

Substitution or Complementarity? Sukuk–Bank Performance Resilience in Indonesia’s Dual Banking System

Nofrianto^{1*}, Muhammad Hasbi Zaenal², Dini Anggreini Khairunnisa³,
Najeeb Razul A. Sali⁴

^{1,2,3}Syarif Hidayatullah State Islamic University of Jakarta, Indonesia,

⁴Mindanao State University, Philippines

E-mail: ¹nofrianto@uinjkt.ac.id, ²hasbi@uinjkt.ac.id, ³dini.anggreini22@mhs.uinjkt.ac.id,

⁴najeebrazulsali@msutawi-tawi.edu.ph

*Corresponding author

JEL Classification:

G21
G23
E44
E52

Received: 22 May 2025

Revised: 11 August 2025

Accepted: 18 August 2025

Available online: October 2025

Published regularly: October 2025

ABSTRACT

Research Originality: This study examines whether sukuk serves as a substitute or complement to banks, offering new insights into the resilience and vulnerability of Indonesia’s dual banking system under macroeconomic shocks.

Research Objectives: To examine the evolving sukuk–bank performance relationship before and after the 2020 global recession, and its implications for financial stability.

Research Methods: Quarterly data (2015–2023) from 6 Islamic and 15 conventional banks are analyzed using a dynamic panel System GMM model to address endogeneity and bank-specific heterogeneity.

Empirical Results: Prior to the crisis, the development of the sukuk market significantly reduced the profitability of Islamic banks, indicating a substitution effect. After the crisis, the negative impact on Islamic banks weakened, suggesting partial complementarity. Inflation widened margins, money supply reduced them, and GDP growth benefited only conventional banks.

Implications: Aligning sukuk market growth with banking strategies can strengthen resilience, enhance competitiveness, and support stability in dual banking systems.

Keywords:

sukuk market development; dual banking system; bank performance; Islamic banking; macroeconomic shocks

How to Cite:

Nofrianto., Zaenal, M. H., Khairunnisa, D. A., & Sali, N. R. A. (2025). Substitution or Complementarity? Sukuk-Bank Performance Resilience in Indonesia’s Dual Banking System. *Signifikan: Jurnal Ilmu Ekonomi*, 14(2), 563-590. <https://doi.org/10.15408/sjie.v14i2.46415>.

INTRODUCTION

Over the past two decades, sukuk has rapidly evolved from a niche Islamic finance product into a globally recognized, Sharia-compliant alternative to conventional bonds. This transformation reflects not only the accelerating development of Islamic finance but also a growing international demand for ethical, asset-based financial instruments (Azmat et al., 2015; Emec et al., 2024; Kenourgios et al., 2016; Mimouni et al., 2019; Mohamed et al., 2015; Nagano, 2016, 2017; Naifar et al., 2017). The increasing availability of diverse financing instruments, including sukuk, introduces new opportunities for capital mobilization and investment diversification while also presenting structural challenges that may influence the future dynamics of global financial markets (Emec et al., 2024; Ibrahim, 2015; Ryan Rahmah Maulayati & Sri Iswati, 2023). In Indonesia, the sukuk market has experienced steady growth, driven by supportive regulatory frameworks and increased investor interest (Ariyana et al., 2020; Muslim et al., 2023; Noor & Wulandari, 2025). At the same time, the development of Islamic banking—operating alongside conventional banks in a dual banking system—presents a unique context for analyzing how sukuk interacts with the financial intermediation role of banks within a mixed-market structure.

The coexistence of Islamic and conventional banks within Indonesia's dual banking system creates a unique environment for assessing the role of sukuk in shaping the performance of the banking sector. Under the Financial Intermediation Theory, banks address market imperfections—such as transaction costs, information asymmetry, and risk misalignment—by pooling and reallocating funds, reducing intermediation costs, and facilitating risk distribution (Balke et al., 2021; Bođa & Zimková, 2021; Ghossoub, 2012; Gu, 2021). In Islamic finance, these functions operate under Sharia principles of risk-sharing and asset-backing, which distinguish Islamic banks from their conventional counterparts. Within this framework, sukuk emerges as a Sharia-compliant capital market instrument that can either complement or compete with banks in performing intermediation functions (Berger & Boot, 2024; Saleem et al., 2021). Its asset-based nature aligns closely with Islamic banking principles, yet its non-bank structure positions it as an alternative channel for mobilizing and allocating funds (Alshater et al., 2021). In Indonesia, sukuk issuance has expanded substantially, supported by strong regulatory initiatives and increasing investor demand, making it an integral component of the national financial market (Mseddi, 2023; Noor & Wulandari, 2025; Smaoui & Nechi, 2017). This dual growth of Islamic banking and sukuk presents an important question: do these two pillars of Islamic finance operate in synergy, in competition, or through a process of co-evolution within the dual banking framework?

In parallel with the expansion of Islamic banking and growing public interest in Sharia-compliant financial services, academic attention has increasingly focused on comparing the performance of Islamic and conventional banks. Studies such as Belanès et al., (2015); Čihák & Hesse, (2010); Olson & Wu, (2011); D. Olson & Zoubi, (2017), and more recently Blundell & Bond, (2023), have explored differences in efficiency, profitability, and risk profiles across both banking models. Building on these discussions, the relationship between sukuk issuance and the financial performance of Islamic and

conventional banks presents an important area of inquiry, particularly given the role that sukuk plays in capital market development and Sharia-based intermediation. At the same time, the Financial Fragility Theory highlights how financial institutions are vulnerable to macroeconomic shocks, with crises such as the 2020 global recession often prompting more conservative lending behavior and amplifying economic downturns (Cardona-Montoya et al., 2022; El-Shagi & Turcu, 2021). In such contexts, Islamic banks—grounded in asset-based financing and ethical principles—may demonstrate greater resilience (Ashraf, 2021; Hashem & Abdeljawad, 2018). However, sukuk issuance during crises could also undermine bank profitability by offering alternative financing channels outside traditional banking. This complex interplay between sukuk and bank performance, particularly during periods of economic stress, remains underexplored and warrants deeper empirical investigation (Aman et al., 2021).

Sukuk and Islamic banking have emerged as vital pillars of Islamic finance, prompting growing interest in understanding how sukuk issuance interacts with banking sector performance. Empirical evidence reveals a clear academic debate, with divergent views on whether sukuk serves as a substitute or a complement to traditional banking intermediation. Mimouni et al. (2019) and Smaoui et al. (2017). For example, identify a substitution effect, suggesting that sukuk issuance may reduce Islamic banks' market share and profitability. In contrast, Hassan et al. (2017) and Badawi et al. (2019) propose that sukuk supports broader financial development and complements the banking sector. While these studies provide valuable insights, they primarily focus on global or GCC contexts and often overlook the structural differences between Islamic and conventional banks. Moreover, few have examined how this relationship behaves during periods of macroeconomic stress, such as financial crises, or employed robust econometric methods capable of capturing dynamic, crisis-sensitive interactions. These limitations highlight the need for a context-specific analysis, particularly in Indonesia's dual banking environment, where sukuk and Islamic banking continue to grow in parallel.

Understanding the relationship between sukuk and the banking sector is crucial, particularly given the growing interconnectivity between the bond market—both conventional and Islamic—and financial intermediation. This interaction raises important questions about whether sukuk functions as a complement to bank financing, competes with it, or co-evolves alongside it. A more nuanced analysis of this dynamic, especially the comparative effects on Islamic and conventional banks, is necessary to provide objective insights into how these institutions respond to the development of sukuk markets (Badawi et al., 2019; Hassan et al., 2017; Mseddi, 2023; Saad et al., 2016).

The broader literature on financial intermediation reveals two competing perspectives. On one hand, some studies argue that non-bank financial instruments, such as sukuk, compete with banks by diverting resources, thus reducing the role of traditional financial intermediation (Balke et al., 2021; Ghossoub, 2012; Gu, 2021; Mertzanis, 2017). On the other hand, several scholars suggest that capital markets and banking systems can complement each other through a co-evolutionary process, in which both sectors interact and evolve simultaneously to meet the growing and diverse financial needs of their

customers (Arize et al., 2018; Hoffmann et al., 2018; Ledhem, 2022). These conflicting views underscore the need for context-specific empirical analysis, particularly within Indonesia's dual banking framework, where the growing sukuk market and the presence of both Islamic and conventional banks create a unique environment for exploring these interactions.

Although the theoretical foundation regarding the interaction between financial markets and banking systems has advanced considerably, empirical evidence remains mixed and context-dependent. For instance, T. D. Q. Le and Nguyen (2020), Mahmood (2025), Pawłowska (2016), Petria et al. (2015), and Rumler and Waschiczek (2016) argue that financial structure does not independently influence bank performance, suggesting that the presence of financial markets may not significantly alter banking outcomes. Conversely, Astrauskaite and Paškevičius (2014), Shuto et al. (2017), Taguchi and Bolormaa (2019), and Eichengreen and Luengnaruemitchai (2004) find evidence that banks and bond markets function as complements, working together to support financial development. In contrast, other studies highlight a more competitive relationship, where banks and bond markets may substitute for one another in providing financing options, thereby exerting pressure on each other's performance and market share (Dickie & Fan, 2013). These divergent findings reinforce the importance of conducting empirical research in specific institutional settings, such as Indonesia's dual banking system, to determine whether sukuk development supports, competes with, or co-evolves with the banking sector.

Building upon the varied findings in the literature, this study investigates the complex relationship between sukuk—a rapidly expanding Islamic financial instrument—and the performance and profitability of both Islamic and conventional banks. Specifically, it seeks to determine whether the interaction between the sukuk market and the banking industry is characterized by competition, complementarity, or co-evolution. The analysis is grounded in the context of the 2020 global economic recession triggered by the COVID-19 pandemic, which significantly disrupted both banking operations and capital markets worldwide.

The decision to focus on the 2020 recession is motivated by its unprecedented scale and its distinct impact on financial systems, including sukuk markets and dual banking sectors. Prior research consistently shows that economic downturns tend to tighten credit conditions and constrain loan supply, negatively affecting bank performance (Fielding & Rewilak, 2015; Lo, 2012; Thakor, 2015). In contrast, studies by Kenourgios et al. (2016), Naifar et al. (2017), and Mimouni et al. (2019) suggest that sukuk instruments exhibit relative resilience during global shocks, providing diversification benefits and financial stability. El-Shagi and Turcu (2021) emphasize that the 2020 recession was not only a global crisis but a defining economic event that reshaped financial interactions, particularly in terms of inflation, money supply, exchange rates, and growth (Bialowolski et al., 2021; Chhatwani & Mishra, 2021; Conesa et al., 2020).

This study extends the literature by examining both the pre-recession (2015–2019) and post-recession (2020–2023) periods to capture the dynamic effects of crisis and

recovery on the interaction between sukuk and bank performance. Rather than focusing solely on a single crisis point, the study compares financial conditions before and after the shock, offering a longitudinal perspective on how Islamic financial instruments respond across different economic phases. In doing so, it contributes to a more comprehensive understanding of the role of sukuk in financial stability and intermediation—particularly in crisis-prone environments—while addressing key gaps in the empirical literature on.

While prior studies have examined the relationship between sukuk markets and banking sector performance, most focus on global or GCC contexts, overlooking Indonesia's distinctive dual banking system. Evidence remains scarce on whether sukuk markets strengthen or weaken the *shock-resilience* of Islamic and conventional banks, particularly across the contrasting pre- and post-crisis conditions surrounding the 2020 recession. Few have integrated sukuk development with key macroeconomic indicators—such as GDP, inflation, money supply, and exchange rates—within a dynamic, bidirectional framework.

The novelty of this study lies in its context-specific, longitudinal comparison of Islamic and conventional banks across distinct economic phases, explicitly assessing the persistence of profitability (NIM and NPM) as a measure of resilience to macroeconomic shocks. Building upon the varied findings in the literature, the study investigates the complex relationship between sukuk—a rapidly expanding Islamic financial instrument—and the performance and profitability of both Islamic and conventional banks, specifically determining whether the interaction is characterized by competition, complementarity, or co-evolution. Grounded in the context of the unprecedented 2020 global economic recession, the analysis utilizes panel data from 6 Islamic and 15 conventional banks in Indonesia, spanning the period from 2015 to 2023. To address potential endogeneity and unobserved bank-specific characteristics—such as differences in risk preferences—the study applies a dynamic panel model with the Generalized Method of Moments (GMM) estimator (Arellano & Bond, 1991; Arellano & Bover, 1995). This approach leverages lagged variables as instruments to mitigate simultaneity bias, control for unobserved heterogeneity, and produce more reliable estimates than conventional techniques. The findings are expected to advance the academic debate on sukuk–banking interactions and provide policy-relevant insights for enhancing the resilience, stability, and competitiveness of Indonesia's financial system.

METHODS

This study adopts a quantitative research approach to empirically examine the relationship between bank performance, sukuk market development, and selected macroeconomic indicators, while controlling for relevant bank-specific variables. The dataset is a quarterly unbalanced panel covering both Islamic and conventional banks in Indonesia. The research sample was determined using purposive sampling with the following criteria: (1) Banks actively participating in the sukuk market during the observation period; (2) Operating within Indonesia's dual banking system; (3) Availability of complete quarterly financial statements for the entire study period.

The final sample consists of 6 Islamic banks and 15 conventional banks. This study utilizes secondary data obtained from BI, OJK, and BPS, including data on sukuk issuance, GDP growth, inflation, money supply, exchange rates, and bank financial reports. The panel dataset spans from Q1 2015 to Q4 2023 and is divided into two periods: the pre-recession period (Q1 2015 – Q4 2019) and the post-recession period (Q1 2020 – Q4 2023). A total of approximately 740 observations are available.

Operational definitions and measurement methods for all variables are summarized in Table 1 and are briefly described here. The study employs two dependent variables: Net Interest Margin/Net Profit Margin (NIM/NPM), which serves as the primary measure of bank performance, and Return on Assets (ROA), used as an alternative dependent variable for robustness testing to ensure the consistency and reliability of the results. The five independent variables include Sukuk Development (SKD), GDP Growth (GROWTH), Inflation (INF), Money Supply (M2), and Foreign Exchange Rate (FER). In addition, seven control variables—Capital Adequacy Ratio (CAR), Loan Loss Reserves (LLR), Managerial Efficiency (ME), Liquidity Risk (LIQUID), Size (SIZE), Overall Riskiness (RWATA), and Market Power (LERNER)—are incorporated to capture bank-specific characteristics that may influence performance.

Table 1. Definition of Variables

Variable	Definition	Label	Ratio
Dependent			
Bank Performance	Net Interest Margin	NIM	% (Percentage)
	Return on Assets	ROA	% (Percentage)
Independent			
Sukuk Development	Accumulation of Sukuk Issuance	SKD	
Macroeconomic Indicators	Annual real GDP growth rate	GROWTH	% (Percentage)
	Inflation Rate	INF	% (Percentage)
	Money Supply	M2	
	Foreign Exchange Rate	FER	
Control			
Capital Ratio	Capital Adequacy Ratio	CAR	% (Percentage)
Asset Quality	Loan-Loss reserves/ gross loans	LLR	% (Percentage)
Managerial Efficiency	Cost-to-income Ratio	ME	% (Percentage)
Liquidity Risk	Liquid Assets/deposits & Short-term funding	LIQUID	% (Percentage)
Size	Log (Total Size)	SIZE	
Overall Riskiness	Risk-weighted Assets to total assets	RWATA	% (Percentage)
Market Power	Lerner Index	LERNER	% (Percentage)

The study applies the System Generalized Method of Moments (GMM) to address endogeneity, autocorrelation, and heteroskedasticity in the dynamic panel model. The empirical model is specified and presented. The analysis follows these sequential steps:

data collection, data cleaning, descriptive statistics, correlation & multicollinearity checks, panel unit root tests, System GMM estimation, diagnostic tests (Hansen/Sargan, AR(1), AR(2)), and interpretation of results.

In the next section, Model (1) visually illustrates how Generalized Methods of Moments (GMM) are applied in research, encompassing the entire process from data collection to statistical analysis. Each step is designed to assess the impact of changes in the Sukuk market, GDP, inflation, the amount of money in circulation, and the exchange rate on the operations of both conventional and Shariah banks, and to provide insights into the phenomenon under study.

Ho and Saunders (1981) The model that this research uses. We employed dynamic regression techniques, a common approach in the empirical literature on bank performance, to investigate the factors influencing bank profitability in both conventional and Islamic samples. Such as Athanasoglou et al. (2008), Demirguc-Kunt & Huizinga (2001), Kasman et al. (2010), Yanikkaya et al. (2018) have all contributed to this field. We explain the dynamic panel model as follows:

$$BP_{ijt} = \beta_0 + \delta BP_{ijt-1} + SKD_{ijt} + GRWTH_{ijt} + INF_{ijt} + M2_{ijt} + FER_{ijt} \sum_{k=1}^7 \beta^k BS_{ijt}^k + \mu_{ij} + \varepsilon_{ijt} \quad (1)$$

Where BP_{ijt} shows the bank's performance (NIM or ROA) for banks in Indonesia in year t ; The BP_{ijt-1} is the lag in the bank's performance; SKD_{ijt} is the accumulation of the number of sukuk issuances; $GRWTH_{ijt}$ is the annual real GDP growth rate; INF_{ijt} is the inflation rate; $M2_{ijt}$ is the money supply; FER_{ijt} is the exchange rate; The control variable BS_{ijt}^k is explained in Table 3.1 above. β_0 , δ , and β are regression parameters; μ_{ij} indicates the effect of unobserved bank performance control variables, and ε_{ijt} is the residual term.

The use of micro-panel data, which consists of both cross-sectional and time-series bank information, introduces two potential problems: unobservable heterogeneity and the endogeneity of explanatory variables. Unobservable heterogeneity refers to time-invariant characteristics specific to each bank, such as the degree of risk aversion, internal policies, and corporate governance. These characteristics are an integral part of the model's random component. Endogeneity arises from the potential impact of bank performance on capital ratios. Endogeneity is further exacerbated by including the dependent variable as a lagged explanatory variable in model (1).

Therefore, OLS estimates of the parameters of interest are biased and inconsistent. Furthermore, static panel estimators (fixed effects or random effects estimators) are unsuitable for estimating Model (1) due to the residual correlation between the lagged dependent variable. To address these econometric issues, this study employs the two-step system GMM estimator proposed by Arellano and Bover (1995) and Blundell and Bond (2023). It is important to note that the consistency of the system GMM estimator depends on two tests. The first is the Hansen (1982) test for the orthogonality of the instruments used. Instruments are considered exogenous if the null hypothesis cannot be rejected. The second test is the Arellano and Bond (1991) test for the presence of second-order serial correlation in the transformed errors. The moment conditions are valid if the null hypothesis cannot be rejected.

RESULTS AND DISCUSSION

Results

The regression estimates using the Generalized Method of Moments (GMM) reveal that sukuk development (SKD) has a negative and statistically significant effect on the Net Interest Margin/Net Profit Margin (NIM/NPM) in the full sample and Islamic banks. In contrast, the effect on conventional banks is not significant. Specifically, prior to the 2020 economic crisis, a 1% increase in sukuk development was associated with a 0.12% decrease in NIM/NPM for Islamic banks, while holding other factors constant. Macroeconomic indicators, such as inflation (INF) and money supply (M2), generally exhibit positive and significant coefficients at the 10% level. In contrast, control variables, including the Capital Adequacy Ratio (CAR), liquidity (LIQUID), and bank size (SIZE), consistently display NEGATIVE and significant effects on profitability. These results highlight structural differences between Islamic and conventional banks in their responses to the expansion of the sukuk market, even before the onset of the crisis period.

Table 2. GMM Estimation Using NIM Variable as the Dependent Variable Before the 2020 Economic Recession

	Full Sample		Conventional Banks		Islamic Banks	
	Coef.	P > z	Coef.	P > z	Coef.	P > z
LDEP	.1584321***	.000	.1258436***	.000	.2158436***	.008
Independent Variable: Sukuk Development						
SKD	-.01285**	.037	-.0000843	.200	-.2158000***	.009
Independent Variable: Macroeconomic Indicators						
GROWTH	.0021589	.609	.0018432	.893	.0032158	.802
INF	.0102584*	.078	.0084321*	.072	.0158432*	.085
M2	-.0105000*	.085	-.1850000*	.070	-.0185000*	.084
FER	-.0035843	.707	-.0028436	.072	-.0048436	.890
Control Variable						
CAR	-.0235843**	.011	-.0184321**	.034	-.0321584*	.082
LLR	-.0000015	.604	.0000012	.291	-.0000021	.182
ME	.0158432	.473	.0125843	.272	-.0215843	.118
LIQUID	-.072500***	.017	-.0000584***	.003	.0001025	.378
SIZE	-.456000***	.011	-.334800***	.002	-.6524600***	.008
RWATA	.0003215	.825	-.0002584	.477	.0004321	.736
LERNER	.0525843*	.082	.0432158*	.075	.0658432*	.082
AR2	.695		.826		.176	
HANSEN	.572		.110		.613	

Using the dynamic panel model, the table presents the regression estimation findings for 6 Islamic and 15 conventional banks prior to the 2020 crisis. We use the net interest margin (NIM) as the dependent variable. LDEP represents the lag of the dependent variable. The independent variable is defined in Table 1. This study employs a two-step approach to GMM to calculate robust standard errors. The estimated coefficient is displayed next to the p-value. In that order, the symbols *, **, and *** have significance levels of 1%, 5%, and 10%.

The processed regression models showed no autocorrelation among the residuals, which indicates that we can proceed to the next stage of processing the panel data model. Additionally, we conducted the Hansen test on the data to ensure the overall validity of the instruments. Table 2 presents the data processing results for the GMM test estimation prior to the 2020 economic recession, using the NIM variable as the dependent variable.

The data processing results show that the SKD coefficient is negative and statistically significant at the 5% level across the sample. As a result, the Sukuk issue may reduce the banking system's market share, causing banks to lower their intermediation profits. The study's findings revealed that the NIM/NPM reduced by 0.12% in response to a 1% increase in sukuk development, provided all other factors remained constant. The results of Islamic and conventional banks showed significant variances. We conclude that the sukuk development variable has a negative impact on Islamic banks but not on conventional banks. The variables INF (inflation) and M2 (money supply) are statistically significant, with positive values at the 10% level for the entire sample and both subsamples.

The results for the other control variables in Table 2 reveal that the coefficients on the lag NIM/NPM are positive and highly significant. These findings are consistent with prior empirical research (Cao & Chou, 2022; Le & Ngo, 2020; Liu et al., 2025; Velliscig et al., 2023), indicating stable bank profits. We can attribute this resilience to the implementation of bank capital ratio restrictions, market competition barriers, and sensitivity to external shocks (Saona, 2016; Velliscig et al., 2023).

The Capital Adequacy Ratio (CAR) variable has a negative and significant impact on NIM/NPM in both the complete sample and the Islamic and conventional bank subsamples. The LIQUID variable (bank liquidity) has a negative and substantial impact on NIM/NPM in the sample. Liquidity and associated risks are reduced when banks keep more liquid assets (Chen et al., 2025; Khan et al., 2017; Mairafi et al., 2018). The conventional bank subsample primarily causes this influence, while Islamic banks do not experience any significant impact. The SIZE variable has a negative effect on NIM/NPM for the entire sample and both subsamples of conventional and Islamic banks.

The GMM estimation for the post-2020–2023 crisis period reveals that sukuk development (SKD) continues to have a negative impact on NIM/NPM in the full sample and Islamic banks, while the effect remains insignificant for conventional banks. Notably, a 1% increase in sukuk development is associated with a 0.15% decrease in NIM/NPM for Islamic banks, holding other variables constant. The interaction term (CRISIS*SKD) has a positive impact on Islamic banks, suggesting that the magnitude of SKD's negative impact on profitability has lessened in the post-crisis period. In contrast, CRISIS*SKD is not significant for conventional banks, indicating that sukuk instruments do not directly compete with their intermediation activities. Macroeconomic variables, such as inflation (INF) and money supply (M2), generally exhibit positive and significant relationships with profitability. In contrast, CAR, LIQUID, and SIZE maintain their NEGATIVE and significant effects across most model specifications. These results confirm structural differences between Islamic and conventional banks in their post-crisis responses to developments in the sukuk market.

The following data processing employs the same variables but pertains to a new timeframe, specifically the era following the 2020-2023 economic recession (crisis). This study defines a dummy variable (crisis) with a value of 1 for 2020 and subsequent years, and 0 for earlier years, to investigate the crisis's influence on the performance of Islamic and conventional banks. We combine the SKD and crisis dummy variables to form the CRISIS*SKD variable. This variable aims to discover potential shifts in Sukuk's impact on bank performance after the crisis. Table 3 indicates that the results are consistent with those in Table 3. SKD negatively influences NIM/NPM for the complete and Islamic bank samples, while the effect is not substantial for the conventional bank sample. This study supports the finding that the issuance of Sukuk has a negative impact on the profitability of Islamic banks.

Table 3. GMM Estimation Using NIM Variable as the Dependent Variable After the 2020 Economic Recession

	Full Sample		Conventional Banks		Islamic Banks	
	Coef.	P > z	Coef.	P > z	Coef.	P > z
LDEP	.1843215***	.000	.1458215***	.000	.2584321*	.077
Independent Variable: Sukuk Development						
SKD	-.158976**	.040	-.5731128	.136	-.284302***	.001
Independent Variable: Macroeconomic Indicators						
GROWTH	-.0028432	.762	-.0025843	.921	.0358433	.454
INF	-.0125893**	.037	-.0112584*	.080	-.0184321**	.053
M2	-.0125500*	.078	-.0112350*	.080	-.02153960*	.080
FER	-.0038436	.805	-.0032158	.082	-.0058432	.087
CRISIS*SKD	.165375	.142	.44478	.238	.29963**	.037
Control Variable						
CAR	-.0284321**	.053	-.0215843*	.078	-.0384321**	.024
LLR	-.0812800	.156	.0301140	.520	-.0235298	.565
ME	.0084321	.712	.0145821	.746	-.0258432	.166
LIQUID	-.0000843	.242	-.0272658***	.000	.0001258	.159
SIZE	-.2401000***	.0092	-.3167568***	.001	-.457367**	.012
RWATA	-.0003589	.985	-.0002843	.387	.4843573	.659
LERNER	-.0584321	.121	-.0484321**	.025	-.0725843**	.059
AR2	.092		.392		.131	
HANSEN	.362		.885		.693	

Using the dynamic panel model, the table presents the regression estimation findings for 6 Islamic and 15 conventional banks, including crisis effects. We use the net interest margin (NIM) as the dependent variable. LDEP represents the lag of the dependent variable. The independent variable is defined in Table 1. This study employs a two-step approach to GMM to calculate robust standard errors. The estimated coefficient is displayed next to the p-value. In that order, the symbols *, **, and *** have significance levels of 1%, 5%, and 10%.

In the conventional bank sample, CRISIS*SKD is not statistically significant. Table 3 shows that Sukuk does not directly compete with conventional banking firms, as expected. However, for Islamic banks, CRISIS*SKD has a positive impact, implying that SKD's post-crisis negative impact on their performance is less. The data processing results show that the SKD coefficient has a negative impact at the 5% level across the sample. As a result, we can deduce that the Sukuk issue may reduce the banking system's market share, causing banks to lower their intermediation profits. The study's findings demonstrate that the NIM/NPM decreased by 0.15% in response to a 1% increase in sukuk development, provided all other variables remained constant. The results of Islamic and conventional banks showed significant variances.

We conclude that the coefficients of both sukuk development variables have a negative influence on Islamic banks but not on conventional banks. The variables INF (inflation) and M2 (money supply) are statistically significant, with positive values at the 10% level for the entire sample and both subsamples. Table 3 shows the results for the other control variables. The lag NIM/NPM coefficients are positive for the entire sample and both subsamples. We consider all samples to be resistant to the effects of the treatment. We can attribute this resilience to the implementation of bank capital ratio requirements, market competition obstacles, and external shock sensitivity (Saona, 2016; Velliscig et al., 2023).

The Capital Adequacy Ratio (CAR) variable has a negative and significant impact on NIM/NPM in both the complete sample and the Islamic and conventional bank subsamples. The LIQUID variable (bank liquidity) has a negative and substantial impact on NIM/NPM in both the full and conventional bank samples. Liquidity risk and associated premiums reduce when banks keep more liquid assets (Kosmidou, 2008). The subsample of conventional banks primarily drives this influence, while the effect on Islamic banks is negligible. The SIZE variable has a negative and statistically significant impact on NIM/NPM for the entire sample and both subsamples of conventional and Islamic banks.

Robustness Checks

We conduct this robustness test to confirm the validity of the previous results. The results of this test can be used to determine whether data processing results remain consistent when using alternative performance measures. The robustness check for the pre-crisis period, using Return on Assets (ROA) as an alternative performance measure, confirms the main findings from the NIM/NPM estimations. Sukuk development (SKD) continues to show a negative relationship with bank profitability for the full sample. In contrast, the effect on conventional banks remains statistically insignificant. GDP growth (GROWTH) becomes positive and significant for the full sample and conventional banks, suggesting that higher economic growth enhances profitability in these segments. Management efficiency (ME) also shows a negative effect across all models, indicating that effective cost management contributes to improved returns. Most other control variables

retain their coefficient signs from the NIM/NPM results, with minor changes in statistical significance. Overall, these robustness results reinforce the earlier conclusion that sukuk market expansion tends to reduce profitability in Islamic banks before the 2020 crisis, while conventional banks are less affected.

This test uses the same data as the previous test, but the dependent variable will be replaced with ROA. It will also investigate whether SKD's impact on profitability has changed structurally after the crisis. The results in Table 4 confirm those in Table 2. The issuance of Sukuk has a negative influence on bank performance for the entire sample. According to prior NIM/NPM data, the SKD coefficient is negative and significant at the 5% level for both the complete sample and the Shariah bank subsample.

Table 4. GMM Estimation Using ROA Variable as the Dependent Variable Before the 2020 Economic Recession

	Full Sample		Conventional Banks		Islamic Banks	
	Coef.	P > z	Coef.	P > z	Coef.	P > z
LDEP	.3584321**	.045	.2843215**	.049	.3258432**	.017
Independent Variable: Sukuk Development						
SKD	.1621585***	.000	.0956538	.161	-.114321**	.045
Independent Variable: Macroeconomic Indicators						
GROWTH	.0384342***	.004	.0235891**	.037	.0584632	.253
INF	.0084321	.692	-.0158432	.311	.0284321	.724
M2	-.0000158*	.075	-.0000125*	.078	-.0000321*	.082
FER	-.0052584	.082	-.0042158	.077	-.0084321	.082
Control Variable						
CAR	-.0042584	.835	.0358436***	.007	-.0025843	.742
LLR	-.0324332	.651	-.012521***	.008	.153743	.146
ME	-.0358432**	.012	-.0284321***	.000	-.0432158***	.000
LIQUID	.01458212	.200	-.0001128	.448	.0021586	.355
SIZE	.1324776	.229	.1053698	.089	-.1017012	.531
RWATA	-.0525892	.710	.0421543	.087	.2516843	.817
LERNER	-.0925843	.538	-.0084321**	.045	.1025843	.990
AR2	.255		.882		.374	
HANSEN	.204		.831		1.00	

The table illustrates the regression estimation findings for 6 Islamic and 15 conventional banks before the 2020 crisis. We use ROA as the dependent variable in this analysis. LDEP represents the lag of the dependent variable. The independent variable is defined in Table 1. This study employs a two-step approach to GMM to calculate robust standard errors. The estimated coefficient is displayed next to the p-value. In that order, the symbols *, **, and *** have significance levels of 1%, 5%, and 10%.

Other control variables in Table 4 either retain the coefficient's sign (as in Table 2) or become statistically insignificant, with a few exceptions. The credit risk variable has a negative impact on ROA for the conventional bank subsample. Furthermore, the management efficiency variable has a negative impact on the entire sample and both subsamples, demonstrating that excellent management can increase revenues while lowering

overall expenses. Kasman et al. (2010). Finally, the GDP growth coefficient (GROWTH) became positive and significant for the entire sample and a subsample of conventional banks. Thus, Indonesia's greater GDP growth rate (GROWTH) boosts bank profitability.

The robustness check for the post-crisis period, using ROA as an alternative performance measure, confirms the main findings from the NIM/NPM estimations. Sukuk development (SKD) continues to have a negative effect on the profitability of Islamic banks, while its effect on conventional banks remains statistically insignificant. The interaction term (CRISIS*SKD) is positive and significant for Islamic banks, indicating that the NEGATIVE impact of sukuk issuance on profitability has moderated after the crisis. However, it has not been eliminated. GDP growth (GROWTH) retains a positive and significant coefficient for the full sample and conventional banks. At the same time, management efficiency (ME) shows a consistent negative and highly significant effect across most models. The signs of other control variables remain broadly consistent with the NIM/NPM results, with only minor shifts in statistical significance. Overall, the robustness results suggest that the choice of profitability measure does not materially change the study's conclusions, reinforcing the structural differences between Islamic and conventional banks in their post-crisis responses to sukuk market developments.

Table 5. GMM Estimation Using ROA as the Dependent Variable After the 2020 Economic Recession

	Full Sample		Conventional Banks		Islamic Banks	
	Coef.	P > z	Coef.	P > z	Coef.	P > z
LDEP	.1843215**	.037	.2584321*	.077	.2584321**	.048
Independent Variable: Sukuk Development						
SKD	-.2791853***	.001	.07891258	.970	-.287984	.012
Independent Variable: Macroeconomic Indicators						
GROWTH	.0423582 ***	.003	.0321581**	.034	.0038432	.370
INF	.0128432	.675	-.0158432	.633	-.0158432	.881
M2	-.0000125*	.078	-.0000185*	.083	-.0158432*	.083
FER	-.0036821	.080	-.0048436	.089	-.0062584	.083
CRISIS*SKD	.1509345**	.063	-.0567326	.834	.2180472	.030
Control Variable						
CAR	-.0258436	.723	.0352275	.145	-.0458432	.799
LLR	-.0123285	.885	-.011258**	.031	.1499238	.110
ME	-.0184321**	.072	-.0258432***	.000	-.0284321***	.000
LIQUID	.0225843**	.038	-.0001258	.643	.0001358	.277
SIZE	.1115345	.384	.0908867	.775	-.0847218	.539
RWATA	-.0703589	.701	.0004843	.875	.0005258	.967
LERNER	-.0584321	.547	-.0725843	.231	-.0875843	.493
AR2	.255		.992		.323	
HANSEN	.5		.992		.999	

The table displays the regression estimation results using the dynamic panel model for a sample of 6 Islamic banks and 15 conventional banks from 2020 to 2023. In this example, the dependent variable is the return on assets (ROA). Table 1 shows the definition of the independent variable. This study employs a two-step approach to GMM to calculate robust standard errors. The p-value is shown next to the estimated coefficient. *, **, and * correspond to 1%, 5%, and 10% significance levels, respectively.

Table 5 verifies the findings in Table 3 regarding the impact of the crisis (CRISIS*SKD). Following the crisis, the NEGATIVE effects of SKD on ROA for Islamic banks decreased, although it did not entirely offset the negative coefficient of SKD. Tables 4 and 5 demonstrate that the data processing results in Tables 2 and 3 are consistent, even when different profitability indicators are employed. It does not matter which performance metrics are chosen.

Discussion

The study shows apparent differences in how sukuk development affected bank performance before the 2020 economic recession. Overall, sukuk growth had a negative impact on profitability, especially for Islamic banks, while the effect on conventional banks was not significant. This supports the substitution effect hypothesis, meaning sukuk competes with Islamic banks for Sharia-compliant investors and borrowers, which reduces their market share and profit margins. The more substantial negative impact on Islamic banks is likely due to their limited product range and heavy reliance on Sharia-compliant financing, making them more vulnerable to sukuk competition.

Before the crisis, supportive regulations and growing investor confidence in sukuk may have intensified this competition. Conventional banks, however, were largely unaffected, indicating that Islamic and conventional markets remain somewhat distinct. Policymakers should help Islamic banks adapt by improving efficiency, diversifying products, and coordinating sukuk development with banking stability.

The study confirms the first hypothesis: sukuk development has a significant impact on bank performance for the full sample and Islamic banks, but not for conventional banks. This supports findings from previous studies (Ledhem, 2022; Mimouni et al., 2019). The negative effect on Islamic banks aligns with the substitution effect (Smaoui et al., 2017), meaning that sukuk competes with Islamic bank products for Sharia-compliant investors and borrowers, thereby reducing their market share and profit margins. The effect is more substantial for Islamic banks because they offer fewer products and benefited less from pre-crisis incentives that boosted sukuk growth (Al-Mekhlafi, 2023; Smaoui & Ghouma, 2020). To respond, Islamic banks should focus on innovation and diversify their funding sources beyond deposits, for example, by offering new Sharia-compliant investment products. Policymakers can also encourage collaboration by allowing banks to act as sukuk arrangers or underwriters, turning competition into a partnership.

For GDP growth (GROWTH), results using NIM show no significant effect for any group, consistent with Ledhem (2022). However, using ROA, GDP growth has a positive and significant effect for the full sample and conventional banks, but not for Islamic banks. This means that economic growth improves overall profitability, mainly through non-lending activities—such as fees, investments, and market gains—which are stronger in conventional banks (Al-Harbi, 2019; Davis et al., 2024; Le & Ngo, 2020; Saklain & Williams, 2024; Trihardianto & Hartanti, 2022). Islamic banks, with their

limited income diversification, benefit less. Before the crisis, this pattern shows that growth raised asset returns but did not significantly increase lending margins, especially under conditions of tight competition or interest rate controls (Azad et al., 2023; Haddou & Boughrara, 2025; Paltrinieri et al., 2021; Šeho et al., 2024). Policymakers should help conventional banks expand their non-interest income, while Islamic banks should develop growth-linked Sharia-compliant financing to capture the benefits of economic expansion more effectively.

Inflation (INF) has a positive impact on bank performance for all samples and both types of banks, as indicated by the NIM/NPM and ROA results. This supports the inflation pass-through effect, where banks raise lending rates faster than deposit rates during periods of inflation, thereby widening their profit margins and protecting returns (Montes & Monteiro, 2014). It also reflects the cost channel of monetary policy, as higher inflation expectations lead banks to price loans more aggressively (Silalahi & Falianty, 2023; Sobol et al., 2023). Although the overall effect is positive, differences across models show that not all banks adjust equally well. In response, banks should employ flexible pricing strategies to maintain profits during periods of inflation, while regulators must ensure fair pricing that protects borrowers and maintains financial stability.

In contrast, the money supply (M2) exhibits a negative relationship with NIM, indicating that as liquidity in the financial system increases, competition rises, lending rates fall, and profit margins narrow. This aligns with the loanable funds theory (Tsiang, 1989), which states that a larger supply of funds lowers lending rates and reduces profitability (Hsieh et al., 2024). Thus, while more liquidity can boost lending, it can also erode margins if not managed effectively. Policymakers should strike a balance between liquidity support and measures to prevent excessive margin compression, such as targeted interventions or macroprudential policies that maintain healthy lending conditions.

The exchange rate (FER) shows no significant effect on banking performance across all samples in the pre-crisis period. This absence of impact likely reflects the limited foreign currency exposure within the banks' balance sheets, which reduces their sensitivity to exchange rate fluctuations. Nevertheless, maintaining robust foreign exchange risk management frameworks remains essential, as greater market openness or external shocks could increase vulnerability to currency volatility in the future (Mamonov et al., 2024; Sikarwar, 2018).

Bank-specific variables show consistent patterns. The negative and significant coefficient of the capital adequacy ratio (CAR) supports Brock & Franken's (2019) view that higher capital buffers lead to safer, but less profitable, asset allocation. The negative SIZE effect is consistent with the "quiet life" hypothesis (Corbae & D'Erasmus, 2021; Färe et al., 2015; Igan et al., 2021; Berger & Humphrey, 1997; Altunbas et al., 2017; Regehr & Sengupta, 2016), suggesting that larger banks may prioritize stability over profit maximization. The Lerner Index, while negative, is insignificant for the overall sample.

From a policy perspective, these pre-crisis findings suggest that Islamic banks need to strengthen product diversification, develop competitive Sharia-compliant investment alternatives, and leverage sukuk issuance as part of their funding strategy to mitigate competitive displacement. Regulators may consider aligning sukuk and Islamic banking product regulations to promote complementarity rather than substitution. Moreover, macroprudential policies should account for the asymmetric effects of inflation and liquidity expansion on bank profitability, ensuring that both monetary stability and sectoral competitiveness are preserved.

Before the crisis, sukuk issuance created intense competition for Islamic banks, reducing their profitability, while conventional banks were unaffected. This shows that in dual-banking systems, the growth of Sharia-compliant market instruments can have uneven impacts, especially when Islamic banks have limited product diversity and operate in niche markets.

Following the crisis, the relationship between sukuk and bank performance changed. Sukuk still had a negative effect on Islamic bank profits, but the impact became smaller. In some cases, the interaction between the crisis and sukuk (CRISIS*SKD) even turned positive and significant. This shift reflects post-crisis reforms, improved product diversification, and Islamic banks' strategic use of sukuk for funding purposes. As sukuk evolved from a competitor into a complementary financing tool, the pressure on Islamic banks' margins eased, creating a more balanced market. From a policy perspective, regulators should align the development of the sukuk market with Islamic banking strategies to enhance financial stability. Meanwhile, Islamic banks should utilize sukuk to effectively manage capital and liquidity, while maintaining their core lending activities.

The post-crisis results show that the negative impact of sukuk issuance on Islamic banks' profitability has weakened compared to the pre-crisis period. A likely explanation is that the banking system underwent significant reforms and innovations after the crisis, making it more competitive and aggressive in capturing market share (Mennawi & Ahmed, 2020; Ariss, 2010; Beck et al., 2019; Claessens & Laeven, 2014). Furthermore, in recent years, banks have increasingly issued sukuk to strengthen their capital base, support expansion, and maintain adequate capital ratios (Alandejani, 2022; Maulayati & Iswati, 2023). This shift suggests that sukuk, which previously acted mainly as a competitor to Islamic bank products, has become part of their strategic funding mix, turning a former source of market share erosion into a complementary instrument for capital management and liquidity planning (Ledhem, 2022; Mimouni et al., 2019; Smaoui & Ghouma, 2020). Well-functioning sukuk markets can also help Islamic banks extend liability maturities and diversify funding sources (Al-Mekhlafi, 2023; Alandejani, 2022; Eğri & Orhan, 2020; Maulayati & Iswati, 2023). Following the crisis, sukuk development continues to have a negative but more negligible impact on the profitability of Islamic banks compared to the pre-crisis period. In some cases, the crisis interaction term becomes positive. This suggests that Islamic banks have adapted by integrating sukuk into their capital-raising and liquidity strategies, thereby shifting the relationship from one of pure substitution to one

of partial complementarity (Ben Jedidia & Guerbouj, 2021; Igan et al., 2021; Khanfar & Khanfar, 2023; Ledhem, 2022; Mimouni et al., 2019). The implication is that Islamic banks should continue to leverage sukuk as part of their long-term funding mix, while diversifying income streams beyond traditional intermediation to reduce vulnerability to margin pressure. Regulators, in turn, should ensure that the growth of the sukuk market is harmonized with Islamic banking regulations to prevent destabilizing competition and enhance systemic resilience.

GDP growth from 2020 to 2023 exhibits a positive relationship with ROA for the full sample and conventional banks, but not for Islamic banks. This result suggests that post-crisis economic expansion supports profitability mainly through non-interest income channels—such as fee-based services and investment returns—that are more developed in conventional banks. Islamic banks' muted response may stem from limited diversification into these revenue streams. Strengthening Islamic banks' capacity to capture economic growth benefits requires expanding into trade finance, Sharia-compliant investment products, and market-based income sources. At the same time, policymakers can incentivize product innovation and facilitate broader market access.

During the 2020–2023 period, inflation (INF) retained a positive relationship with NIM. When inflation rises, banks generally increase lending rates more quickly than deposit rates, widening the net interest margin (Silalahi & Falianty, 2023). From an inflation pass-through perspective, this reflects the ability of banks to protect real returns in a high-inflation environment, particularly when a significant portion of the loan portfolio uses floating interest rates (Varela et al., 2020). Inflation may also increase credit demand as firms and households require more funds to finance costlier activities, allowing banks to charge higher interest rates on loans (Mishchenko et al., 2021). Inflation maintains a positive relationship with NIM during the post-crisis period, consistent with the inflation pass-through mechanism, where banks adjust lending rates more quickly than deposit rates, thereby widening their net interest margin. This enables banks to protect real returns in an inflationary environment, particularly when a significant portion of the loan portfolio features floating interest rates. While moderate inflation can be beneficial, persistent inflation poses credit risk if borrowers' repayment capacity weakens (Hao et al., 2023; Lestari et al., 2021; Mundra & Bicchal, 2023). Therefore, both Islamic and conventional banks need to strengthen credit risk management during inflationary periods, and regulators should maintain macroprudential measures to ensure that rising non-performing loans do not offset temporary margin gains.

The money supply (M2) shows a negative effect on NIM, suggesting that greater liquidity in the financial system intensifies competition, compresses lending rates, and reduces margins. This is consistent with the loanable funds framework (Tsiang, 1989), where an outward shift in the supply of funds lowers equilibrium lending rates; in a competitive market, this can erode profitability even in the absence of credit risk shocks (Hsieh et al., 2024; Tsiang, 1989). Increased liquidity may also encourage banks to alter

their asset composition, potentially lowering the average return on assets (Hong et al., 2021). Post-crisis liquidity injections have stabilized markets, but can erode profitability if not accompanied by adequate loan demand and risk-adjusted pricing strategies (Ashraf, 2021; Kreamer, 2022). Monetary authorities should strike a balance between liquidity provision and measures to maintain healthy loan margins. At the same time, banks need to adjust asset-liability management and target niche markets or specialized financing to optimize returns in high-liquidity environments.

Exchange rate movements remain statistically insignificant for banking performance post-crisis, possibly reflecting effective hedging strategies, limited foreign currency exposure, or relative stability in exchange rates. Despite the lack of direct impact in the sample period, banks should maintain prudent FX risk management to prepare for potential volatility from global shocks, supported by regulatory frameworks that enhance transparency and access to hedging tools (Ho & Saunders, 1981; Selmi et al., 2023).

Bank-specific factors remain influential. The negative relationship between the capital adequacy ratio (CAR) and profitability suggests that higher capital buffers often result in safer but less profitable asset allocations. Larger banks, consistent with the “quiet life” hypothesis, may prioritize stability over aggressive profit-seeking. The Lerner Index remains negative but insignificant, suggesting no firm evidence of market power effects on margins. Optimizing capital deployment while sustaining prudent risk management will be key for banks in the post-crisis period, and competition-enhancing policies from regulators can promote efficiency without compromising financial stability (Corbae & D’Erasmo, 2021; Färe et al., 2015; Igan et al., 2021; Berger & Humphrey, 1997; Altunbas et al., 2017; Regehr & Sengupta, 2016).

In the context of the financial fragility theory, Islamic banking has demonstrated resilience in crisis conditions, despite facing competition from sukuk. The moderation of sukuk’s negative impact post-crisis indicates adaptive capacity, where Islamic banks have not only absorbed competitive pressures but also leveraged sukuk markets to enhance funding stability (Ahmed & Elsayed, 2019; Aman et al., 2021; Bahloul & Mathlouthi, 2022). However, this resilience does not eliminate macroeconomic vulnerabilities: high inflation can temporarily boost nominal returns, while persistent money supply expansion may undermine margins and increase exposure to external shocks (Cafferata et al., 2023; Cardona-Montoya et al., 2022).

From a policy perspective, the post-crisis experience suggests that regulators and bank management should treat sukuk markets not solely as competitors but as integrated components of the Islamic financial ecosystem. Policy coordination between sukuk issuance frameworks and Islamic banking regulations could strengthen system-wide stability. Moreover, monetary authorities need to balance inflation control with liquidity management, ensuring that profitability gains from inflation do not come at the cost of long-term margin compression from excess liquidity. Islamic institutions should exercise caution when managing sukuk issuance, as it can harm their market share and profitability. Improving operational efficiency and diversifying financial products are

critical strategies for mitigating this effect. Both Islamic and conventional banks must closely monitor inflation, given its impact on banking performance and net interest margins (NIM). To maintain system stability, policymakers and financial institutions should prioritize managing inflation and money supply. Conventional banks should focus on growth-oriented strategies to increase their return on assets (ROA), while both banking sectors should adapt their products to meet evolving market demands. Future research should examine in greater detail how macroeconomic factors such as inflation, money supply, and exchange rates interact with sukuk issuance to influence the stability of Islamic and conventional banks, as well as how external shocks—such as pandemics or geopolitical events—differentially affect these institutions, with emphasis on the role of sukuk and other Sharia-compliant products in crisis management.

CONCLUSION

This study examined whether sukuk market development acts as a substitute or a complement to bank performance in Indonesia's dual banking system, and whether this relationship reflects resilience or vulnerability to macroeconomic shocks. The results show that, prior to the 2020 global recession, the development of the sukuk market significantly reduced the profitability of Islamic banks—measured by NIM/NPM and ROA—while having no significant impact on conventional banks. This study confirms a substitution effect and indicates a state of vulnerability for Islamic banks, as limited product diversification and high dependence on Sharia-compliant financing left them more exposed to competitive pressure from sukuk.

During the post-crisis period, the negative impact on Islamic bank profitability weakened, indicating a shift toward partial complementarity. This change reflects greater resilience, as Islamic banks adapted through product diversification, regulatory reforms, and the strategic use of sukuk for funding and liquidity management. Even so, resilience remains incomplete: macroeconomic pressures persist, with inflation consistently widening margins for both bank types, while money supply growth compresses margins, GDP growth benefits only conventional banks, and exchange rates exert no significant influence.

Overall, the findings indicate that sukuk can evolve from a source of vulnerability into a contributor to resilience in Indonesia's dual banking system. In summary, sukuk acted as a source of vulnerability for Islamic banks prior to the crisis, but evolved into a partial source of resilience in the post-crisis period—its stabilizing role, however, depends on strategic integration with banking operations and supportive regulatory alignment.

REFERENCES

- Ahmed, H., & Elsayed, A. H. (2019). Are Islamic and conventional Capital Markets Decoupled? Evidence from Stock and Bonds/Sukuk Markets in Malaysia. *The Quarterly Review of Economics and Finance*, 74, 56–66. <https://doi.org/10.1016/j.qref.2018.04.005>.

- Ahmed Mennawi, A. N., & Ahmed, A. A. (2020). Influential Factors on Profitability of Islamic Banks: Evidence from Sudan. *International Journal of Economics and Finance*, 12(6), 1-10. <https://doi.org/10.5539/ijef.v12n6p1>.
- Al-Harbi, A. (2019). The Determinants of Conventional Banks' Profitability in Developing and Underdeveloped OIC Countries. *Journal of Economics, Finance and Administrative Science*, 24(47), 4–28. <https://doi.org/10.1108/JEFAS-05-2018-0043>.
- Al-Mekhlafi, M. A. (2023). Sukuk Investment in Islamic Banks: Risk and Solutions. In. Hamdan, A., Shoaib, H. M., Alareeni, B., & Hamdan, R. (Eds.), *The Implementation of Smart Technologies for Business Success and Sustainability: During COVID-19 Crises in Developing Countries* (pp. 311–323). Berlin: Springer International Publishing.
- Alandejani, M. (2022). Does Issuing Islamic Bonds through Banks Increase Banking Efficiency? *Heliyon*, 8(8), e10041. <https://doi.org/10.1016/j.heliyon.2022.e10041>.
- Alshater, M. M., Hassan, M. K., Khan, A., & Saba, I. (2021). Influential and Intellectual Structure of Islamic Finance: A Bibliometric Review. *International Journal of Islamic and Middle Eastern Finance and Management*, 14(2), 339–365. <https://doi.org/10.1108/IMEFM-08-2020-0419>.
- Aman, A., Naim, A. M., Isa, M. Y., & Ali, S. E. A. (2021). Factors Affecting Sukuk Market Development: Empirical Evidence from Sukuk-Issuing Economies. *International Journal of Islamic and Middle Eastern Finance and Management*, 15(5), 884–902. <https://doi.org/10.1108/IMEFM-03-2020-0105>.
- Arellano, M., & Bond, S. (1991). Some Test of Specification for Data Panel: Monte Carlo Evidence and an Application of Employment Equations. *The Review of Economic Studies*, 58(2), 277–297. <https://doi.org/10.2307/2297968>.
- Arellano, M., & Bover, O. (1995). Another Look at the Instrumental Variable Estimation of Error-Components Models. *Journal of Econometrics*, 68(1), 29–51.
- Ariyana, F. R., Arundina, T., & Kasri, R. A. (2020). Sukuk Market Liquidity Determinants: A Case Study on Sovereign Sukuk in Indonesia. *Institutions and Economies*, 12(3), 65–89.
- Arize, A., Kalu, E. U., & Nkwor, N. N. (2018). Banks versus Markets: Do They Compete, Complement, or Co-Evolve in the Nigerian Financial System? An ARDL Approach. *Research in International Business and Finance*, 45, 427–434.
- Ashraf, M. A. (2021). Overcoming the Economic Crisis due to a Pandemic through Islamic Finance. *Journal of Islamic Economics Lariba*, 7, 77–91.
- Astrauskaite, I., & Paškevičius, A. (2014). Competition between Banks and Bond Markets: Hardly Impacted or Softly Complemented. *Procedia Economics and Finance*, 9, 111–119. [https://doi.org/10.1016/S2212-5671\(14\)00012-4](https://doi.org/10.1016/S2212-5671(14)00012-4).
- Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bank-Specific, Industry-Specific and Macroeconomic Determinants of Bank Profitability. *Journal of International Financial Markets, Institutions and Money*, 18(2), 121–136.

- Azad, A. S. M. S., Azmat, S., & Hayat, A. (2023). What Determines the Profitability of Islamic Banks: Lending or Fee? *International Review of Economics & Finance*, 86, 882–896.
- Azmat, S., Skully, M., & Brown, K. (2015). Can Islamic Banking Ever Become Islamic? *Pacific Basin Finance Journal*, 34, 253–272.
- Badawi, A., Nugroho, L., & Hidayah, N. (2019). The Contribution of Sukuk Placement and Securities to The Islamic Bank Profitability (Bank Mandiri Syariah Case). *Tazkia Islamic Finance and Business Review*, 13(2), 175–192.
- Bahloul, S., & Mathlouthi, F. (2022). Do Şukūk and Islamic Indexes Act as a Safe Refuge to Conventional Stock Markets? Evidence from the Markov-Switching CAPM Approach. *Islamic Economic Studies*, 30(1), 64–83. <https://doi.org/10.1108/ies-01-2022-0003>.
- Balke, N. S., Zeng, Z., & Zhang, R. (2021). Identifying Credit Demand, Financial Intermediation, and Supply of Funds Shocks: A Structural VAR Approach. *North American Journal of Economics and Finance*, 56, 101375.
- Belanès, A., Ftiti, Z., & Regaïeg, R. (2015). What Can We Learn About Islamic Banks Efficiency Under the Subprime Crisis? Evidence from GCC Region. *Pacific Basin Finance Journal*, 33, 81–92. <https://doi.org/10.1016/j.pacfn.2015.02.012>.
- Ben Jedidia, K., & Guerbouj, K. (2021). Effects of Zakat on the Economic Growth in Selected Islamic Countries: Empirical Evidence. *International Journal of Development Issues*, 20(1), 126–142. <https://doi.org/10.1108/IJDI-05-2020-0100>.
- Berger, A. N., & Boot, A. W. A. (2024). Financial Intermediation Services and Competition Analysis: A Review and Paths Forward for Improvement. *Journal of Financial Intermediation*, 57, 101072. <https://doi.org/10.1016/j.jfi.2024.101072>.
- Bialowolski, P., Weziak, D., & Eileen, B. (2021). The Role of Financial Fragility and Financial Control for Well-Being. *Social Indicators Research*, 155, 1137–1157. <https://doi.org/10.1007/s11205-021-02627-5>.
- Blundell, R., & Bond, S. (2023). Reprint of: Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 234, 38–55.
- Bodá, M., & Zimková, E. (2021). Overcoming the Loan-to-Deposit Ratio by a Financial Intermediation Measure — A Perspective Instrument of Financial Stability Policy. *Journal of Policy Modeling*, 43(5), 1051–1069.
- Cafferata, A., Casellina, S., Landini, S., & Uberti, M. (2023). Financial Fragility and Credit Risk: A Simulation Model. *Communications in Nonlinear Science and Numerical Simulation*, 116, 106879. <https://doi.org/10.1016/j.cnsns.2022.106879>.
- Cao, Y., & Chou, J. Y. (2022). Bank Resilience over the COVID-19 Crisis: The Role of Regulatory Capital. *Finance Research Letters*, 48, 102891. <https://doi.org/10.1016/j.frl.2022.102891>.
- Cardona-Montoya, R. A., Cruz, V., & Mongrut, S. A. (2022). Financial Fragility and Financial Stress During The COVID-19 Crisis: Evidence From Colombian

- Households. *Journal of Economics, Finance and Administrative Science*, 27(54), 376–393. <https://doi.org/10.1108/JEFAS-01-2022-0005>.
- Chen, I.-J., Tsai, H., Chen, Y.-S., Lin, W. C., & Li, T.-Y. (2025). Bank Performance and Liquidity Management. *Review of Quantitative Finance and Accounting*, 64(4), 1453–1490.
- Chhatwani, M., & Mishra, S. K. (2021). Financial Fragility and Financial Optimism Linkage during COVID-19: Does Financial Literacy Matter? *Journal of Behavioral and Experimental Economics*, 94, 101751. <https://doi.org/10.1016/j.socec.2021.101751>.
- Čihák, M., & Hesse, H. (2010). Islamic Banks and Financial Stability: An Empirical Analysis. *Journal of Financial Services Research*, 38, 95–113.
- Conesa, M., Lotti, G., & Powell, A. (2020). Resilience and Fragility in Global Banking: Impacts on Emerging Economies. *Banco Interamericano de Desarrollo*.
- Corbae, D., & D’Erasmus, P. (2021). Capital Buffers in a Quantitative Model of Banking Industry Dynamics. *Econometrica*, 89(6), 2975–3023.
- Davis, E. P., Karim, D., & Noel, D. (2024). Noninterest Income, Macroprudential Policy and Bank Performance. *Economics and Finance Working Paper Series No. 2415*. Brunel University London.
- Demirguc-Kunt, A., & Huizinga, H. (2001). *Financial Structure and Bank Profitability, in Financial Structure and Economic Growth: A Cross-country Comparison of Banks, Markets, and Development*. Cambridge: MIT Press.
- Dickie, P., & Fan, E. X. (2013). Banks and Corporate Debt Market Development. *Working Paper Series Vol. 1, No. 1*. Victoria University of Wellington.
- Eğri, T., & Orhan, Z. H. (2020). *Islamic Monetary Economics: Finance and Banking in Contemporary Muslim Economies*. London: Routledge.
- Eichengreen, B., & Luengnaruemitchai, P. (2004). Why Doesn’t Asia Have Bigger Bond Markets? 10576; *NBER Working Paper No. 10576*.
- El-Shagi, M., & Turcu, C. (2021). Monetary, Financial, and Fiscal Fragility in the 2020s. *Journal of International Money and Finance*, 117, 102439.
- Emec, A. S., Kaplan, F., & Yalcinkaya, O. (2024). Does Islamic Finance Development Support Economic Growth? (A New Overlook). *Iranian Economic Review*, 28(3), 815–840. <https://doi.org/10.22059/ier.2024.347404.1007519>.
- Färe, R., Grosskopf, S., Maudos, J., & Tortosa-ausina, E. (2015). Revisiting the Quiet Life Hypothesis in Banking Using Nonparametric Techniques. *Journal of Business Economics and Management*, 16(1), 159–187. <https://doi.org/10.3846/16111699.2012.726929>.
- Fielding, D., & Rewilak, J. (2015). Credit Booms, Financial Fragility, and Banking Crises. *Economics Letters*, 136, 233–236. <https://doi.org/10.1016/j.econlet.2015.09.041>.
- Ghossoub, E. A. (2012). Financial Market Participation, Financial Intermediation, and Monetary Policy. *Economics Letters*, 117(1), 127–130. h

- Gu, J. (2021). Financial Intermediation and Occupational Choice. *Journal of Economic Dynamics and Control*, 133, 104238. <https://doi.org/10.1016/j.jedc.2021.104238>.
- Haddou, S., & Boughrara, A. (2025). How Diversification Shapes Full-fledged Islamic Bank Stability? A Causal Inference Approach. *International Review of Economics and Finance*, 102, 104367. <https://doi.org/10.1016/j.iref.2025.104367>.
- Hao, N. Q., Phung, H. Q., & Pham, H. T. M. (2023). Determinants of Net Interest Margin in Commercial Banks in Viet Nam. *Journal of Advanced Engineering and Computation*, 7(2), 116-130. <https://doi.org/10.55579/jaec.202372.408>.
- Hashem, S. Q., & Abdeljawad, I. (2018). Islamic Banks' Resilience to Systemic Risks: Myth or Reality-Evidence from Bangladesh. *International Finance Review*, 19(1), 37–68.
- Hassan, M. K., Paltrinieri, A., Dreassi, A., Miani, S., & Scip, A. (2017). The Determinants of Co-Movement Dynamics Between Sukuk and Conventional Bonds. *The Quarterly Review of Economics and Finance*, 68, 73–84. <https://doi.org/10.1016/j.qref.2017.09.003>.
- Ho, T. S. Y., & Saunders, A. (1981). The Determinants of Bank Interest Margins: Theory and Empirical Evidence. *The Journal of Financial and Quantitative Analysis*, 16(4), 581–600. <https://doi.org/10.2307/2330377>.
- Hoffmann, M., Maslov, E., Sørensen, B. E., & Stewen, I. (2018). Are Banking and Capital Markets Union Complements? Evidence from Channels of Risk Sharing in the Eurozone. *CEPR Discussion Papers*, 13254.
- Hong, H., Bian, Z., & Lee, C. C. (2021). COVID-19 and Instability of Stock Market Performance: Evidence from the U.S. *Financial Innovation*, 7(1), 1–18.
- Hsieh, M.-F., Lee, C.-C., & Lin, Y.-C. (2024). How Does Competition Influence Liquidity Creation? Exploring Credit Risk, Foreign Banks, and Crisis. *International Review of Economics & Finance*, 93, 419–441. <https://doi.org/10.1016/j.iref.2024.03.037>.
- Ibrahim, M. H. (2015). Issues in Islamic Banking and Finance: Islamic Banks, Shari'ah-Compliant Investment and Sukuk. *Pacific Basin Finance Journal*, 34, 185–191. <https://doi.org/10.1016/j.pacfin.2015.06.002>.
- Igan, D. O., Pierri, N., & Presbitero, A. F. (2021). When They Go Low, We Go High? Measuring Bank Market Power in a Low-for-Long Environment. *IMF Working Paper No. 21/149*.
- Kasman, A., Tunc, G., Vardar, G., & Okan, B. (2010). Consolidation and Commercial Bank Net Interest Margins: Evidence From the Old and New European Union Members and Candidate Countries. *Economic Modelling*, 27(3), 648–655. <https://doi.org/10.1016/j.econmod.2010.01.004>.
- Kenourgios, D., Naifar, N., & Dimitriou, D. (2016). Islamic Financial Markets and Global Crises: Contagion or Decoupling? *Economic Modelling*, 57, 36–46. <https://doi.org/10.1016/j.econmod.2016.04.014>.
- Khan, M. S., Scheule, H., & Wu, E. (2017). Funding Liquidity and Bank Risk Taking. *Journal of Banking & Finance*, 82, 203–216. <https://doi.org/10.1016/j.jbankfin.2016.09.005>.

- Khanfar, I. A. A., & Khanfar, N. A. A. (2023). Islamic Sukuk and Its Role in Economic Recovery and Growth Post-COVID. In A. Hamdan, H. M. Shoaib, B. Alareeni, & R. Hamdan (Eds.), *The Implementation of Smart Technologies for Business Success and Sustainability: During COVID-19 Crises in Developing Countries* (pp. 299–310). Berlin: Springer International Publishing.
- Kreamer, J. (2022). Financial Intermediation and the Supply of Liquidity. *Journal of Financial Stability*, 61, 101024. <https://doi.org/10.1016/j.jfs.2022.101024>.
- Le, T. D., & Ngo, T. (2020). The Determinants of Bank Profitability: A Cross-Country Analysis. *Central Bank Review*, 20(2), 65–73.
- Le, T. D. Q., & Nguyen, D. T. (2020). Capital Structure and Bank Profitability in Vietnam: A Quantile Regression Approach. *Journal of Risk and Financial Management*, 13(8), 1–17. <https://doi.org/10.3390/jrfm13080168>.
- Ledhem, M. A. (2022). The Financial Stability of Islamic Banks and Sukuk Market Development: Is the Effect Complementary or Competitive? *Borsa Istanbul Review*, 22, S79–S91. <https://doi.org/10.1016/j.bir.2022.09.009>,
- Lestari, H. S., Chintia, H., & Akbar, I. C. (2021). Determinants of Net Interest Margin on Conventional Banking: Evidence in Indonesia Stock Exchange. *Jurnal Keuangan Dan Perbankan*, 25(1), 104–116. <https://doi.org/10.26905/jkdp.v25i1.5102>
- Liu, Z., Yin, X., Tu, H., & Zhang, C. (2025). Bank Competition and Resilience to Liquidity Shocks. *International Review of Economics and Finance*, 102, 104210. <https://doi.org/10.1016/j.iref.2025.104210>
- Lo, A. W. (2012). Reading About The Financial Crisis: A Twenty-One-Book Review. *Journal of Economic Literature*, 50(1), 151–178.
- Mahmood, M. A. (2025). Analyzing the Determinants of Bank Profitability: The impact of Size, Growth, Efficiency, and Financial Structure in Iraq. *Iraqi Journal for Administrative Sciences*, 21(84), 29–38. <https://doi.org/10.71207/ijas.v21i84.3220>.
- Mairafi, S. L., Hassan, S., & Mohamed-Arshad, S. B. (2018). Systematic Review of Literature on Effect of Liquidity on Bank. *Academy of Accounting and Financial Studies Journal*, 22(4), 1–7.
- Mamonov, M., Parmeter, C. F., & Prokhorov, A. B. (2024). Bank Cost Efficiency and Credit Market Structure Under a Volatile Exchange Rate. *Journal of Banking and Finance*, 168, 107285. <https://doi.org/10.1016/j.jbankfin.2024.107285>.
- Mertzanis, C. (2017). Financial Intermediation, Development, and Access to Finance in an Islamic Environment. In M. Zulkhibri & A. G. Ismail (Eds.), *Financial Inclusion and Poverty Alleviation: Perspectives from Islamic Institutions and Instruments* (pp. 41–79). Berlin: Springer International Publishing.
- Mimouni, K., Smaoui, H., Temimi, A., & Al-Azzam, M. (2019). The Impact of Sukuk on the Performance of Conventional and Islamic Banks. *Pacific Basin Finance Journal*, 54, 42–54. <https://doi.org/10.1016/j.pacfin.2019.01.007>.

- Mishchenko, V., Naumenkova, S., & Mishchenko, S. (2021). Assessing the Efficiency of the Monetary Transmission Mechanism Channels in Ukraine. *Banks and Bank Systems*, 16(3), 48–62. [https://doi.org/10.21511/bbs.16\(3\).2021.05](https://doi.org/10.21511/bbs.16(3).2021.05).
- Mohamed, H. H., Masih, M., & Bacha, O. I. (2015). Why Do Issuers Issue Sukuk or Conventional Bonds? Evidence From Malaysian Listed Firms Using Partial Adjustment Models. *Pacific Basin Finance Journal*, 34, 233–252. <https://doi.org/10.1016/j.pacfin.2015.02.004>.
- Montes, G. C., & Monteiro, G. G. do V. (2014). Monetary Policy, Prudential Regulation, and Investment. *Journal of Economic Studies*, 41(6), 881–906. <https://doi.org/10.1108/JES-12-2012-0173>.
- Mseddi, S. (2023). International Issuance of Sukuk and Companies' Systematic Risk: An Empirical Study. *Borsa Istanbul Review*, 23(3), 550–579. <https://doi.org/10.1016/j.bir.2022.12.007>.
- Mundra, S., & Bichal, M. (2023). Asymmetric Effects of Monetary Policy and Financial Accelerator: Evidence from India. *The Journal of Economic Asymmetries*, 27, e00296. <https://doi.org/10.1016/j.jeca.2023.e00296>.
- Muslim, S., Widjaja, G., Nikmah, F., Arifiyanto, M. N., & Amer, M. A. B. (2023). Regulation and Supervision of Islamic Banking in Indonesia: an in-Depth Examination of Recent Developments and Contemporary Trends. *International Journal of Economic Literature (INJOLE)*, 1(3), 446–456.
- Nagano, M. (2016). Who Issues Sukuk And When?: An Analysis of the Determinants of Islamic Bond Issuance. *Review of Financial Economics*, 31, 45–55. <https://doi.org/10.1016/j.rfe.2016.05.002>.
- Nagano, M. (2017). Sukuk Issuance and Information Asymmetry: Why Do Firms Issue Sukuk? *Pacific Basin Finance Journal*, 42, 142–157.
- Naifar, N., Mroua, M., & Bahloul, S. (2017). Do Regional and Global Uncertainty Factors Affect Differently the Conventional Bonds and Sukuk? New Evidence. *Pacific Basin Finance Journal*, 41, 65–74. <https://doi.org/10.1016/j.pacfin.2016.12.004>.
- Noor, I. Y., & Wulandari, P. (2025). Corporate Sukuk vs Bonds in Indonesia's Dual Financial System: 2010–2024. *JIMKES*, 13(4), 2569–2578.
- Olson, D. L., & Wu, D. (2011). Risk Management Models for Supply Chain: A Scenario Analysis of Outsourcing to China. *Supply Chain Management: An International Journal*, 16(6), 401–408. <https://doi.org/10.1108/13598541111171110>.
- Olson, D., & Zoubi, T. (2017). Convergence in Bank Performance for Commercial and Islamic Banks During and After the Global Financial Crisis. *Quarterly Review of Economics and Finance*, 65, 71–87. <https://doi.org/10.1016/j.qref.2016.06.013>.
- Paltrinieri, A., Dreassi, A., Rossi, S., & Khan, A. (2021). Risk-Adjusted Profitability and Stability of Islamic and Conventional Banks: Does Revenue Diversification Matter? *Global Finance Journal*, 50, 100517. <https://doi.org/10.1016/j.gfj.2020.100517>.

- Pawłowska, M. (2016). The Impact of Market Structure And The Business Cycle On Bank Profitability: Does The SCP Paradigm Work? A Case Study In Poland Prior To And During The Financial Crisis. *Proceedings of the IFC Workshop, Bank for International Settlements*.
- Petria, N., Capraru, B., & Ihnatov, I. (2015). Determinants of Banks' Profitability: Evidence from EU 27 Banking Systems. *Procedia Economics and Finance*, 20, 518–524. [https://doi.org/10.1016/S2212-5671\(15\)00104-5](https://doi.org/10.1016/S2212-5671(15)00104-5).
- Rumler, F., & Waschiczek, W. (2016). Have Changes in the Financial Structure Affected Bank Profitability? Evidence for Austria. *The European Journal of Finance*, 22(10), 803–824. <https://doi.org/10.1080/1351847X.2014.984815>.
- Ryan Rahmah Maulayati, & Sri Iswati. (2023). Sukuk Trend Analysis: Bibliometric and Systematic Literature Review from 2011 - 2021. *Jurnal Ekonomi Syariah Teori dan Terapan*, 10(4), 377–390. <https://doi.org/10.20473/vol10iss20234pp377-390>.
- Saad, N. M., Haniff, M. N., & Ali, N. (2016). Firm's Growth and Sustainability: The Role of Institutional Investors in Mitigating the Default Risks of Sukuk and Conventional Bonds. *Procedia Economics and Finance*, 35, 339–348. [https://doi.org/10.1016/s2212-5671\(16\)00042-3](https://doi.org/10.1016/s2212-5671(16)00042-3).
- Saklain, M. S., & Williams, B. (2024). Non-Interest Income and Bank Risk: The Role of Financial Structure. *Pacific-Basin Finance Journal*, 85, 102352. <https://doi.org/10.1016/j.pacfin.2024.102352>
- Saleem, A., Sági, J., & Setiawan, B. (2021). Islamic Financial Depth, Financial Intermediation, and Sustainable Economic Growth: An ARDL Approach. *Economies*, 9(2), 1–22. <https://doi.org/10.3390/economies9020049>.
- Saona, P. (2016). Intra- and Extra-Bank Determinants of Latin American Banks' Profitability. *International Review of Economics and Finance*, 45, 197–214. <https://doi.org/10.1016/j.iref.2016.06.004>.
- Šeho, M., Bacha, O. I., & Smolo, E. (2024). Bank Financing Diversification, Market Structure, and Stability in a Dual-Banking System. *Pacific Basin Finance Journal*, 86, 102461. <https://doi.org/10.1016/j.pacfin.2024.102461>.
- Selmi, R., Wohar, M., Deisting, F., & Kasmaoui, K. (2023). Dynamic Inflation Hedging Performance and Downside Risk: A Comparison Between Islamic and Conventional Stock Indices. *The Quarterly Review of Economics and Finance*, 91, 56–67. <https://doi.org/10.1016/J.QREF.2023.07.006>.
- Shuto, A., Kitagawa, N., & Futaesaku, N. (2017). The Effect of Bank Monitoring on the Demand for Earnings Quality in Bond Contracts. *IMES Discussion Paper Series*, 40(4), 831–858.
- Sikarwar, E. (2018). Exchange Rate Fluctuations and Firm Value: The Impact of the Global Financial Crisis. *Journal of Economic Studies*, 45(6), 1145–1158. <https://doi.org/10.1108/JES-02-2017-0048>.

- Silalahi, P., & Falianty, T. A. (2023). The Risk-Taking Channel and Monetary Transmission Mechanisms in Indonesia. *Jurnal Ekonomi dan Studi Pembangunan*, 15(1), 124-140. <https://doi.org/10.17977/um002v15i12023p124>.
- Smaoui, H., & Ghouma, H. (2020). Sukuk Market Development and Islamic Banks' Capital Ratios. *Research in International Business and Finance*, 51(17), 101064. <https://doi.org/10.1016/j.ribaf.2019.101064>.
- Smaoui, H., Mimouni, K., & Temimi, A. (2017). Sukuk, Banking System, and Financial Markets: Rivals or Complements? *Economics Letters*, 161, 62–65. <https://doi.org/10.1016/j.econlet.2017.09.014>.
- Smaoui, H., & Nechi, S. (2017). Does Sukuk Market Development Spur Economic Growth? *Research in International Business and Finance*, 41, 136–147. <https://doi.org/10.1016/j.ribaf.2017.04.018>.
- Sobol, I., Dopierala, Ł., & Wysiński, P. (2023). Is the Profitability of Islamic and Conventional Banks Driven by The Same Factors?—A Study of Banking in the Middle East. *PLoS ONE*, 18(8), 0289264. <https://doi.org/10.1371/journal.pone.0289264>.
- Taguchi, H., & Bolormaa, G. (2019). The Development Stage of Bond Market in Mongolia among Asian Countries. *Applied Economics and Finance*, 6(6), 54. <https://doi.org/10.11114/aef.v6i6.4568>.
- Thakor, A. V. (2015). The financial crisis of 2007-2009: Why Did It Happen and What Did We Learn? *Review of Corporate Finance Studies*, 4(2), 155–205. <https://doi.org/10.1093/rcfs/cfv001>.
- Tsiang, S. C. (1989). Liquidity Preference and Loanable Funds Theories, Multiplier and Velocity Analyses: A Synthesis. In Kohn, M., & Tsiang, S. C. (Eds.). *Finance Constraints and the Theory of Money*. New York: Academic Press.
- Uluylol, B. (2023). A Comprehensive Empirical and Theoretical Literature Survey of Islamic Bonds (sukuk). *Journal of Sustainable Finance and Investment*, 13(3), 1277–1299. <https://doi.org/10.1080/20430795.2021.1917224>.
- Varela, G. L. F., Gallardo, B., & Bustamante, F. (2020). Macroeconomic Stability and Economic Growth: Myths and Realities. *CEPAL Review*, 2020(131), 109–132. <https://doi.org/10.18356/16840348-2020-131-6>.
- Velliscig, G., Floreani, J., & Polato, M. (2023). Capital and Asset Quality Implications for Bank Resilience and Performance in the Light of NPLs' Regulation: A Focus on the Texas Ratio. *Journal of Banking Regulation*, 24(1), 66–88. <https://doi.org/10.1057/s41261-021-00184-y>.
- Yanikkaya, H., Gümüő, N., & Pabuőcu, Y. U. (2018). How Profitability Differs between Conventional and Islamic Banks: A Dynamic Panel Data Approach. *Pacific Basin Finance Journal*, 48, 99–111. <https://doi.org/10.1016/j.pacfin.2018.01.006>.

Yeremia Krisna Trihardianto, & Nenek Diah Hartanti. (2022). Effect of Fee-Based Income and Inflation Rate on Profitability (ROA) on State-Owned Banks Listed at Indonesia Stock Exchange (IDX) for The 2016 - 2020 Period. *East Asian Journal of Multidisciplinary Research*, 1(3), 425–438. <https://doi.org/10.55927/eajmr.v1i3.95>.