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The Nexus Between Islamic Bank Financing for MSMEs, Financing Quality, and Regional Unemployment: Evidence from Indonesian Provinces

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ABSTRACT

Background: As the stability of the labor market becomes a central pillar of regional economic resilience, the role of Islamic financial intermediation faces critical scrutiny. While Islamic banking aims to foster social welfare, the transmission gap between financing expansion and actual employment absorption remains a challenge. This study investigates the nexus between Islamic MSME financing, financing quality, and regional unemployment across 33 Indonesian provinces, evaluating whether the quality of intermediation (risk) or its quantity (volume) serves as the primary determinant for labor market outcomes.
Method: Utilizing a balanced panel data set of 198 observations from 2020 to 2025, this research employs a quantitative approach. The analytical framework utilizes the Fixed Effect Model (FEM) with Robust Standard Errors (Huber-White sandwich estimators) to address heteroskedasticity and first-order autocorrelation. The model was validated through the Chow, Hausman, Modified Wald, and Wooldridge tests to ensure the robustness of the empirical findings.
Results: The empirical results reveal that Non-Performing Financing (NPF) exerts a significant positive impact on the unemployment rate ($p < 0.05$), confirming that elevated credit risk triggers business failures and subsequent job losses. Conversely, MSME financing volume and liquidity ratios (FDR) exhibit no significant direct effect on unemployment reduction. Notably, economic growth (GRDP) remains the primary negative predictor of unemployment, reaffirming the validity of Okun's Law in the regional context.
Conclusion: This study concludes that the quality of Islamic banking intermediation is more critical than its quantity in addressing socio-economic challenges. Strengthening risk management and financing quality is essential to prevent a credit crunch that hinders labor absorption. Policy interventions should shift from purely growth-oriented strategies to risk-managed growth, ensuring that financing is directed toward labor-intensive sectors accompanied by robust business mentorship to safeguard regional employment stability.

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INTRODUCTION

In recent decades, the Islamic banking sector in Indonesia has transformed into a strategic pillar for fostering inclusive economic growth, particularly through the empowerment of Micro, Small, and Medium Enterprises (MSMEs) (Amalia & Azizuddin, 2022). As the nation with the largest Muslim population in the world, Islamic banking in Indonesia is expected to function not only as a financial intermediation institution but also as an instrument for alleviating social issues, including unemployment (Darmawan et al., 2023; Fitriyah, 2020). The relationship between banking intermediation and labor market stability is frequently perceived as a linear correlation, where enhanced access to capital is assumed to automatically generate employment (Ayadi, Naceur, & Goaied, 2021). Conversely, economic dynamics continue to present complex challenges, where the availability of capital does not always translate proportionally into a reduction in unemployment rates (Garcia, 2023).

Although monetary authorities have launched various relaxation policies to stimulate the expansion of Islamic financing for post-pandemic economic recovery, the transmission of these policies into regional labor markets appears non-uniform. In several provinces, the increase in capital disbursement to the MSME sector was paradoxically followed by a rise in financing risk (NPF), which ultimately acted as a barrier to capital allocation in generating employment (Soremekun et al., 2024;Adil et al., 2025). This phenomenon indicates a disruption in the Islamic intermediation value chain, where the negative externalities of financing risk may exert a more significant weight on unemployment rates than the positive effects of the capital volume itself.

To delineate the urgency of this study, previous research can be categorized into three major thematic groups. The first group focuses on the role of Islamic banking in driving aggregate economic growth, positioning financial access as the primary engine for output expansion (Saleem et al., 2021; Kazak et al., 2023; Rizvi et al., 2020). Consequently, these studies tend to overlook the distributional effects of such growth on the labor market. The second group explores the nexus between Islamic finance and social indicators, such as poverty and unemployment, yet predominantly limits its scope to the quantity or volume of financing without accounting for risk dimensions (Karlan et al., 2021; Meslier et al., 2020). The third group emphasizes the importance of Islamic banking stability and asset quality (NPF); however, these studies generally link these factors to bank profitability (Purwanto & Yanuar, 2017), rather than their socio-economic externalities, such as labor market stability (Hajiyeva et al., 2026; Fedorova et al., 2025).

The significance of this study is rooted in the fact that despite the continuous growth in the volume of Islamic MSME financing, unemployment rates across several provinces still exhibit significant fluctuations (Rukmanda et al., 2025; Fadila et al., 2025). This phenomenon triggers a critical question: is the quantity of disbursed capital truly the determinant factor, or is the quality of such financing more decisive in ensuring MSME business sustainability and labor absorption? In this context, the Non-Performing Financing (NPF) variable plays a pivotal role. High financing risk reflects not only borrower default but also serves as a signal of operational instability within businesses, which has a direct impact on employment termination at the regional level.

This study offers novelty through an integrative analysis that connects financing volume (quantity), liquidity (availability), and financing risk (quality) to unemployment, utilizing provincial-level panel data in Indonesia. Most previous studies are limited by their reliance on aggregate national data, which tends to overlook regional spatial disparities. Consequently, this research fills a critical gap unaddressed by prior scholars by exploring the nexus between internal Islamic banking variables and macroeconomic variables concerning regional unemployment dynamics.

The primary objective of this research is to analyze the extent to which Islamic MSME financing, liquidity (FDR), and financing quality (NPF) influence the unemployment rate in Indonesia. The hypothesis tested in this study is that improving financing quality (indicated by a lower NPF) carries a more profound significance in reducing unemployment compared to a mere increase in financing volume. By elucidating this relationship, the findings are expected to provide strategic recommendations for monetary and banking authorities in formulating higher-quality credit policies to support national labor market stability.

METHOD

Data and Sample Selection

This research utilizes secondary panel data sourced from Islamic Banking Statistics reports, the Indonesian Central Bureau of Statistics (BPS), and the Directorate General of Fiscal Balance (https://djpk.kemenkeu.go.id). The research sample encompasses 33 provinces in Indonesia, with an annual observation period spanning from 2020 to 2025. The total number of observations in this study is 198 (33 provinces x 6 years). The selection of this period is crucial as it captures the post-pandemic economic dynamics and the national economic recovery phase.

Operational Definition and Measurement of Variables

The variables in this study are defined and operationalized to ensure measurement consistency throughout the observation period, as presented in Table 1. This classification distinguishes between the dependent variable, the main independent variables representing the Islamic banking nexus, and the control variables representing the macroeconomic environment.

Table 1. Operational Definition and Measurement of Variables

Variable Category	Variable Name	Symbol	Definition & Operationalization	Unit/Scale
Dependent	Unemployment Rate	*Unplo*	The percentage of the labor force that is unemployed and actively seeking employment in each province.	Percent (%)
Independent	MSME Financing	*LnUMKM*	The total amount of financing disbursed by Islamic Banks to Micro, Small, and Medium Enterprises, transformed into natural logarithms.	Ln (IDR)
	Financing Quality	*NPF*	Non-Performing Financing; the ratio of problematic financing to the total financing disbursed by Islamic Banks.	Percent (%)
	Liquidity Ratio	*FDR*	Financing to Deposit Ratio; the ratio of total financing to total third-party funds collected by Islamic Banks.	Percent (%)
Control	Economic Growth	*PDRB*	The annual growth rate of Gross Regional Domestic Product (GRDP) based on constant prices.	Percent (%)
	Population Size	*LnPoP*	The total number of people residing in each province, transformed into natural logarithms.	Ln (People)
	Gov. Expenditure	*LnGE*	The total realized regional government expenditure (APBD), transformed into natural logarithms.	Ln (IDR)

Model Specification

The econometric model in this study is expressed in the following panel data regression equation:

$$Unplo_{it} = \alpha + \beta_1 LnUMKM_{it} + \beta_2 NPF_{it} + \beta_3 FDR_{it} + \beta_4 PDRB_{it} + \beta_5 LnPoP_{it} + \beta_6 LnGe_{it} + \varepsilon_{it} \quad (1)$$

Where

i : Cross-sectional entity (33 Provinces in Indonesia).

t : Time dimension (Period from 2020 to 2025).

α : The constant or model intercept.

$\beta_1 \ldots \beta_6$: Regression coefficients indicating the elasticity or the direction of the influence of independent variables.

Ln : Natural Logarithm transformation used to normalize the data scale.

ε_{it} : The error term or model residual, assumed to satisfy the normal distribution assumption.

Estimation Procedure and Diagnostic Tests

This study employs a systematic and rigorous panel data estimation procedure to ensure the validity of the empirical results. The initial stage begins with determining the most appropriate estimation model through a series of formal tests. The Chow Test is conducted to compare the Common Effect Model (CEM) and the Fixed Effect Model (FEM), followed by the Hausman Test to decide between the Fixed Effect Model (FEM) and the Random Effect Model (REM) (Lee & Yu, 2020). Based on the results of these two tests, this study adopts the Fixed Effect Model (FEM) as the most credible model for capturing the province-specific characteristics across Indonesia.

The second stage involves classical assumption testing to ensure that the model is free from statistical bias. Given the high complexity inherent in regional panel data, tests were conducted for multicollinearity using the Variance Inflation Factor (VIF), heteroscedasticity via the Modified Wald Test, and autocorrelation using the Wooldridge Test (Disatnik & Sivan, 2016), The diagnostic results indicate that while the model is free from multicollinearity issues, there are strong indications of heteroscedasticity and first-order autocorrelation.

As a solution to the issues of heteroscedasticity and autocorrelation, the final stage is conducted by applying the Robust Standard Errors (VCE robust) method. The use of this robust approach is crucial for correcting standard errors biased by heteroscedasticity and autocorrelation (Kiefer & Vogelsang, 2002). Consequently, the resulting estimators remain unbiased, consistent, and efficient. This ensures that the interpretation of statistical significance (p-values) and the hypothesis testing in this study remain valid and scientifically accountable, despite the initial violations of classical assumptions in the raw data.

RESULTS AND DISCUSSION

Results

Descriptive Statistics Analysis

Table 2 presents the summary of descriptive statistics for all research variables across 33 Indonesian provinces during the 2020–2025 observation period.

Table 2. Descriptive Statistics of Research Variable

Variable	Mean	Std. Dev.	Min	Max
Unemployment Rate	4.924	1.559	1.535	10.015
MSME Financing	6.551	2.037	1.609	9.969
Non-Performing Financing	4.779	3.536	0.021	19.231
Financing to Deposit Ratio	108.078	41.981	25.37	266.750
Economic Growth (GRDP)	4.253	4.450	-9.340	34.170
Population Size	8.480	0.964	7.034	10.827
Government Expenditure	8.846	0.830	7.401	11.156

Surce: Research Data (2026)

Table 2 presents a summary of the descriptive statistics for all research variables across 33 Indonesian provinces during the 2020–2025 period, indicating significant data variability in both Islamic banking and macroeconomic indicators. The average unemployment rate (Unplo) stands at 4.92%, with a wide range spanning from 1.53% to 10.01%, reflecting disparities in labor absorption capacity across regions. In the Islamic banking sector, the Non-Performing Financing (NPF) variable exhibits high volatility, with a standard deviation (3.53%) nearing its mean (4.77%) and a maximum value reaching 19.23%, indicating a sharp disparity in regional risk management quality. Islamic banking liquidity, measured by the FDR, shows a highly expansive position with an average of 108.07%, even reaching an extreme peak of 266.75% in certain regions. Meanwhile, economic growth (GRDP) recorded a negative minimum value of -9.34%, representing the impact of economic contraction during the observation period. Other control variables, such as total population (LnPoP) and government expenditure (LnGE), tend to have more stable distributions with relatively low standard deviations.

Model Selection and Diagnostic Tests

Prior to parameter estimation, a series of tests were conducted to determine the most efficient and consistent panel data model. The summary of these diagnostic tests is presented in Table 3.

Table 3. Model Selection and Classical Assumption Tests

Test Type	Method	Statistical Value	Prob.	Conclusion
Model Selection				
1. Chow Test	F-test	34.47	0.000	Fixed Effect (FE) is better than CEM
2. Hausman Test	Chi-Square	42.81	0.000	Fixed Effect (FEM) Selected
Classical Assumption				
1. Multicollinearity	Mean VIF	2.48	-	No Multicollinearity
2. Heteroskedasticity	Modified Wald	2873.9	0.000	Heteroskedasticity Present (Resolved via Robust)
3. Autocorrelation	Wooldridge	47.207	0.000	Autocorrelation Present (Resolved via Robust)

Source: Stata 17 Output (2026)

Prior to parameter estimation, a series of tests were conducted to determine the most efficient and consistent panel data model. The summary of these diagnostic tests is presented in Table 3. Based on the model selection test results, the Chow Test yielded an F-test value of 34.47 ($p < 0.05$), indicating that the Fixed Effect Model (FEM) is more appropriate than the Common Effect Model. Subsequently, the Hausman Test reinforced this decision with a Chi-Square value of 42.81 ($p < 0.05$); thus, the FEM was officially designated as the optimal model for this analysis. Regarding the classical assumption tests, a VIF value of 2.48 confirms the absence of multicollinearity issues among the independent variables. However, the Modified Wald Test and Wooldridge Test each yielded significance values of 0.000, indicating violations of the heteroscedasticity and autocorrelation assumptions within the model. To address these statistical challenges and ensure that parameter estimates remain consistent and efficient, this study applies the Robust Standard Errors approach. Consequently, the hypothesis testing results remain valid for interpretation, despite disturbances in the residual structure of the panel data.

Hypothesis Testing and Estimation Results

The final estimation results using the Fixed Effect Model (FEM) with Robust Standard Errors are presented in Table 4. The model yields a Prob > F value of 0.0001, indicating that all independent variables simultaneously exert a significant effect on the regional unemployment rate at a 99% confidence level. The R-squared value of 0.3949 suggests that the model explains approximately 39.49% of the variation in regional unemployment across the 33 provinces. These results confirm the overall robustness of the model and its suitability for testing the proposed hypotheses.

Table 4. Final Estimation Results: Fixed Effect Robust Model

Variables	Coefficient	Robust Std. Error	t-Statistic	Prob.	Significance
Main Independent					
MSME Financing (LnUMKM)	-0.1107	0.2251	-0.490	0.626	Not Sig.
Non-Performing Financing (NPF)	0.0796	0.0328	2.420	0.021	Sig. 5%
Financing to Deposit Ratio (FDR)	0.0025	0.0049	0.520	0.606	Not Sig.
Control Variables					
Economic Growth (PDRB)	-0.0571	0.0159	-3.590	0.001	Sig. 1%
Population Size (LnPoP)	-11.9605	2.4504	-4.880	0.000	Sig. 1%
Gov. Expenditure (LnGE)	-0.1968	0.2598	-0.760	0.454	Not Sig.
Constant	108.401	20.520	5.280	0.000	Sig. 1%

Model Fitness					
Observations	198		R-Squared	0.3949	
F-statistic (Prob.)	0.000		Number of IDs	33	

Source: Stata 17 Output (2026)

Based on the partial testing, Non-Performing Financing (NPF) exhibits a significant positive coefficient of 0.0796 ($p < 0.05$), confirming that elevated financing risk in Islamic banking directly contributes to rising regional unemployment. This finding underscores the hypothesis that financing quality is a critical determinant of labor market stability. In contrast, MSME Financing volume (LnUMKM) and the Financing to Deposit Ratio (FDR) do not yield statistically significant impacts. This suggests that the mere volume of financing, absent high-quality asset management, is insufficient to catalyze job creation.

Regarding the control variables, Economic Growth (GRDP) exerts a significant negative effect (-0.0571, $p < 0.05$), reinforcing the validity of Okun's Law in the context of Indonesian provinces. Interestingly, Population Size (LnPoP) also shows a significant negative coefficient, implying that more populous provinces may benefit from economic agglomeration and more diverse labor markets. However, Government Expenditure (LnGE) does not demonstrate a significant influence, potentially due to a time lag between public spending and its actualized impact on employment.

Discussion

The Risk-Unemployment Nexus: Why Quality Matters

The primary finding of this study reveals a significant positive influence of Non-Performing Financing (NPF) on the unemployment rate, with a coefficient of 0.0796. This result can be elucidated through a risk transmission mechanism where NPF serves as a proxy indicator for operational failures in the real sector, particularly among MSMEs. According to financial intermediation theory, a high ratio of non-performing financing reflects information asymmetry and capital allocation inefficiency, leading to cash flow distress within business units (Wang, Zhang, & Zhao, 2022). Within the Islamic economic ecosystem which emphasizes real economic activity and underlying assets a debtor's failure to meet obligations is not merely a financial loss for the bank, but a signal of halted production activities. This condition triggers a domino effect where distortions in business performance force entities to implement cost-efficiency measures, directly resulting in employment termination to ensure corporate survival (Kazak et al., 2023).

Previous research indicates that the quality of intermediation is far more crucial for macroeconomic stability than a mere expansion of capital access. An increase in NPF creates pressure on the credit supply side through the credit crunch phenomenon, where banks tend to become more conservative and restrict fund distribution to other productive sectors to maintain their soundness ratios (Bernauer & Koubi, 2004). This aligns with the findings of Barra & Zotti (2022), who state that poor banking asset quality can hinder regional economic growth and exacerbate labor market conditions. Therefore, these findings underscore that financing not governed by sound risk management can, in fact, become a burden on labor market stability. The validity of these results demonstrates that the stability of the Islamic financial sector has an organic linkage to socio-economic resilience by safeguarding labor absorption capacity at the provincial level.

Furthermore, this relationship highlights the cyclical vulnerability inherent in regional economies where credit risk acts as a restrictive barrier to entrepreneurial expansion. When NPF rises, it does not only signify past business failures but also preemptively stifles future job creation by increasing the cost of capital and tightening collateral requirements for new entrepreneurs. This behavioral shift among Islamic financial institutions—moving from a partnership-oriented approach to a defensive risk-mitigation stance—creates a contraction in the local labor market that disproportionately affects labor-intensive MSMEs. Consequently, the high sensitivity of the unemployment rate to NPF fluctuations in this study suggests that without institutional mechanisms to restructure troubled financing, the banking sector unintentionally accelerates a pro-cyclical downturn in regional employment (Eckstein, Setty, & Weiss, 2019).

The Paradox of MSME Financing Volume: Quality vs. Quantity

A compelling finding in this study is the statistical insignificance of the MSME financing volume (LnUMKM) and the liquidity ratio (FDR) in reducing the unemployment rate. This phenomenon indicates a wide transmission gap within the Islamic financing mechanism at the regional level. While an increase in financing volume is theoretically expected to lower unemployment through business expansion, these empirical results suggest that merely increasing capital flows without considering the target sectors is insufficient. This is likely due to the concentration of financing allocations, which remain dominated by the trade sector—characterized by short-term intermediation and low labor-absorptive capacity. Unlike the manufacturing or agricultural sectors, which possess strong backward linkages for labor absorption, the trade sector tends to have lower employment elasticity (Rodrik & Sandhu, 2025).

Furthermore, these findings emphasize the urgent role of Islamic banking beyond its function as a mere liquidity provider. From an institutional economic perspective, the effectiveness of capital in generating employment is heavily contingent upon business mentorship and the managerial capacity of the debtors (Liu et al., 2024). Without a robust technical guidance system, capital injections will only increase the scale of working capital without being accompanied by a significant expansion in the workforce. This aligns with research by Liu et al. (2024), which states that the impact of Islamic bank financing on social welfare is often hindered by allocative inefficiencies and a lack of focus on productive-progressive sectors. Consequently, this paradox suggests that the primary challenge for Islamic banking in Indonesia today is not a scarcity of funds, but rather the strategic direction of that liquidity toward sectors capable of generating a broader labor multiplier effect.

This structural mismatch further suggests that the expansion of Islamic MSME financing has potentially fallen into a growth-without-employment trap, where capital is utilized primarily for capital-intensive automation or inventory stocking rather than labor expansion. In a regional context, when financing is funneled into businesses with low marginal productivity of labor, the resulting output growth fails to translate into meaningful job opportunities. This decoupling of financing growth and employment indicates that Islamic financial institutions must recalibrate their credit scoring models to incorporate social impact metrics, specifically prioritizing MSMEs that demonstrate high labor-absorptive potential. Without such a strategic shift, the increase in financing volume remains a mere statistical growth on bank balance sheets, failing to fulfill its foundational mandate of fostering social equity and broad-based economic welfare (Storm, 2018).

Macroeconomic Controls and Regional Agglomeration

The findings of this study confirm the relevance of Okun's Law at the regional level in Indonesia, where economic growth consistently serves as the most effective instrument for reducing unemployment rates (Lee & Huruta, 2019). A coefficient of -0.0571 indicates that every 1% increase in GRDP contributes to a 0.05% decrease in the unemployment rate. Theoretically, the expansion of aggregate output creates a derived demand for labor, where growth in the real sector compels firms to expand production capacity and recruit new workers (Hopenhayn, Neira, & Singhania, 2022). This result aligns with research by Fazzari et al. (2020), which asserts that stable GRDP growth is a primary prerequisite for labor market stability. The high significance level in this model proves that economic growth remains the primary engine for alleviating labor issues across the 33 Indonesian provinces.

Conversely, the finding regarding the significant negative impact of population size (LnPoP) on unemployment offers a new perspective that challenges classical Malthusian views. Instead of being a burden, a large provincial population correlates with lower unemployment rates (Malizia & Ke, 1993). This phenomenon can be explained through economic agglomeration theory, where regions with high population concentrations such as provinces on Java Island are capable of creating more dynamic and diversified labor market ecosystems (Rouwendal & Rouwendal, 2025). Population agglomeration fosters efficient labor matching and attracts more massive infrastructure investment, thereby generating a labor absorption capacity far greater than that of sparsely populated regions with limited economic access (Liu et al., 2024). Consequently, Indonesia's large population acts as an economic asset by forming growth centers capable of providing employment more efficiently.

This synergy between GRDP growth and population agglomeration underscores a virtuous cycle of regional development, where market size becomes a catalyst for industrial scaling. In densely populated provinces, the concentration of human capital creates a thick labor market that reduces search

costs for firms, thereby amplifying the impact of economic growth on job creation. Unlike the Malthusian trap that views population as a drain on resources, these results suggest that in the Indonesian context, provincial population density provides the economies of scale necessary for the formal sector to thrive. Therefore, the effectiveness of economic growth in reducing unemployment is not uniform; it is significantly enhanced in regions where demographic density facilitates infrastructure efficiency and a more specialized division of labor, turning population pressure into a driver of productive employment (Burgi & Gorgulu, 2024).

CONCLUSION

This study successfully maps the complex nexus between Islamic banking intermediation and the labor market across 33 Indonesian provinces during the 2020–2025 period. The results of the panel data analysis, utilizing the Fixed Effect Robust Model, conclude that the quality of Islamic financing proxied by Non-Performing Financing (NPF) is a primary determinant affecting regional unemployment rates. These findings confirm that high financing risk not only threatens banking stability but also directly impacts MSME business failures, which in turn triggers a rise in unemployment. Conversely, the volume of MSME financing and the liquidity level (FDR) do not exhibit a significant influence, indicating inefficiencies in the transmission of Islamic capital into labor-intensive real sectors. Meanwhile, economic growth (GRDP) remains the most effective macro-control factor for labor absorption at the regional level.

Based on the findings of this study, several strategic policy recommendations are proposed to strengthen the role of Islamic banking in labor market stability. First, for the Financial Services Authority (OJK) and Bank Indonesia, it is imperative to tighten the supervision of Islamic banking Non-Performing Financing (NPF) ratios at the regional level; this policy is not only crucial for financial system stability but must also be viewed as an integral part of regional labor protection strategies. Second, Islamic banks are expected to transform their MSME financing growth strategies from a quantity-based approach to a quality-based one by strengthening risk early-warning systems and providing intensive business mentorship schemes for debtors to ensure business continuity. Finally, for Regional Governments, unemployment reduction policies should be directed toward creating an investment ecosystem capable of triggering high-quality GRDP growth, while simultaneously fostering stronger synchronization between the Islamic financial sector and leading regional sectors with high labor absorption capacity.

This study is subject to certain limitations, particularly regarding the scope of variables, which focuses solely on aggregate Islamic banking data. Future research is expected to deconstruct the impact of financing based on specific contract types (such as Murabahah versus Mudharabah) or to conduct a more profound sectoral analysis to identify which MSME sub-sectors are most sensitive to Islamic financing in terms of job creation.

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