

# Consolidation Strategies for Enhancing Stability of Indonesian Islamic Regional Banks: Merger versus Joint Business Groups

Consolidation  
Strategies for  
Enhancing Stability

419

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Submitted:  
October 30, 2025

Revised:  
November 8, 2025

Accepted:  
January 30, 2026

Published Online:  
January 31, 2026

## ABSTRACT

A strategic option to accelerate core capital fulfilment and the conversion of sharia business units into full-fledged sharia commercial banks is consolidation through mergers and joint business groups. This approach is particularly relevant for sharia business units under regional development banks that occupy the defensive quadrant in terms of competitiveness and financial performance. This study develops an empirical model to evaluate the influence of internal and external factors on the stability of UUS BPD and to simulate potential resilience gains post-consolidation. Using panel data from 12 UUS BPD between Q1 2012 and Q4 2022, the research applies cluster analysis, the fixed effect model, the analytic hierarchy process, and merger simulation. Results reveal that consolidation supported by profitability, asset growth, and sound risk management significantly improves financial stability. Merger simulations yield Z-scores of 1.1–2.6, indicating moderate stability, while the joint business groups simulation with BJB Syariah shows steady improvement from baseline. Consolidation serves not only as a growth strategy but also as a survival mechanism for Sharia Business Units BPDs facing regulatory and structural challenges, with both merger and Joint Business Groups options classified as moderately prospective for post-consolidation sustainability.

**Keywords:** Consolidation Sustainability, Joint Business Groups, Merger, Regional Development Bank, Sharia Business Unit.

## INTRODUCTION

The consolidation of Sharia Business Units (*Unit Usaha Syariah/UUS*) under Regional Development Banks (*Bank Pembangunan Daerah/BPD*) has emerged as a strategic imperative within Indonesia's Islamic banking sector. Pursuant to the Financial Services Authority (*Otoritas Jasa Keuangan/OJK*) Regulation Number 12/POJK.03/2021 concerning the spin-off requirement, each UUS is mandated to transform into a fully independent Sharia Commercial Bank (*Bank Umum Syariah/BUS*) once its total assets reach a minimum of IDR 1 trillion or within the stipulated regulatory timeframe. Despite this mandate, a considerable number of UUS, particularly those affiliated with BPDs, have yet to attain adequate capital, scale, or financial robustness to comply with the regulation.

To address these constraints, consolidation through merger or the establishment of Joint Business Groups (*Kelompok Usaha Bank/KUB*) has gained prominence as an alternative strategic approach. Such mechanisms are designed to strengthen capital structure, enhance operational efficiency, and improve competitive positioning. This approach is consistent with the government's broader agenda to fortify the Islamic

**JIMKES**

Jurnal Ilmiah Manajemen  
Kesatuan  
Vol. 14 No. 1, 2026  
pp. 419-434  
IBI Kesatuan  
ISSN 2337 – 7860  
E-ISSN 2721 – 169X  
DOI: 10.37641/jimkes.v14i1.4494

banking ecosystem through institutional synergy, financial integration, and digital transformation initiatives (Sudi, 2025).

However, determining whether to pursue a merger or form a joint business group necessitates a comprehensive evaluation of internal financial stability. Previous empirical studies have identified key determinants of Islamic bank stability, namely profitability (Return on Assets/ROA), asset size, capital adequacy (Capital Adequacy Ratio/CAR), cost efficiency (*Biaya Operasional terhadap Pendapatan Operasional/BOPO*), and risk management indicators (Risk Profile, Good Corporate Governance, Earnings, and Capital/RGEC) (Fadhilah et al., 2025). Nonetheless, there remains a paucity of empirical research examining how these internal factors interact within the specific context of UUS BPD consolidation and how such structural strategies (merger or joint business groups) may affect post-consolidation stability.

Strategic mapping using the Strategic Position and Action Evaluation (SPACE) Matrix reveals that most Sharia Business Units of Regional Development Banks (UUS BPD) occupy the defensive quadrant (Syafriada et al., 2023). This positioning indicates that their optimal strategic orientation should emphasize consolidation, efficiency enhancement, and risk mitigation rather than aggressive expansion. Consequently, consolidation either through merger or KUB represents a defensive yet adaptive strategy aimed at ensuring institutional resilience and regulatory compliance, rather than a purely expansionary initiative. However, empirical research that simultaneously examines internal financial determinants, alternative consolidation strategies (merger versus joint business groups), and post-consolidation stability within the specific context of UUS BPD in Indonesia remains limited. Existing studies tend to analyze Islamic bank stability or consolidation independently, with few employing long-term panel data to simulate post-integration outcomes.

Therefore, this study aims to develop an empirical model that quantifies the influence of internal financial and managerial determinants on the stability of UUS BPD, while simulating the potential impact of consolidation through merger and joint business groups on post-integration financial soundness. Utilizing quarterly panel data covering the period from Q1 2012 to Q4 2022, this research employs a Fixed Effect Model (FEM) complemented by cluster analysis, the Analytic Hierarchy Process (AHP), and merger simulation techniques. The findings are expected to contribute both theoretically and practically by informing policy formulation and managerial strategies that support a more sustainable transformation of UUS BPD into fully independent and stable Sharia Commercial Banks.

This research contributes to the academic and practical literature in several significant ways. First, it provides contemporary empirical evidence on the consolidation strategy model of UUS BPD in Indonesia over the period 2012–2022, capturing a decade of regulatory transition and market transformation. Second, it offers analytical insights into how technology adoption, risk management quality, and profitability jointly influence post-consolidation financial stability. Third, the study functions as a preliminary screening framework for identifying prospective Islamic bank mergers, particularly among sharia business units entities within regional banking structures. Fourth, it provides actionable implications for regulatory authorities, notably the financial services authority, in formulating policies that support sustainable consolidation, financial resilience, and the expansion of Indonesia's Islamic banking sector.

## LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

### The Effect of Sharia Business Units

The stability of Islamic banks in Indonesia is shaped by internal and external factors, including market share, government policies, macroeconomic conditions, interbank competition, and key financial ratios (Bakhouché et al., 2022). Empirical evidence on the impact of profitability, measured by Return on Assets (ROA), is mixed by Handayani et al. (2021), Hakim et al. (2021), Rohimah et al. (2024), and Umiyati (2024) report a significant negative effect of ROA on stability, while Dahruji et al. (2022), Risma et al.

(2022), Shahriar et al. (2023), Rushona et al. (2025), and Saputri et al. (2025) find a positive association with the Z-score, suggesting that profitability can enhance resilience under certain conditions. The banking sector demonstrates a positive link between ROA and financial stability, with higher profitability providing stronger buffers against distress and supporting operational continuity (Saputri et al., 2025; Sofwan et al., 2025). These findings highlight the complex profitability–stability nexus and the need for a framework that integrates financial structure, operational efficiency, and institutional strategy, especially for sharia business units under regional development banks.

The Loan-to-Asset Ratio (LAR) indicates the proportion of a bank's assets allocated to lending, reflecting its income-generating focus and intermediation function. A higher LAR can enhance profitability and financial performance, particularly when supported by strong credit appraisal, monitoring, and risk management, which improve revenue diversification and asset productivity. However, excessively high LAR increases exposure to credit risk, potentially raising non-performing loans and financial distress (Hasidi et al., 2024). Empirical evidence is mixed: Billah et al. (2021) report a negative effect of LAR on Nigerian banks' stability due to aggressive lending under weak risk governance, whereas Pham et al. (2021) find a positive impact on Vietnamese banks, where regulatory discipline and credit portfolio quality are stronger. These findings highlight that LAR's influence on stability is context-dependent, shaped by governance, regulation, and credit management quality.

H1: Sharia business units have a positive effect on return on assets.

H2: Sharia business units have a positive effect on the loan-to-assets ratio.

### **Factors Influencing Sharia Business Units**

Bank size, usually measured by total assets, is a key determinant of financial stability. Larger banks generally exhibit greater resilience due to economies of scale, better access to capital markets, and superior risk diversification (Hosen et al., 2022; Beck, 2023). However, excessive size can increase operational complexity and governance challenges. Empirically, bank size is often represented by the natural logarithm of total assets, with numerous studies confirming a positive association with financial stability (Daoud et al., 2020; Gupta et al., 2020; Raouf et al., 2020; Boulanouar et al., 2021; Marie et al., 2021; Pham et al., 2021). Specifically, Jaudar et al. (2023) and Subakti et al. (2023) show that larger Islamic banks achieve higher stability, while Fitriyatustany et al. (2024) confirm that the expansion of Islamic banking assets contributes to financial resilience and sustainable performance.

Effective fund or investment management in Islamic banks enhances institutional soundness by aligning assets with Shariah principles, optimizing returns, and mitigating risk, thereby supporting the financial stability of Shariah business units (Hadi & Wijaya, 2024). Capital intensity strengthens stability, enabling banks to absorb losses, manage shocks, and meet regulatory requirements, while investment management also promotes income diversification and liquidity risk reduction (Lahouel et al., 2024). Analytical frameworks such as Capital adequacy, Asset quality, Management quality, Earnings, Liquidity, and Sensitivity/CAMELS, RGEC, and the Altman Z-Score are widely used to assess bank soundness and financial resilience, with evidence showing RGEC improves banking health post-merger by mitigating distress and enhancing sustainability (Agustin et al., 2021; Khiswaradewi et al., 2023). Financial technology has emerged as a structural determinant of stability, with mixed findings: some studies report potential risks despite competitiveness gains, whereas others highlight positive effects via transparency, adaptive regulation, and risk management, improving Z-scores (Cheng et al., 2020; Daud et al., 2022; Feyen et al., 2023; Fajri et al., 2024; Meero, 2025). Although adoption remains limited in Indonesian Islamic banking and some studies report no significant impact, substantial evidence confirms FinTech's positive contribution to financial performance and institutional resilience (Ma'ruf, 2021; Risman et al., 2021; Pradana et al., 2025).

H3: Total assets have a positive effect on sharia business units.

H4: Investment management has a positive effect on sharia business units.

H5: RGEC (Risk Profile, Good Corporate Governance, Earnings, and Capital) has a positive effect on sharia business units.

H6: Information and communication technology has a positive effect on sharia business units.

### **Simultaneous Effect on Sharia Business Units**

Financial performance and stability in Islamic banking are shaped by a combination of bank-specific determinants rather than isolated factors. Internal ratios such as ROA, capital structure, and risk indicators are significant drivers of bank soundness, with panel data showing that capital adequacy, profitability, and risk management collectively influence performance and sustainability (Siyamto, 2023; Nasri et al., 2023; Safira et al., 2024). ROA not only reflects profitability but also interacts with capital and credit variables to determine financial outcomes. Bank size and economic scale further enhance resilience by supporting earnings capacity and diversified revenue generation, with larger asset bases and strong governance linked to higher stability. While the effects of financial technology and digital adoption show mixed results, integrating digital tools with core financial management improves efficiency and risk monitoring, contributing to long-term performance (Faruq, 2025). These findings indicate that multiple financial, organizational, and technological factors simultaneously shape the performance and resilience of sharia business units, highlighting the need for comprehensive analytical frameworks. Additionally, studies on mergers and efficiency in Islamic banking emphasize growth-oriented strategies, including mergers, separations, acquisitions, and institutional conversions (Al Arif et al., 2020; Rambe et al., 2021; Aulia et al., 2022; Budiantoro et al., 2024).

H7: ROA, total assets, loan to assets ratio, investment management, RGEC, and Information and communication technology have a simultaneous positive effect on sharia business units.

These studies differ from empirical merger frameworks that focus on the relationship between capital structure and financial stability, leaving a research gap in developing an empirical consolidation model tailored to the stability assessment of regional development bank sharia units (Bakhhouse et al., 2022; Nugroho et al., 2022). Addressing this gap, the present study proposes a comprehensive consolidation model that integrates internal and external determinants of financial stability, including profitability, asset size, lending and investment intensity, risk governance, earnings quality, and information and communication technology, using panel data regression analysis. Consolidation strategies through mergers and joint business groups are further validated through expert and regulatory assessments, ensuring methodological rigor and policy relevance. The study assumes that financial stability is jointly determined by the interaction of profitability, scale, liquidity, investment management, risk governance, and technology.

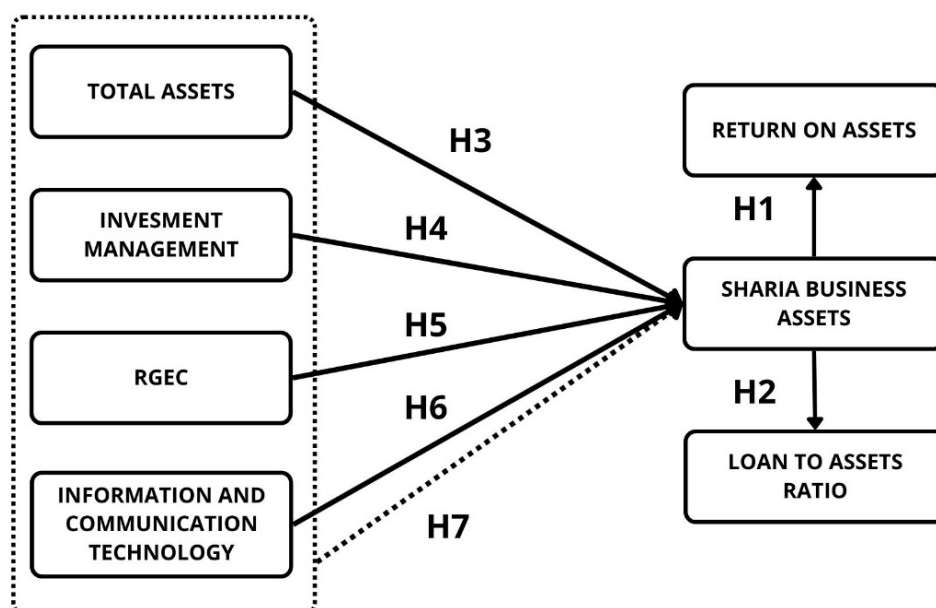


Figure 1. Conceptual Framework

The study's conceptual structure and the connections between internal factors and Sharia Business Unit stability are depicted in Figure 1. According to hypotheses H3, H4, H5, and H6, Sharia business assets are directly impacted by total assets, investment management, risk governance, earnings quality, and information and communication technology. Consequently, the loan-to-assets ratio (H2) and return on assets (H1) are impacted by Sharia business assets. The simultaneous impact of all explanatory variables on overall financial stability is represented by hypothesis H7.

## RESEARCH METHODS

This study examined quarterly reports from twelve UUS BPD over the period 2012–2022. The data were obtained from official sources such as the OJK, Bank of Indonesia, the Indonesia Deposit Insurance Corporation (*Lembaga Penjamin Simpanan/LPS*), and other relevant Islamic banking institutions. The observed UUS BPDs include UUS BPD Sumut, UUS BPD Sumbar, UUS BPD Jambi, UUS BPD Sumsel Babel, UUS BPD DKI, UUS BPD Jateng, UUS BPD DIY, UUS BPD Jatim, UUS BPD Kalsel, UUS BPD Kalbar, UUS BPD Kaltimara, and UUS BPD Sulselbar. The study was conducted between January and June 2023. The study employs fixed effect model panel regression, cluster analysis, AHP, and merger–joint business group simulations to analyze financial stability and consolidation strategies. This research employed a quantitative approach using secondary data derived from the UUS BPD in Indonesia. The analysis aims to measure the effect of independent variables on the dependent variable. In addition, qualitative insights were obtained through in-depth interviews with experts and practitioners of UUS BPD to validate and enrich the quantitative findings.

Data analysis was conducted in four main stages. First, K-Means cluster analysis was applied using total assets, risk governance, earnings quality, and efficiency to identify similarities in financial strength and risk profiles among sharia business units under regional development banks, supporting regulatory compliance and strategic consolidation in line with their defensive positioning (Tavallali et al., 2021). Second, financial stability was estimated using a panel data consolidation model incorporating profitability, asset size, loan-to-asset ratio, investment management, risk governance, and earnings quality, and information and communication technology, with model estimation conducted using OLS, Fixed Effect Model, and Random Effect Model approaches, selected through Chow, Hausman, and Lagrange Multiplier tests and evaluated using  $R^2$

and F-statistics in EViews 10 (Danisman & Tarazi, 2020; Mohammad, 2020; Ariefianto et al., 2022).

Expert interviews were conducted to complement the quantitative analysis using the Analytical Hierarchy Process (AHP) framework to evaluate alternative consolidation strategies, including regional mergers, cluster-based mergers, full integration of sharia business units under regional development banks, and joint business group schemes. The SPACE–AHP analysis was processed using the Expert Choice application, following the hybrid approach of Ashutosh et al. (2019), with data collected from five experts experienced in managing or supervising sharia business units to derive priority weights for each strategy. Based on the AHP results, consolidation scenarios were simulated through descriptive analysis to assess the potential impact of mergers and joint business groups on financial stability, efficiency, and long-term sustainability, ensuring alignment with Financial Services Authority regulations and supporting robust, policy-relevant consolidation strategies.

$$Z_{i,t} = \alpha + \beta_1 ROA_{i,t} + \beta_2 TA_{i,t} + \beta_3 LAR_{i,t} + \beta_4 IM_{i,t} + \beta_5 RGEC_{i,t} + \beta_7 IPTIK_{i,t} + e_{i,t}$$

Where:

ROA<sub>i,t</sub> = Return on Assets

LAR<sub>i,t</sub> = Loan Asset Ratio,

TA<sub>i,t</sub> = Total Assets

IM<sub>i,t</sub> = Intensity of Capital,

RGEC<sub>i</sub> = Risk Profile, Good Corporate Governance, Earnings, and Capital

IPTIK<sub>i</sub> = Information Technology Development Index.

Panel data linear regression was used for the measurements. The measurement of the stability level (Z-Score) in this study was adapted from Apriadi and Handayani (2023). The total assets (TA) and the Loan to Asset Ratio (LAR) variable followed the formulation used by Kozlowski (2021), while the Return on Assets (ROA) was adapted from Banna et al. (2020). Furthermore, the Risk Profile, Good Corporate Governance, Earnings, and Capital (RGEC) framework was adopted from Widhiastuti (2021).

## RESULTS

The cluster analysis grouped UUS BPD into three categories based on total assets, efficiency, and RGEC indicators: Cluster 1 (UUS BPD Sumut, SumselBabel, Jateng, Jatim, Kalsel, and Kaltimtara) with above-average performance, Cluster 2 consisting solely of UUS BPD DKI as the strongest unit, and Cluster 3 (UUS BPD DIY, Kalbar, Sulsebar, Jambi, and Sumbar) with below-average assets. Based on these results and aligned with Financial Services Authority Regulation POJK Number 12/POJK.03/2023, the analytical framework classified units into above-average asset UUS with  $\geq$  IDR 1 trillion in business funds or core capital (Clusters 1 and 2), below-average asset UUS (Cluster 3), and potential merger scenarios among eligible UUS to ensure regulatory compliance and financial stability.

Based on the panel data regression results, the UUS BPD in North Sumatra, SumselBabel, DKI Jakarta, Central Java, East Java, South Kalimantan, and Kaltimtara are identified as potential merger candidates, as each holds business funds or core capital of at least IDR 1 trillion. Referring to the consolidation model estimation presented in Table 1 and aligned with cluster analysis outcomes, units in Clusters 1 and 2 are classified under a bank merger model, with the Fixed Effect Model selected as the optimal specification, revealing that ROA, total assets, investment management, RGEC, and information and communication technology have a significant and positive effect on financial stability at the 5% level.

The model demonstrates a high explanatory power, as indicated by the  $R^2$  value of 49.64% and the adjusted  $R^2$  value of 51.75%, suggesting that approximately half of the variation in the Z-score (stability indicator) can be explained by the included variables,

while the remaining variance is attributed to other unobserved factors beyond the model. Furthermore, the results of the F-statistic test indicate overall model significance at the 95% confidence level ( $p$ -value = 0.0000), confirming the robustness of the FEM specification in explaining the determinants of UUS BPD stability under the merger scenario.

**Table 1.** Consolidation Model Estimation for UUS BPD Stability on UUS BPD Cluster

Description	Merger of BPD UUS (business funds or core capital $\geq$ IDR 1 trillion)	Merger of BPD UUS with Above-Average Assets (Clusters 1 and 2) and core capital $\geq$ IDR 1 trillion	Merger of BPD UUS with Below-Average Assets (Cluster 3)
Constanta	-1.575987	0.720923	-5.095607
Ln ROA	0.000338*	0.000259*	0.000411*
Ln TA	0.000059*	0.000030*	0.000080
Ln LAR	0.018646	0.291133	-
Ln IM	0.109078	0.195349*	-
Ln RGEC	1.184849*	0.212046*	0.433699
Ln IPTIK	0.000202*	0.000117*	0.000360*
R-Square	0.443726	0.517491	0.425768
Adj R-Square	0.421337	0.496359	0.416393
F-Statistic	19.81915	24.48875	45.41429
Prob (F-Stat)	0.000000	0.000000	0.000000
Model	FEM	FEM	REM

Note: \* $p < 0.05$

The analysis indicates that consolidation of UUS BPD should focus not only on asset expansion but also on enhancing profitability and operational sustainability through efficiency improvements, financing margin optimization, and digital transformation, while simultaneously integrating robust risk management and compliance frameworks, with the RGEC framework serving as a key regulatory tool for evaluating consolidation readiness and ensuring long-term institutional stability.

In line with the national institutional strengthening roadmap, consolidation should prioritize merger scenarios based on asset homogeneity or regional proximity to foster synergy and balanced integration, with the ultimate objective of improving profitability through innovation and efficiency, strengthening integrated risk governance, and expanding scale through structured strategies; accordingly, combining model estimations and expert insights, four strategic alternatives are identified: mergers among above-average asset UUS BPD with core capital of at least IDR 1 trillion, full mergers of all UUS BPD, mergers within joint business groups anchored by a core bank, and mergers among UUS BPD within similar regional clusters. The hierarchical structure derived from the AHP analysis, which visualizes the prioritization of these strategic alternatives, is presented in Figure 2.

Figure 2 illustrates the hierarchical priorities within the consolidation strategy for enhancing the stability of UUS BPD. At the factor level, total assets emerge as the most influential factor, with a weighting value of 0.210, highlighting that the size of assets plays a central role in determining the capacity of UUS BPD to sustain operations and expand through consolidation. At the actor level, the top management of the parent BPD is identified as the key driver of the strategy. Holding dual responsibilities over both conventional and Sharia operations, top management is crucial in steering institutional transformation, ensuring the integration of Sharia governance, and maintaining organizational resilience. Regarding strategic goals, enhancing competitiveness is the most critical objective, with the highest weighting of 0.311, reflecting the intent of consolidation not only to improve financial stability but also to strengthen market position and service innovation. At the alternative level, the preferred strategy is the merger of UUS BPD with above-average assets (Clusters 1 and 2), with a weighting value of 0.329.

This approach represents the most effective and feasible pathway to achieve greater stability, operational efficiency, and sustainable growth among Islamic regional banks.

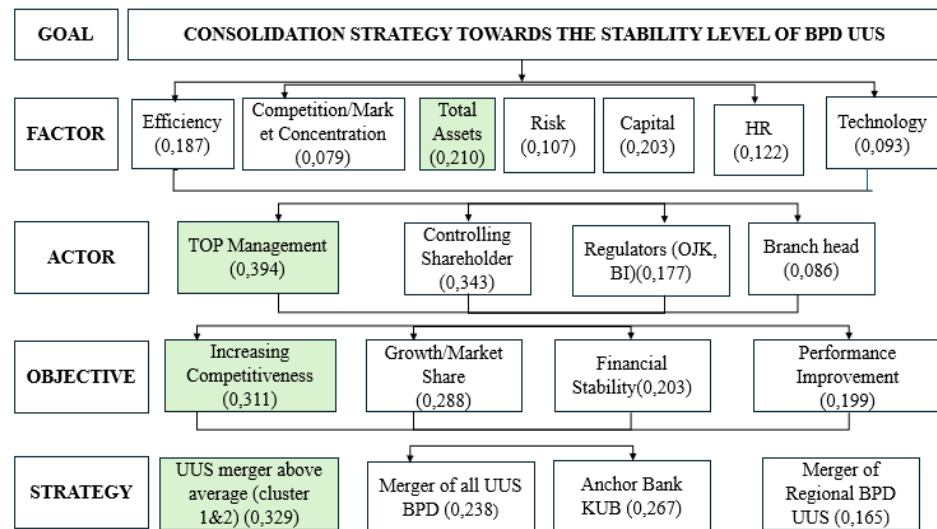


Figure 2. Results of AHP processing in a hierarchical framework

Based on the results of expert validation using the AHP, the merger of UUS BPD with above-average assets (Clusters 1 and 2), with a weighting value of 0.329, represents the primary strategic alternative for consolidation. The joint business group model, with a weighting value of 0.267, constitutes the second strategic option. To further assess the implications of these strategies, a simulation of the consolidation strategy model on the stability level of UUS BPD was conducted. The simulation employed the selected Fixed Effect Model equation, utilizing quarterly data from the December 2025 reporting period for UUS BPD that met the analytical criteria. In this simulation, BJB Syariah was designated as the anchor bank for the KUB scenario.

Given that the RGEC coefficient exhibited the strongest influence within the FEM estimation, the UUS BPD merger simulation was performed by applying the RGEC ranking and weighted average approach to evaluate changes in stability (Z-score). Meanwhile, the KUB simulation with BJB Syariah as the anchor bank adopted conservative, moderate, and optimistic scenarios, reflecting different assumptions for key FEM variables to capture potential variations in consolidation outcomes. The simulation analysis employed the selected FEM to estimate the Z-Score as a proxy for the financial stability of UUS BPD. This model was utilized to project the potential impact of various consolidation strategies, including mergers and joint business group formations, on the overall stability performance of UUS BPD.

Table 2. BPD UUS Stability Simulation under Spinoff Assumptions (Dec 2024, High RGEC)

Merger of UUS BPD After the Spin-Off Assumption	LnZ-Score Merger Prediction	Z-Score Merger Prediction	Core Capital *) After Merger (IDR Trillion)	Z-Score Before Merger
UUS Kalbar +UUS Kalsel+ UUS Sulsebar	0.731	2.070	3.00	Kalbar =2.324 Kalsel=1.948 Sulsebar= 1.686
UUS Kalbar + UUS Jatim+ UUS DKI	0.884	2.420	3.00	Kalbar =2.324 Jatim=2.402 DKI = 1.996
UUS Kalbar +UUS Kalsel+ UUS DKI	0.888	2.430	3.00	Kalbar =2.324; Kalsel=1.948 DKI = 1.996

Merger of UUS BPD After the Spin-Off Assumption	LnZ-Score Merger Prediction	Z-Score Merger Prediction	Core Capital *) After Merger (IDR Trillion)	Z-Score Before Merger
UUS Kalsel + UUS DKI+ UUS Jatim	0.870	2.388	3.00	Kalsel=1.948 DKI = 1.996 Jatim=2.402
UUS Kalbar + UUS Jatim	0.947	2.578	2.00	Kalbar =2.324 Jatim=2.402
UUS DKI+UUS Jatim	0.879	2.490	2.00	DKI = 1.996 Jatim=2.402

The Z-Score serves as a key indicator of a bank's stability, reflecting its capacity to withstand insolvency risk. A higher Z-score denotes a stronger and more resilient financial position. As presented in Table 2, UUS BPDs with higher RGEC ratings exhibited lower pre-merger Z-Scores but demonstrated higher post-merger Z-Scores. This pattern suggests the emergence of risk-sharing mechanisms, operational synergies, and enhanced managerial efficiency following the merger process. The findings imply that the consolidation of UUS BPDs exerts a stabilizing influence on previously vulnerable Islamic banking units, although it may also lead to a slight reduction in stability among the most robust institutions due to the equalization effect of the merger.

Mauluddi et al. (2022) and Putri et al. (2025) show that mergers among banks with high RGEC ratings typically fall within the grey area of the Modified Altman Z-Score ( $1.1 \leq Z < 2.60$ ), indicating low bankruptcy risk but a continued need for stronger risk management and capital buffers; consistent with this, merger simulations indicate that the Kalbar–Jatim combination achieves the highest Z-Score (2.578) yet still requires additional capital or participation in a joint business group, while the Kalbar–Kalsel–DKI merger records a Z-Score of 2.430 and already meets the minimum IDR 3 trillion core capital requirement to qualify as a Sharia Commercial Bank under OJK regulations.

The merging index was determined through a simulation process employing the selected FEM framework. This index was computed using a combination of key financial and operational indicators, namely the Z-Score (as a proxy for financial stability), Human Resources, Branch Network, and Operating Efficiency. The inclusion of these variables reflects a comprehensive approach to evaluating the post-merger performance and resilience of UUS BPDs, emphasizing not only financial soundness but also organizational capacity and operational reach.

The merger index encompasses four primary dimensions: human resources, office network, efficiency (BOPO), and stability (Z-score) to present a comprehensive measure of post-merger financial soundness. The stability component, which reflects the financial resilience of the merged entity, is assessed using the FEM-based Z-score. The HR component captures both the quantity and quality of personnel available for integration, whereas the office network represents the geographical outreach and service coverage of the merged units. Operational efficiency is proxied by the BOPO ratio, for which the merger BOPO is computed as a weighted average based on the operating income base.

The total number of UUS human resources is determined by multiplying the aggregate number of employees by the weighted proportion of financing and office networks, following the formula:

$$HR (UUS) = Total HR \times [(UUS financing / total financing) \times 0.6 + (UUS offices / total offices) \times 0.4].$$

Each UUS is scored on a three-point scale for human resources, office network, and efficiency (BOPO), where higher scores indicate stronger capacity and performance, and these scores are combined with the Z-Score using weighted indices of 50% (Z-Score), 20% (HR), 15% (office network), and 15% (BOPO). The resulting merger index classifies UUS into four scenarios: high potential (score > 2.5), moderately high potential (2.0–2.49), restricted potential (1.5–1.99), and unfavorable for merger (score < 1.5), reflecting varying levels of human resource strength, network capacity, efficiency, and operational risk.

According to Table 3, the UUS BPD merger index is between 2.0 and 2.49. This suggests that the UUS BPD merger has a very good chance of succeeding. The combined Sharia Business Unit has adequate stability, but it is not yet at its best, according to a mid-range index rating. The index's primary metric, the Z-score, measures the financial resilience following a merger. A number in the "quite potential" category means that even with stability gains, there are still a lot of financial risks that need to be strengthened.

**Table 3.** Post-Merger Stability Simulation Results of UUS BPD Meeting Spinoff Criteria (December 2024)

Merger of UUS BPD After the Spin-Off Assumption	ZScore Merger Prediction	Number of Human Resources of the Merged	Number of UUS Merger Offices	BOPO Merger	Merger Index	Interpretation of Index	Information
UUS Kalbar +UUS Kalsel+ UUS Sulselbar	2.070	443	38	31.97	1.685	Limited Potential	
UUS Kalbar + UUS Jatim+ UUS DKI	2.420	768	234	43.55	2.260	Quite Potential	Priority 2
UUS Kalbar +UUS Kalsel+ UUS DKI	2.430	452	52	33.64	2.065	Quite Potential	
UUS Kalsel + UUS DKI+ UUS Jatim	2.388	826	240	41.42	2.244	Quite Potential	
UUS Kalbar + UUS Jatim	2.578	639	234	43.55	2.260	Quite Potential	Priority 1
UUS DKI +UUS Jatim	2.490	632	208	33.64	2.065	Quite Potential	Priority 3

According to the results of the merger model simulation on the stability level of UUS BPD using the Merger Index, the merger between UUS BPD Kalbar and UUS BPD Jatim achieved the highest index value of 2.339. This score reflects a moderately high merger potential, indicating a strong level of financial and operational synergy between the two institutions. However, despite meeting the core capital threshold of IDR 3 trillion, the merged entity still requires additional capital reinforcement or strategic participation within a joint business group framework to enhance its long-term financial resilience and regulatory compliance.

The fixed effect model simulation was applied to evaluate the joint business group scenario by assessing the projected impact of ROA, total assets, LAR, investment management, RGEC, and ICT on the stability (Z-score) of participating UUS, using December 2024 financial data. Focusing on a Bank Jangkar (BJB Syariah)-based KUB, the simulation generated stability projections under conservative, moderate, and optimistic assumptions, providing a forward-looking comparison of the KUB's potential to enhance post-consolidation stability and operational resilience relative to full merger scenarios.

**Table 4.** BJB Syariah KUB Simulation on UUS BPD Stability Meeting Spinoff Criteria (December 2024)

Scenario	KUB BJB Syariah / UUS	LnZ-Score Predictions	Z-Score Prediction	Average Z-Score KUB	Δ Z-Score KUB vs Baseline	% Change in KUB Z-Score
Baseline Data (BD)	BJB Syariah	0.912	2.489	-	-	-
	UUS Jateng	0.199	1.221	1.855	-	-
	UUS Sumselbabel	0.640	1.897	2.193	-	-

Scenario	KUB BJB Syariah / UUS	LnZ-Score Predictions	Z-Score Prediction	Average Z-Score KUB	Δ Z-Score KUB vs Baseline	% Change in KUB Z-Score
Conservative Scenario	UUS DKI + UUS Jatim	0.879	2.409	2.449	-	-
	UUS Jateng	0.229	1.257	1.873	0.018	0.97%
	UUS Sumselbabel	0.672	1.959	2.224	0.031	1.40%
Moderate Scenario	UUS DKI + UUS Jatim	0.914	2.494	2.491	0.002	0.10%
	UUS Jateng	0.233	1.262	1.876	0.003	0.14%
	UUS Sumselbabel	0.679	1.972	2.231	0.007	0.30%
Optimistic Scenario	UUS DKI + UUS Jatim	0.923	2.518	2.504	0.012	0.49%
	UUS Jateng	0.244	1.276	1.883	0.007	0.37%
	UUS Sumselbabel	0.693	1.999	2.244	0.014	0.61%
	UUS DKI + UUS Jatim	0.940	2.560	2.525	0.033	1.33%

Three scenarios were applied in the KUB simulation: conservative, moderate, and optimistic, reflecting minimal, emerging, and substantial performance improvements, respectively, with evaluation based not only on Z-score stability but also asset size, business scale, and market specialization. As shown in Table 4, the BJB Syariah-based KUB projections indicate a consistent increase in Z-scores across all scenarios, with the largest baseline improvements under the conservative scenario observed for Central Java UUS BPD (0.97%) and South Sumatra UUS BPD (1.40%), suggesting a positive but gradual enhancement of financial stability.

Under the optimistic scenario, the most substantial change in the baseline Z-score was observed in the DKI UUS BPD and East Java UUS BPD configuration, where the merger with BJB Syariah yielded an increase of 1.33%. These findings highlight the potential of the KUB framework to enhance institutional resilience and operational synergy among participating UUS BPDs, particularly when supported by strong anchor banks such as BJB Syariah.

The KUB Index integrates stability (Z-score), human resources, office network coverage, and liquidity efficiency (FDR) to assess post-consolidation institutional soundness, with HR and office network treated as constant due to high adjustment costs and their limited impact on index changes. Liquidity efficiency is measured using FDR under baseline, conservative, moderate, and optimistic scenarios, reflecting 0%, 5%, and 10% increases in financing activity and classified into inefficiency, efficiency, and high-efficiency scales. Using weighted scores of 50% for Z-score, 20% for HR, and 15% each for office network and FDR, the index categorizes UUS prospects into high potential (>2.5), moderately prospective (2.0–2.49), restricted potential (1.5–1.99), and unfavorable (<1.5) scenarios for KUB implementation.

**Table 5.** Post-Simulation of UUS BPD KUB with BJB Syariah Meeting Spinoff Criteria (KUB Index)

Scenario	KUB BJB Syariah / UUS	Z-Score Prediction	Number of Human Resources of the Merged	Number of UUS Mergers Office	FDR	KUB Index	Average KUB Index	Interpretation of Index	Information
Baseline Data (BD)	BJB Syariah	2.489	1242	93	93.65	2.395	1.978	LP	Priority 3
	UUS Jateng	1.221	317	26	81.75	1.561	2.147	QP	Priority 2

Scenario	KUB BJB Syariah / UUS	Z-Score Prediction	Number of Human Resources of the Merged	Number of UUS Merger Offices	FD R	KUB Index	Average KUB Index	Interpretation of Index	Information
	UUS Sumselba bel	1.897	302	14	94.94	1.898	2.475	QP	Priority 1
	UUS DKI + UUS Jatim	2.409	639	26	88.90	2.554	2.475	QP	Priority 1
Conservative Scenario	UUS Jateng	1.257	317	26	81.75	1.561	1.978	LP	-
	UUS Sumselba bel	1.959	302	14	94.94	1.898	2.147	QP	-
	UUS DKI + UUS Jatim	2.494	639	26	88.90	2.554	2.475	QP	-
	UUS Jateng	1.262	317	26	1.335	1.561	1.978	LP	-
Moderate Scenario	UUS Sumselba bel	1.972	302	14	1.585	1.749	2.147	QP	-
	UUS DKI + UUS Jatim	2.518	639	26	1.960	2.554	2.475	QP	-
	UUS Jateng	1.276	317	26	1.315	1.561	1.903	LP	-
Optimistic Scenario	UUS Sumselba bel	1.999	302	14	1.565	1.749	1.997	LP	-
	UUS DKI + UUS Jatim	2.560	639	26	1.940	2.554	2.399	QP	-

The calculation results of the KUB Index for the UUS BPDs in partnership with BJB Syariah are presented in Table 5. The KUB Index integrates four fundamental dimensions: office network, Financing Liquidity (FDR), Human Resources (HR), and financial stability (Z-score) to provide a multidimensional representation of post-consolidation institutional performance. In the optimistic scenario, a 10% increase in FDR causes the anchor bank (BJB Syariah) to exceed the 100% threshold, lowering its FDR score and slightly reducing the average KUB Index, confirming the growth–stability trade-off whereby excessive financing expansion without adequate liquidity and capital support weakens consolidation performance. The KUB partnership is classified as “quite potential,” though effective liquidity management remains critical, and future optimization should focus on strengthening capital, efficiency, office networks, and human resources; based on the simulations, the highest-priority KUB is UUS BPD DKI–UUS BPD Jatim with BJB Syariah (KUB Index 2.475), followed by UUS BPD Sumsel Babel with BJB Syariah (2.147).

## DISCUSSION

The study confirms that, under both merger and joint business group schemes, the consolidation of UUS BPD (UUS BPDz falls within the moderately potential category, with index values ranging between 2.0 and 2.49. This classification suggests that, following consolidation, UUS BPDs exhibit a relatively sufficient level of financial

stability, although the condition remains suboptimal in terms of long-term resilience. The empirical estimation using the FEM, which integrates the dimensions of technology, risk management, and profitability, demonstrates that consolidation serves not only as a growth-oriented strategy but also as a strategic necessity for institutional survival in response to internal inefficiencies and regulatory pressures. These results corroborate previous studies indicating a positive correlation between technological capability, risk management, profitability, and banking stability (Z-Score) (Tisnawati, 2021; Ariefianto et al., 2022).

Based on expert validation using AHP analysis, the merger of UUS BPDs with above-average assets emerges as the first-priority consolidation alternative, while the KUB represents the second alternative. These findings imply that consolidation constitutes a strategic imperative for strengthening the resilience and sustainability of UUS BPDs within Indonesia's Islamic banking framework. Mergers among UUS with relatively large asset bases are expected to achieve optimal economies of scale, enhance operational efficiency, and foster competitive advantages (Safira et al., 2024; Wiyati et al., 2024).

For UUS BPDs with insufficient core capital, participation in a KUB framework provides a feasible and sustainable alternative to broaden market reach, reinforce capital adequacy, and improve governance and risk-sharing mechanisms. These results are consistent with Kristijadi (2024), who emphasized that the KUB-based consolidation model offers a viable pathway to safeguard the sustainability and regional economic contribution of BPDs. As BPDs play a pivotal role in promoting regional economic development, the integration of UUS BPDs through mergers or KUB cooperation is crucial for maintaining both institutional viability and systemic stability in the Islamic banking ecosystem.

UUS BPDs with larger asset bases are structurally better positioned for merger strategies, particularly when they can fulfill the minimum core capital requirement of IDR 3 trillion as stipulated by regulatory authorities. Mergers among large-asset UUS BPDs not only enable compliance with spin-off mandates but also promote economies of scale, operational integration, and enhanced financial stability. Conversely, the joint business group framework presents a strategic and pragmatic alternative for small and medium-sized UUS BPDs. By enabling resource sharing in technology platforms, branch networks, and capital bases, KUB provides a mechanism for efficiency enhancement and collaborative growth without the necessity of a full legal merger (Saputri et al., 2025). This scheme allows smaller UUS to strengthen their market presence and competitiveness while maintaining institutional identity and regional orientation.

The findings of this study have important policy and strategic implications for regulators and practitioners in Indonesia's Islamic banking sector. To support compliance with the IDR 3 trillion core capital requirement, the Financial Services Authority may consider introducing transitional flexibility or phased implementation mechanisms that reflect differences in capital readiness among UUS BPD. In parallel, consolidation strategies should be differentiated, with merger approaches more appropriate for UUS BPDs with large asset bases, while joint business group models are better suited for small and medium-sized units that face structural constraints but retain growth potential through collaboration and synergy. The effectiveness of both consolidation paths depends heavily on strengthening digital infrastructure, expanding branch networks, and developing human capital through competency-based programs to ensure operational integration and efficiency. Moreover, the strategic role of anchor banks or Sharia Commercial Bank Jangkar should be reinforced through regulatory incentives that encourage financial linkages, shared technological platforms, and improved liquidity access, thereby accelerating the transformation of UUS BPDs into more resilient and competitive institutions within Indonesia's Islamic banking ecosystem.

## **CONCLUSION**

This study finds that consolidation significantly influences the financial viability of sharia business units under regional development banks. Both merger and joint business

group schemes place post-consolidation sharia business units in the moderately potential category (index 2.0–2.49), indicating satisfactory stability but not optimal institutional resilience. The merger between sharia business units under regional development Banks, East Java and West Kalimantan, produced the highest index (2.339), though regulatory requirements on minimum core capital limit its feasibility.

In contrast, the joint business group model consistently delivers moderately promising outcomes across all scenarios, enabling interbank synergy in capital mobilization, branch expansion, and technological integration without requiring full mergers. These findings imply that while mergers can enhance stability, they pose structural and capitalization challenges, especially for UUS with limited assets, whereas a joint business group offers a practical alternative for smaller units to improve efficiency while maintaining autonomy. Limitations of this study include reliance on simulation models and fixed-effect estimations, which may not fully capture dynamic market behavior, regulatory shifts, or organizational nuances. Future research should examine long-term post-consolidation performance, the role of digital banking, and comparative analyses of consolidation strategies across regions to strengthen generalizability.

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

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

**DECLARATION OF GENERATIVE AI STATEMENT:** During the preparation of this work, the author(s) used ChatGPT, Grammarly, and Turnitin in order to enhance readability, check grammatical consistency, and evaluate textual similarity. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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