quality. The Sales Growth Index (SGI) evaluates expansion by benchmarking current revenue levels against the results of the preceding timeframe. Companies experiencing rapid sales growth may require more capital and thus have greater incentives to manipulate revenue figures, making SGI a useful indicator in this context. The Depreciation Index (DEPI) evaluates shifts in amortization by benchmarking the prior period's rate against current figures. This underlying rate is determined by comparing annual depreciation expenses to the aggregate of accumulated depreciation and net fixed assets. A declining depreciation rate may suggest earnings manipulation through delayed recognition of expenses.

The Selling, General, and Administrative Intensity (SGAI) quantifies the relationship between administrative overhead and sales, assessing how this ratio fluctuates between different financial reporting windows. An increasing SGA I can point to declining administrative efficiency or growing fixed costs, potentially allowing room for earnings manipulation. Accruals quantify the discrepancy between reported earnings and actual cash movements. This is determined by benchmarking the difference between operating income and cash flows against the firm's total assets. Higher accruals signal potential earnings management. The Leverage Index (LEVI) analyzes changes in financial leverage by comparing debt-to-asset ratios over time. Increased leverage may pressure management to engage in earnings manipulation to meet financial obligations.

All of these indices are synthesized into the Beneish M-Score, which, when exceeding the threshold of -2.22, indicates a strong likelihood that the entity has manipulated its accounting data or harbors strong motivation to do so during the period under review. By integrating these financial ratios and indices, this study provides a comprehensive framework to detect and analyze financial statement fraud and risk management within banks.

Financial Distress (FD–Y2)

To evaluate financial distress, this study implements the Altman Z-score framework, recognized for its 95% predictive accuracy and widespread academic endorsement (Aviantara, 2023). Utilizing Multiple Discriminant Analysis (MDA), the model integrates four weighted financial pillars to determine institutional stability. The components include: (X1) the ratio of working capital to total assets for liquidity assessment; (X2) retained earnings relative to total assets to gauge long-term profitability; (X3) EBIT as a proportion of total assets to measure operational strength; and (X4) the book value of equity against total liabilities for solvency evaluation. The composite Z-score is derived using the formula: $Z = 6.56(X1) +$

$3.26(X_2) + 6.72(X_3) + 1.05(X_4)$. Based on the output, entities are classified into three risk tiers: the Distress Zone ($Z < 1.1$), the Gray Zone ($1.1 \leq Z \leq 2.6$), and the Healthy Zone ($Z > 2.6$), indicating high, moderate, and low insolvency risks, respectively.

Liquidity

Liquidity, which is assessed through the current ratio, reflects an institution's capacity to cover existing liabilities using its liquid resources (Ahmad et al., 2023). This metric is determined by benchmarking short-term assets such as cash, receivables, and marketable securities against obligations due within a twelve-month cycle. Examples of these obligations include accounts payable and immediate debt. A ratio surpassing 1.0 generally signifies a robust financial position because it indicates that available resources exceed upcoming liabilities. In contrast, a value below 1.0, for instance 0.8 or 0.9, points toward potential liquidity strain. This condition suggests that the firm might encounter difficulties in meeting immediate financial commitments. Consequently, this ratio serves as a vital indicator of short-term fiscal stability and management efficiency.

Firm Size

The requirement for organizational resources typically intensifies as a company undergoes expansion and structural transformation. A firm's scale determines the volume of assets available to sustain its competitive position within the industry. To quantify this dimension, firm size is calculated using the natural logarithm of total assets. This statistical transformation is implemented to normalize data distribution and minimize the impact of outlier values. Furthermore, utilizing this logarithmic approach enhances the comparability of institutional scale among the various entities included in the research sample.

Firm Age

Firm age represents the chronological lifespan of an independent business entity, which is quantified by the number of years since its initial establishment (Mansikkamäki, 2023). This study determines the age of each institution by calculating the total years elapsed from its founding date to the specific observation period. To test the proposed hypotheses, this research utilizes panel data regression and moderated regression analysis (MRA). These statistical methods are selected to evaluate the relationships between variables while considering the moderating effects within the dataset. The analytical model is formulated through the following equation:

$$FD = \alpha + \beta_1 CR + \beta_2 CA + \beta_3 RK * FSF + \beta_4 KM * FSF + \beta_5 LIK + \beta_6 SIZE + \beta_7 AGE + \epsilon$$

RESULT AND DISCUSSIONS

For the years 2018–2022, 125 banking issuers were included in the study sample, which was determined by the sampling criteria. The following descriptive statistical analysis was obtained from the data processing results:

Table 1. Descriptive Statistic Results

Statistic	CR	CA	FSF	FD	Likuidity	Size	Age
Mean	3,45	28,95	-2,42	3,36	1,62	17,59	50
Median	3,16	24,90	-2,40	2,18	1,34	17,10	48
Maximum	11,34	102,19	2,05	27,28	7,78	21,17	125
Minimum	0,85	-4,33	-11,81	-0,05	0,89	15,01	22
Std. Dev.	1,97	16,68	1,80	4,29	1,13	1,69	24

Source: Data Processing Results (2023)

Tabel 2. Hypothesis and Goodness of Fit Results

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
CR	-0,0559	0,0245	-2,2850	0,0236*
CA	0,0422	0,0064	6,6294	0,0000*
FSF	-0,0827	0,0450	-1,8376	0,0679**
LIK	1,7623	0,1779	9,9084	0,0000*
SIZE	0,5530	0,1537	3,5979	0,0004*
AGE	-0,1239	0,0056	-22,0395	0,0000*
CR*FSF	-0,0080	0,0070	-1,1479	0,2527
CA*FSF	0,0078	0,0015	5,2872	0,0000*
C	-3,8702	2,3194	-1,6686	0,0971
Goodness Of Fit				
R-squared		0,9521		
Adjusted R-squared		0,9375		
S.E. of regression		2,4890		
F-statistic		65,2512		
Prob (F-statistic)		0,0000		
Durbin-Watson stat		2,1371		

* Significance below 0,05; ** Significance below 0,1

Source Data: Data Processing Results (2023)

Table 1 presents the descriptive statistical results, showing that Credit Risk (CR) for the analyzed banking institutions exhibits an average value of 3.45 with a standard deviation of 1.97. These results suggest that credit risk levels remain within a secure threshold, as the mean figure falls significantly below the 5% regulatory limit. However, the highest credit risk value reached 11.34, which comes from Bank Pembangunan Daerah Banten (BEKS), indicating a relatively high-risk position for this entity.

Regarding Capital Adequacy (CA), the data in Table 1 reveals an average of 28.95 among the samples, accompanied by a standard deviation of 16.68. This indicates that the average capital adequacy of banks exceeds the established standard of 8%. A notable finding is that certain banks recorded a CA as low as -4.33, specifically Bank KB Bukopin Tbk. (BBKP).

For Financial Statement Fraud (FSF), the average score in the banking sector is -2.42, which is lower than the -2.22 threshold. As shown in Table 1, this suggests no general indication of financial statement fraud on average. Despite this trend, some companies showed M-Score results above the critical value, such as Bank Syariah Indonesia Tbk. (BRIS) with a score of 2.05, signaling an indication of fraud.

Financial Distress (FD) analysis indicates that the banking industry is generally in the "healthy" zone, with an average value of 3.36. However, a banking issuer, Bank JTrust Indonesia Tbk. (BCIC), recorded a value of -0.05, placing it within the distress zone and reflecting a vulnerable financial position.

Liquidity levels, as summarized in Table 1, show an average of 1.62, meaning that banks are generally in a healthy condition where current assets cover all current liabilities. Nevertheless, Bank Capital Indonesia Tbk. (BACA) reported the lowest ratio at 0.89.

Firm Size averages 17.59, with Bank Rakyat Indonesia (BBRI) as the largest (21.17) and Bank Jago Tbk. (ARTO) as the smallest (15.01). In terms of Firm Age, the sample ranges from long-established institutions like BBRI and Bank Tabungan Negara (127 and 125 years, respectively) to Bank Mandiri (BMRI), which was established in 1998.

The selection process for the optimal regression model involved the Chow, Hausman, and LM tests, which collectively identify the fixed effect approach as superior. Since all resulting p-values were less than 0.05, the model is statistically validated for further analysis. Furthermore, normality was assessed via the Jarque-Bera statistic, yielding a result of 3.722144. Given that the probability of 0.155506 is greater than 0.05, the study concludes that the observation data are normally distributed and suitable for further parametric testing.

The statistical outcomes regarding hypothesis validation and the model's overall goodness of fit are presented in **Table 2**.

The statistical analysis indicates an R-squared value of 0.9521, suggesting that approximately 95.21% of the fluctuations in financial distress (FD) can be explained by the predictors within this model. The remaining 4.79% is influenced by external factors beyond the scope of this research. This high coefficient reflects a strong alignment between the regression model and the observed data.

To validate the research hypotheses, t-tests were utilized to evaluate the significance of each predictor. An independent variable is considered to have a meaningful impact if its probability result is lower than the 5% alpha level. The detailed findings from these assessments are presented as follows:

Statistical Assessment of Credit Risk Impact on Financial Distress

The empirical results demonstrate that Credit Risk significantly influences Financial Distress, as evidenced by a probability value of 0.0236 and a t-statistic of -2.2850. Given that the p-value is below the 0.05 threshold, H_0 is rejected, confirming a negative relationship between these variables. Specifically, the regression coefficient of -0.0559 suggests that for every one-unit rise in credit risk, the financial distress level will decline by 0.0559 units, provided that all other model components are held constant.

Statistical Assessment of Capital Adequacy Impact on Financial Distress

The statistical output reveals a highly significant relationship between the Capital Adequacy Ratio (CAR) and financial distress, evidenced by a p-value of 0.0000 and a t-statistic of 6.629402. Since the probability falls well below the 5% alpha level, the null hypothesis is rejected, confirming that CAR serves as a meaningful predictor for FD. The positive regression coefficient of 0.042164 implies that a single-unit enhancement in capital adequacy will likely result in a 0.042164 increment in the financial distress score, assuming all other environmental factors remain unchanged.

Statistical Evaluation: FSF as a Moderator for Credit Risk Effects

The empirical data regarding the interaction effect indicates that Financial Statement Fraud (FSF) does not function as a moderating variable in the link between credit risk and financial distress. This conclusion is supported by a t-statistic of -1.147929 and a corresponding p-value of 0.2527, which remains above the 5% alpha level for significance. Consequently, the null hypothesis is accepted, suggesting that the impact of credit risk on a bank's financial stability is not significantly altered or influenced by the presence of fraudulent reporting.

Statistical Evaluation: FSF as a Moderator for Capital Adequacy Effects

Based on the interaction analysis, the results confirm that Financial Statement Fraud (FSF) significantly moderates the relationship between Capital Adequacy and Financial Distress. This is demonstrated by a robust t-statistic of 5.287211 and a p-value of 0.0000, which falls well below the 0.05 significance threshold. Consequently, the null hypothesis is rejected, providing empirical evidence that FSF functions as a moderating factor that alters the impact of the Capital Adequacy Ratio (CAR) on a bank's financial stability (FD).

Credit Risk and its Influence on Financial Distress

Based on the partial test outcomes, a negative correlation exists between financial distress and credit risk, which is represented by non-performing loans (NPL). Given the critical function of the banking industry in global economic stability, high NPL levels pose a significant threat. These non-performing assets degrade the financial health of the sector by diminishing the ability of debtors to settle their credit commitments according to the established terms. This situation can disrupt the financial stability of financial institutions, especially banks.

Credit risk dynamics significantly influence the stability of financial statements. A spike in NPLs restricts the growth of income-generating assets and increases the burden of bad debt on the liability side, which negatively affects profitability indicators. Moreover, the financial burden of unpaid interest obligations by debtors must often be absorbed by the bank. As credit risk intensifies, the cost of managing these non-performing accounts rises, as substantial capital is tied up in assets that no longer yield returns.

Based on the criteria set in PBI No. 6/10/2004, a rising NPL ratio serves as a warning of potential insolvency and financial distress. This regulatory perspective is consistent with the Altman Z-score methodology, where a score below the 1.1 threshold officially places an entity in the distress zone, signaling a vulnerable financial position.

Strengthening credit risk governance and meticulously tracking loan performance are fundamental steps in shielding an organization from the disruptive consequences of financial distress. Financial institutions that implement sound credit policies and have strong risk management frameworks in place are more capable of handling these anticipated challenges.

This study's results are consistent with those of Buchdadi (2020), Nugroho (2021), Imbierowicz (2013), and Huljak et al. (2022), which found that credit risk significantly influences financial distress.

Capital Adequacy and its Influence on Financial Distress

Empirical evidence confirms that capital sufficiency, represented by CAR, has a significant positive relationship with financial distress indicators. As an essential metric for banking health, a higher CAR generally implies a reduced probability of insolvency. This alignment is consistent with the Altman Z-Score classification, which categorizes companies with scores above the 2.6 threshold as financially sound and outside the distress zone.

Banks that have the security and ability to repay customer funds demonstrate strong capital strength to finance company operations, thereby avoiding financial distress. Sufficient capital levels fortify a financial institution's defenses against multiple risk categories, encompassing credit defaults, operational failures, and market fluctuations. With sufficient capital, banks have greater capacity to respond to pressures and uncertainties in the economic environment. Therefore, banks need to manage their assets effectively to protect themselves from financial shocks in the future.

Capital strength is also a vital determinant of an entity's lending potential, as it dictates the maximum volume of new credit that can be safely issued into the market. A bank demonstrating an adequate capital adequacy ratio (CAR) tends to garner support from investors and shareholders for its business growth, unlike a bank with a weak CAR, which faces constraints in expanding new credit. This result is in line with studies carried out by Buchdadi (2020), Abou-El-Sood (2015), and (Rezaei, 2023), indicating that the capital adequacy ratio influences financial distress.

FSF as a Moderator in the Credit Risk and Financial Distress Relationship

This study concludes that financial statement fraud does not mitigate or amplify the relationship between credit risk and financial distress, as evidenced by the moderation test results. Financial statement fraud and credit risk are two distinct issues that can affect banking's financial distress. Financial statement fraud

typically involves misleading financial report manipulations, whereas credit risk involves non-performing loans or defaults. Although both can impact an entity's finances, they have different characteristics and implications. This is because high non-performing loans can damage a company's or financial institution's reputation. Inability to manage credit risk can reduce customer, investor, and business partner confidence. Consequently, banks will strive to comply with regulations. Non-performing loans represent a significant challenge in the context of risk appraisal and the fulfillment of mandatory banking compliance requirements.

Various factors explain why financial statement fraud fails to mitigate the negative impact of credit risk on financial stability. External influences like the nation's economic environment, global economic shifts, industry changes, or natural calamities can greatly affect banking risks independently of any financial statement fraud. Although such fraud may foster market uncertainty and erode trust, the primary drivers of credit risk tend to stem more from the inherent volatility found within economic and industrial conditions.

FSF as a Moderator in the Capital Adequacy and Financial Distress Relationship

Evidence suggests that fraudulent financial reporting acts as a moderator that changes the relationship between capital sufficiency and a bank's fiscal health. Financial statement fraud can significantly impact banking capital adequacy, leading to financial distress. This is because financial statement fraud can result in presenting financial conditions that do not reflect the actual situation. If assets or income are misrepresented, reported capital may not reflect the actual risks faced by banks.

Financial statement fraud may include fabricating capital figures or altering reports on financial positions to overstate reported capital levels. When the real capital is missing or less than what is declared, the Capital Adequacy Ratio (CAR) used to evaluate capital sufficiency becomes unreliable, failing to accurately represent the bank's true financial resilience. Should fraud in financial reporting lead to insufficient coverage for possible losses which particularly relating to credit or market risk then the CAR could drop. This reduction heightens the risk that the bank will be less capable of enduring economic challenges.

Financial reports should be free from fraud committed by management, such as material misstatements that can harm investors, customers, and the national economy. Financial statements presented by management are used by stakeholders for decision-making. Inaccurate financial reporting poses a severe risk to investor confidence, potentially leading to a sharp depreciation in stock prices. Investors assessing a company based on erroneous information may experience significant financial losses.

CONCLUSION

Following the comprehensive analysis and evaluation of the data discussed previously, the study reaches several key conclusions: Financial distress is adversely affected by credit risk, measured through non-performing loans (NPLs). Strategic management of loan quality is fundamental in shielding the organization from the disruptive consequences of credit-related risks. Financial institutions that implement strong credit policies and maintain robust risk management frameworks are better positioned to tackle these expected challenges. Strong capitalization, reflected by CAR, enhances a bank's capacity to fund its activities and safeguard depositor funds, which effectively shields the entity from financial distress.

Financial statement fraud fails to moderate the impact of credit risk on financial distress. Although fraudulent reporting can trigger market uncertainty and distrust, the primary drivers of credit risk are more closely linked to macroeconomic shifts and industry-wide fluctuations. Consequently, the direct

causes of credit risk remain more dominant in influencing financial distress than the presence of financial statement fraud.

The scope of this research is restricted to commercial banks on the Indonesia Stock Exchange, excluding microfinance institutions due to data constraints. This exclusion is notable as microfinance entities currently face a higher frequency of insolvency. Furthermore, the model does not account for external macroeconomic variables that may impact institutional stability.

This study provides practical implications for: 1) Banking Institutions. Banks must ensure reporting integrity by eliminating fraudulent practices and maintaining NPL and CAR levels within regulatory limits (below 5% and above 8%, respectively) to mitigate insolvency risks. 2) Regulators. The findings serve as a strategic reference for Financial Services Authority (*Otoritas Jasa Keuangan*—OJK) and Bank Indonesia (BI) to intensify the oversight of credit risk and capital standards, particularly given the high failure rates among Rural Banks (*Bank Perkreditan Rakyat*—BPR) which indicate gaps in regulatory enforcement.

REFERENCES

- Abou-El-Sood, H. (2016) 'Are regulatory capital adequacy ratios good indicators of bank failure? Evidence from US banks', *International Review of Financial Analysis*, 48, pp. 292–302. Available at: <https://doi.org/10.1016/j.irfa.2015.11.011>.
- Ahmad, N. *et al.* (2023) 'Corporate income tax, asset turnover and Tobin's Q as firm performance in Pakistan: Moderating role of liquidity ratio', *Cogent Business and Management*, 10(1). Available at: <https://doi.org/10.1080/23311975.2023.2167287>.
- Ally, O.J. and Bwana, K.M. (2021) 'Prediction of financial distress of listed commercial banks in Tanzania and Kenya: A comparative study', *Sustainable Education and Development*, 1(2007), pp. 383–393. Available at: https://doi.org/10.1007/978-3-030-68836-3_34.
- Almaqtari, F.A. *et al.* (2019) 'The determinants of profitability of Indian commercial banks: A panel data approach', *International Journal of Finance and Economics*, 24(1), pp. 168–185. Available at: <https://doi.org/10.1002/ijfe.1655>.
- Ari, A., Chen, S. and Ratnovski, L. (2021) 'The dynamics of non-performing loans during banking crises: A new database with post-COVID-19 implications', *Journal of Banking and Finance*, 133(xxxx), p. 106140. Available at: <https://doi.org/10.1016/j.jbankfin.2021.106140>.
- Aviantara, R. (2023) 'Scoring the financial distress and the financial statement fraud of Garuda Indonesia with «DDCC» as the financial solutions', *Journal of Modelling in Management*, 18(1), pp. 1–16. Available at: <https://doi.org/10.1108/JM2-01-2020-0017>.
- Beneish, M.D. (1999) 'The Detection of Earnings Manipulation', *Financial Analysts Journal*, 55(5), pp. 24–36. Available at: <https://doi.org/10.2469/faj.v55.n5.2296>.
- Betz, F. *et al.* (2014) 'Predicting distress in European banks', *Journal of Banking and Finance*, 45(1), pp. 225–241. Available at: <https://doi.org/10.1016/j.jbankfin.2013.11.041>.
- Buchdadi, A.D. *et al.* (2020) 'The effect of credit risk and capital adequacy on financial distress in rural banks', *Accounting*, 6(6), pp. 967–974. Available at: <https://doi.org/10.5267/j.ac.2020.7.023>.
- Chandra, P. (2008). (2008) 'Financial management : theory and practice.', Retrieved from https://books.google.co.id/books?id=dKk9wU3MKoC&dq=Brigham,+E.F.,+and+Ehrhardt,+M.C.+2008Financial+Management:+Theory+and+Practice.+Twelfth+Edition.+United+States+of+America:+Thomson+South-Western.&lr=&source=gbs_navlinks_s. [Preprint].
- E.S. Hendriksen, dan M.F.V.B. (2001) *Accounting Theory, 5th Edition (Singapore: Irwin-McGraw-Hill, 2001*.
- F., Tanna Pasiouras, S. and Zopounidis, C. (2009) 'The impact of banking regulations on banks' cost and profit efficiency: cross-country evidence', *International Review of Financial Analysis*, Vol. 18 No. 5, pp. 294–302. [Preprint].

- Ghenimi, A., Chaibi, H. and Omri, M.A.B. (2017) 'The effects of liquidity risk and credit risk on bank stability: Evidence from the MENA region', *Borsa Istanbul Review*, 17(4), pp. 238–248. Available at: <https://doi.org/10.1016/j.bir.2017.05.002>.
- Haryanto, R. (2018) 'Drama Bank Bukopin: Kartu Kredit Modifikasi dan Rights Issue'. Available at: <https://www.cnbcindonesia.com/market/20180427144303-17-12810/drama-bank-bukopin-kartu-kredit-modifikasi-dan-rights-issue>.
- Hodgman, D.R. (1961) 'The deposit relationship and commercial bank investment behavior', *The Review of Economics and Statistics*, Vol. 43 No. 3, pp. 257–268. [Preprint].
- Huljak, I., Martin, R. and Moccerro, D. (2022) 'Do non-performing loans matter for bank lending and the business cycle in euro area countries?', *Journal of Applied Economics*, 25(1), pp. 1050–1080. Available at: <https://doi.org/10.1080/15140326.2022.2094668>.
- Imbierowicz, B. and Rauch, C. (2014) 'The relationship between liquidity risk and credit risk in banks', *Journal of Banking and Finance*, 40(1), pp. 242–256. Available at: <https://doi.org/10.1016/j.jbankfin.2013.11.030>.
- Johnson, William C., Wenjuan Xie, S.Y. (2014) 'Corporate fraud and the value of reputations in the product market.', *Journal of Corporate Finance* 25: 16–39. [Preprint].
- Krisabella, R.A. (2023) 'BI Uji Daya Tahan Perbankan RI, Ini Hasilnya!' Available at: <https://www.cnbcindonesia.com/market/20230725171840-17-457254/bi-uji-daya-tahan-perbankan-ri-ini-hasilnya>.
- Lin, J.J., Chang, C.P. and Chen, S. (2018) 'How does distress acquisition incentivized by government purchases of distressed loans affect bank default risk?', *Risks*, 6(2). Available at: <https://doi.org/10.3390/risks6020039>.
- Mahaningrum, A.A.I.A. and Merkusiwati, N.K.L.A. (2020) 'Pengaruh Rasio Keuangan pada Financial Distress', *E-Jurnal Akuntansi*, 30(8), p. 1969. Available at: <https://doi.org/10.24843/eja.2020.v30.i08.p06>.
- Malau, M. and Murwaningsari, E. (2018) 'The effect of market pricing accrual, foreign ownership, financial distress, and leverage on the integrity of financial statements', *Economic Annals*, 63(217), pp. 129–139. Available at: <https://doi.org/10.2298/EKA1817129M>.
- Mansikkamäki, S. (2023) 'Firm growth and profitability: The role of age and size in shifts between growth–profitability configurations', *Journal of Business Venturing Insights*, 19(December 2022). Available at: <https://doi.org/10.1016/j.jbvi.2023.e00372>.
- Msomi, T.S. (2022) 'Factors affecting non-performing loans in commercial banks of selected West African countries', *Banks and Bank Systems*, 17(1), pp. 1–12. Available at: [https://doi.org/10.21511/bbs.17\(1\).2022.01](https://doi.org/10.21511/bbs.17(1).2022.01).
- Nasir, M.S., Oktaviani, Y. and Andriyani, N. (2022) 'Determinants of Non-Performing Loans and Non-Performing Financing level: Evidence in Indonesia 2008–2021', *Banks and Bank Systems*, 17(4), pp. 116–128. Available at: [https://doi.org/10.21511/bbs.17\(4\).2022.10](https://doi.org/10.21511/bbs.17(4).2022.10).
- Nugroho, M., Arif, D. and Halik, A. (2021) 'The effect of loan-loss provision, non-performing loans and third-party fund on capital adequacy ratio', *Accounting*, 7(4), pp. 943–950. Available at: <https://doi.org/10.5267/j.ac.2021.1.013>.
- Pindado, J., Rodrigues, L. and de la Torre, C. (2008) 'Estimating financial distress likelihood', *Journal of Business Research*, 61(9), pp. 995–1003. Available at: <https://doi.org/10.1016/j.jbusres.2007.10.006>.
- Putri, B.N.L. and Rachmawati, S. (2019) 'Analisis Financial Distress dan Free Cash Flow dengan Proporsi Dewan Komisaris Independen sebagai Variabel Moderasi Terhadap Manajemen Laba', *Jurnal Keuangan dan Perbankan*, 14(2), p. 54. Available at: <https://doi.org/10.35384/jkp.v14i2.127>.

- Rastogi, S. and Kanoujiya, J. (2022) 'Corporate disclosures and financial distress in banks in India: the moderating role of competition', *Asian Review of Accounting*, 30(5), pp. 691–712. Available at: <https://doi.org/10.1108/ARA-03-2022-0064>.
- Rezaei, E. (2023) 'The behaviour of the risk based capital adequacy ratio in Iran's banking system', *Macroeconomics and Finance in Emerging Market Economies*, 16(2), pp. 285–299. Available at: <https://doi.org/10.1080/17520843.2021.1988671>.
- Ross, S.A. (1977) 'Determination of Financial Structure: the Incentive-Signalling Approach.', *Bell J Econ*, 8(1), pp. 23–40. Available at: <https://doi.org/10.2307/3003485>.
- Sa'diah., W.M., & Utomo, M.N. (2021) 'Peran Good Corporate Governance Dalam Meminimalisir Terjadinya Financial Distress.', *BISMA : Jurnal Bisnis Dan Manajemen*, 15(1), 36. [Preprint].
- Sang, N.M. (2021) 'Capital adequacy ratio and a bank's financial stability in Vietnam', *Banks and Bank Systems*, 16(4), pp. 61–71. Available at: [https://doi.org/10.21511/bbs.16\(4\).2021.06](https://doi.org/10.21511/bbs.16(4).2021.06).
- Santosa, A. (2023) 'Siaran Pers Resiliensi Sektor Jasa Keuangan Terjaga di Tengah Berlanjutnya Ketidakpastian Global'. Available at: [https://ojk.go.id/id/berita-dan-kegiatan/siaran-pers/Documents/Pages/Resiliensi-Sektor-Jasa-Kuangan-Terjaga-Di-Tengah-Berlanjutnya-Ketidakpastian-Global/Siaran Pers RDKB April 2023.pdf](https://ojk.go.id/id/berita-dan-kegiatan/siaran-pers/Documents/Pages/Resiliensi-Sektor-Jasa-Kuangan-Terjaga-Di-Tengah-Berlanjutnya-Ketidakpastian-Global/Siaran%20Pers%20RDKB%20April%202023.pdf).
- Smaili, N., Arroyo, P., & Issa, F. A. (2022). The dark side of blockholder control: evidence from financial statement fraud cases. *Journal of Financial Crime*, 29(3), 816–835. <https://doi.org/10.1108/JFC-05-2021-0113>.
- Sekarwulan, W. and Umur, H. (2021) 'Pengaruh Fraud Triangle Terhadap Financial Distress Dengan GoodCorporate Governance Sebagai Variabel Moderasi', *Mizania: Jurnal Ekonomi dan Akuntansi*, 1(2), pp. 85–104.
- Serwadda, I. (2018) 'Impact of credit risk management systems on the financial performance of commercial banks in Uganda', *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 66(6), pp. 1627–1635. Available at: <https://doi.org/10.11118/actaun201866061627>.
- Zhang, Zhichao et al. (2016) 'Determinants of financial distress in large financial institutions: Evidence from U.S. bank holding companies', *Contemporary Economic Policy*, 34(2), pp. 250–267. Available at: <https://doi.org/10.1111/coep.1210>.