

# The Impact of the Basel III Framework Implementation on Banking Performance in Indonesia

Implementation on  
Banking Performance  
in Indonesia

243

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Submitted:  
December 10, 2025

Revised:  
February 7, 2026

Accepted:  
February 27, 2026

Published Online:  
February 28, 2026

## ABSTRACT

Banking stability is crucial to Indonesia's financial resilience. Following the 2008 global crisis, Basel III was introduced to reinforce banks' capital, leverage, and liquidity frameworks. This study aims to analyze the impact of the implementation of the Basel III framework on the financial performance of Indonesian banks, particularly on profitability and operational efficiency during the 2018-2024 period. This study uses secondary quantitative data obtained from the annual financial statements and published reports of publicly listed conventional commercial banks. The collected data include information related to Basel III implementation. Data processing methods used descriptive analysis and dynamic common correlated effects panel data regression analysis. The research data are sourced from financial reports officially published by each bank. The results show that the success of Basel III implementation depends not only on compliance levels but also on each bank's ability to balance stability, efficiency, and growth. For banks, capital optimization, leverage management, and adaptive liquidity strategies are key. Regulators require proportional policy calibration and risk-based supervision. With the right approach, Basel III can be a strategic instrument for sustainably strengthening the competitiveness and resilience of the national banking system.

**Keywords:** Basel III, Financial Performance, Liquidity Management, Profitability, Operational Efficiency.

## INTRODUCTION

The 2008 global financial crisis was one of the most significant events in modern economic history because it demonstrated the vulnerability of the global financial system to financial institutions categorized as too big to fail and potentially posing systemic risk (Valitov et al. 2016). The crisis exposed fundamental weaknesses in banking regulation and risk management, particularly the accumulation of excessive leverage, inadequate capital, and weak liquidity management (Bessis, 2011; Ruozi & Ferrari, 2012; Lysiak et al., 2022). The Basel Committee on Banking Supervision (BCBS) responded by designing the Basel III framework as an improvement on previous standards. The goal was to strengthen global banking resilience through reforms in three key areas: capital adequacy, leverage ratios, and liquidity standards (BCBS, 2011). Basel III requires banks to have stronger core capital to absorb losses, strict leverage controls, and adequate short- and long-term liquidity through the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR) (Hendricks et al., 2023).

These standards were designed to address the pro-cyclical nature of banking and prevent the accumulation of excessive risk that could trigger systemic instability. As part

**JIAKES**

Jurnal Ilmiah Akuntansi  
Kesatuan  
Vol. 14 No. 1, 2026  
pp. 215-230  
IBI Kesatuan  
ISSN 2337 – 7852  
E-ISSN 2721 – 3048  
DOI: 10.37641/jiakes.v14i1.4805

of its G20 commitment, Indonesia adopted Basel III through various regulations issued by the Financial Services Authority (2020) (*Otoritas Jasa Keuangan/OJK*). Implementation began in 2015 with mandatory compliance with the LCR for commercial banks, followed by minimum capital requirements in 2016, then the NSFR in 2017, and the leverage ratio in 2019 (Bonnario, 2018; Shrestha, 2022). Broadly speaking, the Basel III framework in Indonesia aims to ensure banks maintain adequate capital and stable funding, mitigate liquidity risk, and control leverage expansion to remain within safe limits.

The impact of Basel III on banking performance has been debated in various international studies. Giordana and Schumacher (2017) found that increasing capital in Luxembourg banks reduced the risk of default, but potentially limited credit expansion and depressed profitability. Le et al. (2020) on banks in the UK and Australia also showed that high capital can reduce efficiency. Meanwhile, Obadire et al. (2022) found that the LCR actually improved operational efficiency in several African banks. Ogunmola et al. (2022) on US banks, it was noted that high core capital needs to be increased gradually to avoid impairing profitability. Research in Indonesia shows a similar pattern. Bonmario (2018) shows that increasing capital strengthens BNI's financial resilience through more effective loan portfolio management. Gunawan (2019) found that strong capital contributes positively to the profitability of BUKU IV banks, while Operating Expenses to Operating Income (*Biaya Operasional terhadap Pendapatan Operasional/BOPO*) has a negative effect. Laksmana (2019) concluded that CAR has a significant effect on ROA and NSFR, supporting long-term profitability, while LCR actually undermines efficiency.

The empirical and regulatory context suggests that Basel III plays a strategic role in strengthening the stability of Indonesia's banking system, although its impact on profitability and efficiency remains a trade-off. Given that banking is the backbone of the Indonesian economy through its intermediation and credit risk management functions, a thorough understanding of Basel III's impact is crucial for regulators and industry players (Setiawan, 2023; Siraj et al., 2024). A review of capital, liquidity, and leverage components and their implications for banking performance helps ensure a balance between financial system stability and inclusive economic growth.

In practice, Indonesian banks face a trade-off between stability and profitability. While Basel III promotes resilience, many banks struggle to balance capital adequacy, liquidity requirements, and operational efficiency. The mixed empirical evidence highlights a lack of clarity on how the simultaneous implementation of capital, liquidity, and leverage standards affects both profitability and efficiency across Indonesian banks. Previous studies often analyze individual components of Basel III or focus on specific banks. However, there is limited research evaluating the combined impact of all Basel III components on the financial performance of Indonesian banks over a recent period (2018–2024). This study fills this gap by providing a comprehensive assessment of how capital, liquidity, and leverage standards collectively influence profitability and operational efficiency, offering insights for both regulators and bank managers. This study aims to analyze the impact of Basel III framework implementation on the financial performance of Indonesian banks, focusing on profitability and operational efficiency during the 2018–2024 period.

## LITERATURE REVIEW

### Theoretical Framework of Basel III and Banking Performance

At the grand theory level, this study draws on the Resource-Based View (RBV) and the Institutional Theory. RBV suggests that bank performance depends on internal capabilities, including capital quality, risk management, liquidity, and governance (James & Joseph, 2015). Basel III strengthens these capacities by improving capital, controlling leverage, and ensuring liquidity (LCR, NSFR), allowing banks to convert regulations into competitive advantages and enhance efficiency and resilience (Sharma & Chauhan, 2023; Arin et al., 2024). Institutional Theory emphasizes that adoption is also driven by regulatory, normative, and mimetic pressures, as banks comply with OJK policies,

professional standards, and practices of international peers (Meyer & Rowan, 1977; Barney, 2001; Alam & Miah, 2024).

At the middle-range level, this study applies risk management theory (ISO 31000:2008), which stresses systematic identification, analysis, and control of risks to achieve sustainable objectives (Spikin, 2013; Afifawati et al., 2023). In banking, managing credit, market, liquidity, and operational risks is vital for stability and performance. Basel III aligns with this framework by strengthening capital, controlling leverage, and ensuring liquidity, making risk management both a protective and strategic tool for long-term value and good governance. As an applied theory, this study refers to Basel III components under OJK regulations: capital adequacy, leverage ratio, and liquidity standards (LCR, NSFR) (BCBS, 2011). Basel III strengthens banks' ability to absorb shocks, limit risk transmission, and enhance governance. Leverage limits asset accumulation without capital, while LCR and NSFR ensure short- and long-term liquidity. Integrating RBV, Institutional, and Risk Management theories, Basel III impacts banks financially, operationally, strategically, and institutionally, providing a solid foundation for empirical analysis.

### **Leverage and Capital Adequacy Ratio (CAR)**

Leverage and Capital Adequacy Ratio (CAR) are core prudential metrics under the Basel III framework that ensure banks maintain an appropriate financial structure to absorb losses and support sustainable performance (Yamin et al., 2025; Ramadhani & Mangifera, 2025). The leverage ratio is a non-risk-based measure defined by Basel III as Tier 1 capital divided by total exposures, intended to limit excessive build-up of leverage that may amplify bank instability in downturns. A higher leverage ratio implies that a bank is less reliant on borrowed funds, reducing insolvency risk and supporting stakeholder confidence. Empirical evidence suggests varying impacts on profitability metrics; for instance, studies in emerging markets such as Nigeria show that enhanced Tier 1 capital and leverage ratios improve Return on Equity (ROE), though the effect on Return on Assets (ROA) may be limited (Al-Sharkas & Al-Sharkas, 2022).

The Capital Adequacy Ratio (CAR) reflects the share of high-quality regulatory capital to Risk-Weighted Assets (RWAs), ensuring that banks can withstand losses arising from credit, market, and operational risks. Higher CAR is generally associated with stronger stability and lower default risk, which supports long-term performance (Giordana & Schumacher, 2017). However, excessive capital requirements can constrain credit growth and operational leverage, potentially dampening short-term profitability and lending capacity. Thus, leverage and CAR regulate risk positions, while they strengthen solvency and resilience, their influence on performance varies depending on institutional settings and economic cycles (Vu, 2024).

### **Liquidity Coverage Ratio and Net Stable Funding Ratio**

The Basel III liquidity framework comprises two complementary standards: the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR). The LCR ensures banks hold high-quality liquid assets sufficient to cover net cash outflows over a 30-day stress period, enhancing short-term liquidity resilience (BCBS, 2011). Banks with adequate LCR are generally more stable during market stress, contributing to performance by reducing liquidity costs and enhancing stakeholder trust (Shonhadji & Irwandi, 2023). Empirical studies in Southeast Asia indicate that both LCR and NSFR significantly affect profitability measured by ROA (Shonhadji & Irwandi, 2023).

The NSFR complements LCR by promoting sound funding structures over a longer horizon, requiring banks to fund activities with stable sources relative to required stable funding (BCBS, 2011). A higher NSFR stabilizes funding profiles, lowering refinancing risk and supporting operational continuity. Some studies report positive associations between NSFR and efficiency or profitability because stable funding reduces costs and improves balance sheet planning (Sidhu et al., 2022; Le, 2023). Nevertheless, liquidity standards may have non-linear effects: modest increases improve efficiency, while overly

stringent constraints can elevate funding costs and reduce returns. Therefore, LCR and NSFR play strategic roles by mitigating liquidity risk and shaping long-term performance outcomes within Basel III's design (Alaoui & Oubdi, 2022).

### **Return on Assets and BOPO as Banking Performance Indicators**

Return on Assets (ROA) is a widely accepted indicator of bank profitability, reflecting a bank's ability to generate profits from its total asset base (e.g., operational and financial assets). In the banking literature, ROA has been used extensively to assess how internal financial ratios and management practices influence overall performance. Empirical research in Indonesian banks has consistently shown that ROA is negatively affected by inefficiencies and operational costs. For instance, studies indicate that higher BOPO, a measure of operational inefficiency, tends to reduce ROA, meaning banks with higher operating costs relative to income perform worse in terms of profitability (Jatmiko, 2025). Additionally, evidence from regional studies confirms that BOPO's negative relationship with ROA persists when controlling for other financial determinants, affirming BOPO as a key factor influencing profitability performance (Wibowo, 2025).

Operational efficiency, as captured by BOPO, therefore plays a dual role in banking performance: (1) it directly reflects cost management effectiveness, and (2) it influences profitability outcomes measured by ROA. Higher BOPO ratios signal that banks are incurring greater expenses without a proportional increase in operational revenue, which undermines their ability to convert assets into earnings. This dynamic has been observed in several empirical analyses of Indonesian commercial banks, which report that BOPO has a significant negative effect on ROA (Alam et al., 2022; Hartanto & Samputra, 2023; Irawan et al., 2025). Meanwhile, studies that integrate capital strength variables such as Capital Adequacy Ratio (CAR) alongside BOPO and ROA reveal mixed but generally supportive evidence that strong capital buffers can mitigate profitability pressures, even when operational inefficiencies exist (Sari & Fauzan, 2025).

### **RESEARCH METHODS**

This study employs a quantitative approach using secondary data derived from the annual financial statements and published reports of publicly listed conventional commercial banks in Indonesia. Data were collected quarterly during the period 2018–2024, with the aim of providing information after the full implementation of Basel III. The variables analyzed include Basel III prudential ratios, namely LCR, NSFR, leverage ratio, and CAR, as well as banking financial performance indicators, namely ROA, BOPO, NPL, and LDR. All data were obtained from each bank's official website and classified according to KBMI categories. The research variables consist of the independent variable (X) in the form of Basel III ratios: leverage, CAR, LCR, and NSFR, and the dependent variable (Y) in the form of bank financial performance represented by ROA as an indicator of profitability and BOPO as an indicator of operational efficiency. The study population includes all banks listed on the Indonesia Stock Exchange (IDX), with samples selected using purposive sampling based on three criteria. The bank must have gone public during the observation period, have complete Basel III ratio data, and be a non-Sharia bank that is not a Regional Development Bank. Based on these criteria in Table 1, 32 banks were selected as research samples. These 32 banks were further grouped into eight categories according to their total core capital at the end of 2024, allowing for a more granular analysis of capital capacity heterogeneity.

**Table 1.** List of sample banks per category

Category	Bank Code	Bank Name (KBMI)	Total Core Capital FY24
1	BBRI	Bank Rakyat Indonesia (Persero) Tbk. (4)	241.043.217
	BBCA	Bank Central Asia Tbk. (4)	239.468.855
	BMRI	Bank Mandiri (Persero) Tbk. (4)	229.932.670
	BBNI	Bank Negara Indonesia (Persero) Tbk. (4)	142.043.039
2	BNLI	Bank Permata Tbk. (3)	50.989.922
	BNGA	Bank CIMB Niaga Tbk. (3)	48.038.315
	NISP	Bank OCBC NISP Tbk. (3)	39.675.970
	BDMN	Bank Danamon Indonesia Tbk. (3)	36.117.873
3	BBTN	Bank Tabungan Negara (Persero) Tbk. (3)	29.834.471
	BNII	Bank Maybank Indonesia Tbk. (3)	23.664.322
	MEGA	Bank Mega Tbk. (3)	20.121.168
	SDRA	Bank Woori Saudara Indonesia 1906, Tbk. (2)	11.613.179
4	BBHI	Allo Bank Indonesia, Tbk. (2)	7.112.796
	BSIM	Bank Sinarmas, Tbk. (2)	6.930.875
	ARTO	Bank Jago, Tbk. (2)	6.527.434
	BMAS	Bank Maspion Indonesia, Tbk. (2)	6.240.082
5	SEAB	Bank Seabank Indonesia, Tbk. (1)	5.679.685
	AGRS	Bank IBK Indonesia, Tbk. (1)	5.495.654
	BBMD	Bank Mestika Dharma, Tbk. (1)	5.058.298
	BKSW	Bank QNB Indonesia, Tbk. (1)	4.265.916
6	MASB	Bank Multiarta Sentosa, Tbk. (1)	3.759.032
	DNAR	Bank Oke Indonesia, Tbk. (1)	3.571.113
	BBKP	Bank KB Bukopin Tbk. (1)	3.410.320
	NOBU	Bank Nationalnobu, Tbk. (1)	3.379.872
7	BBYB	Bank Neo Commerce, Tbk. (1)	3.325.430
	BGTG	Bank Ganesha, Tbk. (1)	3.308.800
	AMAR	Bank Amar Indonesia, Tbk. (1)	3.287.977
	BABP	Bank MNC Internasional, Tbk. (1)	3.255.572
8	BCIC	Bank Jtrust Indonesia, Tbk. (1)	3.250.944
	AGRO	Bank Raya Indonesia, Tbk. (1)	3.212.876
	BNBA	Bank Bumi Arta, Tbk. (1)	3.134.755
	BSSR	Bank Sahabat Sampoerna, Tbk. (1)	3.129.820

For inferential analysis, this study uses the Dynamic Common Correlated Effects (DCCE) method in STATA, following Ditzgen's (2018) procedure via the `xtdcce2` command. The DCCE method was chosen because it can accommodate inter-bank heterogeneity, cross-sectional dependence, and unobserved global factors (common factors) that commonly occur in the banking industry due to systemic regulations such as Basel III. Estimation is carried out in two horizons, namely a short run to capture the direct impact of changes in the Basel III ratio, and a long run to capture the long-term relationship of structural equilibrium to banking performance. The DCCE regression model in this study includes the lag of the dependent variable and cross-sectional averages of the main variables as proxies for unobserved global factors.

## RESULTS

The short-term estimation results show that the leverage ratio has a significant impact on all banking performance indicators, with a negative impact on ROA and a positive impact on BOPO, reflecting increased risk and decreased efficiency as leverage increases. Meanwhile, CAR has a significant positive impact on ROA and a negative impact on BOPO, indicating that capital adequacy can improve profitability and efficiency. Liquidity variables (LCR and NSFR) do not significantly affect profitability and operational efficiency.

Table 2 shows the short-term DCCE results for ROA and BOPO. Leverage negatively affects ROA ( $-0.2005$ ,  $p < 0.01$ ) but increases BOPO ( $2.3811$ ,  $p < 0.05$ ), while CAR positively influences ROA ( $0.0802$ ,  $p < 0.10$ ) and reduces BOPO ( $-1.1062$ ,  $p < 0.01$ ). LCR and NSFR are not significant in either model. The models explain 50% of ROA and

47% of BOPO variation, indicating that capital and leverage are key determinants of short-term banking performance. The long-term estimation results show that the leverage ratio remains significantly positive on BOPO, indicating that high leverage continues to increase operating costs. CAR has a significantly positive effect on ROA and a negative effect on BOPO, indicating that long-term capital adequacy not only acts as a risk buffer but also supports profitability and operational efficiency. Meanwhile, LCR and NSFR remain insignificant on profitability and operational efficiency in the long run.

Table 2. Short-term DCCE estimation results

Regressor	ROA Model	BOPO Model
Leverage	-0.2005*	2.3811**
CAR	0.0802***	-1.1062*
LCR	-0.0005	-0.0146
NSFR	0.0594	0.0708
R-squared	0.50	0.47
R-Squared (MG)	0.28	0.45

significant\* at the 1% level  
significant\*\* at the 5% level  
significant\*\*\* at the 10% level

Based on Table 3, the long-term estimation results show that the leverage ratio remains significantly positive on BOPO, indicating that high leverage continues to increase operating costs. CAR has a significantly positive effect on ROA and a negative effect on BOPO, indicating that long-term capital adequacy not only acts as a risk buffer but also supports profitability and operational efficiency. Meanwhile, LCR and NSFR remain insignificant for profitability and operational efficiency in the long run.

Table 3. Long-term DCCE estimation results

Regressor	ROA Model	BOPO Model
Leverage	-0.0564	4.2222*
CAR	0.1015**	-0.9898**
LCR	-0.0016	-0.0576
NSFR	0.0042	0.0450
R-squared	0.24	0.40
R-Squared (MG)	0.56	0.42

To further understand how Basel III implementation affects bank performance, the short-term impact on ROA is analyzed across different bank size groups. The following discussion presents the DCCE estimation results for each category, highlighting variations in the influence of Basel III components on profitability.

Table 4. Results of short-term DCCE ROA Model estimation

Regressor	Category							
	1	2	3	4	5	6	7	8
Leverage	-0.1952	-0.0274	-0.0443	0.0615	-0.2935*	-0.0447***	-0.0244	-0.5490
CAR	0.0756	-0.0641	0.2452**	0.0491***	0.0465	0.0128	-0.0073	0.2850
LCR	-0.0055***	-0.0063	0.0011	-0.0082**	0.0057	0.0003	0.0004	0.0067
NSFR	-0.0064	-0.0009	-0.0074	0.0153	-0.0610	-0.0291**	-0.0114	-0.0721
R-squared	0.54	0.30	0.45	0.78	0.60	0.35	0.38	0.40
R-squared (MG)	0.61	0.82	0.25	0.02	0.42	0.98	0.89	0.94

The DCCE model estimation results in Table 4 show that the influence of Basel III components on short-term Profitability (ROA) varies across bank categories in Indonesia. For banks in categories 1 and 2, most Basel III variables are insignificant on ROA, reflecting strong capital stability and liquidity, although LCR in category 1 is shown to have a significant negative effect, in line with the findings of Laksmana (2019).

In categories 3 and 4, CAR has a significant positive effect, indicating the effectiveness of capital utilization in increasing profits. Conversely, in categories 5 and 6, leverage has

a significant negative effect on ROA, indicating a trade-off between capital strengthening and decreased profitability due to increased financing costs. Meanwhile, in categories 7 and 8, no Basel III variables are significant, indicating that Basel III implementation in small banks does not have a significant impact on short-term profitability.

**Table 5.** Estimation results of the short-term BOPO DCCE model

Regressor	Category							
	1	2	3	4	5	6	7	8
Leverage	3.4672	-0.7779	0.9027***	-0.2963	3.5436*	0.5544	0.5703	2.5234
CAR	-1.0470	1.3334*	-3.2446*	-0.8199*	-0.7032	0.0519	-0.0857	-0.2257
LCR	0.1175	0.0727**	0.0414	0.0812**	-0.0467	0.0107	0.0014	-0.1176
NSFR	0.3028	0.1023	0.0984	0.1198	1.0300	0.0478	0.0979**	0.0679
R-squared	0.36	0.34	0.47	0.74	0.55	0.16	0.54	0.46
R-squared (MG)	0.45	0.81	0.46	0.19	0.43	0.99	0.88	0.90

Based on Table 5, the short-term DCCE results show that Basel III components have varying impacts on Bank Operational Efficiency (BOPO) across categories in Indonesia. Leverage generally significantly increases BOPO in categories 3 and 5, suggesting that higher debt levels reduce efficiency. CAR typically decreases BOPO, particularly in categories 3 and 4, reflecting the efficiency benefits of stronger capital, although category 2 experiences higher costs as capital increases. Meanwhile, LCR and NSFR tend to increase BOPO, with LCR significantly increasing costs in categories 2 and 4 and NSFR doing so in category 7, suggesting that tighter liquidity and stable funding requirements create higher opportunity costs and funding costs that temporarily reduce operational efficiency.

The long-term effects of Basel III implementation on the profitability of Indonesian banks exhibit notable heterogeneity when analyzed by bank size. Differences in balance sheet structure, risk appetite, and regulatory capacity lead to varying responses to capital adequacy, leverage, and liquidity requirements across bank categories. In the long run, these regulatory instruments do not uniformly influence banks' return on assets, suggesting that the effectiveness of Basel III depends on structural characteristics specific to each bank size group. This highlights the importance of considering bank heterogeneity when assessing the sustained impact of prudential regulation on banking performance in Indonesia.

**Table 6.** DCCE estimation results of the ROA model in the long term

Regressor	Overall	Category							
		1	2	3	4	5	6	7	8
Leverage	-0.0564	-0.19 94*	0.2356* *	-0.079 2	-0.050 6	-0.6072 *	0.0380	-0.0235	0.1361
CAR	0.1015**	0.0426	0.0005	0.1613	0.0173	0.1403*	-0.008 4	-0.0093	0.0661
LCR	-0.0016	-0.01 00*	-0.0009	0.0008	0.0210	-0.0091	0.0034	0.0002	0.0174
NSFR	0.0042	0.0006	-0.0082	0.1613	0.0247	0.0395	-0.047 0	-0.0192* *	-0.030 0
R-squared	0.24	0.19	0.21	0.23	0.27	0.18	0.38	0.13	0.28
R-squared (MG)	0.56	0.83	0.85	0.52	0.57	0.78	0.97	0.95	0.95

The DCCE model estimation results in Table 6 show that the long-term impact of Basel III components on bank profitability (ROA) is heterogeneous across the eight bank categories in Indonesia. The leverage ratio has a different impact across categories, with a significant positive impact in category 2, reflecting the ability of certain large banks to utilize leverage for productive expansion. While leverage actually decreases ROA in categories 1 and 5 due to increased financial burdens and funding risks, CAR has a generally positive and significant impact on ROA in category 5, confirming that strong capital strengthens resilience and supports banks' ability to generate profits. Meanwhile,

LCR has a significant negative impact in category 1, indicating that increased short-term liquidity depresses profitability by diverting funds into low-yielding assets. The NSFR shows varying effects across categories, with a significant negative effect in category 7, indicating that increasing long-term funding in this group of small banks is ineffective in improving profitability and actually increases funding costs.

Table 7. Long-Term BOPO DCCE Model Estimation Results

Regressor	Overall	Category							
		1	2	3	4	5	6	7	8
Leverage	4.2222*	2.8729	-2.1370** *	1.7340* *	0.0796	8.1411*	1.0751	0.6612	-0.719 0
CAR	-0.989 8**	-0.2375	0.1794	-3.4297 *	-0.8383 *	-1.9491 *	-0.247 7	0.2810	-0.049 0
LCR	-0.057 6	0.1421** *	-0.3397	0.0369* *	0.0362	0.0243	-0.026 7	-0.001 3	-0.171 7
NSFR	0.0450	-0.0101	-0.0092	0.2537	-0.1822	-0.0360	1.2360	0.1082	-0.494 5
R-squared	0.40	0.16	0.21	0.27	0.38	0.15	0.08	0.24	0.15
R-squared (MG)	0.42	0.77	0.85	0.61	0.48	0.80	0.99	0.93	0.96

Table 7 shows that long-term DCCE results indicate that Basel III components have varying impacts on Bank Operational Efficiency (BOPO) across categories. Leverage generally increases BOPO significantly for categories 3 and 5, suggesting that higher debt-based financing reduces efficiency, although category 2 banks exhibit a significant negative impact, reflecting their stronger ability to manage leverage without increasing costs. CAR consistently lowers BOPO over the long run, with significant impacts in categories 3, 4, and 5, suggesting that stronger capitalization improves operational efficiency. LCR has a heterogeneous impact, with significant positive impacts in categories 1 and 3, implying that maintaining high short-term liquidity increases opportunity costs and operating expenses. Meanwhile, NSFR exhibits varying but consistently insignificant effects across bank categories, suggesting that a stable funding structure has not yet led to significant long-term efficiency improvements under Basel III.

## DISCUSSION

The findings demonstrate that the implementation of Basel III has generated differentiated effects on the financial performance of Indonesian banks, both across performance dimensions and bank size categories. In the short term, leverage exerts a negative effect on profitability while significantly increasing operational costs, indicating that higher reliance on debt-based financing amplifies risk exposure and reduces efficiency. This outcome supports the core objective of Basel III to constrain excessive leverage and enhance banking system stability (BCBS, 2011). Similar evidence is reported by Laksmana (2019) and Gunawan (2021), who find that higher leverage under Basel III weakens profitability in Indonesian banks due to rising funding and compliance costs.

In contrast, capital adequacy consistently improves bank performance by enhancing profitability and reducing operational inefficiency in both the short and long run. The positive effect of CAR on ROA and its negative effect on BOPO indicate that stronger capitalization not only functions as a risk buffer but also promotes more efficient resource allocation. These findings are consistent with the resource-based view, which posits that internal financial strength constitutes a strategic asset that supports sustainable performance (Barney et al., 2001). Empirical support for this mechanism is also found in Le et al. (2020), Obadire et al. (2022), and Al-Sharkas and Al-Sharkas (2022), who document that well-capitalized banks are better positioned to absorb shocks and maintain profitability.

Liquidity regulations, represented by the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR), do not exhibit a uniform impact on bank profitability and efficiency. While largely insignificant at the aggregate level, liquidity requirements negatively affect profitability and increase operating costs in specific bank categories,

particularly in the short term. This suggests that the accumulation of high-quality liquid assets and stable funding structures entails opportunity costs, as funds are diverted from higher-yielding investments. These results are in line with Wei et al. (2017) and Tammenga and Haarman (2020), who argue that liquidity regulations primarily serve systemic stability objectives rather than immediate performance enhancement. The heterogeneous effects across bank sizes further support Vu (2024), who highlights the non-linear relationship between liquidity requirements and profitability.

The disaggregated analysis by bank size reveals substantial heterogeneity in the response to Basel III components. Large banks demonstrate greater capacity to manage leverage and liquidity requirements without significant deterioration in performance, reflecting economies of scale and more sophisticated risk management systems. This finding is consistent with Giordana and Schumacher (2017) and supports institutional theory, which suggests that large organizations are better equipped to absorb regulatory pressures with minimal operational disruption (Meyer & Rowan, 1977). Medium-sized banks benefit most from improved capitalization, as CAR significantly enhances profitability and efficiency, indicating effective capital utilization during the Basel III transition. Conversely, smaller banks experience limited or even adverse performance effects, particularly from liquidity and stable funding requirements, reflecting structural constraints and higher relative compliance costs. Similar patterns are documented by Shonhadji and Irwandi (2023) and Setiawan (2023) in the Southeast Asian banking context.

The long-term results reinforce the central role of capital adequacy in sustaining bank performance, while highlighting that leverage and liquidity regulations impose differential efficiency trade-offs depending on bank size. These findings underscore that Basel III is effective in strengthening financial resilience but may generate short-term adjustment costs and heterogeneous outcomes across the banking sector. From a policy perspective, the results imply that a proportional approach to Basel III implementation is essential in emerging banking systems such as Indonesia. Regulators should continue to emphasize capital strengthening while adopting more flexible leverage and liquidity requirements tailored to bank size and operational capacity. Such an approach would enhance financial stability without imposing excessive efficiency costs, thereby supporting sustainable banking performance and long-term economic growth.

## **CONCLUSION**

This study concludes that the impact of Basel III implementation on Indonesian banking performance is highly heterogeneous across bank size categories. Differences in scale, capital structure, liquidity management, and managerial capacity lead to varying responses to leverage, capital adequacy, and liquidity requirements. Basel III contributes positively to financial system stability; however, its effects on profitability and operational efficiency depend on banks' ability to balance regulatory compliance with strategic business objectives. In the short term, leverage tends to reduce profitability and efficiency, reflecting a trade-off between growth and stability, while capital adequacy consistently enhances both performance dimensions. Liquidity requirements exhibit mixed effects, indicating that higher liquidity may generate opportunity costs but can also support risk mitigation when managed optimally. In the long term, capital adequacy remains the most robust determinant of sustainable bank performance, whereas leverage, LCR, and NSFR show uneven effects as banks continue to adjust their asset–liability strategies.

From a policy perspective, these findings imply that Basel III implementation in Indonesia should adopt a proportional and risk-based approach. Regulators should continue to prioritize capital strengthening while allowing greater flexibility in leverage and liquidity requirements, particularly for smaller and mid-sized banks. Such calibration can help minimize efficiency costs without undermining financial stability, thereby supporting a more resilient and competitive banking sector. This study has several limitations. First, it focuses on profitability and operational efficiency, which may not fully capture broader aspects of bank performance, such as risk-taking behavior or market

valuation. Second, macroeconomic shocks and institutional changes interacting with Basel III implementation are not explicitly considered. Future research may address these limitations by incorporating risk- and market-based indicators, examining interactions with macroprudential policies, or conducting cross-country and conventional–Islamic banking comparisons to better assess the contextual effectiveness of Basel III regulations.

**FUNDING STATEMENT:** This research did not receive any specific grant from funding agencies in the public, commercial, or not - for - profit sectors.

**CONFLICTS OF INTEREST:** The author declares no conflict of interest.

**DECLARATION OF GENERATIVE AI STATEMENT:** During the preparation of this work, the author(s) used ChatGPT, Grammarly, and Turnitin in order to assist with language refinement, grammar checking, and originality verification. After using this tool/service, the author(s) reviewed and edited the content as needed and take full responsibility for the content of the publication.

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