

The impact of credit risk on market discipline: Exploring the moderating role of corporate governance through Generalized Method of Moments (GMM) analysis in banking companies

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Abstract

High credit risk poses a significant threat to banks, underscoring the necessity to examine the effectiveness of good corporate governance in mitigating such risks. This study aims to assess the impact of credit risk, represented by non-performing loans (NPLs), on market discipline, reflected through deposit growth, and the moderating role of good corporate governance, focusing on board size and institutional ownership, in this dynamic. Data for the study were sourced from the financial reports of banking companies on their official websites, IDN Financial, and the Indonesia Stock Exchange. The study used a purposive sampling method to analyze a sample comprising 30 banking companies and yielded 300 observations. The research methodology involved dynamic panel regression analysis using the Generalized Method of Moments (GMM) technique. The findings reveal that non-performing loans negatively impact deposit growth. However, it was also found that board size and institutional ownership could positively moderate the adverse effects of non-performing loans on deposit growth. This suggests that market discipline, manifesting as a reduction in deposits and an escalation in credit risk within the Indonesian banking sector, can be effectively managed and mitigated through the strategic implementation of good corporate governance practices, particularly by optimizing board size and enhancing institutional ownership. These mechanisms enable more robust market discipline, contributing to better credit risk management and promoting healthier deposit growth.

Keywords: *Board size, Credit risk, Generalized Method of Moment (GMM), Institutional ownership, Market discipline, Non-performing loan*

JEL Classification: G21, G32, G34

INTRODUCTION

Credit risk refers to the potential for financial losses that arise when a borrower (debtor) fails to meet their debt payment obligations to the lender (creditor) as agreed. This risk includes the possible total or partial loss of loans due to ineffective credit management (The Basel Committee on Banking Supervision, 2011). Credit risk emerges from the possibility that banks may not recover loans extended or bonds

purchased (Ayuningrum, 2011). It is imperative to acknowledge the importance of risk management in mitigating these potential financial losses. Banks must have an efficient credit risk management system that involves identifying, measuring, monitoring, and controlling credit risk. Understanding factors contributing to credit risk, such as the borrower's failure to meet debt payment obligations, shortcomings in credit management, and the potential default on loans or bonds.

An examination of the statistical data from Indonesian banking reveals challenges in credit risk management, as indicated by the rising ratio of non-performing loans and the growth of third-party funds. According to Indonesian Banking Statistics, the non-performing loan ratio increased from 1.76% in December 2013 to 3.00% in December 2021. Furthermore, third-party funds, including savings, current accounts, and deposits, increased from 4,114,420 million in December 2014 to 7,749,463 million in December 2021.

These data present a phenomenon that contrasts with previous research findings, which discussed the negative impact of non-performing loans on deposit growth, as explored by Yan et al. (2012), Riandika & Taswan (2016), Soledad et al. (2022), and Saherudin & Soedarmono (2022). This discrepancy may be due to new factors influencing recent research outcomes, suggesting that the current conditions and circumstances may diverge from those during the earlier studies. Additionally, these new factors could lead to variations in research findings. Therefore, it is imperative to pursue further in-depth and comprehensive research to grasp the evolving dynamics, particularly within the Indonesian banking sector.

Market discipline denotes the market mechanisms that influence the behaviour and decisions of economic agents, especially regarding the supervision and regulation of entities registered in the banking sector. Market discipline in the deposit market manifests when investors and depositors withdraw their funds in response to increased bank risk or when the cost of deposits rises due to heightened bank risk (Soledad et al., 2001; Soedarmono & Tarazi, 2016; Hasan et al., 2013). Government Regulation No. 66/2008 specifies that the Deposit Insurance Corporation (LPS) guarantees deposits up to a maximum value of Rp 2 billion per depositor per bank. Depositors with funds exceeding this insured limit can exert market discipline (Trinugroho et al., 2020). According to the deposit insurance institution in Indonesia, these large depositors represented 59.5% of the total deposits as of January 2022.

Good Corporate Governance (GCG) encompasses the practices and principles dedicated to a company's effective management and oversight. GCG represents a framework that steers and regulates companies to generate value for all stakeholders (Susanti, 2010). The significance of efficient corporate governance within the banking sector is particularly noticeable in its impact on bank market discipline, influencing bank liquidity and risk. Diaz & Huang (2017) observed that banks with superior governance practices often exhibit higher levels of liquidity, potentially leading to increased liquidity risk. This insight underscores the crucial role of governance in risk mitigation and sustaining stability across the banking sector. The importance of governance was starkly highlighted during Indonesia's twin crises in 1997/1998, which involved both currency and banking crises. Hamada & Konishi (2010) pointed out that inadequate governance within the banking sector was a key factor behind the banking crisis in Indonesia, illustrating the necessity for strong governance measures to avert similar crises and to maintain banking industry stability (Acharya & Naqvi, 2012).

Good Corporate Governance (GCG) fundamentally directs and controls companies to create value for all stakeholders (Monks, 2003). This concept underscores

two critical aspects: firstly, the importance of stockholders' rights to receive accurate and timely information, and secondly, the obligation of companies to disclose all performance-related information accurately, promptly, and transparently.

This study investigates the impact of credit risk, as indicated by non-performing loans, on market discipline, as reflected by deposit growth, within banking companies listed on the Indonesia Stock Exchange from 2012 to 2021. Additionally, the research explores the moderating role of good corporate governance variables, namely board size and institutional ownership, on the relationship between credit risk and market discipline.

METHODS

Data used

The study concentrates on banking companies publicly listed on the Indonesia Stock Exchange (IDX) from 2012 to 2021. It utilizes panel data that amalgamates time series and cross-sectional data. The secondary data for this research was sourced from indirect avenues such as financial and annual reports.

The population comprises 49 banking companies listed on the IDX over the specified period. A purposive sampling technique was implemented to select a sample of banks that met specific criteria. These criteria included being listed on the IDX from 2012 to 2021, the consistent publication of financial reports throughout the specified timeframe, the availability of complete data as required for the study, and maintaining listing status without being delisted during the period under review. From the initial population of 49 banking companies, 30 fulfilled these criteria and were subsequently included in the sample.

Data collection was carried out using a documentation method, which involved collecting data from existing documents, such as financial reports accessible through the IDX website (<http://www.idx.co.id/>) and the official websites of the banking companies for the years 2012 to 2021.

Analysis tools

In this study, data analysis was conducted using the Generalized Method of Moments (GMM) technique, facilitated by Eviews 12 software. The selection of the GMM technique is due to the dynamic nature of the panel data under investigation, characterized by dependencies not only on simultaneous variables but also on their historical values (Dendo et al., 2021).

Several tests were employed to verify the model's adequacy. The Arellano-Bond test assessed model consistency, ensuring the model's correct specification. The validity of the instrumental variables used in the analysis was checked through the Sargan test.

Hypothesis testing involved the t-test to determine the statistical significance of each independent variable's impact on the dependent variable, thereby assessing the strength and reliability of observed relationships. Additionally, interaction tests were carried out to investigate the effects of moderation variables.

Moderated Regression Analysis (MRA) was applied to explore the influence of moderation variables on the relationship between independent and dependent variables. The adoption of MRA aimed to deepen understanding of the interaction, elucidate the role of Good Corporate Governance, identify risk management strategies, enhance model precision, and provide insights to augment the stability of banking companies.

The non-performing loan (NPL) ratio served as a measure of credit risk, indicative of a bank's risk level. The study also incorporated moderating variables pertinent to

good corporate governance, such as board size, represented by the logarithm of the number of board commissioners (BOARD) and institutional ownership (INST). Control variables, including the equity-to-asset ratio (EQTA), loan-to-asset ratio (LTA), and bank size, measured by the logarithm of total bank assets (SIZE), were integrated to adjust for additional factors potentially affecting bank credit risk.

The dependent variable, "deposit growth," was chosen to reflect market discipline, drawing on the framework established by Soedarmono & Tarazi (2016). According to Park & Peristiani (2007), market discipline can be gauged through deposit growth, with the premise that depositors may withdraw funds from banks perceived as excessively risky or demanding higher savings interest rates. The NPL ratio, used as a proxy for credit risk, is a key indicator of a bank's risk exposure. A higher NPL ratio indicates elevated credit risk within the bank.

Hypothesis

The study proposes the following hypotheses to explore the dynamics between non-performing loans, board size, institutional ownership, and their collective impact on deposit growth within banking companies:

The effect of non-performing loans on deposit growth

The NPL ratio, serving as an indicator of credit risk, represents the fraction of loans within a bank's portfolio that are considered problematic or at risk of default. This ratio is widely used to assess the level of credit risk and the overall business risk a financial institution faces (Darmawi, 2011). A higher NPL ratio indicates increased credit risk for the bank. Research by Riandika & Taswan (2016) suggests that the NPL significantly negatively impacts deposit growth, as depositors tend to withdraw their funds from banks with high credit risk due to elevated NPL ratios.

H1: Non-performing loans have a significant negative impact on deposit growth.

The role of board size in moderating the influence of non-performing loans on deposit growth

Board size, defined as the number of directors and commissioners within a company, is crucial in determining the company's policies/strategies and ensuring compliance with the articles of association and applicable regulations (Yezzieka, 2013 in Kurniawati, 2016). Research by Saheruddin & Soedarmono (2022) indicates that board size positively and significantly impacts market discipline, particularly concerning deposit growth.

H2: Board size positively moderates the influence of non-performing loans on deposit growth.

The role of institutional ownership in moderating the influence of non-performing loans on deposit growth

Institutional ownership refers to the shares held by external entities such as corporations, insurance companies, banks, or other institutions at the end of the accounting period. Utomo & Rahardjo (2014) highlight the vital role of institutional ownership in monitoring, enforcing discipline, and exerting influence over managers. Andrieș & Nistor (2016) found that external governance variables, such as institutional ownership, significantly and positively affect the impact of corporate governance on systemic risk.

H3: Institutional ownership positively moderates the influence of non-performing loans on deposit growth.

RESULTS AND DISCUSSION

Descriptive analysis

The descriptive analysis provides a comprehensive overview of the data collected for the study, as summarized in Table 1. The output displayed in Table 1 indicates that the dependent variable, growth of deposits (GD), exhibits a minimum value of -0.478696, observed at Bank Pembangunan Daerah Banten Tbk in 2020, and a maximum value of 1.208362, recorded at Bank QNB Indonesia Tbk in 2014. The mean value stands at 0.110561, with a standard deviation of 0.239157. The minimum value for the independent variable, NPL, is 0.0000011, noted at Bank Capital Indonesia Tbk in 2020 and 2021. In contrast, the maximum value is 0.382800, seen at Bank Tabungan Negara (Persero) Tbk in 2014. The average NPL value is 0.037999, with a standard deviation of 0.047764. The moderation variable, BOARD, displays a minimum value of 1.609438 at Bank MNC Internasional Tbk in 2012 and a maximum value of 3.218876 at Bank Rakyat Indonesia (Persero) Tbk in 2019 and 2020. The mean BOARD value is 2.492638, with a standard deviation of 0.353773. Institutional Ownership (INST), another moderation variable, shows a minimum value of 0.109884 at Bank Central Asia Tbk in 2019, with the maximum reaching 1.000000 at Bank J Trust Indonesia Tbk in 2014. The average value is 0.734097, and the standard deviation is 0.198746.

Table 1. Descriptive statistic

Variable	Obs	Min	Mean	Max	Std. Dev.
PD	300	-0.478696	0.110561	1.208362	0.239157
NPL	300	0.0000011	0.037999	0.382800	0.047764
BOARD	300	1.609438	2.492638	3.218876	0.353773
INST	300	0.109884	0.734097	1.000000	0.198746
EQTA	300	0.052063	0.145399	0.750934	0.069979
SIZE	300	28.43109	31.73772	35.08436	1.583896
LTA	300	0.103259	0.627823	1.565143	0.117501

Regarding the control variable, Equity to Total Asset (EQTA), a minimum value of 0.052063 was recorded at Bank Pembangunan Daerah Banten Tbk in 2015, while the maximum value was 0.750934 at Bank Victoria International Tbk in 2016, with an average value of 0.145399 and a standard deviation of 0.069979. The control variable SIZE reported a minimum value of 28.43109 at Bank Bumi Arta Tbk in 2012 and a maximum value of 35.08436 at Bank Mandiri (Persero) Tbk in 2021, with an average of 31.73772 and a standard deviation of 1.583896. Finally, the control variable Loan to Total Asset (LTA) had a minimum value of 0.103259 at Bank Capital Indonesia Tbk in 2021 and a maximum value of 1.565143 at Bank Bumi Arta Tbk in 2012, with an average value of 0.627823 and a standard deviation of 0.117501.

Generalized Method of Moment (GMM) regression

The GMM regression results, as presented in Table 2, delineate the relationship between various financial variables and their impact on deposit growth. The regression analysis includes variables such as the lagged value of growth of deposits (GD(-1)), NPL, BOARD, INST, interactions between NPL and BOARD (NPLBOARD), NPL and INST (NPLINST), Equity to Total Asset (EQTA), SIZE, and Loan to Total Asset (LTA). These variables exhibit coefficients with corresponding standard errors, t-statistics, and probability values, providing insights into their significance and impact.

Table 2. Results of Generalized Method of Moment (GMM).

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GD(-1)	0.340889	0.023670	14.40184	0.0000
NPL	-1.430858	0.284214	-5.034435	0.0000
BOARD	-0.051089	0.069016	-0.740250	0.4651
INST	0.676958	0.074949	9.032283	0.0000
NPL*BOARD	0.666664	0.295731	2.254290	0.0319
NPL*INST	1.782436	0.443979	4.014690	0.0004
EQTA	-0.261267	0.152709	-1.710887	0.0978
SIZE	-0.149303	0.019339	-7.720355	0.0000
LTA	-0.227404	0.115743	-1.964732	0.0591
Effects Specification				
Cross-section fixed (first differences)				
Root MSE	0.223297	Mean dependent var		-0.009603
S.D. dependent var	0.197708	S.E. of regression		0.226626
Sum squared resid	11.96676	J-statistic		18.86307
Instrument rank	30	Prob(J-statistic)		0.709143

The regression results demonstrate that the coefficient for the NPL variable is -1.430858 with a standard error of 0.284214, yielding a t-statistic of -5.034435 and a probability value of 0.0000. This significant negative coefficient indicates that an increase in NPL adversely affects deposit growth, thus supporting the hypothesis that non-performing loans negatively impact deposit growth. The probability value associated with the NPL variable firmly suggests statistical significance, given it is well below the 0.05% significance threshold.

Furthermore, the regression analysis incorporates an effects specification for cross-section fixed (first differences) and metrics such as root mean square error (MSE), standard deviation of the dependent variable, sum squared residuals, and instrument rank. The analysis also provides the mean dependent variable value, standard error of the regression, J-statistic, and the probability of the J-statistic, which collectively contribute to a comprehensive understanding of the model's fit and effectiveness.

In summary, the evidence from the GMM regression analysis, specifically the statistically significant negative coefficient for the NPL variable, allows for accepting the hypothesis that non-performing loans have a detrimental effect on deposit growth.

Model specification test

Sargan test

The hypotheses used in the study are presented as follows: The null hypothesis (H0) posits that the overidentifying restrictions, which are conditions applied in the model estimation, are valid. Conversely, the alternative hypothesis (H1) suggests that these overidentifying restrictions, or conditions in the model estimation, are not valid.

Based on the results of the GMM regression, the probability value (Prob(J-statistic)) obtained is 0.709143, which is greater than the significance level (α) of 0.05. This indicates that the results are not statistically significant. The dynamic panel data test using GMM suggests that the instrumental variables employed in the GMM are exogenous, affirming the model's validity.

Arelano-Bond test

The hypotheses employed in the analysis are delineated as follows: The null hypothesis (H0) asserts that there is no autocorrelation present, while the alternative hypothesis (H1) posits the existence of autocorrelation.

From the results presented in Table 3, it can be concluded that the null hypothesis is accepted for the AR(2) test, as the p-value is 0.9890, exceeding the significance level (α) of 0.05. This indicates the absence of autocorrelation in the first difference error of order -1, thereby suggesting that the estimation is consistent.

Table 3. Result from the Arelano-Bond test

Test order	m-Statistic	rho	SE(rho)	Prob.
AR(1)	-0.917772	-4.582973	4.993585	0.3587
AR(2)	0.013820	0.038154	2.760712	0.9890

Hypothesis Test

Parsial test (t test)

The results indicate that the NPL variable has a p-value of 0.0000, less than 0.05, and a coefficient value of -1.430858. This leads to rejecting the null hypothesis and accepting the alternative hypothesis. Consequently, it can be concluded that the NPL variable significantly negatively affects the growth of deposits.

Moderated Regression Analysis (MRA)

The interaction variable "board" has a p-value of 0.0319, less than 0.05, and a coefficient value of 0.666664. Therefore, it can be concluded that the interaction variable "board" significantly positively affects the relationship between NPL and the growth of deposits.

Furthermore, the interaction variable "institutional ownership" has a p-value of 0.0004, less than 0.05, and a coefficient value of 1.782436. This indicates that the interaction variable "institutional ownership" significantly positively affects the relationship between NPL and the growth of deposits.

Discussion

Hypothesis 1 posits that a NPL adversely affects deposit growth. The test results demonstrate that a NPL significantly negatively impacts deposit growth. The regression analysis reveals that credit risk undermines market discipline, as depositors tend to withdraw their funds from banks with a high NPL risk to avert potential losses. With the increase in NPL, depositors become reluctant to invest their funds in such banks, perceiving them as financially unstable. Consequently, banks must diminish their NPL through effective debt collection efforts and enhancing credit quality, thereby lowering their NPL ratio to a secure level and restoring depositor confidence.

These findings are consistent with prior research conducted by Riandika & Taswan (2016), which also determined that the NPL variable significantly negatively affects deposit growth. This underscores the importance of managing credit risk for banking institutions to maintain depositor trust and ensure financial stability.

Hypothesis 2 posits that board size can positively moderate the relationship between NPL and deposit growth. The test results affirmatively show that Board Size positively moderates the effect of NPL on deposit growth. The study's findings suggest that an increase in the size of the board of directors within banking companies strengthens market discipline among bank depositors. This indicates that a larger board size effectively mitigates the credit risk undertaken by banks. Specifically, an augmented number of board members in the banking sector diminishes the likelihood of banks engaging in excessive risk-taking behaviours and bolsters market discipline. These outcomes underscore the beneficial impact of board size on risk management and market accountability in the banking industry, as demonstrated by the research findings.

These results align with prior research by Saheruddin & Soedarmono (2022), which indicated that the board size variable significantly and positively influences market discipline related to deposit growth. This underscores the importance of board composition and size in enhancing banks' governance and risk management framework, thereby contributing to the stability and growth of deposits amidst challenges posed by non-performing loans.

Hypothesis 3 proposes that Institutional Ownership can positively moderate the relationship between NPL and deposit growth. The test results support this hypothesis, showing that institutional ownership indeed positively moderates the impact of NPL on deposit growth.

The study's findings suggest that substantial institutional ownership intensifies market discipline among bank depositors. Specifically, the greater the institutional share ownership in a bank, the reduced credit risk it undertakes. Significant institutional ownership amplifies pressure on bank management to implement effective credit risk management strategies and reduce the occurrence of NPL. Moreover, institutional ownership enhances market discipline by improving oversight and empowering shareholders to influence management decisions.

These observations align with the research conducted by Andrieş & Nistor (2016), which highlighted that the external governance variable, namely institutional ownership, has a significant and positive effect on the influence of corporate governance on systemic risk. This underscores the vital role of institutional investors in promoting sound risk management practices and maintaining financial stability within the banking sector.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study explored the relationship between credit risk and market discipline in banking companies listed on the Indonesia Stock Exchange from 2012 to 2021, focusing on the moderating role of good corporate governance. The main conclusions drawn are that the Non-Performing Loan (NPL) ratio negatively impacts deposit growth, indicating a decrease in deposits in the banking sector as the NPL ratio rises. This reflects the significant role of market discipline in influencing depositor behaviour and the impact of credit risk on deposit growth during the observed period. The findings emphasize the necessity of effective credit risk management in the banking industry to enhance depositor confidence and ensure stability.

Moreover, it was found that board size positively moderates the effect of NPL on deposit growth, implying that a larger board size can effectively strengthen the negative relationship between non-performing loans and deposit growth, enhancing market discipline by depositors in the Indonesian banking sector.

Institutional ownership was also found to positively moderate the effect of NPL on deposit growth, suggesting that significant institutional ownership can increase the pressure on company management to take appropriate measures to manage credit risk and minimize non-performing loans.

Recommendations

The study's findings lead to several recommendations to improve financial performance for companies. Banks are encouraged to enhance the effectiveness of market discipline by providing transparent and accurate information to depositors, helping to reduce credit risk and mitigate the decrease in deposit growth.

Attention should also be given to the size of the board of directors in its role in supervising and controlling credit risk. Adding qualified and competent board members specialized in finance and risk management could be beneficial. Furthermore, it is crucial to stress the importance of ongoing training and updating current board members with the latest information to ensure they remain knowledgeable about the latest finance and risk management practices.

Strengthening institutional ownership is recommended to exert more pressure on bank management regarding credit risk management. Banks should aim to improve relationships with institutional shareholders and consider strategic options such as mergers or acquisitions to increase institutional ownership. Developing a culture of accountability and transparency when dealing with institutional shareholders is also essential.

To deepen our understanding of this dynamic, further research must explore other factors that could influence the relationship between NPL and deposit growth, such as macroeconomic factors, regulations, and government policies.

REFERENCES

- Abdal, N. M., Nur, W., & Mawaddah, A. A. (2020). Penaksiran Generalized Method of Moments dengan penggunaan metode Marquardt-Levenberg. *Indonesian Journal of Fundamental Sciences (IJFS)*, 4(2), 102–109. <https://doi.org/10.26858/ijfs.v6i1.13943>
- Acharya, V., & Naqvi, H. (2012). The seeds of a crisis: A theory of bank liquidity and risk-taking over the business cycle. *Journal of Financial Economics*, 106, 349–366.
- Alyani, R., Sumantri, F., Gusmella, S., & Rahmah, S. A. (2022). Pengaruh Equity to Total Asset Ratio (EAR), Inflasi dan Suku Bunga terhadap Harga Saham. *Kinerja: Jurnal Ekonomi dan Manajemen*, 19(3), 567–575.
- Andrieș, A. M., & Nistor, S. (2016). Systemic risk, corporate governance and regulation of banks across emerging countries. *Economics Letters*, 144, 59–63. <https://doi.org/10.1016/j.econlet.2016.04.031>
- Ariffin, N. M., Munir, R., & Shamsher, M. (2005). The role of accounting information in market discipline in the Malaysian banking sector. *Asian Academy of Management Journal*, 10(1), 1-23.
- Aspan, H. (2017). Good corporate governance principles in the management of limited liability company. *International Journal of Law Reconstruction*, 1(1), 87. <https://doi.org/10.26532/ijlr.v1i1.1637>
- Ayuningrum, D. (2011). Analisis pengaruh risiko kredit, risiko likuiditas, dan risiko operasional terhadap Capital Adequacy Ratio (CAR) pada bank umum di Indonesia. *Jurnal Ilmu Manajemen Dan Bisnis*, 2(2), 93-107.
- Badan Pusat Statistik. (2022). *Statistik perbankan Indonesia: November 2021*. Jakarta: BPS. Retrieved from: <https://www.bps.go.id/indicator/13/1958/1/perkembangan-dana-pihak-ketiga-perbankan-menurut-jenisnya-.html>
- Basel Committee on Banking Supervision. (2011). *Basel III: A global regulatory framework for more resilient banks and banking systems*. Basel: The Bank for International Settlements (BIS). Retrieved from: <https://www.bis.org/publ/bcbs189.pdf>
- Board of Governors of the Federal Reserve System. (2010). *Bank holding company supervision manual, Supplement 38*. Washington, D.C: Board of Governors of the Federal Reserve System.

- CEIC. (2021). *Indonesia: Rasio kredit bermasalah*. Retrieved from: <https://www.ceicdata.com/id/indicator/indonesia/boar-performing-loans-ratio>
- Darmawi, H. (2011). *Manajemen Perbankan*. Jakarta: PT Bumi Aksara.
- Dendo, M., Suryowati, K., & Jurusan Statistika. (2021). Pemodelan tingkat inflasi di Indonesia menggunakan regresi data panel dinamis dengan estimasi FD-GMM Arellano-Bond dan SYS-GMM Blundell-Bond. *Jurnal Statistika Industri Dan Komputasi*, 6(02), 159–170.
- Díaz, V., & Huang, Y. (2017). The role of governance on bank liquidity creation. *Journal of Banking and Finance*, 77, 137–156. <https://doi.org/10.1016/j.jbankfin.2017.01.003>
- Dufour, J. M., Trognon, A., & Tuvaandorj, P. (2017). Invariant tests based on estimators, estimating functions, and the generalized method of moments. *Econometric Reviews*, 36(1-3), 182-204.
- Fahmi, I. (2014). *Manajemen Risiko*. Bandung: Alfabeta.
- Federal Reserve. (2000). *Market discipline*. Federal Reserve Bank of Cleveland, Annual Report.
- Francis, B., Hasan, I., Liu, L., & Wang, H. (2019). Senior debt and market discipline: Evidence from bank-to-bank loans. *Journal of Banking and Finance*, 98, 170–182.
- Funso, K. T., Kolade, A. R., & Ojo, O. M. (2012). Credit risk and commercial banks' performance in Nigeria: A panel model approach. *Australian Journal of Business and Management Research*, 2(2), 31–38.
- Godspower-Akpomiemie, E., & Ojah, K. (2021). Market discipline, regulation, and banking effectiveness: Do measures matter? *Journal of Banking and Finance*, 133, 106249. <https://doi.org/10.1016/j.jbankfin.2021.106249>
- Gurendrawati, E., Khairunnisa, H., Ulupui, I. G. K. A., Suryarini, T., & Zakaria, A. (2021). Bank risk profile and credit growth in Indonesia. *Jurnal Ilmiah Akuntansi Dan Bisnis*, 16(1), 84. <https://doi.org/10.24843/jiab.2021.v16.i01.p06>
- Hamada, M., & Konishi, M. (2010). Related lending and bank performance: Evidence from Indonesia. *IDE Working Paper*, 229. Institute of Developing Economies Japan External Trade Organization (JETRO)
- Hanafi, J., & Breliastiti, R. (2016). Peran mekanisme good corporate governance dalam mencegah perusahaan mengalami financial distress. *Jurnal Online Insan Akuntan*, 1(1), 195–220.
- Hasan, & Tandelilin, E. (2012). Disiplin pasar perbankan di Indonesia uji empiris terhadap bank konvensional dan syariah. *Jurnal Ekonomi dan Bisnis Indonesia*, 27(2).
- Haryanto, S., Chandrarin, G., & Bachtiar, Y. (2019). Bank size, risk and market discipline with a deposit insurance: Evidence of banking in Indonesia. *AFRE (Accounting and Financial Review)*, 2(2), 81-90. <https://doi.org/10.26905/afr.v2i2.3717>
- Hett, F., & Schmidt, A. (2017). Bank rescues and bailout expectations: The erosion of market discipline during the financial crisis. *Journal of Financial Economics*, 126(3), 635–651.
- Hosono, K. (2005). Market discipline to banks in Indonesia, the Republic of Korea, Malaysia, and Thailand. *Asian Development Bank Institute Conference, Corporate Governance of Banks in Asia*, January 20–21.

- Indrawan, V., & Sutrisno. (2019). Risiko bank dan disiplin pasar studi pada bank umum milik negara dan bank umum swasta nasional. *Jurnal UMKM Dewantara*, 2(1), 47–58.
- Jati, D. P., & Murni, S. (2012). Disiplin pasar, krisis perbankan dan penjaminan simpanan (Studi kasus perbankan Indonesia). *Jurnal Performance*, 16(2). 1-7.
- Kurniawati, E. (2016). Analisis pengaruh ukuran dewan terhadap kinerja perusahaan (Studi empiris pada perusahaan manufaktur yang terdaftar di BEI periode 2010-2014). *Jurnal Ilmu dan Riset Akuntansi*, 5(10), 1-16.
- Lane, T. D. (1993). Can market forces discipline government borrowing? *Finance and Development*, March, 26–29.
- Lin, K. L., Wu, T. C., & Li, K. P. (2022). Government support of banks and market discipline: International evidence. *Review of Financial Economics*, 40(2), 174–199. <https://doi.org/10.1002/rfe.1145>
- Lukviarman, N. (2016). *Corporate Governance*. Solo: PT Era Adicitra Intemedia.
- Llewellyn, D. T., & Mayes, D. (2003). The role of market discipline in handling problem banks. *Bank of Finland Discussion Papers*, 21. Bank of Finland, Helsinki
- Monks, R. A. G., & Minow, N. (2003). *Corporate governance* (3rd ed.). Blackwell Publishing.
- Park, S., & Peristiani, S. (2007). Are bank shareholders enemies of regulators or a potential source of market discipline? *Journal of Banking and Finance*, 31(8), 2493–2515. <https://doi.org/10.1016/j.jbankfin.2006.10.025>
- Peni, E., & Vähämaa, S. (2012). Did good corporate governance improve bank performance during the financial crisis? *Journal of Financial Services Research*, 41(1-2), 19–35. <https://doi.org/10.1007/s10693-011-0108-9>
- Puspitarini, S. (2019). Analisis pengaruh rasio likuiditas, solvabilitas, aktivitas dan size perusahaan terhadap kinerja keuangan perusahaan. *Jurnal Ilmiah Manajemen Dan Bisnis*, 5(1), 78. <https://doi.org/10.22441/jimb.v5i1.5627>
- Riandika, A. F., & Taswan. (2015). Pengujian disiplin pasar perbankan berdasarkan posisi CAR, LDR, ROA dan NPL. *Proceeding Seminar Nasional Multi Disiplin Ilmu & Call For Paper Unisbank*.
- Saheruddin, H., & Soedarmono, W. (2022). Do board size, institutional ownership, and external auditors matter to market discipline in Indonesian banking? *Quarterly Review of Economics and Finance*, 86, 389–395. <https://doi.org/10.1016/j.qref.2022.08.010>
- Salawu, M. K. (2017). Factors influencing auditor independence among listed companies in Nigeria: Generalized method of moments (GMM) approach. *International Journal of Economics and Finance*, 9(8), 191.
- Soledad, M. S., & Schmukler, S. L. (2001). Do depositors punish banks for bad behavior? Market discipline, deposit insurance, and banking crises. *Journal of Finance*, 56(3), 1029–1051. <https://doi.org/10.1111/0022-1082.00354>
- Suliyono, J., & Risfandy, T. (2021). Islamic banking market discipline in Indonesia. *Journal of Islamic Monetary Economics and Finance*, 7(3), 457–472. <https://doi.org/10.21098/jimf.v7i3.1376>
- Susanti, R. (2010). Analisis faktor-faktor yang berpengaruh terhadap nilai perusahaan (Studi kasus pada perusahaan go public yang listed tahun 2005-2008). [Thesis]. Universitas Diponegoro
- Trinugroho, I., Pamungkas, P., Ariefianto, M. D., & Tarazi, A. (2020). Deposit structure, market discipline, and ownership type: Evidence from Indonesia. *Economic Systems*, 44(2), 100758. <https://doi.org/10.1016/j.ecosys.2020.100758>

- Ullah, S., Akhtar, P., & Zaefarian, G. (2018). Dealing with endogeneity bias: The generalized method of moments (GMM) for panel data. *Industrial Marketing Management*, 71, 69-78.
- Utomo, A. T. (2014). Pengaruh mekanisme good corporate governance terhadap kinerja keuangan (Studi empiris pada perusahaan manufaktur yang terdaftar di Bursa Efek Indonesia tahun 2010-2012). *Journal of Accounting*, 3, 1–8.
- Valencia, F., & Laeven, L. (2012). Systemic banking crisis database: An update. *IMF Working Papers*, 12/163. International Monetary Fund. <https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Systemic-Banking-Crisis-Database-An-Update-26015>
- Yan, X., Skully, M. T., Avram, K., & Vu, T. (2012). Market discipline and deposit guarantee: Evidence from Australian banks. *International Review of Finance*, 14, 431-457. <https://doi.org/10.1111/irfi.12028>
- Yogistira, P. S. (2022). Pengaruh risiko bank dan capital terhadap disiplin pasar pada laporan keuangan yang terdaftar di BEI periode 2018-2020. [Thesis]. Universitas Mercubuana Yogyakarta. Retrieved from <https://reader.mercubuana-yogya.ac.id/index.php/display/file/16609/1/>



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