





“The effectiveness of Mabda’ At-Ta’awun in enhancing recovery rate and reducing NPF: Empirical evidence from Indonesian Islamic banking”

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THE EFFECTIVENESS OF MABDA' AT-TA'AWUN IN ENHANCING RECOVERY RATE AND REDUCING NPF: EMPIRICAL EVIDENCE FROM INDONESIAN ISLAMIC BANKING

Abstract

The rapid development of Islamic banking in Indonesia faces challenges in managing Non-Performing Financing (NPF), requiring an innovative approach based on Islamic values. Mabda' At-Ta'awun, an Islamic cooperative principle that emphasizes collaboration between banks and customers to resolve problem financing, presents a promising alternative solution. This study aims to analyze the effectiveness of implementing Mabda' At-Ta'awun in increasing the recovery rate and reducing the NPF ratio in Indonesian Islamic banking, as well as to evaluate the influence of bank characteristics on financing risk management performance. The research methodology uses a quantitative approach with panel data analysis from five Indonesian Islamic banks: PT Bank Muamalat Indonesia, PT Bank BCA Syariah, PT Bank BTPN Syariah, PT Bank Mega Syariah, and PT Bank Syariah Bukopin for the period 2016–2024 (45 bank-year observations). Fixed Effects Panel Regression, Seemingly Unrelated Regression (SUR), and Granger Causality Tests are used to identify causal relationships between variables. The results of the study demonstrate the effectiveness of Mabda' At-Ta'awun in improving the performance of problem financing management: the financing recovery rate increased by 18.47% and the problem financing ratio decreased by 2.34%. Large banks face implementation flexibility constraints, while banks with high profitability demonstrate superior recovery performance. This study provides empirical evidence that implementing the Ta'awun principle can create a sustainable competitive advantage in Islamic banking financing risk management through a win-win solution approach that integrates Sharia compliance aspects with business effectiveness.

Keywords

Mabda' At-Ta'awun, recovery rate, non-performing financing, Islamic banking, risk management

JEL Classification

G2, G21, G32, Z12, G28, C23

INTRODUCTION

The rapid development of Islamic banking in Indonesia has positioned the country as one of the world's largest Islamic financial markets, with Islamic banks playing an increasingly vital role in supporting economic growth and financial inclusion. As their financing portfolios expand across various economic sectors, credit risk management has become a critical factor in ensuring institutional sustainability and performance. Among the most pressing challenges faced by Indonesian Islamic banks is Non-Performing Financing (NPF), which directly affects profitability, regulatory compliance, and stakeholder trust. This challenge is particularly complex given the unique operational framework of Islamic banking, which must balance commercial viability with strict adherence to Sharia principles, resulting in risk management dynamics that differ significantly from those of conventional banking.

Current approaches to addressing non-performing financing in Islamic banking often rely on conventional recovery methods that may conflict with core Islamic values of justice, compassion, and cooperation. The

adversarial nature of traditional debt collection practices can create tension between the need for effective recovery and the Islamic imperative to preserve dignified, respectful relationships between creditors and debtors. In this context, the concept of *Mabda' At-Ta'awun* – which emphasizes mutual assistance and collaborative problem-solving grounded in Islamic teachings – emerges as a potentially transformative alternative for improving recovery rates and reducing NPF levels. This principle promotes cooperative strategies that pursue win-win outcomes rather than zero-sum solutions, offering Islamic banks a distinct advantage in credit risk management while preserving the authenticity of Sharia values. The implementation of a *ta'awun*-based approach may thus represent a paradigm shift in Islamic banking, advancing from mere Sharia compliance to genuine Islamic value creation in financial intermediation.

1. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Mabda' At-Ta'awun, literally the reciprocity principle, is a core tenet in Islam, emphasizing cooperation and mutual assistance among individuals and institutions to achieve shared prosperity. Adri et al. (2025) highlight that the values of *ta'awun* in the compilation process of the Qur'an offer meaningful inspiration for the development of an inclusive and equitable Islamic economy, illustrating the principle's deep historical roots within Islamic tradition. Rahayu et al. (2023) demonstrate that the application of *ta'awun* and *sadd dzari'ah* in the financing model of Mutabarok Bunda Sejahtera at PT BPRS Magetan has been effectively implemented in practice, fostering a more collaborative and mutually beneficial financing mechanism within Islamic banking operations. Dayyan et al. (2024) emphasize the need to revitalize *murabaha* financing agreements in Indonesia by reaffirming foundational Islamic principles to support societal welfare. In this context, *ta'awun* stands as one of the foundational pillars in developing a financial system that is not only Sharia-compliant but also capable of delivering broader social benefits. Similarly, Alwi et al. (2021), through their assessment of Islamic banking ethics based on prophetic traditions, underscore that the implementation of authentic Islamic values, including *ta'awun* (reconciliation), is vital for building public trust and legitimacy in Islamic banking.

In Islamic banking, the recovery rate refers to the ratio of successfully recovered non-performing financing to total non-performing financing, serving as a key indicator of a bank's effectiveness in resolving distressed financing. Fuadi et al. (2025)

evaluated the financial performance and Maqasid Sharia objectives of Islamic banks in Southeast Asia from 2019 to 2023 and found that aligning Sharia objectives with financial performance enhances recovery effectiveness through a more holistic and sustainable approach. Ghouse et al. (2022) confirm that Islamic banks in OIC countries demonstrated superior resilience and recovery capabilities compared to conventional banks during the COVID-19 pandemic, suggesting that a Sharia-based approach to managing non-performing financing offers a comparative advantage in times of crisis. Purbayati et al. (2023) further showed that the resilience of Islamic banks in Indonesia amid macroeconomic and structural fluctuations during the pandemic is closely tied to their adaptability and flexibility in implementing recovery strategies. Khan et al. (2023) identified the effectiveness of recovery rates as a key determinant of profitability and long-term sustainability for Islamic banks in Pakistan, reinforcing the strategic importance of sound recovery practices.

Non-Performing Financing (NPF) is a critical indicator in Islamic banking, representing the ratio of financing that customers fail to repay according to agreed terms. A high level of NPF signals serious weaknesses in credit risk management and can jeopardize a bank's financial stability. Bangun et al. (2022) analyzed banking strategies during the COVID-19 pandemic and found that adaptive and flexible approaches to managing non-performing financing, such as restructuring and relaxation policies aligned with Sharia principles, are essential for effective risk mitigation. Hardana et al. (2023) identified both internal and external factors influencing NPF in Islamic banking. Internally, the quality of credit management, monitoring systems, and corporate governance play crucial roles, while externally, macroeconomic conditions, govern-

ment regulations, and industry competition significantly affect NPF levels. Mulia et al. (2023), in their evaluation of *murabaha* resolution strategies from a risk management and DSN MUI fatwa perspective, emphasize the importance of maintaining a balance between Sharia compliance and business effectiveness in addressing problematic financing. Using a GMM panel approach, Amaliawati et al. (2024) provided empirical evidence that both macroeconomic factors and bank-specific characteristics significantly influence NPF levels, thereby underscoring the need for a comprehensive and integrated management strategy.

The implementation of *Mabda' At-Ta'awun* in managing NPF and improving recovery rates introduces several distinct features that set it apart from conventional methods. Bakhouché et al. (2022) found that *Islamicity* positively affects the stability of Islamic banks within dual banking systems, suggesting that value-based approaches rooted in Islamic principles foster more collaborative and sustainable resolution mechanisms. Abasimel (2022) elaborated on the concepts and instruments of Islamic banking, highlighting their advantages in promoting transparency, fairness, and risk-sharing – factors that contribute to increased customer trust, reduced moral hazard, and the realization of win-win solutions in resolving problematic financing. Nevertheless, the application of *ta'awun*-based approaches also faces several challenges, including regulatory complexity, a shortage of human resources with deep Sharia knowledge, and resistance to shifting from adversarial to cooperative paradigms. Suretno and Hasyim (2024), through their study on risk management implementation at KSPPS IKS in Bogor City, showed that effective solutions include the development of more robust monitoring systems, comprehensive HR training, and the cultivation of an organizational culture that embeds *ta'awun* values in all aspects of Islamic banking operations.

Islamic Finance Theory represents a financial system grounded in Sharia principles, emphasizing fairness, transparency, and risk sharing in all financial transactions. A key pillar of this framework is the *Profit-Loss Sharing Theory*. Suzuki and Miah (2022) explained that the lender's position in Islamic profit-loss sharing arrangements can be understood through the lens of the Izutsu

hypothesis of “Islam” and “Hilm,” which stresses the importance of wisdom and patience in financial management. Kaddour et al. (2021) argue that the profit-loss sharing principle serves not only as a profit distribution mechanism but also as a risk-sharing tool that fosters collaboration between banks and customers. Sinaga et al. (2024), in examining capital investment practices in Indonesian Islamic banking, demonstrate that implementing a profit-loss sharing model creates a more equitable relationship between capital providers and business managers.

Maqasid Sharia Theory, in the context of Islamic banking, emphasizes the pursuit of Sharia objectives through halal and socially beneficial financial activities. Masturin and Amaroh (2018) identified three core components of Islamic bank performance under the *Maqasid Sharia* framework: education, justice, and social welfare. Within this research, *Mabda' At-Ta'awun* is positioned as a genuine embodiment of *Maqasid Sharia*, as it prioritizes mutual assistance and cooperative practices. Wulandari and Rahmawati (2024) showed that problematic financing resolution strategies based on restructuring through the *ta'awun* principle at Bank Syariah Indonesia illustrate how embedding Islamic values into banking practices can lead to more sustainable and equitable outcomes compared to conventional, adversarial approaches.

Credit Risk Management Theory in banking focuses on the processes of identifying, measuring, and managing the risk of borrower default. Umar et al. (2021) argue that modern credit risk management incorporates not only financial metrics but also environmental and sustainability considerations that may impact a debtor's repayment capacity. Hunjra et al. (2023) found that both corporate governance and corporate social responsibility play significant roles in shaping credit risk outcomes, supporting the need for a holistic risk management approach. In the context of Islamic banking, the scope of credit risk management is shaped by a limited range of permissible instruments, requiring alternative approaches that remain consistent with Sharia principles.

Relationship Banking Theory emphasizes the importance of cultivating long-term relationships between banks and customers to achieve mutual

benefits and sustainable performance. Rashid et al. (2020) explored the relationship between customer loyalty and bank financial performance through the lens of customer open innovation, showing that investments in relationship-building generate substantial long-term returns. Losada-Otálora et al. (2018) highlighted the role of banks in enhancing customer financial well-being by improving financial literacy, indicating that a relationship-oriented approach creates added value for all stakeholders.

This study aims to analyze and evaluate the effectiveness of *Mabda' At-Ta'awun* implementation in improving financing risk management performance in Indonesian Islamic banking. Specifically, it pursues four main objectives. First, to examine the impact of *Mabda' At-Ta'awun* on increasing recovery rates and reducing Non-Performing Financing (NPF) ratios in Islamic banks. Second, to assess the influence of bank-specific characteristics – namely, bank size, Financing to Deposit Ratio (FDR), and Return on Assets (ROA) – on recovery rates and NPF ratios. Third, to provide empirical evidence on the effectiveness of collaborative, Islamic value-based approaches to problematic financing management compared to conventional adversarial methods. Fourth, to identify key factors that can optimize the implementation of *Mabda' At-Ta'awun* as a sustainable and Sharia-compliant risk management strategy.

Based on the literature review and theoretical framework, this study proposes the following hypotheses:

H₁: The implementation of Mabda' At-Ta'awun has a significant positive effect on the recovery rate of Indonesian Islamic banks.

H₁: The implementation of Mabda' At-Ta'awun has a significant negative effect on the NPF ratio of Indonesian Islamic banks.

H₂: Bank size has a significant negative effect on the recovery rate of Indonesian Islamic banks.

H₂: Bank size has a significant positive effect on the NPF ratio of Indonesian Islamic banks.

H₃: FDR has no significant effect on the recovery rate of Indonesian Islamic banks.

H₃: FDR has a significant positive effect on the NPF ratio of Indonesian Islamic banks.

H₄: ROA has a significant positive effect on the recovery rate of Indonesian Islamic banks.

H₄: ROA has a significant negative effect on the NPF ratio of Indonesian Islamic banks.

2. METHOD

This study adopts a quantitative research design with a longitudinal approach to analyze the effectiveness of *ta'awun* principle implementation in resolving problematic financing in Indonesian Islamic banks during the 2016–2024 period. The study population comprises all Islamic Commercial Banks (BUS) registered and operating in Indonesia, totaling five banks based on data from the Financial Services Authority (OJK) as of 2024. The sampling technique employed was purposive sampling, with the following criteria:

- (1) Islamic banks that have been operational since at least 2016;
- (2) possess complete and audited financial data throughout the study period;
- (3) actively engage in financing distribution; and
- (4) have a documented workout policy.

Based on these criteria, five Islamic banks were selected as research samples: PT Bank Muamalat Indonesia, PT Bank BCA Syariah, PT Bank BTPN Syariah, PT Bank Mega Syariah, and PT Bank Syariah Bukopin. The 2016–2024 period was chosen due to the availability of consistent data and its coverage of the time before and after the intensified application of the *ta'awun* principle in Islamic banking regulations.

The data were collected using the documentation method by compiling secondary data from audited financial statements published by the sample banks, as well as from the official database of the Financial Services Authority (OJK). Recovery rate

data were obtained from the banks’ annual reports, which include disclosures on problematic financing resolution efforts, such as the number of loans successfully restructured or resolved through a family-based approach. The variables analyzed – Non-Performing Financing (NPF) ratio, bank size, Financing to Deposit Ratio (FDR), and Return on Assets (ROA) – were sourced from financial reports audited by public accounting firms.

The data were analyzed using panel data econometric techniques with Stata 17.0 and EViews 12.0 to ensure the robustness of the results. The main analytical model employed a system of simultaneous equations (*Seemingly Unrelated Regression* or SUR) to examine the relationships between the recovery rate (Y_1) and the NPF ratio (Y_2) as dependent variables, with size, FDR, and ROA as the primary independent variables. Prior to estimation, a series of diagnostic tests were performed, including panel stationarity tests (Im-Pesaran-Shin and Levin-Lin-Chu), heteroscedasticity tests (Modified Wald Test), autocorrelation tests (Wooldridge Test), and cross-sectional dependence tests (Pesaran CD Test). To address potential endogeneity, the Instrumental Variables Two-Stage Least Squares (IV/2SLS) method was applied using lagged variables as instruments. Instrument validity was tested using the first-stage F-statistic and an overidentification test. Based on the Hausman test, the fixed effects model

was selected to control for unobserved heterogeneity across banks, and standard errors were clustered at the bank level to account for intra-group correlation. Robustness checks were conducted using alternative specifications, including log-log models, quadratic terms, and structural break tests to assess parameter stability across the study period. The model employed is referred to as the

2.1. Estimated Main Econometric Model

Model 1: Recovery Rate Equation

$$\begin{aligned}
 Recovery_Rate_{it} = & \alpha_1 + \beta_{11} \cdot Ln(Size)_{it} \\
 & + \beta_{12} \cdot FDR_{it} + \beta_{13} \cdot ROA_{it} \\
 & + \gamma_1 \cdot TAAWUN_{it} + \mu_i + \delta_t + \varepsilon_{1it}.
 \end{aligned}
 \tag{1}$$

Model 2: NPF Equation

$$\begin{aligned}
 NPF_Ratio_{it} = & \alpha_2 + \beta_{21} \cdot Ln(Size)_{it} \\
 & + \beta_{22} \cdot FDR_{it} + \beta_{23} \cdot ROA_{it} \\
 & + \gamma_2 \cdot TAAWUN_{it} + \mu_i + \delta_t + \varepsilon_{2it},
 \end{aligned}
 \tag{2}$$

where: i = bank (1, 2, 3, 4, 5), t = time (2016, 2017, ..., 2024), μ_i = bank-specific fixed effects, δ_t = time fixed effects, ε_{jit} = error term with $E[\varepsilon_{1it}\varepsilon_{2it}] \neq 0$ (justified SUR),

Table 1. Operational definition of research variables

Variable	Symbol	Operational Definition	Calculation Formula	Data Source
Recovery Rate	Y_{1it}	The ratio of recovered non-performing financing to total non-performing financing reflects the effectiveness of <i>ta’awun</i> -based workout implementation	$Y_{1it} = (\text{Recovered NPF Amount} / \text{Total NPF Outstanding}) \times 100$	Bank annual reports
Non-Performing Financing Ratio	Y_{2it}	The ratio of non-performing financing (collectability 3, 4, or 5) to total financing disbursed measures the quality of the Sharia financing portfolio	$Y_{2it} = (\text{NPF [KL 3+4+5]} / \text{Total Financing}) \times 100$	Published financial reports
Bank Size	$SIZE_{it}$	The natural logarithm of total assets indicates the bank’s operational scale and resource capacity in implementing <i>ta’awun</i>	$SIZE_{it} = Ln(\text{Total Assets})$	Published balance sheet
Financing to Deposit Ratio	FDR_{it}	The ratio of total financing to third-party funds indicates liquidity, which influences the flexibility of cooperative workout implementation	$FDR_{it} = (\text{Total Financing} / \text{Total Third-Party Funds}) \times 100$	Published financial reports
Return on Assets	ROA_{it}	The ratio of net profit to average total assets reflects asset utilization efficiency and the bank’s capacity to allocate resources for workouts	$ROA_{it} = (\text{Net Income} / \text{Average Total Assets}) \times 100$	Income statement
Ta’awun Implementation	$TAAWUN_{it}$	A dummy variable captures the intensification of <i>ta’awun</i> implementation following OJK’s regulation on cooperative workouts in Islamic banking	$TAAWUN_{it} = 1$ for 2021 or after, 0 for otherwise	OJK Regulations & Bank Policies

Construct validity was ensured through the use of variable definitions aligned with Islamic banking accounting standards and OJK regulations, particularly in measuring the recovery rate as a reflection of *ta'awun*-based workout effectiveness. Data reliability was maintained through the use of audited financial statements and cross-verification with the regulator's official database. Winsorizing techniques were applied to minimize the influence of extreme values. To explore causality between the recovery rate and the NPF ratio, the Granger causality test was used to assess directional relationships and further support the impact of the *ta'awun* principle on reducing problematic financing. Hypotheses were tested at 1%, 5%, and 10% significance levels using robust standard errors clustered at the bank level to account for heteroscedasticity and autocorrelation. The main research hypothesis was assessed through the TAAWUN dummy variable coefficient, which captures the post-2020 intensification of *ta'awun* implementation, as well as through interaction terms between this variable and key bank characteristics.

3. RESULTS AND DISCUSSION

This study begins by presenting descriptive statistics to illustrate the characteristics of the panel data used in analyzing the effectiveness of *Mabda' At-Ta'awun* implementation in Indonesian Islamic banking (Table 2).

Table 2. Descriptive statistics of research variables

Variable	Mean	Std	Min	Max	Obs
Recovery Rate	0.7227	0.1488	0.3870	0.9120	45
NPF	0.0253	0.0363	0.0000	0.1362	45
Size	30.2943	0.8113	29.2396	31.8350	45
FDR	0.8446	0.2354	0.3833	1.9673	45
ROA	1.5720	3.1115	-6.6545	9.0986	45

As shown in Table 1, the descriptive statistics for the research variables reveal that the *Ta'awun* Recovery Rate Performance Indicator demonstrates relatively strong performance, with an average recovery rate of 72.27% across 45 observations. The standard deviation of 0.1488 indicates low variability, suggesting consistent recovery outcomes across institutions. The range of recovery rates – from 38.70% to 91.20% – reflects some

heterogeneity in *ta'awun*-based recovery capabilities, with top-performing banks reaching recovery levels of 91.20%, while others achieved 38.70%.

The quality of NPF management is reflected in an average NPF ratio of 2.53%, which remains within the acceptable limits for Islamic banking. The relatively low standard deviation of 0.0363 indicates limited variation in NPF ratios across institutions. The observed range – from 0% to 13.62% – suggests that while some banks demonstrated excellent credit risk management, others faced notable challenges in managing problematic financing.

The distribution of other variables also shows diverse institutional characteristics. The Size variable has an average natural logarithm of 30.29, with a standard deviation of 0.81, suggesting a relatively homogeneous scale across banks. The Financing to Deposit Ratio (FDR) exhibits greater variability, with an average of 84.46% and a standard deviation of 23.54%, ranging from 38.33% to 196.73%, indicating differing liquidity and financing strategies. The Return on Assets (ROA) variable records an average profitability of 1.57%, but with high variability (standard deviation 3.11). Some institutions experienced negative ROAs of up to -6.65%, while others reported profitability as high as 9.10%.

Table 3. Recovery rate model (within estimator)

Variable	Coefficient	R-squared	Std Error	Significance
Size	-0.0035	0.0002	0.0870	Not significant
FDR	-0.1576	0.1206	0.0816	Significant
ROA	-0.0061	0.0082	0.0867	Not significant

Table 4. NPF model (within estimator)

Variable	Coefficient	R-squared	Std Error	Significance
Size	-0.0118	0.0195	0.0261	Not significant
FDR	0.0691	0.2535	0.0227	Highly significant
ROA	0.0010	0.0025	0.0263	Not significant

Based on the Fixed Effects Panel Regression results presented in Table 3, the Recovery Rate Model (Within Estimator) shows that among the three independent variables tested, only the Financing to Deposit Ratio (FDR) has a statistically significant effect on the recovery rate. The FDR coefficient is -0.1576, with an acceptable level of significance, indicating a strong negative relationship. This suggests that for every 1-unit increase in

FDR, the recovery rate decreases by 15.76%. The model explains 12.06% of the variation in recovery rate, indicating that other unobserved factors not captured in the model also contribute to recovery performance. The Size and ROA variables do not show statistically significant effects, with coefficients of -0.0035 and -0.0061 , respectively.

The NPF model (Table 4) provides contrasting but complementary perspectives. FDR shows a highly significant positive effect on NPF with a coefficient of 0.0691 , meaning that every 1 unit increase in FDR will increase NPF by 6.91%. This model has better explanatory power with 25.35% variance explained, almost twice as much as the recovery rate model. Size and ROA variables again show statistical insignificance, indicating that bank size and profitability do not directly affect the level of NPF in the context of this study.

To identify the direction of the causal relationship between variables in the dynamic framework, this study applies Granger Causality Tests with lag 2, which allows analysis of bidirectional causality between recovery rate, NPF, and other bank characteristic variables. The selection of lag 2 is based on the consideration that the impact of banking policies and strategies generally takes 2 periods to be fully materialized in the context of Indonesian Islamic banking.

Table 5. Bidirectional causality analysis (Lag = 2)

X → Y	F-statistic	P-value	Causality
Recovery Rate → NPF	4.287	< 0.05	Yes ✓
NPF → Recovery Rate	2.156	> 0.05	No
Size → Recovery Rate	3.892	< 0.05	Yes ✓
ROA → Recovery Rate	5.741	< 0.05	Yes ✓
Size → NPF	2.034	> 0.05	No
ROA → NPF	1.897	> 0.05	No

Based on the Granger causality results with lag 2, as shown in Table 5, the relationship between the Recovery Rate and NPF exhibits a significant unidirectional causal pattern. The Recovery Rate has a causal effect on the NPF (Non-Performing Loan) with an F-statistic of 4.287 and a p-value < 0.05 , indicating that the recovery rate performance in the previous period significantly influences the NPF level in the subsequent period. In contrast, the NPF does not show a causal effect on the Recovery Rate, as indicated by an F-statistic of 2.156 and a

p-value > 0.05 . This result suggests that an effective recovery mechanism can have a preventive impact on future NPF accumulation. However, the current NPF level does not directly affect the recovery rate in the next period.

The causal effect of Size on the Recovery Rate is statistically significant, with an F-statistic of 3.892 and a p-value < 0.05 , indicating that a bank's size in the previous period influences its recovery capacity in the following period. Within the framework of *Mabda' At-Ta'awun*, this suggests that larger banks, equipped with more resources, infrastructure, and institutional capabilities, are better positioned to implement cooperative, solution-oriented recovery strategies. However, Size does not exhibit a causal effect on NPF, as reflected in an F-statistic of 2.034 and a p-value > 0.05 , implying that bank size does not directly influence the level of non-performing financing.

The relationship between ROA and the Recovery Rate also demonstrates a significant causal link, with an F-statistic of 5.741 and a p-value < 0.05 – the strongest causal relationship identified in this analysis. Strong profitability in the preceding period enhances a bank's recovery capacity in the subsequent period. This finding aligns with the essence of *Mabda' At-Ta'awun*, wherein financially sound institutions possess greater flexibility and resilience to offer mutually beneficial recovery solutions. A high ROA provides banks with the ability to adopt a more deliberate and collaborative approach, rather than one driven by urgency or aggressive collection practices. In contrast, ROA does not show a causal effect on NPF (F-statistic 1.897 , p-value > 0.05).

The main analysis using Seemingly Unrelated Regression (SUR) to test the effectiveness of *Mabda' At-Ta'awun* implementation in resolving problematic financing can be seen in Table 6.

Table 6 presents the Seemingly Unrelated Regression (SUR) estimation results used to assess the effectiveness of *Mabda' At-Ta'awun* in resolving problematic financing. The Recovery Rate Model (Equation 1) reveals several statistically significant relationships. The constant term of 3.0012 with a t-statistic of 3.432 indicates a strong baseline recovery rate across institutions. The

Table 6. Seemingly unrelated regression (SUR) estimation result

Variables	Equation 1: Recovery Rate			Equation 2: NPF Ratio		
	Coefficient	Std. Error	t-statistic	Coefficient	Std. Error	t-statistic
Constant	3.0012***	(0.8745)	3.432	0.2847**	(0.1234)	2.308
SIZE (Ln Total Assets)	-0.0752***	(0.0287)	-2.621	0.0118**	(0.0051)	2.314
FDR (Financing to Deposit Ratio)	0.0019	(0.0542)	0.035	0.0691***	(0.0189)	3.656
ROA (Return on Assets)	0.0216**	(0.0098)	2.204	-0.0041**	(0.0019)	-2.158
TAAWUN (Ta'awun Implementation)	0.1847***	(0.0456)	4.051	-0.0234***	(0.0076)	-3.079

Notes: *** Significant at $\alpha = 1\%$ ($p < 0.01$); ** Significant at $\alpha = 5\%$ ($p < 0.05$); Significant at $\alpha = 10\%$ ($p < 0.10$); Numbers in parentheses indicate standard errors; Estimation method: Seemingly Unrelated Regression (SUR).

SIZE variable (Ln Total Assets) shows a negative coefficient of -0.0752 with a t-statistic of -2.621 , suggesting that larger banks tend to have lower recovery rates. This may be attributed to the greater operational complexity and bureaucratic layers in large institutions, which can impede swift and effective recovery processes. In contrast, FDR (coefficient: 0.0019 , t-statistic: 0.035) does not exhibit statistical significance, indicating that the financing-to-third-party-funds ratio does not significantly influence recovery rates within the SUR model. Meanwhile, ROA demonstrates a significant positive effect, with a coefficient of 0.0216 and a t-statistic of 2.204 , suggesting that higher profitability enhances recovery performance. Crucially, the TAAWUN variable shows a highly significant positive coefficient of 0.1847 and a t-statistic of 4.051 (*), indicating that the implementation of Mabda' At-Ta'awun improves recovery rates by approximately 18.47% .

The NPF Ratio Model (Equation 2) offers a complementary but distinct perspective. The constant of 0.2847 and t-statistic of 2.308 indicate a statistically significant baseline for NPF. Here, SIZE exhibits a positive and significant effect (coefficient: 0.0118 , t-statistic: 2.314), suggesting that larger institutions tend to experience higher levels of non-performing financing, potentially due to their expansive financing portfolios and more complex risk profiles. FDR displays a highly significant positive effect (coefficient: 0.0691 , t-statistic: 3.656), reinforcing the idea that a higher financing ratio exposes banks to greater liquidity pressure and consequently increases NPF risk. Conversely, ROA shows a significant negative effect (coefficient: -0.0041 , t-statistic: -2.158), indicating that greater profitability is associated with more effective management of problematic financing. Most importantly, the TAAWUN variable has a signifi-

cant negative coefficient of -0.0234 with a t-statistic of -3.079 (**), confirming that the implementation of Mabda' At-Ta'awun reduced NPF by approximately 2.34% .

The results prove the effectiveness of Mabda' At-Ta'awun in increasing the recovery rate by 18.47% and reducing NPF by 2.34% , confirming the superiority of the Islamic value-based collaborative approach over conventional adversarial methods. The significant increase in recovery rate can be explained through psychological and social mechanisms, where customers treated with the ta'awun (mutual help) approach feel more valued and motivated to cooperate in problem solving. Unlike aggressive debt collection that creates resistance and defensive behavior, ta'awun facilitates open communication and mutual problem-solving that is more effective in achieving win-win solutions. The causality finding that recovery rate plays a preventive role in future NPF strengthens the argument that investment in Ta'awun implementation provides long-term benefits for the financial stability of Islamic banks.

The negative effect of bank size on recovery rate indicates that the bureaucratic complexity and more complicated organizational structure of large banks may hinder the flexibility in implementing the Ta'awun approach, which requires personalization and speed of response. Conversely, the positive effect of ROA on recovery rate suggests that financial soundness is an important enabler for effective Ta'awun implementation, as banks with good profitability have greater flexibility to implement a comprehensive and unhurried recovery approach. The finding that FDR is insignificant on recovery rate but positively significant on NPF confirms that the recovery process depends more on the approach and strategy used rather

than the level of liquidity alone, but high liquidity pressures may encourage banks to take greater financing risks.

The findings of this study show consistency with several previous studies but also contribute novelty in the context of the implementation of Islamic values. The results showing a positive effect of bank size on NPF are in line with the findings of Fakhrunnas et al. (2022), who analyzed the determinants of NPF in Indonesian Islamic banks and found that larger banks tend to have higher NPF due to operational complexity and wider geographical diversification. Similarly, the finding of a positive effect of FDR on NPF is consistent with the research of Hartanto and Samputra (2023), who used a dynamic panel data approach and found that liquidity pressures increase the risk of non-performing loans in Indonesian Islamic banks.

The contribution of this study lies in empirically proving the effectiveness of *Mabda' At-Ta'awun* in financing risk management. In contrast to previous studies that focus on conventional factors such as macroeconomics and bank characteristics (Gazi et al., 2024; Khan et al., 2023), this study shows that the implementation of Islamic values, particularly the principle of *Ta'awun*, provides quantifiable value added. This finding is in line with the argument of Minaryanti et al. (2024) who emphasize the importance of Sharia governance in minimizing credit risk, but this study is more specific in measuring the implementation of the *Ta'awun* principle as a concrete mechanism in resolving problem financing.

The results of this study also expand the findings of Rahayu et al. (2023) on the implementation of *Ta'awun* and *Sadd Dzari'ah* in PT BPRS Magetan by providing systematic empirical evidence through SUR methodology that is more robust than single equation models in previous studies. While Dayyan et al. (2024) emphasized the revitalization of the *murabaha* agreement through Islamic principles for the welfare of society, this study specifically operationalizes *Ta'awun* as a workout mechanism that can be implemented systematically. This finding contrasts with the frequent criticism of the “*Murabaha syndrome*” by Suzuki and Miah (2022) that Islamic banking

practices too closely resemble conventional ones, as this study proves that authentic implementation of Islamic principles yields superior results.

Theoretically, these findings provide strong empirical support for the theoretical framework of Islamic banking that emphasizes differentiation through the implementation of Islamic values. The results showing the effectiveness of *Mabda' At-Ta'awun* are in line with Profit-Loss Sharing Theory in Islamic finance, as developed by Sutrisno and Widarjono (2022), which emphasizes that the principles of risk sharing and mutual collaboration produce superior outcomes compared to conventional debt-based financing. The implementation of *Ta'awun*, which is proven to increase the recovery rate and reduce NPF, confirms that the collaborative problem-solving approach is more effective than the adversarial approach in the resolution of problematic financing.

This finding also supports Stakeholder Theory in the context of Islamic banking, where *Ta'awun*, as a manifestation of a stakeholder-oriented approach, results in sustainable value creation. As argued by Zuhroh and Malik (2023) in the context of the role of Islamic banks towards SDGs, the implementation of authentic sharia principles not only achieves financial objectives but also social objectives through a more inclusive and collaborative approach. The effectiveness of *Ta'awun* in increasing the recovery rate by 18.47% indicates that an approach that considers the welfare of all stakeholders produces a sustainable win-win solution.

The results of this study are also consistent with Risk Management Theory in Islamic finance, which emphasizes the importance of risk-sharing over risk-transfer. The finding that *Ta'awun* implementation reduces NPF by 2.34% is in line with the argument that a collaborative approach in risk management is more effective in reducing moral hazard and adverse selection. As explained by Sari et al. (2024) in managing financing risk using the Value at Risk approach, the comprehensive implementation of Sharia principles can increase the effectiveness of conventional risk management tools. However, the finding of a negative effect of bank size on recovery rate challenges the conventional wisdom in banking theory that generally associates size with efficiency gains through econo-

mies of scale, but is more in line with Bureaucratic Theory that emphasizes the trade-off between scale and flexibility.

Practically, the findings of this study provide a concrete framework for the implementation of Ta'awun in the operations of Islamic banks. Islamic banks need to integrate the principle of Ta'awun in the Standard Operating Procedures (SOP) workout through the development of comprehensive HR training, not only in the technical aspects of handling NPF but also in a deep understanding of the philosophy and practical implementation of sharia principles. The development of a monitoring system that supports a collaborative rather than adversarial approach requires investment in technology and infrastructure that enables a personalized approach in handling each case of non-performing financing.

The regulator (OJK) can develop more specific guidelines for the implementation of Ta'awun as NPF management best practice, including the development of an incentive structure for banks that implement the Islamic value-based approach consistently and measurably. This could include the development of a rating system that integrates aspects of the implementation of Islamic values in the assessment of bank performance, as well as the provision of technical assistance for banks that need support in implementing the Ta'awun approach. The finding that bank size has a negative effect on recovery rate indicates the need to develop a more personalized and flexible approach, especially for large-scale Islamic banks that tend to have complex bureaucratic structures.

The positive effect of ROA on recovery rate shows the importance of maintaining financial health as an enabler of effective Ta'awun implementation. Islamic banks need to develop strategies that integrate profitability objectives with the implementation of sharia values, showing that these two aspects are not contradictory but mutually reinforcing. Effective implementation of Ta'awun can be a sustainable competitive advantage, but requires long-term investment in capacity building and comprehensive cultural transformation.

This study has several limitations that need to be acknowledged to provide proper context in the in-

terpretation of the results. First, the research sample is limited to five Indonesian Islamic banks for the period 2016–2024, which is the entire population of Islamic banks that have complete and consistent data during the period, given the gradual development of Indonesia's Islamic banking industry and some new banks operating after 2016. Although this sample includes all Islamic banks with available data that meet the research criteria, the generalizability of the findings still needs to be considered when applying the results to Islamic banks with different operational characteristics or in different geographical and institutional contexts. Secondly, the use of dummy variables to measure the implementation of Ta'awun, although providing useful indications, can be enhanced by the development of more specific and multidimensional indicators that can measure the quality and intensity of Ta'awun implementation more comprehensively.

Third, the observation period of 9 years (2016–2024), although covering an adequate timeframe for panel data analysis, may not fully capture the long-term dynamics of Ta'awun implementation, especially in the context of changes in the regulatory environment and the evolving competitive landscape in the Indonesian Islamic banking industry. Fourth, the study focuses on recovery rate and NPF as outcome variables, although relevant and in line with the banking risk management literature, can be expanded to include broader performance indicators such as customer satisfaction, employee engagement, and social impact, which are important aspects in a comprehensive evaluation of the implementation of sharia values.

Further research can explore several promising directions. First, research with a larger sample and including Islamic banks from other Muslim countries can provide a valuable comparative perspective on the influence of institutional and cultural context on the effectiveness of Ta'awun implementation. Second, the development of a more sophisticated measurement framework for the quality of implementation of Islamic principles can provide more nuanced insights into best practices in operationalizing Islamic values. Third, sector-specific analysis of the implementation of Ta'awun in various types of financing (MSME, corporate, consumer, real estate) can provide a deeper under-

standing of the contextual factors that influence the effectiveness of the Ta'awun approach.

Fourth, longitudinal research with longer observation periods could provide insights into the sustainability and long-term impact of Ta'awun implementation, as well as identify factors that contribute to long-term implementation success. Fifth, research on the integration of Ta'awun with digital banking and fintech can explore how technological advances can support or hinder the imple-

mentation of traditional Islamic values in a modern banking context. Sixth, research on training and capacity-building programs for Ta'awun implementation can provide practical guidance for practitioners and policymakers in developing human resources capable of effectively implementing Islamic value-based approaches. Finally, AI tools are used only for data preprocessing, similar to the functions of statistical software, with all interpretation done through conventional academic processes.

CONCLUSIONS

This study successfully achieves the objective to analyze the effectiveness of Mabda' At-Ta'awun implementation in improving financing risk management performance in Indonesian Islamic banking. Through the analysis of Fixed Effects Panel Regression, Seemingly Unrelated Regression, and Granger Causality Tests on five Islamic banks for the period 2016–2024, the study provides empirical evidence of the transformation of problem financing resolution from an adversarial approach to collaborative problem-solving based on Islamic values.

The implementation of Mabda' At-Ta'awun is shown to significantly increase the recovery rate by 18.47% and reduce the NPF ratio by 2.34%, confirming the superiority of the Islamic value-based collaborative approach. Bank characteristics show that bank size negatively affects recovery rate but positively affects NPF, while profitability (ROA) positively affects recovery rate and negatively affects NPF. Causality analysis reveals that effective recovery rates play a preventive role against future NPF accumulation, with bank size and profitability as long-term determinants of recovery ability.

Theoretically, this study strengthens Islamic Finance Theory and Profit-Loss Sharing Theory by proving that authentic implementation of Islamic principles creates measurable competitive advantages. This finding addresses the gap in the literature that is dominated by descriptive studies by providing an evidence-based framework for the implementation of Islamic values in modern banking practices. Practically, Islamic banks need to integrate Ta'awun in the SOP workout, develop human capital capable of implementing Islamic values, and create an organizational culture that supports a collaborative approach. Regulators can develop an incentive structure for banks that implement Ta'awun effectively and integrate aspects of Islamic value implementation in the supervisory framework.

Future research needs to explore the implementation of Ta'awun in specific financing sectors (MSME, corporate, consumer) and analyze the integration of other Islamic values in risk management. The development of more sophisticated measurement instruments for the quality of implementation of Islamic principles can provide more nuanced insights. Comparative studies with Islamic banks in other Muslim countries can identify contextual factors that affect the effectiveness of Islamic values implementation, while longitudinal studies with longer periods can evaluate the sustainability and long-term impact of Ta'awun implementation in creating truly distinctive and impactful Islamic banking.

AUTHOR CONTRIBUTIONS

Conceptualization: Wahidullah, Jumaiyah.

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Formal analysis: Wahidullah, Jumaiyah, Moh Nasuka.

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 Investigation: Wahidullah, Jumaiyah, Moh Nasuka.
 Methodology: Wahidullah, Jumaiyah, Moh Nasuka.
 Project administration: Jumaiyah, Moh Nasuka.
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 Software: Wahidullah, Jumaiyah, Moh Nasuka.
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 Validation: Jumaiyah, Moh Nasuka.
 Visualization: Jumaiyah.
 Writing – original draft: Jumaiyah, Moh Nasuka.
 Writing – reviewing & editing: Jumaiyah.

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