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SHARIA BANKING AND SUSTAINABLE DEVELOPMENT GOALS: AN EMPIRICAL ANALYSIS OF SOCIO-ECONOMIC INDICATORS AND INCLUSIVE GROWTH IN ACEH PROVINCE

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ABSTRACT

This study examines whether Aceh's mandatory Sharia financial system contributes to SDG-related socio-economic outcomes and inclusive growth during the 2020–2024 period. Although Aceh represents a distinctive jurisdiction-level case of Sharia finance, limited empirical evidence explains how Sharia banking intermediation and regional fiscal policy jointly shape welfare outcomes. This study analyzes balanced panel data from 21 districts/cities in Aceh, comprising 105 district-year observations, using fixed-effects models with robust standard errors applied where heteroskedasticity is detected. The results show that Sharia financing is significantly associated with lower unemployment, indicating its role in strengthening labor absorption through productive financial intermediation. The Financing-to-Deposit Ratio (FDR) is positively associated with the Human Development Index (HDI), suggesting that more active Sharia banking intermediation supports human development. However, regional government expenditure is positively associated with the Gini Ratio, revealing a fiscal paradox in which public spending appears insufficiently redistributive. The study concludes that Aceh's Sharia financial transformation cannot rely solely on banking intermediation; it requires stronger alignment with inclusive fiscal governance. This research contributes to Islamic economics by showing that ethical financial transformation produces broader welfare effects only when supported by redistributive public policy.

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INTRODUCTION

Aceh Province occupies a distinctive position as a natural laboratory for Islamic economics, as it is the only jurisdiction in Indonesia to implement a comprehensive Sharia-based financial system under Qanun No. 11 of 2018 concerning Sharia Financial

Institutions (*Lembaga Keuangan Syariah*, LKS) (Purwanto et al., 2025). This regulatory framework required the conversion of conventional banking operations into Sharia-compliant financial services by 2020, thereby repositioning Sharia banking not merely as a profit-oriented institution, but as a strategic instrument for socio-economic welfare and inclusive development (Fahmi, 2023). As a special autonomous region, Aceh provides an important empirical setting for examining whether a system-wide financial transition can accelerate progress toward the Sustainable Development Goals (SDGs).

However, this institutional transformation has also exposed a persistent socio-economic paradox. Although Sharia banking financing has grown substantially since 2020, key welfare indicators—such as open unemployment and poverty rates—remain stagnant or highly volatile across several districts (BPS, 2025). Despite the expansion of Sharia financial intermediation, its expected welfare-enhancing effects on income inequality reduction and employment absorption have not materialized in a consistent manner (OJK, 2025). This condition raises critical questions about the extent to which Sharia financing has effectively reached productive and inclusive real-sector activities.

This discrepancy requires a rigorous evaluation of the variables that link banking performance, fiscal policy, and inclusive growth. This study uses Sharia financing and the financing-to-deposit ratio (FDR) to capture Sharia banking intermediation, while the Human Development Index, poverty rate, unemployment rate, and Gini Ratio represent multidimensional indicators of inclusive growth. Government expenditure is incorporated as a fiscal policy variable, and population size is included as a control variable. This specification enables the study to assess whether regional fiscal interventions during the economic recovery period have reinforced, complemented, or diverged from the social objectives of Sharia banking.

The existing literature offers a diverse yet fragmented foundation, leaving a significant discursive gap. Purwanto et al. (2025) comprehensively mapped the resilience and financial health of Sharia banks during the transition. However, the regulatory efficacy of the transition has been questioned by Bin-Armia et al. (2024), who found that Qanun No. 11/2018 had only a limited effect on the performance of financial firms and did not generate significant Cumulative Abnormal Returns (CAR). More importantly, their findings point to an anomaly in which the implementation of the law coincided with rising poverty indicators, suggesting a possible misalignment between normative objectives and economic outcomes.

Public concerns regarding the social consequences of this transition were also documented by Bayumi, Jaya, and Diem (2024), who reported protests over potential unemployment risks after conventional banks were excluded. Conversely, Kurniawan et al. (2023) interpreted the phenomenon through a transformative lens, arguing that the Qanun strengthened Aceh's politico-legal framework by aligning financial practices with local cultural and religious values and broader shared communal aspirations.

At the global level, these divergent findings from Aceh reflect a broader debate on the socio-economic role of Sharia banking. Recent international studies (e.g., Quist, 2023; Tok et al., 2022) argue that Islamic financial institutions possess an ethical foundation that can support inclusive growth and human development. Nevertheless, their practical

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effectiveness often depends on the depth of the local regulatory ecosystem and its alignment with fiscal objectives. The global shift toward value-based intermediation also suggests that Sharia banking should, in principle, perform better than conventional models in poverty reduction and employment creation because of its risk-sharing orientation (Grassa et al., 2022). This study therefore positions the Acehnese experience not merely as a regional anomaly, but as a critical empirical test of these global propositions within a fully mandated Sharia financial jurisdiction.

Despite these contributions, a substantial research gap remains. Existing studies have largely been bank-centric, focusing on internal financial performance, or have examined only the sociological and legal dimensions of Aceh's Sharia financial transition. They have not yet offered an integrated empirical assessment of how Sharia banking intermediation and public expenditure jointly affect multidimensional SDG-related welfare outcomes. This study addresses this gap by examining whether the interaction between fiscal policy and Sharia finance helps explain Aceh's development paradox. Accordingly, it asks: (1) To what extent do Sharia financing and FDR affect unemployment and human development in Aceh? (2) How do these indicators influence economic growth, poverty, and income inequality? and (3) Does regional government expenditure complement or contradict the social outcomes of Sharia banking?

The main novelty of this study lies in its integrated analytical framework, which simultaneously evaluates Sharia financial intermediation, regional fiscal policy, and multidimensional SDG indicators within a single empirical model. Unlike previous studies that tend to examine these dimensions separately, this research uses Aceh's unique institutional context—a fully mandated transition to a Sharia-compliant financial system following Qanun No. 11/2018—as an empirical setting for assessing the Islamic moral economy in practice. By positioning Aceh as a natural laboratory, this study offers a pioneering analysis of the synergy—or possible disconnection—between mandatory Sharia banking flows and regional public expenditure. This integration is crucial for understanding how institutional transformation in the financial sector interacts with decentralized fiscal management in shaping poverty alleviation, employment generation, and income equality. The findings are expected to provide a strategic reference for other emerging economies seeking to develop a more holistic Sharia-based socio-economic transformation.

By addressing these questions, this study evaluates the effectiveness of Aceh's mandatory jurisdiction-level Sharia economic model during the 2020–2024 period. Using panel data analysis across 21 districts/cities, the study aims to provide a strategic roadmap for authorities to synchronize fiscal functions and Sharia financial intermediation. The urgency of this inquiry is clear: without precise policy synergy, Aceh's Sharia economic system risks becoming a form of institutional rebranding rather than a driver of substantive welfare transformation.

LITERATURE REVIEW

Theoretical Foundation

This study integrates Financial Intermediation Theory, Endogenous Growth Theory, *Maqāṣid al-Sharīʿah*, and Fiscal Decentralization Theory to explain how Aceh's Sharia financial transition may affect inclusive growth. Financial Intermediation Theory, developed by Gurley and Shaw (1960), explains how financial institutions reduce information asymmetry and transaction costs by mobilizing funds from surplus units to deficit units (Allen & Santomero, 1997). In Aceh's post-LKS Qanun era, this intermediation function has shifted from interest-based mechanisms to profit-and-loss sharing (PLS), which theoretically strengthens the link between financial flows and real-sector activity because Sharia financing must be supported by underlying assets (Rampini & Viswanathan, 2019).

However, financial intermediation alone does not guarantee equitable development. Lucas's (1988) Endogenous Growth Theory emphasizes human capital as a key driver of long-term growth, making the Human Development Index (HDI) central to evaluating whether Sharia banking contributes beyond Gross Regional Domestic Product (GRDP) expansion. This argument is reinforced by *Maqāṣid al-Sharīʿah*, particularly *ḥifẓ al-māl*, which frames economic growth as meaningful only when it protects wealth, supports vulnerable groups, and reduces structural inequality (Abd-Rahman et al., 2020).

The role of the state is therefore crucial in ensuring that Sharia financial transformation generates inclusive welfare outcomes. From an Islamic political economy perspective, this role can be understood through *siyāsah sharʿiyyah*, namely the exercise of public authority to secure justice, welfare, and public interest within the framework of Islamic law. While Kurniawan et al. (2023) suggest that Sharia banking can strengthen development through institutional and politico-legal transformation, Bin-Armia et al. (2024) show more mixed outcomes in poverty and inequality in Aceh. This contrast indicates the limitation of isolated intermediation models that overlook the state's fiscal and regulatory role.

Accordingly, this study adopts Fiscal Decentralization Theory, which argues that local governments possess informational advantages in allocating public expenditure for development priorities (Akai & Mikami, 2006; Klibanoff & Poitevin, 2022; Li & Li, 2024). The integration of these theories positions inclusive growth as a contingent outcome shaped by Sharia intermediation, human capital development, state fiscal capacity, and regional government expenditure.

Hypothesis Development

This section derives empirically testable hypotheses from the theoretical framework by positioning Sharia banking as a transmission channel for socio-economic transformation. Financing distributed by Sharia Commercial Banks (*Bank Umum Syariah*, BUS) and Sharia Business Units (*Unit Usaha Syariah*, UUS) across Aceh's districts provides productive capital for the real sector. Improved access to financing is expected to increase the productivity of micro, small, and medium enterprises (MSMEs), agriculture, fisheries, and other labor-intensive sectors, thereby strengthening household income and labor absorption.

Sharia Financing and SDG-Related Outcomes

Sharia banking financing is expected to promote economic growth by channeling working capital and investment into productive real-sector activities (Karlan et al., 2021; Rizvi et al., 2020). Its asset-backed structure links financial expansion to tangible economic activity and reduces the risk of speculative financing. This mechanism is consistent with the supply-leading hypothesis, which argues that financial development stimulates GRDP by reallocating resources toward productive and labor-intensive sectors. In Aceh's mandatory Sharia financial system,

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this role becomes more significant because Sharia banks function as key providers of formal financing. Previous studies show a positive relationship between Islamic banking development and economic growth in Muslim-majority economies (Abedifar et al., 2016; Gheeraert, 2014). Tok and Yesuf (2022) further emphasize that value-based principles in Islamic banks can strengthen institutional resilience, sustainability, and social impact. However, the strength of this transmission depends on whether financing reaches sectors with high multiplier effects. Accordingly, increased Sharia banking financing is expected to support district-level productivity and economic growth in Aceh.

H1a*:* Sharia banking financing has a positive and significant effect on economic growth.

Sharia banking financing is also expected to reduce income inequality through the distributive orientation of Islamic finance, particularly its emphasis on partnership, risk-sharing, and broader access to productive capital. By expanding financing access for SMEs and previously underserved groups, Sharia financial institutions may support wider income distribution and reduce socio-economic disparities (Bougatef et al., 2020). This argument is reinforced by the prohibition of ribā and the emphasis on justice in Sharia-compliant contracts, which are intended to prevent excessive capital concentration and promote equitable economic participation (Suzuki & Miah, 2021).

Empirical evidence further suggests that Islamic banking can contribute to income redistribution and inequality reduction in Muslim-majority contexts (Yusuf et al., 2025). However, this redistributive effect depends on financial literacy, accessibility, and the inclusion of marginalized groups in formal financing. In Aceh, the expansion of Sharia financing is therefore expected to reduce structural inequality by broadening access to productive capital.

H1b: Sharia banking financing has a negative and significant effect on the Gini Ratio.

From the perspective of *Maqāṣid al-Sharīʿah*, the protection of life (*ḥifẓ al-nafs*) and intellect (*ḥifẓ al-ʿaql*) is closely related to human development (Jatmiko et al., 2024). Sharia-compliant financing directed toward productive and socially beneficial sectors may improve household welfare by expanding income-generating opportunities and access to education, healthcare, and basic services. In this sense, Sharia banking may contribute to the Human Development Index (HDI), which reflects longevity, knowledge, and a decent standard of living. This relationship operates through the social-impact channel of Sharia finance. Financing for micro-entrepreneurs and households can stabilize income, improve consumption capacity, and support investment in education and health.

Novreska and Arundina (2024) show that Islamic financial inclusion contributes positively to human development indicators. In Aceh, where the financial system has been institutionally restructured toward Sharia compliance, financing is expected not only to generate commercial returns but also to support human capital formation and long-term regional welfare.

H1c: Sharia banking financing has a positive and significant effect on the Human Development Index (HDI).

Sharia financing is expected to reduce unemployment by supporting business expansion and job creation. Productive financing modes, including *muḍārabah* and *mushārakah*, provide entrepreneurs with capital to expand their operations (Kazak et al., 2023). Because Sharia financing is linked to tangible economic activities, it may generate a more direct multiplier effect on production and labor demand than purely financial transactions. This mechanism is particularly relevant in Aceh, where MSMEs constitute an important source of employment. Setiawan et al. (2024) show that Sharia banking financing is associated with job creation, especially in contexts where Islamic finance plays a significant institutional role. Accordingly, the expansion of Sharia financing is expected to strengthen labor absorption across Aceh's districts and cities.

H1d: Sharia banking financing has a negative and significant effect on the unemployment rate.

Sharia banking financing is also expected to reduce poverty by expanding low-income groups' access to productive capital. By offering financing without interest-based obligations, Sharia banking enables vulnerable households and microenterprises to initiate or expand productive activities, increase income, and reduce dependence on informal or exploitative financing (Karlan et al., 2021). This logic aligns with the productive-inclusion model, in which financial access helps poor households shift from survival-based activities toward stable income generation, resilience, and long-term economic mobility.

Partnership-based Sharia contracts may further reduce borrowers' burdens through risk-sharing rather than fixed-interest repayment. Islam et al. (2025) identify financial access as an important determinant of poverty reduction, while Islam and Ahmad (2020) and Cameron (2021) show that Sharia-compliant partnership schemes can improve poor households' welfare through ethical oversight and equitable profit-sharing. Therefore, increased Sharia banking financing is expected to reduce poverty in Aceh by strengthening productive capacity and economic resilience among lower-income groups.

H1e: Sharia banking financing has a negative and significant effect on poverty.

Sharia Intermediation and SDG-Related Outcomes

This study uses the Financing-to-Deposit Ratio (FDR) as a proxy for Sharia banking intermediation. FDR indicates the extent to which deposits collected by Sharia banks are converted into financing activities (Priyadi et al., 2021). A higher FDR suggests that a larger share of public funds is mobilized into productive sectors rather than retained as idle liquidity.

Unlike total financing volume, FDR captures the intensity of fund recycling within the banking system. In Aceh's mandatory Sharia financial framework, this function is crucial because institutional transformation depends not only on the formal presence of Sharia banks, but also on their capacity to channel deposits into productive real-sector financing. Akhtar et al. (2024) emphasize that the quality of financial intermediation supports sustainable growth, while Sulaeman et al. (2019) find that a healthy FDR is positively associated with economic expansion. Accordingly, stronger Sharia banking intermediation is expected to promote economic growth in Aceh.

H2a: The Sharia banking intermediation function has a positive and significant effect on economic growth.

The intermediation function of Sharia banking may reduce inequality by widening access to capital for lower- and middle-income groups. Through active financing distribution,

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Sharia banks can reach sectors and communities that are often underserved by formal financial institutions (Muhammad et al., 2020). In this context, FDR reflects the extent to which public deposits are redirected into community-based financing.

A higher FDR indicates that banks are more actively reallocating funds to SMEs, productive households, and local enterprises through Sharia-compliant financing schemes. Cameron et al. (2021) argue that Sharia financial intermediation can reduce economic disparities because of its emphasis on social justice and profit-sharing. Zuhroh and Malik (2023) similarly find that Sharia banking financing is associated with lower inequality. Accordingly, higher FDR is expected to support more inclusive wealth distribution and reduce the Gini ratio in Aceh.

H2b: The Sharia banking intermediation function has a negative and significant effect on the Gini Ratio.

Sharia financial intermediation may improve human development by easing household and business liquidity constraints. Effective intermediation can expand access to working capital, income-generating opportunities, education, healthcare, and other welfare-enhancing expenditures (Setiawan, 2023). These improvements are reflected in the Human Development Index (HDI), which captures longevity, knowledge, and a decent standard of living (Tok et al., 2022).

This relationship can be understood as a liquidity-to-human-capital transmission process. When deposits are actively converted into productive financing, households and businesses become better able to invest in long-term welfare outcomes. Development economics literature also suggests that efficient financial institutions generate positive spillover effects on macro-social indicators (Akhtar & Rashid, 2024). Therefore, stronger Sharia banking intermediation is expected to improve HDI outcomes in Aceh.

H2c: The Sharia banking intermediation function has a positive and significant effect on the Human Development Index (HDI).

The relationship between Sharia banking intermediation and unemployment operates through real-sector liquidity and job creation. A high FDR indicates that third-party funds are being channeled into business activities, including operational expenditure and capital investment (Muhammad & Nugraheni, 2021). As business activity expands, labor demand is expected to increase.

In Aceh's mandatory Sharia financial system, this mechanism is particularly relevant because Sharia contracts, such as murābaḥah for productive assets and muḍārabah for business financing, are linked to concrete economic activities. Kazak et al. (2023) show that financial intermediation contributes to labor absorption, while Aysan et al. (2018) argue that the real-asset orientation of Islamic banking may strengthen its employment effect. Therefore, stronger Sharia banking intermediation is expected to reduce unemployment in Aceh.

H2d: The Sharia banking intermediation function has a negative and significant effect on the unemployment rate.

Finally, a higher FDR may contribute to poverty reduction by increasing the flow of financing to productive activities among vulnerable groups. When capital reaches low-income households and microenterprises, it can improve productivity, stabilize income, and support movement above the poverty line (Yuli & Rofik, 2023). This argument is consistent with the capital-recycling mechanism in Islamic finance, which requires surplus funds to be redirected toward productive deficit units.

Magwedere et al. (2021) show that robust financial intermediation is an important component of structural poverty reduction. In Aceh, effective intermediation is expected to lower barriers to economic participation by ensuring that local liquidity is reinvested in local productive needs. Consequently, the Sharia banking intermediation function is expected to reduce poverty across Aceh's districts and cities.

H2e: The Sharia banking intermediation function has a negative and significant effect on poverty.

RESEARCH METHODS

This study used a quantitative explanatory design using secondary data from official regulatory and statistical publications. Sharia banking indicators, including total financing volume and the Financing-to-Deposit Ratio (FDR), were drawn from the Sharia Banking Statistics (SPS) published by the Indonesian Financial Services Authority (OJK). SDG-related socio-economic indicators—Gross Regional Domestic Product (GRDP), open unemployment rate, poverty rate, Gini Ratio, and Human Development Index (HDI)—were retrieved from BPS-Statistics Aceh Province, while government expenditure data were sourced from the Directorate General of Fiscal Balance (DJPK). The study covered 21 districts/cities in Aceh Province during 2020–2024 and was structured as a balanced panel dataset combining cross-sectional and time-series variation.

Observation units were selected through purposive sampling based on the availability of complete and consistent data for all variables during the observation period. Data were obtained through documentation by extracting, recording, and classifying information from OJK, BPS, and DJPK publications. Since the study relied solely on secondary data, a documentation matrix was used to organize variables, measurement units, and data sources. Data processing involved constructing a balanced panel dataset, applying natural logarithm transformations to large monetary variables, and conducting diagnostic and model-selection tests to ensure the validity and robustness of the estimated regression models.

The variables were operationalized based on established economic literature, as summarized in Table 1. The dependent variables capture SDG-related socio-economic outcomes, while the independent variables represent the volume and intermediation intensity of Sharia financial intermediation. Government expenditure and population size were included as control variables to reduce omitted-variable bias when estimating the relationship between Sharia financial intermediation and inclusive growth. In Aceh, regional government expenditure, particularly through the Special Autonomy Fund (*Dana Otonomi Khusus*, Otsus), serves as a key fiscal instrument for public goods provision and social protection. Population size was included to account for demographic scale, labor supply, and market capacity, which may affect unemployment, poverty, and other regional welfare outcomes.

Panel data regression was used as the primary analytical technique because it enables the study to examine relationships between variables across districts/cities and time simultaneously. Compared with cross-sectional or time-series analysis alone, panel data regression provides greater degrees of freedom and more efficient estimates (Anwer et al., 2020; Wang et al., 2024). It also allows the model to

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control for unobserved regional heterogeneity, including district-specific socio-economic, institutional, and geographical characteristics that may influence development outcomes in Aceh. To analyze the impact of Sharia financial intermediation and fiscal policy, this study estimated five panel regression models as follows:

$$GRDP_{1,it} = \beta_0 + \beta_1 LnFin_{it} + \beta_2 FDR_{it} + \beta_3 LnGE_{it} + \beta_4 LnPop_{it} + \varepsilon_{it} \quad (1)$$

$$Gini_{1,it} = \beta_0 + \beta_1 LnFin_{it} + \beta_2 FDR_{it} + \beta_3 LnGE_{it} + \beta_4 LnPop_{it} + \varepsilon_{it} \quad (2)$$

$$HDI_{1,it} = \beta_0 + \beta_1 LnFin_{it} + \beta_2 FDR_{it} + \beta_3 LnGE_{it} + \beta_4 LnPop_{it} + \varepsilon_{it} \quad (3)$$

$$Unplo_{1,it} = \beta_0 + \beta_1 LnFin_{it} + \beta_2 FDR_{it} + \beta_3 LnGE_{it} + \beta_4 LnPop_{it} + \varepsilon_{it} \quad (4)$$

$$Pov_{1,it} = \beta_0 + \beta_1 LnFin_{it} + \beta_2 FDR_{it} + \beta_3 LnGE_{it} + \beta_4 LnPop_{it} + \varepsilon_{it} \quad (5)$$

Where i and t represent the district/city and year, respectively; β_0 is the intercept; β_1 to β_4 are the regression coefficients; $lnFin_{it}$ denotes the natural logarithm of total Sharia banking financing; FDR_{it} denotes the Financing-to-Deposit Ratio as a proxy for intermediation intensity; $lnGE_{it}$ denotes the natural logarithm of government expenditure; $lnPop_{it}$ denotes the natural logarithm of population size; and ε_{it} is the idiosyncratic error term.

The analytical procedure began with model specification testing. The Chow test was used to compare Pooled Ordinary Least Squares (Pooled OLS) and the Fixed Effects Model (FEM), while the Hausman test was used to determine whether the Fixed Effects Model (FEM) or the Random Effects Model (REM) was more appropriate (Akhter & Khan, 2017). Multicollinearity and heteroscedasticity tests were conducted to ensure statistical validity (Widarjono, 2009).

If heteroscedasticity was detected, Huber-White robust standard errors were applied to improve the reliability of statistical inference. Data were processed using Stata, and the results were evaluated using the F-test, t-test, and coefficient of determination (R^2) to assess the explanatory power of Sharia banking variables and control variables in explaining inclusive growth outcomes in Aceh.

Table 1. Operational Definition and Measurement of Variables

Variable	Symbol	Measurement Unit	Source
Independent Variables			
Total Financing	lnfin	Billion IDR (Log transformed)	OJK (SPS)
Financing-to-Deposit Ratio	FDR	Percentage (%)	OJK (SPS)
Dependent Variables (SDGs)			
Economic Growth	GRDP	GRDP per Capita Growth (%)	BPS
Gini Ratio	Gini	Index (0 to 1)	BPS
Human Development Index	HDI	Index Score	BPS
Unemployment	Unplo	Open Unemployment Rate (%)	BPS
Poverty	Pov	Percentage of Poor People (%)	BPS
Control Variable			
Total Population	lnpop	Number of People (Log transformed)	BPS
Government Expenditure	lnGE	Billion IDR (Log transformed)	DJPK

Source: Authors' compilation based on OJK, BPS, and DJPK data

RESULTS AND DISCUSSION

Results

Descriptive Statistics

Before conducting the inferential analysis, Table 2 presents the descriptive statistics for all variables. The dataset consists of 105 observations, covering 21 districts/cities in Aceh Province over five years (N = 21 districts/cities × T = 5 years). This balanced panel structure provides the empirical basis for examining the relationship between Sharia banking intermediation, fiscal policy, and SDG-related socio-economic outcomes.

Diagnostic Tests and Model Selection

Diagnostic tests were conducted to ensure that the regression estimates were statistically reliable and model selection was appropriate. As shown in Table 3, the mean Variance Inflation Factor (VIF) was 3.51, below the threshold of 10, indicating that multicollinearity was not a serious concern. The Hausman test yielded a probability value of 0.000 ($p < 0.05$) across all five models, supporting the use of the Fixed Effects Model (FEM) rather than the Random Effects Model (REM), as FEM better accounts for unobserved district-specific characteristics.

Heteroscedasticity was detected only in the GRDP model; therefore, Huber-White robust standard errors were applied. Although the unemployment model showed residual non-normality, the balanced panel structure (N × T = 105) supports asymptotic inference under the Central Limit Theorem (CLT).

Table 2. Descriptive Statistics of Research Variables (2020–2024)

Variable	Obs	Mean	Std. Dev	Min	Max
GRDP (%)	105	1.61	3.127	-17.21	6.45
Gini	105	0.283	0.034	0.207	0.356
HDI	105	72.874	4.854	64.93	88.85
Unplo (%)	105	5.566	2.138	1.24	11.99
Pov (%)	105	15.079	3.418	6.9	20.36
Fin	105	6.963	0.949	5.342	9.344
FDR (%)	105	137.28	48.65	37.04	291.7

Source: Authors' calculation based on OJK, BPS, and DJPK data

Panel Regression Results

Table 4 reports the Fixed Effects (FE) regression results for five dependent variables: GRDP, Gini Ratio, HDI, unemployment (Unplo), and poverty (Pov). Sharia financing has a negative and statistically significant effect on unemployment, with a coefficient of -1.699 ($p < 0.01$), indicating that higher Sharia financing is associated with stronger labor absorption in Aceh. However, Sharia financing does not show statistically significant effects on GRDP, the Gini Ratio, HDI, or poverty at the conventional 5% level. In contrast, the Financing-to-Deposit Ratio (FDR) has a positive and significant effect on HDI, with a coefficient of 0.006 ($p < 0.05$). This suggests that stronger Sharia banking intermediation contributes to human development through the productive channelling of funds.

Control Variables and Fiscal Paradox

The control variables provide additional insight into Aceh's regional socio-economic dynamics. Population size is positively associated with GRDP (68.371; $p < 0.01$) and HDI (63.272; $p < 0.01$) and negatively associated with poverty (-16.118; $p < 0.01$). These results

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suggest that population size may reflect market scale, labor availability, and broader regional economic capacity.

Government expenditure, however, has a positive and statistically significant effect on the Gini Ratio (0.077; $p < 0.01$). This finding indicates a fiscal paradox in Aceh, where higher regional government spending during the study period coincided with wider income inequality. This result suggests that public expenditure may not yet be sufficiently redistributive or effectively targeted toward inclusive welfare outcomes.

Table 3. Summary of Diagnostic Tests

Dependent Variable	VIF	Heteroscedasticity	Normality	Status
HDI	3.51	0.4385 (Not detected)	0.8580	Standard FEM
Gini	3.51	0.3465 (Not detected)	0.4369	Standard FEM
GRDP	3.51	0.0000 (Detected)	0.8580	Robust FEM
Unemployment	3.51	0.6598 (Not detected)	0.0000	CLT compliant
Poverty	3.51	0.3954 (Satisfied)	0.233 (Satisfied)	Standard FEM

Note: VIF denotes the variance inflation factor. Heteroskedasticity and normality tests are reported as p-values. Diagnostic decisions are based on the 5% significance level. Robust fixed-effects estimation is applied where heteroskedasticity is detected.
Source: Authors' calculations based on Stata 17 output.

Table 4. Fixed-Effects Estimation Results

	(1)	(2)	(3)	(4)	(5)
Variables	**GRDP**	**Gini**	**HDI**	**Unemployment**	**Poverty**
lnfin	0.315	-0.006	1.163	-1.699***	0.089
	(3.075)	(0.014)	(0.909)	(0.432)	(0.361)
FDR	-0.020	-0.000	0.006**	-0.002	-0.000
	(0.016)	(0.000)	(0.003)	(0.004)	(0.001)
lnpop	68.371***	-0.154	63.272***	-5.127	-16.118***
	(21.251)	(0.093)	(4.848)	(5.186)	(1.392)
lnGE	-2.263	0.077***	-1.077	-0.261	-0.022
	(3.087)	(0.025)	(0.735)	(0.685)	(0.232)
Constant	-809.204***	1.670	-694.011***	81.499	209.598***
	(243.507)	(1.033)	(56.628)	(59.872)	(15.278)
Observations	105	105	105	105	105
R-squared	0.314	0.186	0.871	0.294	0.643
Cross-sectional units	21	21	21	21	21
Prob > F	0.000	0.000	0.000	0.000	0.000
Hausman test, p-value	0.000	0.000	0.000	0.000	0.000
Estimator	FE	FE	FE	FE	FE

Note: Standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. FE denotes fixed-effects estimation.
Source: Authors' calculations based on Stata 17 output.

Discussion

The statistically significant negative effect of Sharia financing on unemployment in Aceh supports Gurley and Shaw's (1960) Financial Intermediation Theory, which views financial intermediation as a key channel for real-sector activity. In the context of Aceh's Qanun implementation, the results suggest that Sharia banks have contributed to the distribution of productive capital, particularly through financing schemes that engage local labor. This finding is consistent with the supply-leading hypothesis, in which the expansion of financial services precedes and stimulates real economic activity (Gheeraert, 2014). In Aceh, the asset-backed orientation of Sharia financing may strengthen its linkage with labor-intensive sectors, thereby helping explain its significant effect on unemployment.

Theoretically, this effect may be related to the profit-and-loss sharing (PLS) paradigm, which encourages banks and clients to share risk rather than rely solely on debt-based repayment (Meslier et al., 2020). Such risk-sharing mechanisms may support labor market stability by prioritizing business continuity and productive expansion. This mechanism is particularly relevant in post-conflict and disaster-affected regions such as Aceh, where MSMEs, as the backbone of the regional economy, require flexible capital structures to withstand market volatility. These findings align with Setiawan et al. (2024), who suggest that Islamic finance can support job creation by expanding financing access for MSMEs.

Consistent with the role of financing volume, Sharia banking intermediation, proxied by the Financing-to-Deposit Ratio (FDR), emerges as a significant driver of human development through the HDI pathway. An effective intermediation function can facilitate human capital accumulation by improving household purchasing power and supporting access to healthcare and education. This evidence suggests that Sharia banking in Aceh has moved beyond a passive depository role and has become an active channel for productive fund distribution. This finding aligns with Endogenous Growth Theory (Lucas, 1988), which argues that financial development contributes to long-term prosperity when it supports human capital formation. Furthermore, as argued by Wanke et al. (2022), because Sharia financing is linked to underlying assets, it may generate more tangible social spillover effects on welfare indicators than speculative, interest-based financial instruments.

A central finding of this study is the fiscal paradox, in which government expenditure is positively associated with income inequality, as reflected in the Gini Ratio. This misalignment between regional fiscal policy and distributive equity may indicate regressive spending patterns or a flypaper effect (Turnovsky & Erauskin, 2022), where large intergovernmental transfers, including Aceh's special autonomy funds, may not fully reach the intended beneficiaries. In this context, budget allocations may be absorbed by routine bureaucratic expenditure or large-scale infrastructure projects whose benefits are not immediately distributed to grassroots communities (Onana & Bella Ngadena, 2024). This pattern resembles the decentralization paradox observed in other resource-rich emerging economies, where local elite capture and institutional inertia may divert public funds toward sectors with low social multipliers (Li & Li, 2024).

The economic mechanism behind this paradox points to a synergy gap between Sharia banking and regional fiscal policy. While Sharia banks may broaden access to capital at the micro level, fiscal spending may simultaneously reinforce capital concentration at the macro level. This finding indicates that, without pro-poor governance, increased public spending may unintentionally strengthen the economic position of higher-income groups and widen income inequality (Abdulhakeem,

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2024). The role of population size further complicates this relationship: while population growth may support GRDP through market expansion and economic agglomeration, it may also increase pressure on the equitable distribution of public goods.

Overall, the findings indicate that Aceh's Sharia economic transformation requires stronger synchronization between the regional banking and fiscal sectors. Sharia banking appears to function as a socio-economic safety net by reducing unemployment; however, these gains may be weakened by non-inclusive public spending (Jatmiko et al., 2024). This condition calls for Sharia-aligned fiscal governance, in which regional budgets are designed to crowd in MSMEs and productive sectors already supported by Sharia bank financing. To address the fiscal paradox, regional authorities need a more redistributive fiscal framework aligned with the *Maqāṣid al-Sharīʿah* objectives of wealth circulation (*tadāwul al-māl*) and social equity. The success of a regional Sharia economic system therefore depends not only on the solvency of financial institutions, but also on the extent to which public budgets can reinforce financial intermediation, protect vulnerable groups, and support the achievement of the Sustainable Development Goals (SDGs).

The fiscal paradox in Aceh, where increased government spending is associated with wider inequality, requires a restructuring of regional governance. For the regional government, this implies a shift from routine-based budgeting toward a Maqāṣid-based fiscal framework, in which public expenditure is evaluated based on its distributive impact on the grassroots economy rather than merely on budget absorption. The Sharia banking sector should also move beyond passive intermediation and collaborate with the government through public-private-social partnerships. For example, regional budget allocations for social protection could be channeled through Sharia bank microfinancing schemes to create multiplier effects on employment. Such synergy would ensure that fiscal liquidity and Sharia financial intermediation move in the same direction: reducing poverty and inequality simultaneously. Without a synchronized policy roadmap, Aceh's transition to a full Sharia financial system may remain incomplete, as the banking sector's social gains could continue to be diluted by non-redistributive fiscal policies.

CONCLUSION

This study aimed to evaluate how Aceh's mandatory Sharia banking transformation contributes to SDG-related socio-economic outcomes and inclusive growth during the 2020–2024 period. Using a quantitative explanatory design with balanced panel data from 21 districts/cities and Fixed Effects estimation, the study examined the effects of Sharia financing, Sharia banking intermediation, government expenditure, and population size on regional welfare indicators.

The findings show that Sharia financing is significantly associated with lower unemployment, indicating its role in supporting labor absorption through productive financial intermediation. The Financing-to-Deposit Ratio (FDR) is positively associated with the Human Development Index (HDI), suggesting that stronger Sharia banking intermediation can support human development. However, government expenditure is positively associated with the Gini Ratio, indicating a fiscal paradox in which regional public spending appears insufficiently redistributive. These findings imply that Aceh's

Sharia financial transformation requires stronger coordination between banking intermediation and regional fiscal policy to produce more inclusive welfare outcomes.

This study is limited by its reliance on aggregate secondary data and its inability to distinguish the effects of specific Sharia contracts or expenditure categories. Future research should examine contract-level financing, disaggregated fiscal spending, Sharia financial literacy, and digital inclusion to better explain how Sharia finance is transmitted into inclusive welfare outcomes.

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