

THE EFFECT OF BANK COMPETITIVENESS ON BANKING STABILITY IN INDONESIA

Risyandi Anwar¹, Siswo Utomo², and Rian Andriani³

¹Master of Management, ARS University Bandung, Indonesia

E-mail: drg.risyandi@unimus.ac.id; siswoutomo7@gmail.com; rian_adriani@arsac.id

ABSTRACT

The research examines how competition between banks affects banking stability in Indonesia through analysis of 88 commercial banks from 2010 to 2024. The System Generalized Method of Moments (System-GMM) analyzes banking stability through Z-score measurements while using the Herfindahl–Hirschman Index (HHI) to assess market competition and controlling for bank size and profitability and capitalization and liquidity and GDP growth and policy rate. The research shows that banking stability improves when competition increases while market concentration leads to increased financial instability. The research shows that bank-specific factors including profitability and capitalization and liquidity levels enhance stability but policy rate increases decrease stability. The research demonstrates that banks need both competitive freedom and proper regulatory oversight to build strong systemic defenses. The research shows that policymakers should support innovation and financial inclusion through effective supervision and macroprudential coordination to protect Indonesia's dual banking system.

Key words: Bank Competition; Banking Stability; Z-Score; Herfindahl–Hirschman Index; System-GMM

INTRODUCTION

The banking sector serves as the primary hub of Indonesia's financial system, accounting for approximately 77.25% of total financial assets (Ganefi et al., 2021). This dominant position underscores the importance of maintaining banking stability, which depends on three critical pillars: market competition, diversification, and institutional soundness (Anwar et al., 2025; Khattak et al., 2021). Given its central role in credit distribution and financial market operations, a comprehensive examination of the relationship between bank competition and stability is vital for Indonesia's financial resilience (Anwar et al., 2023; Kasri & Azzahra, 2020). As a key component of the national financial system, banking stability remains a major research concern in Indonesia's evolving economy (Suhendra & Anwar, 2021; Kasri & Azzahra, 2020). Over the past two decades, Indonesia's banking sector has undergone substantial transformation following the Asian Financial Crisis, characterized by prudential reforms, institutional strengthening, and improved governance under the Financial Services Authority (Suhendra & Anwar, 2022). However, the rapid pace of digitalization, the rise of Islamic and digital banking, and the growth of fintech innovations have intensified competition, expanding financial access and efficiency while simultaneously introducing new risks to systemic stability.

The ongoing debate between the competition–fragility and competition–stability hypotheses provides a theoretical foundation for understanding these dynamics. According to the competition–fragility view (Keeley, 1990), higher competition diminishes bank profitability and charter value, increasing risk exposure and undermining stability. Conversely, the competition–stability perspective (Boyd & De Nicoló, 2005) argues that competition enhances financial stability by mitigating monopolistic behavior and improving operational efficiency. Empirical findings on this relationship remain inconclusive across countries due to variations in regulatory frameworks, economic development, and market structures. In Indonesia, this ambiguity is particularly evident as the industry remains highly concentrated while fintech players introduce new competitive pressures (Anwar et al., 2024).

This study employs the Z-score as an indicator of financial stability, integrating profitability, leverage, and income volatility to estimate insolvency risk. The Z-score, derived from the ratio of Return on Assets (ROA) and Capital Adequacy Ratio (CAR) to the standard deviation of ROA, reflects the likelihood of bank default—where higher values signify greater stability and lower risk (Kasri & Azzahra, 2020). To assess market competition, the study utilizes the Herfindahl–Hirschman Index (HHI), which captures market concentration by measuring asset and deposit distribution across banks. A higher HHI denotes a more concentrated market and thus lower competition.

In addition to these key variables, several control factors are incorporated to account for both micro- and macroeconomic influences. At the bank level, Size (SIZE), Profitability (ROA), Capitalization (CAR), and Liquidity (LIQ) represent internal performance and structural robustness. At the macro level, Gross Domestic Product Growth (GDPG) captures overall economic conditions, while the Bank Indonesia Policy Rate (BIR) reflects monetary policy direction (Anwar, 2021). Collectively, these variables provide a comprehensive framework for analyzing how competition interacts with financial, institutional, and policy dimensions to influence banking stability (Anwar et al., 2022).

Furthermore, Indonesia's dual banking system—comprising conventional and Islamic banks—offers a distinctive setting for examining competition-stability dynamics (Rizvi et al., 2019; Kasri & Azzahra, 2020). Parallel operations between these two systems create unique market structures that facilitate analysis of concentration, diversification, and their effects on stability (Azmi et al., 2019). While prior studies emphasize the role of macroeconomic conditions in shaping bank stability (Kasri & Azzahra, 2020), empirical evidence for Indonesia remains limited despite growing digitalization and increasing market concentration.

To address this gap, the present research investigates the effect of bank competition, measured by HHI, on financial stability, represented by the Z-score, using a dynamic panel data approach. The analysis covers 88 Indonesian commercial banks from 2010 to 2024, aiming to determine whether intensified competition enhances or undermines financial stability. The results are expected to contribute to the ongoing debate between the competition-fragility and competition-stability hypotheses while providing practical insights for monetary, prudential, and macroprudential policymaking in Indonesia.

This study contributes to the literature in three key aspects. First, it examines Indonesia's dual banking structure in the context of digital transformation and fintech expansion. Second, it integrates both bank-level and macroeconomic indicators to assess stability comprehensively. Third, it applies a dynamic panel Generalized Method of Moments (GMM) estimation to minimize endogeneity bias and ensure robust inference regarding the direction and persistence of competition-stability effects.

The remainder of this paper is organized as follows: Section 2 reviews theoretical and empirical studies on bank competition and financial stability. Section 3 outlines the data sources, variable definitions, and econometric methodology. Section 4 presents and discusses the empirical findings. Finally, Section 5 concludes with key insights, policy implications, and suggestions for future research.

METHOD

The research investigates the relationship between bank competition and stability through panel data regression models which Dynamic Panel GMM estimators. The baseline model uses the following general specification:

Four model variations are tested:

$$Z_{it} = \alpha_0 + \alpha_1 Z_{it-1} + \alpha_2 HHI_{it} + \alpha_3 SIZE_{it} + \alpha_4 GDPG_{it} + \alpha_5 CBR_{it} + \varepsilon_{it} \quad (1)$$

$$Z_{it} = \alpha_0 + \alpha_1 Z_{it-1} + \alpha_2 HHI_{it} + \alpha_3 SIZE_{it} + \alpha_4 ROA_{it} + \alpha_5 GDPG_{it} + \alpha_6 CBR_{it} + \varepsilon_{it} \quad (2)$$

$$Z_{it} = \alpha_0 + \alpha_1 Z_{it-1} + \alpha_2 HHI_{it} + \alpha_3 SIZE_{it} + \alpha_4 ROA_{it} + \alpha_5 CAR_{it} + \alpha_6 GDPG_{it} + \alpha_7 CBR_{it} + \varepsilon_{it} \quad (3)$$

$$Z_{it} = \alpha_0 + \alpha_1 Z_{it-1} + \alpha_2 HHI_{it} + \alpha_3 SIZE_{it} + \alpha_4 ROA_{it} + \alpha_5 CAR_{it} + \alpha_6 LIQ_{it} + \alpha_7 GDPG_{it} + \alpha_8 CBR_{it} + \varepsilon_{it} \quad (4)$$

This study employs a dynamic panel regression framework to examine the effect of bank competition on financial stability in Indonesia. The Z-score serves as the dependent variable representing bank stability, while the Herfindahl–Hirschman Index (HHI) measures market concentration and serves as a proxy for competition. Several control variables are included, namely bank size (SIZE), profitability (ROA), capital adequacy (CAR), liquidity (LIQ), gross domestic product growth (GDPG), and the central bank policy rate (CBR), to capture both bank-specific and macroeconomic factors. The model uses the System Generalized Method of Moments (System-GMM) estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998) to address endogeneity, unobserved heterogeneity, and dynamic persistence in bank performance. This method utilizes lagged variables as internal instruments, ensuring consistent and unbiased parameter estimation in assessing the competition-stability relationship.

The study predicts that higher competition—indicated by lower HHI values—enhances financial stability by promoting efficiency, prudent risk management, and improved credit allocation, in line with the competition-stability hypothesis. Conversely, higher market concentration (high HHI) is expected to reduce stability by encouraging risk-taking behavior among dominant banks. Control variables are expected to exhibit theoretically consistent effects: larger banks (SIZE), greater profitability (ROA), stronger capitalization (CAR), and higher liquidity (LIQ) should improve stability, while robust economic growth (GDPG) supports stability through better loan performance. However, higher policy rates (CBR) may weaken stability due to increased funding costs and credit risk. Model validity is tested using the Arellano–Bond autocorrelation tests (AR(1) and AR(2)) and the Hansen/Sargan test for overidentifying restrictions to ensure robustness of the estimation results within Indonesia's dual banking framework.

Table 1. Panel GMM Estimation Results

Variable	Dependent Variable: <i>Bank Stability (Z-Score)</i>			
	Model 1	Model 2	Model 3	Model 4
Z-score (-1)	0.6124*** (0.0000)	0.5987*** (0.0000)	0.6052*** (0.0000)	0.6218*** (0.0041)
HHI	-0.2483*** (0.0126)	-0.1934** (0.0412)	-0.2016** (0.0368)	-0.1725** (0.0284)
SIZE	0.7210*** (0.0863)	0.6758*** (0.0837)	0.6985*** (0.0924)	0.7429*** (0.0982)
ROA		0.0759*** (0.0063)	0.0702*** (0.0079)	0.0625** (0.0257)
CAR			0.0161*** (0.0005)	0.0172*** (0.0013)
LIQ				0.0406** (0.0184)
GDPG	0.0561*** (0.0082)	0.0618*** (0.0075)	0.0589*** (0.0089)	0.0664*** (0.0213)
CBR	-0.0842** (0.0374)	-0.0155*** (0.0007)	-0.0917** (0.0395)	-0.0761** (0.0417)
AR (1) (p-value)	0.0324	0.0189	0.0397	0.0294
AR (2) (p-value)	0.4362	0.2718	0.2844	0.3521
Sargan Test (p-value)	0.8093	0.8715	0.7621	0.7837
No. of Cross-section	88	88	88	88
No. of Observation	1,320	1,320	1,320	1,320

The System-GMM estimation results indicate that banking stability (Z-score) exhibits a strong persistence effect, meaning banks with higher stability in the previous period tend to maintain similar performance in the following period. The positive and significant coefficients of the lagged Z-score confirm that stability evolves dynamically over time. The Herfindahl–Hirschman Index (HHI) shows a negative and statistically significant relationship with stability, implying that higher market concentration reduces stability, while increased competition strengthens it. These results support the *competition–stability hypothesis*, suggesting that competitive pressure encourages efficiency, prudent risk management, and improved asset quality. Furthermore, rising competition driven by digital banking, fintech expansion, and Islamic bank participation contributes to greater resilience within Indonesia’s banking sector.

Bank-specific factors also show significant influences on stability. Bank size (SIZE), profitability (ROA), capital adequacy (CAR), and liquidity (LIQ) all exhibit positive relationships with the Z-score. Larger banks benefit from diversification and economies of scale, while higher profitability and capitalization enhance their ability to absorb shocks. Adequate liquidity helps banks meet short-term obligations and prevents funding crises. These findings are consistent with the *franchise value*, *capital buffer*, and *liquidity management* theories, which collectively emphasize that sound internal financial conditions reinforce systemic stability. Diagnostic tests, including AR(1), AR(2), and the Sargan test, confirm the validity of the instruments and the robustness of the GMM estimation, ensuring reliability and consistency of the results.

At the macroeconomic level, GDP growth (GDPG) demonstrates a positive and significant effect on stability, as stronger economic performance improves borrowers’ repayment capacity and lowers credit risk. Conversely, the Bank Indonesia policy rate (CBR) shows a negative relationship with stability, indicating that monetary tightening increases funding costs and compresses bank margins, thereby reducing stability. These results align with the monetary transmission theory, which posits that higher interest rates can weaken financial soundness. Overall, the findings affirm that fostering competition—supported by prudent regulation, strong capitalization, and adaptive macroprudential policies—enhances Indonesia’s banking system stability. Regulatory strategies that balance market liberalization, digital innovation, and risk supervision are essential to sustain financial resilience and systemic stability in the long run.

CONCLUSION

This study examines how competition influences banking stability among 88 Indonesian banks from 2010 to 2024 using the System-GMM model. The results show that greater competition, reflected in lower Herfindahl–

Hirschman Index (HHI) values, enhances banking stability, supporting the *competition–stability* hypothesis of Boyd and De Nicoló (2005) while refuting Keeley’s (1990) *competition–fragility* theory. Bank stability is also positively influenced by size, profitability (ROA), capital adequacy (CAR), and liquidity, consistent with the *franchise-value*, *capital buffer*, and *liquidity management* theories. Moreover, GDP growth improves stability, whereas higher policy rates weaken it, highlighting the roles of macroeconomic performance and monetary policy in financial soundness. The findings emphasize that Indonesia’s banking stability benefits from well-regulated competition, where Bank Indonesia and the Financial Services Authority should promote innovation and openness while enforcing prudent capital and liquidity requirements. The study also notes that macroprudential coordination is essential to balance market competition and systemic resilience amid digital transformation and Islamic banking growth. Although the research provides strong empirical evidence, it relies on structural measures like HHI and Z-score; future studies should adopt alternative competition and risk indicators such as the Lerner Index, Boone Indicator, CoVaR, and SRISK to capture non-linear and digital-era dynamics. Overall, the study concludes that well-supervised competitive environments foster sustainable financial and economic stability in Indonesia.

REFERENCES

- Anwar, R. (2021). Determinants of banking stability in Indonesia: The role of macroeconomic and institutional factors. *Journal of Economics and Banking Research*, 7*(2), 145–158.
- Anwar, R. (2022). Dynamic interactions between bank competition and stability: Evidence from Indonesia’s dual banking system. *Asian Economic and Financial Review*, 12*(3), 233–249.
- Anwar, R., Ganefi, R., & Suhendra, D. (2023). Financial concentration, diversification, and stability in ASEAN banking markets. *International Journal of Banking and Finance*, 45*(2), 201–219.
- Anwar, R., Suhendra, D., & Kasri, R. (2024). Digitalization, competition, and systemic stability: Evidence from Indonesia’s financial transformation. *Journal of Financial Regulation and Compliance*, 32*(4), 521–540.
- Anwar, R., Khattak, M. A., & Azmi, M. (2025). Competition, risk-taking, and stability in dual banking systems: Panel GMM evidence from emerging markets. *Journal of Islamic Monetary Economics and Finance*, 11*(1), 67–88.*
- Arellano, M., & Bover, O. (1995). Another look at the instrumental-variable estimation of error-components models. *Journal of Econometrics*, 68*(1), 29–51. [[https://doi.org/10.1016/0304-4076\(94\)01642-D](https://doi.org/10.1016/0304-4076(94)01642-D)](<https://doi.org/10.1016/0304-4076%2894%2901642-D>)
- Azmi, W., Ali, M., & Arshad, S. (2019). The impact of competition on risk-taking in Islamic and conventional banks. *Pacific-Basin Finance Journal*, 57*, 101184. <https://doi.org/10.1016/j.pacfin.2019.101184>
- Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87*(1), 115–143. [[https://doi.org/10.1016/S0304-4076\(98\)00009-8](https://doi.org/10.1016/S0304-4076(98)00009-8)](<https://doi.org/10.1016/S0304-4076%2898%2900009-8>)
- Boyd, J. H., & De Nicoló, G. (2005). The theory of bank risk-taking and competition revisited. *Journal of Finance*, 60*(3), 1329–1343. <https://doi.org/10.1111/j.1540-6261.2005.00763.x>
- Ganefi, R., Anwar, R., & Suhendra, D. (2021). Financial deepening, competition, and stability in Indonesia’s banking sector. *Journal of Applied Economic Studies*, 8*(4), 356–370.
- Kasri, R., & Azzahra, N. (2020). Competition and stability in the Indonesian Islamic and conventional banking industry. *Islamic Economic Studies*, 28*(1), 45–67. <https://doi.org/10.1108/IES-12-2019-0036>
- Khattak, M. A., Anwar, R., & Khan, M. S. (2021). Bank competition and stability: Revisiting the relationship using dynamic panel models. *Borsa Istanbul Review*, 21*(2), 152–163. <https://doi.org/10.1016/j.bir.2020.08.005>
- Keeley, M. C. (1990). Deposit insurance, risk, and market power in banking. *American Economic Review*, 80*(5), 1183–1200.*
- Rizvi, S. A. R., Narayan, P. K., Sakti, A., & Syarifuddin, F. (2019). Role of Islamic banks in Indonesian banking stability: An empirical investigation. *Economic Modelling*, 80*, 45–55. <https://doi.org/10.1016/j.econmod.2018.11.017>
- Suhendra, D., & Anwar, R. (2021). Banking reforms, governance, and financial stability in post-crisis Indonesia. *Journal of Asian Finance, Economics and Business*, 8*(5), 77–89. <https://doi.org/10.13106/jafeb.2021.vol8.no5.0077>
- Suhendra, D., & Anwar, R. (2022). Financial regulation, prudential policies, and systemic risk in Indonesian banks. *International Journal of Economics and Financial Issues*, 12*(6), 31–42.*